

80micro

A WAYNE GREEN PUBLICATION

the magazine for TRS-80* users

®

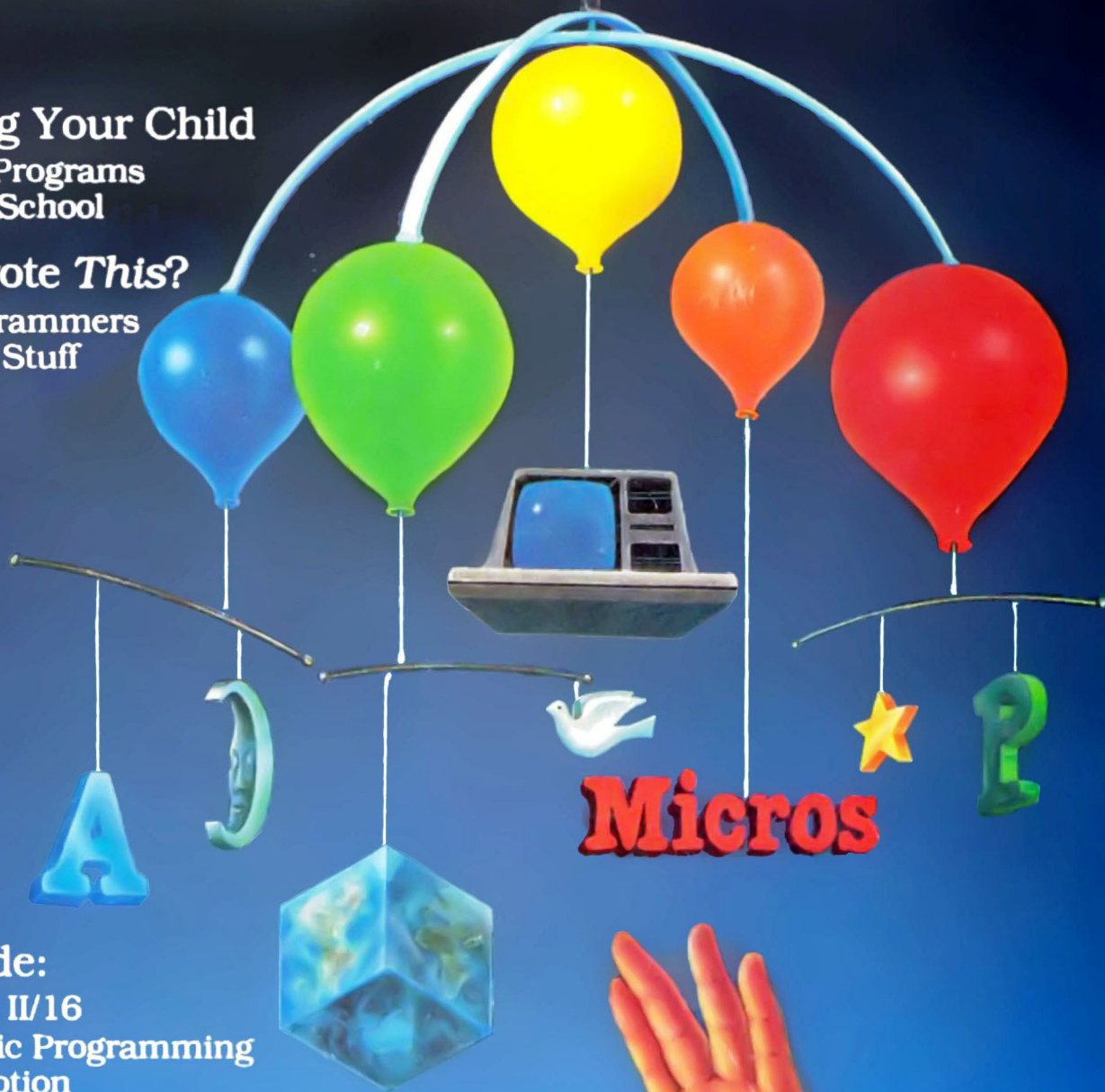
Micros: The New Supertoys

Educating Your Child

Six Simple Programs
Told Out of School

A Kid Wrote *This*?

Young Programmers
Show Their Stuff



Micros

Also Inside:

- Inside Your II/16
- Beyond Basic Programming
- Poetry in Motion
- Son of Pilot
- The Model 16 Reviewed



*TRS-80 IS A TRADEMARK OF RADIO SHACK, A DIVISION OF TANDY CORP

M I C R O T E R M

More and more hardware and communications services are allowing speeds up to 1200 baud. Soon, some may be going faster than that. Today's terminal software simply can't keep up. But now there is an alternative. Micro-Systems Software introduces MicroTerm, the high speed terminal.

Model III MicroTerm will communicate, without insertion of null characters, at 4800 baud. Guaranteed. No cop-outs, no question. MicroTerm is so fast that you can exit from the terminal to the main menu, adjust video width, open the buffer, turn on the printer, or any one of dozens of other functions, and return to the terminal model **without missing a thing!**

MicroTerm continues to input from the RS232, even while at the main menu. This is the only terminal capable of such an astounding feat. MicroTerm offers you most of the features that "Brand X" smart terminals have, plus it gives you: • Ultra high baud rate operation (up to 9600 in certain cases). • Input while at menu. • Easy to use translation tables. • Easy to use phone number listings. • Maximum auto dial support — most major brands. • Direct file transfer companion program included at no extra cost (compatible with DFT). • DOS commands from menu without exiting program. • Over 34K of capture buffer (in a 48K TRS-80). • Can be set to automatically dial telephone and transmit buffer at preset time without any operator intervention.

And many, many more great features. MicroTerm is so fast you must see it to believe it. The various menus are displayed so fast, they seem to jump out at you. Status of various functions can be displayed and altered in split seconds.

For the computerist who wants the ultimate, state-of-the-art terminal software, there is no other choice.

MicroTerm retails for \$79.95, but registered DOSPLUS owners can purchase it for only \$59.95. \$20.00 off the retail price! MicroTerm comes complete with the terminal program, the direct file transfer program, some standard translation tables, and documentation.

Don't delay, order yours today! Specify when ordering: Model I or III and whether you want it on 40 or 80 track media. Requires a 16K TRS-80 with one disk drive. We recommend 48K for serious communications work. MicroTerm will be available beginning June 30, 1982.



**MICRO-SYSTEMS
SOFTWARE, INC.**

4301-18 Oak Circle
Boca Raton, FL 33431
Telephone: (305) 983-3390





We're Expanding Your TRS-80* Model III With Reliable Hard-Line Thinking

Let's cut through all the "compu-babble" about hard-disk systems with some hard-line thinking.

You want a hard-disk system for your TRS-80* Model III for some fairly basic reasons:

- More storage capacity than your present system
- Faster retrieval and storage of information
- Accurate processing with reliable hardware and software

PERCOM DATA was pioneering critical, reliable data separation functions for micro systems long before many of today's companies even began. PERCOM DATA's solid industry reputation is your promise of hard-disk performance, from a drive with specifications equal to or superior to your own system.

PERCOM DATA 5¼ inch PHD's™ are your easy, hard-line answer. These units are available in 5, 10, 15 and 30 megabyte models. The First Drive unit has a micro-processor-based drive controller, permitting you to add up to 3 more hard-disk PHD's. And PHD series prices begin at under \$2500.

So, if you're ready to expand your TRS-80 Model III, do it with PERCOM DATA's PHD. Our hard-line thinking of more than half a decade means you get a reliable, high-quality PERCOM DATA peripheral, backed by the PERCOM DATA Performance Promise.

Take a hard-line of your own today! Call one of our Sales Consultants for more information and specifications or for the name of your close-by PERCOM DATA Dealer.

PERCOM DATA's Hard-Line Hotline is 1-800-527-1222

PERCOM DATA
CORPORATION

Expanding Your Peripheral Vision

DRIVES • NETWORKS • SOFTWARE

11220 Pagemill Road Dallas, Texas 75243 (214) 340-7081
1-800-527-1222

80 Contents

Features

- 38. The Next Step**
A new column on combining Basic and machine language.
Hardin Brothers
- 40. Suite 16**
A new column on the Model III and III/16.
Dan Keen and Dave Dischert
- 166. States and Capitals**
Quick. What's the capital of Ohio? If you guessed Cleveland or Toledo, you'd better use this states program to refresh your memory.
Dennis Weide

COLUMBUS



February, 1983 Issue #37

80 Micro (ISSN 0744-7868) is published 12 times a year by 1001001 Inc., 80 Pine St., Peterborough, NH 03458. Phone 603-924-9471. Second class postage paid at Peterborough, NH, and additional mailing offices. Subscription rates in U.S. are \$25 for one year and \$53 for three years. In Canada and Mexico \$27.97—one year only. U.S. funds drawn on a U.S. bank. Canadian distributor: Micro Distributing, 409 Queen St. West, Toronto, Ontario, Canada M5V 2A5. BC Canadian distributor: Graymar Data Services, Ltd., #4 258 E. 1st Ave., Vancouver, BC V5T 1A6. Foreign subscriptions (surface mail), \$44.97—one year only. U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. In South Africa contact 80 Micro, P.O. Box 782815, Sandton, South Africa 2146. All U.S. and Canadian subscription correspondence should be addressed to 80 Micro, Subscription Department, P.O. Box 981, Farmingdale, NY 11737. Please include your address label with any correspondence. Postmaster: Send form 3579 to 80 Micro, Subscription Services, P.O. Box 981, Farmingdale, NY 11737.



Manuscripts are welcome at 80 Micro. We will consider publication of any TRS-80 oriented material. Guidelines for budding authors are available. Please send a self-addressed envelope and ask for "How to Write for 80 Micro." 80 Micro is published monthly by 1001001 Inc., a subsidiary of Wayne Green Inc. Entire contents copyright 1982 Wayne Green Inc. No part of this publication may be reprinted, or reproduced by any means, without prior written permission from the publisher. All programs are published for personal use only. All rights reserved.

*TRS-80, Scripsit and TRSDOS are trademarks of Tandy Corp.

Cover by William Glese

178. Spelling Challenger

With these three word games, your kids can learn their spelling words while having a good time.

Larry Kregel

184. Math Fun



Your children will have so much fun playing with your micro that they won't even notice they're learning addition and subtraction.

David Haan

208. Michael's Game

Youngsters don't have to grow up afraid of micros. Start them off early with this game program that teaches letters and numbers.

Nancy Modney

212. Refrigerator Controller

Got an old refrigerator hanging around? This unit will let you control its lighting and temperature for all sorts of science projects.

Doug Biedenweg

237. Horse Race II

This revision of a previously published program makes it a more useful educational tool.

Danley Christensen

270. Twinkle, Twinkle, Little Star

With a little help from you and some imaginative graphics, the TRS-80 becomes a poet.

Bill Grout

In our January issue, we published a program by Bruce Tonkin called *The Creator*. It has since come to our attention that Software Technology for Computers (PO Box 428, Belmont, MA 02178) markets a program generator that is also called *The Creator*, and holds a trademark to that name. These programs are in no way related, and should not be confused with one another.

We regret any inconveniences we might have caused *STC* or our readers.

Young Programmer's Awards

84. Introducing the Young Programmers' Awards

We've known for some time kids make up a significant portion of our readers, but we weren't ready for this!



85. Quest for the Key of Nightshade



An adventure written in Assembly language.

David Schmidt (Grand Prize)

96. Project Deep Dive



Guide your sub through a winding tunnel while trying to avoid mines and torpedo launchers.

Michael John Lake (First Place, 14-18)

104. Music Composer

Store up to 200 notes on your Color Computer and save the music you've created on tape.

Carl Huben (First Place, 11-13)

108. Super Draw



Make your CRT a sketch pad, save your drawings, and recall them at a later date.

Terry Myerson (First Place, 10 and under)

116. TRS-Turtle



Now bring this famous teaching tool into your Tandy machine.

Larry Brackney (Second Place, 14-18)

124. The Lair of Kraken

Travel through an underwater palace battling the abominable Kraken.

Beth Norman (Second Place, 11-13)


80 Contents

132. Byte Cycles

A joystick game a la the light cycle races in TRON.


Nathan Miller (Second Place, 10 and under)

134. Boxer

 Test your pugilistic skill in this nifty game involving you against the computer.


Lloyd Kupchanko (Third Place, 14-18)

149. Foreign Flag Quiz

 Test your knowledge of world draperies.


Jennifer Neidenbach (Third Place, 11-13)

152. CASS-80

 Have your own cassette-based bulletin-board system.

Scott Steele (Third Place, 11-13)

160. Math Countdown

 A computer class programming assignment turns into a valuable learning tool.

Adam Wells (Third Place, 10 and under)

Articles

198. The Intersoft C Compiler

This version of the C language incorporates some of the ideas of Pascal and Assembly and provides some features borrowed from UNIX.

Rowland Archer

218. Son of Pilot

If you've wanted to use Pilot, but it did not work on your system, try this altered version.

Randy Hawkins

224. Cassette Index

If you want to save time when loading programs, try this index for the Color Computer.

Andrew Sensicle

228. The Model 16

An in-depth review of Tandy's 16-bit machine.

Jim Hawkes

244. The Art of Encoding and Decoding

Use your computer to translate your messages into an indecipherable mess; then with this program, you can translate them back again.

Karl Andreassen



252. LP VII Screen Printout

Reproduce the video display on paper.

Serge Calmettes

254. Fun for the Younger Set

Introduce your 5-year-old to the TRS-80 with these math and word programs.

Safi Bahcall

256. Convergem

Adjust the color and alignment of your color monitor with this Color Computer program.

James A. Sanford

260. APL Primer—Part III

This month's installment contains a bonanza of functions. To name a few: logical operators, shaping, indexing, and reduction.

Margaret M. Grothman

280. Mod II Random Access

You can benefit from this author's migraine headaches caused by Model II mishandling of disk data.


Terry Kepner

282. Drop Your Color Computer into Disk Drive

Discover life in the fast data lane by putting the pedal to the metal oxide.

Robert Nicholas and Philip Martel

296. Screen Format Program Generator

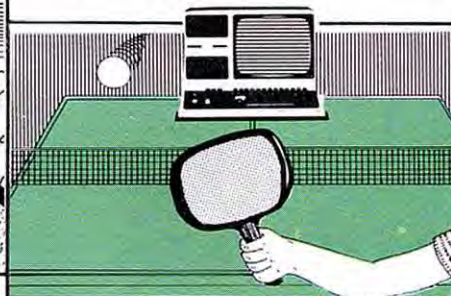
 Save yourself the trouble of figuring screen locations, field prompts, and input fields and let your computer do the work for you.

Joel Belcher

310. Peek Pong

If you thought fast-paced games couldn't be written in Basic, Peek Pong should surprise you.

Charles Gulick



314. Color Life

Watch communities of organisms develop with the Game of Life for the Color Computer.

Larry F. Perry

328. The Input Specifier

A subroutine allowing editing of input and saving your programs from crashing.

G. Schweizer

332. Color Computer Merge

Concatenate your programs on tape.

John Heusinkveld

334. Transmuter

Merge Transmuter with another program and you can relabel any and all program variables.

Jon Mark O'Connor

Departments

8. Remarks

The 16-bit fad.
Wayne Green

10. Proof Notes

Piracy becomes a political issue.

12. To Copy or Not to Copy

A reader offers a helping hand and raises a commotion.

80 Contents

PUBLISHER/EDITOR
Wayne Green
EXECUTIVE VICE PRESIDENT
Sherry Smythe
ASSISTANT TO PRESIDENT
Matt Smith
GENERAL MANAGER
Debra Wetherbee
ASSISTANT PUBLISHER
Jeff DeTray
CORPORATE CONTROLLER
Roger Murphy
CIRCULATION MANAGER
603-924-9471
Patricia Ferrante
BULK & NEWSSTAND SALES MANAGER
Ginnie Boudrieau
ADVERTISING, 603-924-7138
Advertising Manager: David Schissler
Sales: Penny Brooks, Mary Hartwell
Ad Coordinator: Betty Butler
New England
Advertising Representatives:
John A. Garland, Frank Surace,
Garland Associates, Inc., Box 314 SHS,
Duxbury, MA 02332 617-934-6464

PRODUCTION
Manager: Nancy Salmon
Assistant: Michael Murphy
Frances Benton, Mike Ford,
Phil Geraci, Donna Hartwell,
Kim Nadeau, Lynn Parsons,
Dianne Ritson, Deborah Stone,
Theresa Verville, Laura Woerner,
Karen Wozmak;
Ad Coordinators: David Wozmak,
Mary Seaver, Assistant: Paula Ramsey;
Advertising Production: Jane Preston,
Fiona Davies, Bruce Hedin, Scott Philbrick
PHOTOGRAPHY
Thomas Villeneuve, Sandra Dukette,
Laurie Jennison, Irene Vail,
Robert M. Villeneuve
TYPESETTING
Sara Bedell, Marie Barker, Melody Bedell
Michele DesRochers, Jennifer Fay,
Lynn Haines, Linda Locke,
Nancy Newman, Debbie Nutting,
Karen Stewart, Susan Weller
DESIGN
Joyce Pillarella, Susan Donohoe,
Denzel Dyer, Howard Happ,
Laurie MacMillan, Dion Owens,
Susan Stevens, Donna Wohlfarth
PROMOTION COORDINATOR
Christine DesTremps

The left bracket, [, replaces the up arrow used by Radio Shack to indicate exponentiation on our printouts. When entering programs published in *80 Micro*, you should make this change.

80 formats its program listings to run 64-characters wide, the way they look on your video screen. This accounts for the occasional wrap-around you will notice in our program listings. Don't let it throw you, particularly when entering assembly listings.

Article submissions from our readers are welcomed and encouraged. Inquiries should be addressed to: Submissions Editor, 80 Pine Street, Peterborough, NH 03458. Include an SASE for a copy of our writers' guidelines. Payment for accepted articles is made at a rate of approximately \$50 per printed page; all rights are purchased. Authors of reviews should contact the Review Editor, 80 Pine Street, Peterborough, NH 03458.

18. Input

The new exciting PC-2. Better than On Break GOTO. Okidata 83A problems. The meaning of baud.

28. Aid

Engineering software. Last One questions. Interfacing problems Down Under. Model III Cassbox? Scientific reconstruction of auto accidents.

30. Debug

Bugs in Casino Draw Poker. Model III Graftrax. Digital Doodles. Tee for Six. Tax Estimator.

32. Anniversary Correction

Directory Information, Please correction. Here are the listings.
Charles P. Knight

37. Commander 80

Structured programming blues.
Jake Commander

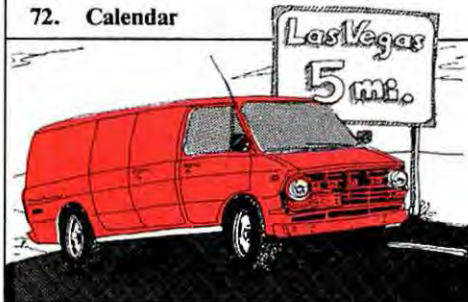
46. Reviews

Quality instructional lessons with Author I. Create compiled Basic programs with The Basic Answer. Graphics-enhanced Basic. Apple Crunch, a computer crime novel. The Echo General Purpose Speech Synthesizer. DBASIC works with FLEX. Doughflo. Ultra-Term. Mikeegraphic Graphic System. Microbuffer and MXPLUS make your Epson perform like never before.

71. Review Digest

El Diablero—An Adventure Game. Telewriter, the disk version. Out-house. Fan for the Color Computer. Roman Checkers, Tandy's Othello.

72. Calendar



80. The Gamer's Cafe

Wherein a sprite named Mercedes Silver helps Max and Rodney win back the van from Nurse Lovelace.
Rodney Gambicus

342. News

Tandy's program to help independent software writers. Isaac Asimov speaks in Brooklyn. Will rent-a-computer be a new trend? Pilot service center in Dallas may be start of something big. Custer's Revenge stirs national outrage.



364. Copernica Mathematica

Aerobic mathematics.
Bruce Powel Douglass

374. MONEY DOS

First came the hotline, now the bulletin board.
J.M. Keynes

380. Fun House

Dice games called Show Up, Drop Dead, and Martinetti.
Richard Ramella

387. Index to Advertisers

406. Feedback Loop

80 to 35 tracks. Model I service manual. Expanding RAM. How to become an independent service person. Color Computer light pen. External Model III double-headed drives. Programming in English. Computer insurance.
Terry Kepner

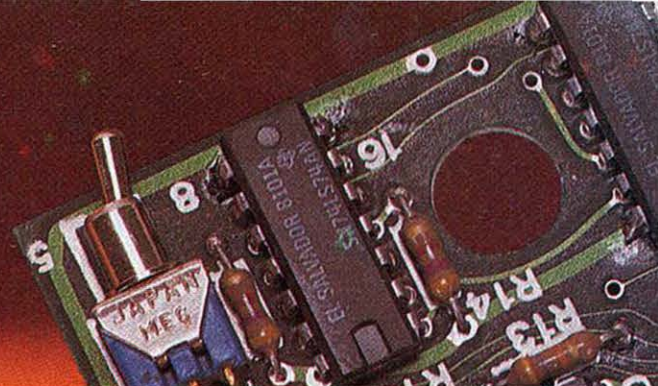
416. Reload 80

The finer points of tape loading.
Art Huston

420. New Products

Personal Speech system. CP/M Software Index. 96K for Model I. Printer Optimizer. The Amazing Ben. Model II Locker. Micromouse. Softrol recorder switch. Zaxxon for Color Computer. Food co-op software. Bumperware 1.0.

THE SWITCH



SWITCH TO 5¹/₈" DOUBLE DENSITY

LNDoubler 5/8

FEATURES

- 5- and 8-inch* disk drives
- Single- & double-density
- Any size and density in any mix
- Read Model I, II* and III disks
- 5- or 8-inch* system disk
- Single & double sided disk drives
- DOS+ 3.3.9 included, with Disk BASIC.
- 6 month warranty
- Up to 3.75 megabytes online
- Easy installation - plug-in & run
- Analog phase lock loop data separation
- Precision write precompensation
- Regulated power supply
- Guaranteed operation at 4MHz
- All contacts gold plated
- Solder masked & silk screened
- Runs under DOS+ 3.3.9, TRSDOS 2.3, NEWDOS 2.1, NEWDOS/80 1.0, LDOS, NEWDOS/80 2.0, and ULTRADOS
- Reads 40- and 35-track disks on 80-track drives
- FD1791 controller + your FD1771
- Fits Model I expansion interfaces
- Fits LNW expansion interfaces
- Track configurations to 80-tracks
- 5 inch disk storage increased to:
 - 161,280 bytes - 35-track SS/DD
 - 322,560 bytes - 35-track DS/DD
 - 184,320 bytes - 40-track SS/DD
 - 368,640 bytes - 40-track DS/DD
 - 368,640 bytes - 80-track SS/DD
 - 737,280 bytes - 80-track DS/DD
- 8 inch disk storage increased to:

591,360 bytes - 77-track SS/DD
1,182,720 bytes - 77-track DS/DD
SS: single-sided DS: double-sided
SD: single-density DD: double-density

COMPLETE - The LNDoubler 5/8, switches your Model I or LNW-80 into the most versatile computer you can own. The LNDoubler's switch allows you to boot from 5- or 8-inch system disks, and it's accessible from outside the interface. The LNDoubler 5/8 comes with a double-density disk operating system (DOS+ 3.3.9), complete with BASIC and utility programs . . . ready to run your software NOW!

VERSATILE - Whether you want single-sided, double-sided, single- or double-density, 5- or 8-inch operation, complete versatility is here today! Any combination of 5- and 8-inch disk storage is possible with the LNDoubler 5/8. Each of your present 40-track, single-sided 5-inch drives will store up to 184,320 bytes (formatted storage) - that's an 80% increase in storage capacity for only half the cost of just one disk drive. With three 8-inch double-density, double-sided drives your Model I will have 3.75 Megabytes of online storage - that's more storage than a Model II or Model III!

ADVANCED - The LNDoubler 5/8 is the most technically advanced, tested and reliable double-density

board you can buy. The LNDoubler 5/8 has more features, more options and more software support than any other product of its kind.

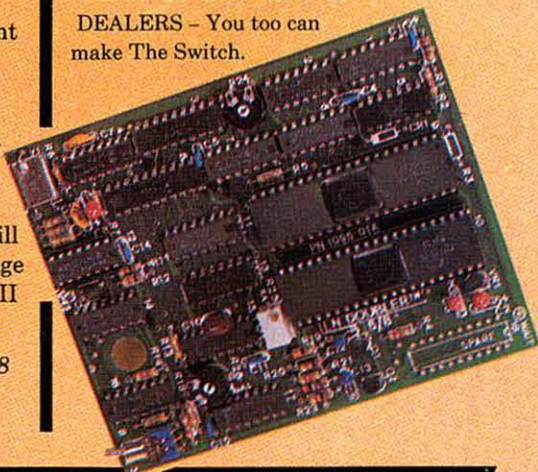
EASY TO INSTALL - The LNDoubler 5/8 is easy to install. There are no traces to cut, no wiring to do, just a screwdriver and a few minutes of your time is all that is required. The instructions are fully illustrated for all interfaces. In minutes you will be 'up-and-running', and enjoying your computer as never before.

COMPARE - Compare features, compare quality, compare value, and make the SWITCH today!

Immediate delivery from stock - at your dealer NOW for only

\$ 219.95

DEALERS - You too can make The Switch.



LNW RESEARCH CORPORATION

2620 WALNUT Tustin, CA. 92680 (714) 544-5744 (714) 641-8850

*8" drive operation requires special cable, 8" double-density requires 3.55MHz CPU speed-up modification or LNW-80 4MHz computer. TRS-80 is a trademark of Tandy Corporation.

If you don't think that all eyes in the microcomputer industry—including those peering through the murk from the Tandy Towers in Fort Worth—are watching IBM, you're dreaming. As soon as news that the IBM Personal Computer was going to be using the 8088 chip (a news flash that preceded the unveiling of the computer by several months, despite the usual IBM efforts at tight security) reached central Texas, there was no further question about delaying a 16-bit computer.

Since the enthusiasm for Tandy stock seems to be tightly connected by investors to the perceived prospects of the TRS-80 computers, there seems to be a natural Tandy tendency to enhance this perception as much as possible.

Could this single-minded concentration on appearances have influenced the technical design of the Model 16? It does strike some people as curious that this system was rushed into production before the 16-bit software support was even a glimmer in the father's eye.

When one looks over the 16-bit processors on the market at present, the 68000 chip selected by Radio Shack does at first look like the best way to go. It is in many ways like the 6800 chip in that it works more in terms of a 32-bit system, but does it in 16-bit segments, just as the 8-bit chips address a 16-bit memory in two steps.

But why, you might ask, if what we really seem to be needing is a 32-bit system, are we horsing around with 16-bit chips? Indeed, I asked just this question to a designer of computers. It was then I discovered that the serious designers of desktop computers have dismissed the 16-bit chips as a temporary fad, one that will probably lead a good many of the software people astray for a few months until they realize that most businesses really need a 32-bit oriented system, at which time they will throw out all of their half-finished programs and conversions to sit down and start anew.

For those of you who are not fast with your binary numbers, an 8-bit binary number can address 256 locations. Sixteen bits allows you to address 65,536 locations. This is simplified to 64K in the ads. Since most business uses of a computer require a lot more addressable locations than that—say, for allowing the computer to sort names and addresses into zip-code order without taking months to do it—the more

Another worry about the Model 16?

internal memory the computer owner can afford, the faster the system can do these number-crunching operations. But there is no use buying more internal memory (RAM) if the computer CPU can't quickly address it.

A practical limit might have been 24 bits, since this would allow the computer to directly address 16 megabytes of storage. Even with the still dropping cost of RAM memories, it is going to be a while before we even approach that limitation. We are seeing some one-megabyte RAM desktop computers (which actually take only 20 bits to address), and, with the growth of 16-bit systems that can address a 32-bit bus, I'm sure we'll soon be seeing systems with two megabytes of RAM... and so on. That still puts 16 MB a long, long way off. Maybe a couple of years.

A 32-bit oriented microprocessor chip is capable of substantially increasing the throughput of a computer as compared with the 16-bit-oriented units. It could be a factor of four times. Now, for the average small office where 99 percent of the time the computer is sitting around waiting for the operator, this may not be an important development... at least for the moment. But let's remember one of the basics of computers, Green's Axiom 107, that the more you use a computer, the more you find for it to do.

We're just starting to be serious about asking that all of our desktop computer systems be able to work with virtually any number of other computers in a network... or to host other smaller computers. The coming proliferation of incredibly inexpensive home computers, any of which can be pressed into service as a satellite computer for a small business network or even a home network, has to be dealt with.

One thing we know for sure, there is a raft of Japanese technicians and engineers (many of them graduates of their ham radio exposure in high school) working enthusiastically to develop

LCD flat screens for the low-end computers. These will be along the lines of the pocket LCD screens on the new television sets. The \$100 (\$79.95 at Lechmere's) home computer, complete with 64 × 16 screen, is coming... soon.

Once we have that, we won't even have to buy a \$69.95 black and white TV set to use for a monitor! But with or without the LCD screen, you know as well as I that home computerists will be running wires around their homes so they can have a remote computer/terminal in the kitchen, by the phone, in the living room, in the bedroom... hell, perhaps in the bathroom for those used to taking in a book to read.

In the office, the el cheapo computer/terminals will be networked to the host system, allowing every worker in the business to access data, swap messages, keep notes, and so on... all without upsetting their word processing or data entry via more traditional computers or terminals.

Such networking calls for some power in the host system, particularly as the users get involved with ever more applications. I think that this demand will put on the pressure for the desktop computer industry to move on to the 32-bit processors... and quickly.

But what about the software, you exclaim? In this case, the news is cheering. From what I've been able to learn, the Intel 80286 chip will run all of that nice 8080 stuff from 1976, the Z80 stuff from 1977-82, the 8086 stuff from this year... and so on. It will also want to have a bunch of new, higher throughput oriented programs written to really take advantage of the new 32-bit power. But at least it won't leave us high and dry as did the Radio Shack Model II and their CoCo.

Since Radio Shack seems to be committed to supporting the business market via a higher end system, I'm sure that somewhere in the bowels of one of the Tandy Towers, a dedicated team of engineers is working day and night to come up with a 32-bit computer with which to dazzle us... and the financial press. Surely they won't wait for IBM to put on the pressure again.

Will we see this by Comdex time this fall? Probably not. But then, considering the pace of the industry, can they afford to wait until their traditional August new product showing time for something as key to their future as this? ■



META TECHNOLOGIES



26111 Brush Avenue, Euclid Ohio 44132

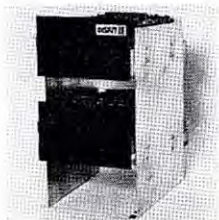
FOR ORDERS ONLY CALL 1-800-321-3552

IN OHIO and all other inquiries call (216) 289-7500

13

DISKIT III

MODEL III DISK UPGRADE



Features

- Gold Plated Edge Connectors
- Switching Power Supply
- Supports 5" or 8" Drives
- 40/80 Track Supported
- Single/Dual Head Supported
- Metal Disk Drive Brackets
- All Hardware and Cables for Two Disk Drives
- 1 Hour or Less for Installation
- 100% Compatible
- No Soldering Needed
- 180 Days Warranty on Controller

DISKIT III W/O Drives	\$269.00
DISKIT III W/ONE Tandem	
100-1 40 Track Drive	\$469.00
DISKIT III W/TWO Tandem	
100-1 40 Track Drive	\$679.00

TRS-80, HEATH, IBM, APPLE, ZENITH DISK DRIVES

BARE DRIVES from \$209.00
Model I & III Complete . . . from \$279.00

LNW

Mod. I System Expansion II
w/32K RS232 \$349.00
LNDOUBLER 5/8 Board \$149.00

Expand your TRS-80™ MODEL I with

EXTENT-80™ CONNECT UP TO 8 DRIVES

Complete with instructions and patch program diskette for configuring your favorite operating system \$79.95

BOOKS

OTHER MYSTERIES	
TRS-80 DISK	\$19.95
Microsoft Basic Decoded	\$24.95
The Custom TRS-80	\$28.95
Basic Faster & Better	\$29.95
The Custom Apple	\$28.95
DISK I/O	\$29.95
1001 Things To Do With Your Personal Computer	\$ 7.95

APPLE is a registered trademark of Apple Computer Inc. TRS 80 is a trademark of the Radio Shack Division of Tandy Corporation. DATALIFE is a trademark of VERBATIM. PLAIN JANE, PARAGON MAGNETICS are trademarks of MTC. ©1982 by Meta Technologies Corporation

TO ORDER CALL

1-800-321-3552

IN OHIO

AND ALL OTHER INQUIRIES

(216) 289-7500

PRICES IN EFFECT

THRU

February 28, 1983

Prices, Specifications, and Offerings subject to change without notice

8302

WE ACCEPT

- VISA
- MASTER CHARGE
- CHECKS
- MONEY ORDERS
- C.O.D.

- Add \$3.00 for shipping & handling.
- \$2.00 EXTRA for U.S. Mail delivery.
- \$5.00 EXTRA for C.O.D.
- Ohio residents add 6.5% sales tax.

MTC's

premium Single-Sided, Soft-Sector DOUBLE-DENSITY, 5 1/4-inch diskettes with reinforcing HUB-RINGS. Individually 100% ERROR-FREE certified. Invest in GOLD!

PARAGON MAGNETICS GOLD \$24.95

VERBATIM

Soft-Sector Diskettes

5-1/4" 1S/DDen(MD525-01)	\$26.95
5-1/4" 2S/DDen(MD550-01)	\$39.95
5-1/4" 2S/4Den(MD557-01)	\$51.50
8" 1S/DDen(FD34-8000)	\$43.95

Hard-Sector Diskettes

5-1/4" 1S/DDen 10-sector (MD525-10)	\$26.95
5-1/4" 2S/DDen 10-sector (MD550-10)	\$39.95
5-1/4" 2S/4Den 10-sector (MD557-10)	\$51.50

HEAD Cleaning Kit \$24.95

HUB RING KIT for 5 1/4" disks \$10.95

HUB RING KIT for 8" disks \$12.95

REFILLS (50 Hub Rings) \$ 5.95

5 1/4-inch diskette case \$3.50

8-inch diskette case \$3.95

5 1/4-inch File Box for 50 diskettes \$24.95

8-inch File Box for 50 diskettes \$29.95

PRACTICAL PERIPHERALS

MICROBUFFER™. IN-LINE FOR ALL COMPUTER/PRINTER OR COMPUTER/MODEM COMBINATIONS

MICROBUFFER II

16K Parallel	\$259.00
32K Parallel	\$299.00
16K Serial	\$259.00
32K Serial	\$299.00

MICROBUFFER/E

MBP-16K Parallel	\$159.00
MBS-8K Serial	\$159.00

MICROBUFFER IN-LINE

32K Parallel	\$ CALL
64K Parallel	\$ CALL
32K Serial	\$ CALL
64K Serial	\$ CALL
64K Memory Expansion Modules	\$ CALL

MODEL I / III SOFTWARE

Apparat's NEWDOS/80 V2 + MTC Que Card™	\$129.95
Electric Pencil Version II - Disk Version	\$ 79.95
Electric Pencil Version II - Tape Version	\$ 69.95
Introduction to TRS-80 Assembly Programming	
Remassem-1 (Tape Version)	\$ 69.95
Remassem-1 (Disk Version)	\$ 74.95
Remassem-3 (Tape Version)	\$ 74.95
Remassem-3 (Disk Version)	\$ 79.95
Remdisk-1 (Disk I/O Techniques)	\$ 29.95

PROOF NOTES

The editors look at the issues

MANAGING EDITOR
Eric Maloney

SENIOR EDITOR (EDITORIAL)
Michael E. Nadeau

SENIOR EDITOR (PRODUCTION)
Lynn Rognsvoog

NEWS EDITOR
John P. Mello Jr.

REVIEW EDITOR
Janet Fiderio

NEW PRODUCTS EDITOR
Eric Grevstad

ASSISTANT EDITORS
Deborah Sargent
Mary E. Ruth
Stephen F. Tomajczyk
Lynne Patnode

TECHNICAL CONSULTANT
Jake Commander

TECHNICAL EDITORS
G. Michael Vose
Art Huston

PRODUCTION EDITOR
Susan Gross

LAYOUT EDITORS
Joan Ahern, Bob Dukette,
Sue Hays, Laura Landy,
Anne Vadeboncoeur

PROOFREADERS
Peter Bjornsen,
Harold Bjornsen,
Vinoy Laughner, Louis Marini

EDITORIAL ADMINISTRATION
Carole Macioci, Nancy Noyd

Subscriptions:

Problems with Subscriptions: Send a description of the problem and your current and/or most recent address to: *80 Micro*, Subscription Department, P.O. Box 981, Farmingdale, NY 11737.

Change of Address: Send old label or copy of old address and new address to: *80 Micro*, P.O. Box 981, Farmingdale, NY 11737. Please give eight weeks advance notice.

Microfilm: This publication is available in microform from University Microfilms International. United States address: 300 North Zeeb Road, Dept. P.R., Ann Arbor, MI 48106. Foreign address: 18 Bedford Row, Dept. P.R., London, WC1R4EJ, England.

Dealers: Contact Ginnie Boudrieau, Bulk Sales Manager, *80 Micro*, Pine St., Peterborough, NH 03458. (800) 343-0728.

As we sifted through the mail concerning "To Copy or Not to Copy" (see p. 12), one point became clear: Software piracy has become a political issue.

True, some people are out there duplicating software to avoid the expense of buying it; and some are selling pirated software to make a dishonest buck. But an increasing number of consumers are copying disks and tapes as a form of retaliation. They're sticking it to an industry that they feel has been shafting them for too long.

They are, in essence, waging guerrilla warfare.

Of course, many software manufacturers conduct themselves in a responsible and professional manner. And as the industry matures, more and more companies are realizing the importance of being responsive to their customers' needs.

But we are still seeing myriad questionable business practices. Companies that advertise in computer magazines one month are nowhere to be found the next. Basement outfits with suddenly successful products find themselves unable to properly fill orders. Poor management, shifts in personnel, and changing product lines lead to inadequate after-sale support. Promises made in magazine ads turn out to be misleading or fraudulent.

It is in this atmosphere of confusion that software manufacturers are complaining about software piracy. Is it any wonder that consumers are less than sympathetic? That they are refusing to increase numbers to buy protected software? And that they are breaking such software with so much zeal?

Unfortunately, manufacturers have tended to look at the piracy problem strictly in economic terms. As they see it, the consumer is trying to rob them of their rightful riches. So they've responded by pulling out the heavy artillery: law suits, fancier protection schemes, bloated user's manuals, and owner's registration numbers. Entire packaging and marketing plans are being influenced by efforts to stop unauthorized software duplication.

Such strategies are narrow-minded and shortsighted. They are doing nothing but encouraging further resistance. They are doomed to failure.

Piracy has become political issue

If manufacturers want to curb software piracy, they're going to have to take a much bigger step. They are going to have to improve their responsiveness to their customers' needs. They are going to have to provide ample proof that the loyalty and respect they demand of the consumer is reciprocated. Only then will the consumer feel any responsibility to protect the manufacturers' proprietary interests.

Unfortunately, the better companies must share the anger fostered by others. But they are also in the best position to do something about it. Perhaps the time has come for them to take the lead in guiding and policing the software industry. Perhaps they need to develop a code of ethics and take steps to enforce it.

As long as there are people who want to make a quick buck from the labors of others, software piracy will be a problem. But that problem could be curbed considerably if the software industry made a concerted effort to regain the respect of the consumer. Otherwise, we can expect the insurgency to continue for some time to come.

* * * * *

In our response to "To Copy or Not to Copy," we asked readers to advise us on whether we should publish the name of the person offering the key to backing up Super Utility Plus. The response was an overwhelming "Yes." Nevertheless, we have decided to withhold the name.

We agree with many of the comments made. Most readers would like to back up Super Utility Plus, and other software, only to guard their own interests. But we do not want to declare open season on the manufacturers of protected software. To do so, we feel, would only aggravate an already-volatile situation.

On the other hand, we understand our role as a primary source of information on the TRS-80 microcomputers.

continues on p. 29



META TECHNOLOGIES



26111 Brush Avenue, Euclid Ohio 44132
CALL TOLL FREE 1-800-321-3552 TO ORDER
IN OHIO, call (216) 289-7500 (COLLECT)

A Few Words About The NEW AIDS-III™ by SofTrends, Inc.

1. TRUSTWORTHY. A bad diskette or an dependable machine can ruin your whole day. The NEW AIDS-III checks itself. If something's wrong, it tells you, instead of turning on you like a mad dog.

2. GENEROUS. The NEW AIDS-III doesn't use BASIC. But it does use the memory BASIC uses. And to make the most out of that extra memory, it selectively compresses bytes into tiny bits. It all adds up to more usable data records. Up to 3 times as many.*

3. THOUGHTFUL. The NEW AIDS-III never treats you harshly. If one keystroke will do, it won't ask for two. The NEW AIDS-III remembers things like report formats, search strategies and file names. So you don't have to. It even reminds you, gently, to save your important data.

4. INTELLIGENT. The NEW AIDS-III is smart. It doesn't waste your time with questions about record sizes, field counts and other technical mumble-jumble. A new system can be created, or an old one modified, in a couple of minutes. Even if your name isn't Albert Einstein.

5. KIND. The NEW AIDS-III is always ready to help. It says so, on every screen display. HINTS™ (Help INdexed To Screen) tells you on which page in the NEW AIDS-III manual to look for more information. The manual is easy to understand and easy on the eyes.

6. QUIET. If you hit the wrong key, you won't hear any annoying buzzes, clicks or chirps. Instead, FLAWS™ (FLash-Annunciated Warning System) will create a striking visual effect. But only for an instant. And without affecting any of the text on the screen. Guaranteed to catch the eye of the fastest touch-typist.

7. ALERT. If the NEW AIDS-III is left alone, it lets you know it missed you. It worries about your important data. After several minutes of no activity, the NEW AIDS-III creates a striking visual display to get your attention. Touch any key to let it know you're still there, and it stops. For a little while, anyway.

8. LEAN. There's no fat in the NEW AIDS-III. That's because it uses SofTrends' proprietary PMX™ system architecture. Small, lightning-fast, reliable. Lean? Yes. Mean? Definitely not.

9. FAST. Searches and sorts hundreds of records in seconds. Screens are displayed in the blink of an eye. Disk access rates approach one-thousand characters per second. No waiting for "garbage collection". The NEW AIDS-III lives fast. Up to 10 times as fast.*

10. REASONABLE. At only \$79.95, the NEW AIDS-III is very reasonable. Down-right inexpensive, if you value your time. Join the thousands of AIDS owners around the world. Order yours today and put the NEW AIDS-III data management system to work for you.

* As compared to MTC AIDS-III, Version 1.0

Specify Model I or Model III \$79.95

**** CALL REGARDING UPGRADE POLICY ****

CALCS-IV (ADVANCED CALCULATION SUBSYSTEM) has the following features:

- All the capabilities of CALCS-III.
- SAVE REPORT FORMATS on disk for EDITING, as required.
- More than TWICE the COMPUTATIONAL POWER of CALCS-III.
- Non-interpretive report execution for FASTER EXECUTION.
- Reports can be run by a NOVICE.

ONLY \$20 when purchased with AIDS-III/Version 2.0!

Specify Model I or Model III \$39.95

NEW AIDS SUBSYSTEMS by SofTrends, Inc. VISAPLEX™

Interfaces AIDS-III and VisiCalc*. Use AIDS-III for data entry, sorting and selection. Then load the data into VisiCalc*, perform computations, summations, etc. Like what you see? Change the data back into AIDS-III format for future processing. Remarkably easy to use. Comprehensive documentation complete with examples.

Specify Model I or Model III \$39.95

ADEPT™

This module is ideal for entering large batches of data into AIDS-III. Features include pre-defined field values, definition and expansion of abbreviations, transposition of entries, range checking, entry of data from previous record, expanded validation and more! Type as fast as you can . . . no problem! Use with VISAPLEX™(above) to provide a comprehensive data entry facility for VisiCalc*. Complete documentation with examples.

Specify Model I or Model III \$29.95

If you own Apparat's NEWDOS/80-Version 2.0 you need BREVI-T™ by SofTrends, Inc.

If you have trouble remembering command formats, want to simplify use of DOS, do a lot of program development or just want to be more effective with your TRS-80™, then BREVI-T is for you. Abbreviations can be defined for both DOS and BASIC. These are automatically expanded as part of the command line processor. Optionally, parameters may be defined as part of an abbreviation. For example, "F 1" might be used to FORMAT drive 1. Change the 1 to a 2 and FORMAT drive 2. It's that simple. Complete with easy-to-follow instructions, examples and a sample abbreviation file.

Specify Model I or Model III \$19.95

Let your TRS-80™ Test Itself With THE FLOPPY DOCTOR & MEMORY DIAGNOSTIC

by David Stambaugh

A complete checkup for your MODEL I or MODEL III. THE FLOPPY DOCTOR-Version 3 completely checks every sector of single or double density 35-, 40-, 77-, or 80-track disk drives. Tests motor speed, head positioning, controller functions, status bits and provides complete error logging. THE MEMORY DIAGNOSTIC checks for proper write/read, refresh, executability and exclusivity of all address locations. Includes both diagnostics and complete instruction manual.

SYSTEM DIAGNOSTICS . \$24.95
For MODEL III \$29.95

TRS-80 is a trademark of the Radio Shack Division of Tandy Corporation. VisiCalc is a trademark of Visi Corp. PLAIN JANE, AIDS-I, AIDS-III, CALCS-III, CALCS-IV, MERGE-III are trademarks of MTC.
1982 by Meta Technologies Corporation

TO ORDER CALL
1-800-321-3552
IN OHIO
AND ALL OTHER INQUIRIES
(216) 289-7500

**PRICES IN EFFECT
THRU
FEBRUARY 28, 1983**
Prices, Specifications,
and Offerings subject to
change without notice
8302

WE ACCEPT
• VISA
• MASTER CHARGE
• CHECKS
• MONEY ORDERS
• C.O.D.

• Add \$3.00 for shipping & handling.
• \$2.00 EXTRA for U.S. Mail delivery.
• \$3.00 EXTRA for C.O.D.
• Ohio residents add 6.5% sales tax.

In the November 1982 issue we published a letter from a reader who offered information on copying Super Utility Plus should Powersoft Inc. ever be unable to provide back-ups. We withheld the name of the author, and requested your reactions to both the letter and the whole subject of protected software. We also contacted eight manufacturers for their views, but only Apparat Inc. responded. Read on for some representative viewpoints. For 80 Micro's views on the subject, see Proof Notes on p. 10.

What's the Big Deal?

Why the agony on releasing the key to Super Utility?

The utility itself is designed to break others' protection, and with a modest amount of perseverance it can be broken, too. What seems odd is that you think what is sauce for the goose is not sauce for the gander.

Please release the name.

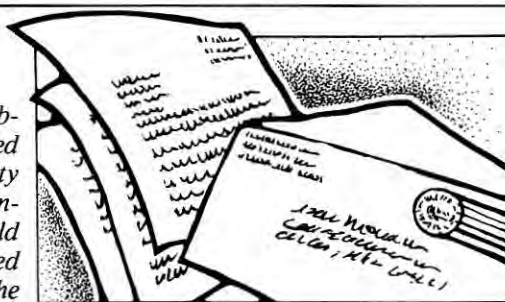
Theodore C. Hossfeld
President
Consted Productions
P.O. Box 285
Tiburon, CA 94920

Truth in Advertising

Nobody wants to buy protected programs. You know it, I know it, and the vendors know it. That's why, in spite of repeated requests, practically none of the people who sell protected programs will even mention this fact in their ads. But this matters so much to the buyer, and that's who you should be looking out for—the tens of thousands of people who pay for all the software and, directly or indirectly, all the issues of your magazine.

Why does the consumer always come last? You should require that any ad for protected software include that fact, right next to the price. And your software reviews should always address this question. When the buyer is at last given an honest choice between protected program A, and its unprotected competitor B, we will see the protection mania disappear, to everyone's benefit.

Here is an open question to Acorn, Med Systems, SubLogic, Adventure International, Powersoft, and all the other vendors who silently sell protected programs: You cannot pretend that



To copy or not to copy

your customers don't care about backing up the software they buy from you. So why don't you mention such a simple, well-defined, deliberate aspect of your programs in those big, fancy ads? You are purposely deceiving the very people who are supporting you. This leaves you in a poor position to complain about "software morality." You have a huge market; don't try to ignore and even subvert one of the main reasons it exists—software freedom and accessibility.

Roxton Baker
Box 8272

APO San Francisco, CA 96555

Software Collection

I collect records. Starting in the early 50s, I would tape my LPs and play the tapes. Today, I have wonderful, perfect-condition records and have upgraded my taped copies as tape quality improved. I have and will continue to handle software similarly, working only with copies of my purchased originals.

Any software that is not compatible with this approach is dead on the market as far as I'm concerned. I hope most users will adopt this philosophy. As a minimum, there ought to be a requirement that any locked software be advertised and labeled conspicuously as such.

Edward O. Noble
P.O. Box 759
Mesilla Park, NM 88047

Apparat's Answer

Apparat, like other software developers, is very concerned about piracy. In the case of the NEWDOS80 operating system, Apparat has found many illegal copies on the market. In the past, Apparat has taken some steps against software pirates, and will take much more severe steps in the months to come.

Apparat has never made software that could not be copied by the consumer, and probably never will. Our feeling is that the customer paid for the right to reproduce the software for his own personal use at the time of purchase. By limiting the number of copies, or preventing copying entirely, you may very well be limiting your customer base. Also, nothing can be locked that cannot be unlocked. And locked software can provoke many typically honest people into becoming backyard pirates.

Apparat sees only two ways to prevent, or hinder, the software piracy business. The first is the standard: registration numbers and no service if you cannot provide us with a verifiable number. The second is the hardware lock for software, similar to that used by Simutek in their Copyart word processor. The hardware lock can be duplicated also, but not easily, and most software pirates neither have the brains nor the inclination to unlock the secrets hardware can hide.

Jason Robert C. Matthews
Manager, Software R&D
Apparat, Inc.
4401 So. Tamarac Parkway
Denver, CO 80237

Routine Copies

For several years I have been quietly cracking the protection codes on games. As I have gained more experience, it has become quite routine for me to unlock the protected disks as soon as I get them, make a copy, and place the original on a shelf far from harm. Software piracy is disagreeable, but the thought of having a locked disk is equally distasteful. I would be afraid to use it, for fear that I would destroy it and never be able to use it again.

In the November 1982 issue of 80 Micro, on page 443, the ad for Sales Data Inc. states that they will sell the

If you can beat these prices, you must have a brother-in-law in the business.

PRINTERS

COMREX CR-1 PARALLEL.....	839.00
COMREX CR-1 SERIAL.....	859.00
C-ITOH F-10 40 CPS PARALLEL.....	1390.00
C-ITOH F-10 40 CPS SERIAL.....	1390.00
C-ITOH 8510 PROWRITER PARALLEL.....	480.00
C-ITOH 8510 PROWRITER SERIAL.....	590.00
EPSON MX-80 III W/GRAFTRAX +.....	SCALL
EPSON MX-80 III F/T W/GRAFTRAX +.....	SCALL
EPSON MX-100 III W/GRAFTRAX +.....	SCALL
IDS MICROPRISM 480.....	SCALL
NEC 8023A.....	485.00
NEC SPINWRITER 3530 P.R.O.....	1995.00
NEC SPINWRITER 7710 S.R.O.....	2595.00
NEC SPINWRITER 7730 P.R.O.....	2595.00
OKIDATA MICROLINE 80.....	389.00
OKIDATA MICROLINE 82A.....	460.00
OKIDATA MICROLINE 83A.....	700.00
OKIDATA MICROLINE 84.....	1170.00
OKIGRAPH 82.....	49.95
OKIGRAPH 83.....	49.95

EPSON ACCESSORIES

MICROBUFFER‡ MBS-8K.....	159.00
MICROBUFFER‡ MBP-16K.....	159.00
MICROBUFFER IN-LINE 32K.....	299.00
MICROBUFFER IN-LINE 64K.....	349.00
GRAFTRAX PLUS.....	60.00
MX-80 RIBBONS.....	8.95
MX-80 PRINTHEAD.....	49.00
MX-100 RIBBONS.....	24.00
MX-100 PRINTHEAD.....	52.00
EPSON SERVICE MANUAL.....	20.00

16K RAM SPECIAL 13.95

Set of 8 NEC 4116 200ns. Guaranteed one year.

MODEL I, III SOFTWARE

PROSOFT NEWSRPT/LABELS MOD I, III.....	109.00
OMNITERM SMART TERMINAL MOD I, III.....	89.95
MAXI-MANAGER MOD I, III.....	89.95
DOS PLUS 3.4 MOD I, III.....	89.00
LDOS 5.1 MOD I, III.....	119.00
MICROSOFT EDITOR ASSEMBLER + MOD I (DISK).....	44.95
MICROSOFT FORTRAN MOD I.....	80.00

TRS-80 GAMES

All games are disk versions. Cassette versions may not be available.

TEMPLE OF APSHAI.....	31.35
HELLFIRE WARRIOR.....	31.35
STAR WARRIOR.....	31.35
RESCUE AT RIGEL.....	23.36
CRUSH, CRUMBLE AND CHOMP.....	23.36
INVADERS FROM SPACE.....	16.50
PINBALL.....	16.50
MISSILE ATTACK.....	17.95
STAR FIGHTER.....	24.95
Z-CHESS III.....	23.61
ADVENTURE NO. 1, 2, & 3.....	34.95
ADVENTURE NO. 4, 5, & 6.....	34.95
ADVENTURE NO. 7, 8, & 9.....	34.95
DUEL-N-DROIDS.....	16.50
STARFLEET ORION.....	21.95
INVASION ORION.....	19.95
OLYMPIC DECATHLON.....	23.36
MONTY PLAYS MONOPOLY.....	31.95
SARGON II.....	27.26
BLACKJACK MASTER.....	27.95
ROBOT ATTACK.....	15.95
GALAXY INVASION.....	15.95
SUPER NOVA.....	15.95
TUESDAY MORNING QUARTERBACK.....	26.95
LUNER LANDER.....	23.36
THE MEAN CHECKER MACHINE.....	21.95
SPACE ROCKS.....	18.95
PIGSKIN.....	16.50
ZOSSED IN SPACE.....	18.95
ARCADE-80.....	21.95
SPACE INTRUDERS.....	19.95
MORTON'S FORK.....	23.61
SCARFMAN.....	17.95

SPECIALS

SPECIAL NO.1
TRS-80 DISK AND OTHER MYSTERIES, BOX OF VERBATIM DISKS, PLASTIC LIBRARY CASE.....44.50

SPECIAL NO.3
NEWDOS/80 2.0, BOX OF VERBATIM DISKS, PLASTIC LIBRARY CASE.....149.00

SPECIAL NO.4
MICROSOFT BASIC COMPILER, BOX OF VERBATIM DISKS, PLASTIC LIBRARY CASE.....179.00

SPECIAL NO.5
MICROSOFT BASIC DECODED AND OTHER MYSTERIES, BOX OF VERBATIM DISKS, PLASTIC LIBRARY CASE.....49.95

DOUBLE DENSITY SPECIAL
PERCOM DOUBLER II, NEWDOS/80, BOX OF VERBATIM DISKS, PLASTIC LIBRARY CASE.....279.00

BATIM DISKS, PLASTIC LIBRARY CASE.....279.00

COMMUNICATION SPECIAL MOD I & II

NOVATION MODEM, OMNITERM TERMINAL SOFTWARE.....219.00
ACOUSTIC SPECIAL (CAT).....219.00
DIRECT CONNECT SPECIAL (D-CAT).....239.00
SERIAL CABLE.....25.00

DISK LIBRARY SPECIAL

RACET DISKCAT CATALOGING PROGRAM, FLIP SORT (50 DISK CAPACITY), 50 STICK-ON DISK LABELS.....59.95

BOOKS

BASIC BETTER & FASTER DEMO DISK.....18.00
THE CUSTOM TRS-80.....24.95
MICROSOFT BASIC FASTER & BETTER.....24.95
CUSTOM I/O MACHINE LANGUAGE.....24.95
TRS-80 DISK & MYSTERIES.....16.95
MICROSOFT BASIC DECODED.....24.95

DISKETTES

ALPHA DISKS.....21.95
Single sided, certified Double Density 40 Tracks, with Hub-Ring, Box of 10. Guaranteed one year.
SCOTCH 3M
S.S.D.DEN 40 TRK.....23.50
D.S.D.DEN 40 TRK.....36.50

VERBATIM

MD 525-01, 10, 16.....26.50

DISKETTES STORAGE

5 1/4" PLASTIC LIBRARY CASE.....2.50
8" PLASTIC LIBRARY CASE.....3.50
PROTECTOR 5 1/4".....21.95
PROTECTOR 8".....24.95

TRS-80 HARDWARE

PERCOM DATA SEPARATOR.....27.00
PERCOM DOUBLER II W/ DOS 3.4.....159.00
TANDON 80 TRK DISK DRIVE W/ P.S. 345.00
TANDON 40 TRK DISK DRIVE W/ P.S. 289.00
LNW DOUBLER W/ DOSPLUS 3.3.....138.00
LNW DOUBLER 5/8 W/ DOSPLUS 3.4.....181.00

ISOLATORS

ISO-1 3-SOCKET.....49.95
ISO-2 6-SOCKET.....49.95

MODEMS

NOVATION CAT ACOUSTIC.....140.00
NOVATION D-CAT DIRECT CONNECT.....156.00
NOVATION AUTO-CAT AUTO ANSWER.....219.00
NOVATION D-CAT (1200 BAUD).....619.00
HAYES SMART MODEM (300 BAUD).....227.00
HAYES SMART MODEM (1200 BAUD).....540.00
SIGNALMAN MODEM W/ RS-232C.....85.00

SUPPLIES

AVERY TABULABELS
1,000 3 1/2 x 15/16.....8.49

3,000 3 1/2 x 15/16.....14.95
5,000 3 1/2 x 15/16.....19.95

FAN FOLD PAPER

(Prices F.O.B. S.P.)
9 1/2 x 11 18lb WHITE 3,000 ct.....29.00
14 7/8 x 11 18lb WHITE 3,000 ct.....39.00

To order or for information call

In New York:

(212) 509-1923

In Los Angeles:

(213) 706-0333

In Dallas:

(214) 744-4251

By Modem:

(213) 883-8976

CALL OUR MODEM LINE FOR WEEKLY SPECIALS!

Alpha Byte
COMPUTER PRODUCTS

31245 LA BAYA DRIVE
WESTLAKE VILLAGE, CA 91362

MODEL III DISK DRIVE KITS

CONTROLLER KIT INCLUDES ALL BOARDS ASSEMBLED AND TESTED, INTERNAL CONTROLLER, MOUNTING BRACKETS, SWITCHING POWER SUPPLY, AND INSTALLATION INSTRUCTIONS. HANDLES 4 DRIVES.....259.00

KIT #1: CONTROLLER KIT AND 2 TM100-3 SINGLED-SIDED, 80 TRACK DRIVES...748.00

KIT #2: CONTROLLER KIT AND 2 TM100-4 DOUBLE-SIDED, 80 TRACK DRIVES...979.00

KIT #3: CONTROLLER KIT AND 2 TM100-1 SINGLED-SIDED, 40 TRACK DRIVES...638.00

KIT #4: CONTROLLER KIT AND 2 TM100-2 DOUBLE-SIDED, 40 TRACK DRIVES...779.00

We guarantee everything we sell for 30 days — no returns after 30 days. Defective software will be replaced free, but all other software returns are subject to 15% restocking fee and must be accompanied by RMA slip. No returns on game software, unless defective. We accept VISA and MasterCard on all orders; COD orders, up to \$300. Shipping charges: \$3 for all prepaid orders, actual shipping charges for non-prepays; \$3 for COD orders under 25lbs. (\$6 for over) plus a \$4 surcharge; add 15% for foreign, FPO and APO orders. Calif. add 6% sales tax, in L.A. County add 6 1/2%. Prices quoted are for stock on hand and are subject to change without notice.

CP/M is a reg. trademark of Digital Research. *Requires Z-80 Softcard. †Reg. trademark of Micro Pro International Corp. ‡Trademark of Practical Peripherals, Inc. **Trademark of Software Dimensions, Inc.

software to allow unlimited back-ups of Scripsit and VisiCalc on the Model III. Since Scripsit for the Model III comes on a protected disk, you are clearly willing to allow mention and sales of protection-unlocking programs in your magazine. I, for one, am grateful for both of those policies.

*Paul Jaeger
61 Jane St.
New York, NY 10014*

Excess Aggravation

I have only purchased one protected software package. I agree with the letter writer about the aggravation, so I have promised myself never to buy another product that has this type of protection.

I fully support Logical Systems with LDOS and ABC Sales with Lazy Writer. These products are sold with serial numbers and full support for future upgrades. By providing technical support only to registered owners, they keep down the pirates and allow honest buyers unlimited back-up copies. The people making the most fuss over this are the same ones that only want to sell software for the money, with no regard for the customer after the sale.

If companies sold software at reasonable prices, there would also be less pirating. Why does the same package cost more for the Model II and III than it does for the Model I? Is this honest pricing policy?

If the author of the letter can save even one other person from getting into trouble with no back-up, he should tell others. If the goal of *80 Micro* is to provide information to help its readers (why else do we buy it?), then it also should not hold back information to please its advertisers.

*Jeffrey Sherman
20 Riviera Drive
Somerville, NJ 08876*

Reject Those Ads

As a responsible, consumer-oriented publishing company, you and your fellow magazine publishers can solve the protected software problem by refusing to accept ads from companies with protected software, unless you receive with such ad an unlock routine and permission to publish same in the event of the demise of the company or its inability to furnish service to owners of

the software.

*Spencer Trimble
229 Lipona Road South
Tallahassee, FL 32304*

Preserving the Free Market

Super Utility Plus is without a doubt one of the finest utility programs ever written for the TRS-80; however, it suffers from a serious flaw. In an attempt to protect the program from unauthorized duplication, it is distributed on a protected disk. This may provide protection from pirates, but it serious-

*“Maybe software
manufacturers should look
to their retail prices.”*

ly limits the usefulness of the program to the people who have paid for it.

In this format a disk failure can force a user to pay a fee, not to mention lost work time, to obtain a new copy of the program. Every time the disk makes a revolution, magnetic coating wears off the disk. No matter how careful the user, or reliable the system, any disk will eventually wear out. We should not be forced into being dependent on any manufacturer for back-ups of programs that have been legally obtained. We find it disturbing that the program brags about its ability to duplicate protected disks while the author has ensured his own work would remain uncopied.

TRS-80 users are notorious for the use of oddball hardware configurations and patchwork systems. Users who have modified their systems usually work out patches to programs to accommodate their hardware. With a protected disk, this becomes an impossible task. The educational value of getting inside a top-notch utility like SU+ cannot be overestimated.

We don't believe back-up protected disks serve the best interest of users or publishers and are against their use. This does not mean we are against authors receiving just compensation for their work. A minority of users and crooked publishers are causing the legitimate publishers to use protected media. If the majority of users will refuse to deal with pirates, and that includes users who swap back-ups of

copyrighted programs, publishers won't feel they need to use protection schemes. As a user and publisher we would rather see the free market continue.

The alternatives are government involvement or hardware protection schemes. If either of these becomes necessary, you can expect software costs to skyrocket, as well as creativity to be stifled. With unprotected software a program can reach the market with an investment of a few thousand dollars. If users force publishers to use hardware protection schemes, programs that don't have mass-market appeal will never see the light of day. All computer users have a vested interest in seeing the free market continue.

*Jean Marie Witt
President
WittSoft
1302 41st St.
Orlando, FL 32805*

WittSoft has recently introduced Super Duper, a program that can create copies of Super Utility Plus.—Eds.

The Price Problem

To copy in order to resell or otherwise pass on is, of course, a violation of the law. Having been so victimized, I can understand the author's point of view.

However, when we purchase a program that may be used at several stations in the building, it's a nuisance to be forced to make a several-hundred-yard round trip to pick up a disk from another room, use it for five minutes, and then return it. My vote is to release the name and address, hoping—however vainly—that resale will not occur. Maybe software manufacturers should look to their retail prices. We can afford a \$40 program, but to spend \$120 to have it available at three separate stations is an expense I can't justify. No one photocopies a \$6 book, but a \$60 one might not be so immune.

*The Rev. George T. Cook
50 Anchor Ave.
P.O. Box 98
Oceanside, NY 11572*

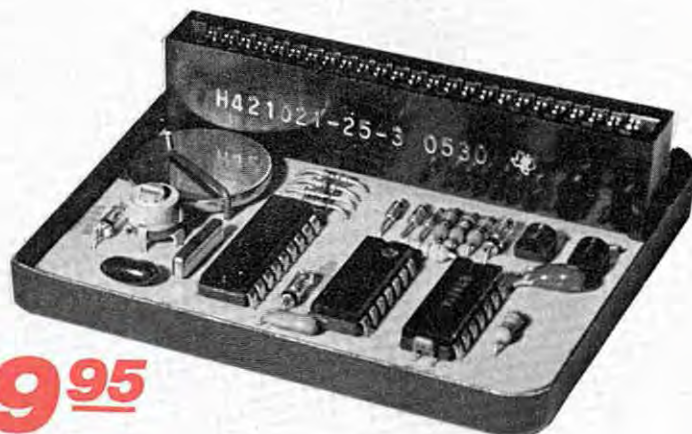
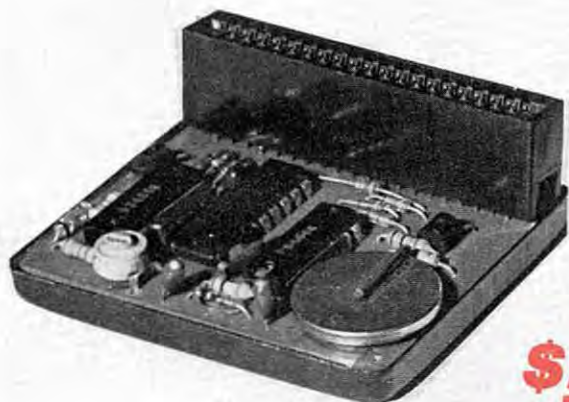
Piracy Policy

We agree with the statement that software should not be copy-protected. Staten Island Labs has some software like this, and it is very aggravat-

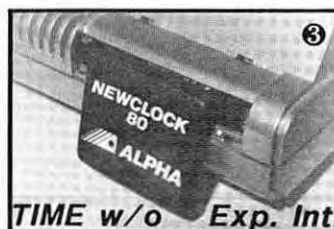
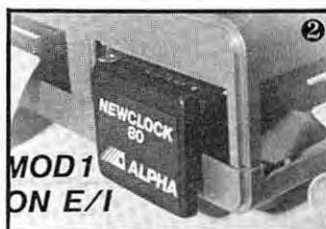
NEWCLOCK-80

MODEL I

MODEL III



\$59⁹⁵



Wouldn't it be nice if your computer could always boot up with the right time and date and then stay accurate. Newclock-80 will enhance your Model I or III system with powerful clock/calendar/timer functions.

Using LSI (large scale integration) and custom circuits, Newclock-80 provides MO/DATE/YR, HR:MN:SEC plus AM/PM and day of week and even takes care of leap years! It continues to keep time and date with quartz accuracy when the computer is turned off or experiences a power failure. A single battery lasts over 2 years.

Compatibility: Newclock-80 is compatible with any operating system, including DOSPLUS, NEWDOS, LDOS. With its fully decoded circuitry it will work with any other hardware you may own. Bus expanders are available.

Installation is very simple, no tools, no disassembly, no soldering. Just plug it in, that's all. There is no power supply or messy cable. Newclock-80 plugs into the rear of the keyboard **3** or side of the Exp. Int. **2**. Model III Newclock fits the 50 pin card edge (underneath) **1**.

The Software: Newclock-80 is as easy to use as it is to install. -"SET", a Basic program, is used only once to set the time and date and select 12 or 24 hour format. -"TIMESTR", also in Basic, patches your computer "TIME\$" function to read Newclock-80. It also adds "TIME\$" to keyboard-only systems, a short routine is simply "poked" into low memory.

Newclock-80 uses 12 ports (176 to 188): 6 for the time, 6 for the date. The data is conveniently stored in decimal form, no conversion is needed. You can read or modify any digit using simple Basic "INP" and "OUT" statements.

No risk trial. Order your Newclock-80 today, see how easy it is to install and operate then decide within 30 days if you want to keep it. If for any reason you are not delighted with its quality and performance, you may return it for a prompt and courteous refund.

Your unit will come complete **4** with software on tape, detailed instructions, handy reference card, and a 90 day warranty. Specify Model I or III. Software is also available on disk: add \$5. Lithium battery (not included) available from RADIO-SHACK (#23-162) or add \$1.50 to your order.

Thanks to outstanding engineering and efficient manufacturing, ALPHA Products is once again able to offer a great product at a surprising price. Order your Newclock-80 at no obligation today.

Toll Free Order Line
800-221-0916

Orders Only, NY & Info call (212) 296-5916. Hours: 9-5 E.S.T.

ALPHA Products

79-04 Jamaica Ave., Woodhaven, NY 11421

(212) 296-5916

ADD \$2.50 PER ORDER FOR SHIPPING AND HANDLING. WE ACCEPT VISA, MASTERCARD, CHECKS, M.O. C.O.D. ADD \$3.00 EXTRA. NY RESIDENTS ADD SALES TAX. OVERSEAS, FPO, APO: ADD 10%. DEALER DISCOUNTS AVAILABLE.



ing not to have back-ups. We prefer the policies of certain software companies, such as Logical Systems Inc. and Prosoft, that support only registered owners of their programs.

Our policy toward copy-protected software is to attempt to break the lock and pirate it, not because we want the programs, but because we are against the policy of copy protection.

*Philip Herbst
Senior Partner
Staten Island Labs
140 Castleton Avenue
Staten Island, NY 10301*

Low Life

I am strongly opposed to pirated software! Those computerists who pirate software are the lowest form of animal life on the planet. However, I feel that any company selling software on protected disks is only one step above the pirate.

For the most part, purchasers of original software have little knowledge of how a computer works. These people pay good money to software suppliers for programs that will in some way save time, reduce mistakes, or increase productivity. Waiting for a company to send a replacement disk is at best an inconvenience and may spell disaster for a person or company that has come to rely on the program.

The pirate, on the other hand, is as

cunning as a fox and patient as a saint. He views a protected program as a challenge. The better the protection scheme, the sweeter the taste of victory when it is broken—and there is no protection scheme available that cannot be broken! When the program is rendered defenseless, the pirate will move on to another challenge. For this reason, it is not in the best interest for software suppliers to protect their software and it is not in the best interest of users to purchase protected software.

*James S. Schaefer
33 Jackson Road
Berlin, NJ 08009*

Pathos in Advertising

First let me say that I feel the recent letter on copying locked software should have been printed as you did, without the author's name. The issue is whether as users we have rights to the software we purchase as opposed to the rights of the authors of the software.

As both an end user and a programmer, I have a tremendous amount of compassion for both sides of the question. My personal solution to the problem is to enclose a picture of my little boy with every program sold. I will also enclose a note begging people not to make illicit copies of the program or I will not be able to feed my little boy.

At prices that are competitive, I have

to sell many programs to recover development time. I also need a good product that I can stand behind and support. You are important to me as a customer, so I won't lock your software. Your success in using my product directly relates to my success.

One last comment is directed to the morally concerned at *80 Micro*. You had to be kidding when you said some of the editorial staff who are of "conservative inclinations felt that to publish (the letter) would be to condone and promote an illegal (and perhaps immoral) act." A fascinating viewpoint when your magazine carries advertising for companies that promote programs that unlock other software. Your moral considerations are inconsistent and hypocritical to say the least. I applaud the side of the editorial staff that won and published the letter.

*Gary A. Shade
3847 Galesburg Court
Arlington Hts., IL 60004*

Positive Piracy

I have some pirated programs, but I also purchase software regularly, often after using a pirated copy. I probably would not have purchased some of the programs if I hadn't had an opportunity to try the pirated copies. In those cases, pirating was a form of advertising. In other cases, I have to say, "I'm glad I didn't pay money for this!"

I doubt that authors will stop writing software because of piracy; a good author will keep writing and keep selling because his next program will be better than his last. While piracy undoubtedly takes its toll in uncollected royalties, the prolific author can even benefit from having his programs widely circulated as more people are introduced to his work.

Protecting a disk or tape ought to be an author's prerogative. However, as a purchaser, I should be told in advertising whether a program can be backed up, as this is sometimes a factor in making the decision to buy a particular program. There is software I haven't purchased simply because I knew it was protected and I wanted to be able to back it up. In this case, protecting a disk kept an author from getting his royalty.

*Tom Kilbride
4117 Lyle
Waco, TX 76710*

TRS-80 MODEL I T.M.* GOLDPLUG - 80

Eliminate disk re-boots and data loss due to poor contact problems at card edge connectors. The GOLD PLUG - 80 solders to the board card edge. Use your existing cables.

CPU/keyboard to expansion interface \$18.95
Expansion interface to disk, printer, RS232, screen printer (specify) \$9.95 ea
Full set, six connectors. . . \$54.95



EAP COMPANY
P.O. Box 14, Keller, TX 76248
(817) 498-4242

*TRS-80 is a trademark of Tandy Corp.

216



"80" DEMI-CASE

Shown: "80" MDX DEMI-CASE 174

**Encloses LNW & MDX I & II
P.C. Boards, plus
Cabling, A/C Cords, etc.
Silver-gray Fiberglass**

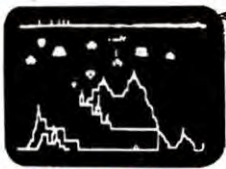
**\$32.50 plus \$2.50 shipping
N.Y.S. residents add 7% tax**

SYRACUSE R&D CENTER
Box 125, Dewitt, N.Y. 13214
"Specializing in Electronic Packaging"



REAR GUARD

Deadly waves of enemy Cyborg craft attack your fleet from the rear. You are the Mother Ship's sole defender. You have unlimited firepower but the Cyborgs are swift, nimble attackers. Your abilities are tested hard in this game of lightning fast action and lively sound from Adventure International. Price: B



STRIKE FORCE

As the primary defender of a world of cities under deadly alien attack, your weaponry is the latest: rapid fire missiles, long range radar, and incendiary "star shells." Your force field can absorb only a limited number of impacts. A complex game of strategy, skill and reflexes from Melbourne House. Price: A



PANIK

Trapped at an enemy building site, your fate seems certain. Your laser is empty and evil Mzors are closing in. You'll have to climb ladders and think one step ahead of the various monsters. A challenging game for agile minds. From Fantastic Software with voice (Disk has larger vocabulary). Price: B



SEA DRAGON

Your submarine, the U.S.S. Sea Dragon, penetrates a mined enemy channel. Armed with missiles and torpedoes, you engage the enemy while navigating unknown waters. Succeed or come to a salty end in this game. 29 screens of horizontally scrolling seascape and sound from Adventure International. Price: B

SAVE
10, 15, 20%



"If you purchase Alpha's Joystick you get the exquisite pleasure of enjoying (action games) to the limit of arcade-style realism."

-80 Microcomputing
80 Reviews, Jan '82

FEEL THE POWER...

THE ALPHA JOYSTICK

ONLY \$39.95

- + Features the famous Atari Joystick
- + Works with all Model I or III systems
- + Compatible with any other accessories
- + Saves your keyboard from abuse
- + Experiment in BASIC. Use A=INP(0)
- + Complete, ready to plug in and use
- + Model I: plugs into KB or E/I
- + Model III: plugs into 50 pin I/O bus

Price includes Joystick + Alpha Interface + Instructions + Demo Program listing. Please specify Model I or III.

© 1982 ALPHA Products

14 DAY MONEY BACK GUARANTEE

THE BEST FOR LESS

As you can see, all the best games from the top producers are joystick compatible. These games are fun without the joystick but we hope that you are one of the many thousands who enjoy the advantage of real joystick action.

Now you can deduct up to 20% on the price of games: buy any 2 games deduct 10%, buy any 3 games deduct 15%, buy any 4 games deduct 20% from game prices.

TOP TEN

1. SCARFMAN - All time favorite
2. PANIK - Remarkable Voices
3. PENETRATOR - Rave reviews
4. ARMORED PATROL - Super 3D graphics
5. CATERPILLAR - Good rendition
6. CRAZY PAINTER - Unique game concept
7. DEFENSE COMMAND - Tough struggle
8. STELLAR ESCORT - Fast and Challenging
9. ROBOT ATTACK - With voice
10. SEA DRAGON - Amazing "Seascape"

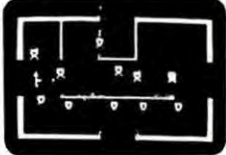
STELLAR ESCORT

The latest super action game from Big Five. As the Federation's top space fighter you've been chosen to escort what is possibly the most important shipment in Federation history. The enemy will send many squadrons of their best fighters to intercept. With sound. Disk version has voice. Price: A



ROBOT ATTACK

Talks without a voice synthesizer through the cassette port. With just a hand laser in a remote space station, you encounter armed robots. Some march towards you, more wait around corners. Careful, the walls are electrified. Zap as many robots as you dare before escaping to a new section. More robots await you. Price: A



LUNAR LANDER

As a vast panoramic moonscape scrolls by, select one of many landing sights. The more perilous the spot, the more points scored -- if you land safely. You control LEM main engines and side thrusters. One of the best uses of TRS-80 graphics we have ever seen. From Adventure International. With sound. Price: A



SUPER NOVA

Asteroids float ominously around the screen. You must destroy the asteroids before they destroy you! (Big asteroids break into little ones). Your ship will respond to thrust, rotate, hyperspace and fire. Watch out for that saucer with the laser! As reviewed in May 1981 Byte Magazine. Price: A



OUTHOUSE

You are the mighty protector of this small (but important) wooden structure. For reasons unknown, a bizarre gang of miscreants wish to vandalize, loot and otherwise destroy the little "hall moon house." Your patrol craft has lasers and smart bombs to deal with this terror. From SSM with sound. Price: A



GALAXY INVASION

The sound of the klaxon is calling you! Invaders have been spotted warping toward Earth. You shift right and left as you fire your lasers. A few break formation and fly straight at you! You place your finger on the fire button knowing that this shot must connect! With sound effects! Price: A



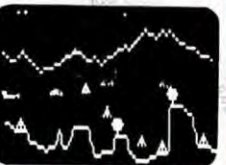
LASER DEFENSE

In this game of IBM's, high-energy lasers and particle beams, you control the U.S. strategic defense satellite system. From your viewpoint high above the globe, you intercept Soviet nuclear missiles in flight and attempt to destroy their scattered missile sites. With sound from MED Systems. Price: B



CHICKEN

Will the chicken cross the road? That's up to you. Can you guide these helpless little chicks across the perilous 10 lane super highway to safety? Or will you bumble, littering the backstop with a storm of chicken feathers? A humorous yet challenging game of nerves from SSM with sound. Price: A



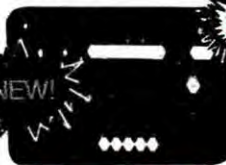
PENETRATOR

Soar swiftly over jagged landscape, swooping high and low to avoid obstacles and enemy missile attacks. With miles of wild terrain and tunnels to penetrate, you're well armed with bombs and multiple forward missile capability. From Melbourne House. Features sound, trainer mode and customizing program. Price: C



DEFENSE COMMAND

The invaders are back! Alone, you defend the all important nuclear fuel canisters from the repeated attacks of thieving aliens, repeatedly. An alien passes your guard, snatches a canister and flies straight off. Quick! You have one last chance to blast him from the sky! With sound and voice. Price: A



BOUNCEOIDS

Huge boulders careen off the walls. You're in the middle, in danger of being flattened. Keep your wits about you as you blast these "bounceoids" from the screen. Large ones break into many small ones. Clear a screen, and enter a fast-paced challenge stage with a chance for big bonus points. From the Cornsoll Group. Price: A



SCARFMAN

This incredibly popular game craze now runs on your TRS-80! It's eat or be eaten. You run Scarfman around the maze, gobbling up everything in your path. Try to eat it all before nasty monsters devour you. Excellent high speed machine language action game from the Cornsoll Group. With sound. Price: A



ARMORED PATROL

A realistic tank battle simulation. Your view is a 3-D perspective of an alien landscape. Maneuver your T-36 tank to locate and destroy enemy tanks and robots that lay hidden, ready to assault you. Clever graphics create the illusion of movement and dimension. From Adventure International. With sound. Price: B



CATERPILLAR

An arcade favorite! Stop these multi-sectioned crawlers before they creep down through the mushrooms. Zap one and it splits into two smaller bugs, each with its own sense of direction. There are molts and tumble bugs too. It all adds up to lots of fun for kids and adults alike. From Soft Sector Marketing. With sound. Price code: A



CRAZY PAINTER

You have to paint the floor white. We give you the paint and brush. Sounds easy? Hah! You'll be confounded by stray dogs, snakes, sloshing buckets of turpentine, even a ravenous "paint eater." A crazy, imaginative new game with ten selectable levels of skill for new or seasoned game players. Lots of laughs. Price: A

LATEST RELEASES:



FROGGER

OFFICIAL VERSION LICENSED BY SEGA



WEERD

THE VERY LATEST FROM BIG FIVE!

WITH ANY ORDER FROM THIS PAGE STICK-ON LCD CLOCK-CALENDAR

FREE!

BLACK COLOR. BATTERY INCLUDED LIMITED: ONE PER CUSTOMER



GAME PRICES

A: TAPE: \$15.95 DISK: \$19.95
B: TAPE: \$19.95 DISK: \$24.95
C: TAPE: \$24.95 DISK: \$24.95

TAPE: Model I/III, 16K Level 2 DISK: Model I/III, 32K, 1 Disk All games are joystick compatible or may be played using arrow keys.



ALPHA Products
79-04 Jamaica Ave., Woodhaven, NY 11421

Toll Free Order Line
800-221-0916

Orders Only, NY & Info call (212) 296-5916. Hours: 9-5 E.S.T.

Add \$2.00 per order for shipping/handling. We accept Visa, Mastercard, Checks, M.O. C.O.D. - Add \$3.00 extra. N.Y. Residents add sales tax. Overseas, FPO, APO: Add 10% Dealer discounts available.



The Too New PC-2

I look forward every month to receiving each new issue of *80 Micro*. I am hoping for more PC-2 coverage. I realize PC-2 is new, just like the Color Computer was last year, so maybe I need to be patient. I hope this information arrives sooner, not later.

Doyle R. Painter, Jr.
311 Furys Ferry Road
Martinez, GA 30907

Unfortunately, we have received only a couple of articles about the exciting new Pocket Computer. Author Tim Daniel will reveal many of the secrets of the PC-2 in a future issue. Anybody out there care to help?—Eds.

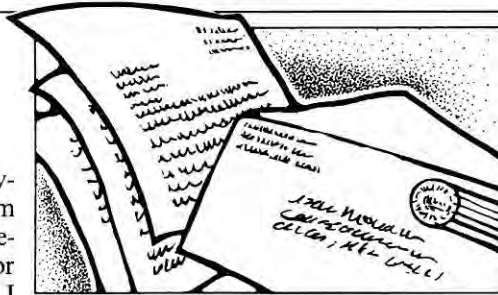
Find the Line

On Break GOTO—now, there's a good idea (*80 Micro*, November 1982, p. 390). Everybody who has used a TRS-80 has wanted this function. However, there may be a better way. The method used by SFC Donais intercepts the break vector at 16396, directs control to the sergeant's patch, which rectifies the stack and returns control to the Basic command processor with HL pointing to the first line of the program.

Basic then takes over, and, with a couple of tests, directs program flow to an appropriate Break-handling line of Basic. Wouldn't it be better to return control to Basic at the appropriate line? All we need to do this is the address of the beginning of that line.

As it happens, there is a ROM call that finds the beginning of a specified line, at 1B2CH. This is a fairly straightforward call. The DE register is loaded with the number of the line being sought, the call is made, and, on return, BC contains the address of the first byte in the line. If the line doesn't exist, control passes to the Basic error handling routine. The procedure would be:

- Call 1B8FH to rectify the stack.
- Load DE with the line number sought.
- Call the line finder at 1B2CH.
- Decrement BC to point zero before the line.
- Transfer this address to HL.
- Jump to the command processor at 1D1EH.



Program Listing 1 is the assembler code for the routine, which takes 15 bytes. Listing 2 is a rewrite of the sergeant's Basic program, altered to use the new routine. By POKEing a dif-

```

7FF1 CD8F1B      CALL    1B8FH      ;RECTIFY STACK
7FF4 113601     LD      DE,310    ;TARGET LINE #
7FF7 CD2C1B      CALL    1B2CH      ;FIND LINE
7FFA 0B         DEC     BC         ;POINT TO ZERO
7FFB C5         PUSH   BC
7FFC E1         POP    HL         ;TRANSFER TO HL
7FFD C31E1D     JP     1D1EH      ;TO BASIC
                          END
    
```

Program Listing 1

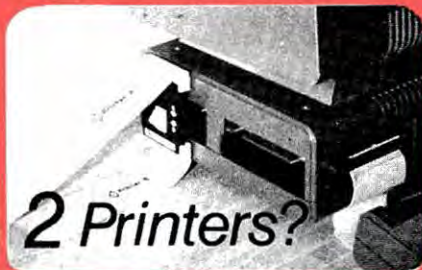
```

100 REM ***=**** ON BREAK GOTO ...DEMONSTRATION ***=****
110 REM
120 IF PEEK(16396)=195 GOTO 320: 'PATCH INSTALLED ?
130 REM ***RESET MEMORY-SIZE ***=
140 ADDR = PEEK(16561)+PEEK(16562)*256 - 15
150 POKE 16562,ADDR / 256
160 POKE 16561,ADDR - PEEK(16562) * 256
170 CLEAR
180 REM ***= ENTER CODE PATCH ***=
190 POKE 16553,255: 'ROM DATA-READ FIX
200 START = PEEK(16561) + PEEK(16562)*256+1
210 FOR ADDR = START TO START + 14
220 READ CODE
230 POKE ADDR, CODE
240 NEXT ADDR
250 REM ***= RESET VECTOR BACKWARDS FOR NO BOMB ***=
260 POKE 16398,START / 256
270 POKE 16397,START - PEEK(16398) * 256
280 POKE 16396,195: 'JP TO PATCH
285 GOTO 320
290 REM
300 REM ***= INITIALIZE BASIC VARIABLES & CONSTANTS ***=
310 PRINT: PRINT "--USER ABORT--":GOTO 380
320 CLEAR 50
340 REM
350 REM ***=*****=*****=*****=*****=*****=*****=*****=*****=*****=
360 REM ***= NORMAL PROGRAM EXECUTION RESUMES HERE ***=
370 REM
380 PRINT "MEMORY =" MEM,"INPUT = "A$,"COUNT = "X
390 PRINT,"TO EXIT TEST & RESTORE TRS-80, ENTER SPACES."
400 INPUT"HOM MANY SUBROUTINES TO STACK ";A$
410 IF A$="" GOTO 500
420 X=VAL(A$)
430 GOSUB 440
440 PRINT,"MEMORY = ";MEM
450 X = X - 1
460 IF X>0 GOTO 430 ELSE 400
470 REM
480 REM ***=*****=*****=*****=*****=*****=*****=*****=*****=*****=
490 REM ==* RESTORE MEMORY SIZE & BREAK VECTOR ==*==*==*
500 X=PEEK(16561)+PEEK(16562) * 256 + 15
510 POKE 16396,201
520 POKE 16562,X / 256
530 POKE 16561,X - PEEK(16562) * 256
540 REM BASIC POINTERS ARE OKAY, STRING BUFFER INCREASED BY 15
550 REM
570 DATA 205,143,27,17,54,1,205,44,27,11,197,225,195,30,29
    
```

Program Listing 2

NOW MODEL I AND MODEL III!

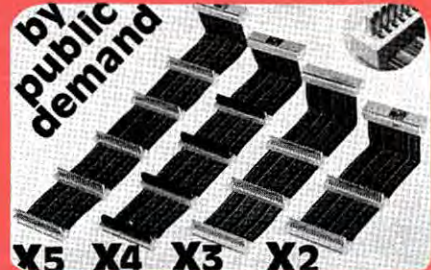
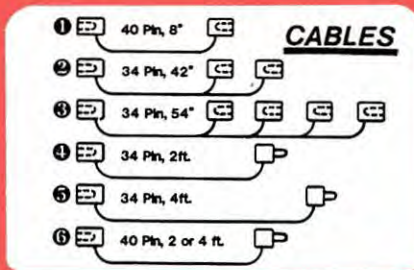
Now Model III users can take advantage of the ALPHA I/O system too. Our new MOD III/I BUS CONVERTER allows most port based Model I accessories (such as our ANALOG-80, INTERFACER 2 and INTERFACER-80) to connect to the Model III bus. MOD III/I BUS CONVERTER, complete with all connectors, only \$39.95.



2 Printers?

PRINTSWITCH

Have 2 printers on line at all times and select printer 1 or 2 by means of a conveniently located switch. End the problem of constantly plugging and unplugging printer cables. PRINTSWITCH is a compact module that plugs into the parallel printer port of your TRS-80 and provides an edge connector for each of your two printers. It works with any two types of printers: dot matrix, daisy wheel, plotters, TRS-80 converted electrics, etc. Assembled, tested, ready to use with connector and instructions. For Model I or III (please specify). ONLY... \$59.00



YOU ASKED FOR IT: "EXPANDABUS" X1, X2, X3 AND X4. CONNECT ALL YOUR TRS-80 DEVICES SIMULTANEOUSLY into the 40 pin TRS-80 bus. Any device that normally plugs into the keyboard edge connector will also plug into the "EXPANDABUS". The "X4" is shown with protective covers (included). The TRS-80 keyboard contains the bus drivers (74LS367) for up to 20 devices, more than you will ever need. Using the E/I, it plugs either between KB and E/I or in the Screen Printer port. Professional quality, gold plated contacts. Computer grade 40 conductor ribbon cable. X2...\$29 X3...\$44 X4...\$59 X5...\$74 Custom configurations are also available. call us.



ANALOG-80: A WORLD OF NEW APPLICATIONS POSSIBLE.

8 DIGITAL MULTIMETERS PLUGGED INTO YOUR TRS-80!!! Measure Temperature, Voltage, Current, Light, Pressure, etc. Very easy to use: for example, let's read input channel #4: 10 OUT 0.4 Selects input #4 and also starts the conversion 20 A=INP(0) 'Ruts the result in variable "A" Voila! Specifications: Input range: 0-5V to 0-500V. Each channel can be set to a different scale. Resolution: 20mV (on 5V range). Accuracy: 8 bits (.5%). Port Address: jumper selectable. Plugs into keyboard bus or E/I (screen printer port). Assembled and tested. 90 day warranty. Complete with power supply, connector, manual... \$139.



TIMEDATE 80: REAL-TIME CLOCK/CALENDAR MODULE

Keeps quartz accurate time for 3 years on 2 replaceable AAA batteries (not included). Gives MO/DATE/YR, DAY of WEEK, HR, MIN/SEC and AM/PM. Features INTELLIGENT CALENDAR and even provides for Leap Year. This compact module simply plugs into rear of Keyboard or side of Expansion Interface (may be slipped inside E/I). Includes cassette software for setting clock and patching to any DOS (including NEWDOS 80, 2.0). Optional "Y" connector allows for further expansion. For Model I Fully assembled and tested. Complete with instructions and cassette. ONLY \$95.00 "Y" option add \$12.00

GREEN SCREEN WARNING

IBM and all the "biggies" are using green screen monitors. Its advantages are now widely advertised. We feel that every TRS-80 user should enjoy the benefits it provides. But **WARNING:** all Green Screens are not created equal. Here is what we found:

- Several are just a flat piece of standard colored Lucite. The green tint was not made for this purpose and is judged by many to be too dark. Increasing the brightness control will result in a fuzzy display.
- Some are simply a piece of thin plastic film taped onto a cardboard frame. The color is satisfactory but the wobbly film gives it a poor appearance.
- One "optical filter" is in fact plain acrylic sheeting.
- False claim: A few pretend to "reduce glare". In fact, their flat and shiny surfaces (both film and Lucite type) ADD their own reflections to the screen.
- A few laughs: One ad claims to "reduce screen contrast". Sorry gentleman but it's just the opposite. One of the Green Screen's major benefits is to increase the contrast between the text and the background.
- Drawbacks: Most are using adhesive strips to fasten their screen to the monitor. This method makes it awkward to remove for necessary periodical cleaning. All (except ours) are flat. Light pens will not work reliably because of the big gap between the screen and the tube. Many companies have been manufacturing video filters for years. We are not the first (some think they are), but we have done our homework and we think we manufacture the best Green Screen. Here is why:
 - It fits right onto the picture tube like a skin because it is the only CURVED screen MOLDED exactly to the picture tube curvature. It is Cut precisely to cover the exposed area of the picture tube. The fit is such that the static electricity is sufficient to keep it in place! We also include some invisible reusable tape for a more secure fastening.
 - The filter material that we use is just right, not too dark nor too light. The result is a really eye pleasing display.
 - We are so sure that you will never take your Green screen off that we offer an unconditional money-back guaranty: try our Green Screen for 14 days. If for any reason you are not delighted with it, return it for a prompt refund.
 - A last word: We think that companies, like ours, who are selling mainly by mail should list their street address have a phone number (for questions and orders) accept CODs, not every one likes to send checks to a PO box offer the convenience of charging their purchase to major credit cards. How come we are the only green screen people doing it? Order your ALPHA GREEN SCREEN today...\$12.50



SPECIAL THIS MONTH!

\$8⁹⁵

DISK DRIVE EXTENDER CABLE, FREE YOUR MINI-DRIVES.

End the messy-chain mess once and for all. Fits all mini-drives: Percom, Aerocomp, Shugart, Micropolis, MTI, Vista, Pertec, Siemgas, BASF. Easy to install: just remove the drive cover, plug in the EXTENDER CABLE and replace the cover. Now you can change and move your drives without disassembly. Keep the cover on and the dust out. High reliability gold plated contacts, computer grade 34 conductor cable. Tested and guaranteed.

Get one for each drive... ONLY... \$8.95



INTERFACER-80: the most powerful Sense/Control module.

• 8 industrial grade relays. Single pole double throw isolated contacts. 2 Amp @ 125 Volts. TTL latched outputs are also accessible to drive external solid state relays.

• 8 convenient LEDs constantly display the relay states. Simple "OUT" commands (in basic) control the 8 relays.

• 8 optically-isolated inputs for easy direct interfacing to external switches, photocells, keypads, sensors, etc. Simple "INP" commands read the status of the 8 inputs. Selectable port address. Clean, compact enclosed design. Assembled, tested, 90 days warranty. Price includes power supply, cable, connector, super user's manual... \$159



✓ 17

ADD \$2.50 PER ORDER FOR SHIPPING AND HANDLING ALL ORDERS SHIPPED FIRST CLASS MAIL WE ACCEPT VISA, MASTER CHARGE, CHECKS, M.O. COD: ADD \$2.00 EXTRA QUANTITY DISCOUNTS AVAILABLE N.Y. RESIDENTS ADD SALES TAX

79-04 Jamaca Ave., Woodhaven, N.Y. 11421

Info and order: (212) 296-5916

ferent line number into START+4 (LSB) and START+5 (MSB), the routine can be made to seek any line number existing in the Basic program.

By setting the variable Break to a value dependent on the portion of the program being executed, and directing the Break-handling routine to a line containing an ON BREAK GOTO NNN,NNN,NNN statement, a press of the break key can be made to have different responses depending on where the program was when the key was pressed.

*J. Stewart Schneider
2813 Louisa St.
P.O. Box 365
Catlettsburg, KY 41129*

Adapting to the Future

Sure, computers can help our educational system, which is in terrible shape, but Wayne Green is a dreamer. The idea behind a proper liberal arts course is not to teach students to appreciate trees, although there is nothing wrong with that. The idea is to help these students develop thought processes and problem-solving abilities. This way, when Mr. Green's technical students find that their field has turned over so fast that the techniques they learned only two years ago in his industrial park are already outdated, they will have the ability to adapt to changes in technology that were unforeseen.

*James Magliano
462 West 6 Ave.
Roselle, NJ 07203*

Bugs in the Board

In your August 1982 issue of *80 Micro*, Dennis Kitsz published a PC card layout for the Radio Shack Color Computer. As an avid user of the 6809-based machine interested in generating my own specialized PROM boards, I had a prototype board made. Lo and behold, it didn't work. After many hours of debugging, the corrections for the published layout are as follows:

- The edge connector is not to the proper scale (0.100") and could short out one's Color Computer if any further reductions are made, or if the total edge connector size is not correct.

- The traces as published are too fine for easy photocopying. My board had several micro-cracks in the traces which had to be found with an ohm meter.

- The 74LS138 (p. 348) is in backwards.

- A hole should have been provided for the cartridge interrupt self-start function (edge connector pins 7-8).

And now for the most serious bugs (see Fig. 1):

1. The trace to the edge connector pin 37 should be cut (see Fig. 2).

2. Cut the trace from the edge connector pin 20. Pin 20 is mistakenly connected to pin 19 in the drawing; this shorts A0 to A1 whereby the CoCo will not work.

3. Add a jumper from the plate-through hole below where the trace was cut in 2 above to (2K ROM C, 4K ROM D) pin 7.

4. The plate-through hole under (2K ROM A, 4K ROM C) does not connect to the IC socket pin 15. A short piece of

wire soldered in the hole will make this connection.

5. With the component side up, on the edge connector, on the right side, solder a small jumper from the next to the last terminal to the hole above it and to the right.

With the above corrections made, I have successfully made the prototype board work with both 2716s and 2732s, fully populated. The lesson I learned was not to believe all that is published. We are designing our own Color Computer board with plans to hold four 2716s, four 2732s, two 2764s or one 27128.

*G.W.J.K., Jr.
The Irishman's Software
P.O. Box 119
Churchville, NY 14428*

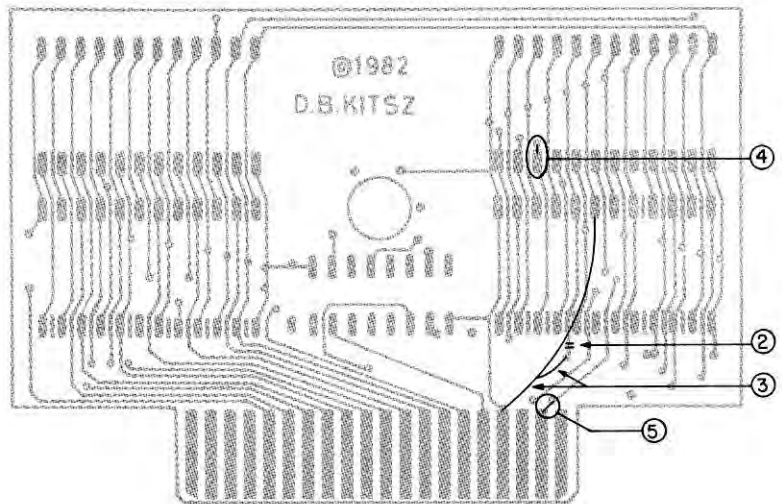


Figure 1

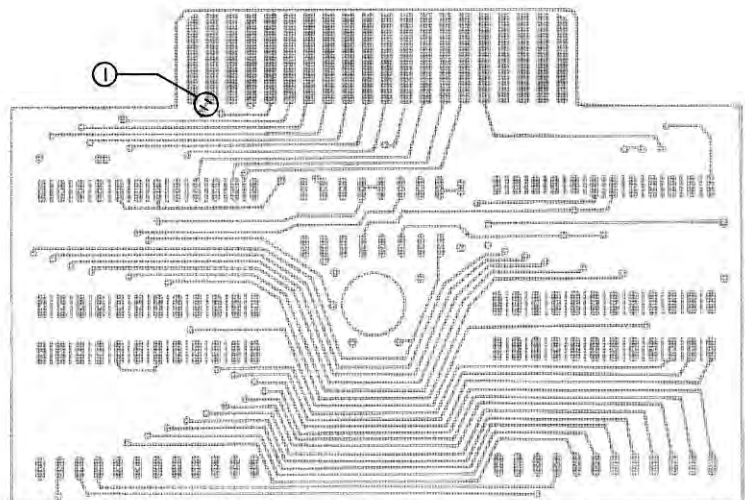
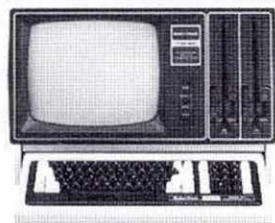


Figure 2

From Computer Plus to YOU...

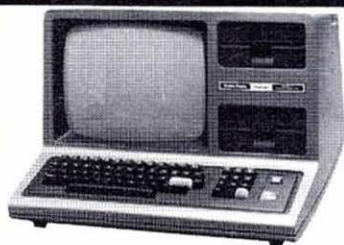
PLUS after PLUS after PLUS



Model 16 128K
1 Drive \$4199
2 Drive \$4799



Color Computer 16K \$249
w/16K Ext. Basic \$335
w/32K Ext. Basic \$449



Model III 16K \$799
Model III 48K
2 Disk & RS232 c \$1899



Okidata 80 \$325
Okidata 82A \$425
Okidata 84 \$1029



Color Computer Disk Drive
Drive O \$385 Drive 1 \$239



Smith Corona TP1
Daisy Wheel \$575

BUY DIRECT Here are just a few of our fine offers...
call TOLL FREE for full information.

COMPUTERS

Model II 64K	\$2675
Model III 4K LEV I	599
MODEL III 16K	799
MODEL III 32K	856.50
*MODEL III 32K	831.50
MODEL III 48K	914
*MODEL III 48K	864
Model III 48K	
2 Disk & RS232 c	1899
Color Computer 16K	249
Color Computer 16K w/extended basic	335
Color Computer 32K w/extended basic	449
‡Color Computer 32K-64K w/extended basic	460
Pocket Computer 2	230
Model 16 1DR 128K	4199
Model 16 2DR 128K	4799
DT-1 Data Terminal	599
PT-210 Portable Terminal	779

MODEMS

Lynx Direct Connect MII/MIII	235
Hayes Smart Modem II	235
R.S. Acoustic Coupler AC-3	134
R.S. Modem I D.C.	130
R.S. Modem II D.C.	210

PRINTERS

Daisy Wheel II	1715
DWP-410	1335
Smith Corona TPI Daisy Wheel	575
Epson MX80	499
Epson MX80 FT	549
Epson MX100	735
CGP-115	199
DMP-100	315
DMP-200	599
DMP-400	1029
DMP-500	1569
Microline 80	325
Microline 82A	425
Microline 83A	679
Microline 84 Parallel	1029
P. C. Plotter Printer	199

DISK DRIVES

R.S. Model III 1ST-Drive	650
Tandon 40 Track MI	289
Color Computer Drive 1	239
Color Computer Drive 0	385
Primary Hard Disk MII	3899
Primary Hard Disk MIII	1999

ETC.

CCR-81 recorder	52
C. C Joysticks	22
16K RAM N.E.C. 200 N.S. chips	25
64K Ram Chips	75
Color Computer Flex D.O.S.	99
Brand Name Software • Send for listing.	
R.S. Software 10% off list	

*Computer Plus New Equipment,
with NEC RAM installed.
180 Day Computer Plus Warranty.

‡Color Computer 64K requires
Disk 0 and Flex D.O.S.

**TOLL FREE
1-800-343-8124**

computer plus

P.O. Box 926
480 King Street
Littleton, MA 01460
617-486-3193

Write for your
free catalog

We have the lowest possible
Fully Warranted Prices AND
a full complement of Radio Shack
Software.

Prices subject to change without notice.
Not responsible for typographical errors.
TRS-80 is a registered trademark of Tandy Corp.



Kitsz Comments

I'm sorry G.W.J.K., Jr. met with so much difficulty. I did double-check the published material against my own; see the Updates in this month's "Applications" for an offer to readers.

As for G.W.J.K.'s comments: My film negatives are to the proper scale of 0.1 inch, derived from 2x originals. The size error, as well as the ink dots, scratches, and blurring, was introduced during the production of the magazine, something beyond my control. The traces, however, photocopy just fine on my machine; such detail was required for the board to fit in Radio Shack's plastic case. I did reverse the 74LS138 in redrawing the parts overlay from my pencil copy.

G.W.J.K.'s five board corrections will work. I would like to offer an apology and an explanation to readers who may have been frustrated by my errors. The electronic design, two wire-wrap versions, four sets of original PC artwork and three prototypes were done and updated. The final prototype was made for me by the company who intended to sell the ROM board. I was told they had the board working; however, I failed to ask if they had made final corrections, and I further neglected to examine the prototype when I received it. My last set of artwork,

which still contained errors, was sent in for publication. That company went out of business last month.

I, too, have learned a lesson from this experience, and it has made me layout-shy. Although this is the first PC layout with flaws that has appeared in print, it is the last PC layout I will produce for publication. Future articles will contain only the schematics; however, PC boards will still be available for each project, and I will give a source for them.

*Dennis Kitsz
Green Mountain Micro
Roxbury, VT 05669*

Secret Slip

I enjoyed James T. Demberger's "I Have a Secret" program (80 Micro, October 1982, p. 296). My complaint with the article is that Mr. Demberger implies that an exclusive OR (XOR) logic function could not be constructed within Level II Basic without the use of machine code. This is absolutely false! Level II Basic contains three logical operators: NOT, AND, and OR. With combinations of these three operators, any logic function can be simulated.

The XOR logic function can be simulated by taking two inputs and AND-ing them with each other's inverse, then

ORing the result. To test the XOR function, type and run Program Listing 3 or 4. Listing 3 displays the XOR truth table and Listing 4 is a short crypto cipher/decipher algorithm.

*William T. Faulkner
5350 N. Lover Lane Road
Milwaukee, WI 53225*

Printer Problem

I would like to share with 80 Micro readers a problem I've encountered with the Model III and the Okidata Microline 83A printer. In Basic, a line feed is often done by using the LPRINT"" statement; however, this will not work with the Okidata 83A because of an apparent error in its ROM. A technician at Okidata indicated that the company was aware of the problem and that a new ROM would be issued sometime in the future.

When using LDOS 5.1.2, NEW-DOS80, TRSDOS 1.3, or Level II, a line feed can be issued by using LPRINT or LPRINT"", but neither statement will work when using DOSPLUS 3.4 or MULTIDOS 1.1 with the Okidata 83A.

While most of our software was easily adapted to conform to the statement that the printer would accept under LDOS, Newsprint 7.0 refused to eject the page or to issue line feeds between paragraphs. The people at ProSoft stated that they had not been aware of this difficulty; because the program had performed well with a Microline 80, it was assumed that it would work with the 83A. While ProSoft was willing to find a fix for the problem, I was unwilling to wait and found that Newsprint will run under LDOS or DOSPLUS if the following statement is appended to line 7340 of the Script module:

:LF\$ = CHR\$(10)

Although not an official fix from ProSoft, this has enabled us to use the word processor without difficulties.

Any prospective buyer of the Microline 83A, which I still consider an excellent printer, should be aware of the line feed idiosyncrasy and its possible incompatibility with two of the major operating systems.

*Ernest Stefanik
Fax Plus Computing
373 Wilson St.
Derry, PA 15627*

```
10 CLS: PRINT " TRUTH TABLE"
20 FOR A=0 TO 1
30 FOR B=0 TO 1
40 REM :::: C= A XOR B
50 C= (A AND (NOT B)) OR ((NOT A) AND B)
60 PRINT A;"XOR";B;"=";C
70 NEXT B,A
80 END
```

Program Listing 3

```
10 CLS: PRINT
20 A$="CIPHERKEY"
30 B$="MESSAGE 1"
40 FOR I=1 TO 9
50 A= ASC(MID$(A$,I,1))
60 B= ASC(MID$(B$,I,1))
70 REM :: C= A XOR B :: D= A XOR C :: NOTE : B=D
80 C= (A AND (NOT B)) OR ((NOT A) AND B) 'CIPHER
90 D= (A AND (NOT C)) OR ((NOT A) AND C) 'DECIPHER
100 PRINT A;"XOR";B;"=";C;" ",A;"XOR";C;"=";D
110 NEXT I: PRINT
120 END
```

Program Listing 4

Convert to CP/M and Save.

Unprecedented Sale for Model III Owners. Call for Details.

The Trouble with TRS-DOS.

Although TRS-DOS is an excellent operating system, it has one major disadvantage. When compared with CP/M, TRS-DOS locks you into a limited and possibly dead-end course. When you are ready to upgrade to a new computer, it is likely that none of your present software will run on the new machine. All of the time and money you have invested in TRS-DOS software will be lost.

CP/M for the TRS-80.

Converting to CP/M offers the TRS-80 owner many advantages. The TRS-80 immediately becomes capable of running twice the software of any other computer on the market. Perhaps more importantly, CP/M permits software portability. Unlike TRS-DOS programs, CP/M programs can be directly transferred to your next computer. The savings in time and software costs can be quite significant. CP/M conversion can easily pay for itself with the money saved on one or two software purchases. The sooner you convert to CP/M, the more you stand to save.

CP/M Acquires Unprecedented Support.

Over the past year, a number of powerful competitors have introduced new microcomputers. Most people will instantly recognize the names of Xerox, IBM, Hewlett-Packard, Digital Equipment and Zenith. The Japanese companies, Sony, NEC, Sanyo, Toshiba and Sharp, are equally well-known. Together, these companies have committed over a billion dollars to compete effectively in the micro market. TRS-80 owners should be aware that every one of these companies has chosen CP/M for their standard operating system. Over the next few years, these companies will sell millions of CP/M computers. Considering these facts, it is clear that CP/M is the operating system of the future.

Apple and Commodore Offer CP/M.

In a recent press conference, the Apple Computer Company stated, "The largest installed base CP/M system in the world today is the Apple II with the Z80 card from Microsoft." In a recent full page ad in the Wall Street Journal, Apple announced CP/M for the Apple III. Commodore, refusing to be left behind, has recently announced their "Emulator" series of computers that support CP/M. There are even rumors that the new Tandy 16 will support a version of CP/M.

Plan Ahead.

The Omikron "Mapper" offers the ideal step to upgrading to a newer, more powerful computer. With the "Mapper," your TRS-80 can run both CP/M programs and TRS-DOS. With CP/M, you can build a software library that's fully compatible with the newest CP/M business computers. All of the time and money you spend on selecting, purchasing, and learning CP/M software can be considered an investment in the future. In addition, your old TRS-80 can gain a new lease on life as a fully compatible back-up unit. Consider all these points carefully. The Omikron "Works" package offers the best solution for protecting your investment in the TRS-80. By choosing the "Works," you can purchase a "Mapper" and also receive over \$1,000 worth of top-quality CP/M software. Value, Utility, performance — Omikron offers you more than ever before.

COUGAR ... Omikron's Users Group.

CP/M has always been the standard for business and professional use. This market has always demanded high quality and high performance. The high prices for CP/M programs reflect the additional effort required to develop top-quality software products. To help our customers afford CP/M software, Omikron has formed Cougar, our official users group. Through Cougar, Omikron can purchase software products in large volume. This allows us to offer our customers some of the best CP/M software in the industry at greatly reduced prices.

Omikron Puts It All Together.

Omikron has sold more CP/M conversions than all of our competitors combined. Omikron was the first in the market with a CP/M conversion. Omikron has continued to lead the market for one simple reason — our total commitment to our customers. Only Omikron offers a "Works" type introductory package. Only Omikron has a "Cougar" type users group for long-term savings. Our hardware has always been designed with reliability first. Our software is well designed, complete, and bug free. Our technical hot line assists those with problems. Finally, our exchange policy has enabled our customers to upgrade to our new designs for much less than the cost to new customers. When you buy from Omikron, you buy from a company with a proven record of dedication and success.

OMIKRON

Products that set Precedents
1127 Hearst Street, Berkeley, CA 94702 (415) 845-8013

What Model II?

I recently subscribed to your magazine and found it very entertaining. A better name for your publication, however, might be *80 Micro for the Model I & III*. What I would like to see in your magazine, as you may have guessed, is more on the Model II.

Wayne C. Bucklaew
700 Etheridge Road
Chesapeake, VA 23320

Starting in March 1983, we will publish Model II versions of many of the Model I/III programs that appear in each issue. The conversions are being made by our technical staff and a cadre of 80 Micro authors who specialize in Model II software. In addition, we remain vigilant in our efforts to obtain high-quality articles on the Model II.—Eds.

Controversial Definition

As a senior Telecommunications Analyst, I could not believe Jay Chidsey's definition of baud (*80 Micro*, October 1982, p. 96). It does not mean "bits of audio data." Emile Baudot's name is the source of the term; he created a five-level code for data transmission many years ago, after Samuel Morse created the Morse code.

The correct definition of baud is: "The number of signal level changes per second regardless of the information content of those signals." A modem (MODulator/DEModulator) clocks at a certain speed; that is, the timing inside the modem changes signal levels at a preset speed. The clock must time at the speed of the data being transmitted or faster. The faster the clock, the faster data can be transmitted. This does not mean that baud and BPS (bits per second) are the same. A modem can clock at 4800 or 9600 baud, but data will be transmitted at 1200 or 2400 BPS. The only time baud and BPS are interchangeable is at the speed of 1200 BPS or less. That is because the modems at those speeds usually clock at the same rate as the data. The correct way to refer to data transmission speed is by the term BPS, not baud.

I discovered a second error in Mr. Chidsey's reference to processor speed. The speed of a computer is never rated in terms of baud. Computers, either micros, minis, or large mainframes such as IBM's 303X series, are measured by

the time it takes to execute a single machine code instruction. The term for this is IPS, Instructions Per Second. A mainframe like IBM's 3033 Model N is rated at a speed of about 3.6 MIPS. This means that the computer can execute 3.6 million instructions per second. Another method of comparing processors is by rating it against a benchmark machine, in this case the IBM 370/158 Model 3.

Chuck Bolvin
1234 Valley Lake Drive, Apt. 542
Schaumburg, IL 60195

Chidsey's Response

First an explanation, which is not intended to serve as an excuse. The idea of the "Bit Smitten" column was to assign a person who had writing experience and some familiarity with a TRS-80 the task of recalling questions he had in the early part of the experience of working with the computer, and then to research answers and, with the back-up of technical people on the 80 Micro staff, write columns based on this research and on simple tips for newcomers to the micro field. "Bit Smitten" is a researched column, not one written by a computer expert. That is, however, no excuse for passing on false or inadequate information.

Mr. Bolvin's description of the derivation of the word baud is persuasive, but I must protest to him that all three of the other authorities checked ascribe the term to "bits of audio data." Reference to a standard work, Computer Dictionary and Handbook by Charles Sippl, Howard W. Sams & Co., Indianapolis, Kansas City and New York, confirms Mr. Bolvin's point without question.

Further checking, with Mr. Bolvin's assistance, reveals that Emile Baudot created a five-level (or five-bit) code for use in automatic telegraph transmission (teletype). By making use of shift option, two sets of 32 characters were possible: a total of 64. The Baudot code was, however, little used in America. Donald Murray created a five-level shifted code, which is used here. American microcomputers use the eight-bit ASCII code, and are now in the process of moving to 16-bit code.

Baud and BPS are used loosely and incorrectly as synonymous by some manufacturers and advertisers of peripherals, such as modems. The rule of

thumb appears to be that information on big machines, directed toward technicians, uses BPS in describing data transfer rates, and information on micros, directed toward businessmen and hobbyists, uses baud rate.

I was clearly wrong in using baud to refer to IPS as a measure of speed of execution for a single machine-code instruction within a computer. I stand abashed and instructed.

Jay Chidsey
205 East Adams St.
Green Springs, OH 44836

Subscription Solution

I am shocked by the flippant answer given by your editors to Mr. Hoover (*80 Micro*, December 1982, p. 20). Your subscribers deserve better. If it had been me, I would have complained to the postal service about mail fraud.

L.J. Kutten
201 South Central
P.O. Box 16185
St. Louis, MO 63105

It was not our intent to be flippant. We responded to Mr. Hoover's problem as quickly as possible, and resolved it three months prior to the publication of his letter. Our first priority is to serve our readers, and such matters therefore receive immediate attention. We published Mr. Hoover's letter because we were impressed by (and grateful for) the humor with which he handled a very unusual situation, and we wanted to share that humor.—Eds.

Earning Our Keep

It's articles like the one Dennis Kitz wrote in the October 1982 issue (*80 Micro*, "Applications," p. 368) that keep me a faithful subscriber. The most-used keys on my machine, 1 and space bar, had long since stopped responding to my cleaning efforts, and were working so poorly that it seemed a trip to the Radio Shack Repair Center was inevitable. Since my Model I has been heavily modified, taking it back is not something I undertake lightly, but I couldn't figure out what the problem was.

Then along came the October issue and there was the answer! Sure enough, there were tiny cracks in the solder connecting the key contacts to the board, just as Dennis said. In a matter of

Special: SAVE \$15
NEWSSCRIPT + Mailing Labels
\$139.95

“IF YOUR PRINTER

— NEWSSCRIPT COMPATIBLE PRINTERS —

Anadex 9500 (Parallel/Serial) • Anadex 9501 (Parallel/Serial) • Anadex DP-9000 (Parallel/Serial) • Atari 825 (Parallel/Serial) • C. Itoh 8300P (Parallel) • C. Itoh 8300P (Serial) • C. Itoh Printmaster F10 (Parallel) • C. Itoh Printmaster F10 (Serial) • C. Itoh Starwriter FP 1500 (Parallel) • C. Itoh Starwriter FP 1500 (Serial) • C. Itoh Starwriter II 8550 (Parallel) • C. Itoh Starwriter II 8550 (Serial) • C. Itoh Starwriter F10 (Parallel) • C. Itoh Starwriter F10 (Serial) • C. Itoh II 8510A (Parallel) • C. Itoh II 8510A (Serial) • Centronics 737 (Parallel) • Centronics 737 (Serial) • Centronics 739 (Parallel) • Centronics 739 (Serial) • Decwriter II • Diablo 1610 • Diablo 1620 • D-FT (Parallel) • Epson MX-80 with FT (Serial) • Epson MX-70 (Parallel) • Epson MX-70 (Serial) • Epson MX-80 (Parallel) • Epson MX-80 (Serial) • Epson MX-80 with Graftrax 80 (Parallel) • Epson MX-80 with Graftrax 80 (Serial) • Epson MX-80 with Graftrax Plus (Parallel) • Epson MX-80 with Graftrax Plus (Serial) • Epson MX-80 with Graftrax Plus and FT (Parallel) • Epson MX-80 with Graftrax Plus and FT (Serial) • Epson MX-100 with Graftrax Plus (Serial) • Epson MX-100 with Graftrax Plus (Serial) • IDS Paper Tiger 460 • Kogyosha (All typewriters) • NEC 8023A (Parallel) • NEC Spinwriter 5515 • NEC Spinwriter 5520 • NEC Spinwriter 5525 • NEC Spinwriter 5530 • NEC Spinwriter 5535 • NEC Spinwriter 5550 • Olivetti 121 • Quime Sprint 5 • Quime Sprint 5 • Radio Shack Line Printer II • Radio Shack Line Printer IV • Radio Shack Line Printer V • Radio Shack Line Printer VII • Smith Corona TP1 (Parallel) • Smith Corona TP1 (Serial) • Teletype 43 • TI 725

IS ON THIS LIST, NEWSSCRIPT SHOULD BE ON YOUR COMPUTER.”



NEWSSCRIPT'S exclusive print processor gives you total printer control.

NEWSSCRIPT's exclusive print processor takes over where formatting leaves off with over 200 print processing and support features. NEWSSCRIPT takes you beyond text formatting — beyond just printing text on paper. With NEWSSCRIPT's Print processor you take full advantage of your printer's hardware and software features, creating an unsurpassed printed image. Text editing (the part you see), is only part of the job, printing is the other part — the part others will see.

NEWSSCRIPT controls over 80 popular printers.

You don't even have to know how your printer works — only what it can do. NEWSSCRIPT will do the rest with such major features as underlining, right justified proportional printing, top and bottom titles, top/bottom left-right-center page numbering, chaining and embedded printing of any length file with disk spanning, fully formatted merging of form letters with selective editing, boldface, sub/super scripts, character substitution/translation, table of contents, indexing,

hanging indents, paragraph numbering, line numbering, double width characters, italics, hard and soft hyphens, in-memory spooling, and many other features.*

NEWSSCRIPT'S text editor has sophistication to match its print processing.

Buffered key entry rates to 450 characters per second — you never drop characters. Windowing to 240 characters, block move and copy within and between files, definable auto save, “HELP” and “WHOOFS” commands, repeat and query last command, search and replace within column and line limits as well as globally, and an automatic interface to the ELECTRIC WEBSTER spelling checker (sold separately).

NEWSSCRIPT'S 277 page manual contains an introductory tutorial with explanations of the beginner's most common needs, a “How to Section” to help when you're stuck, a fully alphabetized description of the commands with literally hundreds of examples, a topical index with over 1,300 entries, and a handy quick-reference card (naturally!).

Start getting the printed results only NEWSSCRIPT can give you for \$124.95. Requires TRS-80 Model I or III with 48K and 1 disk (minimum — 2 recommended)

NewsScript

is available at computer stores, selected B. Dalton Book Sellers, and selected independent book dealers. If your dealer is out of stock order direct. Include \$3.00 (domestic), \$6.00 (Canada) for shipping and handling. Foreign residents add \$15.00 plus purchase price, in U.S. funds.

TO ORDER, CALL NOW, TOLL-FREE:
(800) 824-7888, Operator 422
Calif: (800) 852-7777, Oper. 422
Alaska/Hawaii: (800) 824-7919
For technical information call:
(213) 764-3131, or write us.

PROSOFT

Dept. C, Box 560, No. Hollywood, CA 91603

NEWSSCRIPT companion programs (sold separately): MAILING LABELS \$29.95, DAISY WHEEL PROPORTIONAL \$49.95 (not required for Daisy Wheel II), PENCIL & SCRIPSIT FILE CONVERSION \$24.95, ELECTRIC WEBSTER (spelling checker and automatic correction) \$149.50, GEAP (TRS-80 graphics — requires Epson MX-80) \$49.95, DOTWRITER (Hi-res graphics — requires Epson MX-80/100 with Graftrax) \$69.95, GEAP/DOTWRITER combination (requires Epson MX-80/100 with Graftrax) \$99.95

Dealers: NEWSSCRIPT is distributed by IJG, Inc. (714) 946-5805

*Some features work only if your printer has the mechanical capability.

NEWSSCRIPT trademark

PROSOFT registered U.S. Pat. Office TRS-80 registered trademark TANDY Corp.

minutes my four-year-old keyboard was working like new.

I probably would never have thought of looking that closely at the soldering, and I'm not sure the Radio Shack technician would have either; it's a tough one to catch. As a result, that article saved me somewhere between the minimum \$15 labor charge and \$75 for a new keyboard. When you also figure the time it saved me (taking the machine apart and at least one round trip of 1½ hours to the nearest Center and back), you can see how that one article easily paid for at least a whole year's worth of magazine.

*Jim Unwin
18022 Valley Vista
Mulino, OR 97042*

Leaning on the Lamp Post

Program Listing 5 is a modification on "Drunkard's Walk" (80 Micro, Oc-

tober 1982, p. 97). It provides an interesting holding pattern for those moments before inspiration strikes.

Information, at least in English, is hard to come by over here in Germany and you fill the bill for TRS-80 owners. I'm also pleased at the response time on your reader service card and of several of your advertisers.

*Richard W. Stubbs
HHC, V Corps (G3)
APO NY 09079*

Tandy Bonus

Despite all the warnings given in your fine magazine, I recently managed to destroy my TRSDOS system disk. Last Saturday I headed for my local Tandy store, where I have received superb service since buying my Model III 15 months ago. I duly purchased a replacement disk and received the expected lecture on how not to do what I had done. On arriving home I booted the disk

and found that not only did the directory show the usual LPC/CMD, HERZ50/BLD, etc., but full working copies of several disk dump programs and Big Five's Defense Command. I have read that Tandy is soon to start merchandising non-Tandy software, but did not think that this was the intended modus operandi!

*Bryan W. Carter
219 White Oak Ridge Road
Short Hills, NJ 07078*

TRSDOS Patches

The following are three patches that I came up with, but I have not seen any of them published. These patches bypass the logo and copyright displays on TRSDOS when the system is reset. The last patch was written by John Ratzlaff and appeared in the September issue. These must be typed in exactly as they appear and are used on version 1.3 of TRSDOS.

```
PATCH *0:0 (ADD=4E85,FIND=21,CHG=C3)
PATCH *0:0 (ADD=4E86,FIND=6C,CHG=9D)
PATCH *0:0 (ADD=4E87,FIND=51,CHG=4E)
PATCH *0:0 (ADD=4EA9,FIND=CA,CHG=C3)
```

The first patch changes the present LD mnemonic to JP for a jump to the memory location specified by the second and third patches. The fourth patch bypasses the time and date input for the system. If you want to change the system back to the original specifications, redo the patches but switch the values for FIND and CHG of each patch.

*Hermes S. Mendez
Forest Lake Academy
P.O. Box 157
Maitland, FL 32751*

Inside Information

Those of you who are interested in contacting Craig Lindley concerning his "Inside Scripsit" articles (80 Micro, September, October, and December 1982), can call him in the evenings at 303-685-1786. Craig has received over 75 letters already. Unfortunately, he cannot respond to each one individually, but he'll be glad to discuss the articles with anyone who calls.—Eds.

```
0  *** IDLER
1  *** ADAPTED FROM: 'DRUNKARDS WALK' (80 MICRO/OCT 82, PG 97)
2  *** BY: DICK STUBBS (HHC,V CORPS-G3 APO NY 09079)/6 OCT 82
3  *** FOR: TRS-80 MOD III(48K) (TRSDOS 1.3)
10 X=RND(127):Y=RND(47)
20 CLS:SET(X,Y)
30 Z=RND(2)
40 X=X+(RND(2)-Z)
50 Y=Y+(RND(2)-Z)
60 IFX>127ORX<0,10
70 IFY>47ORY<0,10
80 IFPOINT(X,Y)RESET(X,Y)ELSESET(X,Y)
90 RANDOM
100 Z$=INKEY$:IFZ$="",30ELSECLS
110 PRINT@527,"< B >ASIC or < T >RSDOS ?":I$=INKEY$:IFI$=""110
120 IFI$="T"CLS:CMD"S"
130 CLS:END
```

Program Listing 5

The Perfect Business System

Buy
Package

1. *TRS 80 Mod III - 48K
2. 2 Dual Sided/DD 40 TR Tandon Drives
3. Apparatt Disk Controller
4. Okidata 83A Printer w/ Cable
5. MAS 80 GL, AP, AR, CW, PR
6. NEWDOS 80

Package Price: \$4100

Or
Items
Separate

CALL: MINI SYSTEMS SUPPORT
TANDY CORP.

430

(607) 732-3186

NEW!
ESF III
NOW AVAILABLE!

SIMPLY AMAZING!

NEW LOW PRICE—\$99.50

How else can you describe the *Exatron Stringy Floppy* system? You could say that it's an under \$100, compact, reliable, robust, high-speed, computer-controlled, easy-to-use, well-supported alternative to disk drives, for a Model I or III TRS-80—*simply amazing!*

Amazing Technology

Based on a special endless-loop tape cartridge, called a Wafer, the ESF system was designed specifically for computer data storage. The direct-drive transport mechanism has only one moving part, and data is transferred to and from the tape at a rate of 7200 baud.

Amazing System

Thousands of ESF buyers have been amazed by 16K programs loading in less than 20 seconds; automatic verification of saved programs; up to 70K bytes, and 99 files, on a single Wafer; a ROM operating system (RAM based in Model III); no need for an expansion interface; and 1-year parts and labor warranty.

Amazing Support

With an ESF system you don't just get a piece of hardware, you get total support with hundreds of user workshops; dozens of high-quality, reasonably priced programs (such as Electric Pencil 2.0, Electric Spreadsheet, File Management System and Technical Word Processor); access to hundreds of FREE public-domain programs; an @NEWS user column in 80-US; @LOAD program magazine; and a toll-free information line.

Amaze Yourself

To see for yourself how amazing the ESF system is, or for more detailed information, call us toll-free at **800-538-8559** (inside California **408-737-7111**) and take advantage of our 30-day money-back return policy. Copies of the 80-page manual are available for \$4.95 (which you can credit towards an ESF), and while you're on the line ask about our equally amazing 64K RAM/ROM board for the Model I.



excellence in electronics

exatron

~93

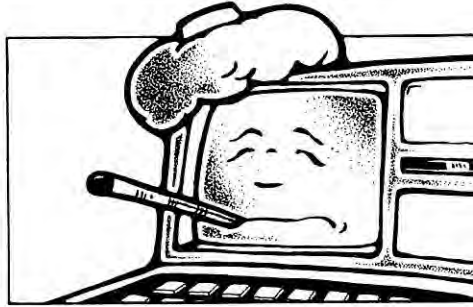
181 Commercial Street,
Sunnyvale, CA 94086

TRS-80 is a trademark of Tandy Corporation.
Stringy Floppy is a trademark of Exatron Corporation.

Engineering Software

Can someone give me the name and address of a software distributor that is interested in programs for engineering applications?

John A. Henson, II
2011 Dawn Heights Drive
Lakeland, FL 33801



Looking for Software

I am looking for software for my Model III 48K that will let me use the cassette port from a communications receiver to input CW and translate to ASCII and display/print. This will be used for monitoring only since I don't have a ham license.

Also, I need to find someone locally who has The Last One program-generator package, and who would be willing to answer some questions I have about the operation and the efficacy of a \$600 program generator.

Alfred Kohlberg, Jr.
Communications Service Company
5706 84th Avenue
New Carrollton, MD 20784
(301) 577-2023

DDC Problems

I have a System 80 with the expansion interface that has an RS-232 port and S100 capability (this is the Australian version of the American marketed PMC 80). Recently I bought the Aerocomp DDC to give me double-density capability, and found that it was not compatible with the System 80 interface.

I would appreciate information from anyone who has managed to get the DDC working in a System 80 expansion interface, the similar PMC 80 system, or in the Video Genie 80.

R.A. Ivory
P.O. Box 2320
Christchurch, New Zealand

Typing Blind

I recently purchased a Modem I with cassette software, and an extra cable to hook up the modem through the cassette port of my TRS-80 Model I. I did this so I would not have to purchase an expansion interface or an RS-232 to communicate with my school's IBM

370. There is, however, one problem. If I type in a program line, I can't see it until I list it afterwards. Also, there is no carriage return.

Has any other reader had this problem? How can I correct it? Note that the system at school is running in the half-duplex mode. Could it be a problem with the IBM 370 sending machine?

Christopher Inguanta
23-06 21st St. Apt. 6J
Astoria, NY 11105

Converted Program Wanted

I would appreciate a listing from anyone who has successfully converted the Cassbox program by Charles E. Gillen (November 1982) to work with a Model III, and an Epson MX-80 with Graftrax-Plus. I can't get the printer to print double-wide characters on the front label.

If anyone has figured out how to use the Epson control codes while using the cassette Scripsit, or if anyone knows of a good patch program, I'd like to hear from you. I want to be able to change codes while using Scripsit.

Larry E. Ierley
923 Thistle Road
Elizabethtown, PA 17022

Parts and Ribbons

In response to Bryan Headley's question (Aid, November 1982), parts and ribbons for the Base 2 Model 800 printer (printer mechanism only) can be obtained from the OEM, Two-Day Corporation, 203 East Main Street, Riverton, WY 82501 (307) 856-1111. Ribbons are \$9.95 each plus shipping.

Computer Peripheral Repair, 1483 East Warner Avenue, Santa Ana, CA 92705, has made exclusive arrangements with Base 2 Corp. to support all repair work with factory-trained personnel, and to stock all major replacement parts. Minimum charge is

\$50 plus parts.

Neither company accepts credit cards, though the Two-Day Corp. will ship C.O.D.

Roger Parish
1712 Anna Rose Drive
Belleville, IL 62221

Police Need Help

I am interested in finding a program that will aid me in the scientific reconstruction of automobile accidents. I have a Model II with two disk drives. Can someone help?

Sgt. Michael J. Capman
Crown Enterprises
823 Parchmount Avenue
Parchment, MI 49004

Programs for the Handicapped Needed

We at the Cheshire Home for the physically handicapped are building a program library for disabled computer users. We are looking for new programs to add to this library. We already have several Apple, Pet, and TRS-80 programs. Does anyone have any programs of this nature for the ZX series of computers?

The program scope is unlimited, but please remember that many handicapped operators have restricted vision, so the display needs to be extremely clear.

Robin Nixon
Seven Springs Cheshire Home
Pembury Road,
Tunbridge Wells, Kent
England TN2 4NB

Instruction Booklet Wanted

I am desperate! I need a copy of the instruction booklet for the Voxbox (Catalog #26-1181). I bought this from a Radio Shack store about a year ago, and have been trying ever since to get the booklet. Can anyone help me?

John Marcinisen
230 Cedar Road
East Northport, NY 11731

Route Problems

I recently purchased a Model III with

the intention to use both the parallel and serial outputs directly to the matrix and daisy-wheel printers. To my dismay, I found that the serial driver cannot be used since the Route command does not function properly on the current DOS system.

Does anyone have a solution? I don't want to give up my Model III.

*Stanford L. Hart
22110 Napa St.
Canoga Park, CA 91304*

Coding Wand

Can anyone provide hardware and software information for using a low-cost bar-coding wand with the TRS-80 Model III? I intend to use this system for inventory control and batch number record keeping.

*Jerry Ellis
Laboratory Service Company
P.O. Box 7526
Clearwater, FL 33518*

Needs Help

I am trying to interface a TRS-80 Model III with two additional video monitors for use in a press operation at a motorsports facility. Any help in obtaining either a circuit or an interface box to perform this function is appreciated.

*Michael F. Hollander
Racing Information Systems
7317 Haskell Avenue, Suite 214
Van Nuys, CA 91406*

continued from p. 10

Thus, we will continue to accept advertisements that offer programs to back up protected software.

Furthermore, we feel strongly that whether a program is protected has become an important buying consideration for many consumers. Thus, we are encouraging our writers to include this information in their reviews. We will also solicit such information for our buyer's guides.

We hope that such steps will eventually become unnecessary. We would like to see a healthy and trusting relationship develop between microcomputerists and manufacturers. The computerists have made their feelings known in no uncertain terms. It is now up to the manufacturers to respond.

—E. M.

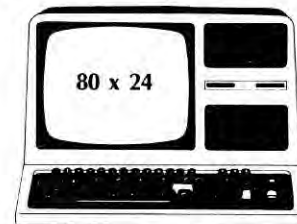
TRS-80®
MOD. III

FINALLY

TRS-80®
MOD. I

80x24 VIDEO DISPLAY PLUS! 112 K AND CP/M®

Others offer you CP/M or 80x24.
We give you what you've been waiting for.



SPRINTER™

"Double Your Speed"

Speed-up cuts computer operation time for accounting, word processing, etc., in half. Saves Time and Money.

- Automatic Slow-down for disk I/O (defeatable).
- | | |
|-------------------------------|---------|
| SPRINTER III (MOD. III) | \$99.50 |
| SPRINTER I (MOD. I) | \$99.50 |

"DOUBLE DENSITY ADAPTER

- Run 5¼ or 8" drives
- Adapter utilizes new technology for high performance at a lower price.

"MODEL III Disk Controller/Clock"

- Double density, 8" capability, battery powered, **clock calendar**. Assembled board only (DX-3D)
- Complete Drive O package — DX-3D, drive, power supply, brackets

SPECIAL!!! HOLMES EXPANSION INTERFACE SYSTEM (Mod. I)

- Includes: Double Density Disc Controller (DX-2D), RS232 w/32K RAM (RX-232M), Metal enclosure (MF-1).

Double Density Disk Controller w/8" drive capacity (DX-2D)	\$189.95
RS232 (RX-232)	\$119.50
RS232 w/32K (RX-232M)	\$199.50
Case/power supply — tor	
4 plug-in boards (MF-1)	\$99.50
Case — for	
2 plug-in boards (MF-2)	79.50

DISTRIBUTORS:

Bi-Tech, N.Y. (800) 645-1165
Level IV Products, MI (800) 521-3305
M & M Micro Mart,
Quebec, Canada (514) 731-9486
Soft Sector Marketing,
MI (800) 521-6504

DEALERS:

CIE, CA (714) 757-4849
OK Electronics, CA (714) 749-0299
Bond Exchange, CA (213) 681-6797
Dimensional Software,
CA (714) 275-4243
Ebert Personal Computers,
CO (303) 693-8400
Apparat, Inc., CO (303) 741-1778
Ace Computer Products,
FL (305) 427-1257
Comptek, FL (305) 267-6414
Comntek, GA (404) 396-0034
EBG & Associates, IL (312) 782-9750
Radio Shack, IL (309) 944-4111
Stephen-Christopher Co.,
IL (312) 662-2356
A-Computer Store, IN (317) 898-0331
Projects of America, KS (316) 231-3670
Microware, KS (913) 631-2029
Perry's Computer System,
KY (502) 754-5313

Software Support, MA (617) 872-9090
CompuDontix, MA (617) 533-8433
Vespa Computer Outlet,
MI (313) 538-1112
Alternate Source, MI (517) 482-8270
Compute Unlimited,
MI (517) 631-3090
Computer Shack, MI (313) 673-2224
Cosmopolitan Electronics,
MI (313) 397-3126
Computer Place, MN (612) 869-3245
Cosmopolitan Electronics,
MI (313) 397-3126
Micro Support Services,
MO (314) 474-6064
I Compute, MO (314) 449-7880
Micro Innovations,
MO (314) 962-1638
Mountain Data, MT (406) 622-5651
Computer Stuff, NM (505) 256-9708
Hewitt's Computer,
NM (505) 883-0984
Info Inc., NY (516) 924-9229
Jerry's Computer, OH (216) 579-0648
Micro Data Supplies,
OH (216) 951-6502
Progressive Electronics,
OH (614) 653-1329
Heart to Heart Computer Services,
OH (513) 663-4558

Golden Fantasies, OR (503) 484-2834
Stevens Radio Shack,
PA (215) 933-3441
Montezuma Micro, TX (214) 339-5104
CTL Associates, TX (713) 444-5405
Micro Mart, TX (512) 349-9741
East Coast Data, VA (804) 484-6636
Tidewater Data, VA (804) 397-9636
Freedom Micro-Systems,
VA (703) 228-5800
WGS, WA (206) 747-3495
ABC Computer, WA (206) 775-6944
FOREIGN DEALERS:
National Management Services,
Quebec, Canada (514) 387-2609
International Software,
Victoria B.C. Canada
382-1344
MicroDeal, Bodmin,
England (0726) 850821
Victor Saleh, Middlesex, England
Graphie France, Paris, France
ASP Microcomputers,
East Malvern, Australia 211-8555
Computerware,
Koeln, West Germany
Computer Service,
Buerstadt, West Germany
Moonbase Computer,
Scotland (041) 883-1189

TRS-80 is a registered trademark of Tandy Corporation. CP/M is a registered trademark of Digital Research. One year warranty on all products. Add Shipping/Handling — MF-1, MF-2, \$9.00 U.S., \$15.00 Canada, Overseas \$30.00. Other products add \$5.00 U.S. & Canada. All others add 15%. Prices subject to change without notice. **DEALER INQUIRIES INVITED. FOR INFORMATION SEND SELF ADDRESSED STAMPED ENVELOPE.** Reader service takes 8 weeks.

VID 80™

"80 Character Video"

- Adds all the extra ram and logic necessary to convert to an 80 character, 64K or 112K CP/M system.
 - Functions in 80x24 or 64x16 character mode.
 - Software patches available for many programs.†
 - Reverse video (full screen).
 - Improved graphic resolution.
 - Easy plug-in installation inside case.
 - Two models available:
Model III (VX-3) and
Model I (VX-1)
 - CP/M system requires purchase of Holmes CP/M package.
 - VX-1 requires upgraded monitor for 80x24.
 - VX-1 requires purchase of MF-1 or MF-2.
- | | |
|---|----------|
| VID 80 (VX-3, VX-1) | \$279.95 |
| VID 80 plus 64K CP/M
(Holmes package) | \$399.00 |
| VID 80, Holmes CP/M package
and 64K added memory
(112K total) | \$499.00 |

"48K MEMORY WITHOUT AN INTERFACE"

- Adds memory INSIDE keyboard up to 48K
- | | |
|------------------------------|----------|
| IM-2 w/16K (32K total) | \$119.50 |
| IM-2 w/32K (48K total) | \$139.50 |
- †Call or write for price

holmes
engineering inc.

Peripherals Division
3555 South 3200 West
Salt Lake City, Utah 84119
(801) 967-2324



✓153

"Practical" Corrections

The gremlins are at it again! My article "Practical Regression Analysis" (November 1982) contains three errors that might cause confusion.

- The probability subroutine found on page 102 is incorrect. The proper version is:

```
2790 'PROB
2800 DX=D1:DY=D2:DZ=D2:FF=F:IF F<
1 THEN DY=D1:DX=D2:DZ=D1:FF=1/F
2810 DX=2/9/DX:DY=2/9/DY
2820 DD=(FF*(1/3)*(1-DY)+DX-1)/SQR
(FF*(2/3)*DY+DX)
2830 IF DZ<4 THEN DD=DD*(.08*DD+4/
DZ(3+1))
2840 FP=.5/(1+DD*(.19685+DD*(.11519+
DD*(.000344+DD*.01953))))+4
2850 IF F>=1 THEN FP=1-FP
2860 RETURN
```

- At the end of page 103, there is a "Listing continues" note. Actually, this is the end of the listing; there are no missing lines.

- The legends on page 106 are switched for Figs. 7 and 8.

Delmer D. Hinrichs
2116 S.E. 377th Avenue
Washougal, WA 98671
(206) 835-2983

Poker Correction

Thanks to Karl Weeks, I have found a couple of errors in my "Casino Draw Poker" game (November 1982). The game doesn't recognize either the royal flush or the four-of-a-kind. Since I have never gotten either, I didn't realize the problem existed until Mr. Weeks informed me of it. To correct the problem, change line 8120 to:

```
8120 IF (FF=1) AND (CS(5,1)=13) AND
(CS(4,1)=12) AND (CS(3,1)=11) AND
(CS(2,1)=10) AND (CS(1,1)=1) THEN WV=
9:GOTO9000
```

You must also change the WT=7 in lines 8140 and 8150 to WV=7.

Ron Balewski
412 East Ridge St.
Nanticoke, PA 18634
(717) 735-3736

Model III Graftrax

There are several bugs in the listings of Thomas McNamee's "Graftrax 80"



article (September 1982).

- In line 370 a test is made for printer ready by PEEKing at location 14312 to see if it is "61." This will not work on my Model III. The number should be 63.

- The count for the number of codes, and the codes themselves, are sent out to the printer using the CHR\$(X) function. Unfortunately, Basic will not send out codes of 0, 10, and 12. I recently realized that the printer was connected as a port, and that I could use the OUT &HF8, X (or in decimal, OUT 248, X) command. This results in the following changes in lines 530-540:

```
530 LPRINT CHR$(125); " ";CHR$(27)"L";
532 OUT &HF8, CC
533 IF PEEK (14312)<>63 THEN GOTO 533
535 LPRINT CHR$(255);
537 FOR T=1 TO CC: OUT &HF8, G(T)
538 IF PEEK (14312)<> 63 THEN GOTO
538
540 NEXT
```

The program comes close to the correct aspect ratio for the 960 density, but is far off for the 480 density, which I use. This can be improved by modifying the program to light two horizontally adjacent pixels, and then testing X two steps at a time.

Donald Wade
35-41 72nd St.
Jackson Heights, NY 11372
(212) 672-6399

Case Dismissed

I have had many phone calls and letters concerning the September Debug on how to connect the plotter in my "Digital Doodles" article (January 1982) to the computer. The following information will help answer these questions:

- On the left side of the schematic, the inputs to the three inverters labeled 0, 1, and 2 go to the address lines 0, 1, and 2. The gates labeled 04 are 74LS04s, and

those labeled 02 are 74LS02s. All the plotter software is written to use output port #2 (second 74LS373 from the top). The other three ports are not needed. The reason for the other three ports is that this is the schematic for the I/O ports I use to make sure that it will work. The 74LS373s are no longer stocked by Radio Shack, but they are still sold by many advertisers in *80 Micro*.

- If you have access to the address and data lines, I don't see why the hardware should not work on a Model III. Most of the software is in Basic so there should be no problem, though the one routine in machine language may have to be changed.

Alan Sehmer
150A Lorretta Drive NW
Corrales, NM 87048
(505) 897-0955

Lucky 13 Fix

I encountered an error in Carl Bevington's article "Tee for Six" (August 1982). To play the game Lucky 13 correctly, change the 211 in line 800 to 212. Without this change a move from B to K is allowed, but the correct legal move from B to L is read as incorrect.

Hal Smith
1334 Keith Drive
Colorado Springs, CO 80916

Tax Estimator

I have received several letters concerning my "Income Tax Estimator" article (October 1982). I would like to clear up some of the questions raised by readers.

- The data used in the sample was randomly chosen for illustrative purposes, and did not represent real numbers for any particular individual. (I am not naive to allow 100,000 readers to peruse the numbers in my own return.) Given correct data, the program does produce correct results.

- The program was originally written in 1980, and submitted to *80 Micro* in 1981. Minor revisions to update to 1981 tax rules were made in 1982. Given the lead time for magazine publishing it is impossible to ensure that any tax program will still be correct by the time it is published.

Convert your TRS-80* into a World Class Computer

ALSO...
UNIQUE
RED & BLUE
CRT'S
AVAILABLE
NOW!

NOW ALSO
AVAILABLE
FOR
MODEL I
AND
OTHER
12" MONITORS

that
**REDUCES EYE FATIGUE
AND DOESN'T FLICKER**



...with LSI's new **Soft-View™** Replacement CRT...

The black & white "TV Screen" CRT (picture tube) which came with your TRS-80* model II or III is an inexpensive rapid "P4" Phosphor CRT intended for TV use. The display is actually strobing 60 times a second. No amount of "green plastic" will stop this strobing or eliminate the eye fatigue it causes. But a new **Soft-View™** CRT display tube with a slower decaying, colored Phosphor will.

- Available in slow-decay green (similar to new IBM* and APPLE III* monitors) or medium decay "European Orange" (easy on the eyes, elegantly beautiful, and the standard for CRT displays in Europe)
- Leaded glass stops X-ray emission
- Optional Anti-Glare Frosted Glass available to reduce eye strain from glare
- Easy installation — tube comes with pre-mounted hardware
- 30-Day Money-Back Guarantee
- Ideal for Word-Processing & Programming, fast enough for Games & Graphics
- Finest quality double-dark glass and phosphor fields make the letters seem to be coming out of black space

Try This Test:



Turn the brightness control on your TRS-80* all the way up. Wave your hand up and down in front of the screen. See how jerky it seems? Just like in front of a strobe light! That's because the screen actually is strobing at you. A slower-phosphor CRT will reduce that troublesome strobe effect. That's why most of the newer monitors, from IBM* to Apple III* are using the new slow-phosphor CRT's.

LSI's new **Soft-View™** CRT

LSI SYSTEMS **Soft-View™** CRT's: 80 M-283

- #GN42 Green Phosphor \$79.95
- #GN42G Green Phosphor with anti-glare \$89.95
- #OR34 Orange Phosphor \$89.95
- #OR34G Orange Phosphor with anti-glare \$99.95

ADD \$7 FOR PACKAGING AND UPS SHIPPING

Langley-St. Clair
Instrumentation
Systems, Inc.

To Order Call:
1-800-221-7070
Dealer Inquiries Invited

132 West 24th Street, New York, N.Y. 10011 212-989-6876

IBM, APPLE* and TRS-80* are trademarks of IBM, APPLE Computer & TANDY Corp.

● The program was written so that it acts as a summary program: It serves to keep track of each item, and provides a running computation of the entered data. Providing that the user makes intelligent decisions as to what to list and deduct with the new regulations in mind, the program will still provide the correct results.

● Concerning the absence of the self-employment schedule SE: This particular version was developed for the case where neither husband nor wife are subject to SE tax, because Social Security payments are fully covered by their income from wages. Since this is not the general case, the following lines should be added to the program:

```
1561 IF C1<400 THEN GOTO 1570
1562 PRINT "WITH SCHEDULE C INCOME OF $"; C1
1563 PRINT "YOU MAY BE SUBJECT TO SCHEDULE SE. CALCULATE"
1564 PRINT "ANY SELF-EMPLOYMENT TAX AND ENTER IT NOW."
1565 INPUT S1
1566 D=S1 : K$="SELF-EMPLOYMENT
```

```
TAX": GOSUB 6000
1567 X=X+S1 : D=X
```

Peter A. Stark
P.O. Box 209
Mt. Kisco, NY 10549
(914) 241-0287

Golf Fix

Helpful callers have identified a few errors in the coding of my "Callaway Golf Scoring Program" (May 1982). The changes are as follows:

```
1220 L=0:L1=0:P1=0: IF SH<>1
```

```
GOTO1270
2380 PRINT X+Y,TS(X+Y), T1(X+Y)
2400 X=X+10:IF NP>X GOTO 2370
```

Also, delete line 2360.

To use the program with a disk system, do not set the memory size, and delete lines 10-30 and 160-200. The screen-print routine will not work, but if your DOS has such a feature you can use that instead.

Rodger Wells
1008 Kehoe Drive
St. Charles, IL 60174

On page 320 of our Anniversary 1983 issue, we published an article by Charles Knight entitled "Directory Information Please" without the Program Listings. They are printed below. We apologize for the oversight.—Eds.

Program Listing 1

```
20 REM *****
40 REM ***      MAGIDEX Disk directory Management      ***
60 REM ***      program by Charles P. Knight          ***
80 REM ***      COPYRIGHT (C) 1982 - ALL RIGHTS RESERVED ***
100 REM***      Version 1.2                            ***
120 REM*****
140 CLEAR2000
160 ONERRORGOTO260
180 OPEN "I",1,"TRANSFER/DAT"
200 INPUT#1,VI,D2,D2$,DN,IN,KT$
220 CLOSE
240 GOTO280
260 IFERR=106THENRESUME280ELSEPRINT"UNRECOVERABLE ERROR":CMD"E":
PRINT"PROGRAM ABORTED:STOP
280 ONERRORGOTO0
300 G$=""
320 CLS:PRINT@9,"Disk Directory Management Program Master Menu";

340 PRINT@67,"Requires L.D.O.S. operating system and at least 2
drives";
360 IFD2$=""THENNC$="No data in system at present - select optio
n 1"ELSENC$="Disk containing directory data should be in drive "
+RIGHT$(D2$,1)
380 PRINT@128+32-(LEN(NC$)/2),NC$;
400 PRINT@192,STRING$(64,143);
420 PRINT@284,"M E N U"
440 PRINTSTRING$(64,143);
460 PRINT"          {1}      Enter more disks"
480 PRINT"          {2}      Sort Directory data file"
500 PRINT"          {3}      Print results"
520 PRINT"          {4}      End program"
540 PRINT@320,CHR$(191);:PRINT@383,STRING$(2,191);:PRINT@447,STR
ING$(2,191);:PRINT@511,STRING$(2,191);:PRINT@575,STRING$(2,191);
:PRINT@639,CHR$(191);
560 PRINTSTRING$(64,143);
580 PRINTTAB(33)"Copyright (C) 1981 by"
600 PRINTTAB(33)"Charles P. Knight."
620 QQ=330
640 PRINT@903,"Do not press <ENTER> after entering menu selectio
n";:IFD2$<>"THENPRINT@704,"Number disks in file :";DN-1;:ELSEPR
INT@704,"File not initialized!";
660 IFKT$<>"THENPRINT@973,"Library of : ";KT$;
680 PRINT@768,"Enter selection please: ";
700 CK=5
720 IK$=INKEY$:PRINT@795,IK$;:IFIK$<"1"ORIK$>"4"THEN740ELSEM=VAL
(IK$):GOTO840
740 CK=CK+2:PRINT@287+CK,CHR$(143);:PRINT@287-CK,CHR$(143);:IFCK
>30THENCK=5:PRINT@291,STRING$(28,32);:PRINT@256,STRING$(28,32);:
PRINT@795," ";:PRINT@832,"No. files in system :";IN;
760 IFQQ=330THENFL=FL+1:IFFL>32000THENFL=0
```

Listing 1 continues on p. 392

150 BUSINESS UTILITIES

Just **\$29.95**
On Disk, Model III.

This new concept in software packaging gives you the most for your money!! Over 150 business utilities that provide step-by-step solutions to common problems in business, finance, and every day life.

Includes routines for:

- ★ Graphs and charts (with print routines)
- ★ Real estate analysis
- ★ Depreciation techniques
- ★ Amortization schedules
- ★ Pricing and profit strategies
- ★ Financial decision making aids
- ★ Savings and investment tools
- ★ Over 60 common conversions and equivalents
- ★ Plus much more !!!

These easy-to-use programs are menu driven, use SOUND and GRAPHICS, and come with a handy user's guide with examples of each subroutine.

To get in on this amazing limited offer, send \$29.95, check or money order to:

MCS SOFTWARE

809 Parkway, Conway, AR 72032

1-501-327-4443



✓393



DISCOVER



LOW PRICES JORDAN COMPUTERS

Okidata	SPEED/cps	PARALLEL	SERIAL	PRICE
82A	120	STD.	STD.	\$494.00
83A	120	STD.	STD.	\$765.00
84	200	\$1169.00	\$1295.00	--
2350	350	\$2405.00	\$2765.00	--

NEC Spinwriters

3510-1 RO	33	--	STD.	\$2195.00
3515-1 RO	33	--	STD.	\$2195.00
3530-1 RO	33	STD.	--	\$2195.00

NEC

7710-1 RO	55	--	STD.	\$2625.00
7715-1 RO	55	--	STD.	\$2675.00
7720-1 KSR	55	--	STD.	\$3050.00
7725-1 KSR	55	--	STD.	\$3125.00
7730-1 RO	55	STD.	--	\$2625.00

Mannesmann/Tally

MT-1605	200	--	STD.	\$1549.00
MT-1602	200	STD.	--	\$1549.00
MT-1805	200/50	--	STD.	\$1820.00
MT-1802	200/50	STD.	--	\$1820.00

SPECIALS OF THE MONTH

- ▲ Okidata 82 A **\$474.00** 9.5" Width
- ▲ Epson MX-80 F/T **\$525.00** 9.5" Width
- ▲ Epson MX-100 **\$699.00** 15" Width
- ▲ NEC PC-8023 **\$538.00** 9.5" Width

Manufacturer's warranty included on all equipment.
Free use of Master Card, VISA and American Express.
Cashier's checks, certified check, money order or C.O.D.'s
accepted. California residents add 6% sales tax.
Please allow 2 weeks clearance for personal checks.

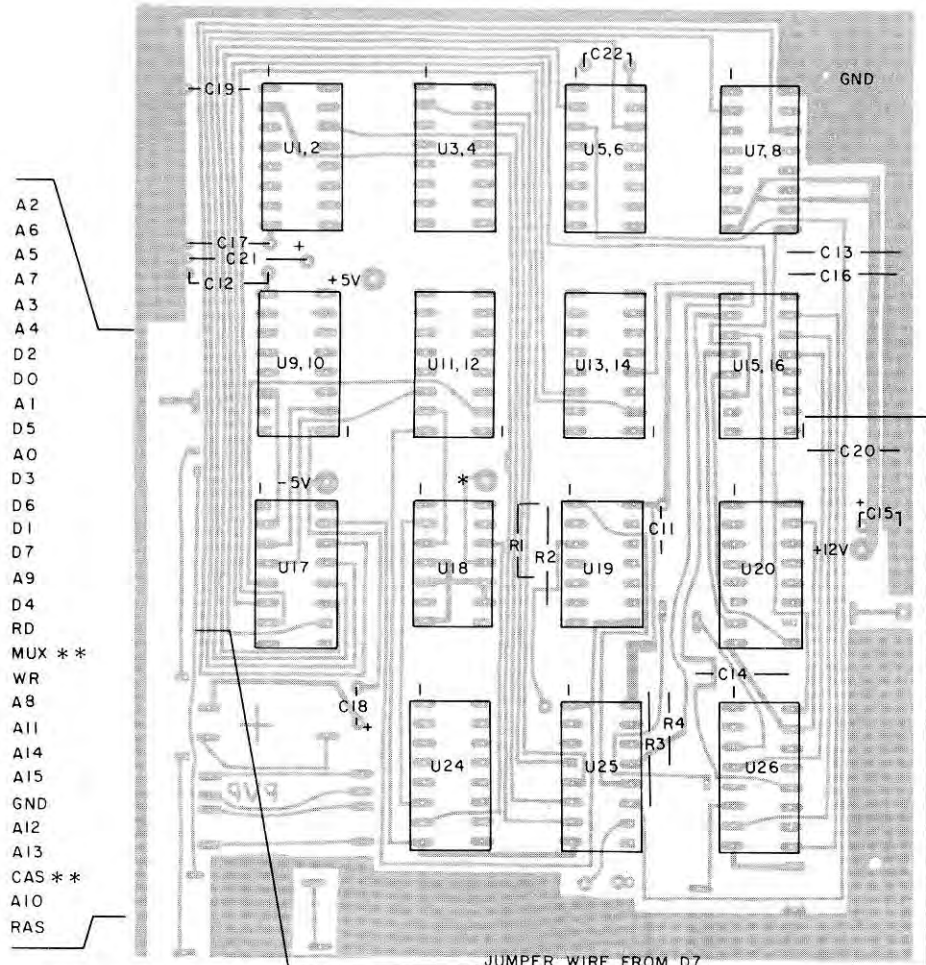
Call Toll Free (outside California): **800-772-9091**
California, Alaska, Hawaii: **714-974-8310**

Hours: 8:30 am — 5:00 pm Monday-Friday (PST)
10:00 am — 5:00 pm Saturday & Sunday (PST)

Prices subject to change without notice.

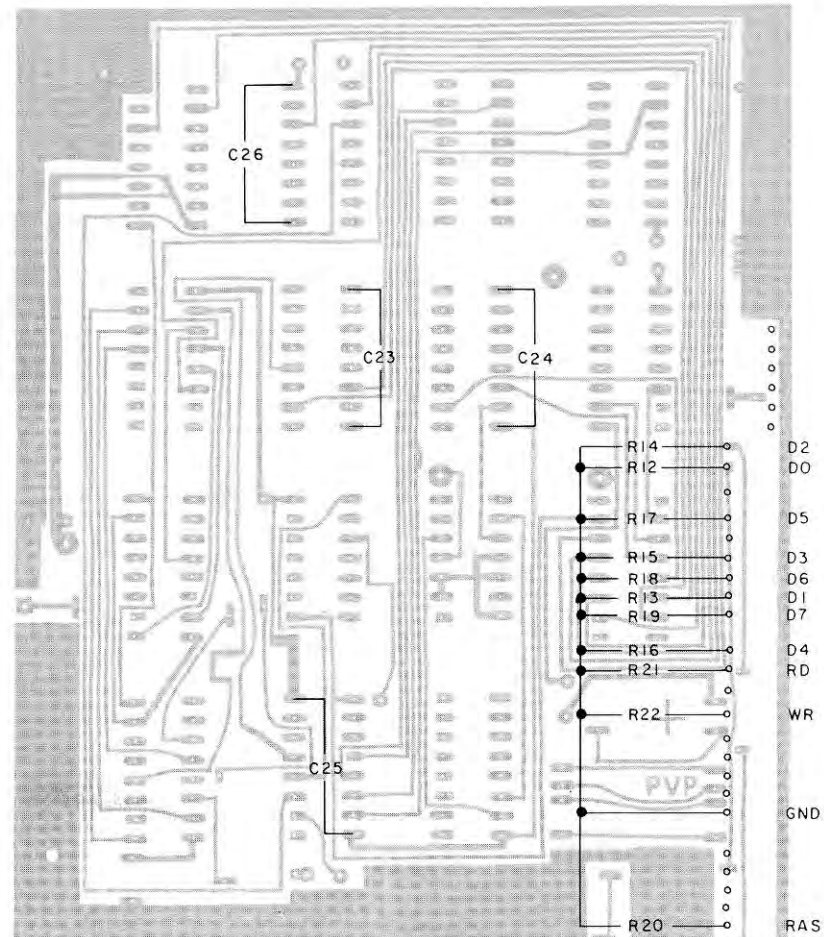
Jordan Computers, Ltd.

PRINTER DIVISION
202 W. LINCOLN, SUITE E • ORANGE, CA 92665



- I PIN I IC ORIENTATION
- * COMMON CONNECTION POINT FROM PIN 15 OF ALL UPPER-GROUP RAMs.
- ** NOT USED FOR RIBBON CABLE ATTACHMENT. SEE FIG. 6b AND TEXT.

Fig. 6a. Memory board parts placement and external connections. See Fig. 6b for U27 placement. Drill a 5/16-inch hole at the + location to allow passage of a keyboard housing post through the board. The large donut in the lower right corner denotes a board attachment site if the 32K mod will not be housed in the keyboard cabinet. Note that pin 1 orientation of ICs U9-U16 is opposite to that of the other ICs.



- INTERCONNECT THE COMMON GROUND LEADS ON THIS SIDE USING INSULATED WIRE, IF NECESSARY, TO INSURE THAT THE LEADS DO NOT SHORT TO THE PC FOIL PATTERN.
- SOLDER THE SHORTENED COMPONENT LEADS ON THIS SIDE TO THE PROTRUDING RIBBON CABLE WIRES.

Fig. 11. Noise-suppression component placement. Install these after soldering ribbon cable to the other side of the PC board. Install C23-C26 close to PC board, keeping leads very short.

100% NEW

80's 3 in '83!

And to celebrate we've published a special
ANNIVERSARY ISSUE,

containing

- * all new articles & programs.
- * over 500 pages of the same high 80 MICRO quality.
- * dozens of games and programs for your computer.
- * exclusive articles by well-known authors.
- * the most in-depth coverage of the Color Computer yet.
- * tutorials on having peripherals and software.
- * page after page of specials from 80's advertisers.
- * a 3-year 80 MICRO index—annotated and cross-referenced.

PLUS

THE FIRST 3D STEREOSCOPIC COLOR COMPUTER GRAPHIC

This amazingly versatile Anniversary Issue can go anywhere* with you. Fits easily in your briefcase or your purse. Lies flat in your knapsack. Rolls up to fit snugly in your glove compartment. Stores on any bookshelf. Looks great on any coffee table.

You can also get the amazing Special Edition LOAD 80 Companion to the Anniversary Issue. All those games and programs, just waiting for you to load. No more keyboarding. No more debugging. No more hassles.

You'd expect special editions of this quality to cost you hundreds of dollars. (Well, maybe dozens.) But for a limited time only, you can get the 80 MICRO ANNIVERSARY ISSUE for only \$5.95. That's right—\$5.95. And the LOAD 80 Companion is just \$9.95 for cassette, \$19.95 for floppy disk.

Note: This is an extra issue and will not be included as part of your regular subscription. So call today and order your very own Anniversary Issue and LOAD 80 Companion. Or give them as gifts. Just fill in the attached reply cards and drop them in the mail. Or call toll free—1-800-258-5473.

1-800-258-5473 *Call today!*

Operators are standing by (during business hours, of course). MasterCard and Visa accepted. (American Express, too.)

Please allow 6-8 weeks for delivery.

* Use of this product in the shower is not recommended by the publisher.

**3-D
GLASSES
IN EVERY
ISSUE**

**3-D COLOR
STEREOSCOPIC
COMPUTER
GRAPHIC**

**BUY
ONE
FOR A
FRIEND!**

**BUY ONE
FOR
YOURSELF**



That's
That number again
That's



Hey, what's this? Mmmm. Looks like some kind of box. Let's take a closer look. Hey, it's a soapbox. It looks very familiar. Friendly even. I wonder what'll happen if I stand on it. Whoooosh....

All I want is to be left alone. Just leave me in front of a computer with an idea and an editor, assembler, interpreter, or a compiler, and I'm happy. The fact that a usable piece of software results from my efforts is merely a bonus that makes programming more attractive. I really enjoy it for its own sake.

But then, along come the prophets of doom. Many times, when I read a book or an article about programming, I get preached at. Not that anyone gets on a soapbox and pontificates, but I come away with the idea that the author wouldn't approve of the way I do things. You see, I don't care a fig for how my programming ideas get in the computer as long as they work. In short, I'm an unstructured programmer, and I want to stay that way.

Maybe I feel I should be left alone with my sinful ways because I program mainly in machine code, which seems to afford me a special status. But then I fancy a change of style and write something in Basic. Then a little Pascal for dessert. I love it! Make that stupid computer jump through hoops!

But then what do I see as I leaf through a Rodnay Zaks book on Pascal? A kind of pseudo-subliminal preaching. I can understand the author of a reference on Pascal taking a stand on structured programming, but this one seems to want to herd all potential programmers into the same stable. He says that perhaps 10 percent of the programming population has a natural flair for programming and has little problem in producing a working piece of software. The other 90 percent? Well, they can come out with a finished result, but only with an effort that will be the inverse ratio of the amount of structured techniques they use.

Of course, in my programming vanity, I place myself in the upper echelons of the first 10 percent and smugly face my monitor to continue entering byte after awful unstructured byte of code. But Rodnay isn't going to let me get away with that. He trips me up with a typically structured piece of structured logic. He informs me that nearly *all* pro-



Structured programming blues

grammers consider themselves to be in that same 10 percent. Thanks, buddy.

Now my ego and conscience suffer as I continue to enter my nasty unstructured code. Am I really a talented programmer with a future, or just an egotistical computer hacker with delusions of grandeur? It seems the only way to be saved is to subscribe to the Church of the Pascalites and bow daily to the deity of disciplined programming. Well, no thanks.

Nobody tries that with composers or painters or sculptors, and nobody's going to do it with me. I love the actual medium that I work with far too much to change my style now. Other artists are allowed so-called artistic license, and I demand the same. I don't know a single artist who enjoys his work who wouldn't go bananas if told

to change his style. These people develop their talents by emulating the works of other artists they admire until they finally develop their own style. And so it is with me.

I learned programming back in the 1960s under the tutelage of a book by D.D. McCracken. Good old McCracken introduced me to programming through a fictitious computer called TYDAC (for typical digital automatic computer). He assured the reader that the techniques learned would be of benefit to any programmer of almost any digital computer.

These were the wild west days of computing before sheriffs had been invented. Things were tough then. Memory (old-fashioned core-memory) was a scarce commodity and was most definitely finite. This was constraint number 1. Also, in those bad old days, computers were huge expensive monsters that cost a fortune. Consequently, time on those computers was also expensive. Results had to be produced quickly—someone else was always waiting in the wings to run his own important program. So, constraint number 2 was time.

By the time he'd finished, McCracken had me wrestling with space and time to end up with working routines that had attained a mystical quality—elegance. This word isn't used any more in regard to programming, especially in the books on structured programming. Now the quality to be reached for is discipline. I had enough of that at school and I relish the freedom I achieve by assembling any byte, anywhere and anyhow I like.

The best of it is that many machine-language programmers I know share my views. Structured high-level code is OK for beginners or for people who want to learn programming without making too great an effort. But leave me and my buddies alone, we'll happily (even enthusiastically) sit down and write your next structured interpreter in any style we see fit—and that just may be unstructured code.

My legs are getting a little tired. What on earth am I doing standing on this box? I guess it's time to step down and stretch my legs. Good grief, did I just say all that stuff about structured programming? Sounds like awfully good sense to me. I have a feeling I might get on the box again next month. ■

You've learned to program your Model I or Model III efficiently in Basic. You've also started learning to program simple Assembly-language programs. You are ready for the next step.

The major topic of this column will be the techniques of combining machine language and Basic. It will cover everything from the simple first steps of language interfacing to techniques of altering Basic verbs, using the "low memory" pointers, and even creating a Basic metalanguage for special applications. Although I'll present short machine-language routines, my purpose is to show you techniques you can use for your own creations.

I make some assumptions about you. First, I assume you are working with a Model I or Model III. Although a few columns might be limited to disk-based systems, most will be equally applicable to either disk or tape Basic.

Second, I assume you have an editor/assembler program and that you can write and understand at least simple Assembly-language programs. Third, I assume you understand hexadecimal notation and can convert values from hexadecimal to decimal.

And, finally, I assume you are curious about how and why your computer works, and that you would like to make it work more efficiently.

Since the possible configurations of TRS-80 systems are many, I'll try to give values and addresses for 16K, 32K,



Fixed location routines

and 48K RAMs for tape and disk systems of the Model I and Model III. At times up to 12 different values may exist for the same pointer or address. Be sure you pick the one that applies to your system.

Fixed Location Routines

The first techniques presented involve separate machine-language routines that are written to load to specific, fixed locations in memory. These techniques are most useful for long or

complex routines or for routines that seem to defy all efforts at relocatable programming. Program Listing 1 does not fit these qualifications, but it is the demonstration program for this month.

Listing 1 is a short routine that "melts" all the characters on the screen; it is useful as a showy, if slow, screen clear. Its origin is at 7FE6H, which is compatible with 16K, 32K, or 48K systems. Before reading further, assemble it and save the program to either tape or disk.

Fixed location programs are easy to use, but loading them separately from your Basic program can be tedious. The only difficulty you might find is in setting the appropriate memory size pointers correctly and letting Basic know where the program is. You must set the memory size to protect the program from being overwritten by the other machinations of Basic. Because this process is different for tape and disk users, the processes for each are explained separately.

For Tape Users

Before loading and using a fixed memory routine with a Level II tape system, you must make two calculations. First, convert the lowest address of the routine to decimal to answer the "Memory Size?" prompt. Your answer tells Basic the first byte of memory it cannot use. In Listing 1, the lowest address you need to protect is 7FE6H, which equals 32742 in decimal, so you would set the memory size value at 32742.

Load the assembled machine-language program from tape and then return to the memory size prompt. How do you do that? Load the program by setting your tape recorder to the assembled program, then type SYSTEM and enter. Answer the "?" prompt with the name of the program, and the tape recorder will transfer the routine to the computer. When the routine is loaded, another "?" appears. Respond with /0 and enter, and you will return to the memory size prompt. Now enter 32741; the routine will be safely loaded and protected in memory, waiting for you to call it.

Then you face a second problem. To call the program from Basic, first tell the computer where it is. The starting

```

00100 ;*****
00110 ;*
00120 ;* Screen Melt --
00130 ;* to be interfaced
00140 ;* to Basic
00150 ;*
00160 ;*****
00170 ;
7FE6 00180 ORG 7FE6H
7FE6 21003C 00190 LOOP1 LD HL,3C00H ;BEG. OF SCREEN MEMORY
7FE9 010004 00200 LD BC,400H ;LENGTH OF SCREEN MEMORY
7FEC 1600 00210 LD D,00H ;RESET FINISH FLAG
7FEE 7E 00220 LOOP2 LD A,(HL) ;GET SCREEN CHARACTER
7FEF FE20 00230 CP 20H ;IS IT AN ASCII SPACE?
7FF1 2803 00240 JR Z,GO ;GO IF IT IS
7FF3 16FF 00250 LD D,0FFH ;ELSE SET FLAG
7FF5 35 00260 DEC (HL) ;AND DECREMENT CHARACTER
7FF6 23 00270 GO INC HL ;BUMP POINTER
7FF7 0B 00280 DEC BC ;DECREMENT COUNT
7FF8 78 00290 LD A,B ;GET HIGH VALUE
7FF9 B1 00300 OR C ;MERGE WITH LOW VALUE
7FFA 20F2 00310 JR NZ,LOOP2 ;FINISH SCREEN
7FFC BA 00320 CP D ;IS D STILL ZERO?
7FFD 20E7 00330 JR NZ,LOOP1 ;GO BACK IF NOT
7FFF C9 00340 RET ;ELSE RETURN TO BASIC
0000 00350 END
00000 TOTAL ERRORS
    
```

Program Listing 1

address (not necessarily the lowest address) of the routine must be stored in a pointer at memory positions 16526 and 16527, and your program must POKE the appropriate values there. First take the *last* two hex digits from the beginning address of the routine (E6H), convert that value to decimal (230), and POKE the result into 16526. Then take the *first* two hex digits (7FH), convert them (127), and POKE that value into 16527. For Listing 1 the line of Basic would read:

```
POKE 16526,230: POKE 16527,127
```

Finally, to use the routine, you must include a USR command in your Basic program. Since no values are to be passed to or from this routine, all you need is a statement such as Q=USR(0). Instead of Q, you can use any valid, unused numeric variable name. Instead of 0, you can place any integer inside of parentheses.

For Disk Users

Using a fixed-location routine at the top of memory involves a special consideration for disk users. Not only does the memory size have to be set so Basic leaves the routine alone, but also a special HIMEM pointer must be set to guarantee that DOS commands will not mess up the routine. The problem comes about because TRSDOS, as well as some DOSes, uses the top 256 bytes of memory as a buffer for transferring programs from disk to memory.

The address of the high memory pointer is 4049H and 404AH for the Model I, 4411H and 4412H for the Model III. The easiest way to set the pointer is with a DOS that includes a HIMEM command. For example, the Model III TRSDOS command for the screen melt program is CLEAR (MEM=7FE5). Without a special command, you have to do some thrashing around.

From DOS Ready, load the routine from disk. Then go to Debug, display the pointer, enter the Modify mode and set the pointer to the appropriate value. Be careful, though. Because of the way the Z80 stores and retrieves data from memory, DOS expects the value to be in "normal" reversed order, with the second half of the value first.

For Listing 1, set either 4049H or 4411H to E6H and either 404AH or 4412H to 7FH. Then exit from Debug

back to DOS Ready and disable Debug from interrupting other commands.

Setting high memory has one large advantage—you can ignore the memory size question entirely because Disk Basic sets the top of its allowed memory from the high memory value when you enter Basic. You can hit enter at the memory size prompt without having to convert the program address to decimal.

Avoid having to set the high memory address separately by using a special trick. Add two lines to the original Assembly source code so the program will protect itself as it's loaded. In Listing 1, add the following two lines between lines 340 and 350:

```
342 ORG 4049H
344 DEFW 7FE6H
```

With a Model III, the ORG value would be changed to 4411H.

Your second step, letting Basic know where the program starts, is easier in Disk Basic than in Level II. The DEFUSR command recognizes hexadecimal as well as decimal numbers, so instead of POKEing values into memory, include the command DEFUSR0=&H7FE6. You can change the zero to any single digit because Disk Basic lets you point to ten separate USR routines simultaneously. If you omit the

```
100 *****
110 *
120 * Melt Demonstration --
130 * for tape systems
140 *
150 *****
160 '
170 CLS
180 FOR I=0 TO 1022 STEP 3
190 PRINT @ I, CHR$(RND(161)+31);
200 NEXT I
210 POKE 16526,230: POKE 16527,127
220 Q=USR(0)
230 GOTO 180
```

Program Listing 2

```
100 *****
110 *
120 * Melt Demonstration --
130 * for disk systems
140 *
150 *****
160 '
170 CLS
180 FOR I=0 TO 1020 STEP 3
190 PRINT @ I, CHR$(RND(161)+31);
200 NEXT I
210 DEFUSR0=&H7FE6
220 Q=USR(0)
230 GOTO 180
```

Program Listing 3

digit, Basic assumes you meant 0 and acts accordingly.

To use the routine, the Disk Basic command is Q=USR0(0). Again, you can use any of ten digits in place of the first 0, but be sure you use the same digit you used in the DEFUSR command. And again, if the digit is omitted, Basic assumes you meant 0.

For Everyone Again

Follow the above instructions and then enter and run either Program Listing 2 or Program Listing 3. Listing 2 is for those with tape systems; Listing 3 is for disk users. If all goes well, you will know you have learned to handle this first interfacing technique.

Generally, this fixed-location, separate-load technique is not used with routines as short and simple as my example. Also, the routine is put as high as possible in memory to conserve space. If you have 32K of RAM, assemble this program to 0BFE6H; with 48K RAM, the address would be 0FFE6H. Of course, you must adjust the memory size and USR pointers accordingly.

How do you calculate those addresses for your own memory size? Let the assembler do it for you. In our example, change lines 180 and 340 like this:

```
180 ORG 0000H
340 STOP RET
```

Assemble the program with the /NO option (no output), and note the address of the STOP label in the symbol table (0019H). Then change line 180 to read:

```
180 ORG 7FFFH-19H
```

Make the 7FFFH value equal to the highest address and the 19H value equal to the former address of STOP. Assemble the program to disk or tape, but be sure to write down the new ORG address to use later in setting the necessary pointers.

Next month I'll explain techniques for saving and loading fixed location programs as part of your Basic program. Also, for tape users, I'll present a simple technique that almost gives you the same power and flexibility that disk users have to control multiple user routines without constantly POKEing values into 16526 and 16527.

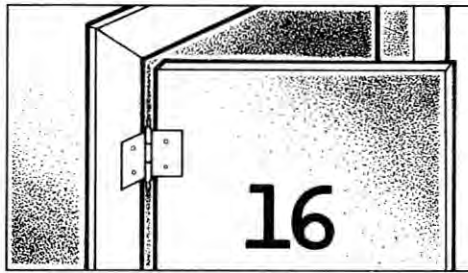
If you have comments, questions, or suggestions for future columns, please contact me through 80 Micro or CompuServe. My EMAIL address is 72165,735. ■

Welcome to the first installment of a column dedicated to the Model 16 and to those Model II computers that have been upgraded with the Model 16 enhancement boards.

In the months ahead we will investigate all aspects of life with the Model 16 and II/16. When new software becomes available, we will discuss it here. We also plan to clarify concepts presented in the owner's manual and the Assembler-16 manual. If you have questions about your system, let us know and we'll answer as many as possible in print.

First Impressions

One of the first things a new owner will try after uncrating the machine is to make a back-up of the TRSDOS 16* System disk. To our surprise, it cannot be done on a single-disk-drive computer! The back-up command re-



First thoughts on the Model 16

quires at least two disk drives. With some experimentation we found this to be true also of the Model II/16 upgraded computers. Obviously this machine is designed for use by people

who have large storage needs and who would normally have either two or more floppy-disk drives or a hard disk connected to it. So for those readers who plan to buy a Model 16 but are not contemplating getting a hard disk, we advise purchasing a two-disk system right away.

We tried to get around this one-drive problem by using the format command under TRSDOS 2.0* and then backing up under TRSDOS 16*. It was to no avail—under no circumstances can a back-up be made with only one disk drive.

Model 16 users who have owned a Model II will have to get in the habit of placing disks in the drives with the label facing toward the screen rather than away from it.

The disk operating system for the Model 16 was written by the Ryan-McFarland Corporation, the same

Assembly-Language Corner

The only language now available on the Model 16 is Assembly language. In this section of our column, we will explain some fundamentals of programming the MC68000 microprocessor. We plan to make comparisons to Z80 programming, since the Models I, II, and III use this chip, as does the Model 16.

What does a Model 16 Assembly-language listing look like? A sample program is in the Listing. Like any computer language, the code looks like Greek the first time you lay eyes on it. However, it is no more difficult than programming in any other Assembly language.

The frame of many programs can be developed using subroutines built into the disk operating system. These routines are referred to as supervisor calls. All peripheral addressing can be handled by supervisor routines, disk I/O, getting input from the keyboard, displaying text and information on the screen, and sending

data to a printer. In the months to come, we will examine many of the commonly used supervisor calls and show various ways to put them to work within an Assembly-language program.

The Program Listing instructs the computer to clear the screen, position the cursor at the first line on the top of the screen and 36 spaces to the left, display the message "80 MICRO" centered horizontally, and finally return to the disk operating system Ready mode.

Those of you who purchase books on programming the MC68000 chip will have to do some translating. Unfortunately, the Shack Assembler-16 mnemonics and notations are not always in keeping with Motorola's syntax. This forces programmers to translate instructions in other books. The Assembler-16 manual claims the reason for this is an effort to standardize mnemonics.

The conventions and symbols referring to an address pointed to

by a register (that is, indirectly addressing a register) are the first differences you might note. Some of the op-codes themselves appear different. The instruction to move data from one register to another or one memory location to another is shown as MOV in the Assembler-16 manual, yet Motorola uses MOVE.

The editor that allows development of source codes is in the same format as editors for most other microprocessors. Four columns represent label, op-code, operand, and comments.

The actual character count from left to right establishing each column is somewhat flexible. As long as there are at least two spaces between each element, then the editor assumes it to be classified under the next heading to its right. For example, if two spaces were placed between an op-code and its operand, the editor would know that the last instruction is an operand, even though it might not line up underneath the operand column. ■

Introducing SooperSpooler's™ Little Brother

Who knows spoolers better than Consolink? We pioneered this industry with our revolutionary SooperSpooler, the Intelligent Printer Interface.

Now meet the newest family addition:

MicroSpooler™

especially designed and engineered for those who need cost-effective solutions to their spooler requirements without sacrificing quality and sophistication.

No More Waiting on the Printer

The new MicroSpooler stores data and then feeds it to a printer as fast as the printer can handle it.

That means no down time: in a matter of seconds, your computer is free for the next job **without waiting** for the printer to finish the last job.

Quality, Reliability, Flexibility

As with the SooperSpooler, the new MicroSpoolers are the product of the highest engineering standards to insure trouble-free operation. Now Consolink offers a complete line of stand-alone spoolers that can be installed in-line between virtually any printer and any computer.

Easy to install. Easy to use. Easy on the budget.

Features include:

- 16K Memory: User or factory expandable to 32K or 64K
- Multiple Copy Function
- Status Readout: Tells you how much data is stored or how many copies are left to run
- Pause Function: To let you change paper, make adjustments
- Self-Test Routine: Performs a comprehensive check of most internal functions and memory
- Internal Power Supply: No bulky plug adapters
- Vertical Mount Configuration: Saves desktop space
- Plug-in connections to most computer combinations

- Independently Selectable Baud Rates on Serial Ports
- One Year Limited Warranty**
- Thirty-Day Money Back Guarantee**
- Four Models: Any Combination of Parallel or Serial I/O
- \$199 for 16K parallel to parallel unit with an internal power supply

And When You Need the Very Best...

Remember SooperSpooler, the Intelligent Printer Interface with a remarkable range of software controlled features and formatting capabilities.

See our new MicroSpoolers at quality dealers everywhere. For immediate answers to your questions, call Toll Free 800-525-6705

**Spoolers by Consolink—
Now you have an Intelligent
Choice.**

CONSOLINK
CORPORATION



Without MicroSpooler
21 Minutes

CPU time for 20 pages†
80 CPS Bidirectional



With MicroSpooler
16 Seconds

CPU time for 20 pages†

For immediate answers to your questions, call Toll Free: 800-525-6705

Consolink Corporation, 1840 Industrial Circle, Dept. ML1-203 Longmont, CO 80501 (303) 652-2014

*Formerly Compulink Corporation

**Consult your dealer or Consolink for details

†60 lines per page, random line lengths, 40 char/line.

Assumes CPU can output text at a minimum of 3000 char/sec.

```

BEGIN
CLEAR THE SCREEN
    LDA    .A0,SVC BLOCK *LOAD A0 WITH ADDR OF SVC
    MOVW  @A0,#8          *IDENTIFYING FUNCTION CODE
    MOVW  6@A0,#27        *CODE TO CLEAR SCREEN
    BRK   #0              *JUMP TO SUBROUTINE
*POSITION THE CURSOR
    MOVW  @A0,#10         *IDENTIFYING FUNCTION CODE
    MOVW  6@A0,#1         *ROW POSITION
    MOVW  8@A0,#36        *COLUMN POSITION
    BRK   #0              *JUMP TO SUBROUTINE
*DISPLAY A LINE OF TEXT
    MOVW  @A0,#9          *IDENTIFYING FUNCTION CODE
    MOVW  6@A0,#18        *LENGTH OF MESSAGE
    MOVW  8@A0,#13        *ASCII CODE CARRIAGE RETURN
    MOVL  10@A0,#MESSAGE *LOADS ADDRESS OF TEXT
    BRK   #0              *JUMP TO SUBROUTINE
*RETURN TO DOS READY
    MOVW  @A0,#264        *IDENTIFYING FUNCTION CODE
    BRK   #0              *CALL SUBROUTINE
MESSAGE TEXT '80 MICRO'
    DATAB 13              *DEFINE AN AREA OF MEMORY
                                *AND PLACE AN ASCII 13 THERE
SVC BLOCK
    RDATA 32,0           *ESTABLISH 32 CONSECUTIVE BYTES
                                *IN MEMORY AND FILL WITH ZEROS
    END    BEGIN
    
```

Program Listing, Model 16 Assembly-Language Source Program

people that wrote the Model I, II, and III Cobol development packages sold in Shack stores. Accompanying the purchase of this computer is an editor/assembler disk and manual for writing Assembly-language programs for the MC68000 microprocessor. It, too, is by Ryan-McFarland. While both the assembler and the Model 16 owner's manuals contain a great deal

of information, they do make a lot of assumptions. One of the goals of this column is to fill in the gaps.

Reader Forum

Users need an outlet for praises and complaints, as well as to give others answers to specific questions.

Since this is the first column to appear in this series, we haven't had the

opportunity to get any feedback from readers. So we visited several Shack stores that were selling the Model 16 and asked the salesmen what the most frequent customer questions are.

One consistently asked question concerns the software available for this new machine. All software that will run on the Model II will also run on the 16 and II/16. But that software only uses the Z80 microprocessor. The MC68000, which gives the computer its powerful advantage over other micros, lies dormant. Updated versions of many programs that use the 16-bit central processing unit are being prepared for release.

You can expect programs for this machine to take advantage of its multi-user capability. This is where the Model 16 really shines. One of the main purposes for its design is to allow several people to access the machine at the same time. Naturally, you can use this machine to store a simple Profile file, but there is no point to it. Such a thing can be done on a Model II at a far lower cost.

The manager of a Radio Shack Computer Center told us that Shack plans to release a multi-user disk operating system soon. Such a system will cut up the RAM memory to enable up to three different programs to run simultaneously. Thus the system will not only be multi-user but also multitasking. One operator can print information from an accounts receivable program while another user at a remote location works on the payroll. Obviously, this microcomputer is not intended to be a personal home computer.

Some criticism has been raised concerning the release of hardware before any software is available. We applaud Shack for putting the Model 16 on the market as soon as the computer itself was ready. This allows large software houses as well as Mom-and-Pop outfits to get a jump ahead of the manufacturer and begin developing programs. More software is available for the consumer to choose from at an earlier date than if he were forced to wait for the manufacturer to develop it. We need not be dependent upon Radio Shack for programs to fit our business needs.

Please send your questions and comments to Dan Keen and Dave Dischert, Soft Horizons, RD 1, Box 432, Cape May Court House, NJ 08210. ■

WIN \$500.00 WORTH OF HARD/SOFTWARE OF YOUR CHOICE

This advertisement is sponsored by a group of independent software authors and hardware suppliers interested in showing you their top quality products for all popular computer systems. In addition, when you respond to this advertisement, you will be eligible to win \$500.00 worth of hardware or software of your choice. Winner to be drawn Sept. 1, 1983. Send your name, address and computer preference to:

VALLEY RESEARCH COMPANY
 P.O. Box 241
 130 Homestead Dr. #18
 Mankato, MN 56001 ✓352

MULTIPLE ENTRIES ACCEPTED IF SENT SEPARATELY
 CONTEST VOID WHERE PROHIBITED

S TROUBLE FINDING THE MOST RECENT MICROCOMPUTER INFORMATION?

 • MICROINDEX — A monthly index to all available ads and articles concerning microcomputers and their hardware and software
 \$8/issue Subscription \$79/year

PROGRAMS TO ORGANIZE YOUR LIFE

- All-Purpose-SHOPPER — Save \$\$\$ and time when shopping. \$59.95
- Medical Diary — A personal medical record system for the whole family. \$49.95
- MEALPLAN — Choose your meals and get your detailed shopping list. \$79.95
- Tax 82 — Tax form completion for 1983 \$39.95

MODELS I, III, IBM, CP/M Systems

 Please write/call for more information
SERIOUS PERSONAL COMPUTING
 P.O. BOX 7059 S. NASHUA, N.H. 03060
 (603) 888-1376 ✓528

The Official

FROGGER™

by SEGA®

The popular arcade game
now available for the
TRS 80® Model I & III



TRS 80® Model I & III
\$19.95 Tape
\$22.95 Disk

Joystick compatible. Frogger is available
from your local software dealer or order direct.

All orders by VISA, Mastercard or
check add \$1.50 shipping. Indiana
residents please include 4% sales tax.

The Comsoft Group

6008 N. Keystone Ave., Indianapolis, IN 46220 (317) 257-3227

TRS 80® is a registered trademark of the Tandy Corporation.

and™ designate trademarks of Sega Enterprises, Inc.
© 1981 Sega Enterprises, Inc.

PLEASE ANSWER THESE 5 QUESTIONS

1. Do you have information that must be kept organized and accessible?
2. Do you ever need to perform statistical analyses?
3. Would you like to have a tool that will allow you greater flexibility in managing your own or your company's money?
4. Could you use a mail list program that will be easy to use, maintain an unlimited number of names, allow you great sorting flexibility, and even interact with a word processor?
5. Do you own or have access to a TRS-80 microcomputer?

YES NO

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

If you answered "yes" to any of these questions, we can be of assistance to you. Our Maxi Series of applications programs are designed to give you maximum versatility with a minimum of hassle. These programs were created for business use, but you'll find yourself using them for personal applications as well.

Thorough support — Of course, each program comes with in-depth, user-oriented documentation, and is menu-driven to make it easy to use. When necessary, the Maxi programs are compatible with each other, and, whenever pertinent, are interactive with the major word processing and spreadsheet programs published by other manufacturers. Also, we maintain a telephone support line to provide you with any assistance you might require.

Maxi Manager by Dale Kubler

Maxi Manager is a remarkable data base manager. Its fast machine language sort complements its large data storage capacity. The sophistication of its data entry, management, and printing capabilities makes Maxi Manager a versatile tool for many applications.

The program now includes Maxi Utility, which allows you to rescue files on diskettes that have been damaged by excessive wear or misuse and lets you expand, add, or delete fields from an existing data base. Let the unmatched capabilities of Maxi Manager handle your data management!

Model I & Model III. Minimum 1 disk drive required 012-0196 \$149.99

Maxi Cras by Dale Kubler

(Check Register Accounting System)

Maxi Cras is a system that will computerize check writing, recording and analysis for business and personal finance. The system features 223 income and expense accounts, each of which will handle an unlimited number of transactions. Extensive register and report printing capabilities make Maxi CRAS an indispensable tool for managing money effectively.

Model I & Model III. Minimum 2 drives required 012-0145 \$99.95

Maxi Mail by Dale Kubler

Maxi Mail is a powerful mail list management system that:

1. Is easy to use.
2. Has virtually unlimited storage capacity.
3. Interfaces with the major word processors to generate form letters and other text.
4. Prints mailing labels up to four-across in any format desired.
5. Has virtually unlimited coding capabilities with thirteen fields of information for each record.

Maxi Mail is the most sophisticated user-oriented mail list program available.

TRS-80 Model III only. 2 disk drives required 012-0148 \$99.95

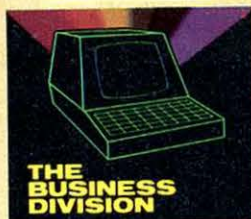
Maxi Stat by David Walonick

Maxi Stat is the most useful statistical analysis package on the market today. It was developed to allow maximum flexibility in designing customized analysis. Maxi Stat handles the three main components of statistical analysis:

1. Complete menu-driven codebook creation and editing.
2. Menu-assisted data entry.
3. User-created control files to describe the statistical analyses to be performed and printed out on the variables of your choice.

Model I & Model III. Minimum 2 drives required 012-0153 \$199.95

A Division of
Scott Adams, Inc.



Send \$1.00 for our 16 page booklet "Getting The Most From Your Micro" All 16 pages are packed with in-depth explanations and printout samples from the Maxi Series of applications programs.

THE BUSINESS DIVISION
BOX 3435
LONGWOOD, FL 32750
(305) 830-8194

✓20

FOCUS ON: MAXI CRAS



What is Maxi CRAS?

Maxi CRAS (for Check Register Accounting System) takes the work out of printing checks, balancing your account, and reconciling it with bank statements. And that's only the beginning!

Who can use it?

Maxi CRAS is powerful enough for small businesses, and easy enough to handle for family or personal use. Best of all, it won't make you change the way you do business. Write checks by hand and enter them into the computer later, or let Maxi CRAS do all the work, and print checks automatically.

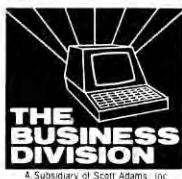
But what makes it different from all the rest?

We're glad you asked! Disk-based Maxi CRAS handles a virtually unlimited number of checks and deposits each month. And to keep track of all those financial transactions, Maxi CRAS supports up to 223 separate income and expense accounts, and your transactions can be assigned to one or even all 223 accounts.

Why is this so important? For some transactions it's not. Suppose you write a check for \$250.00 to Jolly John's Jalopy Jumpers for repairs to your automobile. You would simply assign the check to the AUTO REPAIRS account. But suppose you had Jolly John fill the tank, and you picked up a gallon of milk while you were there. With Maxi CRAS you can simply add the \$50.00 worth of gas and the \$2.00 worth of milk to the \$250.00 you owed him for the new windshield wiper, and write a check for \$302.00. Many systems would force you to assign this check to a single account. But Maxi CRAS lets you charge \$250.00 to AUTO REPAIRS, \$50.00 to your GAS & OIL account, and \$2.00 to your FOOD account. Six months, or even six years from now, you'll still know exactly what that \$302.00 went for. That's power!

I'm interested. Tell me more!

Organizing the data is just half the picture. Maxi CRAS provides six essential reports and statements in a fraction of the time required to do them by hand. At tax time, you'll have all the data you need at your fingertips. No more sifting through shoeboxes full of cancelled checks!



MAXI CRAS

By Dale Kubler

For your TRS-80 Model I or III with 48K, two disk drives, and an 80-column printer.

\$99.95

Soon to be released for IBM/PC

THE BUSINESS DIVISION
BOX 3435 • LONGWOOD, FLORIDA 32750
(305) 862-6917

For detailed forecasting and budgeting, Maxi CRAS now interfaces EASILY with VISICALC™, the electronic spreadsheet program sold by Radio Shack. A Maxi CRAS exclusive!

The Last Check Register Accounting System You'll Ever Need!

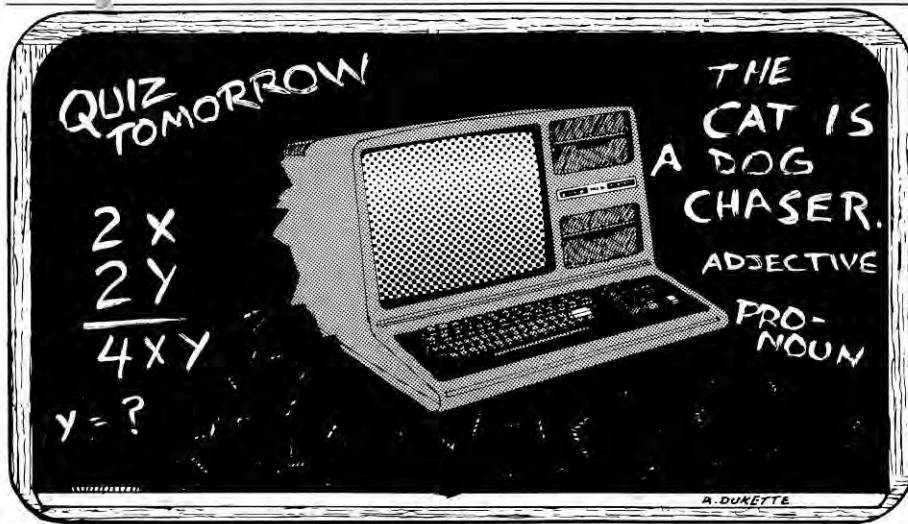
Strong statement? Check out these features!

- Write checks by hand, or print automatically on single or continuous form checks (NEBS 9020).
- Data Entry routine second to none — saves time AND eliminates errors. You don't need to be a computer expert to use Maxi CRAS.
- The best selection of printed reports available — complete check register, income and expense subtotals, bank statement reconciliation, list of check register notes, and an account distribution statement. Compare!
- For even more detailed analysis, Maxi CRAS data is readable by VISICALC™.
- Checkbook balance is constantly updated and instantly accessible. No more embarrassing overdrafts!
- A notes option can be used to flag tax-deductible transactions.
- Handles up to 223 income AND expense accounts. Many other systems only allow ONE income account.
- Assign transactions to a single account, or distribute over multiple accounts. Assign specific amounts, or pro-rate by fraction or percentage. Cash transactions can be recorded in any account without affecting check-book balance.
- Check Address data base stores up to 40 addresses and automatically prints them on your checks.
- Fast and easy bank statement reconciliation. Compare!
- Maxi CRAS is supplied with a complete User's Manual, sample printouts, and TDOS, a special version of the DOSPLUS operating system.

WE INVITE YOU TO COMPARE.

Compare Maxi CRAS with any other system available. We did, and we're sure you'll find Maxi CRAS to be the most versatile, easy to use Check Register system available — at any price!

THE BUSINESS DIVISION



★★★★

Author I
Radio Shack
Model I and Model III
\$150, Complete Package
\$65, Teacher/Student Module

by Edward A. Imbier

Author I enables those who do not know a line of Basic to write quality instructional lessons that also measure what a student has gained from the learning experience.

Instead of having to settle for pre-packaged software that doesn't fit a situation, an instructor with Author I can write a teaching module precisely geared to the student, the subject matter, and the proper academic level. Author I programs can measure how a class is following a lesson on the whole and which portions are not being understood. They can identify pupils who need more help; tell how long each student takes to complete up to five subsections and the whole lesson; and grade answers and compute subscores, the total score, and averages.

From the perspective of the student, Author I provides a customized, one-to-one learning experience. Who could ask for a better student/teacher ratio?

When using Author I, the student selects the gears; the computer picks the route. The program jumps over material already mastered and branches to remedial explanations when necessary. It gives hints, compliments, and scoldings when necessary. Its built-in dictionary can store definitions to words not understood by the student.

The Main Modules

The authoring package has four main modules:

Teach	Student lessons
Student	Scoring and timing files of the class
Author	Development software for constructing and editing a lesson
PRTVERF	Prints, verifies, and error-checks the labels and question groupings

After choosing the module you want, enter the name of the lesson desired. When students access the Teach module, they are asked for their names. This is for two reasons: to check if that student is allowed to take the lesson in question, and also to be able to use the student's name within the lesson for more personalized instruction. This and other character strings input by the student can be used anywhere within the lesson.

The student is escorted from page to page by pressing the space bar or the down arrow. Pages change and can contain text, questions, and glossaries. To enliven the display, text is mixed with graphics and special characters. Answers can be a single-key entry for multiple-choice questions or up to 58 keys and enter for fill-in-the-blank questions. Answers can also be selected by merely sliding the cursor over a chosen entry and pressing the enter key. Students can repeat lesson segments by using the up arrow. They are not allowed to return to the previous question page, but they do have the option of leaving the lesson by hitting the break key. Answers and the time it takes to complete a lesson are stored in the Student records module for later use.

I found operation smooth and need-

REVIEW CONTENTS

Author I	46
The Basic Answer	48
Graphic Enhanced Basic	52
<i>Apple Crunch</i>	56
Echo-GP Speech	
Synthesizer	58
DBASIC	58
Ultra-Term	64
DoughFlo	64
Mikeographic	
Graphic System	68
Microbuffer	69
MXPLUS	69

Our reviewers use a five-star rating system. One star represents the low end of this spectrum, while five stars represent the spectacular and high end of the spectrum.

ed very little instruction to use the Teach module. I could not get into trouble with practice lessons that I had written no matter how hard I tried.

Depending on the length of a lesson, up to 99 students can be enrolled within a given score file in the student module. A menu lets you select options to set up a score file, edit an existing one, and add students to an existing file. When examining the score file of individual students, you can choose to allow a student to have only one chance to complete a lesson (lockout mode) or several chances to complete the same lesson displaying either the current scoring and timing information (overlay mode) or an average (average mode). Scores, subscores, timings, and subtimings are available for each student. If you want a printout of an entire class, then PRTSCORE, a Basic program, must be run. Besides the normal scorekeeping and timing data, a score group section provides the total number of students whose grades fall into 10 score ranges (a frequency distribution).

MAILING LIST ~~\$149.95~~ SYSTEM

\$99.95 when Form letter option is additionally purchased.

FOR TRS-80 (Tandy Trademark) Model I and III

WHAT SETS OUR SYSTEM APART?...

- Our system is configured specifically for large mailing lists (or small) on **floppy disk drives**. Some other major systems run on floppies but are really intended for use on hard disk drives. Such a system assumes that you have vast amounts of on line disk storage capacity...the continuity of the data is limited to what you can have on line at one time. To get the real benefit of such a system, one usually has to purchase expanded track/density floppy disk drives and even then the problem occurs when all the drives are filled with data. We have neatly solved this problem by allowing all your data disks to be maintained in continuous order...even though, due to the limitations of your drives, the list may be too large to all be "on line" at one time. Thus our system accommodates extremely large lists using your existing drives and yet avoids the "segmented" data problems of the hard disk approach.
- While it is fashionable to advertise all-machine-code systems, our system is primarily written in BASIC...with embedded machine code for the speed sensitive areas. What this means is that our system is **easy to modify**, yet extremely fast. This is very important since many users like to have custom modifications made (either by them or us) so as to fit some unique requirement. Our manual has a section devoted exclusively to such modifications...Remember all-machine-code systems are extremely difficult to modify.
- Continuity of the ordered data (even data spanning many disks) is not limited to a "session", but is permanent.
- Optional "backing up" of your data as-you-go is an integral part of the system and is not restricted to the end of a session. This is true even for deletions.
- The length of our data fields are more than adequate to accommodate even your longest names/addresses.
- Adjusts to a 32K memory although full use is made of a 48K memory...Can be used with any DOS including TRSDOS.
- The program disk does not have to stay on line, thus freeing more space for data storage.
- Load and scroll through entire entries or selected fields. Edit as you scroll or go directly (takes about 2 sec) to a specific entry and edit or delete.
- Our automatic repeat feature allows often used names/addresses to be entered with a single key stroke.
- Each disk entry optionally "remembers" how many mailings have been made for that particular entry...Can be tied in with purge/select.
- Continuing **expert** support just a phone call away. You will be able to discuss your problems/modifications with the authors.
- **Money back guarantee if not fully satisfied.**

ADDITIONAL FEATURES:

- Simple to use, even for the novice...menu oriented.
- Permits **2260** names "on-line" with 40 track double density drives and almost **5000** names with 80 track drives. The older 35 single density drives permit 1025 on-line entries...made possible with our unique data compression techniques.
- Super fast sort by alph or zip order (8 sec. for 1000 entries). Both orders can exist **simultaneously** on disk.
- High speed recovery of entries from disk...speed of sort is meaningless if retrieval from disk is slow. Ours pulls in over 11 per sec!
- Master list printout of your list in several formats (not just a rehash of labels)...extremely useful.
- Zip order is "sub-alphabetized"
- Less than 5 digit zips have leading 0's appended.
- Supports 9 digit zips, **Canadian zips**, and foreign abbrev.
- Optional second address line.
- Optional reversal of names about commas. This permits disk storage in last-name-first order to facilitate meaningful order-

- ing while the printout will be in "natural" order.
- Permits telephone, account, and/or serial numbers, etc.
- Prints on envelopes or labels 1, 2, 3 or 4 across.
- Can print individual labels at time of creation or editing
- Test label/envelope printing allows you to make vertical and horizontal adjustments with ease...
- Transfers old files to our system. ← **LOOK!**
- Selective printout by specific zips or zip ranges
- Plenty of user defined fields with provisions for simultaneously purging and/or selecting the printout...even allows for inequalities...Powerful and easy to use.
- Editing is simple and fast...direct access or automatic search...Batch transfer of edited entries to backup disks.
- Optionally provides for duplicate labels.
- Deleted entries have "holes" on disk filled automatically and alph. order is still maintained!
- All labels optionally support an "Attn" line with provisions for multiple entries. This permits mail to be sent to several people at given addresses...conserves disk space.
- All 0's are replaced by easier to read O's in addresses.
- Continuous display of number of labels/envelopes printed
- Extensive use of error traps...even recovers from a power failure during a printout.
- Extensive assortment of extra cost options for customized master list printout (in addition to the standard one mentioned above), transfer of entries between disks, summary reports, and "publisher's" type multiple list label printouts.
- Hardware requirements...32K, printer, and 1 or 2 drives.

FORM LETTER (Use with Mail List System) \$39.95

Create letters and store on disk with provisions for later retrieval and additions. Then print your letters using your mailing list.

- Same select and purge features as mailing list system.
- Select either continuous fanfold or "cut sheet" paper
- Selectable tabing, test printing, and paging.
- Allows regular or legal size pages.
- Greetings are selectable by codes on mailing list. Options include Mr./Mrs., First/Last Name, global, or user defined

SUPER CALENDAR (Supplied on tape only) \$19.95

Prints out calendars of individual months of years ranging from 1583 to any time in the future. Standard banker's holidays are noted...Additionally prints out large "graphics" type wall calendars with memos under each day...Use as a planning calendar with optional disk storage...Requires 16K and a printer.

Loan Amortization (Supplied on tape only) \$29.95

Achieves pin point accuracy with a built in calendar. This sophisticated program produces an exceptionally professional looking printout that includes yearly summaries as well as "totals-to-date"...Several options for calculating interest including one that pushes the payment date ahead to the next business day if the regular pay date falls on a weekend or holiday

FOOTBALL SCOUT (disk only) \$89.95

Charge local schools up to \$1000 per season for these sophisticated reports. Analyze the tendencies of opposing teams...Equivalent to that used by the pros.

- Mailing List System Loan
 Form Letter Football Scout Super Calendars

Model I or III? _____

Total (Add \$3.00 for Shipping & Handling) _____

Check C O D Visa MC

Card No. _____ /Exp. _____

Name _____

Address _____

City, State, & Zip _____

PRECISION PROTOTYPES

410 E. Roca Refugio, TX. 78377 (512)526-4758

The lesson developer generates the pages for the lesson. The Author and PRTVERF modules allow editing and provide branching information and error-checking of lesson flow. Author is the screen-oriented text editor that produces the text, question, glossary, and control pages comprising a lesson. I recommend the software manual be on your lap during the branching and labeling phases of lesson production. Otherwise, it is not much needed.

Operations are smooth and slick. Mixed text and graphics and special character symbols can be easily positioned and moved around the screen. When you are finished, what you see is what you get. Arrow keys position the cursor for text and graphics entry; shift, arrow inserts and deletes a character or line; shift, @ initiates the graphics mode; double shift, @ initiates the special character mode for choosing from over 100 special characters.

Within the graphics mode, hitting the zero, period, or the enter key toggles you to the drawing, no-drawing, and erase modes. The special characters mode has a disadvantage: At least four key depressions are required to display one character. If you have a good eye, though, you can create an eye-catching display with most of the line graphics and special characters of the Model III (some limitations here for Model I users). A buffer to store various repetitive drawings would have been a timesaver.

Seven types of labels can be embedded within the text and control pages to make use of question groupings, answers, date, student's name, and a random-number generator. The number of tries to give a correct answer, as well as the points for each answer, can be selected, and the messages for responding to correct and incorrect answers can be selected in generating question pages.

A good flowchart of a lesson should be made before dealing with the branching option in this module. Control pages allow conditional and unconditional branching (with possibilities such as greater-than or equal-to question groupings or address labeling). This is probably the most difficult area to design in producing a lesson.

Basic and machine-language programs can be accessed from the Teach module if a small number of lines of code can be inserted within the external program. After the external program is run, the student automatically returns

to the Teach module with scoring information. It does take about 20 seconds for even the smallest external Basic program to run and return to Author I. It would have been convenient to be able to pass variables from the external program into the Author I package. Then the system would be able to do things like generate its own math questions.

PRTVERF is a module to print, verify, and error-check a given lesson. Three error codes and eight reference codes aid you (the lesson developer) in troubleshooting your lesson.

My misgivings are not with this very able software package, but with the limitations of the Model I and III computers I tested it with. Color and a touch screen would enhance the package greatly. Early in 1983 an authoring soft-

ware package will be available for the Color Computer that will be screen oriented, in color, and will make use of the built-in tone generator circuitry.

Author I is sold in two ways. A complete package with all the modules sells for \$150. An abbreviated version, with just the Teach and Student modules, sells for \$65 and is designed to run packaged software. One such package is a series of 150 programs sold in four modules called CARD (computer-aided reading development). Sentence, paragraph, reading for details, and comprehension are the topics these modules address.

Author I is an impressive package that can be used by even those with no Basic experience to produce interactive, good-looking lessons. ■

★★★★★

**The Basic Answer
Logical Systems Inc.
11520 Port Washington Road
Mequon, WI 53092
Model I and III
\$69**

**by G. Michael Vose
80 Micro staff**

The Basic Answer, or TBA, is a text-processing utility that works like an advanced computer system compiler. It allows you to create Basic program source code using a word processor or text editor and then use that textual code to produce an executable Basic program. It is designed to work only with the LDOS operating system. What makes TBA unique is that it allows you to use a descriptive, English-like syntax and it encourages the use of that ol' black magic "structured programming."

Now structured programming is a concept that frightens some computerists and is the holy grail for others. The disciples of structured programming scoff at the undisciplined masses who program in interpreted Basic, that most unstructured of all languages that allows you to GOTO and GOSUB a line number. The structuralists cringe at the idea that you can send execution to a place without a name.

The wild and unruly masses of programming mavens addicted to inter-

preted Basic's easygoing, meandering style—a style that lets you tack on a new idea when it comes to mind—recoil in horror at the mention of structured programming ideas like "procedures," "labels," and "compile."

In a debate between the two camps, the structuralists would argue that making each function in your program a subroutine, identified and called by a label, makes for more understandable source code—code that is much easier to read when you come back to it a year later. They would claim that isolating individual routines forces the programmer to give more thought to the overall structure of his program. The traditionalists would argue that Basic's major attraction is that it is interpreted, providing instant gratification to programmers who can write a line of code and test it immediately to see if it works. Besides, a traditionalist argues, you can write structured Basic code if you just do a little planning and flowcharting ahead of time. As for labels, what are remark statements for?

While this debate rages on, TBA steps in with a typically American solution to this problem—a compromise. TBA lets you write your source code in structured fashion, labels and all, and gives you a simple tool to create ordinary Basic code to execute at everyone's favorite time, not bedtime or mealtime, but run-time.

How It's Done

Here's how TBA works. First, you

Dot Writer Ver. 1.5

FEATURES:

- ★ GEAP CHARACTER FONTS
- ★ CREATE HI-RES DRAWINGS WITHOUT TRS-80 MODIFICATIONS OR PROGRAMMING KNOWLEDGE
- ★ CREATE OR MODIFY FONTS
- ★ TRUE PROPORTIONAL LETTER/LINE SPACING
- ★ PRINT TIME OPTIONS SUCH AS MAGNIFY, DOT SPACING CONTROL, REVERSE CHARACTERS, UNDERSCORING, TRUE PROPORTIONAL PRINT
- ★ SUPPORTS R/S LP/IV, V & VI, OKIDATA MICROLINE, EPSON 80/100 & PROWRITER WITH MORE ON THE WAY
- ★ COMPATIBLE WITH YOUR DOS
- ★ WORKS WITH YOUR WORD PROCESSOR
- ★ WORKS WITH TRS-80 MODELS 1 & III
- ★ SUBSCRIPT, INTERMIX FONTS AND HI-RES GRAPHICS ON THE SAME LINE
- ★ EXPANDED PRINT AND MORE!
- ★ USER FRIENDLY

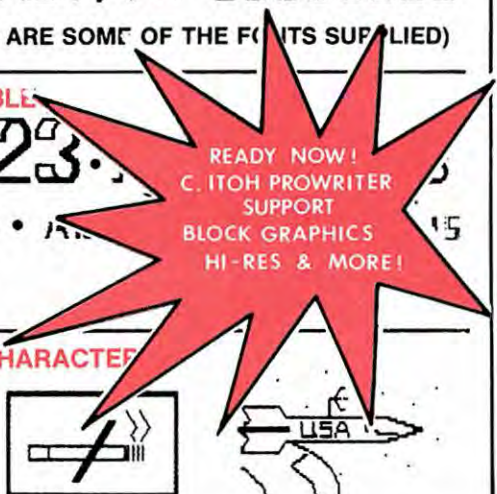
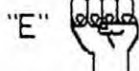
ACTUAL CHARACTER FONTS/SIZE

ABCDEF · **ABCD abce** 123456 · **ABCD abcd** 123456
ABCDEF abcd 123456 · **ABCD abcd** 12345 : ; ? * · **ABCDEFGHI**
ABCDEFGHIJKLMN · **ABCDEFGHIJKLMN** (THESE ARE SOME OF THE FONTS SUPPLIED)

ADDITIONAL FONTS AVAILABLE

ABCDEF 1234 · **ABCDEF** 1234
ABCDEF abcd 12345 · **ABCDEF** abcd 12345 · **ABCDEF**
ABCDEF · **ABCDEF** a b c d · **ABCDEF** abcd

SAMPLES OF HI RES AND MODIFIED CHARACTER



WELCOME THE PROWRITER

Now we have added the C. Itoh Prowriter to our line of fully supported printers. With Dot Writer 1.5C you get all of the power available to Epson users, plus the additional benefits of the Prowriter's unique abilities. Prowriter users can even use italics and TRS-80 Block Graphics.

GEAP - The ultimate in TRS-80 Graphics. **GEAP 2.1** - Instant Graphic Letters. Create screen graphics easily by magnifying, reversing, multiplying, rotating, merging and much more. Let **GEAP 2.1** create a BASIC program to recreate your graphic masterpiece! Numerous expansion modules give **GEAP 2.1** limitless power: EPSON/OKIDATA/Radio Shack LPV/IV printer block graphics; QuickCursor with 2, speed controllable cursors, instant line, rectangle and circle. NewScript interactive expansion module. Much more! There is **NO** other graphic utility on the market that is as powerful, versatile and easy to use as **GEAP 2.1**. **GEAP 2.1** \$49.95

DOT WRITER 1.5 - The undisputed leader in High Resolution graphics. Numerous special Hi-Res type fonts for your Epson MX 80/100. Create your own type fonts or Hi-Res graphics. No hardware or modifications needed! Now, true proportional print, underlining, expanded print, and much more! **Dot Writer 1.5 + GEAP 2.1** turns your TRS-80 and EPSON into a Hi-Res Graphic typesetter! Requires 48K, disk and Epson MX 80/100 with Grafrax 80/PLUS. Grafrax available for easy home installation. **DOT WRITER 1.5** \$69.95

GEAP 2.1 and Dot Writer 1.5 or 1.5C \$99.95

We are the best! Have you seen our competition display their product in their ads as we have? In fact, in the 12/82 issue of this magazine, 5 ads (not counting ours) were created in whole or in part with our program!

Additional disks ready now! Dot Writer comes with 12 type styles, but each of these styles can be expanded, reversed or magnified to create a minimum of 36 unique fonts. In addition, we now have 2 disks with 10 fonts each. The first disk includes some unique, stylized fonts. Disk 2 includes 10 italicized versions of our most popular fonts.

EACH ADDITIONAL DISK \$29.95

ADDITIONAL PRODUCTS

In addition to our own products, we also carry the following fine software.

NewScript 7.0 - NewScript is the best and most powerful word processor available for the TRS-80. **\$124.95**

Electric Webster - Cornucopia Software's top-notch spelling checker. A 50,000 word dictionary that you can customize to your needs. Error free hyphenation and unique grammar checking are extras that make Electric Webster a must for your work station! With correction feature! **\$149.50**

Faster - Also a fine print product from ProSoft. Faster optimizes BASIC code. **\$25.95**

Trashman - A utility that reduces string compression time by as much as 95%. **\$39.95**

Quick Compress - A real space saver from ProSoft software. **\$19.99**

RPM - A real time disk motor speed analysis program. Keep your disks running perfectly! **\$24.95**

Multidos - the "smart" operating system. **\$99.95**

JF CONSULTING

West - 74355 Buttonwood, Palm Desert, Ca. 92260 (619) 340-5471
 East - 221 Hirschfield Dr., Williamsville, N.Y. 14221 (716) 634-3026



✓ 273

West - 74355 Buttonwood, Palm Desert, Ca. 92260 (619) 340-5471
 East - 221 Hirschfield Dr., Williamsville, N.Y. 14221 (716) 634-3026

create source code using a word processor, text editor, or even your Basic program editor. Obviously, a word processor or flexible text editor will make writing, adding or deleting characters, and changing your source code easier. You then save your source code text file in ASCII. Next, you use TBA

“While this debate rages on, TBA steps in with a typically American solution to this problem—a compromise.”

to compile your source file into an object file—this object file will *not* be machine code, but familiar Basic code. Once your object file is created, you can load and run it as any Basic program.

Since you must compile your source file before you attempt to run your program, there is an extra step involved in programming the TBA way.

This can be annoying if you make errors in your source code since you'll find the errors only when you run your object code file. When you make errors, you must reload your source file, correct the errors, recompile the object file and run the program a second time to ascertain whether the errors have been corrected. This procedure gets tiresome very quickly and guarantees that you'll become a careful programmer in a short time.

Let's Have a Look

Listings 1 and 2 are examples of TBA source and object programs. I've used the program featured in December 1982's *80 Micro* (“TRS-80 Tongues,” p. 216) as my example. The first thing you'll notice about TBA source code is that there are no line numbers used. The other major difference between the source and the object code is the variables. TBA source code allows you to use up to 14 characters for variable names, and all 14 characters are significant. Furthermore, there are two kinds of variables—local variables whose values are retained only within the routine in which they appear, and global variables whose val-

ues are maintained throughout the program.

The next major difference in TBA source code is that all GOTOs and GOSUBs are followed by labels, not line numbers. Each routine in the program is defined by a label. When you want to perform a routine, you call that routine, or procedure, to use the structuralist's term, by using its label after a GOTO or GOSUB. Therefore, your source code will specify “GOTO @Format.Screen” to call a procedure for setting up a screen display. The compiled object file will then read, less descriptively, “GOTO100” (the @ sign is used by TBA to signal that what follows is a label).

There are some other slight differences in TBA source code. All variable types must be declared each time the variable's name appears in the code—the four variable types are integer, single precision, double precision, and string. The Basic keyword REM lets you place remarks in the source code that will be carried over to the compiled object program; if you use the abbreviation for Remark (the apostrophe, '), the remark will be deleted from the object program.

Otherwise, you write TBA source code much as you would regular Basic code, using labels and no line numbers. This results in source code that looks like Pascal. Logical Systems Inc. just might legitimize Basic in the eyes of upper echelon computerists with this refined achievement.

The real power of TBA may go beyond this refinement of the Basic language, however. The writers of TBA built into the system the ability to process the source code in a variety of ways. This processing is accomplished using directives. Directives allow the writing of master source code that accommodates all possible program configurations. At processing time, the directive appropriate for a specific application is chosen to produce an object program that serves that application. An example will illustrate this concept.

TRS-80s run with a variety of peripherals—a distinction becoming more common, for example, is floppy disk versus hard disk. With TBA, it is possible to write your master source code with a directive to allow discrimination between hard- and floppy-disk operation. When processing, or compiling, the source program, you can

```
REM Fahrenheit to Celsius conversion
@beginning=count%
cls
=Celsius.temp%,Fahrenheit.tem%
  gosub @get.Cval
  Fahrenheit.tem%=(Celsius.temp% * 9/5) + 32
  print@400,Celsius.temp%      degrees Celsius is
"Fahrenheit.tem% degrees Fahrenheit"
  for count%=1to1000:next count%
  goto @beginning

@get.Cval
print@140,"Type in the Celsius temperature";
input Celsius.temp%
return
```

Program Listing 1. TBA Source File

```
1 REM Fahrenheit to Celsius conversion
3 CLS
5 GOSUB 12
6 FA%=(CE% * 9/5) + 32
7 PRINT@400,CE% degrees Celsius is "FA% degrees Fahrenheit"
8 FOR CO%=1TO1000:NEXT CO%
9 GOTO 3
12 PRINT@140,"Type in the Celsius temperature";
13 INPUT CE%
14 RETURN
```

Program Listing 2. TBA Object File

SLAYING MONSTERS IS NO GAME.

Role-playing games are a serious business. They require thought and strategy, skill and luck. Your computer role-playing games should help you, not slow you down. In this age, there is no excuse for endless disk I/O delays and constant referral to manuals. That's why Med Systems does role-playing right. Our Warrior or RAS games are entirely implemented in machine memory, with machine language speed and dungeon-master complexity. Why settle for anything less?

Each volume of the Warrior of RAS trilogy is completely different from the others. New graphics, different goals, additional monsters. And each Warrior of RAS volume can generate millions of unpredictable games. Not just data bases, but new mazes. New caverns. New challenges.

Since a Warrior of RAS encounter may last many days, games can be saved directly to tape or disk. And the characters you develop can also be saved, and can be loaded into any of the other Warrior of RAS games. Don't spend your time playing games.

*ride the dragon.*TM

*The Warrior of RAS trilogy requires 48K on the TRS-80 Model I or Model III.

*Please add \$2.00 for first class postage, \$4.00 for overseas order.

Volume I	DUNZHIN	Tape or Disk	\$39.95
Volume II	KAIV	Tape or Disk	\$39.95
Volume III	THE WYLDE	Tape or Disk	\$39.95

MED SYSTEMS SOFTWARE • P.O. BOX 3558 • CHAPEL HILL, NC 27514
TO ORDER, CALL: 1-800-334-5470, or see your dealer.

then choose to compile a floppy- or hard-disk version of the object program. TBA calls this conditional processing. Conditional processing provides greater flexibility and ease in programming applications that require many different conditions.

Evaluation

TBA is a very sophisticated programming tool, yet it is easy to use and learn. The documentation is similar in style to the LDOS manual. The manual is complete, professional, and full of

examples of TBA features. Logical Systems does not write products that unsophisticated TRS-80 users are likely to buy, so their documentation style tends to be complicated because there is no fluff—each sentence is packed with important information.

TBA's error messages are descriptive and well thought out. As you might expect from a professional programming tool such as this one, TBA provides a cross-referenced label and variable table when processing a source file. Table 1 is the table for the sample program in Listings 1 and 2.

The generation of software products exemplified by TBA promises to push microcomputers into sophisticated new environments. Companies like Logical Systems Inc. deserve support and congratulations. ■

Procedure Label	Defn #	Line #	Referenced at Line #'s
@BEGINNING	2	3	9
@GET.CVAL	11	12	5

Variable Label	Defn #	XLATE	Referenced at Line #'s
CELSIUS.TEMP%	4	CE%	6,7,13
COUNT% *	2	CO%	8,8
FAHRENHEIT.TEM%	4	FA%	6,7

Table 1. TBA Label and Variable Table

★★★★★

Graphics Enhanced Basic
Autel Electronics
P.O. Box 11187
Albuquerque, NM 87192
Model I or III, disk only
48K RAM
\$69.95

by Bruce Powel Douglass

A number of printers are now available with dot-addressable graphics: the Epson with Graftrax option, the C. Itoh 8510, and the NEC 8023A. A few programs are also available to dump screen graphics and make figures on these printers, but they are slow or inadequate for a number of applications. Graphics Enhanced Basic (GEB) solves this problem. It is a plotter language for

making high-resolution figures on the Epson, C. Itoh 8510, and NEC 8023A printers.

Unlike most programs that use the high-resolution features of these printers, GEB actually interfaces with your Basic. Figures 1-3 were all done on my C. Itoh 8510 using GEB. The programs (see Listings 1-3) are all quite simple. GEB works with TRSDOS, NEW-DOS80, LDOS, and MULTIDOS. It does not work with DOSPLUS.

One problem associated with making pictures on the printer is the huge amount of memory they require. GEB avoids the issue by spooling out to disk, so not all of the picture needs to be in memory at once. GEB resides in about 6K of high memory. It uses an adjustable buffer below it.

GEB allows different densities on the various printers. The Epson can run in

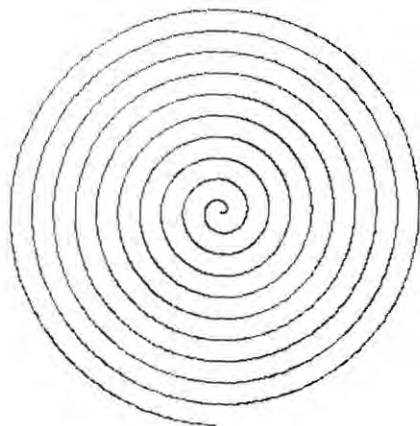


Figure 1

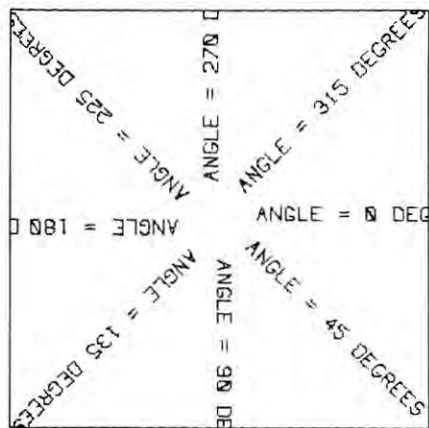


Figure 2



Figure 3

A Computer That Writes Programs For You.

What will they think of next..?



Your computer is fantastically fast...once it knows what to do. You probably realize that a computer is really the combination of hardware and software, working together smoothly, to give you what you want. Either one alone is useless. Software is really the key...the "mind" of a computer system. Every project or task you want to do requires a new specific software application to make it behave exactly the way you desire.

Of course, you may be able to "force-fit" an application into some existing canned program you have, but to really get results, you need a separate application program to run on your computer.

Until now, that meant you were forced to pay money for application software off the shelf, or if you could afford it, have it custom written for you, or, if you are qualified, do it yourself...spending endless hours figuring it out and writing it. Now, your computer can write individual application programs for you. These programs are each separate, unique software programs that run in standard Basic on your computer.

A company named FutureSoft has developed this exciting and long awaited remarkable working tool for you. There are two versions called *Quikpro+Plus* and standard *Quikpro*. Both of them create unique separate Basic programs for you...to do exactly, precisely, what you want to do. And listen to this...you create a new program in minutes instead of hours.

You can quickly generate a new program when you want it. You can generate thousands of different unique programs, each one standing alone as a complete program that runs in Basic. Best of all, you do not have to be a programmer to do it. The *Quikpro* software becomes your personal programmer, waiting to do your work for you any time of day or night you choose to use it.

The custom programs you generate from this software provide for: Data Entry, Additions, Changes, Record Locating & Searches, great variety of Computations, and Report Printing (if you have a printer). It lets you decide what data to manipulate and how to manipulate it. It lets you decide the formats you want to appear on your screen and/or to print out in a report. It lets you use differing formats on the same data base. It lets you make calculations from data within records without altering the data base. It lets you report results with or without including the base data from which results were calculated.

All this is included in the ability/power of the program you create. You do it by simply answering questions that appear on your screen. Instantly, the *Quikpro* software instructs the computer to perform complex and

error free instructional sequences. You get the immediate benefits of professionally written software for your application.

The resulting custom program is truly a separate Basic program. You can list it, you can modify it, you can actually see what makes it tick. You can even ask it to print out its own operating instruction manual so others can run it for you. Finally, you can really tap the speed and power of your computer the way you really want. You can create new programs for every use you have in Business, Science, Education, and Hobby areas. And you can start now.

The software is available immediately from the creators. It comes in two versions. If you want to generate separate Basic programs with all the data handling plus Calculations and Report Printing features, you want *Quikpro+Plus*. Specify to run on TRS80 Model I and Model III at only \$149; to run on TRS80 Model II at \$189.

If you do not need Calculation ability or Report Printing in the separate Basic programs you will create from this program generating software, then standard *Quikpro* will do the job for you. Standard *Quikpro* to run on TRS80 Model I or Model III is \$89; to run on TRS80 Model II is \$129. (Later on you can always trade up to the Plus Versions for only the cost difference between the two).

Both programs are available to run on many other computers besides TRS80. Details are available by calling or writing.

You can order right now by phone or mail. If you have Visa/Mastercard, call toll-free from:

All States except CA-AL-HI 1-800-824-7888 OP# 441
From California call 1-800-852-7777 Op# 441
From Alaska/Hawaii call 1-800-824-7919 Op# 441

Operators on duty 24 hours daily. Operators can not answer technical questions. If you need technical information or want to order from Canada or other nations, call 1-904-269-1918 during office hours, Eastern Time, Mon.-Fri.

Send mail orders with check, money order or credit card information to: FutureSoft, P.O. Box 1446-D, Orange Park, Florida 32073. FutureSoft gives you a satisfaction or your money refunded guarantee for 10 days from delivery. You can run the software yourself on your own computer and see with your own eyes what it can do for you. Order now. ✓66

ADVERTISEMENT

60 and 120 dots/inch density, and the C. Itoh and NEC printers allow densi-

ties of 80, 96, 136, and 160 dots/inch. For comparison, the Tandy six-pen plot-

ter has a resolution of 200 dots/inch. The amount of memory necessary to hold all the graphics information is:

Size=length * width (inches squared)
* density * 9

where Size is in bytes. This means that a page width of 8 inches, 15 inches long, with 60 dots/inch density would require a full 64K for storage. GEB performs smooth spooling of this out to disk, so you need not even be aware of the large size (except that your disk drives will be on).

A list of the graphics commands is in Table 1. These commands form a plotting language powerful enough for virtually any application. You can draw lines, move the imaginary pen around on the plotted page, scale graphics, and move the origin about. You can rotate any number of radians (the Tandy six-pen plotter only allows you to specify four rotations) or create plots within plots with the Clip command.

One of GEB's more powerful features is its ability to print text. Not only

```

10 REM set memory size to 47000; draws figure 1
20 ESC(27,62):REM UNIDIRECTIONAL PRINTING
30 ESC(27,63):REM BOLD PRINT SELECT
40 CLEAR 500
50 PI=3.141592654:PH=PI/4
60 BUFFER(6)
70 LIMIT(4,4)
80 OPENFILE("PLOT/GEB:1",1)
90 SETMARGIN(0,1)
100 AREA(0,8,0,8)
110 FRAME
120 ORIGIN(4,4)
130 HEIGHT(.3)
140 FOR I=0 TO 7
150 A$=" ANGLE =" +STR$(PH*I*180/PI) + " DEGREES"
160 TEXT(0,0,A$)
170 ROTATE(PH)
180 NEXT I
190 PLOT
200 CLOSE FILE
210 NPAGE
220 END
    
```

Program Listing 1

SKYSCRAPER



SKYSCRAPER, the fast moving, arcade style game program, has fast machine language action. It provides several levels of play and three mazes to keep even the best arcade PRO captivated for hours and hours of fun.

SKYSCRAPER is ALPHA JOY-STICK* compatible and is complete with sound effects to make the game more like real arcade action.

So answer the challenge, get SKYSCRAPER and avoid the barrels and fires, and see how high you can get!!!!

TRS-80** Models I & III

16k Tape \$21.95
32k Disk \$24.95



MISSOURI RESIDENTS
PLEASE ADD
4% STATE SALES TAX

*ALPHA JOYSTICK Trademark of Alpha Products
**TRS-80 Trademark of Tandy Corp.



24 HOUR ANSWERING SERVICE
1-816-356-4211
1-816-356-8197

P.O. BOX 11676 KANSAS CITY, MO 64138 ✓210

DAISY WHEEL PRINTERS...

- SMITH CORONA TPI
- BROTHER HR-1
- DAISYWRITER 2000
- DIABLO 620/630 KSR
- QUME SPRINT 9 KSR

COMPUTER SYSTEMS...

- ATARI 800
- TRS-80 MODEL III

\$\$\$ CALL FOR PRICE \$\$\$

You won't believe it!!!

Rainbow

P & P CORPORATION ✓264
PO BOX 362 • HADDONFIELD, NJ 08033

800-257-6170 in NJ call 609-428-3900

do you have a full alphabet with numbers, you also have a predefined Greek character set, and the ability to define your own characters. The text is dis-

played with the TEXT(x,y,A\$) command. A\$ is then printed out with the first character at (x,y). You can print text at size (set by the Height command)

and rotation (set by the Rotate command). The height versus width of the characters is determined by the ratio of the limits of the x and y directions in your plot.

```

10 REM Program to generate spiral; figure 2
20 ESC(27,33)
30 REM SET MEMORY SIZE TO 47000
40 BUFFER(6)
50 LIMIT(4,4)
60 OPENFILE("PLOT/GEB:1",1)
70 SETMARGIN(0,1)
80 AREA(-1,1,-2,2)
90 PE=3.14159:TH=PI/180:RA=1:DR=RA/3600:CLS
100 SCALE(1,2)
110 MOVE(SIN(0),COS(0))
120 FOR I=0 TO PI*20 STEP TH
130 PRINT@32,I
140 DRAW(SIN(I)*RA,COS(I)*RA)
150 RA=RA-DR
160 NEXT I
170 PLOT
180 CLOSEFILE
190 NPAGE
200 END
    
```

Program Listing 2

The ESC command allows you to output special escape sequences to your printer to do things like change font, force bidirectional printing, or use bold printing.

Clip lets you specify a rectangular space within the graphics page for temporary clipping. This means that you can plot figures and draw lines within this clipping area, but parts of these lines and figures that fall outside of the clipping rectangle will not be drawn. You can use Frame to draw boxes around the clipping rectangle. This gives you a number of distinct plots within a single graphics page, a powerful feature indeed!

GEB's manual, although short, contains enough information to use the program effectively. Several sample programs are provided for demonstra-

NEW PRINTERS ADDED! FIND YOURS BELOW.		RIBBON SALE				EXACT REPLACEMENTS. LONG-LIFE, HEAVY INKING			
Good This Month RADIO SHACK-CENTRONICS-EPSON-ANADEX-BASE 2-HEWLETT PACKARD-MALIBU-IBM-NEC-C.ITOH-IDS									
PRINTER MAKE, MODEL NUMBER (Contact us if your printer is not listed. We can probably RELOAD your old cartridges.)	RIBBON SIZE Inches by Yards	INSERTS EZ-LOAD™ EXACT REPLACEMENTS made in our own shop feature Long-Life and Heavy Inking. Our instructions: DROP IN, NO WINDING! <small>Cartridges NOT included!</small>		RELOADS You SEND your used CARTRIDGES to us. We RELOAD them for you.		NEW CARTRIDGES <small>(from the various manufacturers. Subject to availability. *)</small>		SILVER DOLLAR WIND TO LOAD WHY DO WE SELL THESE? <small>This is the type ribbon you get if you order from our fellow advertisers. We sell them for less since we make them ourselves. Do you really like the mess and inconvenience of unwinding and dumping this type ribbon into a wastebasket or out on a newspaper and/or winding it into your cartridge? We don't know why these are being sold. Computers should simplify your life, not make it more complex just to save a few pennies. You are welcome to order these if you cannot afford our EZ-LOAD™ INSERTS, RELOADS, or NEW CARTRIDGES. But BEWARE! You now know how to avoid disappointment. One more caution: be sure to check the length of any ribbon BEFORE you buy it. For instance, an MX-100 ribbon should be 30 yards long, not 20 as in the MX-80.</small>	
ANADEX 9000 Series	1/2 x 30	\$21/3	\$78/12	\$10/1	\$9 ea./2 or more	*	*		
BASE 2	1/2 x 20	\$18/3	\$66/12	\$9/1	\$8 ea./2 or more	\$30/2	\$87/6	\$168/12	
CENTRONICS 7 - MEG 702/703/704/753	5/16 x 70	-----	-----	\$11/1	\$10 ea./2 or more	\$25/2	\$72/6	\$140/12	
HP-MALIBU 2608-2631	3/4 x 60	-----	-----	\$20/1	\$18 ea./2 or more	*	*		
RADIO SHACK DAISY WHEEL II Carbon Film (26-1419) COLORS Red, Green, Blue, Brown Long-Life Fabric (1449)	1/4 x 130	\$25/6	\$48/12	\$270/72	\$15/3	\$18/3	\$70/12	\$408/72	
LP I-II-IV 700 Zip-Pack (1413) 730/737/739/779	5/16 x 16	\$13/3	\$48/12	-----	-----	-----	-----	-----	
LP III-V (26-1414)	1/2 x 18	\$18/3	\$66/12	\$9/1	\$8 ea./2 or more	\$25/2	\$75/6	\$150/12	\$12/3 \$44/12 \$252/72
LP VI-VIII (26-1418)	5/16 x 14	\$17/3	\$62/12	\$9/1	\$8 ea./2 or more	\$22/2	\$66/6	\$132/12	\$11/3 \$40/12 \$228/72
LP VII (26-1424)	Inker Loop	-----	-----	-----	-----	\$16/2	\$48/6	\$96/12	-----
EPSON MX 70-80 IBM	1/2 x 20	\$18/3	\$66/12	\$9/1	\$8 ea./2 or more	\$18/2	\$58/6	\$100/12	\$12/3 \$44/12 \$252/72
MX 100	1/2 x 30	\$21/3	\$78/12	\$10/1	\$9 ea./2 or more	* \$30/2 *			\$18/3 \$66/12 \$360/72
C.ITOH Printer: 1550-8510 Paper: 450-460 Tiger: 500 Series	1/2 x 18	\$18/3	\$66/12	\$9/1	\$8 ea./2 or more				
IDS	1/2 x 35	-----	-----	\$11/1	\$10 ea./2 or more				
DATA ROYAL 5000	1/2 x 16	\$18/3	\$66/12	\$9/1	\$8 ea./2 or more				
NEC 8023 Series	1/2 x 18	\$18/3	\$66/12	\$9/1	\$8 ea./2 or more				
Spinwriter Fabric	1/2 x 18	\$13/3	\$66/12	\$8/1	\$7 ea./2 or more				
MS Carbon Film	1/2 x 130	\$25/6	\$48/12	\$270/72	\$15/3				
COLORS	1/4 x 130	\$3/6	\$58/12	\$324/72	\$18/3				

WORRIED ABOUT ORDERING BY MAIL? Relax. We've been in business for many years and can please the smallest and largest account. You receive some of the finest ribbons available made of our own exclusive IMAGE PLUS™ fabric and carbon film. Our ribbons fit your printer exactly. COMPARE, but BEWARE! We order all our competitor's products and are amazed at what we get. Have you ever received a new fabric ribbon you had to unwind and dump out on the table before you could use it? We have. Or, carbon film inserts that had no end-of-ribbon sensor? Or, 7-meg cartridges with only HALF enough ribbon at full retail? Our only business is RIBBON manufacturing and distribution. We use the latest state-of-the-art production equipment and are blessed with a fine, dedicated staff. We fully guarantee all our products because we make them ourselves. You must be completely satisfied, period. Our ribbons are made fresh daily and shipped within 24 hours. Write for our brochure and newsletter "INK SPOTS".

B&C President

Volume 1 **MODEL II 8" GAME DISCS** Volume 2
 Biorhythms, Trap Ugly, Bingo
 Rip Cord, Yacht Sea Towers, Blackjack
 Concentration & 4 more Farkle, PONY & 3 more

SEND CHECK, MONEY ORDER, or COD TO:

BCCOMPCO
 800 South 17 Box 246
 SUMMERSVILLE, MO 65571 ✓ 152
 (417) 932-4196

WE PAY UPS SHIPPING ON PREPAID ORDERS. PLEASE INCLUDE STREET ADDRESS FOR UPS DELIVERY. ADD \$1.00 FOR POSTAL, APO, FPO, or AK, AS, CM, GU, HI, PR, TT, VI, CANADA or MEXICO. FOREIGN ADD 10%, U.S. FUNDS.

```

10 REM set memory size to 30000
20 CLEAR 500
40 BUFFER(8)
45 LIMIT(10,8)
50 OPENFILE("PLOT/GEB:1",5)
60 SETMARGIN(0,1)
70 AREA(0,25,0,25)
90 HEIGHT(.4)
100 FOR I=1 TO 21
110 PRINT "line number ";I
120 A$=CHR$(I)+" "+CHR$(I+21)+" "+CHR$(I+42)+
" "+CHR$(I+63)+" "+CHR$(I+84)+" "+CHR$(I+105)
130 TEXT(0,22-I*.75,A$)
140 NEXT I
150 PLOT
160 CLOSEFILE
170 END
    
```

Program Listing 3

- BUFFER—Set buffer size
- CLOSEFILE—Close the current graphics file
- LIMIT—Define the size of the graphics page in inches
- OPENFILE—Open a disk file for graphics
- PLOT—Route graphics file to the printer
- SETMARGIN—Define top and left margins
- NPAGE—Put printer at top of page
- ESC—Send escape sequences to the printer
- AREA—Scale the graphics page in user-defined units (UU)
- CLIP—Define a clipping rectangle
- MOVE—Move to (x,y); no line is drawn
- DRAW—Draw to (x,y); line is drawn
- FRAME—Draw a rectangle around current clipping values
- PUTDOT—Draw a single point
- ROTATE—Rotate the effects of all subsequent commands
- SCALE—Scale the results of subsequent graphics commands
- ORIGIN—Define where (0,0) is (translation)
- CLEARMAT—Cancel rotate, scale, and origin calls
- TEXT—Display text on the graphics page
- HEIGHT—Define the height of characters in UU

Table 1

tion purposes; they are printed in the manual and provided on disk. The disk also contains a text character table and the Assembly source code for the various characters. This provides a simple way to produce your own characters and create a table for your plots.

I am quite impressed with GEB and highly recommend it to anyone who has one of these printers. In fact, for most plotting needs, I recommend buying a printer that works with GEB. It is easy to take advantage of this powerful plotting language to do vir-

tually anything that a digital plotter can do (and for less than half the cost). The only exceptions that come to mind are situations in which you need higher resolution than 160 dots per inch, plots larger than 8 by 15 inches, or multicolored plots. ■

★★★★

Apple Crunch
Frederic Vincent Huber
 Hearst Corporation
 Avon Books Division
 New York, NY
 Softcover, 264 pp.
 \$2.95

by Don Stauffer

The apple in *Apple Crunch* refers not to a Brand-X computer, but to the city of New York. Here is a fictional novel about computer crime that is contemporary, realistic, and believable—and a TRS-80 even figures prominently in several places.

The “bad” guys, a computer-school dropout and his ex-professor, are out to bilk the Big Apple out of 10 megabucks with some clever computerized extortion. After some common computer embezzlement to finance their major operation, they attempt to access, hide, and hold for ransom the information needed by the city to apply for a \$200 million Federal loan. Their motive:

revenge for having lost a loved one through bureaucratic bungling and apathy, combined with “computer errors.” The protagonists are a pair of city employees. Joe Copely is an aging de-

child with a TRS-80, also helps in his computer education. The author is obviously knowledgeable about computers. I did not catch any technical flaws in the entire book.

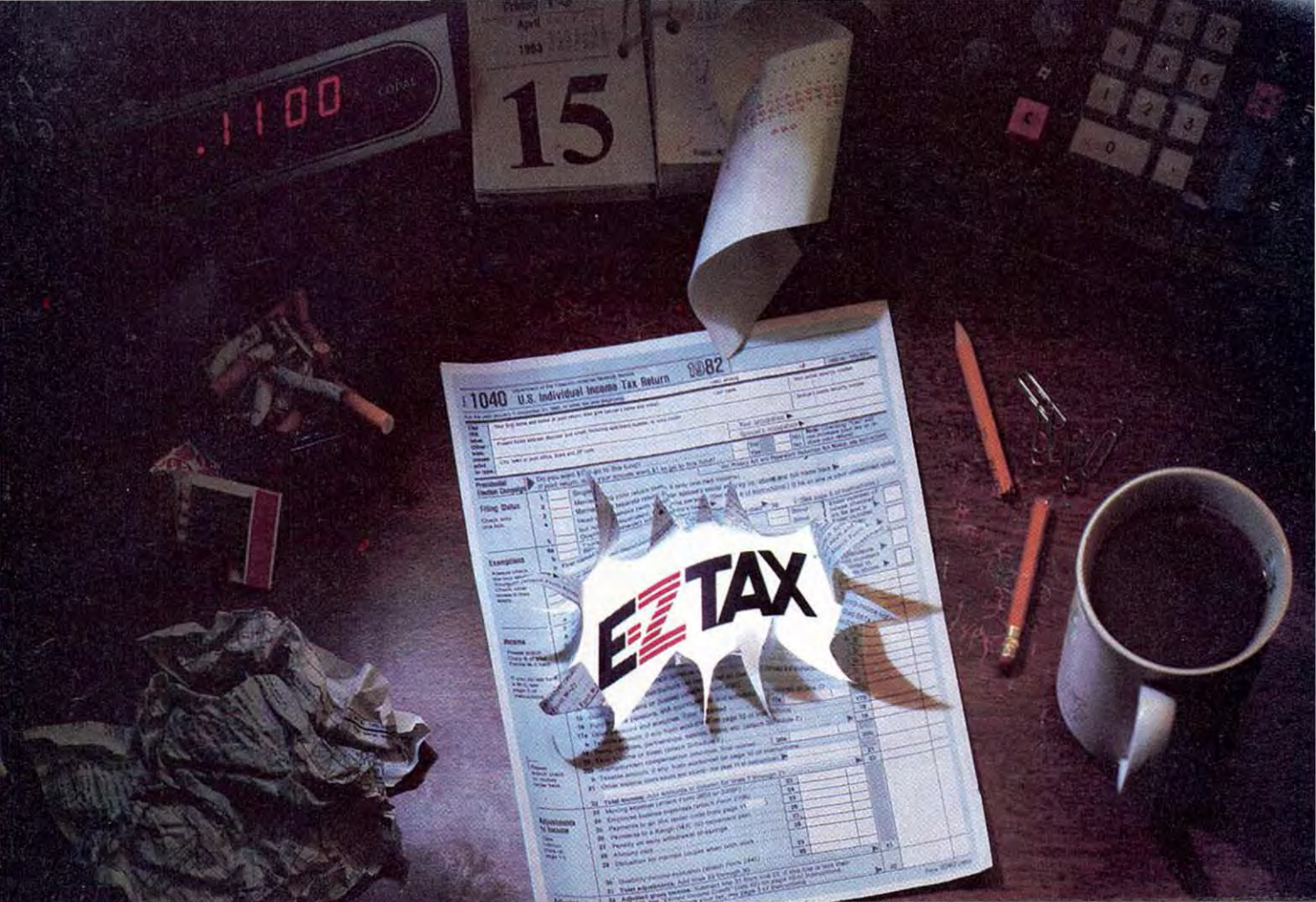
“This book could almost be a do-it-yourself manual for computer crime. I suspect, however, that the methods described are ones that Klein’s real-life counterparts . . . deal with effectively.”

tective, assigned to a harmless detail after his probes of graft and corruption in the NYPD irritated too many people. Klein is the chief of computer security for the city.

This pair make perfect foils for one another. Klein is long on computer and computer-security expertise, but short on investigative skills. Copely is just a streetwise cop who knows next to nothing about computers. As each teaches the other their skills, the reader is offered a fascinating glimpse into the worlds of police work and computer crime. Copely’s granddaughter, a gifted

His description of a TI Silent 700 is accurate even to the color of the keys. The details of police work were also very convincing, as were his descriptions of computer crime.

This book could almost be a do-it-yourself manual for computer crime. I suspect, however, that the only methods described are ones that Klein’s real-life counterparts have already learned to deal with effectively. I thoroughly enjoyed this highly readable and suspenseful novel. A surprise ending is a delightful dessert to an excellent book. ■



The Tax Break You've Been Looking For!

You Just Found It!

E-Z Tax — the easiest to use tax preparation software ever developed. Now you can do your own tax return without any knowledge of taxes or computer programming.

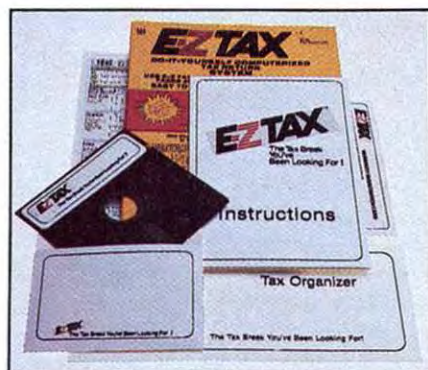
E-Z Tax's self-prompting questions assure you that nothing is overlooked. The program automatically computes the lowest tax for you.

E-Z Tax prepares the following IRS Forms and Schedules

1040 A	2106
1040 EZ	2119
1040 P. 1 & 2	2210
Sch. A	2440
Sch. B	2441
Sch. C	3468
Sch. D	3903
Sch. E	4137
Sch. F	4684
Sch. G	4972
Sch. R/RP	5695
Sch. W	6251
1040 SE	6252
1040 ES	

Prints on Federal Forms

It's so easy to use, you'll be doing your tax return the moment you insert the 5 1/4" disk. When you're finished E-Z Tax will print out your information on the official Federal Forms.



Very Friendly!

E-Z Tax is user friendly. When you have a question, the program will tell you on what page in the E-Z Tax Guide Book you'll find the answer. If you make a mistake the program alerts you immediately with screen prompts.

We Support You!

E-Z Tax has a toll-free customer service number available 24 hours a day for your convenience.

Never in the history of computer software has there been so much for so little.

ONLY **\$69⁹⁵**
TAX DEDUCTIBLE

Available in the following versions.
Apple II (48K), IBM PC (64K), Atari, CP/M
and TRS-80 Models II & III

For the name of your
nearest distributor CALL:

408/264-1040
800/331-1040 U.S.A.
800/344-1040 CA

TRS 80™ is a trademark of Tandy
Apple II™ is a trademark of Apple Computer, Inc.
CP/M™ is a trademark of Digital Research, Inc.
IBM™ is a trademark of IBM Corp.
Atari™ is a trademark of Atari, Inc.

E-Z TAX™

2444 Moorpark, San Jose, CA 95128

✓147

★★★

Echo GP Speech Synthesizer
Street Electronics Corp.
 1140 Mark St.
 Carpinteria, CA 93013
 (805) 684-4593
 \$299.95

by Bruce Powel Douglass

The Echo General-Purpose (GP) speech synthesizer is a versatile add-on built around the Texas Instruments TMS 5200 speech processor chip, an enhanced version of the chip used in Speak and Spell. It models the human voice track using linear predictive coding.

The serial version of the Echo GP requires an RS-232 interface. The parallel version, which looks just like a printer to the computer, plugs into the printer port of your expansion interface, or any Centronics-type parallel printer port. (I used the parallel version for this review.)

Routines in firmware called Text-Talker convert standard ASCII text into voice output. If you have the parallel version, you need only LPRINT your text to hear it spoken. You can access a number of features of the Echo GP by entering a CNTRL-E (CHR\$(5)) followed by an appropriate command. These features include pitch control, volume control (there is also a volume knob on the front of the Echo GP), punctuation modes, speech rate, "caps" mode, letter mode, word pronunciation, and others.

You can also choose to output phonemes rather than words. This option is useful because a large number of words are incorrectly pronounced by the Echo GP. Take "begin," for example. Echo GP normally pronounces this word "be-jin." Using phonemes allows you to correct the pronunciation. The manual contains a table of commonly mispronounced words and misspellings that you can use to force correct pronunciation. For example, to pronounce "begin" correctly, you should spell it "big in." To pronounce "achieve," you should spell it "ucheeve."

You can control the voice output with the CNTRL-E command sequences. The pitch goes from male to female, and the voice can be flat or intonated. English intonation often

depends on context, so although Echo cannot copy normal speaking intonations, it is an improvement over simple monotone speech.

The volume control is equally easy to control. For example, if your application for the Echo is in education, it is nice to be able to accent important words or phrases from within the program. The same is true for games.

The speech rate has a compressed mode, in which speech is almost twice as fast as normal. With just a little practice, this is still very understandable. The "caps" mode means that groups of capital letters will be spoken as single letters rather than as a word (IBM is pronounced as three separate letters instead of "ibm"). The letter mode is similar, but it spells out all words rather than pronouncing them as a whole. The Echo GP normally pronounces all words it finds unless it does not recognize it as a word (for example, "zps" will be spelled out), or if the "word" is a number. The character string 12.23 is spelled out "One Two

Point Two Three."

The manual describes the phonemes used by the Echo GP and how you can use them for best results. How to place stress on syllables and how to insert pauses, as well as pitch and volume control, are all covered, and a table of phoneme codes is provided.

I am pleased with the Echo GP. It is not good for proofreading documents by routing them to the printer, since it will mispronounce many words. However, for programs that require speech synthesis, it is a useful and extremely flexible tool. An internal buffer also lets your computer continue with what it needs to do before the text has been spoken.

While speech synthesis technology is not yet to the level of human speech, it is readily understandable, and pitch and intonation control go a long ways towards making it pleasant. Certainly the Echo GP is vastly superior to those talking games that use the cassette port. The Echo GP provides a quality synthesized voice for a modest cost. ■



★★★

DBASIC 1.0
Frank Hogg Laboratory, Inc.
 770 James St.
 Syracuse, NY 13203
Color Computer, 64K,
Hogg Lab's FLEX operating system
\$30 when purchased with FLEX,
\$40 alone

by Scott L. Norman

With the recent availability of FLEX, Color Computer owners can choose from a wide variety of new

software packages: high-level language compilers and interpreters, data-base managers, word processors, and more. One new FLEX interpreter is DBASIC from Frank Hogg Laboratory.

A Little Background

Before deciding to make the minor hardware modifications necessary to use FLEX on your machine, how will you benefit from the system? After all, FLEX by itself leaves you with 48K of perfect stupidity—there is in effect no programming language aboard, just RAM. The Hogg Lab version of FLEX includes a command, CBASIC, which

A LITTLE BIT OF "GREEN" GOES A LONG WAY!!!

Micro Data Supplies is quickly becoming famous for its high quality products at low warehouse prices. We have helped thousands of people just like yourself with all their computer needs. We have accomplished this not only because of our prompt service, but because we believe in a long forgotten phrase: "Value for your money." You have my word that with M.D.S., "a little bit of green goes a long way."



Russ Knotts
Russ Knotts • President

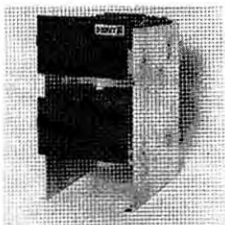
... Call (216) 481-1600

DISKIT III

MODEL III DISK UPGRADE



Floppy Doctor with the purchase of any DISKIT III \$30.00 VALUE!



Features

- Gold Plated Edge Connectors
- Switching Power Supply
- Supports 5" or 8" Drives
- 40/80 Track Supported
- Single Dual Head Supported
- Metal Disk Drive Brackets
- All Hardware and Cables for Two Disk Drives
- 1 Hour or Less for Installation
- 100% Compatible
- No Soldering Needed
- 180 Days Warranty on Controller

DISKIT III W/O Drives	\$269.00
DISKIT III W/ONE Tandon	
100-1 40 Track Drive	\$469.00
DISKIT III W/TWO Tandon	
100-1 40 Track Drive	\$679.00

DEALER INQUIRIES WELCOME

DISKIT III is a trademark of MDS

TRS-80, HEATH, IBM, APPLE, ZENITH DISK DRIVES

AT OR BELOW DEALER'S COST!

Model I & III Complete Case & Power Supply
Tandon 40 Track as low as \$239.00
Tandon 80 Track SCALL

SPECIAL
Tandon 80/80 Track \$429.00

BARE TANDON
T100-1 40 Track SCALL
T100-2 40/40 Track SCALL
T100-3 80 Track SCALL

SPECIAL
T100-4 80/80 Track \$359.00

TRAXX 8 INCH MODELS
Seaman 77 Track s/s SCALL
NEW TANDON "THIN LINE" 8 INCH
848-1 Single Side \$399.00
848-2 Dual Side \$499.00

APPLE
5 1/4" Add-On Disk Drive \$339.00

VERBATIM \$26.50 DISKETTES MAXELL

PARAGON MAGNETICS GOLD, Soft-Sectored, Single-Sided, Double-Density, 5 1/4 inch diskettes with reinforcing HUB-RINGS \$23.95
VERBATIM-Soft-Sectored Diskettes
5 1/4" 1S DDen (MD525-01) \$26.50
5 1/4" 2S DDen (MD550-01) \$39.95
5 1/4" 2S 4Den (MD557-01) \$51.50
8" 1S DDen (FD34-8000) \$43.95

MAXELL Soft-Sectored Diskettes
5 1/4" 1S/DDen (MD1) ~~\$65.95~~ \$31.95
5 1/4" 2S/DDen (MD2) ~~\$78.50~~ \$44.95
The DYSAN alternative...
the finest diskette money can buy!

PRACTICAL PERIPHERALS

MICROBUFFER

FOR ALL COMPUTER/PRINTER OR COMPUTER/MODEM COMBINATIONS

MBP-16K Parallel	\$149.00
MBS-8K Serial	\$149.00
MICROBUFFER II	
16K Parallel	\$249.00
32K Parallel	\$289.00
16K Serial	\$249.00
32K Serial	\$289.00
MICROBUFFER IN-LINE	
32K Parallel	\$289.00
64K Parallel	\$339.00
32K Serial	\$289.00
64K Serial	\$339.00
64K Memory Expansion Modules	\$169.00

EPSON PRINTERS EPSON

NEW LOWER PRICES

Epson MX-80	SCALL
Epson MX-80FT w/Graftrax	SCALL
Epson MX-100 w/Graftrax	SCALL
IDS Prism 80	SCALL
IDS Prism 132	SCALL
Okidata Microline 80	SCALL
Okidata Microline 82A	SCALL
Okidata Microline 83A	SCALL
Okidata Microline 84	SCALL
Prowriter 8510	SCALL
Smith Corona TP-1	\$629.00

LNW

LNW-80 Computer	\$1595.00
LNW-80-II Computer w/cpm 96K	\$1995.00
Mod. I System Expansion II w/32K RS232	\$349.00
LNDUHLER 5 8 Board	\$ 149.00

TRS-80

Model III w/ 2 Tandon 48K	\$1699.00
Model III w/ 1 Tandon 48K	\$1499.00

Both units come with 120 day warranty from MDS and use our MEMORY and DISKIT

SOFTWARE

CP/M • IBM • APPLE • TRS-80 owners	
WordStar R dBase II™	\$700.00 \$489.00
WordStar R	\$600.00 \$269.00
MailMerge™	\$150.00 \$ 99.00
SuperCalc™	\$300.00 \$219.00
VisiCalc™	\$250.00 \$199.00
NEWDOS 80 2.0	\$139.95
DOSPLUS 3.4 Model I	\$ 89.00
DOSPLUS 3.3 Model I	\$ 69.95
NEW Electric Pencil	\$79.95
ELECTRIC WEBSTER	
50,000 Word Spelling Checker	\$ 79.95
Correcting Feature	\$ 59.95
When purchased together	\$129.95
UNITERM Terminal	\$ 79.95
UNITERM 80 Terminal	\$ 89.95
ACE MAIL for Hayes Smart Modem	\$ 69.95
LABELMAKER for MX80	\$ 19.50
AIDS III Data Management	\$ 49.95
Maxi Manager	\$ 89.00
Floppy Doctor I, III	\$ 24.95
Inventory -	\$ 29.95
Cash Register 80	\$ 29.95

SUPPLIES

HUB RING KIT for 5 1/4" disks	\$10.95
HUB RING KIT for 8" disks	\$12.95
REFILLS (50 Hub Rings)	\$ 5.95
CLEANING KIT for 5 1/4" drives	\$24.95
5 1/4" Diskette Case	\$ 3.50
8" Diskette Case	\$ 3.95
5 1/4" File Box for 50 diskettes	\$24.95
AVERY TABULABLES	
1,000 3 1/2" x 15 16	\$ 5.49
3,000 3 1/2" x 15 16	10.95
5,000 3 1/2" x 15 16	\$15.95
FAN FOLD PAPER	
(Prices F.O.B. S.P.)	
9 1/2 x 11 18 lb. WHITE 3,000 ct.	\$29.95
14 1/2 x 11 18 lb. WHITE 3,000 ct.	\$39.95

BOOKS

OTHER MYSTERIES	
TRS-80 DISK Decoded	\$19.95
Microsoft Basic Decoded	\$24.95
The Custom TRS-80	\$28.95
Basic Faster & Better	\$29.95
The Custom Apple	\$28.95
1001 Things To Do With Your Personal Computer	\$10.95
Choosing A Word Processor	\$15.95
CP/M Primer	\$15.95
I Speak Basic TRS-80	\$12.95

MODEMS

UDS 103 LP Direct Connect	\$175.00
UDS 103 JLP AUTO ANS	\$209.00
Hayes Micromodem II (APPLE)	\$299.00
Hayes 100 Model (S-100)	\$325.00
Hayes Smart Modem (RS-232)	\$249.00

WE ACCEPT
• Visa
• MasterCard
• Checks
• Money Order
• C.O.D.

ALL PRICES ARE FOR MAIL ORDER ONLY
Prices, Specifications and Offerings subject to change without notice

ADD \$3.00 FOR SHIPPING & HANDLING
\$6.00 Extra for C.O.D. Orders
Ohio Residents add 6.5% Sales Tax

MDS
MICRO DATA SUPPLIES

22295 EUCLID AVE.
EUCLID, OHIO 44117
(216) 481-1600

459



OMNITERM

The ULTIMATE TRS-80 Terminal Package

What is OMNITERM?

OMNITERM is a professional communications package for the TRS-80 that allows you to easily communicate and transfer files or programs with almost any other computer. We've never found a computer that OMNITERM can't work with. It's a complete package because it includes not only the terminal program itself, but also conversion utilities, a text editor, special configuration files, serious documentation and serious support.

Why do I need it?

You need OMNITERM if you need to communicate efficiently with many different computers, or if you want to customize your TRS-80 for use with one particular computer. You need OMNITERM to SOLVE your communications problems once and for all.

What do I get?

The OMNITERM package includes the OMNITERM terminal program, four conversion utilities, a text editor, and setting files for use with popular computers such as CompuServe, the Source, and Dow Jones — just as samples of what you can do for the computer you want to work with. The package includes six programs, seven data files, and real documentation: a 76-page manual that has been called "the best in the industry." And OMNITERM comes with real user support. We can be reached via CompuServe, Source, phone, or mail to promptly answer your questions about using OMNITERM.

What do I need to use OMNITERM?

A Model I or Model III TRS-80, at least 32K of memory, one disk, and the RS-232 interface, or Microconnection modem. OMNITERM works with all ROMs and DOSes, and will work with your special keyboard drivers.

What will it do?

OMNITERM allows you to translate any character going to any device: printer, screen, disk, keyboard, or communications line, giving you complete control and allowing you to redefine the character sets of all devices. It will let you transfer data, and run your printer while connected for a record of everything that happens. OMNITERM can reformat your screen so that 80, 32, or 40 column lines are easy to read and look neat on your TRS-80 screen. It even lets you get on remote computers with just one keystroke! The program lets you send special characters, echo characters, count UART errors, configure your UART, send True Breaks and use lower case. It accepts VIDEOTEX codes, giving you full cursor control. It will even let you review text that has scrolled off the screen! Best of all, OMNITERM will save a special file with all your changes so you can quickly use OMNITERM for any one of many different computers by loading the proper file. It's easy to use since it's menu driven, and gives you a full status display so you can examine and change everything.

"OMNITERM has my vote as the top TRS-80 terminal program available today" Kilobaud Microcomputing, June 1981, pages 16-19.

OMNITERM is \$95 (plus shipping if COD) Call for 24 hour shipment. Manual alone \$15, applied toward complete package. Visa, M/C, and COD accepted. MA residents add 5% tax. Dealer inquiries invited.

Also available OMNITERM for the TRS-80 Model II and IBM personal computer. Contact Lindbergh Systems for details.

Lindbergh Systems

41 Fairhill Road, Holden, MA 01520
✓135 (617) 852-0233

Source: TCA818 CompuServe: 70310267

TRS-80 is a™ of Tandy Corp.

REVIEWS

copies the Color and Extended Color Basic ROMs to RAM so that you can use these interpreters without erasing FLEX from memory, but this is of limited use. After all, you had the Color Basics before you started! Besides, this command restricts you to cassette I/O, so it is a giant step backwards.

DBASIC

DBASIC provides a fairly inexpensive means for using Radio Shack Disk Color Basic to produce files that can be examined and manipulated by standard FLEX utilities. The actual I/O chores are handled by FLEX, but this is transparent to the user. With one exception, which I'll discuss later, you simply program in Disk Color Basic.

Getting Acquainted

DBASIC consists of two binary disk files, DBASIC.COM and DBASIC.SYS, and a utility called RTF.BAS that converts existing Radio Shack ASCII files to FLEX format. Both DBASIC files must be present on the same disk at run time. If you purchase DBASIC and FLEX at the same time, everything will be delivered on one single-sided, double-density disk. If you purchase DBASIC separately, copy the new files to the system disk. DBASIC will only work with the Hogg Lab's implementation of FLEX and can be run on a single-drive system. A pair of drives makes life much easier, though. I'll describe operation with one drive.

Once FLEX has been booted up, the DBASIC command invokes a routine that moves the Basic interpreters from ROM to the upper half of RAM, shuffling portions of the code to avoid interference with FLEX itself. The system now reads the DBASIC.SYS file, which contains modifications to Disk Basic's initialization routine. When memory has settled, you receive two more messages: the standard Disk Extended Color Basic logo, plus one for DBASIC. The usual Color Basic cursor replaces FLEX's + + + prompt.

A couple of minor differences show up immediately; for one thing, PRINT MEM returns a value of 22567, which is 256 bytes fewer than that returned by Disk Basic immediately after startup. If the FLEX system disk is still in the drive, the DIR command can be used to obtain a directory listing. The directory format resembles that of FLEX more than that of Disk Basic, however. It dis-

plays file name, extension, file size (in 256-byte sectors, not grans), and date of file creation. The Radio Shack format includes information about file type (ASCII, binary, and so on), but this is not preserved by DBASIC; the extension has to be used to indicate the nature of each file, instead.

A few other differences are spelled out in the documentation. Disk Basic's Back-up, Copy, and DSKINI commands have been replaced by their FLEX equivalents. Print Free(0) will often return enormous numbers, since FLEX measures everything in sectors instead of grans. A new command, FLEX, has been added to the Basic vocabulary; naturally enough, it returns the system to the operating system.

For the most part, you program in DBASIC just as though FLEX didn't exist. If your program creates output files that are to be manipulated by other FLEX utilities, they should be saved in ASCII format by appending ,A to the Save command, as usual. Either a period or a slash can be used to separate the file name and extension. If you want to specify a drive number, it should precede the file name (0:MYFILE.XYZ would be appropriate). Note that a colon is required between drive number and the file name, in contrast to FLEX's period.

The one major difference between DBASIC and Radio Shack's standard Disk Color Basic is that DBASIC will not support random (direct access) files. None of the associated commands such as Field, LSET, RSET, and so on, are recognized. You can use all the commands normally used for sequential files, of course, but be aware that disk files created under DBASIC will be incompatible with standard Disk Color Basic. All cassette files, though, are compatible.

Some Simple Experiments

My first effort working with DBASIC was a short program segment that I saved to disk in ASCII format. (The BAC extension is mentioned in the documentation as a convenient way of identifying ASCII programs.) Just as advertised, programs can be reloaded with DBASIC's Load command; it can also be listed from FLEX. When I saved the same program in tokenized form, however, List wouldn't work. DBASIC would still accept it using the Load command, however, just as the original Mi-

crosoft interpreter accepts both forms of Basic programs with a single command.

Continuing the theme of manipulating files created by DBASIC, I stored a second program segment in ASCII format, making sure that its line numbers were higher than those in my first trial program. I was then able to use FLEX's Append command to merge the two segments.

I found this works with data files, too. As a quick test, I copied and ran the simple checkbook program that appears on page 28 of the Radio Shack Disk System manual. The output file, CHECKS.DAT, was automatically generated in ASCII. This is where I first got a glimpse of the advantages of running under a full-fledged DOS; I could use FLEX's List command to examine the data file, independent of the program that created it.

In principle, other utilities then could have been used to work on the file. Of course, this flexibility requires that you pay a little more attention to system operation than is required for stock Basic. For example, when running DBASIC it is quite possible to load an ASCII file that is not a program. The consequences may be interesting, but they are unlikely to prove useful!

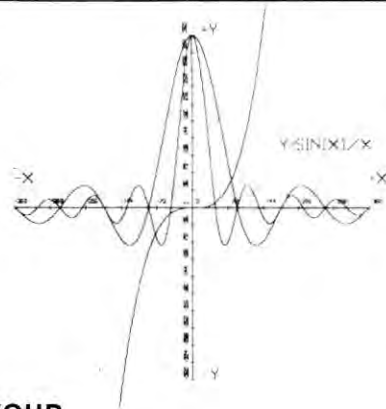
Using Stock Programs

DBASIC would be of very limited interest if it were unable to use programs written for the standard Color Basics—subject to the sequential file restriction, of course. Therefore, I decided to try running a fairly serious commercial program under FLEX via the DBASIC package. The example I chose was Trans Tek's C.C. Writer (CCW) word processor, a friendly line-oriented editor that I often use for correspondence.

C.C. Writer is written in Basic and outputs ASCII text files, so it seemed to be a natural candidate. Trusting to dumb luck, I booted FLEX, called DBASIC, and loaded the cassette containing the master copy of CCW; standard practice is for each user to make his or her own disks from the tape.

Everything went like clockwork. At the end of the loading process, a DBASIC disk catalog appeared on screen, verifying that the various files making up C.C. Writer at this stage were indeed present. CCW's loader program puts the two main program segments, CCW.DAT and CONVERT.

EPSON GRAPHICS



FROM YOUR
BASIC • FORTRAN • PL-1 • PASCAL
PROGRAMS

Grafpac-80 will read data from a disk file on your system and convert it to a hi-resolution plot or graph. Grafpac-80 plots up to 960 dots across and ± 32000 dots vertically on the Epson MX-80 — that's ± 25 pages !!

Grafpac-80 commands include: circle, ellipse, two and three dimensional data, penup/down, plot/move relative or absolute, single character or string plotting with rotation and size control, border generation, and many more...

Grafpac-80 is available for CP/M on 8 inch disk, TRS-DOS (model I and III) on 5 1/4 inch disk. Requires 48K memory. TRS-DOS systems need two disks.*

Prices: TRS-DOS I & III **\$49.95**
CP/M **\$69.95**

(Please include \$3.00 shipping charge with all orders)

* A version is available for TRS-DOS users with one disk, however, you must send us a copy of your TRS-DOS and include \$10.00 for copying.

M.E.S.C. • Parkhurst Drive • Salisbury, MD 21801 • (301) 742-7333

The following are registered trademarks: CP/M - Digital Research; TRS-DOS, TRS-80 - Tandy Corp.; MX-80 - Epson Corp.

398

Still Searching?



What Does
The Bible
Say?

And Where?

Now you can use computer technology to search the Bible on any subject. With THE WORD processor (including a disk copy of the complete KJV Bible text) you can create indexes on keywords. Or phrases. Even on concepts. A full spectrum of text search functions allows detailed analysis for the real student of the Bible.

Print or display selected verses and/or references for personal study or Bible classes. Build your own computerized library of research material.

THE WORD
processor **\$199.95***

Bible Research Systems • 8804 Wildridge Drive • Austin, Texas 78759 • (512) 346-2181

Requires 48K, 1 disk drive, APPLE, TRS-80, or IBM-PC** *Plus \$3.00 postage/handling
**Trademarks of APPLE Computer, Inc., Tandy Corp., and IBM Corp., respectively.

DAT, on disk in ASCII. Once again I used FLEX's Append to merge them, renaming the joint file NEWCCW. Finally, I saved both ASCII and tokenized versions of NEWCCW.

Both versions loaded and ran normally under DBASIC, although the actual loading processes took longer for the FLEX version. I assume that this has to do with the way FLEX allocates the 256-byte sectors where programs are stored. The difference in storage formats seemed to confuse CCW's ability to calculate the free space remaining on the disk, as well. Outside of this, I detected no bugs in the program's operation. I was able to use FLEX to examine text files produced by NEWCCW just as for the Radio Shack checkbook program.

The bottom line, then, is that even though DBASIC's disk I/O is actually handled by FLEX utilities, you rarely need be concerned with the fact. Incidentally, DBASIC will also read Color Computer machine-language cassette programs. There is no compatibility for machine-language disks, however.

Converting Your Old Basic Programs

Earlier I mentioned the RTF program, which converts ASCII files stored in Radio Shack's Color DOS format to similar files that can be read by FLEX. This is the tool to use if you have Color Disk Basic programs that you would like to run under DBASIC.

RTF itself is loaded from DBASIC. The Run command brings up a four-item menu, giving you the option of listing a directory for a Radio Shack or FLEX disk, copying from Radio Shack to FLEX format, or returning to DBASIC. The copy option prompts you for the numbers of the drives holding the two disks (these can be the same) and the name and extension of the original file. Next, you insert the source disk in the drive. After it is read, you receive a prompt that identifies the starting gran (in decimal and hex, no less) and asks you to insert the destination (FLEX) disk.

Hitting the enter key starts the conversion process. The file is listed on screen as the conversion proceeds. Large files have to be copied in several stages, but this is no problem as RTF prompts you to switch disks as needed. After completion of the process, an "All Done" message appears on the screen. If you now examine the direc-

"Incidentally, DBASIC will also read Color Computer machine-language cassette programs."

tory of the FLEX disk, you will find your converted file, old extension and all. Again, since this will be an ASCII file, it can be manipulated by FLEX utilities.

A Bug and Its Cure

While most of DBASIC's operating characteristics are quite benign, I did encounter one bug. There is a pretty simple fix, though, and something of a surprise twist to the whole affair.

The bug appeared when I tried to use the graphics commands of Extended Color Basic. Whenever a graphics screen was called up, the desired display appeared on about the ninth line of the screen preceded with eight lines or so of garbage. The top of the graphics was there, but it was displaced downwards from its rightful position. Of course, this meant that about eight lines of desired material were lost from the bottom of the screen.

The nature of the undesired stuff varied, depending on whether or not any programs had been run before the graphics commands were used. At various times, I saw square wave patterns, circular arcs, and isolated dots. The background of the garbage screen was always the correct color as defined by the Color Basic commands. Text displays were not affected; PRINT@0 put a character at the extreme upper left corner of the screen, just as it should.

I discussed this with Frank Hogg and Tom Speer, the author of DBASIC. Their first opinion was that the problem lay with FLEX's file control blocks, which can cause a DBASIC graphics display to begin at locations other than a 256-byte page boundary, contrary to the rules of Extended Color Basic. The fix that they recommended was inserting a FILES 1 or FILES 3 command in a program anywhere ahead of the commands that call up graphics. These Files statements reserve more or less buffer space than the default of two buffers, and thus move the start of the graphics RAM. This works perfectly well.

The Files statements can also be entered from the command mode before your program is run. The command mode is especially useful for FILES 3, which halts execution if included in a program; this has to do with reserving more space than the default. Having to enter Run twice to get a program running can be an annoyance.

If you want to write programs requiring more than three buffers, 'FILES n' also takes care of the graphics bug if one of the following values of n is used: 6, 8, 9, 11, or 14.

A few days after I brought this matter up, Frank Hogg informed me that the same bug occurs in Disk Color Basic itself—the numbers are just different! Sure enough, the same effects do crop up, and for the same general reason. For the record, you can get clean graphics in Disk Color Basic for the following numbers in a Files statement: 2, 5, 7, 9, 11, and 13.

Summary

DBASIC is evolving along with the Color FLEX DOS. My copy of FLEX was version 5.0, but by the time this review appears, purchasers will be receiving version 5.0:1. The difference is that 5.0:1 uses software-defined text screens giving 24 lines of either 51 or 64 characters, like Martin Consulting's Colorterm intelligent terminal program. This affects the way in which DBASIC must store and piece together code from the Basic ROMs. Hogg Labs promises to keep track of changes, though, so the DBASIC shipped at any time will be compatible with the contemporary version of FLEX. Future versions may even cure the graphics bug once and for all.

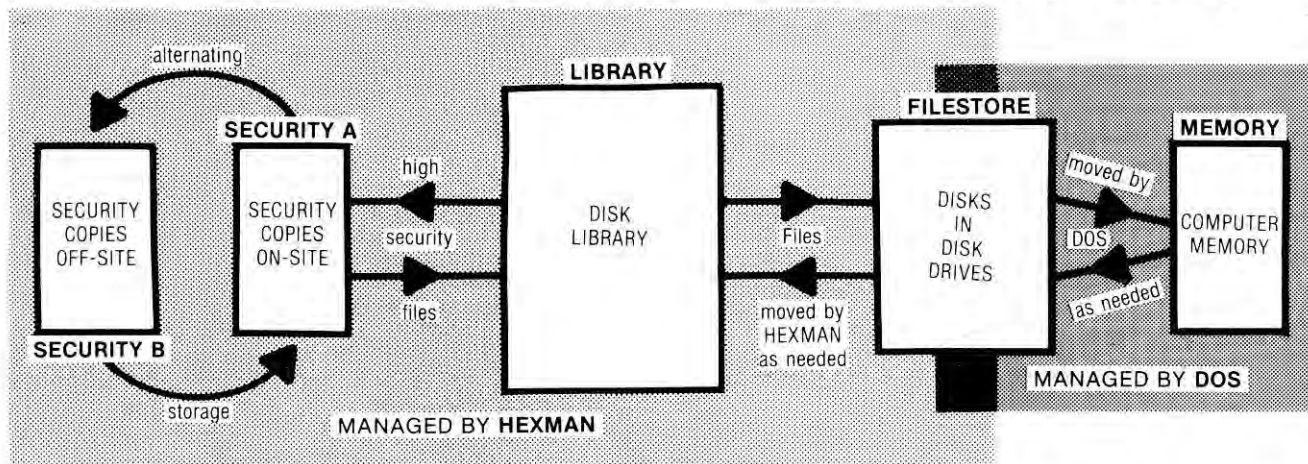
Other than the restriction to sequential files, DBASIC imposes no particular restrictions. Most programming tasks can be carried out just as for Extended Color Basic, with the added advantage of having I/O files that can be examined and manipulated outside of their parent programs.

The language is of dubious value if you are not interested in reading and writing disk data files, but then FLEX itself has little to offer if you are only interested in writing totally self-contained Basic programs. If you are seriously contemplating stepping up to FLEX, however, DBASIC is a reasonably priced addition to your programming library. ■

HEXMAN D.M.S.

DISK MANAGEMENT SYSTEM

Computerized file storage and retrieval for your whole disk library.



Your Disk Operating System makes a fine job of managing the files that are in your disk drives. No need to worry about where your old files are kept or where to store new files,

your DOS takes care of it. Now HEXMAN takes over where your DOS leaves off, and extends worry free file storage and retrieval to your whole disk library.

Storage Management

Only a small portion of your disks can be in your disk drives at any one time. These disks form the "Filestore" to which your computer has immediate access, and the remaining disks form your disk "Library". Ideally the "Filestore" should contain the most active files, while inactive files are kept on "Library" disks stored near the computer.

HEXMAN comes as close to this ideal as it can by monitoring file activity and keeping the most frequently used files in the Filestore. If previously inactive files are needed, they are moved in from the Library. If the Filestore becomes full, the least active files are moved out to the Library. The net result is the files you are most likely to use are ready and waiting.

HEXMAN also performs other storage management chores such as daily backups of modified files, on-site and off-site storage of security copies, and file growth monitoring.

File Retrieval

HEXMAN manages up to 8000 files (2000 originals with up to 4 copies of each). If remembering that many eight letter file names gives you a headache — don't worry. HEXMAN gives you two easy ways to find the files you need. With HEXMAN you find files by function e.g. "Get all the files I need for the end of month Sales Reports" or by description e.g. "Find the letter I sent to Radio Shack about my disk drives". HEXMAN finds your files in seconds. Once you have found them you may Review them, Load them or Delete them as needed.

Requirements

Model III — 48K, 2 drives.

Model I — 48K, 2 drives. Double Density adaptor. Lower case modification.

LDOS operating System. If you do not have LDOS, please add \$35 for a copy of the smal-LDOS operating system.

\$169
US



90-day trial - just \$20.

We are sure HEXMAN will become a "must have" program for all serious TRS-80 users. But check it out for yourself. Purchase HEXMAN now and try it out. If you feel you can live without it (unlikely!), return it for a prompt refund less a \$20 evaluation charge.

Offer valid for direct sales only - dealer terms may vary.



**WARNING —
TIMELOCKED SOFTWARE**

This product is time-locked. Unregistered copies will expire at a future date. Registered owners will receive an extension patch when needed.

A NOTE ON CANADIAN MAIL — please allow 5 to 10 days in each direction for mail delivery. For faster service leave your orders or enquiries on our 24-hour answering machine.

**HEXAGON
SYSTEMS**

P.O. Box 397, Station A
Vancouver, B.C. Canada V6C 2N2
Telephone (604) 682-7646
Electronic Mail-Micronet 70235,1376

✓ 46

★ ★ ★

Ultra-Term
Don Burgan
United Software Associates
North Palm Beach, FL 33408
Models I & III
\$59.95

by **Stewart E. Fason**

The Ultra-Term smart terminal package is running my new direct-connect, auto-answer modem and I couldn't be happier. It is easy to operate—you need no arcane knowledge to run the program.

Features

With Ultra-Term, you can transmit and receive files without converting them to ASCII (if Basic) or hex (if machine language). Because other terminal programs may demand files be sent in ASCII or hexadecimal, two programs included in the package will automatically convert a file so that it can be sent to any system, and convert a file received in hex back to machine language.

It is compatible with all major operating systems: TRSDOS, NEWDOS, DOSPLUS, LDOS, and MULTIDOS.

Ultra-Term lets you receive an unlimited number of files while unattended, as long as the computer sending data is also using Ultra-Term. When two computers using Ultra-Term are talking, they can send files just as they are on disk. This method is usually faster than using ASCII or hex—converting one byte of a machine-language file to hex requires two bytes, and a compressed Basic file converted to ASCII will be about 30 percent longer. Furthermore, the size of the file transmitted is limited only by the size of the disk, rather than by the buffer size at each end. Ultra-Term also verifies every bit to ensure accuracy.

It lets you set your RS-232 parameters to conform with the system on the other end. Most bulletin boards use 300 baud, 7-bit words, one stop bit, and even parity. Compatibility is no problem among TRS-80 owners, but I often talk to IBMs, Apples, Commodores, Burroughs, or who knows what. If they can't use my RS-232 settings, I must be

able to use theirs.

Ultra-Term automatically dials pre-programmed telephone numbers, or one that the operator enters through the modem. It lets a colleague on the west coast access my computer long after I have left for the day. He can use my system (with some limitations) as though he were at my keyboard. He can upload, download, and leave messages (which can be password protected).

The package lets you turn the printer on or off by pressing three keys simultaneously. It has a 1K buffer, which makes life easy for slow printers.

When the operator on the other end sends an ASCII bell (control G, hex 07), a tone comes through your cassette port. If you have an amplifier hooked up, the other end can signal you with audio at any time.

Ultra-Term lacks some frills—it has no auto-log-on and you can't modify control characters, for example. Don't expect a fancy leather-bound notebook containing the disk and documentation. The manual is only eight pages long, but as I've said, the program is simple. For \$59.95, you can't beat it. ■

★ ★ ★ ★

Doughflo
Alphanetics
P.O. Box 597
Forestville, CA 95436
Model I and III, disk system
\$79.95

by **Bruce Powel Douglass**

Until I received Doughflo, my checking account *never* balanced. But as my business began to grow, I needed to know where my money was going, and where it was coming from. How much do I spend on computer equipment? Software? Office supplies? Women? A hand accounting system is just not the way to go.

Doughflo from Alphanetics is the program that solved all my accounting problems. My accounts balance to the penny and I have monthly records of all my financial dealings. Thirty-three categories for income and expenditures define my subtotal categories, such as personal costs, equipment costs, business costs, taxable income, and total expenses. With Doughflo, I not

only keep track of the final balance, but I can easily and quickly see where my everyday expenses lay.

Doughflo is a convenient way to solve a variety of common income and expenditure analyses, tax preparation, and bookkeeping tasks; this is true for both the household and for the small business. For the household, it is an excellent bookkeeping system; for the business, it is simply the easiest way to keep track of your income and expenses.

Doughflo requires at least 32K RAM and one disk drive. It comes on three disks for the Model I and two disks for the Model III. There is a large ASCII file of instructions and two identical copies of Doughflo, in case one copy gets zapped. Sample data files are also enclosed and these are used in the manual to show the workings of Doughflo.

My version of Doughflo cannot be backed up and only works in single density for the Model I, but by the time you read this, Doughflo will be unprotected by Alphanetics, allowing you to use your favorite operating system and even double density.

I dearly love Doughflo, but there are a couple of small points that I dislike about the system. First, the manual is

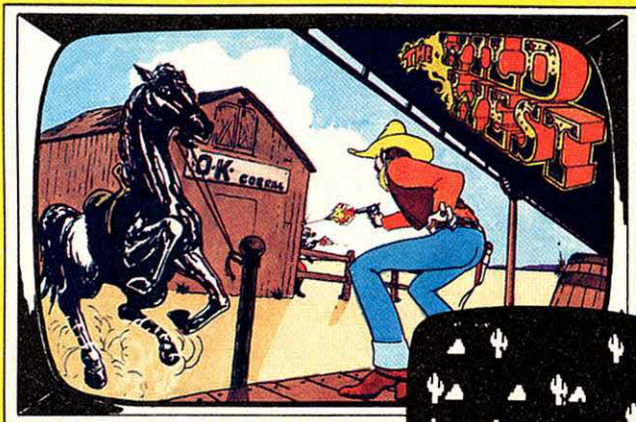
not particularly outstanding, and it is not provided in a printed form—it is supplied on disk. You must route it through your own printer. It would be difficult to read the manual by listing it to the screen and pausing the listing with shift @, but it can be done. It would be much more convenient to supply a printed manual.

In terms of content, the manual is helpful but lacks referencing (such as a table of contents or an index). Fortunately, a cursory reading of it is all that is necessary to use Doughflo, because the program itself is menu-driven.

You can configure Doughflo using the CATGEN option from the main menu. The default is to use only one drive, requiring you to switch your program and data disks frequently. If you configure it for a multiple-drive system, Doughflo stores this on the program disk, and you are not required to switch disks.

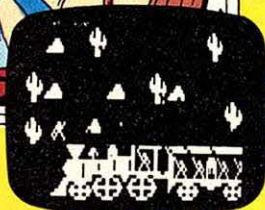
CATGEN also lets you create your categories and set up the reports generated by Doughflo. Various categories can be summed in any order and the results labeled for meaningful presentation, either to the screen or the printer. You can define up to eight such subtotal reports. The system I set up is shown in

TONIGHT ON YOUR TRS80



KEEP THE WEST BEAUTIFUL

It's up to you! Outlaws and renegade Indians on all sides. Even the train's been hijacked by outlaws with all the payroll on board. Can you clean up THE WILD WEST by Clifford Abrahams?



EXPLORE MARS

Fortunately your craft can jump over small boulders and pits and can blast away at the larger boulders. But watch out - the natives are not friendly. Join the MARTIAN PATROL by Rick Maurice.



DRIVE THROUGH THE NIGHT

Hostile competitors, oil slicks, wandering pedestrians and a treacherous raceway all combine to make this a real challenge. Roll your TRS up to the starting line for GRAND PRIX 80 by Rick Maurice.



SAVE YOUR HOME CITY

Steady your nerves, keep a sharp lookout, and prepare for battle. Fiendish aliens are all around, and if they destroy the city, you're next. It's a SPACE ATTACK by Clifford Abrahams.



Orders to: **MELBOURNE HOUSE SOFTWARE INC.**
Dept. CS 347 Reedwood Drive, Nashville, TN 37217

Visa and M/C orders
can be phoned in: 615/361-3738

Dealer orders and queries: 800/251-5900
(ask for a Melbourne House operator)

✓ 250

Cassettes (16K Model I/III)		
<input type="checkbox"/>	26518	PENETRATOR \$24.95
<input type="checkbox"/>	26542	STRIKE FORCE \$15.95
<input type="checkbox"/>	26585	GOBBLEMAN \$15.95
<input type="checkbox"/>	18775	THE WILD WEST \$15.95
<input type="checkbox"/>	18760	MARTIAN PATROL \$15.95
<input type="checkbox"/>	18743	GRAND PRIX 80 \$15.95
<input type="checkbox"/>	14074	SPACE ATTACK \$15.95

Disks (32K Model I/III)		
<input type="checkbox"/>	26710	PENETRATOR \$24.95
<input type="checkbox"/>	26734	STRIKE FORCE \$19.95
<input type="checkbox"/>	26760	GOBBLEMAN \$19.95
<input type="checkbox"/>	19172	THE WILD WEST \$19.95
<input type="checkbox"/>	19139	MARTIAN PATROL \$19.95
<input type="checkbox"/>	19111	GRAND PRIX 80 \$19.95
<input type="checkbox"/>	14049	SPACE ATTACK \$19.95

TOTAL: \$ _____

Residents of CA, MD, TN, please add sales taxes: _____

S&H: \$2.00

TOTAL: \$ _____

Enclosed is my check or money order for \$ _____.

Please charge my Visa or MasterCard Card # _____ expiration date _____

Signature _____ Name _____

Address _____ City _____ State _____ Zip _____

Table 1.

When I enter the checkbook, receipts, and so on, into this program, I assign each expenditure or income into one of these categories. I can then print out monthly totals for each column, the percent of each of these categories is of total income, or total expenses. The grand total is printed for the all expenses and all income as well, and the net profit/loss (the sum of the total expenses and total income).

Other reports can be defined. For example, the subtotal category Personal Costs is defined to be the sum of categories N, O, P, Q, R, S, and T. Equipment costs are the sum of C, D, E, and F. You can easily define these subtotal categories as the sum of the primary categories as flexibly as you wish. It is the perfect tool to see who your money is running off with, or which accounts yield the largest profit margin after expenses are subtracted.

Entering the data is easy. To protect your files as much as possible, the data files are chosen by you and then dumped into an intermediary file. All work is done with this file. When you are done processing, you can save the contents of the intermediary file into permanent file storage.

Expense Categories

- A Gas and Electricity
- B Postage
- C Office Supplies
- D Computer Hardware
- E Computer Software
- F Miscellaneous Equipment
- G Reference Materials
- H Phone Bills
- I Printing Costs
- J Advertisement Costs
- K Media Costs
- L Insurance
- M Rent
- N Auto Insurance
- O Personal Insurance
- P Eating Out
- Q Groceries
- R Savings
- S Auto Maintenance
- T Miscellaneous Expenses

Income Categories

- 1 Deposits
- 2 Magazine Writing
- 3 Book Writing
- 4 Manual Writing
- 5 Program Royalties
- 6 Job Income
- 7 Nontaxable Income

Table 1. Sample Expense and Income Categories

“... Doughflo will soon be unprotected by Alphanetics...”

The permanent files are arranged by months. You can have more than one month in the intermediary file, so you can do bimonthly, trimonthly, or even yearly reports just as easily as monthly reports. When you load in the intermediary file for inputting data, you will see the last record read in. For example,

```
Entry Number.....254      Date 03/31/82
Category Receipt/CK#Name Description Amount
Z   C30332*   Mastercard      $-500.00
```

This is the standard data display screen. The entry number tells you where the entry occurs in the intermediary file. The data is the date given to the record. The category assigned to the entry tells the type of expense/income it is. The Receipt/Ck# is for further identification of the entry. For checkbook balancing, this is the check number, or deposit slip number. The C in this column tells Doughflo automatically that this is a check. The * tells that the check has been entered but not yet cleared by the bank. The Name/Description column lets you say to whom the check was written and for what purpose, or to identify the entry further. The amount is negative because it is a check, hence money leaving your account. The entry is assumed to be negative (even though you don't enter a minus sign) unless a plus sign precedes the amount.

You can edit a file by deleting entries, adding entries, or editing an entry. You have full editing capabilities for each column in the record, so you can easily alter the date, amount, whether the check has cleared, or whatever. You can display records in several ways. You can

Seek an entry by entry number and display it in the same format as above. To display the next entry, press the N key, or press P to display the previous entry. Press the F key to scan forward and the R key to scan in reverse. The entries are displayed one after the other (in the direction requested) until the last entry is reached or the first entry is reached, or you tell it to stop.

Pressing B causes the program to compute a balance up to the current entry. You are asked for the beginning entry. If you press the enter key, the first entry is assumed. A balance is calculated by adding up all the amounts. The result looks something like Table 2. After this, you can save the file to disk or not, when you exit to the menu.

From the main menu, you can sort by category, date, name/description, or receipt/check number. You can sort all permanent files, or the intermediary file. You can save the intermediary files into the permanent monthly files. This option searches through the intermediary file and puts the various entries into the monthly files in which they belong.

Doughflo's report generation is very good. The output may be sent to the printer or to the video screen. Doughflo assumes 66 lines per page, and cannot be used to output escape sequences to change the printer's font. If you are content with standard formatting, Doughflo is quite adequate. It supplies two top titles with your title name and the date ranges for the report. The summary report generates the grand totals for each category and the percentage each category total is of total expenses and total income. The summing report generates similar information for each of your subtotal categories.

Doughflo is an excellent income/expense analysis program. It will tell you where your money goes and where it comes from. ■

	ENTRY NUMBER.... 10	DATE 01/08/81	
CATEGORY	RECEIPT/CK#	NAME/DESCRIPTION	AMOUNT
U	M0108	WINDOW WASHING	\$ -10.00
2 INCOME	\$ 500.00 :	CLEAR CHECKS	\$ -400.00
3 CREDIT	\$ 500.00 :	+ TOTAL BANK DEPOSITS	\$ 1000.00
4 NOT INC.	\$ 100.00 :	= BALANCE	\$ 600.00
5 NOT INC.	\$ 200.00 :	UNCLEAR CHECKS	\$ -200.00
6 EXPENSE	\$ -400.00 :	TOTAL OTHER INCOME	\$ 500.00
7 EXPENSE	\$ -100.00 :	OTHER EXPENSES	\$ -110.00
8 CREDIT	\$ 99.99 :	GRAND TOTAL EXPENSES	\$ -710.00
NOT INC EXP	\$ 300.00 :		
NOT INC CRD	\$ 599.99 :	G.T. INCOME + EXPENSES	\$ 790.00

Table 2. Sample Balance Table

Star Micronics **GEMINI-10**



\$419.88 UPS DELIVERED

- 100 characters per second, bi-directional, logic-seeking printhead action (48 lines/min.) with 2K print buffer, expandable to 4K on-board
- 9 x 9 matrix produces proportional, 10, 12, 17 cpi with true descenders, double width, double strike, italics, & special graphics characters
- 120 x 144 hi-resolution dot-addressable graphics matrix
- Subscripts, superscripts, underlining, backspace, plus 2K user-programmable character ROM, perf skip, vert/horz tabs
- Friction/tractor standard; handles 3-part forms (8.5")

PRINTERS

Anadex DP-9501A	\$1409.88
Anadex DP-9629A	\$1499.88
Centronics 122-1	\$829.88
Centronics 122-3	\$949.88
Centronics 352	\$1649.88
Centronics 353	\$2324.88
C. Itoh Prowriter	\$499.88
w/RS-232C	\$609.88
C. Itoh Prowriter 2	\$734.88
w/RS-232C	\$789.88
C. Itoh F-10 Starwriter, 40 cps	
Parallel or RS-232C	\$1499.88
C. Itoh F-10 Printmaster, 55 cps	
Parallel or RS-232C	\$1799.88
F-10 Tractor	\$289.88
Daisywriter 2000	\$1089.88
Daisywriter Tractor	\$149.88
Daisywriter Cable	\$49.88
Diablo 620	\$1269.88
Diablo 630	\$1969.88
Diablo 630 KSR	\$2694.88
630 Tractor	\$314.88
DMP-85 Printer	\$469.88



The "generic" version of the NEC & Prowriter. Features 120 cps, bi-directional, logic-seeking print action. 9 pin print-head produces 4 fonts (including proportional), 8 sizes, subscripts, superscripts, underlining & Greek/math fonts. Dot-addressable graphics matrix is 160 x 144 dpi, with 1/144" line feed. Friction & tractor feed is standard (takes 9 1/2" width paper).

IDS Micropism	\$679.88
IDS Prism 80	\$1104.88
above w/graphics	\$1339.88
above w/sheetfeed	\$1459.88
above w/4-color	\$1539.88
IDS Prism 132	\$1269.88
above w/graphics	\$1339.88
above w/sheetfeed	\$1459.88
above w/4-color	\$1699.88

PRINTERS

Microline 80	\$349.88
Microline 82A	\$439.88
80/82A Tractor	\$59.88
82A Roll Paper Holder	\$49.88
Microline 83A	\$694.88
82A/83A Okograph ROM	\$44.88
Microline 84 w/graphics & tractor	
Parallel, 200 cps	\$1044.88
RS-232C, 200 cps	\$1164.88
NEC PC-8023A	\$509.88
NEC 3510	\$1929.88
NEC 3530	\$1809.88
NEC 3550	\$2199.88
3500 Tractor	\$239.88
Smith Corona TP-1	\$599.88
10 or 12 cpi, parallel or RS-232C	

CALL FOR PRICES on Epson, DIP, MPI, Datasmith, & other printers.

TRS-80 HARDWARE

TEC Drives	\$239.88
Hayes Chronograph	\$214.88
Model I/III cable	\$29.88
Model II/16 cable	\$39.88
TRS-80 Color cable	\$29.88
TRS-80 Color RS-232C-to-Parallel Converter & cable	\$99.88

MODEMS



The **LYNX** TRS-80 direct-connect modem features auto-dial, auto-answer,

MODEMS

0-300 baud transmission. Will work with-out RS-232C interface on Model III. Comes complete with hardware.

LYNX TRS-80 Modem	\$229.88
-------------------	----------



Hayes Smartmodems feature program-ability in any language, auto dial & auto answer, full & half duplex, keyboard control, user-selectable parameters, 7 LED status lights & an audio monitor. Comes complete with power supply and modular telephone cable.

300 Baud	\$239.88
1200 Baud	\$569.88

Signalman Mark 1	\$89.88
------------------	---------

TRS-80 SOFTWARE

MICROTERM

A terminal program from Micro-Systems Software, makers of DOSPLUS. Micro-term supports the features on auto-dial & answer modems like the Lynx & Smart-modem. Features pre-programmed dial & transmit, direct file transfer, 34K capture buffer, and high operational baud rate (near 9600). Specify Model I or Model III when ordering.

Microterm	\$79.88
-----------	---------

DOSPLUS 3.4

The preferred disk operating system for Model I or III. Features BASIC array sort, (multi-key, multi-array), active "DO", device routing, DOS command repeat, etc. Exceptional. Specify Model I or III, single or double track, 40 or 80 track drive.

DOSPLUS 3.4	\$99.88
-------------	---------

TRS-80 SOFTWARE

NEWSCRIP 7.0

Prosoft's NEWSCRIP is the best word processing software available for the TRS-80 Model I or III. NEWSCRIP supports the features of most popular printers, including NEC, C. Itoh, Okidata, Epson, Centronics, etc.

NEWSCRIP features true proportional spacing, single and double width type, subscripts, superscripts, underlining, boldface, multiple pitches, full-screen editing, global search & replace, and customized "form" letters that also will create a MAIL LABEL (see below).

A typehead/printthead buffer maximizes printer & computer speed. Plain English commands simplify operation and editing. NEWSCRIP comes with a complete manual, including many applications, and support from the authors. Specify Model I or III when ordering.

NewScript	\$109.99
-----------	----------

MAIL LABEL OPTION

Create mailing labels from NEWSCRIP files. Format 2 up, 3 up, etc. for use on envelopes, packages. Not a mail list program with so I options. Available only with purchase of NEWSCRIP (not as an upgrade).

Mailing Label Option	\$15.00
----------------------	---------

SCRIPTIT/NEWSCRIP CONVERSION

Takes either Electric Pencil or Scriptit files and converts them to NEWSCRIP files. Upgrade your older library of files with this handy program.

Scriptit Conversion	\$15.00
---------------------	---------

ELECTRIC WEBSTER

A 50,000 word dictionary for NEWSCRIP. It can be selected from the main menu, used, then returns you to main menu. The Electric Webster features spell checking, options on change, & a "browse" feature allowing you to choose spellings or to enter your own. Fully compatible with NEWSCRIP.

Electric Webster	\$134.88
------------------	----------

Information & Orders

(603)-881-9855

Orders Only: (800)-343-0726

NO HIDDEN CHARGES

FREE UPS shipping on all orders—No extra charge to use credit cards—All equipment shipped factory fresh with manufacturer's warranty—COD orders accepted (\$10 fee added)—No purchase orders accepted—No foreign or APO orders accepted—Minimum \$50 per order—This ad prepared in November; prices subject to change.

HIGH TECHNOLOGY AT AFFORDABLE PRICES



THE BOTTOM LINE



MILFORD NH 03055-0423

TRS-80 MODEL II/16
DISPLAY MANAGEMENT SYSTEM

CTENSL

Complete.....\$89.
 Demo disk.....\$19.
 Info pack.....Free

FAST EASY TO USE
FULL SCREEN UPDATES
SUPPORTS ALL LANGUAGES
EXCEEDS CICS/BMS SUBSET

MICROWAVES

Bridle Road
 Antrim, N.H. 03440
 Telephone 603 352 7725
 603 352 7744

548

TAX PREPARERS!

PROFESSIONAL FEDERAL INCOME TAX PROGRAMS

FOR TRS-80 MODEL I, II OR III

- Cuts manual production time by as much as 75%.
- Determines least tax quickly.
- Saves input information on disk—automatic transfer of essential information.
- Batch processing possible.
- Uses IRS prescribed computer generated print outs.
- Prohibits bypassing of mandatory entries.
- Accuracy assured by triple check logic.
- Enter only pertinent lines—faster than line by line.
- Single line correction with automatic update of succeeding totals.
- Professionally used—nationally advertised.
- Overlays available.
- Requires 2 disk drives & 48K.
- BASIC TAX PACKAGE \$165.00 • INCLUDES 1040, 1040A, 1040EZ AND SCHEDULES A&B
- OTHER SCHEDULES \$35.00 EACH
- MANUAL \$5.00



MICRO-TAX

P.O. Box 4262, Mountain View, CA 94040

Call: (415) 964-2843



339

REVIEWS

★★★★

Mikegraphic Graphic System
Mikee Electronics Corp.
 P.O. Box 3813
 Bellevue, WA 98009
Model I and III
\$340

by **Jake Commander**

Many TRS-80 owners might argue that the machine's single greatest weakness is its inability to display high-resolution graphics. Whereas many micros can boast a resolution of 256 by 192, the TRS-80's graphics performance of 128 by 48 looks puny by comparison. True, even these 6,144 pixels can be made to do some fascinating work, but it's usually a case of speed fooling the eye into not noticing the ragged, stepped edges of such poor resolution.

If you've drooled enviously at the Mikee Graphics advertisements, here's a chance to see how it performs in real life.

The Mikee Graphics Board from the Mikee Electronics Corporation offers a hardware option to upgrade the graphics of the TRS-80 from third to first class. After installing the board in the keyboard unit, you can hook up an extra module to allow resolutions of 384 by 192 on a Model I or a massive 512 by 192 on a Model III. That's 73,728 and 98,304 dots respectively!

With this kind of resolution, many more serious tasks in the realm of computer-aided design and management (CAD/CAM) can be undertaken. What makes it even more effective is that the graphics can be intermixed with text to allow labeled diagrams and the like. A demo program supplied with the package amply demonstrates its many features. In addition to the normal low-resolution graphics, the system allows high-resolution graphics of 384 by 192 on the Model I, 512 by 192 on the Model III, or medium-resolution graphics of 192 by 192 on the Model I, and 256 by 192 on the Model III (all in combination with inverse video).

Mikee Electronics has opted for a memory-mapped video display similar to the normal TRS-80 system. Whereas normal video is mapped from 3C00 to 3FFF hex, the Mikee video is mapped from C000 to EFFF hex. That's 12K of RAM at the top of memory, making the TRS-80 memory map look like Fig. 1.

Notice that in a 48K system, the top 4K is untouched by the Mikee system

but the 12K immediately below it is commandeered for the medium- and high-resolution graphics. This works out very conveniently for maintaining software (such as driver routines) that may use the top RAM in your system. If you have less than 48K, your resident software will be below the Mikee Graphics RAM anyway. If you do have 48K then you retain the use of your upper 4K for high-RAM software—this is more than adequate under normal circumstances.

The 12K that's set aside for high resolution is flipped in with a port output command. In fact, all options in the system are selected by this method, with port 254 (hex FE) being the control port. Four output bits are used to select any or all appropriate combinations of the following options:

- Bit 7—Select Mikee Graphics RAM (12K)
- Bit 6—Select mid-resolution mode
- Bit 5—Select normal TRS-80 graphics
- Bit 4—Select inverse video

I would have preferred another port than 254, as this is already a de facto standard for the control of most high-speed clock modifications. This has to be accounted for by using bit 0 (which controls the high or low clock speed) along with the four control bits outlined above.

It's a simple matter to mix text with high-resolution graphics in much the same way as with low-resolution graphics. Under normal circumstances on an unmodified TRS-80, any byte placed in video RAM that has a value less than 128 is displayed as a character. The shape of this character is fetched from a character-generator ROM that is pre-programmed to generate the appropriate shapes according to the ASCII char-

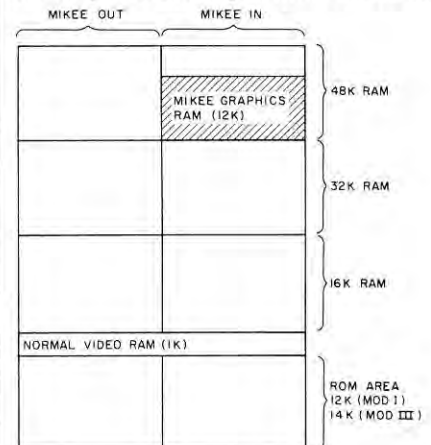


Fig. 1. The TRS-80 Memory Map

acter set (plus a few extra on the Model III). However, when the byte in video memory has a value between 128 and 191, the displayed shape is no longer fetched from the character generator ROM. Instead, a system called "bit-mapping" comes into play. On the TRS-80, the lower six bits are taken from the display byte and loaded into a shift register. As the electron beam scans down the face of the screen, each bit is displayed in a carefully synchronized sequence as a white point if it's a 1, or a dark point if it's a 0. Each of the six points controls a particular pixel, hence the term "bit-mapping."

The Mikee Graphics system detects all bytes that are graphics characters and (ignoring the normal six graphics bits) uses its own method of bit-mapping the pixels. So if the normal TRS-80 video RAM is filled with graphics characters (they would normally be dummy graphics blanks), the whole of the screen will be given over to the Mikee bit-mapped graphics. However, if you throw a letter A into normal video RAM, it will switch out Mikee at that character position and display the correct character generator shape. This neat touch does away with the need to generate ordinary text from the bit-mapped pixel graphics—exactly what you have to do on the Color Computer if you want text in high-resolution display mode.

Apart from text generation, the graphics are pretty logical. Any bit set anywhere in the 12K of Mikee Graphics RAM lights any one of the 73,728 or 98,304 points on the screen (according to Model I or III use). It's as simple as that.

So much for the theory. What about the practical aspects of receiving and installing the package? Well, the system comprises a small printed-circuit board that fits inside the keyboard unit and at-

taches via a multi-way connector to the main graphics unit (a small gray box).

You're also supplied with an installation and instruction manual...and a magnifying glass! No, it's not for small print—the manual is exceptionally clear and contains numerous photographs illustrating step-by-step installation instructions. Separate sections cover Model I and Model III installations, and some software examples help you get the thing into action.

The magnifying glass is to help you check your soldering for any bridges or solder balls. As you have to make 15 soldered connections, a thorough checkout with the glass makes rather good sense. Not only that, but when you've finished the subsequent computing session, you can start collecting butterflies.

A tool kit is available from Mikee Electronics for those people who've never dabbled with a soldering iron, but if you have no previous soldering experience, get somebody else to install it—soldering to integrated circuit pins can become a tragic mess to a beginner. The unit is easy to install, though, and worked the first time on my Model III.

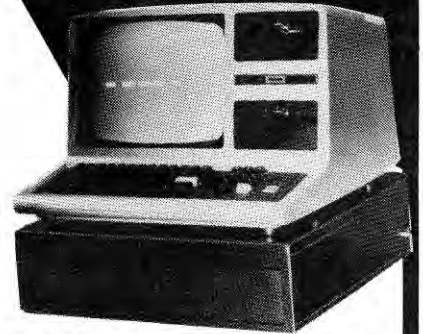
Criticisms

I have a couple of small gripes, but they're far outweighed by the excellent performance of the system. I've already crabbled about the use of port 254 as the control port. This could be a minor nuisance if you have a high-speed clock.

When you turn the system on, it doesn't default to normal TRS-80 graphics. It's necessary to output to port 254 to set the computer to its standard display mode. I think this is a disadvantage.

I can thoroughly recommend Mikee Graphics to any Model I or III owner with a need for high-resolution graphics. ■

Control Cash & Inventory at Check-out



NEW SYSTEM MAKES TRS-80 III A TOTAL CASH REGISTER & POINT-OF-SALE COMPUTER

Which performs all the normal functions of a computer and is specially programmed to...

- COMPUTE Sales Taxes, Discounts, Special Sales and Promotions
- TRACKS Sales by Type, such as Visa, Mastercard, Check, Charge, etc. and by Employee/Operator for up to 30 people
- SELF-PROMPTING to Cashiers
- Produces Audit Trails and ACCOUNTING DATA for entire operation
- CONTROLS up to 20,000 INVENTORY LINE ITEMS on our Hard Disk Drive
- CONTROLS up to 1,500 INVENTORY LINE ITEMS on your Floppy Drive
- Complete, Ready-to-Run SOFTWARE comes with Cash Control Drawer Unit
- AUDIBLE SIGNAL produced when any key is depressed by any operator
- DRAWER operates automatically or by manual override anytime
- Generates RECEIPTS on Printer
- Available to display in English, French, Spanish, or German Languages
- Operates on 110AC or 220AC...just plug it in
- NO INTERFERENCE with or modification of regular TRS-80 Mod III...plugs right into computer

FREE Specifications and Data Package or order complete Operating manual for \$15 from

ICR/FutureSoft
Box 1448 - Orange Park, Florida 32073
(904) 269-1918 for technical assistance and Dealer Information

Integrated Cash Register Systems from as low as \$449.



Software of Tomorrow... Today ✓211

Microbuffer
Practical Peripherals, Inc.
31245 La Baya Drive
Westlake Village, CA 91362
Epson MX-80 and 100
\$159

MXPLUS
Dresselhaus Computer Products
Box 929
Azusa, CA 91702

Epson MX-80 and 100
\$49.95

by L. W. C. Dye

When the Epson MX-80 arrived about two years ago, it rapidly pushed established printers aside and captured about 40 percent of the small-printer market. However, with the rapid advances in technology, it seems that whatever we buy today is obsolete tomorrow. The Microbuffer and MXPLUS are two products that will make your Epson perform as it never

did before and make a new printer seem less attractive.

The Microbuffer

The Microbuffer comes in two versions—the serial MBS-8K and the parallel MBP-16K. The parallel version is Centronics compatible, buffers 16,000 characters, and replaces the standard Centronics interface on the Epson. The serial version buffers 8,000 characters and supports both hardware and software handshaking at speeds from 300–19,200 baud. The 8K buffer on the serial version was probably a space limitation because the RS-232C components fill the majority of the board.

Both versions are built on high-quality PC boards. There is one socketed ROM on the board and all other components are soldered. The installation instructions are thorough and clear. Although my board slipped right in, the instructions point out some possible tight spots due to minor variations in the Epsons and how to handle them.

My printer and my computer were flying now and running faster at 4,800-baud serial than they had been running parallel. The buffer was soaking up the lines and freeing the computer as fast as it could transmit. Unless I was sending a lot of graphics over the cable, the computer could get ahead of the printer and the buffer would slowly fill. When it does get full, the computer must again wait for the buffer to empty enough to get another line in but the computer will always stay 8K to 16K ahead of the printer.

To illustrate the speed difference, I ran four tests with both the Microbuffer and an unbuffered Epson serial interface board. The first test was printing a 6,380-character text file with my word processor with right-justification and emphasized print turned on. The second test was the same text file but with right-justification and emphasized print

turned off. The third test was an LLIST of the 13K word processor itself. The last test was an LLIST of a small 2.5K program that could not fill the buffer.

The Epson normally prints at about 80 cps, but slows down to about half that when printing emphasized or double strike. The word processor goes through additional work for the right-justification and needs more time to get a line ready.

Table 1 shows the results of these tests. In every test with the Microbuffer, the computer was done before the printer and was available for more work. Using the unbuffered serial board, the computer and printer always finished together so only one time is shown. The print time improvement is dramatic for the Basic word processor, but minimal for the LLIST's. However, the computer is freed up earlier in all cases. Note that the buffer filled about 45 seconds into the 13K LLIST but the computer was still freed up three minutes earlier than it would have been.

The MXPLUS is another PC board add-on for the Epson. To install it, you remove the 1B ROM and plug it into the MXPLUS board. The board is then plugged into the 1B socket and one connection is made to the 3C chip with a test clip. The instructions are clear but the installation is very tight and the board could be made a little smaller. It takes a little juggling with the test clip on 3C to get a good connection and ensure that it is not shorting out another pin. The MXPLUS board ends up under the Microbuffer, but there is adequate clearance.

The MXPLUS contains firmware programming to give you hardware control of many of the Epson, Graftrax, and Graftrax+ functions. The on-line, form-feed, and line-feed buttons are your controls and a small sticker is supplied as a reminder of the nine functions provided. They are:

- Reset All Functions
- Condensed Print
- Double Wide Print
- Emphasized Print
- Double Strike
- Perforation Skipover
- Italics (with Graftrax)
- Indentation
- Eight lines per inch

MXPLUS is activated by pressing and holding the on-line button until the Epson beeps. The on-line light will blink in a short on, long off pattern if none of the functions are turned on. This is also the reset function, and a press of the form-feed button will turn all functions off.

Each additional press of the on-line button will take you to the next function. If the on-line light is in the short on, long off pattern, the function is off. If the pattern is long on, short off, the function is on. The functions are toggled on and off with the form-feed button. You can quit at any time by pressing the line-feed button to escape and then the on-line button to ready the printer.

Emphasized print will still override condensed print just as on a normal Epson, but in general, you can mix software and hardware control. Hardware-selected wide print will not turn off at the end of each line, however. Perforation skip prints 58 lines then skips eight for LLISTs and such. It should be turned off if pagination is under program control. Indentation moves the left margin in six spaces to allow three-hole punching or binding, but if a line wraps, the continuation is not indented. The eight-lines-per-inch function also resets top-of-form except with Graftrax+.

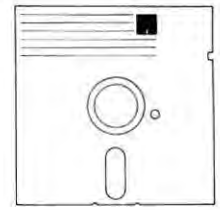
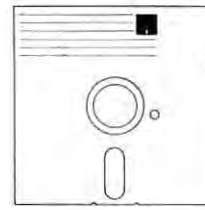
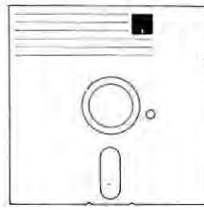
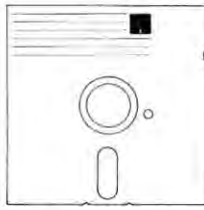
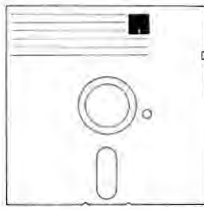
With MXPLUS, I can now print documents in double width, condensed print for that bold look. Since you can stop the printer and switch modes at any time, changing type styles in the middle of a document without inserting control codes is possible.

The only problems I found were the lack of indentation on wrap-around lines and that the first character on a double-width wrap around will be single width—minor problems indeed compared to the features added.

Both the Microbuffer and the MXPLUS are good “value added” modifications to the Epson that add features to an already excellent product and save you some time, too. ■

Tests at 4800 baud	Buffered Time		Unbuffered Time Both Done
	Computer	Printer	
6K Text—Justified and Emphasized	2:35	4:06	6:05
6K Text—Regular unjustified	2:05	2:38	4:05
13K LLIST	1:44	4:59	5:01
2.5K LLIST	0:09	1:17	1:18

Table 1



REVIEW DIGEST

Computers for Everyone, Jerry Willis and Merl Miller, Dilithium Press, Beaverton, OR, \$6.95, soft cover, pp. 262.

"Despite its annoying tone, I would recommend this for people who know little or nothing about computers and don't mind sifting through the verbosity and corny jokes. It can be a relatively painless way to learn the basics. It is loaded with useful information and has illustrations that are both amusing and informative." *Classroom Computer News*, October, p. 64.

PDS (Partitioned Data Sets), Misosys, 5904 Edgehill Rd., Alexandria, VA 22303, Model I or III, LDOS, \$40.

"Basically PDS is a file on a disk that itself contains subfiles. . . It is a sophisticated utility for a sophisticated audience. It is an excellent complement to the file-handling procedures already found in LDOS, and will find particular application by users who have large disk-storage problems." *InfoWorld*, November 29, p. 100.

Beta-80, MECA, 56677 Sunset Ave., Yucca Valley, CA 92284, Model I, \$699 single density, \$849 double density.

"I was bound and determined to find effective mass storage at low cost. I pored over computer journals for months before I learned about a small company in California called MECA. They had just started production of a digital-cassette storage device called the Beta-80, which was designed to interface directly with the TRS-80 Level II. I have owned my Beta-80 for well over a year now, with no more than a handful of lost bytes." *80 U.S. Journal*, December, p. 100.

El Diablero—An Adventure Game, Computerware, Dept. C., Box 668, Encinitas, CA 92024, Color Computer, \$19.95 cassette, \$24.95 disk.

"Your 'situation' in El Diablero is that you awake, dazed and confused, in the middle of the desert. . . knowing that you have been learning the techniques of sorcery from an old man in these parts. The problem is that you can't remember anything you have learned, and you can't find the old man. You must learn to use this 'magical' power. . . another excellent game from Computerware." *'68' Micro Journal*, November, p. 14.

DiscatER, softERware, 16007 Miami Way, Palisades, CA 90272, LDOS, Model I and III, \$39.95.

"Although DiscatER is a floppy-disk-cataloging program, it actually keeps track of each file on the disk. . . This is an extremely functional product at an excellent price. DiscatER is simple enough to be used by people with minimal computer proficiency. . ." *InfoWorld*, November 15, p. 49.

Madam Rosa's Massage Parlor, The Softcore Software Co., 9 Southmoor Circle, Kettering, OH 45429, Color Computer, \$15.

"Madam Rosa's Massage Parlor falls far short of all expectations (whatever yours may be) and it's not even a very good adventure. It was written on the level of a slightly voyeuristic 15-year-old recluse without the deviousness one would expect for \$15." *Rainbow*, November, p. 66.

Outhouse, Soft Sector Marketing, 6250 Middlebelt, Garden City, MI 48135, Model I or III, \$15.95 cassette, \$19.95 disk.

"... what we have here is a game that is fast and funny. But is it a good game? I have played a few fast action games that just did not appeal to me. Fortunately, Outhouse is not one of these. There are enough different types of aliens to give the game variety and hold your interest. There is enough variance in speed to give a seemingly endless challenge." *80 U.S.*, December, p. 101.

Color Fan, Atomic City Electronics (Atomtronics), 3195 Arizona Ave., Los Alamos, NM 87544, Color Computer, \$34.95.

"Most readers. . . are aware of the power supply and heat problems of the Color Computer, and have seen several of the published 'fixes'. Atomtronics has now come up with a 3" cooling fan for the Color Computer that is easy to install and will help alleviate some of these problems. . . This is a product that we have needed for the Color Computer for a long time, and will greatly extend the life of parts and pieces in the computer." *'68' Micro Journal*, November, p. 15.

Roman Checkers, Tandy/Radio Shack, Radio Shack Stores, Color Computer, \$29.95.

"Don't let the name fool you. Roman Checkers is Radio Shack's version of the popular board game, Othello. This RS product is a surprisingly clever rendition of the board game that uses 'reversible discs'." *The Rainbow*, November, p. 55.

CALENDAR

February

- 5 **Computer Swap America** Santa Clara County Fairgrounds, San Jose, CA.
- 7-9 Technical Education Research Centers, Cambridge, MA. **Microcomputers in Education** Washington, DC.
- 14-17 IEEE Computer Society, Silver Spring, MD. **Computer Science Conference** Orlando, FL.
- 16-18 IEEE Computer Society, Silver Spring, MD. **International Solid State Circuits Conference** New York, NY.
- 16-18 TALMIS, Oak Park, IL. **3rd Annual Software Publishers and Computer-Based Training Conference** Ambassador West, Chicago, IL.
- 17-19 Technical Education Research Centers, Cambridge, MA. **Microcomputers in Education** New York, NY.
- 18-21 **2nd Annual Pacific Computer Expo** Convention and Performing Arts Center, San Diego, CA.

March

- 1-3 IEEE Computer Society, Silver Spring, MD. **COMPCON Spring '83** San Francisco, CA.
- 8 IEEE Computer Society, Silver Spring, MD. **MICRODELCON** Newark, DE.
- 10-12 The Council for Exceptional Children, Reston, VA. **Use of Microcomputers in Special Education** Hartford, CT.
- 14-15 Michigan Association for Computer Users in Learning, Wayne, MI. **MACUL '83** Dearborn, MI.
- 16-18 IEEE Computer Society, Silver Spring, MD. **16th Annual Simulation Symposium** Tampa, FL.
- 17-19 Arizona State University, Tempe, AZ. **Microcomputers in Education** ASU campus.
- 18-20 **West Coast Computer Faire** Brooks Hall, San Francisco, CA Civic Auditorium.
- 25-26 **1983 Small College Computing Symposium** St. Olaf College, Northfield, MN.

- 29-31 IEEE Computer Society, Silver Spring, MD. **Workshop on Computer System Organization** New Orleans, LA.

April

- 4-8 IEEE Computer Society, Silver Spring, MD. **Tutorial Week East '83** Orlando, FL.
- 6-8 IEEE Computer Society, Silver Spring, MD. **1983 International Optical Computing Conference** Cambridge, MA.
- 10-13 Association for Computing Machinery (ACM)/SIGAPL, Washington, DC. **APL83** Sheraton Washington Hotel.
- 17-22 **Infocom '83 Town & Country**, San Diego, CA.
- 25-27 IEEE Computer Society, Silver Spring, MD. **1983 Symposium on Security and Privacy** Claremont Hotel, Oakland/Berkeley, CA.

Coming Next Month

The March issue of *80 Micro* will feature several you-can-build-it hardware projects. Topics include a \$5 CP/M modification for the Model I, an audio amplifier, a guide to constructing an EPROM programmer, and computer security with a credit card. We'll also have a cassette operating system and the first installment of a Lisp interpreter series.

Our new Color Computer column

will make its debut. Called *The Color Key*, it's authored by Scott Norman.

Model II owners will find a special surprise beginning in March. Each month, we'll print conversion tables for a few Model I/III programs to make them usable on the Model II.

In *Fun House*, Richard Ramella introduces an adventure game that players can customize with names they choose for characters and locations. ■

The Original Magazine for Owners of the TRS-80™ MicroComputer

MODEL I • MODEL II • MODEL III • POCKET COMPUTER • COLOR COMPUTER

Software
for TRS-80
Owners

H & E COMPUTRONICS INC.

Monthly
Newsmagazine
for TRS-80
Owners

MONTHLY NEWS MAGAZINE



- PRACTICAL APPLICATIONS
- NEW EXPANDED BUSINESS SECTIONS
- GAMBLING
- GAMES
- EDUCATION
- PERSONAL FINANCE

- BEGINNER'S CORNER
 - NEW PRODUCTS
 - SOFTWARE EXCHANGE
 - MARKET PLACE
 - QUESTIONS & ANSWERS
 - PROGRAM PRINT OUTS
- ...and MORE!

YOUR CHOICE

FREE

with your Subscription or Renewal

A.

NANOS SYSTEMS CORP.

TRS-80 At Your Fingertips

Complete quick reference guide to basic, assembly language* and graphic codes — all at your fingertips for all TRS-80 computers (specify computer).

Assembly Language Section N/A for Color Computer

B.

A Word Processor, Data Management System and Cleanup

(A maze game) All on cassette. (Add \$3 for diskette, add \$5 for modified MOD-II diskette version — N/A on color computer or pocket computer.)

OR

✓ READER SERVICE FOR H & E COMPUTRONICS ✓ 9

H & E COMPUTRONICS INC.

50 North Pascack Road
Spring Valley, New York 10977

- One Year Magazine Subscription \$24 New Renewal
 Two Year Magazine Subscription \$48.00 New Renewal
 Sample Issue \$4. Mod II Newsletter Subscription \$18

Your Choice: TRS-80™ at Your Fingertips or Word Processor/ Data Management
Model I Model II Model III Color Computer Pocket Computer

CALL TOLL FREE 800-431-2818

(Outside of New York State)

24 HOUR ORDER LINE
914-425-1535



NEW! NEW!

MOD-II NEWSLETTER

"\$18/year (or 12 issues)"

Name _____ Address _____ City _____

State _____ Zip _____ Signature _____

Credit Card Number _____ Expiration Date _____

Add \$12/Year (Canada, Mexico)—Add \$24/Year Air Mail outside of U.S.A., Canada, and Mexico
All Prices and Specifications Subject to Change

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp.

from **HOWE SOFTWARE**
FOR THE TRS-80 MODEL I AND MODEL III

System Diagnostic

For Cassette or Disk

IS YOUR COMPUTER WORKING CORRECTLY? ARE YOU SURE?
Tests every component of your TRS-80 for proper operation.

DISK
\$99.95

CASSETTE
\$94.95



- ROM: Checksum test
- RAM: Four separate tests including every address and data value
- Video Display: Character generator, video RAM, and video signal tests
- Keyboard: Every key contact tested
- Line Printer: Character test
- Cassette Recorder: Read/write/verify data
- RS-232-C Interface: Read sense switches (Model I), connector fault, data transmission, framing, data loop, baud rate generator
- Disk Drives: Disk controller, drive select and restore, track seek and verify read, read/write/verify all tracks and sectors, formatting, disk drive timer, disk head cleaner
- Model I: single or double density, 35, 40 or 80 track drives
- Model 3: single or double density, 35, 40 or 80 track drives single or double sided drives

- One program adapts to any system configuration and hardware.
- Individual tests of each device with operator monitoring and intervention.
- Continuous system tests run continually for hours, with diagnostic reports optionally written on line printer.
- Complete instructions and documentation.

SPECIFY TRS-80™ MODEL I OR MODEL III

SMART TERMINAL

Enables your TRS-80 to be used as a data communications terminal to a time-sharing system, computer bulletin board, or another computer, via the RS-232-C interface.

- MEMORY BUFFER holds data for transmission or data received from other computer.
- CASSETTE or DISK may be used to load or save data from memory.
- AUTOMATIC TRANSMISSION of data from memory.
- AUTOMATIC STORAGE of incoming data at user's option.
- TRANSMIT or RECEIVE WITH VERIFICATION options included for communication between two TRS-80s using Smart Terminal.
- Full CONTROL KEYS, including control key mapping into any ASCII character. True BREAK key. Lower case supported on Model I.
- Buffered LINE PRINTER ECHO for incoming data.
- Disk and cassette files fully compatible with ELECTRIC PENCIL™ and SCRIPSIT™ programs.
- BAUD RATE and RS-232-C CHARACTERISTICS can be reset from within the program.
- SAVE PROGRAM option creates "personalized" back-up copy of program with all options set as specified by user.
- ONE PROGRAM supports both cassette and disk systems. Program is compatible with PMC-80 and other TRS-80 "work alike" computers.

Model I or III Version supplied on cassette \$69.75
Model I or III Version supplied on diskette \$74.95
Model II (CP/M) Version \$79.95

MON-3 and MON-4

The TRS-80 Monitor Programs #3 and #4 are powerful utility programs enabling you to interact directly with the TRS-80 in Machine Language. They are as useful for beginners as for advanced programmers.

- BEGINNERS can learn to interact directly with the computer in Machine Language.
- 40-PAGE MANUAL provided with each program.
- SIMPLE commands, easy to use.

The Features Of The Monitor Programs Enable You To The Following.....

- DISPLAY memory in different ways.
- DISASSEMBLE memory to see Machine Language commands.
- MOVE and COMPARE memory areas.
- SEARCH through memory to find specific values.
- MODIFY memory in various ways.
- RELOCATE object programs.
- PRINT output on video display or line printer.
- READ and WRITE object tapes in SYSTEM Format.
- UNLOAD programs using low RAM on disk.
- SAVE and READ disk files (MON-4 Only).
- INPUT and OUTPUT of disk sectors (MON-4 Only).
- SEND and RECEIVE data over RS-232-C Interface (MON-4 Only).
- Create SYMBOLIC Tapes (MON-3) or Files (MON-4) of Disassembled output for Editor/Assembler program.

MON-3 (For Cassette Systems) \$39.95
MON-4 (For Disk Systems) \$49.95

MAILING LIST

Maintains mailing lists of up to 1326 names (48K version). Add, change, delete, or find names. Machine language sort according to information in ANY field (first or last name, address, city, state, zip code). Three or four line labels printed in 1, 2, 3, or 4 columns, in master list, or on video display.

TRS-80 Model 1/3 Disk Version \$69.95
IBM PC Disk Version \$79.95

HOME BUDGET

Keeps track of your monthly and year-to-date income and expenses. Income and expenses classified by code numbers for identification of categories. Data includes date, code number, amounts and check number (optional). Computes monthly and year-to-date summaries showing income tax deductions. All output printed on video display or line printer at user's option. Complete instructions for customizing to suit your own budget.

TRS-80 Model 1/3 Cassette Version \$29.95
TRS-80 Model 1/3 Disk Version \$49.95
IBM PC Disk Version \$59.95

SMALL BUSINESS ACCOUNTING

Based on Dome Bookkeeping Record #612, this program keeps track of income, expenditures, and payroll for a small business. Receipts and expenditures can be entered on a daily, weekly, or monthly basis. Program computes monthly, through last month, and year to date summaries. Payroll section (included in disk version only) keeps record of employees and paychecks with up to six categories of payroll deductions. Computes employee payroll records and year-to-date payroll totals. Complete instructions for customizing to suit your own business.

TRS-80 Model 1/3 Cassette Version \$29.95
TRS-80 Model 1/3 Disk Version \$49.95
IBM PC Disk Version \$59.95

COMPUTRONICS
MATHEMATICAL INSTRUMENTS DIVISION

50 N. PASCACK ROAD
 SPRING VALLEY, NEW YORK 10977



✓ 9
24 HOUR ORDER LINE
(914) 425-1535

NEW TOLL-FREE ORDER LINE
 (OUTSIDE OF N.Y. STATE)
(800) 431-2818

- All orders processed within 24 Hours
- 30-Day money back guarantee
- Add \$3.00 for shipping in UPS Areas
- Add \$4.00 for C.O.D. or NON-UPS Areas
- Add \$5.00 to Canada or Mexico
- Add exact postage to all other countries

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™



The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™

\$99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™

\$99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™

\$99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™

\$99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™

\$149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

SATISFACTION GUARANTEED!

Every VERSABUSINESS™ module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any VERSABUSINESS™ module, you may return it within 30 days for a refund. Manuals for any VERSABUSINESS™ module may be purchased for \$25 each, credited toward a later purchase of that module.

To Order:

Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- * add \$3 for shipping in UPS areas
- * add \$4 for C.O.D. or non-UPS areas

- * add \$5 to CANADA or MEXICO
- * add proper postage elsewhere

DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. • APPLE is a trademark of Apple Corp. • IBM is a trademark of IBM Corp. • OSBORNE is a trademark of Osborne Corp. • CP/M is a trademark of Digital Research. • XEROX is a trademark of Xerox Corp.

H & E COMPUTRONICS INC.

•• EVERYTHING FOR YOUR TRS-80™ • ATARI™ • APPLE™ • PET™ • CP/M™ • XEROX™ • IBM™ • OSBORNE™ ••

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. • ATARI is a trademark of Atari Inc. • APPLE is a trademark of Apple Corp. • PET is a trademark of Commodore
 * CP/M is a trademark of Digital Research • XEROX is a trademark of Xerox Corp. • IBM is a trademark of IBM Corp. • OSBORNE is a trademark of Osborne Corp.



★ All orders processed within 24-Hours
 ★ 30-Day money back guarantee

BUSINESS PAC 100 100 Ready-To-Run Business Programs

(ON CASSETTE OR DISKETTE).....Includes 128 Page Users Manual.....
 Inventory Control.....Payroll.....Bookkeeping System.....Stock Calculations.....
 Checkbook Maintenance.....Accounts Receivable.....Accounts Payable.....

BUSINESS 100 PROGRAM LIST

NAME	DESCRIPTION
1 RULE78	Interest Apportionment by Rule of the 78's
2 ANNU1	Annuity computation program
3 DATE	Time between dates
4 DAYYEAR	Day of year a particular date falls on
5 LEASEINT	Interest rate on lease
6 BREAKEVN	Breakeven analysis
7 DEPRSL	Straightline depreciation
8 DEPRSY	Sum of the digits depreciation
9 DEPRDB	Declining balance depreciation
10 DEPRDDB	Double declining balance depreciation
11 TAXDEP	Cash flow vs. depreciation tables
12 CHECK2	Prints NEBS checks along with daily register
13 CHECKBK1	Checkbook maintenance program
14 MORTGAGE/A	Mortgage amortization table
15 MULTMON	Computes time needed for money to double, triple, etc.
16 SALVAGE	Determines salvage value of an investment
17 RRVARIN	Rate of return on investment with variable inflows
18 RRCONST	Rate of return on investment with constant inflows
19 EFFECT	Effective interest rate of a loan
20 FVAL	Future value of an investment (compound interest)
21 PVAL	Present value of a future amount
22 LOANPAY	Amount of payment on a loan
23 REGWTH	Equal withdrawals from investment to leave 0 over
24 SIMPDISK	Simple discount analysis
25 DATEVAL	Equivalent & nonequivalent dated values for oblig.
26 ANNUDEF	Present value of deferred annuities
27 MARKUP	% Markup analysis for items
28 SINKFUND	Sinking fund amortization program
29 BONDVAL	Value of a bond
30 DEplete	Depletion analysis
31 BLACKSH	Black Scholes options analysis
32 STOCVAL1	Expected return on stock via discounts dividends
33 WARVAL	Value of a warrant
34 BONDVAL2	Value of a bond
35 EPSEST	Estimate of future earnings per share for company
36 BETAALPH	Computes alpha and beta variables for stock
37 SHARPE1	Portfolio selection model-i.e. what stocks to hold
38 OPTWRITE	Option writing computations
39 RTVAL	Value of a right
40 EXPVAL	Expected value analysis
41 BAYES	Bayesian decisions
42 VALPRINF	Value of perfect information
43 VALADINF	Value of additional information
44 UTILITY	Derives utility function
45 SIMPLEX	Linear programming solution by simplex method
46 TRANS	Transportation method for linear programming
47 EOQ	Economic order quantity inventory model
48 QUEUE1	Single server queuing (waiting line) model
49 CVP	Cost-volume-profit analysis
50 CONDPFOP	Conditional profit tables
51 OPTLOSS	Opportunity loss tables
52 FQOQO	Fixed quantity economic order quantity model
53 FQEOQSH	As above but with shortages permitted
54 FQEOQPB	As above but with quantity price breaks
55 QUEUECB	Cost-benefit waiting line analysis
56 NCFANAL	Net cash-flow analysis for simple investment
57 PROFIND	Profitability index of a project
58 CAPI	Cap. Asset Pr. Model analysis of project

59 WACC	Weighted average cost of capital
60 COMPBAL	True rate on loan with compensating bal. required
61 DISCBAL	True rate on discounted loan
62 MERGANAL	Merger analysis computations
63 FINRAT	Financial ratios for a firm
64 NPV	Net present value of project
65 PRINDLAS	Laspeyres price index
66 PRINDPA	Paasche price index
67 SEASIND	Constructs seasonal quantity indices for company
68 TIMETR	Time series analysis linear trend
69 TIMEMOV	Time series analysis moving average trend
70 FUJPRINF	Future price estimation with inflation
71 MAILPAC	Mailing list system
72 LETWRT	Letter writing system-links with MAILPAC
73 SORT3	Sorts list of names
74 LABEL1	Shipping label maker
75 LABEL2	Name label maker
76 BUSBJD	DOME business bookkeeping system
77 TIMECLCK	Computes weeks total hours from timeclock info.
78 ACCTPAY	In memory accounts payable system-storage permitted
79 INVOICE	Generate invoice on screen and print on printer
80 INVENT2	In memory inventory control system
81 TELDIR	Computerized telephone directory
82 TIMUSAN	Time use analysis
83 ASSIGN	Use of assignment algorithm for optimal job assign.
84 ACCTREC	In memory accounts receivable system-storage ok
85 TERMSPAY	Compares 3 methods of repayment of loans
86 PAYNET	Computes gross pay required for given net
87 SELLPR	Computes selling price for given after tax amount
88 ARBCOMP	Arbitrage computations
89 DEPRSF	Sinking fund depreciation
90 UPSZONE	Finds UPS zones from zip code
91 ENVELOPE	Types envelope including return address
92 AUTOEXP	Automobile expense analysis
93 INSFILE	Insurance policy file
94 PAYROLL2	In memory payroll system
95 DILANAL	Dilution analysis
96 LOANAFFD	Loan amount a borrower can afford
97 RENTPRCH	Purchase price for rental property
98 SALELEAS	Sale-leaseback analysis
99 RRCONVBD	Investor's rate of return on convertible bond
100 PORTVAL9	Stock market portfolio storage-valuation program

- TRS-80 Cassette Version \$99.95
- TRS-80 (Mod-I or III), Pet, Apple or Atari Versions \$99.95
- TRS-80 Mod-II, IBM, Osborne and CP/M Versions \$149.95

ADD \$3.00 FOR SHIPPING IN UPS AREAS
 ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
 ADD \$5.00 TO CANADA AND MEXICO
 ADD PROPER POSTAGE OUTSIDE OF U.S., CANADA AND MEXICO

COMPUTRONICS
 MATHEMATICAL APPLICATIONS SERVICE

50 N. PASCACK ROAD
 SPRING VALLEY, NEW YORK 10977

ASK FOR OUR 64-PAGE CATALOG
 DEALER INQUIRIES INVITED

**NEW TOLL-FREE
 ORDER LINE**
 (OUTSIDE OF N.Y. STATE)
(800) 431-2818

AMERICAN EXPRESS

**24 HOUR
 ORDER
 LINE**

VISA



(914) 425-1535

ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE
 DELIVERY SUBJECT TO AVAILABILITY

Use IRS label. Otherwise, please print or type.	Your first name and initial (if joint return, also give spouse's name and initial)	Last name	Your social security number
	Present home address (Number and street, including apartment number, or rural route)		Spouse's social security no.
	City, town or post office, State and ZIP code		Your occupation

Presidential Election Campaign Do you want \$1 to go to this fund? Yes No
 If joint return, does your spouse want \$1 to go to this fund? Yes No

Note: Checking "Yes" will not increase your tax or reduce your refund.



TRS-80* Owners Do Your Own Taxes Like An Expert with TAX/SAVER II™

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp.

FOR MODEL I, II** or MODEL III

TAX/SAVER II™ — The tax help program for the layman, the professional accountant or tax preparer.

New and expanded, TAX/SAVER II™ offers a different approach to preparing a tax return. Like the original, the new version has the tax regulations programmed in so it is more than just a calculator. Designed for non accountants, TAX/SAVER II™ asks you questions, just as an accountant does. Based on your answers, it leads you through the tax maze to your lowest legal tax. Then it tells you how to fill in your return, line by line, or it will output to a printer.

TAX/SAVER II™ also has speed features for those doing more than one return. Optional program instruction and tax text make TAX/SAVER II™ the practical system for professional preparers as well. TAX/SAVER II™ has full disk storage of data files (with optional password protection).

The manual includes information on special tax areas, lists of possible deductions and a tax glossary.

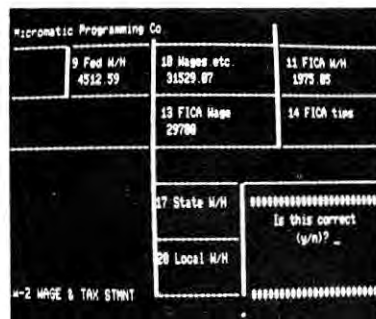
TAX/SAVER II™ compares itemized deductions to national averages; automatically computes certain limitations for example, on medical deductions and contributions; checks for excess FICA; helps determine dependents. Yet, TAX/SAVER II™ offers the privacy and convenience of home use.

The user-oriented design with special screen formatting makes data entry, verification and correction easy. Yet you are always in control. You can skip any help features or parts of the program that you don't need.

TAX/SAVER II™

- Completes long and short forms (1040 & 1040A)
- Itemized Deductions - Schedule A
- Interest & Dividends - Schedule B
- Tax Calculation - Tables, Rates
- Tax Savings Methods - Income Averaging, Maximum Tax, Alternative Tax
- Business Income - Schedules C & SE
- Capital Gains - Schedule D
- Allows you the privacy of your own home
- Lets you help friends and relatives with their taxes
- Has built-in aids. Answers specific questions like "Is my father my dependent?" and "Are my deductions reasonable?"
- Manual includes 1982 tax forms, information on special tax areas, lists of possible deductions, and glossary of tax terms
- Completes long and short forms including itemized deductions, excess FICA, earned income credit, community property, tax calculation (comparing all possible filing statuses in one run)
- Tax regulations are programmed in by our team of accountants. Just type in your figures & you've done your own tax return
- Helps you find the lowest tax
- Discounts on yearly updates
- Prints out on standard IRS forms overlays or plain tractor feed paper
- Accepts totals from all other tax forms not listed here

Now With Printout!



REVIEWS:

"... well designed and easy to use" D. Lubar, Creative Computing 1:81
 "... TAX SAVER™ may very well live up to its name" M. Tannenbaum, CPA, 81 Microcomputing 2:81

CUSTOMERS:

"For the price it can't be beat. I am looking forward to next year. With this program I finish my filing in 2 hours. Thank you."
 "Excellent presentation. Tutorial style is one of its most attractive attributes. Finally, a program I can really use!"

PROFESSIONALS:

"This is the perfect program for those doing taxes for others for reasonable fees. It was obviously written by folks that know both programming and tax law." "TAX SAVER™ is superior."

NEW PROFESSIONAL TAX/FORECASTER™

TAX/FORECASTER™, the quick tax estimator (with printout) for both 1982 and 1983 lets you revise its estimate by merely changing one or more lines. Use it as a tax planner either together with TAX/SAVER II™ or by itself. TAX/FORECASTER™ lets you quickly ask all of your WHAT IF? Questions and instantly recalculates your taxes. A great tax preparation aid for both the layman and professional. Includes Income Averaging and disk storage of Client files.

• Both TAX/SAVER II™ and TAX/FORECASTER™ are tax-deductible • Discounts are given on yearly updates • Free tax newsletter is issued annually.
 With the combined package TAX/SAVER II™ and TAX/FORECASTER™, you can now have, at an affordable price, the power to predict, control and reduce your tax liability

- TAX/SAVER II™ (MOD I & III) \$139.95 - Manual Included
- PROFESSIONAL TAX/FORECASTER™ (MOD I & III) \$99.95 (\$79.95 if purchased with TAX/SAVER II™)
- UPDATE for Registered TAX/SAVER II™ Owners \$83.95
- TAX FORM OVERLAYS \$19.95
- TAX/SAVER II™ - Model II** Version \$199.95
- PROFESSIONAL TAX/FORECASTER™ - Model II** Version \$129.95

SYSTEM REQUIREMENTS

- TRS-80 Model I with 32K and 2 disk drives
- TRS-80 Model III with 32K and 2 disk drives
- TRS-80 Model II** with 64K and 1 disk drive

** Availability of Model II programs uncertain at press time.



50 N. PASCACK ROAD
 SPRING VALLEY, NEW YORK 10977

NEW TOLL-FREE ORDER LINE
 (OUTSIDE OF N.Y. STATE)
(800) 431-2818



24 HOUR ORDER LINE
(914) 425-1535

*** 30-Day money back guarantee**

- * ADD \$3.00 FOR SHIPPING IN UPS AREAS
- * ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
- * ADD \$5.00 TO CANADA AND MEXICO
- * ADD PROPER POSTAGE OUTSIDE U.S., CANADA & MEXICO

H & E COMPUTRONICS INC.

● ● ● EVERYTHING FOR YOUR TRS-80* ● ● ● MODEL I, MODEL II & MODEL III

* TRS-80™ is a trademark of Tandy Corp.

FROM

 RACET COMPUTES LTD.

- All orders processed within 24 Hours
- 30-Day money back guarantee
- Add \$3.00 for shipping in UPS Areas
- Add \$4.00 for C.O.D. or NON-UPS Areas
- Add \$5.00 to Canada or Mexico
- Add exact postage to all other countries

*** ESSENTIAL UTILITY PROGRAMS FOR EVERY TRS-80 OWNER ***

Facts About Racet Computes Utility Programs

- *** ALL PROGRAMS ARE WRITTEN IN MACHINE LANGUAGE
- *** ABSOLUTELY NO KNOWLEDGE OF MACHINE LANGUAGE IS NECESSARY TO USE ANY OF THE UTILITY PROGRAMS
- *** EACH UTILITY PROGRAM IS CALLED UP FROM **BASIC** USING THE SIMPLE BASIC COMMANDS PROVIDED
- *** EACH UTILITY PROGRAM COMES WITH A **RACET COMPUTES** INSTRUCTION MANUAL
- *** EACH INSTRUCTION MANUAL INCLUDES SEVERAL EXAMPLES OF UTILITY USAGE
- *** EACH UTILITY ALLOWS THE USER TO PERFORM CERTAIN BASIC OPERATIONS TEN, TWENTY OR MORE TIMES FASTER THAN THE EQUIVALENT BASIC ROUTINE (FOR EXAMPLE, **GSF** CAN SORT AN ARRAY OF 1000 RANDOM NAMES INTO ALPHABETICAL ORDER IN UNDER 9 SECONDS!!)

GSF (GENERALIZED SUBROUTINE FACILITY)

- SORTS 1000-ELEMENT ARRAYS IN 9 SECONDS
- SORTS UP TO 15 ARRAYS SIMULTANEOUSLY (MIXED STRING, FLOATING POINT AND INTEGER)
- SORTS SINGLE OR MULTIPLE SUBSTRINGS AS ASCENDING OR DESCENDING SORT KEYS
- READ AND WRITE ARRAYS TO CASSETTE
- COMPRESS AND UNCOMPRESS DATA IN MEMORY
- MOVE ARRAYS IN MEMORY
- DUPLICATE MEMORY
- FAST HORIZONTAL AND VERTICAL LINES
- SCREEN CONTROLS FOR SCROLLING THE SCREEN UP, DOWN, LEFT, RIGHT AND FOR GENERATING INVERSE GRAPHIC DISPLAYS
- ADDS PEEKS AND POKES (MOD-II VERSION ONLY)

MODEL-I VERSION \$25.00
 MODEL-II VERSION \$50.00
 MODEL-III VERSION \$30.00

KFS-80 (KEYED FILE SYSTEM)

- CREATE ISAM FILES (INDEX SEQUENTIAL ACCESS METHOD)
- ALLOWS INSTANT ACCESS TO ANY RECORD ON YOUR DISKETTE
- INSTANTLY RETRIEVE RECORDS FROM MAILING LISTS, INVENTORY, ACCOUNTS RECEIVABLE OR VIRTUALLY ANY APPLICATION WHERE RAPID ACCESS IS REQUIRED TO NAMED RECORDS
- PROVIDES THE BASIC PROGRAMMER THE ABILITY TO RAPIDLY INSERT OR ACCESS KEYED RECORDS IN ONE OR MORE DATA FILES
- RECORDS ARE MAINTAINED IN SORTED ORDER BY A SPECIFIED KEY
- RECORDS MAY BE INSERTED OR RETRIEVED BY SUPPLYING THE KEY
- RECORDS MAY BE RETRIEVED SEQUENTIALLY IN SORTED ORDER
- RAPID ACCESS TO ANY FILE REGARDLESS OF THE NUMBER OF RECORDS
- MULTIPLE INDEX FILES CAN BE EASILY CREATED WHICH ALLOWS ACCESS OF A SINGLE DATABASE BY MULTIPLE KEYS (FOR EXAMPLE, BY BOTH NAME AND ZIP-CODE)

MODEL-I VERSION \$100.00
 MODEL-II VERSION \$175.00
 MODEL-III VERSION \$100.00

DSM (DISK SORT MERGE)

- SORT AN 85K DISKETTE IN LESS THAN THREE MINUTES!
- SORTS LARGE MULTIPLE DISKETTE FILES ON A MINIMUM ONE DRIVE SYSTEM
- ALL RECORDS ARE PHYSICALLY REARRANGED-NO KEY FILES ARE REQUIRED
- SORTS RANDOM FILES CREATED BY **BASIC**, INCLUDING FILES CONTAINING SUB-RECORDS SPANNING SECTORS
- SORTS ON ONE OR MORE FIELDS IN ASCENDING OR DESCENDING ORDER
- FIELDS MAY BE STIRINGS, INTEGER, BINARY INTEGER OR FLOATING POINT
- THE SORTED OUTPUT FILE MAY OPTIONALLY HAVE FIELDS DELETED, REARRANGED OR PADDED
- SORT COMMANDS CAN BE SAVED FOR REUSE
- SINGLE SORT, MERGE, OR MIXED SORT/MERGE OPERATIONS MAY BE PERFORMED
- SORTED OUTPUT MAY BE WRITTEN TO A NEW FILE, OR REPLACE THE ORIGINAL-INPUT FILE.

MODEL-I VERSION \$75.00
 MODEL-II VERSION \$150.00
 MODEL-III VERSION \$90.00

MAILLIST (A MAILING LIST DATABASE SYSTEM)

- IDEALLY SUITED FOR ORGANIZATION MAILING LISTS, PERSONAL ADDRESSBOOK, OR MAILING LISTS BASED ON DATES SUCH AS REMINDERS FOR BIRTHDATES OR DUES PAYABLE
- USED ISAM (INDEX SEQUENTIAL ACCESS METHOD) FOR RAPID ACCESS TIMES
- YOUR **MAILLIST** CAN ALWAYS BE SORTED AND MAINTAINED BY UP TO FOUR INDEX FILES (FOR EXAMPLE, NAME, ZIPCODE, DATE AND NUMBER)
- **MAILLIST** ALLOWS UP TO 30 ATTRIBUTES TO BE SPECIFIED (TO BE USED IN SELECTION OF SPECIFIED RECORDS WHEN GENERATING REPORTS OR MAILING LABELS)
- **MAILLIST** SUPPORTS BOTH 5 OR 9-DIGIT ZIPCODES
- PRINTING MAY BE STARTED OR ENDED AT ANY POINT IN THE LIST...THE USER CAN SPECIFY FIELDS OR CODES TO BE PRINTED
- CAPACITY IS 600 NAMES FOR MODEL-I, 3500 NAMES FOR MODEL II, 38,000 NAMES FOR MODEL II WITH HARD DISK DRIVE. 1200 NAMES FOR MODEL III

MODEL-I VERSION \$75.00
 MODEL-II VERSION \$150.00
 MODEL-III VERSION \$75.00

HSDS HARD DISK DRIVE SOFTWARE

- MAKES TRSDOS COMPATIBLE WITH MOST HARD DISK DRIVES
- ADDS MANY EXTRA FEATURES TO TRSDOS \$400.00

COMPROC (COMMAND PROCESSOR)

- AUTO YOUR DISK TO PERFORM ANY SEQUENCE OF INSTRUCTIONS THAT YOU NORMALLY GIVE FROM THE KEYBOARD (FOR EXAMPLE, INSERT THE DISKETTE, PRESS THE RESET BUTTON, YOUR COMMAND FILE COULD AUTOMATICALLY SHOW YOU THE DIRECTORY, SHOW THE FREE SPACE ON THE DISKETTE, LOAD A MACHINE LANGUAGE SUBROUTINE, LOAD BASIC, LOAD AND RUN A BASIC PROGRAM, AND SELECT A GIVEN ITEM ON YOUR MENU...ALL WITHOUT TOUCHING THE KEYBOARD!)

MODEL-I VERSION \$20.00
 MODEL-III VERSION \$30.00
NOT AVAILABLE FOR MODEL-II

DISCAT (DISKETTE CATALOG SYSTEM)

- THIS COMPREHENSIVE DISKETTE CATALOGUING/INDEXING UTILITY ALLOWS THE USER TO KEEP TRACK OF THOUSANDS OF PROGRAMS IN A CATEGORIZED LIBRARY...FILE INCLUDES PROGRAM NAMES AND EXTENSIONS, PROGRAM LENGTH, DISKETTE NUMBERS AND FREE SPACE ON EACH DISKETTE...KEEP A COMPLETE CATALOG OF THE DIRECTORIES ON ALL YOUR DISKETTES IN ALPHABETICAL ORDER (SORTED ON EACH DISKETTE, OR COMPLETE ALPHABETICAL LIST OF PROGRAMS ON ALL YOUR DISKETTES)

MODEL-I VERSION \$50.00
 MODEL-III VERSION \$50.00
 MODEL-II VERSION (SEE MODEL-II UTILITY PACKAGE)

BLINK (BASIC LINK FACILITY)

- LINK FROM BASIC PROGRAM TO ANOTHER SAVING ALL VARIABLES
- THE CHAINED PROGRAM MAY EITHER REPLACE THE ORIGINAL PROGRAM OR CAN BE MERGED BY STATEMENT NUMBER

MODEL-I VERSION \$25.00
 MODEL-III VERSION \$30.00
 MODEL-II VERSION (SEE MODEL-II UTILITY PACKAGE) \$50.00

INFINITE BASIC

- ADDS OVER 80 COMMANDS TO BASIC
- SORTING, STRING CENTERING, ROTATION, TRUNCATION, JUSTIFICATION, DATA COMPRESSION, STRING TRANSLATION, COPYING, SCREEN DISPLAY, SCROLLING, MATRIX OPERATIONS, SIMULTANEOUS EQUATIONS (THROUGH MATRIX INVERSION), DYNAMIC ARRAY RESHAPING

MODEL-I VERSION \$50.00
 MODEL-III VERSION \$60.00
NOT AVAILABLE ON MODEL-II

INFINITE BUSINESS

- ADD ON PACKAGE TO INFINITE BASIC (REQUIRES INFINITE BASIC)
- ADDS PACKED DECIMAL ARITHMETIC WITH 127 DIGIT ACCURACY (F, D, T, I)
- COMPLETE PRINTER PAGINATION CONTROLS, AUTO HEADERS, FOOTERS AND PAGE NUMBERS
- BINARY SEARCH OF SORTED AND UNSORTED ARRAYS (INSTANT SEARCH OF AN ELEMENT WITHIN AN ARRAY)
- HASH CODES

MODEL-I VERSION \$30.00
 MODEL-III VERSION \$30.00
NOT AVAILABLE ON MODEL-II

REMODEL-PROLOAD


- THE ULTIMATE RENUMBERING PROGRAM, RENUMBERS ALL OR PART OF A PROGRAM (ALLOWS PARTIAL RENUMBERING IN MIDDLE OF PROGRAMS)
- PARTIAL OR COMPLETE MERGE OF TWO CASSETTE PROGRAMS

MODEL-I VERSION \$35.00
 MODEL-III VERSION \$35.00
NOT AVAILABLE ON MODEL-II

COPSYS

- COPY AND VERIFY ALL MACHINE LANGUAGE (SYSTEM) TAPES WRITTEN IN STANDARD FORMAT...IF YOU BUY A MACHINE LANGUAGE PROGRAM, COPSYS ALLOWS YOU TO EASILY COPY THE PROGRAM ONTO ANOTHER CASSETTE AS A BACKUP

MODEL-I VERSION \$15.00
 MODEL-III VERSION \$20.00
NOT AVAILABLE ON MODEL-II

FOR DEALER INFORMATION CALL: 

1330 N. GLASSEL, SUITE M, ORANGE CA 92667
 (714) 997-4950

MODEL II SPEEDUP—FAST DISK I/O

THIS IS AN ENHANCEMENT FOR TRSDOS 2.0 THAT WILL RADICALLY DECREASE DISK ACCESS TIME.

- DISKS BOOT FASTER TO DOS
- IMPROVE DISK I/O UNDER BASIC

MODEL II ONLY \$99.95



MODEL II FASTBACK — FULL DISK BACKUP IN 55 SECONDS

IN BUSINESS TIME IS MONEY, AND ONE BACKUP IS WORTH A THOUSAND TEARS.

- WORKS ON SYSTEMS WITH 2 OR MORE DRIVES
- CAN REPLACE YOUR EXISTING TRSDOS 1.2 OR 2.0 BACKUP UTILITY

MODEL II ONLY \$75.00



MODEL-II UTILITY PACKAGE

- ESSENTIAL FOR EVERY MOD-II OWNER
- RECOVER AND REPAIR FILES AND DIRECTORIES (BY JUST ENTERING A SINGLE COMMAND)
- XCOPY...SIMILAR TO COPY BUT CAN COPY ANY NUMBER OF FILES AT ONE TIME FASTER AND MORE ACCURATE THAN COPY SINCE RECORDS ARE COPIED IN GROUPS RATHER THAN ONE RECORDS AT A TIME...USING XCOPY YOU CAN COPY FILES THAT CAN NOT BE COPIED USING THE COPY COMMAND
- SZAP...PROVIDES THE CAPABILITY TO READ AND MODIFY ANY SECTOR ON A DISKETTE
- XHIT...CAN BE USED TO REPAIR A DISKETTE DIRECTORY
- DCS...DIRECTOR CATALOG SYSTEM IS A UTILITY FOR THE MANAGEMENT OF USER DISKETTES...SETS OF A MULTIPLE DISKETTE DIRECTORY FILE (WITH UP TO 1200 INDIVIDUAL FILE NAMES)...ALLOWS SELECTIVELY LISTED OR PRINTED LISTS OF DIRECTORY FILES IN COMBINED SORTED ORDER (FOR EXAMPLE, LISTED ALPHABETICALLY BY DISKETTE, OR A COMPOSITE ALPHABETICAL LIST OF ALL YOUR DISKETTES)
- DEBUG-II...ADDS SEVERAL FEATURES TO THE PRESENT TRSDOS DEBUG UTILITY INCLUDING SINGLE INSTRUCTION CYCLE, AUTO (LOOP) BREAKPOINTS, SUBROUTINE CALLING, BREAK-KEY DETECTION AND MANY OTHERS

MODEL-II ONLY \$150.00

MODEL-II DEVELOPMENT SYSTEM

- THIS PACKAGE IS A MUST FOR ASSEMBLY LANGUAGE PROGRAMMERS
- INCLUDES THE MICROSOFT EDITOR ASSEMBLER PLUS WITH ENHANCEMENTS FOR THE MODEL-II
- A COMPLETE DISASSEMBLER
- SUPERZAP FOR READING AND MODIFY ANY SELECTOR ON A DISKETTE

MODEL-II ONLY \$125.00

MOD-II BASIC CROSS REFERENCE UTILITY

- LIST OR PRINT A SORTED CROSS REFERENCE TO ALL NUMBERS OR VARIABLES WITHIN A PROGRAM
- LIST OF PRINT ALL LINE NUMBERS CONTAINING A SPECIFIED STRING OF CHARACTERS

MODEL-II ONLY \$50.00

*** ALL PRICES AND SPECIFICATIONS SUBJECT TO CHANGE ***

END USERS CALL:

COMPUTRONICS
MATHEMATICAL ANALYTICAL SYSTEMS

50 N. PASCACK ROAD
 SPRING VALLEY, NEW YORK 10977



24 HOUR ORDER LINE

(914) 425-1535

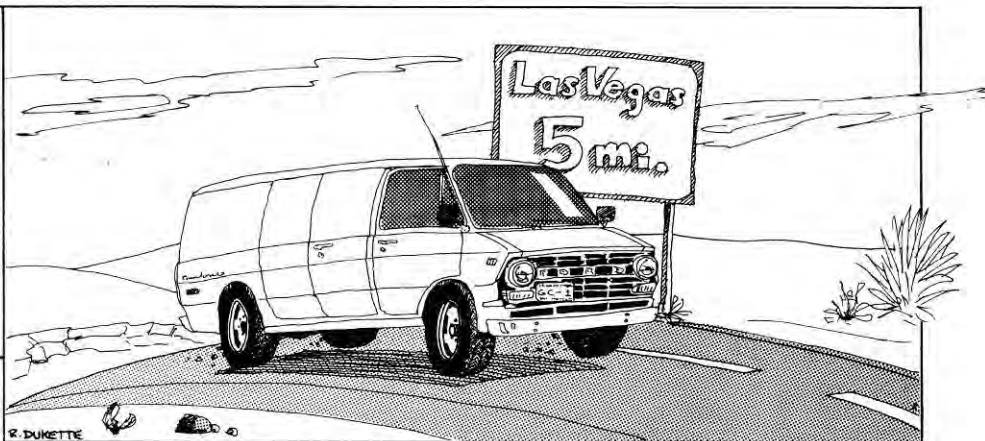


NEW TOLL-FREE ORDER LINE
 (OUTSIDE OF N.Y. STATE)
 (800) 431-2818

ADD \$3.00 FOR SHIPPING IN UPS AREAS
 ADD \$4.00 FOR C.O.D. OR NON-UPS AREAS
 ADD \$5.00 TO CANADA AND MEXICO
 ADD PROPER POSTAGE OUTSIDE OF U.S., CANADA AND MEXICO

DEALER INQUIRIES WELCOME

Out of Vegas and into Asylum



Las Vegas doesn't like the unlucky. Mad Max and I had been walking the Strip for three days, trying to set up a mini-Cafe with a card table, the PMC, and Galaxy Invasion, and getting chased away from all the best places. Our hotel bill was overdue, and the van was lost at the Prairie Sunset Rest Home. We were about to gamble our last \$3.70 at the MGM Grand when the bouncers threw the 10-year-old girl out in front of us.

"I was not card counting!" she yelled. "This is another system altogether! You take probability theory and—"

Max and I didn't listen to the rest, partly because she started shouting differential equations and partly because we'd never seen a child with battleship-gray hair. It wasn't battleship gray exactly, it was—

"Mercedes Silver," she introduced herself. "I dyed it when I was into punk, but I outgrew that now I'm in college." Max was gaping, but I managed to shake hands. "Did you see those guys at the casino? I was just trying a blackjack analysis I worked out on a TRS-80 at the Hop—"

At the words "TRS-80" we were all ears. "The Hop?"

"Johns Hopkins Center for Mathematically and Scientifically Precocious Youth," Mercedes said. "I've got a B.S. there; I'm supposed to go back for a master's this semester. My dad's a Radio Shack dealer in Baltimore. He sent me to Suzuki programming school when I was 3."

Max interrupted. "You say you have this gambling system—"

"Sequential forecasting. Probability analysis. Geez, don't you guys know from calculus or anything?"

"You can play cards," Max continued. "There's this nurse at a rest home outside of town who won this van full of TRS-80s that belongs to us, and if you could challenge her to a game..."

We climbed over the fence at Prairie Sunset and found the van in the staff parking lot. "Geez," Mercedes said again. "I was expecting something, you know, with bright colors and maybe a mural."

"There's some more mail here forwarded from Peterborough," Max said. Considering where we were, the letter was appropriate:

I need help getting past the guard at the beginning of Asylum. Are you supposed to trade with him? Or kill him? He keeps catching me and putting me in a straitjacket. And what do you do with the invisible inmate by the guard? What key do I need to open the doors where the inmates giggle or say "Let me out and I'll kill you"? What do I need to get into the officers' wing and stay there? And where do I get that?

Tom Abelson
6537 N. Keating
Lincolnwood, IL 60646

This letter started our usual argument. Max insisted we leave Tom to his fate—Max is an adventure Darwinist—and I wanted to help the readers and boost our image. A pay-phone call to William Denman, Med Systems president and cameo player in Asylum II, brought a compromise.

Fight, trade, or whatever, said Denman, you cannot get past the first guard; he'll always put you in the room with the burning straitjacket. Roll around if you find yourself on fire. If you slide a newspaper under the door and poke the keyhole to retrieve the key, you'll be able to tiptoe out and face a second guard; punch him and knock him out, and then frisk him to get enough keys and items to keep you going for a long time.

Past that, Med Systems sells hint sheets for \$1. Remember Max's motto:

"There are no invisible inmates, only inmates' voices coming from behind doors."

Speaking of Med Systems (or whatever they'll call themselves; there's talk of a merger and a name change), Denman revealed that Randall Don Masteller, author of the Warrior of Ras trilogy, has six more games due in early '83. A second, advanced trilogy will load characters from the first, which is recommended ("The odds are that, if you try any of these games as a Level I warrior, you will not come out alive"). A Wizard of Ras trilogy, while it won't load warrior characters, lets you do everything from throw stones to cast spells. Both feature better graphics than Dunzhin, Kaiv, and The Wyld; when you're attacked by monsters, the display zooms in on your immediate area, letting you see whom you're hacking and who's sneaking around for a flank attack.

"Mr. Max, is it?" came a voice from behind us. "Thinking of stealing back the truck?"

"Van," Max corrected, smiling back at the figure in white. "Actually, Nurse—"

"Lovelace. Ada Lovelace."

"—my friend here was hoping you'd agree to a rematch."

"Blackjack," Mercedes smiled by way of introduction. "You look like a woman who stands on 17."

It was no contest. On the first hand, Nurse Lovelace lost the Color Computer and Astro-Blast. Next, Mercedes claimed the Models Is and our adven-

ture collection; next, two IIIs and the Melbourne House library. The van and everything else took another half hour, during which I read some Gamer's Cafe feedback or input or whatever they call that section in the front of the magazine:

Michael Johnson (3138 Doggitt Drive, Spring Arbor, MI 49283) writes to say that Jim Daniel's patch in the November 1982 issue, adapting the Alpha Products joystick to Voyage of the Valkyrie, works on the Model I but leaves Mod III owners out in the cold. Jim wonders whether the two PEEK statements (16458 and 16459) in line 10000 would be hardware-specific. Any Model III Wagnerians out there with a patch for the patch?

* * * * *

"On the road again," bellowed Max—who usually prefers the Doors to Willie Nelson and who sings like the cassette port voice in Panik—as we headed out of town on Route 93. "Time to set up the awning and get computers on the sidewalk again, do the Johnny

Appleseed of games bit. Anybody beat my score on Sea Dragon?" (No one has yet; send in those scores and screen photos, all games welcome.)

"I ought to trade in the Pocket Computers and get us a printer," Mercedes said, watching my monthly struggle with Scripsit. That "I" and "us" made Max and me turn around in the middle

of driving and writing. "I own all this stuff now, you know. It's a kick."

Well, she's right. First my partner Winthrop goes Color Berserk and ends up in a rest home, and now we men are working for a 10-year-old. We're supposed to be taking her to Baltimore. Maybe her dad can get us a copy of Poltergeist. ■

Apple Panic	Mad Max	51,400
Armored Patrol (AI)	Winthrop	81,000*
Cosmic Fighter (Big 5)	Winthrop	103,980
Demon Seed	Mad Max	52,400
Eliminator	Winthrop	88,950
Galaxy Invasion (Big 5)	Winthrop	1,000,000**
Sea Dragon	Mad Max	147,910 +
Swamp Wars	Winthrop	39,200 + +

* Method I. Winthrop racked up 281,000 points using Method II.

** Winthrop still had six ships left, but he got bored.

+ Novice mode. Max got 69,480 in the expert mode.

+ + Winthrop got through all nine swamps, too.

Gamer's Cafe readers are invited to submit their high scores, for these and other TRS-80 games. We'll print unvalidated scores, but validated scores (a photo of the screen) will, of course, rank higher in prestige.

New From Pel-Tek INDOOR SOCCER

A new and exciting arcade game for the TRS-80 Mod I or III 16K- Features:

- Four levels of play against the computer
- or play head to head against a friend
- Real time graphics—dribble, pass, steal shoot the ball, — play the boards
- Control the whole team!
- Sound effects & Joystick compatible

only 15⁹⁵ tape

7 DAY TOLL FREE ORDER LINE
800-523-2445
in Penna 215-947-2334

- Price Breakthrough -

THE PEL/TEK "WORD MACHINE"
for the TRS-80* MOD I/III DISC

Here's a low cost Text Processor in fast machine language. Some features include:

- Lower case for MOD I ■ Saves/Loads Disc files ■ Access to DOS ■ Embedded printer control ■ Chain Printing of text files ■ Numerous edit commands ■ And much more... Features an easy command structure—Great for letters, reports or your kid's homework (3rd grade & up!)

(send S.A.S.E. for FREE copy of users manual)

32 K disc only \$16.95
48 K disc \$16.95
add \$2.00 shipping and handling

Mini Discette Organizer

Portable • Saves Space • Protects • Economical

PEL/TEK's exclusive loose leaf storage binder set includes a slim-line binder (only 7" deep) with ten pockets with capacity of twenty discettes in their jackets. Our own unique design.

Binder & pockets for 20 discettes
Quantity 1-2 Sets.....\$9.95
3-up.....\$8.95

\$8.95
in quantities

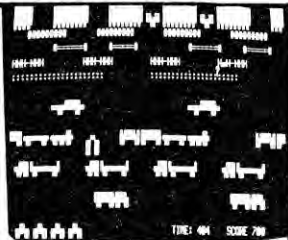
Add \$2.00 postage and handling for first set, \$1.50 per set for 2-5. Free shipping for 6 or more sets.



324

Dealers Inquiries Welcome

J
U
M
P
\$ 14.95 Y



You're a rabbit trying to get to your cover! Cross highways and rivers—dodge moving cars and trucks—jump from boat to boat — an incredible journey. Gets harder and harder and... High scores saved on disc version

Mod I/III Tape or Disc



If you just bought another computer,
boy are you gonna be sorry.

Epson.

The new Epson QX-10 is unlike any personal computer you've ever seen. It's a computer for people who don't have the time to learn computers; a computer you can be using within minutes.

And fortunately, you don't have to take our word for it. Here's how *Byte*, one of the computer industry's most prestigious magazines, describes the QX-10.

The first anybody-can-use-it computer.

"The Epson QX-10 (is) a computer for less than \$3000 that may well be the first of a new breed of anybody-can-use-it 'appliance' computers ... In addition to being a highly integrated word processing/computer system that offers as much usable processing power as almost any existing microcomputer, the QX-10 ... system is designed to be used by people with minimal technical knowledge. We've certainly heard that claim before, but Epson has delivered on this promise in a way and to an extent that no microcomputer manufacturer has done."

That's nice to hear from a magazine like *Byte*, of course, but it doesn't surprise us. It's just what we intended the QX-10 to be all along.

More computer. Less money.

But useability isn't the only thing the QX-10 has going for it. As *Byte* says, "the QX-10 gives you a great deal for your money.

"Help is available at any time through the HASCI (Human Application Standard Computer Interface) keyboard Help key ... Text can be entered at any time just as you would in a conventional word processor. The Calc key turns the system into a basic

4-function calculator. Graphics can be created via the Draw key. The Sched (schedule) key gives you access to a computer-kept appointment book, a built-in clock/timer/ alarm, and an event scheduler."

Advanced hardware for advanced software.

As for hardware, *Popular Computing*, another industry leader, says: "The QX-10 includes ... a number of advanced hardware features ... The basic components of the system are a detachable keyboard, a high resolution monochrome display, and a system unit containing two 5¼ inch disk drives. The drives use double-sided, double-density disks (340K bytes per disk) and are amazingly compact ... The QX-10 uses an 8-bit Z80A microprocessor. The system contains 256 bytes of RAM. Some of the RAM is ... battery powered ... which lets the computer retain information when the power is off."

You won't have to wait much longer.

The new Epson QX-10 may very well be the computer you've been waiting for. And fortunately, you won't have to wait much longer — it will be appearing soon in computer stores all across the country. In the meantime, write Epson at 3415 Kashiwa Street, Torrance, CA 90505, or call (213) 539-9140. We'll be happy to send you copies of our reviews.

After all, as *Popular Computing* puts it, the QX-10 will "do for computing what the Model T did for transportation."

And we couldn't have said it better ourselves.



✓97

EPSON
EPSON AMERICA, INC.
COMPUTER PRODUCTS DIVISION

3415 Kashiwa Street
Torrance, California 90505
(213) 539-9140

YOUNG PROGRAMMER'S 80micro WINNERS CONTEST

1982-1983

We've known for some time that kids make up a significant portion of the TRS-80 population. Still, we weren't ready for the response we got to our first annual Young Programmer's Contest.

The number of entries—nearly 200—was, by itself, impressive. But what struck us was the ambition, skill, and creativity shown by the entrants. Even some of the programs that didn't win are good enough to be published, and will appear in future issues.

Our three-man panel of judges scored the entries in five categories:

Programming elegance. Here we looked at how well the program was written and performed its task, and how attractive the screen displays were. We also considered the ease with which the program could be used.

Documentation. First, we looked for descriptions of how to use the program and how it worked. We gave extra points for when flowcharts, variable lists, program listings, and tables were included.

Originality. This was a tough one to measure, since little software under the sun is entirely new. We finally decided to measure originality by how much creative thinking went into designing the program.

Error-trapping. How tough was it for us to crash the program?

Usefulness. In the case of a game, we measured usefulness by how entertaining it was.

The Grand Prize

The grand-prize winner turned out to be 16-year-old David Schmidt's *Quest for the Key of Nightshade*, an adventure game for the Model I. *Quest* is one of the better adventure games we've seen in a while, and it scored high in every category.

What impressed us the most about *Quest* was

the fascinating and internally consistent world it paints. David gives the land of *Nightshade* so much detail that it seems almost three-dimensional. And what greater praise can be given to a fantasy than that it seems real?

Quest was one of four games that won prizes. But games aren't all you'll find in the next 78 pages. Here's a quick look at our other winning entries:

Project Deep Dive, by Michael John Lake, won first place in the 14-18 category. The game puts you in a submarine, which must fight its way through a tunnel to get to its base. First prize in the 11-13 category went to Carl Huben for his submission *Music Composer*, which tells you how to turn your computer into a piano keyboard. And topping the 10-and-under category was Terry Myerson's program *Super-Draw*, which lets you draw and save figures on your Model III.

Larry Brackney's *TRS-Turtle* took second prize in the 14-18 group. It lets you use your Model I to explore some of the features of Logo. In the 11-13 group, second place was won by Beth Norman for her adventure game *Lair of Kraken*. And Nathan Miller's joystick game *Byte-Cycles* was runner-up in the 10-and-under category.

Lloyd Kupchanko's *Boxing Game*, a machine-language arcade game for the Model I, finished third in the 14-18 group. We had a tie for third in the 11-13 category—Jennifer Neidenbach's *Foreign Flag Quiz* and Scott Steele's bulletin board program *CASS-80*. And third place in the 10-and-under group was won by Adam Wells for his submission *countdown*.

If you're interested in seeing what kids are doing with their computers these days, by all means check out the Young Programmer's Contest winners.

And if you're 18 or under, start working on your entry for our next competition. This year's contest set some pretty high standards to match. ■

Quest for the Key of Nightshade

by David Schmidt
Grand Prize

The objective of Quest for the Key of Nightshade is threefold. First, the adventurer must attempt to increase the size and strength of his army. Next, the adventurer must try to collect five pieces of a key that lay scattered throughout

the Land of Nightshade. Once all pieces have been collected and the adventurer has a large and powerful army, he can attempt to capture Castle Nightshade. The purpose of this is to rescue the good king who is held prisoner by the evil emperor currently ruling the land.

screen is a graphic map depicting the terrain around the player. The lower-most section is used as a communications box. Its purpose is to display warnings and other necessary messages. The section furthest to the right displays the current options available to the player and requests a command. The display always depicts the status and options pertaining you, the player, and your army.

The Key Box
Model I or III
16K, 32K RAM
Cassette or Disk Basic
Assembly Language
Editor/Assembler Opt.

The Display

The screen display is divided into five sections. The uppermost section merely displays the game's name. The section furthest to the left displays the status of the entire army. In the middle of the

The Map

The land of the nightshade is 30 by 30

Living Beings

Crimson Reaper

Domain: Castle
Fighting Ability: 15
Special Attributes: None

The Crimson Reaper is a highly trained warrior. He wears partial plate armor and a helm. The Reaper is armed with a bastard sword and a spiked shield.

The Crimson Reaper has awesome strength and speed. Pain has no effect on him. So, to remove him from battle, he must be killed.

These warriors guard the treasures of Castles Death Shadow and Gray Stone. The Reapers never talk and are rarely seen outside of a castle. Because of their great fighting power, they are feared by all. In fact, many people believe the Reaper is not a human at all, but a disciple of the beast.

Firedrake

Domain: Castle
Fighting Ability: Variable
Special Attributes: None

The firedrake is the true dragon. It stands about 10 meters tall and has a wingspread of over 20 meters. This beast has immense claws and fangs, and it breathes fire.

The dragon is located in Castle Nightshade. Its purpose is to protect the imprisoned king. The fighting ability of the dragon is determined by the skill level you choose.

Jo-Toe

Domain: Water areas
Fighting Ability: 4
Special Attributes: None

The jo-toe is 2 meters tall and looks like a cross between a wingless bird and a reptile. It has very large webbed feet. The powerful tail is used for balance and propulsion in the water. The jo-toe has a long neck and a small head which is mostly beak.

The creature can run at speeds of over 60 kilometers per hour. This is its main defense, because it is a terrible coward. When cornered, it will fight by kicking with its large clawed feet and by jabbing with its beak.

The jo-toe is a herbivore and scavenger. It spends most of the day wading through the swamps looking for tender shoots of grass. It does enjoy a dead carcass when available.

The creature is basically timid and need not be feared if you are careful.

Kathake

Domain: Desert
Fighting Ability: 5
Special Attributes: Treasure carrying

The kathake is a female warrior from the desert tribe of the Thake. This human is armed with a large curved sword called a kantana. She wears a cloak and has little or no armor.

The kathake, though not a good sword fighter, is very quick and

continues on page 86

units. Each unit is one possible location you can occupy. The display shows a small portion of the map with your party in the center. The map depicts the terrain for four units in each direction. As you move you stay stationary relative to the display while the map moves under you. Small graphic characters on the map symbolize conditions present at that location. The meanings of the symbols are in Table 1.

Landmarks such as rivers, lakes, mountains, and deserts are in the same positions during each game. The locations of man-made objects like bridges, towns, cities, castles, and tombs, vary however, from game to game.

Marketplace

In the marketplace you can buy all items for yourself and your army. Marketplaces can be found in any human settlement. Items will cost more in a smaller settlement than in larger cities. When you buy an item, you buy it for the entire army. Certain items such as weapons, armor, and men always require you trade in present equipment. The medium for trade in the marketplace is gold fashioned into small pieces.

Weapons and Armor

Weapons and armor make an army more powerful. The greater the number of weapons, the greater the fighting strength. The fighting ability is a number representing fighting strength. You can find this number by adding the armor class and sword class, plus one. The higher the number, the greater you are in battle. Fighting ability is subject

	Mountains
	Desert
	Water
	Bridge
	City
	Town
	Castle Death Shadow
	Castle Grey Stone
	Castle Nightshade
	Tomb
	Marsh

Table 1. Symbols

continued from page 85

therefore she is not to be taken lightly. The greatest danger is that they will use any means to win at battle. For example, females will approach a male seductively, only to kill him once close enough.

The kathake's primary form of livelihood is piracy. The women travel in nomadic bands across the desert in search of a prize. The males of the tribe stay near the camp, while the females become the warriors.

Kathakes always carry the treasures of their victims with them.

Kilgard

Domain: Open
Fighting Ability: 7
Special Attributes: Edible

The kilgard is a 6-meter long, fur-covered serpent. The fur of the beast is a greenish-brown, which helps it to hide well in long grass and trees. The snake has very large venomous fangs that can pierce most types of armor. Large folds of pointed skin protrude from the head, helping directional hearing.

The kilgard is a quick and agile fighter for its size. The snake will lunge at an enemy with its immense fangs while its tail whips around, striking a blow on the opponent. This beast will attempt to smother the life out of an enemy by coiling around him and then constricting.

The kilgard is a nocturnal creature. It can be found in shady knolls during the day. The kilgard's favorite place is a large tree limb.

The flesh of the kilgard has an enjoyable taste; in fact, many humans consider it a delicacy.

Merlad

Domain: Water areas
Fighting Ability: 11
Special Attributes: Treasure carrying

The merlad is an amphibious humanoid. The creature is covered with scales and has a membrane protruding from the rear parts of its body. The merlad has gills and can also breathe air directly. It has large fangs and claws.

The primary weapon of the am-

phibian is a trident. The beast can throw the weapon as far as 40 yards with great accuracy. The trident is also used like a lance at close hand-to-hand combat. When not armed with a trident, the merlad is still very dangerous, using its fangs and claws to fight.

Merlads live in small, partially submerged cities. A merlad's primary food source is fresh water clams, crawfish, and fish. The creatures will kill humans who get too close to their cities, and reap the benefits from their purses.

Metore

Domain: Water areas
Fighting Ability: 8
Special Attributes: Edible

The metore is a cross between a shark and an alligator. The fish is about 3 meters long and looks very much like a shark. The skin of the fish is very rough and thick. It has massive saw-edged teeth and an extremely powerful jaw. Its fins have bones in them and can be used like feet.

The fish fights like a shark in the water and like an alligator on land. The fish will attempt to rub its skin against its prey because its skin is like coarse sandpaper. The fish also thrash with its tail. The metore is driven into a frenzy by the presence of salt in the water.

The fish hunts for food—it is a total carnivore. With the boned fins, the metore can make excursions onto land to hunt or to sun itself. The fish live in deep underwater caves. Their flesh is edible and tastes much like pork.

When entering the water, you'd better hope a metore isn't swimming silently under you.

Quandar

Domain: Mountains
Fighting Ability: 5
Special Attributes: Treasure carrying

The quandar is a 1½-meter tall feline humanoid. It is an intelligent social animal armed with a small sword. Although it is the same size as a human, it possesses far greater

continues on page 88

Telewriter-64™

the Color Computer Word Processor

- **3 display formats: 51/64/85 columns × 24 lines**
- **True lower case characters**
- **User-friendly full-screen editor**
- **Right justification**
- **Easy hyphenation**
- **Drives any printer**
- **Embedded format and control codes**
- **Runs in 16K, 32K, or 64K**
- **Menu-driven disk and cassette I/O**
- **No hardware modifications required**

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

...one of the best programs for the Color Computer I have seen...

— Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24!! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command. The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPV11/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminus, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot-graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

File and I/O Features: ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive, Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

...truly a state of the art word processor...
outstanding in every respect.

— The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs \$49.95 on cassette, \$59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec
704 Nob Ave.
Del Mar, CA 92014

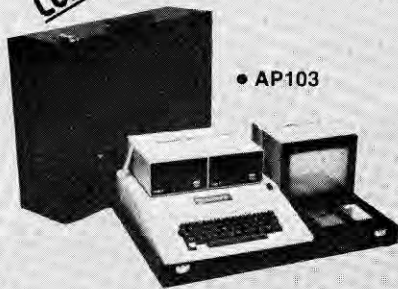
✓ 121

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add \$2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.

**Computer
Case
Company**



• AP103

Attache-style cases for carrying and protecting your complete computer set-up. Accommodates equipment in a fully operational configuration. Never a need to remove equipment from case. Simply remove lid, connect power, and operate.

- AP101 Apple II with Single Drive \$109
- AP102 Apple II with Two Disk Drives 119
- AP103 Apple II, 9 Inch Monitor & Two Drives 129
- AP104 Apple III, Two Drives & Silentye Printer 139
- AP105 13" Monitor with Accessories 99
- AP106 AMDEK Color Monitor 119
- RS201 TRS-80 Model I, Expansion Unit & Drives 109
- RS204 TRS-80 Model III 129
- AT301 ATARI Computers with Peripherals 109
- P402 Centronics 730/737 & Radio Shack Printer 89
- P403 Epson MX70/80 or Microline 82A 89
- P404 Epson MX100 Printer 99
- P405 IDS 560 or Prism 132 Printer 109
- P406 Starwriter/Printmaster F-10 Printer 119
- P407 Okidata Microline 83A or 84 Printer 99
- P408 Prowriter 2 Printer 99
- P409 Prowriter (Apple Dot Matrix) Printer 89
- IB501 IBM Personal Computer 129
- IB502 IBM Monitor 99
- HP601 HP41 with Accessories 99
- CM703 Commodore Model 64 with Drives 119
- CM704 Commodore Model 64 with Dataset 109
- NS010 North Star Advantage 139
- CC80 Matching Attache Case (5") 85
- CC90 Matching Attache Case (3") 75
- CC91 Matching Accessory Case 95
- CC92 5.25" Diskette Case 49

Computer Case Company

5650 Indian Mound Court
Columbus, Ohio 43213
(614) 868-9464 ✓139

**CALL TOLL FREE
800-848-7548**



to change by fatigue and randomness. A list of sword classes and armor classes is in Table 2.

Food, Water, and Potions

Food, water, and potions are required to play the game. You use food and water to feed your army, and can

only carry 25 units of each. One unit is consumed during each turn. The supplies can be bought in the marketplace or they can be acquired in the wilderness. Food supplies are replenished each time you kill an edible beast. Water stores can be refilled by entering any body of water (either a lake or a river).

You can carry only 10 potions at any time. When consumed, they refresh you and return the fatigue number to 0 percent. Potions cannot be found in the open—they must be bought in the marketplace. If an army is out of food and water (represented by a negative number on the status display) for several days, all members will die from starvation or dehydration.

Fatigue

As you move and fight across the land, you are bound to become tired. This factor is displayed in the status list

Armor	
Leather	1
Chain	3
Plate	5
Swords	
Short	2
Long	3
Broad	5
Two-Handed	7

Table 2. Armor and Weapon Classes

continued from page 86

strength. The coat of the animal is so fine that it is often illegally hunted just for this purpose.

Quandars are not very good fighters. Their tactics consist of running whenever possible. If this is not plausible, they will attempt to disarm their opponent so that they can use their strength advantage in hand-to-hand combat.

Quandars are generally a thieving race. Because their ancestry is feline, they are very stealthy. For this reason they can enter a dwelling and burglarize it before the occupants even know of their existence. Most quandars become outlaws, but some live in harmonious coexistence with man. They carry the prizes from their crimes.

Sand Devil

*Domain: Desert
Fighting Ability: 8
Special Attributes: None*

The sand devil appears to be 2 meters tall and part man, part beast. Actually the beast is as far removed from a man as is a sneeth. It has no intelligence and acts purely on instinct. A horn protrudes from the top of its head, and long claws sit on the end of its fingers. The sand devil has awesome strength but is rather slow.

The sand devil will fight every-

thing it encounters; this is simply its nature. The animal doesn't use its horn or its claws as weapons, but it attempts to crush its victim between its bare hands. Upon seeing an animal's movement, the beast will charge directly at it, not giving the enemy time to think. Once the animal has been killed, the sand devil will devour it, human or not.

The sand devil spends all its time wandering around the desert looking for food. It has a voracious appetite and will eat anything. The only thing the sand devil can offer the adventurer is danger.

Scorch

*Domain: Desert
Fighting Ability: 6
Special Attributes: Edible*

The scorch is a vicious, meter-long sand lizard. A long poisonous spike is connected to the end of the scorch's tail. Scorches also have small blunt teeth and long sharp claws. The scorch has thick scaly skin and a dorsal membrane.

Its teeth are ineffective as weapons, so the scorch uses its poisonous tail spike as its major defense. The potent poison on the tail will kill a man in about 5 minutes unless an antidote of jo-toe blood is consumed. The scorch's greatest asset is the advantage of surprise. The skin of the beast so closely matches its

as a percent. The lower the percent the less tired you are; the higher the percent the more tired you are. This factor can be affected by a number of things: terrain, equipment, army's state of health and the battles fought.

If the fatigue number reaches 100 percent, men may begin to die. The dead men's supplies will automatically be distributed evenly among the remaining crew. In these situations you will die last. Fatigue percentage is the average fatigue percent of the entire army.

Encounters

As you enter tombs or castles, or just wander across the land, you are bound to run into other living beings. When this happens, you may retreat. The fighting abilities of beings will vary as much as their domain. Killing these beings can be beneficial: survival, trea-

sure, key piece, and entrance to a tomb or a castle. The outcome of a battle is determined by the relative fighting numbers of the beings and your army, and by the numbers of each. The only exception to this rule is when the army is in the water—then they can't defend themselves. A detailed list of the beings is in the sidebar.

Castles and Tombs

Castle Death Shadow, Castle Grey Stone, and tombs are the locations of treasures and possibly key pieces. You can attempt to conquer a castle or a tomb by killing the beings defending them. In this case you gain the entire treasure. You can also attempt to burglarize a castle, gaining only part of the treasure. To do this a thief must be present in the ranks of the army. After you and your party have left the structure, it will be reinhabited.

Castle Nightshade

Castle Nightshade is the final objective of the game. It is three large connected towers with no windows. The only entrance to the castle is through a locked door that can only be opened with a completed key. A den of fire-drakes protect the castle and its contents. Only when the king is free is the game finished.

Skill Level

The skill level option is added to always make the game a challenge. The greater the number you enter, the tougher the resulting game will be. This number has an effect on randomness of encounters, number of beings per encounter, and the fighting ability of certain beings. ■

David Schmidt, age 16, can be reached at 6513 W. 32nd St., Loveland, CO 80537.

surroundings that an adventurer can step on it before he even perceives it.

The animal spends most of the day motionless to avoid exertion in the heat. At night the animal hunts small rodent-like creatures called podoms. Scorches are often domesticated and herded like cattle to be used as a meat source.

Shadow Beast

Domain: Tomb

Fighting Ability: 12

Special Attributes: None

The shadow beast is a large panther-like animal. The coat of the creature is a sleek black color. It has large white gleaming teeth. The eyes of the shadow beast glow red with an intensity that far surpasses the mere reflection of light.

Few people have ever seen how the beast fights and lived to tell about it. Legend claims that the beast only has to look at a person to kill him, but the shadow beasts actually fight like any other cat.

Because they live in tombs and because their eyes glow red, it is commonly believed the beasts are apparitions from hell. They are never seen outside of a tomb and no one knows what they eat. This legend of the shadow beast coming from hell seems to have a very solid factual basis.

continues on p. 92

Program Listing

```

10 CLEAR100:RANDOM:DEFINTA-Z:DEFDBLP:DIMM(31,31),M$(11),T$(11),P
T$(11),WM$(11),MOS$(11,3),MO$(11,3)
12 CLS:PRINT@464,"":INPUT"ENTER DIFFICULTY FACTOR (1-20)":CT%:I
F(CT%<LORCT%>20)THEN12ELSECLS:PRINT@460,CHR$(23);"*** INITIALIZIN
G ***":FORA=1TO3
17 RESTORE:B=RND(10):FORC=1TOB:READD,E:NEXT:IFM(D,E)=4THEN17ELSE
M(D,E)=4:NEXT:RESTORE:FORA=1TO20:READB:NEXT:FORA=1TO30:READB:FOR
C=1TOB:READD,E,F:IFF=3THENFORG=D-1TOE+1:FORH=A-1TOA+1:IFM(G,H)=0
THENM(G,H)=11:NEXT:NEXTELSENEXT:NEXT
30 FORG=DTOE:IFM(G,A)<>4THENM(G,A)=F:NEXT:NEXT:NEXTELSENEXT:NEXT
:NEXT
35 FORA=1TO4
50 B=RND(30):C=RND(30):IF(M(B,C)>2ANDM(B,C)<11)THEN50ELSEM(B,C)=
5:NEXT:FORA=1TO10
80 B=RND(30):C=RND(30):IF(M(B,C)>2ANDM(B,C)<11)THEN80ELSEM(B,C)=
6:NEXT:FORA=7TO9
110 B=RND(30):C=RND(30):IF(M(B,C)>2ANDM(B,C)<11)THEN110ELSEM(B,C
)=A:CX%(A-6)=B:CY%(A-6)=C:NEXT:FORA=1TO5
116 B=RND(30):C=RND(30):IF(M(B,C)>2ANDM(B,C)<11)THEN116ELSEM(B,C
)=A:TX%(A)=B:TY%(A)=C:NEXT:C=0:D=0:FORA=1TO5
118 B=RND(4):IF(B=CORB=D)THEN118ELSEIFB=1THENC=1ELSEIFB=2THEND=2
ELSEIFB=3THENLH%=LH%+1
119 L(A)=B:NEXT:FORA=0TO10:FORB=1TO3:READC:M$(A)=M$(A)+CHR$(C):N
EXT:NEXT:M$(11)=" . ":FORA=0TO3:FORB=1TO3:READA$,C:MO$(A,B)=A$:M
O$(A,B)=C:MO$(11,B)=A$:MO$(11,B)=C:NEXT:NEXT:FORA=0TO11:READA$:T
$(A)=A$:NEXT:FORA=1TO7:READA$(A),FA$(A),FB$(A),P(A):NEXT:DEFDBL
G,JK
150 X=RND(30):Y=RND(30):IFM(X,Y)>0THEN150ELSEWR%=1:FO%=25:WA%=25
:SW$="SHORT":AR$="LEATHER":G=10000:FT%=15:FT%(1)=10:FT%(2)=5:
FT%(11)=2:WM$(1)=1:FB%=4:PO%=10:TG%=1:TL%=1:CLS
160 PRINT@0,STRING$(63,131);:PRINT@128,STRING$(63,176);:PRINT@78
5,STRING$(46,131);:PRINT@960,STRING$(63,176);:FORA=0TO960STEP64:
PRINT@A,CHR$(191);:PRINT@A+62,CHR$(191);:IFA>128THENPRINT@A+17,C
HR$(191);:IFA<768THENPRINT@A+45,CHR$(191);
180 NEXT:PRINT@65,STRING$(14,"=");"QUEST FOR THE KEY OF NIGHT SH
ADE";STRING$(15,"=");:FORA=194TO898STEP64:READA$:PRINT@A,A$;:NEX
T
190 GOSUB200:GOTO210
200 PRINT@200,X;:PRINT@206,Y;:PRINT@209,CHR$(191);:PRINT@267,T$(
M(X,Y));:PRINT@333,K;:PRINT@391,"":PRINTUSING"***,#####";G;:P
RINT@458,T;:PRINT@523,WR%;:PRINT@585,SW$;:PRINT@649,AR$;:PRINT@7
14,FA$;"%";:PRINT@775,FO%;:PRINT@840,WA%;:PRINT@906,PO%;:RETURN
210 C=210:PRINT@210,"":FORA=Y-4TOY+4:FORB=X-4TOX+4:IF(A<LORA>30
ORB<LORB>30)THENPRINT" + ";ELSEPRINTM$(M(B,A));
220 NEXT:C=C+64:PRINT@C,"":NEXT
222 IF(M(X,Y)=5ORM(X,Y)=6)THEN800ELSEIFM(X,Y)=3THENWA%=25:FT%(3)
=2*FT%:PRINT@859,"* WATER SUPPLIES REFILLED *":GOSUB8500:GOSUB2
00
225 IFM(X,Y)=7THENA$="CASTLE DEATH SHADOW":GOSUB2490ELSEIFM(X,Y)
=8THENA$="CASTLE GREY STONE":GOSUB2490ELSEIFM(X,Y)=9THENGOSUB290

```

Listing continues



First in
Its Class
and
Looking
for
Work.

TRS-80 Model I, II, III

Five multiple regression procedures (including stepwise, backward elimination, all subset, and ridge), 24 transformations, comprehensive data base manager (with search and sort), descriptive statistics, hypothesis testing (7 tests), time series analysis (7 models), random variate generation, discrete probability distributions, sampling distributions, nonparametrics (5 tests), and complete documentation.

Complete package with manual — \$125
To order, send payment plus \$2.00 shipping and handling to:

Quant Systems

P.O. Box 628
Charleston, S.C. 29402
803-571-2825

S.C. residents add 4% sales tax
Overseas orders add \$7 for shipping

Listing continued

```

0ELSEIFM(X,Y)=10THENGOSUB2600
226 IFRND(3+INT(CT%/5))=1THENGOSUB6005
227 FORA=16438TO16441:POKEA,0:NEXT
228 IFFA%>69THENPRINT@867,"** WARNING **";:PRINT@926,"- FATIGUE
LEVEL HIGH -";:GOSUB8500
230 GOSUB4000:PRINT@245,"N";:PRINT@309,"I";:PRINT@369,"W";:CHR$(
93);" + ";CHR$(94);" E";:PRINT@437,CHR$(92);:PRINT@501,"S";:IFM(
X,Y)=3THENI=627:GOSUB1750:GOTO250ELSEPRINT@562,"(R) EST";
235 IFPO%>0THENPRINT@623,"(T)AKE POTION";:I=756:GOSUB1750ELSEI=6
92:GOSUB1750
250 IFAS="N"THEN260ELSEIFA$="E"THEN270ELSEIFA$="S"THEN280ELSEIFA
$="W"THEN290ELSEIF(A$="R"ANDM(X,Y)<>3)THEN300ELSEIF(A$="T"ANDPO%
>0ANDM(X,Y)<>3)THEN340ELSEGOSUB500
252 GOSUB2000:GOTO250
260 IFY-1<1THEN310ELSEDE=0:E=-1:GOTO320
270 IFX+1>30THEN310ELSEDE=1:E=0:GOTO320
280 IFY+1>30THEN310ELSEDE=0:E=1:GOTO320
290 IFX-1<1THEN310ELSEDE=-1:E=0:GOTO320
300 PRINT@868,"<< REST >>";:GOSUB8500:D=0:E=0:FA%=FA%-30:FT%=FT%
(M(X,Y)):IFFA%+FT%+FT%(M(X,Y))<0THENFA%=0:FT%=FT%(M(X,Y)):GOTO32
0ELSE320
310 PRINT@850,"- EXPLORATION INTO AND BEYOND THE PERIMETER";:PRI
NT@922,"WILL AVAIL YOUR QUEST NOTHING.";:GOSUB8500:GOTO226
320 FA%=FA%+FT%+FT%(M(X,Y)):FO%=FO%-1:WA%=WA%-1:WM%(M(X,Y)):IF(F
O%<LANDA$="R")THENFA%=FA%+3ELSEIFFO%<1THENFA%=FA%+6
325 IF(FO%<LANDA$="R")THENFA%=FA%+2ELSEIFWA%<1THENFA%=FA%+5
326 IFWA%=0THENPRINT@863,"- WATER SUPPLY GONE -";:GOSUB8500
327 IFFO%=0THENPRINT@863,"- FOOD SUPPLIES OUT -";:GOSUB8500
330 X=X+D:Y=Y+E:IFWA%<-4THEN360ELSEIFFO%<-7THEN350
335 IFFA%>99THEN370
337 IFAS="R"THENGOSUB200:GOTO227ELSE190
340 PO%=PO%-1:FA%=0:PRINT@861,"+ ELIXIR POTION TAKEN +";:PRINT@9
17,"- YOU ARE NOW RESTORED TO 0 % FATIGUE.";:GOSUB8500:GOSUB200:
GOTO227
350 PRINT@865,"** STARVATION **";:PRINT@932,"- ALL DIE -";
355 GOTO8700
360 PRINT@865,"** DEHYDRATION **";:PRINT@932,"- ALL DIE -";
365 GOTO8700
370 FA%=95:PRINT@866,"** EXHAUSTION **";:IFM(X,Y)=3THEN700ELSEA=
RND(WR%+T+1):IFA=WR%+T+1THEN390ELSESET=T-A:IFT<0THENWR%=WR%+T:T=0
375 IFWR%=0THEN400
380 FO%=FO%+FO%*A/(WR%+T):WA%=WA%+WA%*A/(WR%+T):PO%=PO%+PO%*A/(W
R%+T)
381 IFFO%>25THENFO%=25
382 IFWA%>25THENWA%=25
383 IFPO%>10THENPO%=10
385 IFA=1THENPRINT@930,"- 1 MAN DIES -";:GOTO387
386 PRINT@930,"-";:A;"MEN DIE -";
387 GOSUB8500:GOTO190
390 PRINT@931,"- NONE DIE -";:GOSUB8500:GOTO190
400 PRINT@932,"- ALL DIE -";
410 GOSUB8700
500 PRINT@864,"- INPUT ERROR -";:GOSUB8500:RETURN
700 PRINT@931,"- ALL DROWN -";
710 GOSUB8700
800 PRINT@857,"- YOU HAVE JUST ENTERED A ";:IFM(X,Y)=5THENPRINT"
CITY -";ELSEPRINT"TOWN -";
810 GOSUB8500:GOSUB4000:PRINT@239,"- DO YOU WISH";:PRINT@303,"TO
GO TO THE";:PRINT@367,"MARKET PLACE?";:I=499:GOSUB1740
820 GOSUB1610:IFA$="Y"THEN830ELSE230
830 PRINT@856,"- WHAT DO YOU WISH TO PURCHASE?";:GOSUB8500:GOSUB
4000:PRINT@240,"(A)RMOR";:PRINT@304,"(F)OOD UNITS";:PRINT@368,"
(I)NFO";:PRINT@432,"(M)EN";:PRINT@496,"(S)WORDS";
835 PRINT@560,"(P)OTIONS";:PRINT@624,"(W)ATER UNITS";:I=756:GOSU
B1750:IFA$="A"THEN840ELSEIFA$="E"THEN880ELSEIFA$="I"THEN980ELSEI
FA$="M"THEN920ELSEIFA$="S"THEN900ELSEIFA$="P"THEN890ELSEIFA$="W"
THEN885ELSEGOSUB500:GOTO835
840 GOSUB6000:PRINT@367,"(L)EATHER";:PRINT@431,"(C)HAINMAIL";:PR
INT@495,"(F)ULLPLATE";:I=628:GOSUB1750:IFA$="L"THENFTG%=1ELSEIFA$
="C"THENFTG%=2ELSEIFA$="F"THENFTG%=3ELSEGOSUB500:GOTO840
850 P=P(TG%):P=P*(WR%+T):GOSUB1100:H#P:GOSUB2300:IFP=H#THENGOSU
B1400ELSEGOSUB1200
860 GOSUB1600:IFA$="N"THEN1700ELSEIFP<=GTHENG=G-P:AR$=AR$(TG%):G
OTO1700ELSE1800
870 GOSUB3000:IFN+E>DTHEN3050ELSEIFN=0THEN1700ELSEP=F*N*(WR%+T):
GOSUB1100:GOSUB1400:GOSUB1600:IFA$="N"THEN1700ELSEIFP>GTHEN1800E
LSEG=G-P:IFE<0THENE=N:RETURNELSEE=E+N:RETURN
880 D=25:E=FO%:F=3:GOSUB870:FO%=E:GOTO1700
885 D=25:E=WA%:F=1:GOSUB870:WA%=E:GOTO1700
890 D=10:E=PO%:F=20:GOSUB870:PO%=E:GOTO1700
900 GOSUB6000:PRINT@367,"(S)HORSTWORD";:PRINT@431,"(L)ONGSWORD";
:PRINT@495,"(B)ROADSWORD";:PRINT@559,"(T)WO-HANDED";:I=692:GOSUB
1750:IFA$="S"THENFTL%=4ELSEIFA$="L"THENFTL%=5ELSEIFA$="B"THENFTL%=6
ELSEIFA$="T"THENFTL%=7ELSEGOSUB500:GOTO900
905 P=P(TL%):P=P*(WR%+T):GOSUB1100:H#P:GOSUB2400:IFP=H#THENGOSU
B1400ELSEGOSUB1200
910 GOSUB1600:IFA$="N"THEN1700ELSEIFP<=GTHENG=G-P:SW$=AR$(TL%):G

```

Listing continues

LARGECAPACITYSYSTEMSLARGECAPACITYSYSTEMS

SMALL & (REQ. 32K 2 DISKS)
LARGE CAPACITY MI PROGRAMS MIII
ON TDOS (A MINI DOSPLUS)
ACCOUNTS RECEIVABLE
5000+ CUSTOMERS
15000+ TRANSACTIONS
BALANCE FORWARD 99 TRANSACT CODES
30-60-90-120 AGED STATEMENTS SHOW
DATE/INV#/DESCRIP/AMT (WITH AGEING)
SELECTIVE FINANCE CHARGES & RATES
FAST ENTRY POSTING W/AUDIT REPORT
SUB-ACCTS % OF CREDIT LIMIT DATE OF
LAST PAYMENT SALES ANALYSIS SPECIAL
90 DAY ACCOUNTS LABELS

\$149.95

GENERAL LEDGER
400+ ACCOUNTS
5000+ TRANSACTIONS/MONTH
NO OTHER SYSTEM OFFERS...
+ REPORT FLEXIBILITY/CAPACITY
+ DEPARTMENT P & L (UP TO 5)
+ UNLIMITED ACCOUNT CATEGORIES
+ STATEMENT OF CHANGES (ASSETS)
+ PERCENT P&L comparison
100% sales MTD vs YTD
or net sales QTD vs YTD
or total Exp. MTD vs QTD

\$149.95
TEST SETS \$50.00 MANUALS \$30.00
HOLMAN D-P SERVICE
2059 WEST LINCOLN 3.00 S&H
OROVILLE, CA 95965 VISA OR MC
916-533-5992 COD

Both for \$199.95 ✓355

MSLARGECAPACITYSYSTEMSLARGECAPACITYSYSTEMS



DAISY WHEEL

New Smith Corona TP-1

True letter quality printer for less than the cost of an office typewriter! Priced \$500 less than other popular daisy wheel printers!

SALE PRICE:
\$599.00

FEATURES:

- ★ Friction feed
- ★ 15 cps, 120 wpm
- ★ Changeable daisy wheels
- ★ Parallel or serial interface
- ★ Compatible with R/S, Apple, etc.



SUNLOCK SYSTEMS
4217 Carolina Ave.
Richmond, Va. 23222

ADDITIONAL PRINTER SPECIALS

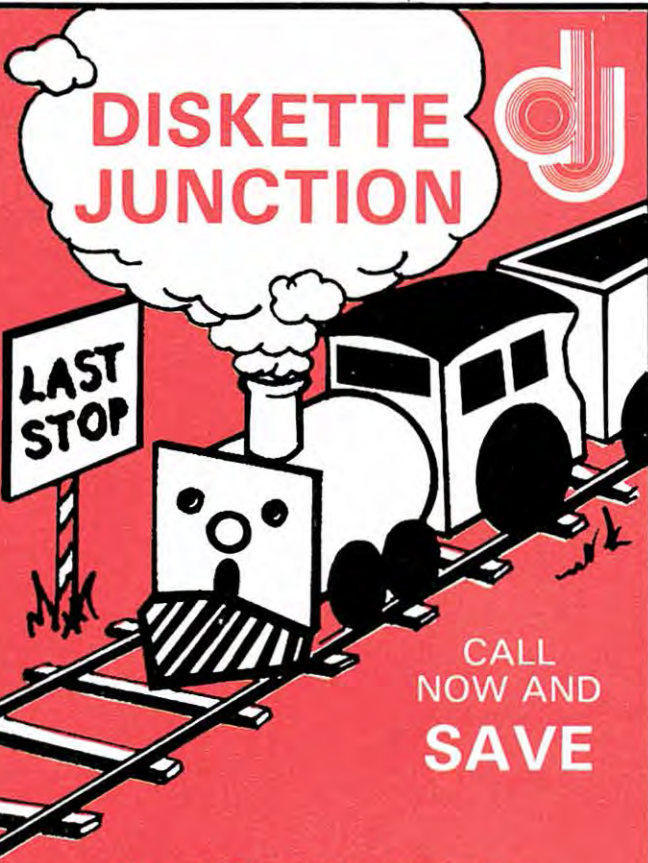
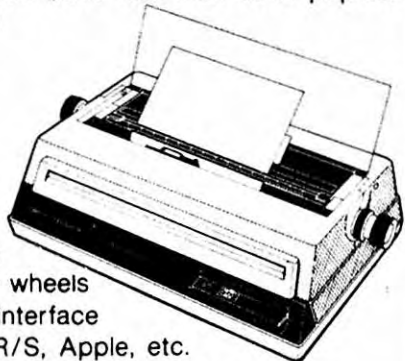
Epson	Okidata	C.Itoh (par)	(ser)
MX80 \$469	82A \$429	8510 \$479	\$579
80FT 519	83A 659	1550 699	749
MX100 699	84A 1025	F10-40 1395	1395
	84S 1150	F10-55 1695	1695

WE WILL MEET OR BEAT ANY ADVERTISED PRICE

TO ORDER CALL TOLL FREE 800-368-9191

In Virginia call 804-321-9191

We accept MasterCard, Visa and CODs ✓456



CALL
NOW AND
SAVE

Scotch® DISKETTES

\$22.50 per box of 5 1/4"

1 side/D Density (744D-O) diskettes
compatible with Verbatim (MD525-01)

Scotch® Head Cleaning Kits
5 1/4" and 8" Kits
\$19.95 each

DISKETTE-JUNCTION stocks a complete line of **3M** magnetic media including 96TPI Quad Density. Call now to order the **Scotch®** diskette for your equipment.

TOLL FREE
800-321-5134
OHIO RESIDENTS CALL
800-362-5134

DISKETTE JUNCTION ✓5
5918 Smith Rd. • Cleveland, Ohio 44142

- WE ACCEPT
VISA • MASTER CHARGE • CHECKS
MONEY ORDERS • C.O.D.
- Add \$3.00 for shipping & handling.
 - \$2.00 EXTRA for U.S. Mail delivery.
 - \$3.00 EXTRA for C.O.D.
 - Ohio residents add 6.5% sales tax.

Authorized Distributor
Information Processing Products



NEW for the Color Computer TRS-80

'COCOCASSETTE' SUBSCRIPTION SOFTWARE

• TRS 80 IS A TRADEMARK OF TANDY COMPANY



ENJOY A MONTHLY COLLECTION OF 8-10 PROGRAMS!

Including games, education, home finance and more; on cassette for as low as \$5.00 a month! Add some action and imagination to your Color Computer... Best of all, we do the work!

PRICES

1 YR (12 ISSUES) . . \$55.00
6 MO (6 ISSUES) . . \$30.00
SINGLE COPIES . . \$ 6.00

—MICHIGAN RESIDENTS ADD 4% TO ORDER
—OVERSEAS ADD \$10.00 TO SUBSCRIPTION AND \$1.00 TO SINGLE COPIES

616 396-7577



PROGRAMS ARE FOR
EXTENDED BASIC
MODEL ONLY ISSUES
ARE SENT FIRST CLASS

✓408

SUBSCRIPTION SOFTWARE



SEND CHECK OR MONEY ORDER TO:



T & D SOFTWARE P.O. BOX 256-C • HOLLAND, MICH 49423

COLOR COMPUTER

ONLY \$19.95 TWO FOR \$37.95



★ ★ JOYSTICKS ★ ★

Tired of broken joysticks? Our **affordable** units are built to **last**, with good smooth pots, and a **strong** lever and internal mechanism. These are **superior** to the Radio Shack design. Get your joystick programs working the way they **should!**

Up to **20% OFF** on software.
We stock excellent programs from **Prickly Pear, Tom Mix, Mark Data, and Others.**

KONG IS HERE!
Donkey King (32k) (Tom Mix's) \$24.95
4 screens-full action

Write or call for free catalog.
Add \$2.00 shipping on Joysticks. We pay shipping on software. \$1.50 additional for C.O.D.

ENDICOTT SOFTWARE ✓283
P. O. Box 12543, Huntsville, AL 35802

205/881-0506




DO YOU HAVE 2 PRINTERS?



Now you can have **2 PRINTERS ON-LINE** at all times. Our **MODEL 80 LINE PRINTER SWITCH** is designed for the TRS-80 computer to allow the user to easily select between two printers by means of a conveniently located switch without changing cables. Our compact module connects to the parallel printer port of your Model I or Model III, through a printer port extension cable and provides a card-edge connector for each of your two printers. Gold plated contacts ensure excellent connection reliability. Our Model 80 switch comes assembled, tested, and ready to use for the low cost of \$52 including shipping to any U.S. destination. A printer port extension cable is available from us at a cost of \$12.50 for the Model I/III. Call now for more information. Request application note AN-B21 for Model I/III use. ✓409

hf signalling inc.

5114 Bristol Ave., Kansas City, MO 64129
1-816-861-4448

TOLL FREE 1-800-831-4448





Maxell Diskettes



The floppy disks that meet or exceed every standard of quality. Dealer inquiries invited.

**Call Toll Free
1-800-237-8931.**

**In Florida, call
813-577-2794.**



Tech Data Corporation
3251 Tech Drive North
St. Petersburg, FL 33702 ✓440

continued from p. 89

Sneeth

Domain: Open
Fighting Ability: 10
Special Attributes: None

The sneeth is 2 meters long and closely resembles a terrestrial badger. The creature's torso is covered with a 5-centimeter thick calcium carapace. Two large tusks protrude from the lower jaw. The animal has a long powerful tail that resembles the tail of a rat.

The sneeth's main attack strength lies in its ability to teleport from location to location. The creature will use its tusks to thrust up and gore the opponent in battle. The sneeth will also use its tail as a weapon, flailing it about like a mace.

The sneeth is primarily a subterranean creature with poor eyesight and superb hearing. Ground hogs and other small rodents are the sneeth's primary sustenance. The animal is attracted to shiny or curious objects and will fight if necessary to obtain them.

Terolt

Domain: Open
Fighting Ability: 6
Special Attributes: Treasure carrying

The terolt is a meter-tall humanoid. Its body is covered with black hair, while the head of the beast is covered with long white hair. A vicious-looking pug face frames two rows of small razor-sharp teeth. The beast has long arms and fingers tipped with large claws. The terolt is armed with nothing but a celebus, a small sharp knife. Although small and squat in stature, the terolt is still very strong.

The greatest fighting strength of the creature is its ability to move with silent speed. It can remain motionless, hiding in bushes or trees, for up to three hours. Once the victim has almost stepped on it, the terolt will launch itself towards the prey. Landing on the prey, the terolt will plunge its celebus into the victim's body many times. Although experts at ambush, the beasts can't fight well when confronted in the open.

The terolt is nocturnal, sleeping

during the day in caves and hunting at night. It hunts for three reasons: treasure, food, and sport. The heads of its kills adorn the walls of its cave.

Wolfaut

Domain: Mountains
Fighting Ability: 7
Special Attributes: None

The wolfaut looks like a 2-meter tall horse, although it is actually more like a wolf. The beast is black in color and is very heavysset. Being a carnivore, it has numerous sharp teeth. The wolfaut also has a horn in the middle of its forehead.

The wolfaut fights using its horn and its teeth. Given the chance, the beast will also attempt to trample its prey. The creature is powerful in battle and eats everything that it kills.

The wolfaut usually hunts in packs. Humans and humanoids are natural prey, as are other creatures. Although resembling a horse, wolfauts are far too dangerous to be used as a mount.

Xantau

Domain: Mountains
Fighting Ability: 14
Special Attributes: Edible

The xantau is a 5-meter long carnivore that resembles a terrestrial tiger. This beast has large front teeth and an extremely powerful set of jaws. When standing on its hind legs, the xantau can attain a height of over 8 meters, allowing it to see over the tops of most smaller trees.

The xantau is one the most dangerous beasts in the Land of Nightshade. Even though the creature is of tremendous size, it still possesses great speed and agility. The coat of the xantau is so thick that most swords can't even penetrate it. In battle the creature fights with his teeth and claws.

Xantaus live in caves far removed from settlements of human beings. They are extremely protective of their families and will fight to all ends to protect them. They primarily eat wolfauts and other large forest-dwelling beasts.

The flesh of the xantau produces no ill effects when eaten by man; in fact, it is often used for medicinal purposes. ■

```

OTO1700ELSE1800
920 GOSUB6000:PRINT@368,"(T)HIEVES";:PRINT@432,"(W)ARRIORS";:I=5
64:GOSUB1750:IFA$="T"THENP=675:E=1ELSEIFA$="W"THENP=550:E=2ELSE
OSUB500:GOTO920
930 GOSUB3000:IFN=0THEN1700ELSEP=P*N:H#=P:GOSUB2300:GOSUB2400:IF
P=H#THENGOSUB1400ELSEGOSUB1200
940 GOSUB1600:IFA$="N"THEN1700ELSEIFP<GTHENG=G-P:SW$="NONE
":AR$="NONE":TG$=0:TL$=0:FO$=(FO*(WR%+T))/(WR%+T+N):WA$=(WA*(
WR%+T))/(WR%+T+N):PO$=(PO*(WR%+T))/(WR%+T+N):FA$=(FA*(WR%+T)
)/(WR%+T+N)ELSE1800
945 IFE=1THENT=T+N:GOTO1700ELSEWR%=WR%+N:GOTO1700
980 P=100:GOSUB1100:GOSUB1400:GOSUB1600:IFA$="N"THEN1700ELSEIFP>
GTHEN1800ELSEG=G-P:PRINT@851,"- ONE MOMENT PLEASE. I WILL ASK A
ROUND TO";:PRINT@915,"SEE IF ANYONE KNOWS WHERE A PIECE IS.";:FO
RA=1TO3000:NEXT:GOSUB8500
982 P=2000:GOSUB1100:IFRND(5)>1THEN990ELSEB=RND(5):IFL(B)=4THEN9
90ELSEIFL(B)=3THENC=RND(LH%):E=TX%(C):F=TY%(C):P=P+500
984 PRINT@851,"- I HAVE FOUND THE LOCATION OF A KEY PIECE.";:GOS
UB1400:GOSUB1600:IFA$="N"THEN1700ELSEIFP>GTHEN1800ELSEG=G-P:IFL(
B)=3THENPRINT@851,"- A PIECE LAYS IN A TOMB LOCATED";:GOSUB5050:
FORA=1TO1500:NEXT:GOSUB8500:GOTO1700
986 IFL(B)=1THENA$="DEATH SHADOW"ELSEA$="GREY STONE"
988 PRINT@851,"- A PIECE OF THE KEY LAYS IN THE TREASURES";:PRIN
T@915,"OF THE CASTLE ";A$;". ";:FORA=1TO1500:NEXT:GOSUB8500:GOTO1
700
990 PRINT@851,"- I AM SORRY, I CAN NOT FIND THE LOCATION";:PRINT
@915,"OF A KEY PIECE.";:FORA=1TO1500:NEXT:GOSUB8500:GOTO1700
1100 IFM(X,Y)=5THENRETURNELSEP=INT(P+(P/3)):RETURN
1200 PRINT@862,"- WITH TRADE IN --";:IFP<1THENP=0:GOSUB1500:RET
URNELSEGOSUB1400:RETURN
1400 PRINT@922,"* COST =";P;"GOLD PIECES *";:GOSUB8500:RETURN
1500 PRINT@923,"* THERE WILL BE NO COST *";:GOSUB8500:RETURN
1600 GOSUB4000:PRINT@238,"- DO YOU ACCEPT";:PRINT@304,"THE OFFER
?";:I=435:GOSUB1740
1610 IFA$="Y"ORAS$="N") THENRETURNELSEGOSUB500:GOSUB2000:GOTO1610

1700 FT%=FA%(TG%)+FA%(TL%)+15:FB%=FB%(TG%)+FB%(TL%)+1:GOSUB200:G
OSUB4000:PRINT@238,"- WILL THERE BE";:PRINT@303,"ANYTHING ELSE?"
;:I=435:GOSUB1740:GOSUB1610
1710 IFA$="N"THEN230ELSE830
1740 PRINT@I,"(Y)ES";:PRINT@I+64,"(N)O";:I=I+192
1750 PRINT@I,"COMMAND-";:I=I+8:GOSUB2000:RETURN
1800 PRINT@856,"- YOU DON'T HAVE ENOUGH GOLD --";:GOSUB8500:GOT
O1700
2000 A$="":PRINT@I,CHR$(32);:PRINT@478,STRING$(2,191);CHR$(149);
:FORA=1TO50:A$=INKEY$:IFA$<>" "THENRETURNELSENEXT:PRINT@I,CHR$(14
3);:PRINT@478,M$(M(X,Y));:FORA=1TO50:A$=INKEY$:IFA$<>" "THENRETUR
NELSENEXT:GOTO2000
2300 A$=LEFT$(AR$,1):IFA$="N"THENRETURNELSEIFA$="L"THENP=P-35*(W
R%+T):RETURNELSEIFA$="C"THENP=P-150*(WR%+T):RETURNELSEP=P-275*(W
R%+T):RETURN
2400 A$=LEFT$(SW$,1):IFA$="N"THENRETURNELSEIFA$="S"THENP=P-30*(W
R%+T):RETURNELSEIFA$="D"THENP=P-65*(WR%+T):RETURNELSEIFA$="B"THE
NP=P-180*(WR%+T):RETURNELSEP=P-200*(WR%+T):RETURN
2490 GOSUB2800
2500 GOSUB4000:GOSUB2700:PRINT@432,"(A)TTACK";:IFT>0THENPRINT@49
6,"(B)URGLARIZE";:PRINT@560,"(C)ONTINUE ON";:I=692ELSEPRINT@496,
"(C)ONTINUE ON";:I=628
2510 GOSUB1750:IFA$="A"THEN2520ELSEIF(A$="B"ANDT>0) THEN2530ELSEI
FA$="C"THENRETURNELSEGOSUB500:GOTO2500
2520 B$="SOLDIER":N=RND(CT%*5)+CT%*5:B=15:GOSUB7000:PRINT@866,"*
BATTLE! *";:GOSUB8500:GOSUB7500:J=RND(N*3000)+N*1000:C=0:FORA=1
TO5:IFL(A)=M(X,Y)-6THENC=1:L(A)=0:GOSUB7600:GOTO6020ELSENEXT:GOS
UB7600:GOTO6020
2530 IFRND(3)=1THENPRINT@850,"** YOUR THIEF HAS BEEN CAUGHT AND
KILLED **";:GOSUB8500:T=T-1:GOSUB200:GOTO2500ELSEIFRND(5)>1THEN2
550ELSEPRINT@851,"- YOUR THEIF STOLE THE TREASURE AND RAN";:PRIN
T@915,"OFF WITH IT.";:GOSUB8500:T=T-1
2540 FORA=1TO5:IFL(A)=M(X,Y)-6THENL(A)=4:GOSUB200:GOTO2500ELSENE
XT:GOSUB200:GOTO2500
2550 PRINT@851,"- YOUR THIEF STOLE THE TREASURE AND";:PRINT@915,
"RETURNED IT TO YOU.";:GOSUB8500:J=RND(N*3000)+N*1000:C=0:FORA=1
TO5:IFL(A)=M(X,Y)-6THENC=1:L(A)=0:GOSUB7600:GOSUB200:RETURNELSEN
EXT:GOSUB7600:RETURN
2600 A$="AN ANCIENT TOMB":GOSUB2800:GOSUB4000:GOSUB2700:PRINT@43
2,"(C)ONTINUE ON";:PRINT@496,"(E)NTER TOMB";
2610 I=628:GOSUB1750:IFA$="C"THENRETURNELSEIFA$="E"THEN2620ELSEG
OSUB500:GOTO2610
2620 B$="SHADOW BEAST":N=RND(CT%*4)+CT%*4:B=12:GOSUB7000:PRINT@8
61,"* YOU ARE ATTACKED! *";:GOSUB8500:GOSUB7500:J=RND(N*2000)+N*
750:C=0
2630 FORA=1TO5:IFL(A)<>3THENNEXT:GOSUB7600:GOTO6020:RETURNELSEFO
RA=1TO5:IF(TX%(A)=XANDTY%(A)=YANDA<=LH%) THENFORB=ATO4:TX%(B)=TX
%(B+1):TY%(B)=TY%(B+1):NEXT:LH%=LH%-1:L(A)=0:C=1:GOSUB7600:GOTO60
20ELSENEXT:GOSUB7600:GOTO6020
2700 PRINT@239,"- WHAT DO YOU";:PRINT@303,"WISH TO DO?";:RETURN
2800 PRINT@851,"- YOU HAVE COME UPON ";A$;"!";:GOSUB8500:RETURN
    
```

Listing continues

SFINKS 3.0 CHESS PROGRAM



PRIZE WINNER
1981 Paris
World
Microcomputer
Chess
Championship

the
finest
available!
See 80 U.S.
June 1982

- 32 book openings
- chess clock
- printer output
- problem mode
- audio alert
- thinking on opponent's time
- infinite levels

32K
Model 1 (E.I.)
or Model 3
tape or disk
only
\$39.95

SFINKS 1.81

Plays Chess
Pre-Chess and
Transcendental
Chess

PRIZE WINNER
1980 San Jose
U.S.
Microcomputer
Chess
Championship

- nine levels
- problem mode
- move suggestion
- move take back
- audio alert
- good documentation

32K
Model 1 or 3
tape or disk
only
\$24.95

SFINKS CHESS TUTOR

Learn to
play chess

Step-by-Step
Programmed
Learning
for the
Newcomer

- tutor
- 3 level game
- problem mode
- audio alert
- printer output
- book openings
- superb graphics

32K
Model 1 or 3
disk only
only
\$19.95

Please specify
tape or disk and
Model 1 or 3
Include \$2.00
Shipping
WILLIAM FINK
SUITE 248
1105 N. MAIN ST.
GAINESVILLE, FL
32601

**EXCEPTIONAL
DEALER
DISCOUNTS**
(904) 377-4847

SFINKS

MICROSETTE

DISKETTES CASSETTES



We now offer 5/4-inch single sided, soft sector, single or double density diskettes, in addition to our quality short length cassettes.

Our Prices Include Boxes and Shipping

CASSETTES

Item	10 Pack	50 Pack
C-10	\$ 7.50	\$ 32.50
C-20	9.00	39.00
C-60	11.00	50.00
C-90	15.00	70.00

DISKETTES 5 1/4-inch

MD-5	\$25.00	\$110.00
------	---------	----------

UPS shipment in continental U.S.A. only.
We cannot ship to P. O. Boxes.

Item	Qty.	Price	Total
SUBTOTAL			
Calif. Cust. add Sales Tax			
TOTAL			

Shipping address enclosed
 Check or money order enclosed
 Charge to: Visa MasterCard
 Account No. _____
 Expiration Date _____
 Signature _____

MICROSETTE CO.

475 Ellis St., Mt. View,
CA 94043 (415) 968-1604

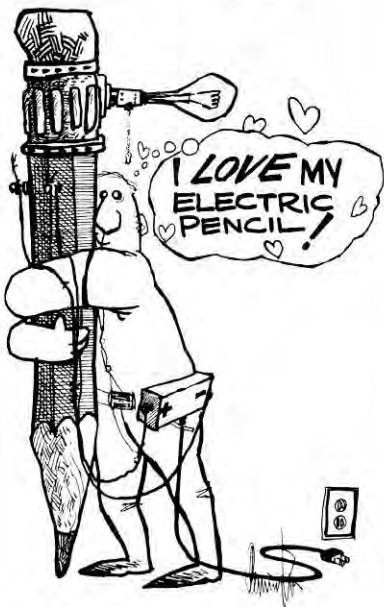
✓312

Listing continued

```

2900 A$="CASTLE NIGHT SHADE":GOSUB2800:GOSUB4000:PRINT@239,"- DO
YOU WISH?";PRINT@303,"TO ENTER THE";:PRINT@367,"CASTLE?";:I=499
:GOSUB1740:GOSUB1610:IFA$="N"THENRETURN
2910 IFK<5THENPRINT@851,"- YOU NEED A COMPLETED KEY TO GAIN ENTR
ANCE";:PRINT@915,"TO CASTLE NIGHT SHADE.";:FORA=1TO1500:NEXT:GOS
UB8500:RETURNELSEPRINT@851,"** YOU HAVE SUCCESSFULLY GAINED ENTR
ANCE **";:GOSUB8500:
2920 B$="FIREDRAKE":N=CT%*2:B=CT%*20+RND(20):GOSUB7000:PRINT@866
,"* BATTLE! *";:GOSUB8500:GOSUB7500:PRINT@855,"** YOU HAVE COMPL
ETED YOUR QUEST! **";:PRINT@915,"- THE KING IS SAVED AND THE LAN
D IS FREED!";
2930 GOTO8700
3000 K(1)=-1:K(2)=-1:GOSUB6000:PRINT@239,"- HOW MANY DO";:PRINT@
306,"YOU WISH?";:PRINT@431,"<ENTER> ENTERS";:PRINT@495,"<CLEAR>
ERASES";:PRINT@630,"";:I=630
3010 GOSUB2000:IF(ASC(A$)>47ANDASC(A$)<58)ORA$=CHR$(13)ORA$=CHR
$(31)THEN3020ELSEGOSUB500:GOTO3010
3020 IF<632THEN3030ELSEIFA$=CHR$(31)THEN3000ELSEIFA$=CHR$(13)TH
EN3040ELSE3010
3030 IFA$=CHR$(31)THEN3000ELSEIFA$=CHR$(13)THEN3040ELSEPRINT@I,A
$;:I=I+1:K(I-630)=VAL(A$):GOTO3010
3040 IFK(2)=-1THENN=K(1):RETURNELSEN=K(1)*10+K(2):RETURN
3050 PRINT@854,"<< A MAN CAN'T CARRY MORE THAN";D;" >>";:GOSUB85
00:GOTO8700
4000 FORA=238TO750STEP64:PRINT@A,CHR$(207);:NEXT:RETURN
5050 PRINT@915,"AT MAP X:";E;" Y:";F;:FORA=1TO3000:NEXT:GOSUB850
0:RETURN
6000 GOSUB4000:PRINT@239,"- WHICH TYPE?";:RETURN
6005 E=RND(3):B$=MO$(M(X,Y),E):IFB$=" "THENRETURNELSEN=RND(CT%*5)
:B=MO(M(X,Y),E):GOSUB7000:IFM(X,Y)=3THENPRINT@861,"* YOU ARE ATT
ACKED! *";:GOSUB8500:GOSUB7500:GOSUB2000:RETURN
6010 GOSUB4000:PRINT@239,"- DO YOU WISH?";:PRINT@303,"TO ENGAGE?
";:I=435:GOSUB1740:GOSUB1610:IFA$="N"THENIFRND(7)>1THENRETURNELS
EPRINT@852,"* ATTEMPT TO DISENGAGE IS UNSUCCESSFUL *";:GOSUB8500
6015 PRINT@866,"* BATTLE! *";:GOSUB8500:GOSUB7500:C=0:IFE=2THENP
RINT@858,"* FOOD SUPPLY REPLENISHED *";:GOSUB8500:FO%=25ELSEIFE=
3THEN6020ELSEJ=N*D*(RND(300)+100):F=RND(5):IF(L(F)=4ANDRND(3)=1)
THENC=1:L(F)=0:GOSUB7600ELSEGOSUB7600
6020 FA%=FA%+30:IFFA%>99THENFA%=99:GOSUB200:RETURNELSEGOSUB200:R
ETURN
7000 PRINT@863,"-= ENCOUNTER -=";:GOSUB8500:PRINT@863,"* TYPE: "
;B$;:PRINT@927,"* NUMBER:";N;:FORA=1TO1500:NEXT:GOSUB8500:RETURN
7500 C=FB%+RND(3)-INT(FA%/45):D=B+(2-RND(3)):F=INT(N*D/C):H=INT(
(WR%+T)*C/D):IFM(X,Y)=3THENH=0ELSEIFP>(WR%+T)THENF=WR%+T
7510 IFH>NTHENH=N
7520 T=T-F:IFT<0THENWR%=WR%+T:T=0
7530 PRINT@863,"MEN KILLED:";F;:PRINT@927,B$;"S KILLED:";H;:FORA
=1TO1000:NEXT:GOSUB8500:IFWR%>0THENPRINT@860,"* YOU ARE VICTORIO
US! *";:GOSUB8500:RETURNELSEPRINT@861,"* YOU ARE DEFEATED *";
7540 GOTO8700
7600 G=G+J:PRINT@852,"* TREASURE COLLECTED:";J;"GOLD PIECES *";:
IFC=1THENPRINT@923,"* AND A PIECE OF THE KEY *";:K=K+1:GOSUB8500
:RETURNELSEGOSUB8500:RETURN
8500 FORA=1TO1200:NEXT:PRINT@850,CHR$(236);:PRINT@914,CHR$(236)
:RETURN
8700 GOSUB8500:GOSUB4000:PRINT@239,"- DO YOU WISH?";:PRINT@303,"T
O PLAY AGAIN?";:I=435:GOSUB1740
8710 GOSUB1610:IFA$="Y"THENRUNELSENEW
9000 DATA1,1,22,5,24,9,22,12,22,16,26,20,20,23,16,24,18,28,27,2
8
10000 DATA3,8,10,2,15,18,1,21,21,3,3,10,11,2,14,19,1,21,21,3,3,9
,9,2,14,19,1,21,22,3,3,8,9,2,15,18,1,21,24,3,5,6,8,3,9,10,2,17,1
7,1,22,22,3,24,24,3,4,5,9,3,10,11,2,22,22,3,24,24,3,3,4,9,3,10,1
2,2,22,24,3,3,4,10,3,11,11,2,24,24,3,3,5,9,3,10,10,2,24,24
10010 DATA3,4,6,6,3,7,10,2,15,17,3,24,24,3,3,6,8,2,16,18,3,22,24
,3,3,6,6,2,16,16,3,22,22,3,2,7,8,2,21,22,3,2,8,9,2,21,23,3,2,8,1
0,2,21,22,3,2,8,8,2,22,22,3,3,8,10,2,22,22,3,24,24,2,3,7,7,2,9,1
0,2,22,26,3,3,9,9,2,23,25,2,26,26,3,4,8,9,2,13,14,1,23
10020 DATA24,2,26,26,3,4,9,10,2,13,15,1,22,24,2,26,26,3,5,11,11,
2,13,14,1,16,20,3,23,24,2,25,26,3,6,11,11,2,13,13,1,15,17,3,20,2
0,3,23,23,2,25,25,3,4,9,10,2,12,14,1,16,16,3,20,27,3,5,8,9,2,10,
15,1,16,17,3,23,23,2,27,27,3,4,9,11,2,12,15,1,17
10030 DATA18,3,27,28,3,4,9,10,2,11,14,1,18,18,3,27,28,3,4,8,9,2,
10,14,1,18,18,3,27,27,3,4,10,11,2,13,15,1,18,18,3,26,27,3,4,8,10
,2,11,16,1,18,19,3,25,28,3,128,128,128,144,132,129,152,137,144,1
53,162,132,179,179,145,152,156,144,184,172,144
10040 DATA19,140,148,189,173,149,180,181,148,184,173,144,TEROLT
,6,KILGARD,7,SNEETH,10,KATHAKE,5,SAND DEVIL,8,SCORCH,6,QUANDAR,5
,XANTAU,14,WOLFAUT,7,MERLAD,11,METORE,8,JO-TOE,4
10050 DATA "OPEN", "DESERT", "MTNS.", "WATER", "BRIDGE", "CITY", "TO
WN", "CASTLE", "CASTLE", "CASTLE", "TOMB", "MARSH", "LEATHER", "2,1,80",
"CHAIN", "5,3,350", "PLATE", "10,5,600", "SHORT", "1,2,75", "LONG
", "2,3,150", "BROAD", "3,5,250", "2-HANDED", "5,7,450
20000 DATA "MAP-X: Y:", "TERRAIN:", "KEY PIECES:", "GOLD:", "THIEV
ES:", "WARRIORS:", "SWORD:", "ARMOR:", "FATIGUE:", "FOOD:", "WATER:",
"POTIONS:"
    
```

**Word Processing
Software
for TRS-80*
Model I**



World's most popular word processing package. Fully proven Electric Pencil* now enhanced and offered in 16K cassette version only.

- Easiest to learn
- Simple to operate
- Full screen editing
- Global search & replace
- Powerful insert/delete
- Dynamic print formatting
- No control key mod.

Send check or MO for \$24.00 plus sales tax for Calif. cust. UPS shipping in USA prepaid.

\$24.00

\$10.00 for manual only

*Electric Pencil licensed to PMC Software by Michael Shrayner. TRS-80 trademark of Tandy Corp.

PMC SOFTWARE

**Proven Software Solutions
for the TRS-80, PMC-80 & 81 User
At VERY Special Prices**

GAMES

Title	List	Our Price	Title	List	Our Price	Title	List	Our Price
Advanced Operating Systems			SCOTT ADAMS' ADV. #1, #2 & #3			Big 5		
+ VOYAGE OF THE VALKYRIE			D 32K I & III	39.95	31.00	ATTACK FORCE		
D 32K I & III	39.95	32.00	T 16K I & III	39.95	24.00	D 32K I & III	19.95	15.00
T 16K I & III	29.95	24.00	SCOTT ADAMS' ADV. #4, #5 & #6			T 16K I & III	15.95	12.00
Adventure International			D 32K I & III	39.95	31.00	COSMIC FIGHTER		
ARMOR PATROL			SCOTT ADAMS' ADV. #7, #8 & #9			D 32K I & III	19.95	15.00
D 32K I & III	24.95	19.00	D 32K I & III	39.95	31.00	T 16K I & III	15.95	12.00
T 16K I & III	19.95	15.00	SCOTT ADAMS' ADV. #10, #11 & #12			DEFENSE COMMAND		
COMBAT			D 32K I & III	39.95	31.00	D 32K I & III	19.95	15.00
D 32K I & III	20.95	16.00	SEA DRAGON			T 16K I & III	15.95	12.00
T 16K I & III	19.95	15.00	D 32K I & III	24.95	19.00	GALAXY INVASION		
CONQUEST OF CHESTERWOOD			T 16K I & III	19.95	15.00	D 32K I & III	19.95	15.00
D 32K I & III	20.95	16.00	SHOWDOWN			T 16K I & III	15.95	12.00
T 16K I & III	19.95	15.00	D 32K I & III	20.95	16.00	METEOR MISSION		
+ DEMON VENTURE #1-			T 16K I & III	14.95	12.00	D 32K I & III	19.95	15.00
REIGN OF THE RED DRAGON			+ SILVER FLASH-PINBALL 1			T 16K I & III	15.95	12.00
D 32K I & III	24.95	19.00	D 32K I & III	19.95	15.00	ROBOT ATTACK		
T 16K I & III	19.95	15.00	T 16K I & III	14.95	12.00	D 32K I & III	19.95	15.00
ELIMINATOR			D 32K I & III	20.95	16.00	T 16K I & III	15.95	12.00
D 32K I & III	24.95	19.00	SPACE INTRUDERS			+ STELLAR ESCORT		
T 16K I & III	19.95	15.00	T 16K I & III	19.95	15.00	D 32K I & III	19.95	15.00
GALACTIC EMPIRE			D 32K I & III	20.95	16.00	T 16K I & III	15.95	12.00
D 32K I & III	14.95	12.00	STAR FIGHTER			SUPER NOVA		
T 16K I & III	14.95	12.00	D 32K I & III	29.95	23.00	D 32K I & III	19.95	15.00
GALACTIC TRADER			T 16K I & III	24.95	19.00	T 16K I & III	15.95	12.00
D 32K I & III	14.95	12.00	STAR TREK 3.5			Cornsoft		
T 16K I & III	14.95	12.00	D 32K I & III	19.95	15.00	+ BOUNCEOIDS		
+ GALACTIC TRILOGY			T 16K I & III	14.95	11.00	D 32K I & III	19.95	15.00
D 32K I & III	39.95	30.00	TREASURE QUEST			T 16K I & III	15.95	12.00
LUNAR LANDER			D 32K I & III	19.95	15.00	SCARFMAN		
D 32K I & III	20.95	16.00	T 16K I & III	14.95	11.00	D 32K I & III	19.95	15.00
T 16K I & III	14.95	11.00	UPPER REACHES OF APSHAI			T 16K I & III	15.95	12.00
MACES & MAGIC #1-BARLOG			D 32K I & III	19.95	15.00	Med Systems		
D 32K I & III	29.95	23.00	T 16K I & III	14.95	11.00	ASYLUM		
MACES & MAGIC #2-			Automated Simulations (EPYX)			D 32K I & III		
D 32K I & III	29.95	23.00	CRUSH, CRUMBLE & CHOMP			D 32K I & III	22.95	18.00
MORTON'S FORK			D 32K I & III	29.95	23.00	T 16K I & III	19.95	15.00
D 32K I & III	29.95	23.00	DUNJONQUEST-			+ ASYLUM II		
T 16K I & III	19.95	15.00	HELLFIRE WARRIOR			D 32K I & III	22.95	18.00
MISSILE ATTACK			D 32K I & III	39.95	30.00	T 16K I & III	19.95	15.00
D 32K I & III	20.95	16.00	DUNJONQUEST-			DEATHMAZE 5000		
T 16K I & III	14.95	11.00	KEYS OF ACHERON			D 32K I & III	17.95	14.00
OTHER VENTURE #2-			D 32K I & III	19.95	15.00	T 16K I & III	14.95	11.00
CROWLEY MANOR			DUNJONQUEST-			Labyrinth		
D 32K I & III	20.95	16.00	SORCERER OF SIVA			D 32K I & III	17.95	14.00
T 16K I & III	19.95	15.00	D 32K I & III	29.95	23.00	T 16K I & III	14.95	11.00
OTHER VENTURE #3-			T 16K I & III	29.95	23.00	WARRIOR OF RAS-DUNZHIN		
ESCAPE FROM TRAAM			DUNJONQUEST-			D 48K I & III	29.95	23.00
D 32K I & III	20.95	16.00	TEAR OF APSHAI			T 48K I & III	29.95	23.00
T 16K I & III	19.95	15.00	D 32K I & III	39.95	30.00	WARRIORS OF RAS-KAIV		
OTHER VENTURE #4-			T 16K I & III	39.95	30.00	D 48K I & III	29.95	23.00
EARTHQUAKE SF 1906			DUNJONQUEST-			T 48K I & III	29.95	23.00
D 32K I & III	20.95	16.00	UPPER REACHES OF APSHAI			D 48K I & III	29.95	23.00
T 16K I & III	19.95	15.00	D 32K I & III	19.95	15.00	T 48K I & III	29.95	23.00
OTHER VENTURE #5-			T 16K I & III	19.95	15.00	Melbourne House Software		
+ DEATH PLANET			+ RICHOCHET			PENETRATOR		
D 32K I & III	19.95	15.00	D 32K I & III	19.95	15.00	D 32K I & III	24.95	20.00
T 16K I & III	19.95	15.00	T 16K I & III	19.95	15.00	T 16K I & III	24.95	20.00

Now Twice As Many Programs!

EDUCATION	WORD PROCESSING	OPERATING SYS.
Advanced Operating Systems	Aspen Software	Micro Systems Software
MOSTLY BASIC	GRAMMATIC	DOS PLUS V3.3S
EDUCATIONAL PKG. 7 PRG.	D 32K I	D 32K I
T 16K I & III	PROOF EDIT	100.00
24.95	D 32K I	80.00
UTILITIES		
MOSTLY BASIC	PROOFREADER	Adventure International
SCIENTIFIC PKG. 7 PRG.	D 32K I	DIRECTORY INFO. MGT. II (DIM II)
T 16K I & III	SOFT-SCREEN	D 32K I & III
24.95	D 48K I	24.95
Howe Software		
AMERICAN HISTORY	SOFT-TEXT	MON3
T 16K I & III	D 48K I	T 16K I
24.95	69.00	39.95
Michael Shrayner Software		
TIME DUNGEON-	ELECTRIC PENCIL	MON4
T 16K I & III	T 16K I	D 32K I
24.95	100.00	49.95
INFO. PROCESSING		
+ WORLD HISTORY	Adventure International	STERM
T 16K I & III	+ MAXI CRAS	T 16K I
24.95	D 48K I & III	69.95
MAXI MANAGER		
20.00	D 48K I & III	55.00
MAXI MANAGER UTILITY PACK #1		
Automated Simulations (EPYX)		
JABBERTALKY	+ MAXI STAT	SYSTEM DIAGNOSTIC
D 32K I & III	D 48K I & III	D 32K I & III
29.95	199.95	99.95
23.00	147.00	79.00
MISCELLANEOUS		
T 16K I & III	Adventure International	HINT SHEET for single
23.00	HINT SHEET for single	Adventure #1 thru #12
Small Business Systems Group		
ACCOUNTS PAYABLE	+ COMPUTER FILING SYSTEM (CFS)	1.00
D 48K I & III	D 32K I & III	1.00
195.00	69.00	Software Affair
155.00	55.00	ORCHESTRA-85
ACCOUNTS RECEIVABLE	Dan Haney Associates	T 16K I
D 48K I & III	ELECTRIC SPREADSHEET	D 16K I
195.00	D 32K I & III	99.95
155.00	D 48K I & III	95.00
GENERAL LEDGER	D 32K I & III	+ NEW
D 48K I & III	T 16K I & III	
195.00	69.95	
INVENTORY CONTROL	34.95	
D 48K I & III		
195.00		
PAYROLL		
D 48K I & III		
195.00		

PMC SOFTWARE

475 Ellis St. v242
Mtn. View,
CA 94043

Orders: (415) 968-1604

PMC SOFTWARE

475 Ellis St., Mt. View, CA 94043

Orders: (415) 968-1604

v242

Terms: FOR FAST DELIVERY, send certified checks, money orders, VISA or MasterCard number and expiration date. Personal checks require 3 weeks. U.S.A. sales only. PRICES INCLUDE UPS continental delivery (do not use P.O. Box). CALIFORNIA customers add 6 1/2% tax. Prices subject to change.

Project Deep Dive

by Michael John Lake
First Place
14-18

Project Deep Dive is an arcade-style game with sound in which you command a submarine going down a long winding tunnel. You gain points for destroying other objects, and for docking at the end. After docking you start over again until you are destroyed.

Project Deep Dive will run on the Model I or III with 16K or Disk Basic with 32K.

About the Program

The original version of Deep Dive had only a slow speed, no sound, slower graphics, and less action. After realizing the potential of game programming, I quickly expanded the original game into what it is now.

This program contains machine language, so be careful when typing it in. Be sure to save copies before running it, or you may experience full Basic crash, resetting your system and destroying the program in the process. (It is a good idea to save any program with POKES or machine language before running it.)

To save time, and memory, you can leave out all the remarks and the instructions occupying lines 1020-1090.

To hook up the sound, either put the large gray plug for the cassette recorder into the input jack of an amplifier, or use your cassette recorder directly with an earphone or speaker.

To set up your recorder first take out any tape and press record and play while holding down the record tab micro switch in the top left corner inside the cassette compartment. Then remove all the plugs from their jacks and put the large gray plug into the auxiliary jack. Then take an earphone or speaker and plug it into the ear jack. You will now be able to hear sound when the game is run.

To control your ship, use the greater-than and less-than keys (< and >) to move left and right. To shoot, use the numeric keys 1-6 on the numeric keypad or top row. Keys 2 and 5 fire straight down, 1 and 4 fire left, and 3 and 6 fire right. (They line up on the nu-

meric keypad in the directions you are shooting.) Key 0 produces a force field, which vaporizes the objects immediately around you. For continuous movement or fire, keep the key pressed down.

When you start, you have 40 units of energy (displayed at the top of the screen). Each time you shoot you lose one unit of energy, but gain one unit each time you move down a line. The force field uses 10 units of energy, which means you should use it sparingly.

After reading the directions you will be asked if you want to start with fast speed. Press N to start with the slow speed, which is best for beginners. When playing at fast speed, you obtain double the points you would obtain with slow speed.

The first things you will come across are mines (#). They are worth two points. Next are torpedo launchers (A), which shoot torpedos (!) at you. They are worth 10 points. Then there are the sidemovers (H), which move sideways randomly. These are worth 20 points. Finally are the quick bombs, either up-arrows or left brackets, which pop up all over the screen. They are worth 10 points.

Program Listing

```
4 GOTO8800
8 '10-30: SCAN KEYS & JUMP TO SHIP CONTROL ROUTINES
10 A=PEEK(15136):B=PEEK(15120):C=C+1:IFC<GTHENIF0=A+BTHEN10ELSE3
0
20 GOTO40
30 IFA=16THEN200ELSEIFA=64THEN300ELSEIFE<1THENC=C+1:GOTO10ELSEIF
B=4THEND=64:GOTO410ELSEIFB=2THEND=63:GOTO410ELSEIFB=8THEND=65:GO
TO410ELSEIFB=16THEND=-1:GOTO450ELSEIFB=64THEND=1:GOTO450ELSEIFB=
32THEND=64:GOTO410ELSEIFB=1THEN150ELSEC=C+2:GOTO10
38 '40-70: COMPUTE TUNNEL WALLS & CHECK SHIPS STATUS
40 E=E+1:IFE>40THENE=40
50 I=I+RND(0)/7:J=J+RND(0)/8:K=SIN(I)*10+14:L=SIN(J)*10+26:POKEM
+26,K:POKEM+28,L:POKEM+77,E:IFO=1THENDEFUSR=&HBB9DELSEPOKE16526,
29
```

Listing continues

The Key Box

Model I or III
16, 32K RAM
Cassette or Disk Basic
Cassette Plug Amplifier Opt.

DRIVE A HARD BARGAIN



Save more money (and data) with our hard disk drive

Introducing the new, low-priced Winchester hard disk drive from A.M. Electronics. Designed to put the power of hard disk data storage within reach of more system owners than ever before.

More megabytes per buck

Our drive features an unformatted data capacity of 6.7 megabytes, with an average access time of 75 milliseconds. Up to four drives can be daisy-chain connected for even greater capacity.

Ready to run with TRS-80

Each drive comes complete with controller board, ST-506 interface, and a DOS Plus 4.0i for complete plug compatibility with your TRS-80 system.

Quality you can count on

Manufactured from the finest components, the A.M. Electronics hard disk drive has an expected life rating of five years when used 50% of the time.

Power consumption is unusually low: typically one amp less than other Winchester systems.

The disk and read/write heads are fully enclosed in a module using an integral air recirculation system with an absolute filter. You can depend on stable operation and high reliability in any office environment.

Think of the possibilities

Word processing, large mailing lists, database management, financial planning and forecasting . . . demanding applications like these and many more are now possible—and affordable—with the new A.M. Electronics hard disk drive.

For more information, or to find the location of your nearest dealer, please contact: A.M. Electronics, Inc., 3446 Washtenaw Ave., Ann Arbor, MI 48104, 313/973-2075, Telex: 220821 HPC. In Europe, contact A.M. Electronics, Ltd., 10 Barley Mow, Barley Mow Passage, Chiswick, London W4 4PH, England, Tel. (01)994-6477, Telex: 8811418.



A.M. ELECTRONICS^{INC}
THE POWER BEHIND THE DRIVES™

Listing continued

```
60 C=PEEK(S+64):B=PEEK(S+65):A=PEEK(S+66):PRINT@S-F," "":PRINT
@960,"":PRINT@S-F,"+O+":X=USR(X)
70 PRINT@0,"ENERGY:":PRINT@48,"POINTS:":P:POKES+1,79:IFA=32AND
B=32ANDC=32THENC=0:GOTO84ELSE1600
78 '80-120: JUMP TO PROPER ENEMY WEAPON ROUTINE FOR PHASE
80 N=N+1:GOTO10
84 IFO=1THENDEFUSR=&HBB81ELSEPOKE16526,1
90 C=0:IFN>309THEN120ELSEIFN>208THEN800ELSEIFN>127THENIFN=128THE
N700ELSE700
100 IFN>48THENH=H+1:IFH=1THEN600ELSEIFH=2THEN610ELSEIFH<9THEN630
ELSEH=0:GOTO100
110 IFN>40THEN600ELSE510
120 IFN>319THEN920ELSEIFN=319THEN914ELSEIFN>314THEN900ELSEIFN>31
2THEN910ELSE900
148 '150-160: FORCE FIELD
150 IFE<10THENC=C+2:GOTO10ELSEA$=CHR$(131):B$=CHR$(140):PRINT@S-
F-7,CHR$(191)" "+O+" "CHR$(191):PRINT@S-F+57,A$B$CHR$(1
76)STRING$(11,32)CHR$(176)B$A$:PRINT@S-F+124,A$B$STRING$(7,176)
B$A$:
160 FORA=0TO9:OUT255,1:OUT255,2:NEXT:PRINT@S-F-7," "+O+
":PRINT@S-F+57,STRING$(17,32):PRINT@S-F+124,STRING$(11,32):
:E=E-10:POKES+1,79:C=C+21:FORA=0TO9:NEXT:GOTO10
198 '200-300: MOVE SHIP LEFT-RIGHT
200 S=S-1:T=PEEK(S):PRINT@S-F,"+O+":POKES+1,79:IFT=32THENC=C+1
:GOTO10ELSE1600
300 T=PEEK(S+3):PRINT@S-F," +O+":POKES+2,79:S=S+1:IFT=32THENC=C
+1:GOTO10:ELSE1600
408 '410-440: SHOOT AT LOW ANGLE
410 E=E-1:W=S+D+1:POKEM,40:T=USR(8):T=PEEK(W):POKEW,46:IFT<>32TH
EN424
420 FORA=1TO13:W=W+D:T=PEEK(W):POKEW-D,32:POKEW,46:IFT=32THENEX
T:POKEW,32:C=C+21:GOTO10
424 IFT=46THENP=P-9ELSEIFT=35THENP=P-8ELSEIFT=72THENP=P+10
430 IFT=153ORT=166THEN440ELSEPRINT@W-F-1,"***":P=P+10:C=C+21:X=
RND(255):Y=256/X*(14-A):POKEM,X:T=USR(Y):PRINT@W-F-1," "":GOTO
10
440 POKEW,42:OUT255,1:FORD=0TO9:NEXT:C=C+21:A=A*10:POKEW,32:FORD
=ATO130:NEXT:GOTO10
448 '450-490: SHOOT AT WIDE ANGLE
450 E=E-1:W=S+65+D+D:POKEM,44:T=USR(8):T=PEEK(W):POKEW,46:IFT<>3
2THEN474
460 FORA=1TO13:W=W+64+D+D:T=PEEK(W-D):IFT<>32THENW=W-D:POKEW-64-
D,32:GOTO474
470 T=PEEK(W):POKEW-64-D-D,32:POKEW,46:IFT=32THENNEXT:POKEW,32:C
=C+24:GOTO10
474 IFT=46THENP=P-9ELSEIFT=35THENP=P-8ELSEIFT=72THENP=P+10
480 IFT=153ORT=166THEN490ELSEPRINT@W-F-1,"***":P=P+10:C=C+22:X=
RND(255):Y=256/X*(13-A)+1:POKEM,X:T=USR(Y):PRINT@W-F-1," "":GO
TO10
490 POKEW,42:FORD=0TO9:NEXT:C=C+22:A=A*20:POKEW,32:FORD=ATO130:N
EXT:GOTO10
508 '510: MINE ROUTINE
510 FORT=1TO2:POKERND(L)+K+959+F,35:NEXT:FORT=0TO9:NEXT:GOTO80
540 '(C)1981-MICHAEL J. LAKE
598 '600-680: TORPEDO ROUTINE
600 U=RND(L/2-4)*2+K+963+F:V=RND(L/2-4)*2+K+963+F:IFU=VTHEN600EL
SEPOKEU,65:POKEV,65:U=U-64:V=V-64:GOTO80
610 POKERND(L)+K+959+F,46:T=PEEK(U):U=U-128:IFT=65THENPOKEU+64,3
3
620 T=PEEK(V):V=V-128:IFT=65THENPOKEV+64,33:GOTO80
630 POKERND(L)+K+959+F,46:T=PEEK(U):IFT=33THENA=PEEK(U-64):IFA=3
2THENPOKEU,32:POKEU-64,33
640 T=PEEK(V):IFT=33THENB=PEEK(V-64):IFB=32THENPOKEV,32:POKEV-64
,33
650 U=U-128:V=V-128:GOTO80
680 POKERND(L)+K+959+F,46:GOTO80
698 '700-760: SIDEMOVER ROUTINE
700 POKERND(L)+K+959+F,46:IFO=1THENDEFUSR=&HBB9ELSEPOKE16526,10
5
710 FORU=0TO3:V=A%(U):V=USR(V):IFV>127+FTHEN730ELSET=PEEK(V):IFT
=32THEN730ELSEIFT<>72THEN730ELSEIFV<STHENA=1ELSEA=-1
720 FORB=1TO8:V=V+A:T=PEEK(V):IFT=43THENB=8:NEXT:GOTO1600ELSEPOK
EV-A,32:POKEV,72:NEXT
730 IFV<F+64THENPRINT@K+960,STRING$(L,32):V=INT(L*.5)+K+960+F:P
OKEV,72
740 V=V-64:A%(U)=V:NEXT:N=N+1:IFO=1THENDEFUSR=&HBB81ELSEPOKE1652
6,1
750 GOTO80
760 A%(0)=16320:A%(1)=16064:A%(2)=15808:A%(3)=15552:GOTO80
798 '800-820: QUICK BOMB ROUTINE
800 POKERND(L)+K+959+F,46
810 V=RND(824)+196+F:T=PEEK(V):IFT=32THENPOKEV,91:ELSE810
820 GOTO80
898 '900-970: END OF TUNNEL - DOCKING ROUTINE
900 FORT=0TO9:NEXT:GOTO80
910 PRINT@960+K,STRING$(L,PEEK(16610)):GOTO80
914 POKERND(L-10)+K+962+F,89:GOTO80
920 PRINT@960+K,STRING$(L,151):IFN<>332THEN800ELSET=PEEK(S+65):P
```

Listing continues

After going through the quick bombs, you must blast through a wall and dock. This is tricky, but you could use the force field to make a quick, easy opening. To dock with the docking port (Y), be sure you are centered directly above it. You get 200 points for docking and five points for each unit of energy you have left. You can then start again, keeping your score and gaining more points.

Your game ends when you crash or miss docking. If you have a high score, you will be asked for your name. Then you will be asked if you want a printout of your score; if so, press P, get your printer ready, and press Y.

You can press E to end the game, D to see the directions, or another key to start you playing again.

Correcting Errors

If, while you are playing the game, the computer suddenly displays Memory Size?, reboots the DOS, or hangs up, then something is wrong with the data statements, USRs, POKES, or other related function. This also might be the problem if the sounds don't work correctly, the tunnel is drawn strangely or the sidemovers don't work. To correct these problems start by checking lines 2000-8800 for errors. If you spot no problems, check the rest of the program starting from the beginning.

How This Game Works

By looking at the listing you might think this program is poorly structured. When it was first written, it was correctly structured, but because of upgrades, some of the design logic was lost.


I have included comments in the listing that describe what various lines do. All the single-letter variables are used for the program, as well as variables, A%, H%, H!, XX, A\$, and N\$.

I included some machine-language subroutines in the program to speed up a few functions. These routines draw the walls, show the energy, move the sidemovers, and make the music.

To protect the routines in high memory without answering the memory-size question, I POKEd the address of where the machine language is to start into locations 16561 and 16562. Then to reset other internal Basic registers I used a clear statement. Then the routines are POKEd into protected memory. ■

Michael John Lake, age 15, can be reached at 5486-F Jamison St., Fort Knox, KY 40121.

FINALLY. SERIOUS SOFTWARE YOU CAN REALLY USE!

 Our 4th year of providing TRS-80 software for business and technical applications. We support what we sell. Our customer list reads like a who's who in business, industry and technology.

MASTER-FILE (includes FILE CARD)

Database manager/text manager/report calculator, all in one program for floppy or hard disk systems. See your datafile and related scrollable text on screen together. Flexible database adds/deletes fields anytime, transfers fields among files (even dissimilar files). Input from keyboard or other data bases. Merges small files into master or splits masters into disk sub-files. 5-level search and 10-level sort pinpoint desired records easily. Use all your printer's features to make reports in database, text, or combined formats, with autospacing of columns, or layout you select. Stores 15 report and 15 mailing/specialized label formats, plus 15 equations for calculations. Prints multiple copies of labels automatically.

DATABASE

SCROLLING TEXT

PROMPT

- Easy, quick set-up. *Marvelous field flexibility.*
- Text from one word to "infinite" length. *Linked to each database record. Print what you need.*
- Simple to operate. *Will not leave you stranded!*

Versatile text manager allows typed text entry, simple graphics, and/or input from, or output to, word processor or ASCII files without retyping text. Global text searches link to

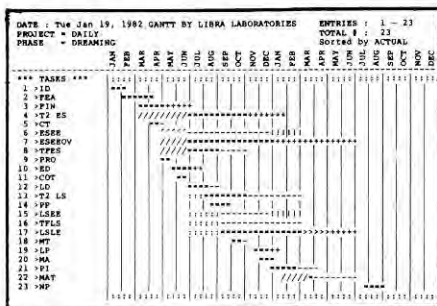
related database records for easy, specific information access, even from huge databases.
Model I, III 48K, 2 Disks \$224.50
Model II/16 64K, 2 Disks \$224.50

GANTT-PACK® V. 3.0

This FAST, friendly program manages all your scheduling needs. Use Gantt charts to visualize any time management application, such as:

- Client/patient appointments
- Meeting schedules/business plans
- Academic calendars/training courses
- Engineering/construction projects
- Research programs/technical projects
- Hourly
- Daily
- Weekly
- Monthly
- Yearly

Scratchpad entry and easy updates or changes let you explore alternatives, or adapt to new situations. Play, "What if...?" Automatically organize activi-



Beautiful, clear, accurate screens and printouts. On-time, early, late and overrun auto adjustments. Designed by project managers.

ties—plan, review, track and report projects easily with clear charts and tables. Maintain time awareness and project

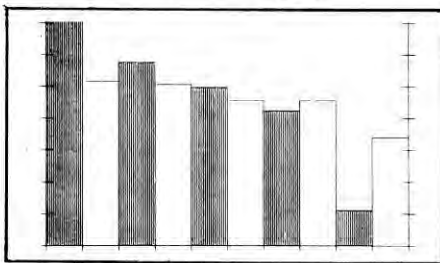
control using a method engineers have perfected. Computer graphics and convenience are tied together to enhance your productivity.

CRITICAL PATH METHOD add on module now available. PERT soon. Upgrades available from V. 2.0.

Model I, III 48K, 2 Disks \$224.50
Model II/16 64K, 2 Disks \$224.50

STAT-TO-PLOTTER

Use your Radio Shack or Houston Instruments intelligent multipen plotter to produce publication quality graphics. Numerical entries from keyboard, datafiles or databases are automatically reformatted to pass through your Radio



Histogram with (shown) or without shading, Scattergram (new module), Regression, Time Series Analysis, User selectable pen colors and symbols. Autoscaling of axes. Improvements to R.S. programs supplied. H.I. says "Great!"

Shack Statistical Analysis programs. Results are plotted in color on paper or projection transparencies. The graphs and legends are accurate enough for scientific, business, or technical presentations. Plotter driver subroutines are accessible for installation into other programs.

Model I, III 48K, 2 Disks \$99.50
Model II/16 64K, 2 Disks \$99.50

DEALER INQUIRIES INVITED

TERMS: Orders shipped UPS free for M/C, VISA, check, or money order. • Orders shipped UPS C.O.D. for P.O. No. • International orders add 10%. • Specify computer model.

FOR SAME DAY PERSONAL SERVICE CALL (201) 494-2224



LIBRA LABORATORIES, INC.
 488 MAIN STREET, METUCHEN, NEW JERSEY 08840 (201) 494-2224

YES! I want to buy I want more information about

MASTER-FILE GANTT-PACK® STAT-TO-PLOTTER

Enclosed is my check, M.O. for \$ _____

Name _____ Address _____ City _____ State _____ Zip _____

FINALLY!!



ARCADE GAMES
AND GOOD GRAPHICS
FOR MODEL II

Galactic Invaders 19.95
The Wrath of Ken 19.95
Wormy (fast paced action) 19.95
Chess & Othello 17.95
Racer & Hang the Butcher 14.95

SPECIAL! Any 2 for only 29.95

Delivered on 8" execution disk
Call or write for full game list.

Mr. Kenneth Kuzel c/o
KUZEL COMPUTER SERVICES
8654 W. Berwyn Ave. #3S
Chicago, Illinois 60656
(312) 399-0273

✓354

TRS-80 MODEL 16 AND 68000 SYSTEMS

DATABASE AND FILE SOFTWARE

Relational Database System
Easy To Use - Powerful

INTRODUCTORY OFFER \$595

Menus & English Subset
Query Language
68000 Code Efficiency

Features Never Seen Before.

Send For Catalog.

DATA MANAGEMENT SYSTEMS

211 N. EL CAMINO REAL, 101C
ENCINITAS, CA 92024
or Phone: (619) 942-0744

✓478

TRS-80 is a trademark of Tandy Corp.



**Sure
it's insured?**

SAFWARE™ Insurance provides full
replacement of hardware, media and
purchased software. As little as \$35/yr covers:

- Fire • Theft • Power Surges
- Earthquake • Water Damage • Auto Accident

For information or immediate coverage call:

1-800-848-0598

(In Ohio call 1-800-848-2112)

CNGA

COLUMBIA NATIONAL GENERAL AGENCY

✓368

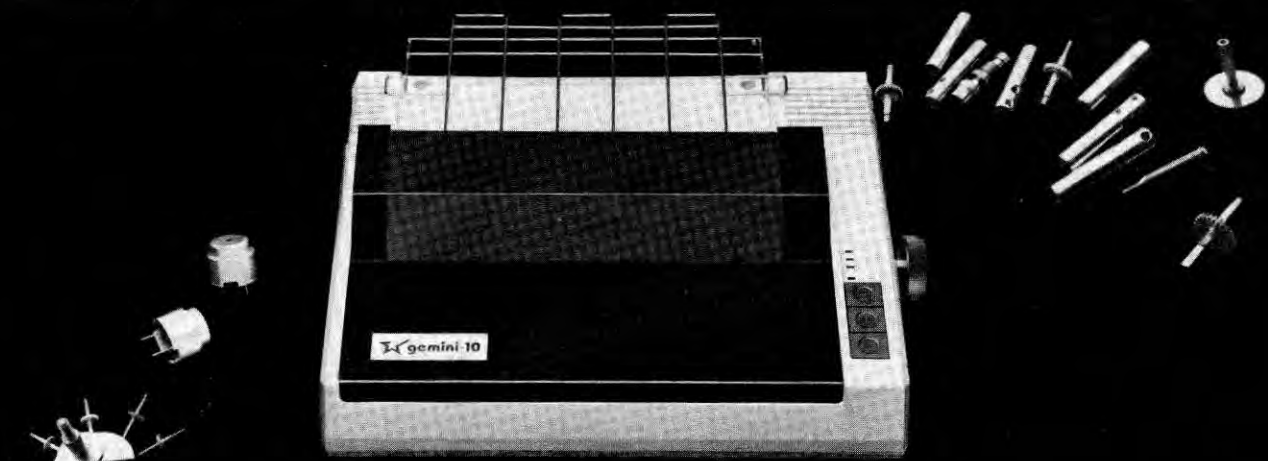
Listing continued

```
=P+E*5:R=R+1
930 FORU=0TO9:PRINT@256,CHR$(31)CHR$(23)"YOU MADE IT!";POKEM,44
:A=USR(80):PRINTCHR$(28);:FORV=0TO9:NEXT:NEXT:PRINT@280,"- BUT D
IDN'T DOCK, SORRY.";:IFT=89THENPRINT@280,"- AND DOCKED SAFELY TO
O 1";:P=P+200
940 IFG=22THENPRINT@384,"YOUR SCORE IS DOUBLE AT FAST SPEED.";:P
=P*2
950 PRINT@54,P;:Q=Q+P:PRINT@512,"YOUR TOTAL POINTS SO FAR ARE -"
;Q;"AFTER";R;"RUNS";:GOSUB1400
960 IFT<>89THEN1640
970 PRINT@896,"PRESS 'S' TO STOP, ANOTHER KEY TO CONTINUE.";GOSU
B1200:IFA$="S"THEN1640ELSE1100
998 '1004-1010: PROGRAM SIGN ON
1004 ONERRORGOTO0:CLS:GOSUB8400:PRINTCHR$(28);:S=158
1006 FORP=1TO14:PRINT@S-64," ";:PRINT@S,"+0+";:OUT255,1:OUT255
,2:FORB=0TO99:NEXT:S=S+64:NEXT:S=990:FORP=1TO14:S=S-64:PRINT@S+6
4," ";:PRINT@S,"+0+";:OUT255,1:OUT255,2:FORN=0TO99:NEXT:NEXT
1010 GOSUB8410:GOSUB1110:PRINT@896,"DO YOU WANT TO SEE THE DIREC
TIONS?";:GOSUB1200:IFA$="N"THEN1096
1018 '1020-1090: DIRECTIONS
1020 PRINT@388,CHR$(31)"YOUR MISSION IS TO GO DOWN A WINDING TUN
NEL, DESTROY ALL THEWEAPONS YOU COME ACROSS, AND DOCK WITH THE D
OCKING PORT AT THE BOTTOM SO A TEAM OF TRAINED PERSONNEL CAN DE
STROY THE EVIL BASE.";GOSUB1110
1030 PRINT@64,CHR$(31)STRING$(62,140);:PRINT@704,STRING$(62,140)
;:PRINT@194,STRING$(40,45)"STRING$(15,45);
1040 FORP=5TO33:SET(0,P):SET(1,P):SET(86,P):SET(87,P):SET(122,P)
:SET(123,P):NEXT:PRINT@130,"DISPLAYED OBJECTS ";:PRINT@173,"CON
TROL KEYS ";:A$=" - WORTH ";B$=" POINTS "
1050 PRINT@258,"# ' MINE"A$"2"B$"SHOT";:PRINT@322,"!' TORPEDO"A
$"10"B$;:PRINT@386,"'A' TORPEDO LAUNCHER"A$"10"B$;:PRINT@450,"'H
' SIDE MOVER"A$"20"B$;:PRINT@514,"'[' QUICK BOMB"A$"10"B$;:PRINT
@578,"'.' MINI MINE"A$"1"B$;
1054 PRINT@642,"'Y' DOCKING PORT-WORTH 200"B$"DOCKED";
1060 PRINT@301,"< - MOVE LEFT";:PRINT@365,"> - MOVE RIGHT";:PRIN
T@429,"0 - FORCE FIELD";:PRINT@493,"FIRE DIRECTIONS";
1070 PRINT@561,CHR$(176)"4 5 6"CHR$(176);:PRINT@622,CHR$(176)CHR
$(140)CHR$(131)CHR$(160)"1 2 3"CHR$(144)CHR$(131)CHR$(140)CHR$(1
76);:PRINT@685,CHR$(131)"CHR$(152)CHR$(129)" "CHR$(191)" "C
HR$(130)CHR$(164)" "CHR$(131);
1074 PRINT@772,"LOOK AT THE DATA ABOVE. IT SHOWS HOW TO CONTROL
YOUR SHIP &SHOWS THE DIRECTIONS YOUR GUN FIRES ( KEY 6 FIRES RI
GHT-DOWN ). YOU START WITH 40 UNITS OF ENERGY, AND EACH SHOT USE
S UP ONE.";:GOSUB1110
1080 PRINT"YOU GAIN 1 UNIT OF ENERGY PER SECOND, SO PLAN YOUR SH
OTS. THE FORCE FIELD USES UP 10 UNITS OF ENERGY, USE IT SPARIN
GLY. YOUR SHIP,'+0+', WILL BE DESTROYED IF YOU CRASH, SO BE CAR
EFUL.";:GOSUB1110
1090 PRINT"FOR SOUND CONNECT THE LARGE GRAY PLUG TO AN AMPLIFIER
. YOU CAN START PLAYING. GOOD LUCK!";:GOSUB1110
1094 '1096-1100: START TUNNEL RUN
1096 F=15360:G=44:Q=0:R=0:XX=0:CLS:PRINT"WOULD YOU LIKE TO START
WITH FAST SPEED?";:GOSUB1200:IFA$="Y"THENG=22
1100 E=40:S=90:F=N=0:I=0:J=0:P=0:H=0:POKEL6610,46:CLS:PRINT@0,ST
RINGS$(64,95);:FORA=0TO23:PRINT@A,CHR$(95)".STRING$(4,188)CHR$(1
91)CHR$(157);:PRINT@A+66," +0+";:FORB=1TO20:OUT255,RND(2):NEXT:N
EXT:FORA=0TO999:NEXT:GOTO80
1108 '1110-1210: INKEY$ ROUTINES
1110 PRINT@976,"---- PRESS ANY KEY TO GO ON ----";:A$=INKEY$
1120 A$=INKEY$:IFA$=" "THENX=RND(255):POKEM,X:Y=USR(8):GOTO1120EL
SEPRINT@768,CHR$(31);:RETURN
1200 A$=INKEY$
1210 A$=INKEY$:IFA$=" "THEN1210ELSERETURN
1398 '1400-1580: GAME COMMENTS
1400 IFQ<500THENPRINT@640,"MAYBE YOU SHOULD READ THE INSTRUCTION
S!";
1410 IFQ>499ANDQ<1000THENPRINT@640,"GOOD START FOR A TRAINEE!";
1420 IFQ>999ANDQ<2000THENPRINT@640,"YOU ARE DOING OK...SO FAR!";

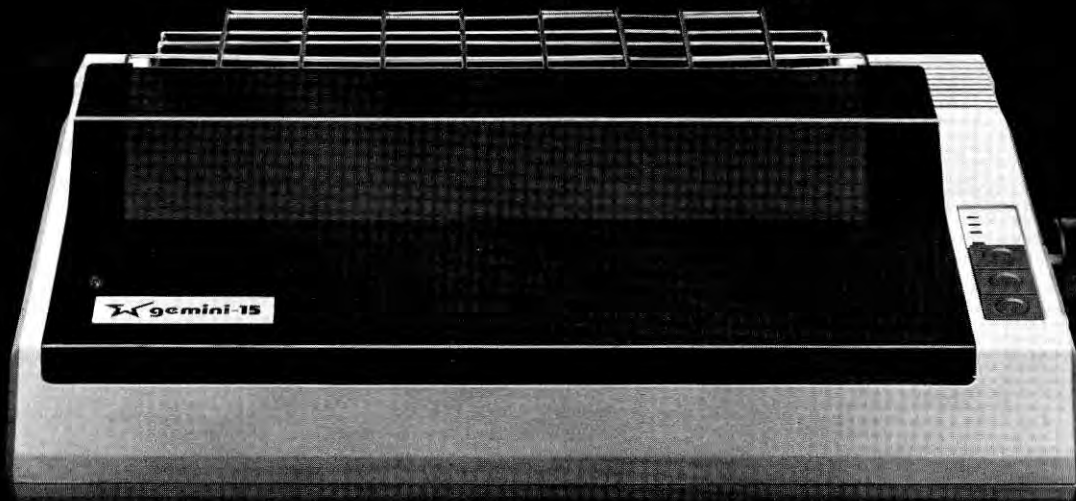
1430 IFQ>1999ANDQ<4000THENPRINT@640,"TRY TO MAKE 4000, AND HEAR
SOME MUSIC.";ELSEIFXX=-1THENFORA=0TO99:POKERND(64)+15999,RND(255
):OUT255,RND(2):NEXT:FORA=0TO999:NEXT:PRINT@640,STRING$(64,32);
1440 IFQ>15999THENIFXX=0THENPRINT@640,"DIVE, DIVE, DIVE TO THE B
OTTEM OF THE SEA ";:PRINT"SO YOU MIGHT HAVE VICTORY -":PRINT"PRO
JECT DEEP DIVE IS ITS NAME ";:PRINT"AND ITS GONNA DRIVE YOU INSA
NE !";
1450 IFQ<4000THENRETURNELSEXX=XX+1:IFXX<>1THEN1470ELSEXX=-1:REST
ORE:FORP=0TO163:READB:NEXT:FORP=0TO30:READX,B:V=40:IFINT(X/2)<>X
/2THENX=X-1:V=80
1460 Y=256/X+V:POKEM,X:Y=USR(Y):FORV=0TOB*2:NEXT:NEXT:PRINT@640,
CHR$(31);
1470 IFQ>5999ANDQ<10000THENPRINT@640,"YOU ARE DOING GREAT! LETS
TRY FOR 10,000!";
1480 IFQ>9999ANDQ<16000THENPRINT@640,"LETS GO FASTER NOW!";:G=22

1490 IFQ>19999ANDQ<30000THENPRINT@640,"YOU MUST HAVE PRACTICED B
EFORE!";
1500 IFQ>29999ANDQ<50000THENPRINT@640,"KEEP ON GOING, TRY FOR 1,
```

Listing continues



GEMINI— FOR PRINTER VALUE THAT'S OUT OF THIS WORLD



Over thirty years of down-to-earth experience as a precision parts manufacturer has enabled Star to produce the Gemini series of dot matrix printers—a stellar combination of printer quality, flexibility, and reliability. And for a list price of nearly 25% less than the best selling competitor.

The Gemini 10 has a 10" carriage and the Gemini 15 a 15½" carriage. Plus, the Gemini 15 has the added capability of a bottom paper feed. In both models, Gemini quality means a print speed of 100 cps, high-resolution bit image and block graphics, and extra fast forms feed.

Gemini's flexibility is embodied in its diverse specialized printing capabilities such as super/sub script, underlining, back-spacing, double strike mode and emphasized print mode. Another extraordinary standard

feature is a 2.3K buffer. An additional 4K is optional. That's twice the memory of leading, comparable printers. And Gemini is compatible with most software packages that support the leading printers.

Gemini reliability is more than just a promise. It's as concrete as a 180 day warranty (90 days for ribbon and print head), a mean time between failure rate of 5 million lines, a print head life of over 100 million characters, and a 100% duty cycle that allows the Gemini to print continuously. Plus, prompt, nationwide service is readily available.

So if you're looking for an incredibly high-quality, low-cost printer that's out of this world, look to the manufacturer with its feet on the ground—Star and the Gemini 10, Gemini 15 dot matrix printers.



MAKING A NAME FOR OURSELVES

1120 Empire Central Place, Suite 216, Dallas, TX 75247

For more information, please call Bob Hazzard, Vice President, at (214) 631-8560.

NEW SOFTWARE for TRS 80 Model III and the Color Computer

■ Church Contribution System
designed to simplify and facilitate the tedious chore of recording envelopes. Provides a variety of reports. Maintains its own data-files. Only **\$150**

■ Data Base Manager
designed to help organize all your data and provide you with meaningful reports. Add or delete any information. New files can be created and old information transferred. Only **\$150**

■ Single Entry Ledger
designed as an uncomplicated control of finances for home or small business. Add, delete, edit at any time. Compatible with DBM. Only **\$95**

Write or phone for complete software price list.



Dept. 80M-2
2457 Wehrle Drive
Amherst, NY 14221
716/631-3011

←417

LNW OWNERS!

At last! A really FAST graphics driver with low memory overhead.

HIRES 1 - Supports the 480-by-192 B&W mode with easy commands to create lines, circles, tones and 80-character text formats.

35-track, sng-density disk sent Priority Mail. \$20 plus \$1 S & H.

"Faster is Better!"

E & H Software
11814 Coursey Blvd.
Suite 249
Baton Rouge, LA 70816
(504) 293-3400

←385

two/sixteen magazine

The journal for business professionals and software developers. 100% TRS-80 compatibility.

**SOFTWARE
EXCLUSIVELY
FOR MODEL II
USERS**

two systems software
131 East Orange St.
Lancaster, Pa. 17603
(717) 397-4364

Listing continued

```

000,000";
1510 IFQ>49999ANDQ<75000THENPRINT@640,"THIS IS INSANE!";
1520 IFQ>74999ANDQ<100000THENPRINT@640,"YOUR FRIENDS WILL BE SUP
RISED!";
1530 IFQ>99999ANDQ<250000THENPRINT@640,"VERY FEW PEOPLE GET THIS
FAR!";
1540 IFQ>249999ANDQ<500000THENPRINT@640,STRING$(30,33):FORP=0TO9
99:NEXT:PRINT@640,"THIS MIGHT BE A RECORD SCORE!";
1550 IFQ>499999ANDQ<1000000THENFORP=33TO42:PRINT@640,STRING$(52,
P):FORB=0TO99:NEXT:NEXT:PRINT@640,"I THINK YOU CAN MAKE IT TO 10
00000 - A RECORD SCORE!";
1560 IFQ>999999THENFORP=33TO191:PRINT@640,STRING$(128,P)STRING$(
128,P);:X=255-P:POKEM,X:Y=256/X*4:Y=USR(Y):NEXT:GOTO1580
1570 RETURN
1580 PRINT@640,CHR$(31)CHR$(23)"YOU HAVE MADE A RECORD SCORE!":P
RINT"YOU HAVE OVER 1,000,000 POINTS!"CHR$(28);:FORP=0TO999:NEXT:
GOTO1640
1598 '1600-1630: SHOW SHIP CRASH
1600 IFO=1THENEDEFUSR=&HBB81ELSEPOKE16526,1:POKE16527,125
1604 S=S-F:A$=CHR$(191):PRINT@S,CHR$(138)A$CHR$(133);:POKEM,40:Y
=USR(8):B$=STRING$(2,191):PRINT@S,CHR$(175)A$CHR$(159);:POKEM,80
:Y=USR(20):PRINT@S-1,STRING$(5,191);:PRINT@S+64,STRING$(3,131);:
POKEM,100:Y=USR(40):PRINT@S-2,STRING$(7,191);
1610 PRINT@S+62,CHR$(130)CHR$(139)STRING$(3,143)CHR$(135)CHR$(12
9);:POKEM,120:Y=USR(80):PRINT@S-3,STRING$(9,191);:PRINT@S+61,CHR
$(130)CHR$(139)CHR$(175)A$B$CHR$(159)CHR$(135)CHR$(129);:POKEM,1
60:Y=USR(60)
1620 PRINT@S-3,B$STRING$(2,157)A$STRING$(2,174)B$;:POKEM,200:Y=U
SR(8):PRINT@S-3,CHR$(157)CHR$(153)CHR$(157)CHR$(153)A$CHR$(166)C
HR$(174)CHR$(166)CHR$(174);:PRINT@S+63,CHR$(167)CHR$(182)A$CHR$(
185)CHR$(155);:POKEM,250:Y=USR(8)
1630 PRINT@256,CHR$(31)"WATCH OUT FOR OBJECTS, ONE JUST DESTROYE
D YOUR SHIP!";:T=0:GOTO940
1638 '1640-1650: END OF GAME - HIGH SCORE
1640 PRINT@960,CHR$(23)"HIGH SCORE:"CHR$(28);:PRINT@982,NS" -";H
I;"POINTS";HR;"RUNS";:IFQ>H!THENPRINT@768,"YOUR SCORE IS THE HIG
HEST, WHAT IS YOUR NAME";:INPUTN$:H!:=Q:HR=R
1650 FORU=0TO9:PRINT@960,CHR$(31);:FORB=0TO99:NEXT:PRINT@960,CHR
$(23)"HIGH SCORE:"CHR$(28);:PRINT@982,NS" -";H!;"POINTS";HR;"RUN
S";:POKEM,160:Y=USR(8):NEXT
1658 '1660-1680: SCREEN PRINTOUT (CHANGES GRAPHICS & PRINTS)
1660 PRINT@896,"PRESS 'P' TO MAKE A PRINTOUT, ANOTHER KEY TO CON
TINUE";:GOSUB1200:IFAS<>"P"THEN1690ELSEPRINT@896,"PRINTER READY?
"STRING$(38,32);:GOSUB1200:IFAS<>"Y"THEN1660ELSEPRINT@896,STRING
$(52,32);:T=0:FORP=0TO1023
1670 B=PEEK(P+P):IFB=130THENB=73ELSEIFB=151THENB=84ELSEIFB>127TH
ENB=88ELSEIFB<32THENB=B+64
1680 LPRINTCHR$(B);:T=T+1:IFT=64THENLPRINT:T=0:NEXT:GOTO1660ELSE
NEXT
1690 PRINT@896,"PRESS 'E' TO END, 'D' FOR DIRECTIONS, ANOTHER KEY
TO PLAY AGAIN";:GOSUB1200:IFAS$="E"THENPOKE16396,201:ENDELSEIFAS
="D"THEN1004ELSE1096
1998 '2000-2260: MACHINE LANGUAGE & MUSIC DATA
2000 FORX=0TO225:READB:A=A+B:NEXT:IFA<>21201THENPRINT:PRINT"ERRO
R-CHECK DATA":POKE16396,201:END
2010 RESTORE:FORX=0TO163:READB:POKEM+X-4,B:NEXT:GOTO1004
2200 DATA 205,127,10,14,4,65,62,1,211,255,181,62,2,16,251,43,65,
62,2,211,255,124,181,16,252,32,234,201
2210 DATA 217,6,4,14,4,62,1,211,255,30,64,58,226,64,33,192,63,11
9,35,29,16,251,54,32,35,29,13,32,249,119,35,29,32,251,33,226,64,
214,153,40,4,54,153,24,2,54,166
2220 DATA 6,57,33,7,60,62,4,230,255,40,7,54,138,35,5,61,32,249,5
4,32,35,16,251,62,2,211,255,217,201
2230 DATA 205,127,10,126,214,72,32,25,237,95,230,3,40,19,71,237,
95,230,1,40,15,54,32,43,126,214,32,32,21,54,72,16,244,195,154,10
,54,32,35,126,214,32,32,11,54,72,16,244
2240 DATA 24,239,35,54,72,24,234,43,54,72,24,229
2250 DATA 189,40,189,40,189,40,146,40,170,40,198,0,206,40,146,20
,170,20,207,80,135,40,146,40,171,40,100,40,135,0,146,0,207,80,10
0,0,66,40,135,40,101,40,134,40,188,40,67,80
2260 DATA 135,40,189,40,170,40,101,40,147,40,101,0,67,255
6998 '7000-8030: CHECK FOR DISK BASIC AND SET MEMORY SIZE VALUE
7000 ONERRORGOTO7010:DEFUSR=&HBB81:O=1:GOTO8030
7010 O=0:POKE16526,1:POKE16527,125:RESUME8030
8030 POKE16610,0:IFO=1THENPOKE16561,128:POKE16562,187ELSEPOKE165
61,0:POKE16562,125
8038 '8040: SET UP PROGRAM VARIABLES
8040 CLEAR400:DEFINTA-H,R,L,N-P,R-Z:C=0:B=0:S=0:T=0:U=0:V=0:F=15
360:O=PEEK(16610):IFO=1THENM=-17531ELSEM=32005
8050 GOTO2000
8400 PRINTCHR$(23)"((( PROJECT DEEP DIVE )))";:RETURN
8410 PRINT@448,"(C) COPYRIGHT 1981 -- MICHAEL JOHN LAKE ++";:RET
URN
8420 'FOR FURTHER INFORMATION CALL (502) 942-0722 OR WRITE:
MICHAEL JOHN LAKE
5486 F JAMISON ST.
FORT KNOX, KY. 40121
8800 CLS:RANDOM:POKE16396,175:POKE16397,201:GOSUB8400:GOTO7000

```

SCRINPUT

(outline #1 in a series)

SCRINPUT, (SCReen INPUT), is a fully relocatable 908 byte machine language routine that replaces the BASIC INPUT statement. Instead of entering data one item at a time, SCRINPUT allows you to create a video form on the screen of your disk based Radio Shack TRS-80 Model 1 or 3. Data entry, is then a simple matter of filling in the blanks. Up to 80 "data fields" can be created on one video screen. Each field is assigned a length, screen position and one or more data types: Upper case alpha, lower case alpha, numeric or punctuation. Only characters matching type specifications can be placed in the field.

After defining data fields and specifying screen information, (Caps lock, Case reversal, cursor symbol and initial cursor location are among the features that can be activated), SCRINPUT is called via the BASIC USR function.

A flashing cursor symbol indicates where keyboard entered data will appear. As each character is entered, the cursor moves right one position. At the end of a data field, SCRINPUT repositions the cursor to the start of the next field. Keystrokes of invalid type are ignored.

Arrow keys can be used to move the cursor from one data field to another. Error correction is a simple matter of overtyping the bad characters with new data. The whole process is very similar to traditional screen oriented word processors.

SCRINPUT assigns all data fields to standard BASIC variables. These can be handled by your BASIC program in the same manner as information gathered by INPUT. You can even include error checking to insure that information is within reasonable bounds.

Be warned! SCRINPUT is only a utility and is designed for use within BASIC programs. If you cannot program, you can't use SCRINPUT. SCRINPUT works with any Disk Operating System (DOS) and comes with a 65 page manual containing sample programs, instructions and suggestions. Flow charts and source code are also included.

SCRINPUT has a 15 day money back guarantee: If you are not satisfied for ANY reason, return the package in good condition for a full refund. This is an enhanced version of the original SCRINPUT reviewed in the 4/82 issue of 80 Micro. Features added since that review include character insert and delete, user defined cursor character, a completely revised manual and alterations to allow easy use of SCRINPUT in the editing of existing data files.

SCRINPUT 3.0 is priced at \$49.95 plus 3.00 shipping, CHECKS, VISA and MASTER-CHARGE are accepted. We cannot accept ANY purchase orders — including government agencies! Phone orders are welcome. Call (702) 367-2033 for prompt service or use the order blank below.

SoftTouch

**3200 Polaris, Suite 3
Las Vegas, NV 89102**

Please Send Me:

SCRINPUT on diskette \$49.95

Nevada Residents please add 5.75% sales tax.
Personal Checks take two weeks to clear.

Name _____

Address _____ City _____ State _____ Zip _____

Credit Card Number _____ Expiration Date _____

Signature _____

Phone Orders Welcome

(702) 367-2033

- All orders shipped within 24 hours
- 10-day money back guarantee
- VISA or Mastercharge accepted

Music Composer

by Carl Huben
First Place
11-13

The lack of programs using the Color Computer's sound function is very disappointing. But I've come up with a program to use this interesting capability. This program is easy to use—it's even simpler than playing Beethoven's Fifth on a touch-tone telephone.

My program allows you up to 200 notes, with features such as save on tape, retrieve from tape, forward or backward play, editing, and the highlight of the programs, three keyboards.

How It Works

When first run, you are presented with four options. The first lets you recall sound from the tape, while the others specify the three keyboards.

The first of these keyboards, the piano keyboard, is set up like a real one, except in three rows.

On this scale, the letter T is middle C. This keyboard allows you five octaves, excluding sharps and flats. The first octave uses the keys E to O, going across. The next octave is from keys P to H. The keyboard continues in this manner. (You use the semi-colon, comma, and period keys to produce notes.)

One major drawback of this keyboard is its slowness. There is a delay between when you press a key and when the note is produced. The delay is most apparent in the highest octaves. When you press a key, the program searches through data to locate it, and then reads the number that represents that key. After that, it will produce a tone of the desired pitch. It will take the computer longer to reach the last keys than the first keys, because that is the order they are in in the data statements. This delay is not present on the replay.

An advantage of this keyboard is its order, which can be helpful.

The next two keyboards are essentially the same. These are the A-Z and Z-A keyboards. These are much faster than the first, but lack the order present in the other. You only use the letter keys for these scales.

After typing out your great composition, you'll want to play it back. Just press the space bar. After entering whether you want forward or reverse play, your song will be played back, note for note (including the pauses between each note).

The program will ask if you want to edit the music that you've created. If you decide to, you will be asked the tones you want replayed. This is offered as a convenience for those who want to track down the sour note. Afterwards, you are presented with three choices: make changes, replay previously selected tones, or respecify replay numbers.

Program Listing

```

10 CLS:PRINTTAB(9) "MUSIC COMPOSER"
20 PRINT:PRINT:PRINT:PRINT(1) LOAD MUSIC FROM TAPE":PRIN
T"(2) PIANO KEYBOARD":PRINT(3) A-Z SCALE KEYBOARD":PRINT(4
) Z-A SCALE KEYBOARD"
30 PRINT@64,:;:INPUT"ENTER CHOICE";A
40 ON A GOTO 60,190,340,470
50 GOTO 30
60 CLS:PRINT:INPUT"HOW MANY FILES OF MUSIC PRIOR TOTHE DESIR
ED ONE";B:IFB=0THEN 120
70 PRINT:PRINT"PRESS PLAY ON THE TAPE-DECK"
80 FORC=1 TO B:OPEN "I",-1,"MUSIC"
90 IF EOF(-1) THEN RUN 100
100 INPUT #-1,AS
110 GOTO 90: NEXT
120 DIM T(200),S(200):PRINT"LOADING SOUND"
130 OPEN "I",-1,"MUSIC"
140 INPUT#-1,L
150 INPUT#-1,XX
160 IF EOF(-1) THEN 500
170 INPUT #-1,T(Z),S(Z)
180 Z=Z+1:GOTO 160
190 GOSUB 680:CLS:XX=0
200 TIMER=0
210 M$=INKEY$:IF M$="" THEN 210
    
```

Listing continues

Variable	Description
L	Note length
S()	Pause between stored notes
T()	Stored notes
XX	Present keyboard mode
Z	Current number of note

Table 1. Variables

The Key Box
Color Computer
16K RAM
Color Basic

PROGRESSIVE ELECTRONICS

PRESENTS

!! AFFORDABLE EXPANSIONS !!
FOR

TRS-80* MODEL-I

TRS-80* MODEL-III

» * READY to RUN 32K MODEL-1
MDX-2 EXPANSION INTERFACE
.....\$469.00.....

* MODEL-3 COMPUTERS with 48K MEM
2 DISK DRIVES (no RS-232)
.....\$1699.00.....

NEW

""""""COLOR GRAPHICS....COLOR GRAPHICS....COLOR GRAPHICS""""""

» COMPLETE EAZY to ASSEMBLE KIT with ALL PARTS,Cables,Power
Supply,Enclosure and SOFTWARE for 15 COLOR 192 X 256 dot
Resolution...FOR MODEL-1 or MODEL-3.(TV REQUIRED)....\$149.95
.....

» DOUBLER Double Density for MOD-1 or MDX-2.....\$99.95

» MOD-1 CHARACTER GENERATOR (TRUE-L.C.DESSENDERS).....\$18.95

» PE-1000 DIRECT CONNECT PHONE MODEM (NO EXPANSION INTERFACE
NEEDED) USES 40 PIN TRS-80* BUSS.....(KIT).....\$129.95
.....

» *MDX-2..Board & Manual..\$74.95

BOARDS

*MDX-3..Board & Manual..\$74.95

PARTS KIT.....\$199.95

PARTS KIT.....\$169.95

ASSEMBLED BOARD.....\$399.95

ASSEMBLED BOARD.....\$299.95

MDX-2..MOD-1 Expansion with...
Disk Controller,32K RAM,
Printer Port,Serial Port,
and Direct Connect Modem.
.....

MDX-3..MOD-3 Expansion with...
Disk Controller,Serial Port,
and Direct Connect Modem.
.....

» *MDX-4..Board & Manual..\$29.95

*MDX-5..Board & Manual..\$49.95

PARTS KIT.....\$40.00

PARTS KIT.....\$79.95

ASSEMBLED BOARD.....\$99.00

ASSEMBLED BOARD.....\$159.95

MDX-4..Direct Connect Modem
0 to 300 Baud
.....

MDX-5..MOD-3..Serial Port &
Direct Connect Modem
.....

» *MDX-6 Upgrade for MODEL-3..A COMPLETE FIRST DRIVE INSTALLATION
1,40 track 5ms. step Disk Drive,..MDX-6..Disk Controller and
All Mounting Brackets,Cables and Hardware.....\$399.00
.....

» *TEC 40 Track Disk Drives 5ms. Step Double Den.....\$180.00
COMPLETE with Case and Supply.....\$234.95

» *"CURE" a Double Density Data Sperator.....\$34.95
*** COMING SOON ***** COMING SOON ***

» INTERNAL MOTHER BOARD for TRS-80 MODEL-3.....

» SINCLAIR ZX-81 EXPANSION INTERFACE,..DISK DRIVE.....
.....

PROGRESSIVE ELECTRONICS ✓ 143

643 East Chestnut st.

Lancaster Ohio 43130

PHONE 614-687-1019

MASTER CARD & VISA ACCEPTED

TRS-80 is TRADEMARK of TANDY CORP. ZX-81 TRADEMARK of SINCLAIR

Krell's College Board
SAT*
 Preparation Series
NEW FOR 83

A COMPREHENSIVE PREPARATION
 PACKAGE / MORE THAN 40 PROGRAMS / \$299.95

1. Diagnostic analysis
2. Prescription of individual study plans
3. Coverage of all SAT* skills
4. Unlimited drill and practice
5. SAT* Exam Question simulator
6. All questions in SAT* format and at SAT* difficulty level
7. Instantaneous answers, explanations and scoring for problems
8. Worksheet generation and performance monitoring - (optional)
9. A complete record management system - (optional)
10. Systematic instruction in pertinent math, verbal and test taking skills - (optional)

Krell's unique logical design provides personalized instruction for each student according to individual needs.

**Shelby
 Lyman
 Chess**



Shelby's Socrates Chess Tutorial Series uses the latest AI techniques to customize each lesson for you. Construction modules cover every aspect of the game. For all micro's. Call or write for details.

Amazing Ben
 The Royal Road to
 Artificial Intelligence.
\$79.95

Connections

A complete game system. Learn the principles of scientific reasoning in your choice of game formats. Expand minds at all ages. Subject areas include: Geography, Biology, Everyday Objects, etc.

Game System \$99.95
 Data Base, \$24.95 per subject,
 3 for \$50

Isaac Newton + F.G. Newton

Perhaps the most fascinating and valuable educational game ever devised - ISAAC NEWTON challenges the players to assemble evidence and discern the underlying "Laws of Nature". FULL GRAPHICS NEWTON - presents all data in graphic form. This game is suitable for children. Players may select difficulty levels challenging to the most skilled adults.

Both Games \$49.95

ALSO AVAILABLE

- Time Traveler / Odyssey in Time
- Competency Proficiency Series
- Pythagoras and the Dragon
- Botticelli / Micro Deutsch
- Super Star Baseball / Sword of Zedek
- War of the Samurai

CALL FOR DETAILS AND PRICES

✓51

KRELL®
SOFTWARE CORP.

The state of the art in educational computing

1320 Stony Brook Road / Stony Brook NY 11790
 Telephone 516.751.5138

Krell Software Corp. has no official ties with the College Entrance Examination Board or the Educational Testing Service.

Krell is however a supplier of products to the E.T.S.

N.Y.S. residents add sales tax

Prices Slightly Higher Outside U.S.

Listing continued

```

220 IF ASC(M$)=32 THEN 500
230 S(Z)=TIMER
240 READ Y$,Y : IF Y$=M$ THEN 270
250 IF Y$="." THEN RESTORE : GOTO 200
260 GOTO 240
270 T(Z)=Y : RESTORE
280 PRINT@128,Z;"NOTES PLAYED,";200-Z;"NOTES":PRINT"REMAINING"
290 IF Z=199 THEN 480
300 Z=Z+1
310 SOUND Y,L
320 GOTO 200
330 DATA Q,5,W,32,E,58,R,78,T,89,Y,108,U,125,I,133,O,147,P,159,A
,159,S,170,D,176,F,185,G,193,H,197,J,204,K,210,L,216,,218,Z,223
,X,227,C,229,V,232,B,236,N,238,M,239,"",242,,244
340 GOSUB600 : CLS : XX=1
350 TIMER=0
360 M$=INKEY$: IF M$="" THEN 360
370 IF ASC(M$)=32 THEN 500
380 S(Z)=TIMER
390 IF M$>"Z" OR M$<"A" THEN 350
400 IF XX=2 THEN E=255-((ASC(M$)-65)*9.8) ELSE E=((ASC(M$)-65)*9
.8)+1
410 SOUND E,L
420 T(Z)=E
430 Z=Z+1
440 PRINT@128,Z;"NOTES PLAYED";200-Z;"NOTES":PRINT"REMAINING"
450 IF Z=200 THEN 480
460 GOTO 350
470 GOSUB 600 : CLS : XX=2 : GOTO 350
480 PRINT"YOU HAVEN'T ANY MORE NOTES"
490 FOR B=1 TO 800 : NEXT
500 CLS : PRINT : INPUT"DO YOU WANT FORWARD OR BACKWARDSPLAYBACK
(1 OR 2)";J : ON J GOTO 510,530
510 FOR N=0 TO Z-1:PRINT@128,"NOTES #"N+1:SOUND T(N),L : FOR K=1
TO 7.6666*S(N) : NEXTK,N
520 GOTO 540
530 FORN=Z-1 TO 0 STEP -1 : PRINT@128,"NOTE #"N+1:FOR O=1 TO S(N
)*7.6666 : NEXT O:SOUND T(N),L:NEXT N
540 CLS : PRINT : INPUT"DO YOU WANT IT PLAYED BACK";P$: IF P$="Y
ES" THEN INPUT"FORWARD OR BACKWARDS";Q$ ELSE 560
550 IF Q$="FORWARD" THEN 510 ELSE530
560 INPUT"DO YOU WANT TO EDIT IT";X$: IF X$="YES" THEN 740
570 INPUT"DO YOU WANT TO SAVE THE MUSIC TOTAPE";U$: IF U$="YES"
THEN 580 ELSE RUN
580 CLS : PRINT : PRINT"PRESS PLAY AND RECORD":PRINT : PRINT"HIT
ANY KEY TO SAVE SOUND"
590 IF INKEY$="" THEN 590
600 OPEN "O",-1,"MUSIC"
610 PRINT#-1,L
620 PRINT #-1,XX
630 FOR H=1 TO Z : PRINT #-1,T(H),S(H) : NEXT
640 CLOSE -1
650 PRINT : PRINT"FINISHED" : PRINT : PRINT"HIT ANY KEY TO RETUR
N"
660 IF INKEY$="" THEN 660
670 RUN
680 CLS : PRINT : DIMS(200),T(200)
690 CLS : PRINT:INPUT"ENTER TONE DURATION (1 FOR EVERY.06 SECOND
)";L
700 IF L<1 OR L>255 THEN 690
710 PRINT : PRINT"PRESS ANY ANY KEY TO START MUSIC"
720 IF INKEY$="" THEN 720
730 RETURN
740 CLS : PRINT : INPUT"SPECIFY START NUMBER AND END NUMBER O
F TONES";X1,X2
750 IF X1<1 OR X2>Z THEN 740
760 FOR X=X1-1 TO X2-1 : PRINT@128,"NOTE #"X+1 : SOUND T(X),L :
FOR P=1 TO 7.6666*S(X) : NEXT P,X
770 PRINT@256,"(1) MAKE CHANGES" : PRINT"(2) REPLAY NUMBERS" : P
RINT"(3) RESPECIFY REPLAY NUMBERS" : PRINT@192,,: INPUT"ENTER N
UMBER";YY:ON YY GOTO 780,760,740 : GOTO 770
780 PRINT@256,"(1) CHANGE A NOTE":PRINT"(2) EXTEND MUSIC":PRINT"
(3) DELETE NOTES":PRINT@192,,:INPUT"ENTER NUMBER";YY:ON YY GOTO
820,790,810 : GOTO 780
790 CLS : PRINT@128,"PRESS ANY KEY TO START"
800 IF INKEY$="" THEN800ELSE ON XX+1 GOTO 200,350,350
810 CLS :PRINT:INPUT"NUMBERS TO DELETE";Q1,Q2:Q2=Q2+1:FORJ=Q2 TO
Z:T(Q1+(J-Q2))=T(J):S(Q1+(J-Q2))=S(J):NEXT:Z=Z-(Q2-Q1):GOTO490
820 CLS : PRINT:RESTORE : INPUT"NUMBER TO CHANGE";W : IF XX=1 TH
EN 890
830 FOR T=1 TO 29 : READ A$,X : PRINT@206,T
840 SOUND X,1 : Z$=INKEY$ : IF Z$="" THEN840
850 IF ASC(Z$)=32 THEN 870 ELSE NEXT
860 RESTORE :GOTO 830
870 T(W)=X : INPUT"DELAY (1-10)";P : S(W)=8*P
880 INPUT"DO YOU WANT TO EDIT ANOTHER";Q$: IF Q$="YES" THEN740
ELSE 500
890 FOR T=1 TO 26
900 PRINT @206,T
910 SOUND T*9.8,1 : Z$=INKEY$ : IF Z$="" THEN 910
920 IF ASC(Z$)=32 THEN 940ELSENEXT
930 GOTO 890
940 T(W)=T*9.8
950 INPUT"DELAY (1-10)";R : S(X)=R*8
960 PRINT : INPUT"CARE TO EDIT ANOTHER";L$: IF L$="NO" THEN 500
970 CLS : GOTO 770
  
```

Line	Purpose
10-50	Set up menu and input choice
60-180	Sound-loading routine
190-330	Piano keyboard function
340-470	A-Z and Z-A keyboards
480-490	Indicate no more notes
500-550	Play back music
560-570	Ask to edit and save
580-670	Save function
680-730	Subroutine to enter tone duration
740-970	Edit function

Table 2. Line Functions

Choosing to make changes gives you another three options: change a note, extend the music, or delete portions of

your song. The program explains the extension and deletion of notes in your music.

The change-a-note function asks for the number of the note to change. You will then hear the lowest note in the keyboard you were in. Each time you press a key, the note gets higher, until you find the desired replacement note. Press the space bar, and it will be replaced. It will then ask the delay you want between this note and the next. You will then be forwarded to the playback mode so it can be played back.

Now you have your composition. You certainly don't want to lose the work of 10 or 20 minutes, so use the save-on-tape feature. When you're in the playback mode, say no to every

question until it asks if you care to save on tape. Position your tape, and enter yes, then press any key to save.

After saving music on tape, you can use yet another feature, the loading function. When you enter this mode, you will be asked how many files of music are before the one you want. The program searches for your file, and loads it into memory.

The many options and features should provide hours of fun composing. Enjoy! ■

Carl Huben (age 11) can be reached at 6929 Lee Crest Drive, West Bloomfield, MI 48033.

GAMESTER SOFTWARE

9 Southmoor Circle, Kettering, Ohio 45429 [513] 294-3383
Mail & Phone Orders [from 12-6] accepted [COD, VISA/MASTER CARD, Check].
Usually same-day shipment! Dealer inquiries invited. We pay postage!

16K COLOR COMPUTER

- #402 SPIDER a fast-action graphic arcade game! by Chromatic Software \$19.95 T
- #403 PAC-DROIDS the best color game available! by The Programmers Guild \$19.95 T
- #404 DRAGONQUEST challenging adventure! Ext. basic req. by The Programmers Guild \$19.95 T
- #405 TOWER OF FEAR a classic adventure! Ext. basic req. by The Programmers Guild \$19.95 T
- #406 THUNDER ROAD a FUN adventure! Ext. basic req. by The Programmers Guild \$19.95 T
- #407 LOST DUTCHMAN'S GOLD an adventure! Ext. basic req. by The Programmers Guild \$19.95 T

16K COLOR MISADVENTURES

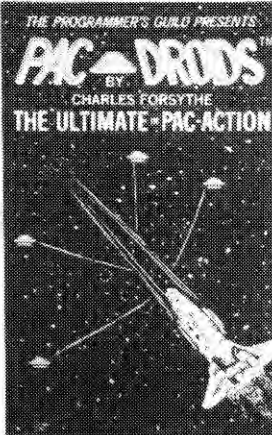
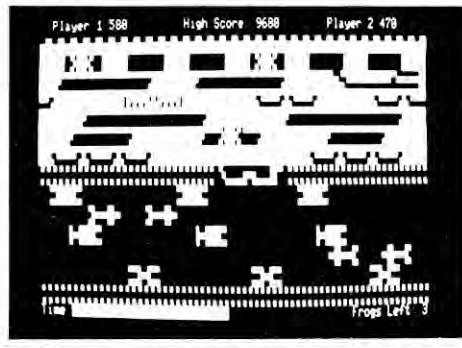
extended basic not needed

- #501 MADAM ROSA'S MASSAGE PARLOR Fun! Slightly risqué! \$15.00 T
- #502 WET T-SHIRT CONTEST Wet and Wild Adventure! Fun! \$15.00 T
- #503 SEWERS OF MOSCOW Challenging Misadventure! \$15.00 T
- #504 CASINO OF PLEASURE Take the ultimate gamble! \$15.00 T
- #505 NAKED NIGHTMARE ready 1-10-83 NEW! \$15.00 T
- #506 SUPER HERO MISADVENTURE ready 2-16-83 NEW! \$15.00 T

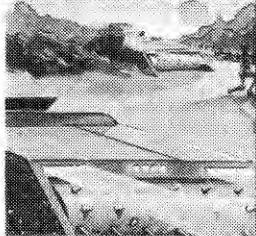
DOHNE' BUGG is our best-selling ADVENTURE-DECODER! Are you STUCK in a machine-language ADVENTURE GAME? This program will display on the screen all VERBS that interact in the game, all LOCATIONS & OBJECTS you will find, and all ACTIONS that result! A MUST FOR THE SERIOUS ADVENTURER!

LEAPER: now with VOICE! NEW!

Joystick compatible! 1 or 2 players. Fast-action MACHINE LANGUAGE! Best 1-board "frog-game" available!



TOTALLY NEW CONCEPT! YOU ARE THE SUPER HERO! SOUND & GRAPHICS!



16K MODEL I AND III

- #301 DOHNE' BUGG an adventure-decoder! \$15.00 T
- #302 BLOCK BREAKER by Cedar Software best "break-out type game" available! \$14.95 T
- #303 LEAPER by Cedar Software Now with VOICE! NEW! This is the best single-board "frog" game available! \$15.95 T
- #304 DEMON SEED by Computer Shack - NEW! arcade fun - amazing game! \$19.95 D
- #305 CYBORG by Computer Shack The galaxy's ultimate sport! \$24.95 D
- #306 BOUNCEIDS by Cornsoft Group Crazy Fun...go for it! \$15.95 T
- #307 FROGGER by Cornsoft Group Authorized version! GREAT MUSIC! \$19.95 D
- #308 CRAZY PAINTER by Cornsoft Group What else can we say but WOW! \$21.95 D
- #309 MICRO CORD by Cornsoft Group Easy! Two-tone harmony! Make your own beautiful music - and save it on tape or disk! \$19.95 T



Our MISADVENTURE SERIES consist of CHALLENGING and FUN "adventure-type" programs that may occasionally be a bit naughty!

MISADVENTURE SERIES

- \$15.00 each 16K Model I or III
- #1 MADAM ROSA'S MASSAGE PARLOR
- #2 WET T-SHIRT CONTEST
- #3 SEWERS OF MOSCOW
- #4 CASINO OF PLEASURE
- #5 NAKED NIGHTMARE
- #6 SUPER HERO ADVENTURE
- #7 coming soon!

NOTE: Radio Shack refused to include our first Misadventure [MADAM ROSA'S MASSAGE PARLOR] in their Sourcebook due to our description of the game! We appreciate the publicity - thanks!

Super-Draw

by Terry Myerson
First Place
10 and under

Program Listing

```

0 REM *** A DRAWING PROGRAM CALLED SUPER-DRAW
5 REM *** BY TERRY JAY MYERSON KNOWN AS T.J.
7 REM *** AGE 10
8 REM *** 233 PINE CONE TRAIL ORMOND BEACH, FLORIDA 32074
10 POKE 16396,175:POKE 16397,77
20 CLS
30 FOR X=0 TO 127:SET(X,44):NEXT X
40 PRINT@960,"MODE: SKETCH";
50 FOR R=1 TO 221
60 READ X,Y
70 SET(X,Y)
80 FOR L=1 TO 5:NEXT L
90 NEXT R
100 PRINT@920,"by Terry Myerson"
110 FOR X=1 TO 15:IF S=0 THEN PRINT@960+21,"P R E S S A N Y K
E Y T O B E G I N"; ELSE PRINT@960+21,"
";
120 A$=INKEY$:IF A$<>" THEN GOTO 260
130 NEXT X
140 IF S=0 THEN S=1 ELSE S=0
150 GOTO 110
160 A$=INKEY$:IF A$="" THEN 160 ELSE GOTO 260
170 DATA 32,8,31,7,30,6,29,6,28,5,27,5,26,5,25,5,24,6,23,7,23,8,
22,9,22,10,23,11,24,11,25,11,26,11,27,11,28,11,29,11,30,11,31,12
,31,13,30,14,30,15,29,16,28,17,27,17,26,17,25,17,24,17,23,16,22,
16,21,15,20,14
180 DATA 37,11,36,12,35,13,35,14,35,15,35,16,36,17,37,17,38,17,3
9,17,40,17,40,16,41,15,42,14,43,13,43,12,43,11,43,15,43,16,44,17
190 DATA 48,11,48,12,48,13,48,14,48,15,48,16,48,17,48,18,48,19,4
8,20,48,21,48,22,49,12,50,11,51,11,52,11,53,11,54,11,55,11,56,12
,56,13,56,14,56,15,56,16,55,17,54,17,53,17,52,17,51,17,50,17,49,
16
200 DATA 60,14,61,14,62,14,63,14,64,14,65,14,66,14,67,14,68,14,6
9,14,68,13,67,12,66,11,65,11,64,11,63,11,62,11,61,12,60,13,60,15
,61,16,62,17,63,17,64,17,65,17,66,17,67,17,68,17,69,16
210 DATA 72,11,73,11,73,12,73,13,73,14,73,15,73,16,73,17,74,13,7
4,12,75,12,76,11,77,11,78,11,79,11,80,11,81,12,82,13,82,14
220 DATA 32,22,33,22,34,22,34,23,35,23,36,23,37,23,38,24,39,25,3
9,26,39,27,39,28,38,29,37,30,36,30,35,30,34,30,33,31,32,31,31,31
,31,30,31,29,31,28,31,27,31,26,31,25,31,24,31,23,31,22
230 DATA 42,26,42,27,42,28,42,29,42,30,42,31,43,27,44,27,44,26,4
5,26,46,26,47,26,48,26,49,27,50,28
240 DATA 60,26,59,27,59,28,59,29,59,30,60,31,58,27,57,26,56,26,5
5,26,54,26,53,27,53,28,53,29,53,30,54,31,55,31,56,31,57,31,58,30
250 DATA 67,26,67,27,66,28,65,29,65,30,66,31,67,31,68,31,68,30,7
0,29,71,28,71,27,71,26,69,30,69,31,70,31,71,31,72,31,73,30,74,29
,75,28,75,27,75,26
260 CLEAR 10000
270 ON ERROR GOTO 2110
280 CLS
290 PRINTTAB(20)"CHOOSE SKETCH SCREEN"
300 PRINTTAB(15)"USE ARROWS"
310 PRINT@448+32-3,"? ";CHR$(143);" ?";
320 PRINT@448+32-64,"?";
330 PRINT@448+32+64,"?";
340 N=PEEK(14440)
350 IFNAND8THENS=1

```

Listing continues

Super-Draw will make you and your TRS-80 creative. It lets you draw on the CRT, reproduce figures several times on the same screen, and save and recall drawings.

I wrote this program on a Model III with 48K and two disk drives. Only one disk drive is necessary to run the program, though, and you can use a joystick.

How to Use It

After the introduction to Super-Draw is finished, you can choose your sketch pad. The six possibilities are in Fig. 1.

For screen A, press the up arrow; for screen B, press the down arrow; for screen C, press the left arrow; and for screen D, press the right arrow.

For screens A-D, just press the arrow pointing to the part of screen you want white. For screen E, press any arrow, L (load), and then 0 (load 0). For screen F, press any arrow, L (load), and then 0 (load 0). When the computer is done, press C (convert).

Simple Drawing Techniques

To move the sketcher, use the arrow keys or the joystick. Hold down two arrow keys to draw diagonals.

To choose a new sketch screen or restart your drawing, press the space bar or the red button on the joystick.

The Key Box

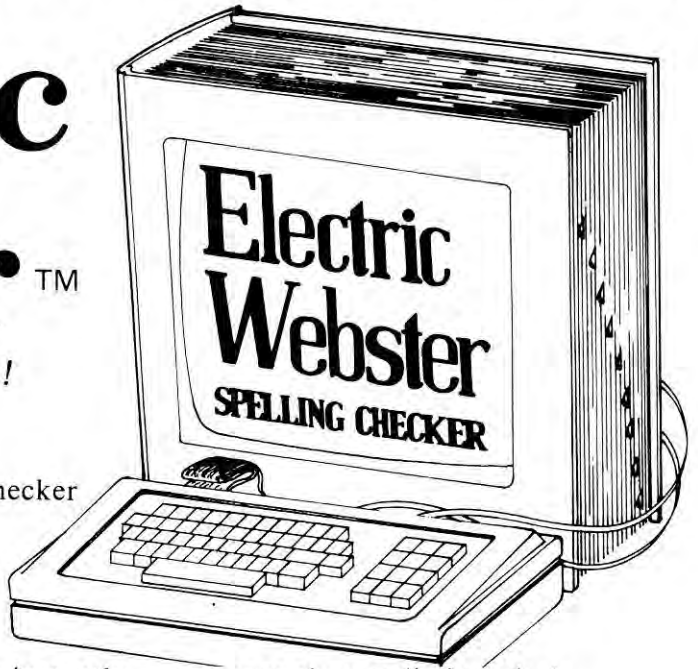
Model I or III
48K RAM
Disk Basic
One Disk Drive

Finally, a Spelling Checker that can SPELL!

Electric Webster™

The "Cadillac" of Spelling Checkers!

80 Microcomputing, 9/82



- **FAST and ACCURATE** — No other spelling checker comes close!
- **INTEGRATED** — Proofs and corrects from within all these popular word processing programs: Scripsit, Newsprint, Lazy Writer, Electric Pencil, Superscript, and CopyArt.
- **SMART** — Finds and displays correct spellings instantly — no more clumsy dictionaries!
- **HYPHENATES** automatically — inserts discretionary hyphens with 100% accuracy. (optional)
- **COMPLETE** — One step proofing system with integrated Grammatical and Hyphenation features. (optional)

No other program can claim even one of these features.

EASY TO USE: Type your text using any of a number of popular word processing programs. When you are done, hit the appropriate key, and ELECTRIC WEBSTER proof-reads your document, displaying misspellings and typos on the screen.

Then, Correcting Electric Webster can display each error separately, requesting you to enter the correct spellings for each. You are given the options of displaying errors in context, adding words to ELECTRIC WEBSTER's 50,000 word dictionary, or even displaying the dictionary to find the correct spelling. If you think you know the correct spelling, Electric Webster will verify it for you.

Finally, Electric Webster CORRECTS YOUR TEXT, automatically inserts discretionary HYPHENS (optional), and points out GRAMMATICAL errors (optional), all with remarkable speed!

LOW PRICES: Standard Electric Webster is available for \$89.50 (TRS-80™ Model I & III, or Apple™) or \$149.50 (CP/M™, TRS-80™ Model II and all others.) The optional Correcting Feature can be added at any time (\$60) as can Hyphenation (\$50) and Grammatical (\$40). During the closing months of 1982 only, we are offering 6 W/P integration programs FREE (reg. \$35 each) with the purchase of Correcting Electric Webster.

The Ultimate PROOFING SYSTEM



CORNUCOPIA SOFTWARE

Post Office Box 6111 Albany, California 94706 • (415) 524-8098

**NOW
AVAILABLE
FOR APPLE!**

REVIEWS OF MICROPROOF (EW's predecessor):

"There is simply no finer program available . . ."
Creative Computing, March 1982

"This is a very useful product and should be obtained by anyone who uses a word processor."
80 Microcomputing, August 1981

"The summary review of this program? One word—Excellent."
Computronics, September 1981

"In a comparative review of proofreading programs (with smaller dictionaries) MICROPROOF was found to be considerably faster than all the others, when tested against a 400 word sample document."
BYTE Magazine, November 1981

"A 1500 word document took 26 seconds to load, process and proof . . . it is very friendly and any person able to use a word processing program can master it in moments."
InfoWorld, January 1982

"By far, the most capable and efficient of these spelling checker programs."
Microcomputing, June 1982

AND NOW ELECTRIC WEBSTER:

"Actually, Electric Webster is faster than its predecessor (Microproof) . . . and spelling corrections are immediately verified against the dictionary before being accepted . . ."
Microcomputing, June 1982

"Electric Webster is the Cadillac of vocabulary programs."
80 Microcomputing, September 1982

To find out where the sketcher is, press enter and the sketcher will start blinking. To stop the blinking, press break.

Advanced Drawing Techniques

To erase or move to another place on the screen, press clear. Then move the eraser with the arrow keys or joystick. To exit, press enter or the red button on the joystick.

To change everything black to white and everything white to black, press C. To save a drawing, hit S and the drawing number (1-9). To load a drawing, hit L and the drawing number (1-9).

Creating and Using Functions

To create a function, type E while in

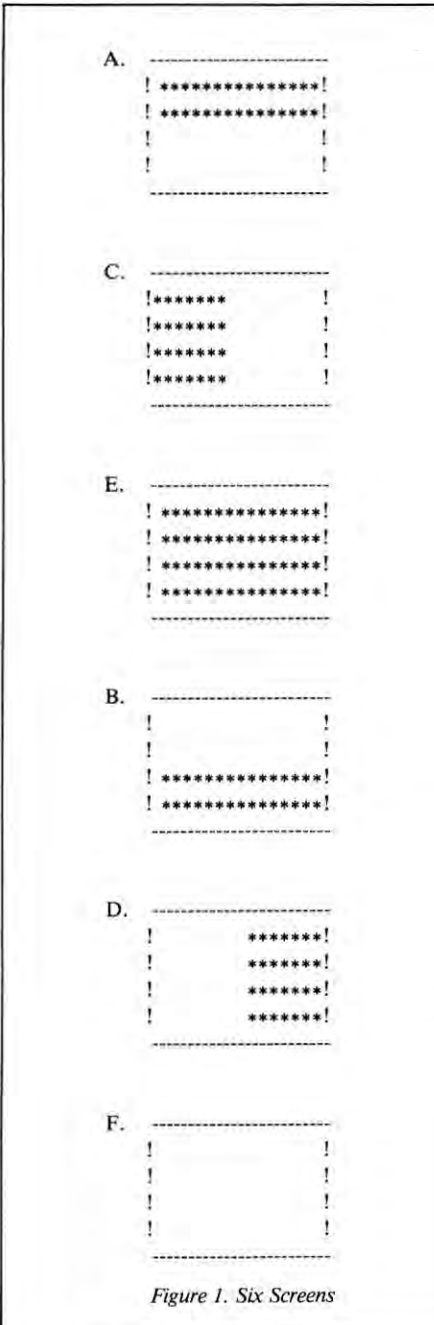


Figure 1. Six Screens

Listing continued

```

360 IFNAND16THENS=2
370 IFNAND32THENS=3
380 IFNAND64THENS=4
390 OUT236,16
400 A=255-INP(0)
410 IFAAND1THENS=1
420 IFAAND2THENS=2
430 IFAAND4THENS=3
440 IFAAND8THENS=4
450 IFS=0ORS>4THEN340
460 CLS
470 IFS=1THENFORX=0TO7:PRINT@64*X,STRING$(64,191);:NEXTX
480 IFS=2THENFORX=8TO14:PRINT@64*X,STRING$(64,191);:NEXTX
490 IFS=4THENFORX=0TO15:PRINT@64*X+32,STRING$(32,191);:NEXTX
500 IFS=3THENFORX=0TO14:PRINT@64*X,STRING$(32,191);:NEXTX:
510 FORX=0TO127:SET(X,44):NEXTX
520 PRINT@960,"MODE :SKETCH";STRING$(20,128);
530 IFS=1ORS=3THENX=64:Y=24
540 IFS=2THENX=64:Y=23
550 IFS=4THENX=63:Y=23
560 SET(X,Y)
570 POKE16396,175:POKE16397,201:N=PEEK(14440)
580 IFN=128THENGOTO 260
590 A$=INKEY$
600 IF A$="S" THEN GOTO 1100
610 IFA$="L"THENGOTO1300
620 IF A$="C" THEN GOTO 1790
630 IF A$="P" THEN GOTO 1990
640 IF A$="E" THEN GOTO 2130
650 GOSUB 1670
660 IFA=0ANDN=0THEN570
670 IFNAND8THENY=Y-1
680 IFNAND16THENY=Y+1
690 IFNAND32THENX=X-1
700 IFNAND64THENX=X+1
710 IFNAND1THEN3000
720 IFNAND4THENPOKE16396,195:POKE16397,77:GOTO 760
730 IFNAND2THEN910
740 GOSUB 1600:GOSUB 1530
750 GOTO570
760 PRINT@960,"MODE :FUNCTION LOAD","TYPE FUNCTION FILE NAME";
770 EL=X:F=Y
780 E=Y+11
790 A$=INKEY$:IF A$="" THEN 790
800 POKE 16396,195:POKE 16397,77
810 OPEN"1",3,"FUNC"+A$+"/FUC"
820 IF X>(127-35) THEN WQW
830 IF Y>(47-11) THEN GOTO 570
840 FOR X=X TO X+36:FOR H=Y TO E
850 INPUT#3,P
860 IF P=1 THEN SET(X,H) ELSE RESET(X,H)
870 NEXT H,X
880 CLOSE
890 X=E1:Y=F
900 F
910 PRINT@960,"MODE :SKIP & ERASE";STRING$(20,128);
920 F=PEEK(14440):A=255-INP(0)
930 IFF=0ANDA=0THEN920
940 IFFANDLORAAND16THENPRINT@960,"MODE :SKETCH";STRING$(20,128);
:GOTO1760
950 GOSUB1020
960 IFFAND8ORAAND1THENY=Y-1
970 IFFAND16ORAAND2THENY=Y+1
980 IFFAND32ORAAND4THENX=X-1
990 IFFAND64ORAAND8THENX=X+1
1000 GOSUB1600
1010 GOSUB1530:GOTO920
1020 IFS=1THENIFY<24SET(X,Y)ELSERESET(X,Y)
1030 IFS=2THENIFY>23SET(X,Y)ELSERESET(X,Y)
1040 IFS=3THENIFX<64SET(X,Y)ELSERESET(X,Y)
1050 IFS=4THENIFX<64RESET(X,Y)ELSESET(X,Y)
1060 IF S=5 THEN SET(X,Y)
1070 IF S=6 THEN RESET(X,Y)
1080 RETURN
1090 E=X:F=Y
1100 PRINT@960,"MODE :SAVE";STRING$(20,128);:L=PEEK(15360):POKE1
5360,35
1110 A$=INKEY$
1120 A=VAL(A$)
1130 IFA<LORA>9THEN1110
1140 PRINT@960,"MODE :SAVE DRAWING #";A$;
1150 POKE 16396,195:POKE 16397,77
1160 OPEN"O",1,"DRW"+A$+"IG"+"DAT"
1170 PRINT#1,S,"";
1180 PRINT#1,X,"";
1190 PRINT#1,Y,"";
1200 POKE15360,L
1210 FORX=15360TO16383

```

Listing continues

For serious business microcomputing, only one operating system exactly fits.

Whether you're in business and do microcomputing, or in computing and sell to business, you'll like OASIS.* Not a hobby or scientific system warmed-over for business use, OASIS is the only operating system designed from the ground up for business.

SERIOUS BUSINESS

COMES IN ALL SIZES.

Whatever your business need, OASIS has the operating system to match: 8-bit or 16-, single-user or the multi-user system that professionals tell us makes micros run like minis. And that's even truer now with new OASIS-16.** (OASIS exact business fit #1: choice.)

A SYSTEM IS ONLY AS GOOD AS THE BUSINESS PROGRAMS IT RUNS.

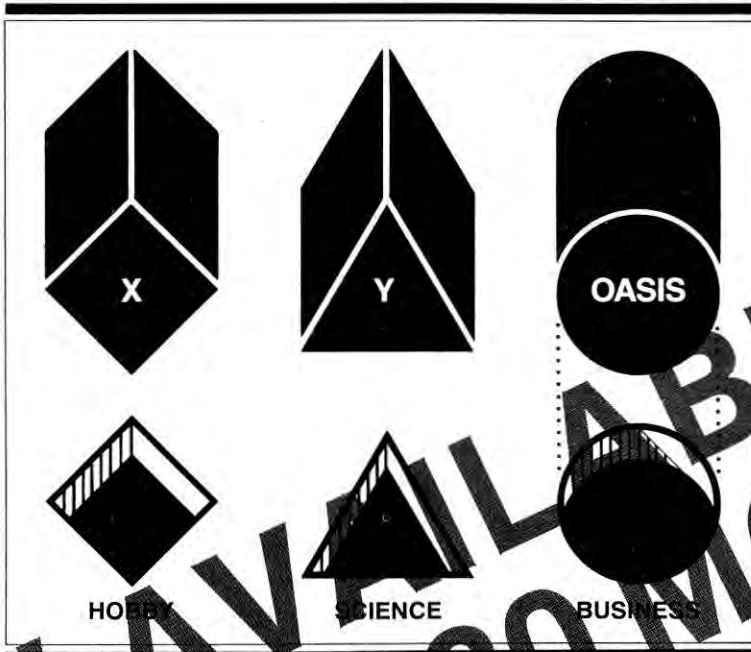
The acid test for any business operating system is the application software available to run on it. There's plenty for OASIS—for nearly any job.

And it's top quality, too, because our integrated tools are top quality—and there are more of them. Like a high-level BASIC Interpreter/Compiler/Editor/Debugger; ISAM/Keyed Directory/Sequential Files; a smart Print Spooler; Automatic Record Locking (OASIS exclusive); plus COBOL & 'C' Languages. These tools are mandatory for high-quality business application program development—ask any developer. (OASIS exact business fit #2: high-quality application software.)

PORTABILITY PROTECTS BUSINESS SOFTWARE INVESTMENTS.

OASIS is custom-fitted to manufacturers' hardware so application software developed to run on one OASIS equipped machine can also run on others—and is upwardly compatible from 8-bit OASIS Single-User to Multi-User, on up to OASIS-16. This kind of application software portability is exclusive with OASIS.

Device independence allows various printers and terminals to be used—with no modification to application



available, type 'HELP' and the command function title—OASIS displays the syntax and options available.

Of course it's all in your language—not computerese. (OASIS exact business fit #5: user-friendliness.)

AND, AND, AND...

Some of the best, most extensive documentation in the industry; a packed Application Software Directory; multi-level training; direct telephone support; worldwide sales & service; options like CONTROL Relational Data Base Management System and MASTERPLAN Financial Modeling Package; OASIS does it all. (OASIS exact business fit #6 through #12.)

Now you know why there's no reason to struggle trying to put a square peg in a round hole. For serious business microcomputing,

there is one operating system that exactly fits: **OASIS**. Call or write us today for details.

* For Z80

** Available for 8086/8088. Available soon for 68,000, 16,000 and others

software: OASIS system software compensates for differences. (OASIS exact business fit #3: compatibility.)

ACCURATE DATA IS SECURE SYSTEMS REDUCE BUSINESS RISKS.

Data integrity—a challenge for any multi-user system—is insured by OASIS File & Automatic Record Locking. With it, normally all users can view a record at the same time. BUT, if the record is being updated by one user, other users are automatically denied access until the update is complete. That means data is always accurate and up-to-date. It's still another OASIS exclusive.

For system security, there's OASIS Logon, Password & Privilege Level. User Accounting keeps track of who used the system, when. (OASIS exact business fit #4: data integrity/system security.)

A FRIENDLY SYSTEM IS GOOD BUSINESS.

For user-friendliness, OASIS sets new standards. Example: the EXEC Job Control Language is so smart it walks users through their applications—and around the operating system.

With our 'HELP' feature, if you are unsure of the functions and options

OASIS

STRICTLY BUSINESS

PHASE ONE SYSTEMS, INC.

7700 Edgewater Drive, Suite 830
Oakland, CA 94621-3051
Telephone 415/562-8085 TWX 910-366-7139

I'm serious about my business—please send me:

- OASIS-16 Manual, \$75
- OASIS Manual, \$60
- Free Application Software Directory and put me on your mailing list.

(Add \$3 for shipping. California residents add sales tax.)

Name _____

St. (No Box #) _____

City _____ State _____ Zip _____

- Check enclosed VISA Mastercharge
- UPS C.O.D. American Express

Card No. _____ Exp. date _____

Signature _____

TRS-80*
Models
I & III



**Discount
Prices!**

Do you have these best sellers?

	Your Cost
Entertainment	Tape / Disk
The Eliminator (Adv. Int.)	19.90/19.90
Reign... Red Dragon (Adv. Int.)	- /19.90
Star Fighter (Adv. Int.)	19.90/23.90
Defense Command (Big Five)	12.70/15.90
Robot Attack (Big Five)	12.70/15.90
Bounceoids (Comsoft)	12.70/15.90
Panik (Fantastic)	15.90/19.90
Venture (Horizon)	11.90/15.90
Dunzhin (Med Systems)	23.90/23.90
The Institute (Med Systems)	15.90/15.90
Laser Defense (Med Systems)	12.70/15.10
Penetrator V (Melbourne)	21.20/21.20
Business	
Lazy Writer (ABC Sales)	- /148.75
Postman Mailing System (SSM)	- / 99.95
Maxi Manager & Util. (Adv. Int.)	- /119.90
Personal Check Mgr. (Adv. Int.)	- / 19.90
GL/Cash Journal (Taranto)	- / 60.00
Electric Webster (Prosoft)	- /119.60
Newsprint 7.0 (Prosoft)	- / 99.90
Newsprint 7.0 + Labels (Prosoft)	- /111.90
Programming Tools	
BASIC Editor (Comp. Appl.)	23.90/ -

Free gift with order!

RIMES COMPUTER PRODUCTS

262 Tracey, Dept. 2A
Grand Island, N.Y. 14072
(716) 773-2519

✓480

Add \$1.50 for U.S. shipping. Add \$1.50 for COD.
Add \$4.50 for Canada or Mexico.
For fastest service send M.O. or cert. check,
Mastercard/Visa also accepted.
Allow 2 weeks for personal checks.
New York Residents add sales tax.
*TRS-80 is a trademark of Tandy Corp.

Listing continued

```

1220 N=PEEK(X)
1230 PRINT#1,N;",";
1240 NEXTX
1250 PRINT@960,"MODE :SKETCH";STRING$(20,128);
1260 CLOSE
1270 POKE 16396,195:POKE 16397,201
1280 X=E:Y=F
1290 GOTO570
1300 PRINT@960,"MODE :LOAD";STRING$(20,128);:L=PEEK(15360)
1310 POKE15360,35
1320 A$=INKEY$
1330 A=VAL(A$)
1340 IFA<0ORA>9THEN1320
1350 IF A=0 THEN IF A$<>"0" THEN 1320
1360 POKE 16396,195:POKE 16397,77
1370 OPEN"1",2,"DRW"+A$+"IG"+"/DAT"
1380 INPUT#2,S
1390 INPUT#2,X
1400 INPUT#2,Y
1410 CLS
1420 IFEOF(2)THEN1500
1430 ZX=ZX+1
1440 INPUT#2,W
1450 IFZX=961THENGOTO1470ELSEPRINTCHR$(W);
1460 GOTO1420
1470 GOSUB1650
1480 GOSUB1600
1490 ZX=0
1500 CLOSE
1510 POKE 16396,175:POKE 16397,201
1520 GOTO570
1530 IFS=1THENIFY<24RESET(X,Y)ELSESET(X,Y):RETURN
1540 IFS=2THENIFY<24SET(X,Y)ELSERESET(X,Y):RETURN
1550 IFS=3THENIFX<64RESET(X,Y)ELSESET(X,Y):RETURN
1560 IFS=4THENIFX<64SET(X,Y)ELSERESET(X,Y):RETURN
1570 IF S=5 THEN RESET(X,Y)
1580 IF S=6 THEN SET(X,Y)
1590 RETURN
1600 IFY>=44THENY=0
1610 IFY<=-1THENY=43
1620 IFX<=-1THENX=127
1630 IFX>=128THENX=0
1640 RETURN
1650 PRINT@960,"MODE :SKETCH";STRING$(20,128);
1660 RETURN
1670 OUT236,16
1680 A=255-INP(0)
1690 IFA=0THENRETURN
1700 IFAAND16THENGOTO 260
1710 IFAAND1THENY=Y-1
1720 IFAAND2THENY=Y+1
1730 IFAAND4THENX=X-1
1740 IFAAND8THENX=X+1
1750 RETURN
1760 A=255-INP(0)
1770 IFA=16THEN1760ELSEPRINT@960,"MODE :SKETCH";STRING$(20,128);

1780 GOTO570
1790 PRINT@960,"MODE :CONVERT SKETCH SCREEN";:E=X:F=Y
1800 FOR Y=0 TO 43
1810 FOR X=0 TO 127
1820 IF POINT(X,Y) THEN RESET(X,Y) ELSE SET(X,Y)
1830 NEXT X,Y
1840 X=E:Y=F
1850 ON S GOTO 1870,1890,1910,1930,1950,1970
1860 PRINT@960,"MODE: SKETCH";STRING$(20,128);:GOTO 570
1870 S=2
1880 GOTO 1860
1890 S=1
1900 GOTO 1860
1910 S=4
1920 GOTO 1860
1930 S=3
1940 GOTO 1860
1950 S=6
1960 GOTO 1860
1970 S=5
1980 GOTO 1860
1990 E=X:F=Y
2000 PRINT@960,"MODE :PRINT HI - RESOLUTION GRAPHICS ON OKIDA
TA 83A";
2010 FOR X=0 TO 127:FOR Y=0 TO 5:GOSUB 2740:NEXT Y:LPRINT CHR$(Z
);:Z=0:NEXT X
2020 FOR X=0 TO 127:FOR Y=6 TO 11:GOSUB 2740:NEXT Y:LPRINT CHR$(
Z);:Z=0:NEXT X
2030 FOR X=0 TO 127:FOR Y=12 TO 17:GOSUB 2740:NEXT Y:LPRINT CHR$(
Z);:Z=0:NEXT X

```

Listing continues

For
the
Model III
48 K RAM
2 Disk Drive
Computer.
TRS DOS
120 day warranty
✓ Out of state
buyers pay no tax

1-606-325-2210
Mon.-Fri. 10-6 EST

ASHLAND COMPUTER
1716 Wilshire Blvd.
Ashland, Ky. 41101

✓514



Poor Man's Floppy

HIGH SPEED CASSETTE SYSTEM

Now for the TRS-80™ Color Computer

The JPC Products High Speed Cassette System, in operation for over 4 years, is now available for all versions of the Radio Shack Color Computer.

• TC-8C

The TC-8C plugs directly into the expansion port of your TRS-80 Color Computer. It is fully compatible with all versions of the Color Computer from the Standard 4K up to the Extended 32K systems.

• FAST

The TC-8C saves and loads files at more than twice the speed of the built in Color Computer system.

• RELIABLE

All of JPC Products high speed cassette systems have a proven reliability of less than one error in a million bits.

• TWO DRIVES

The TC-8C fully supports two cassette drives. Save and load through either drive by simple software selection. You can use standard Radio Shack CTR-80A tape recorders or their equivalent.

• ALL FILE TYPES

The CCCOS operating system allows you to save, load, verify or run both BASIC and machine language files. Data files are also supported.

• MOTOR CONTROL

On board relays are provided for both cassette ports on the TC-8C.

• SPARE EPROM SOCKET

The TC-8C has a spare EPROM socket on the board. You can install either 2716 or 2732 EPROM's. This memory space can be used for any of your application programs or you could install the optional JPC Products monitor program - JBUG.

• JBUG MONITOR

The JBUG Monitor is a 2K relocatable monitor program with fantastic features for the Color Computer user.

• ASSEMBLER

Line assemble any machine language program directly into memory using standard 6809 assembly language mnemonics.

• DIS-ASSEMBLER

Dis-assemble any memory resident program (ROM or RAM) directly on the screen.

• MEMORY MODIFY & LIST

Modify memory directly or list memory in both HEX and ASCII.

• BREAK POINT TRAPS

Set, clear or continue from break points.

• CASSETTE OR EPROM

The TC-8C is not required in order to use the JBUG Monitor. It is available on cassette or a 2732 EPROM.

• SUPERB DOCUMENTATION

The TC-8C and the JBUG Monitor come with complete and extensive user manuals (JPC's documentation is praised almost as highly as our hardware and software). Complete command descriptions and background information are provided. Examples and sample programs are provided to help the novice and experienced individual take full advantage of the TC-8C and the JBUG Monitor.

• READY TO GO

The TC-8C comes completely assembled and tested with the CCCOS operating system. It is backed with a 30 day Money Back Guarantee and a 90 day Full Warranty.

TC-8C	\$129.95
JBUG (EPROM)	\$34.95
JBUG (CASSETTE)	\$29.95

Terms: Cash, Master Card or Visa
Shipping & Handling \$ 3.50 (US)
\$5.50 (Canada) \$15.00 (Foreign)

Technical Inquiries: Phone 5:00 - 6:00 PM MST



JPC PRODUCTS CO.
Phone (505) 294-4623
12021 Paisano Ct. N.E.
Albuquerque, N.M. 87112

sketch mode. Start creating your function with the arrow keys or joystick. To convert the sketch screen, press C. To restart function drawing, press the space bar or the red button on the joystick.

To save a function hit enter, then S, then name the function (using one character). To load a function, hit enter, L, and the name you used (using one character). To exit the sketch pad, press enter and then E.

To load your function into the sketch pad, position the sketcher where you want the top left corner of your function, press break, and then the function name (using one character).

To draw your function again on the same sketch pad, repeat the instructions in the last paragraph. To exit the program hit the orange key. ■

Terry Myerson (age 10) can be reached at 233 Pine Cone Trail, Ormond Beach, FL 32074.

Listing continued

```

2040 FOR X=0 TO 127:FOR Y=18 TO 23:GOSUB 2740:NEXT Y:LPRINT CHR$(
(Z);:Z=0:NEXT X
2050 FOR X=0 TO 127:FOR Y=24 TO 29:GOSUB 2740:NEXT Y:LPRINT CHR$(
(Z);:Z=0:NEXT X
2060 FOR X=0 TO 127:FOR Y=30 TO 35:GOSUB 2740:NEXT Y:LPRINT CHR$(
(Z);:Z=0:NEXT X
2070 FOR X=0 TO 127:FOR Y=36 TO 41:GOSUB 2740:NEXT Y:LPRINT CHR$(
(Z);:Z=0:NEXT X
2080 FOR X=0 TO 127:Y=42:GOSUB 2740:LPRINT CHR$(Z);:Z=0:NEXT X
2090 PRINT@960,"MODE :SKETCH";STRING$(35,128);
2100 X=B:Y=F:GOTO 570
2110 CLOSE:PRINT@960,"MODE :SKETCH";STRING$(51,128);
2120 RESUME 570
2130 POKE 16396,175:POKE 16397,201
2140 POKE 16409,1
2150 CLS
2160 ON ERROR GOTO 2710
2170 PRINT STRING$(15,179);"SUPER - DRAW :FUNCTION CREATOR";STRIN
NG$(15,179);
2180 PRINT:PRINT:PRINT
2190 FOR Y=25 TO 40:SET(40,Y):SET(80,Y):NEXT Y
2200 FOR X=40 TO 80:SET(X,25):SET(X,40):NEXT X
2210 Y=33:X=60
2220 SET(X,Y)
2230 N=PEEK(14440):OUT 236,16:A=255-INP(0)
2240 IF INKEY$="C" THEN 2690
2250 IF N AND 1 OR A=16 THEN 2380
2260 IF N AND 2 THEN 2610
2270 IF N AND 128 THEN 2130
2280 IF N AND 8 OR A AND 1 THEN Y=Y-1
2290 IF N AND 16 OR A AND 2 THEN Y=Y+1
2300 IF N AND 32 OR A AND 4 THEN X=X-1
2310 IF N AND 64 OR A AND 8 THEN X=X+1
2320 GOSUB 2330:GOTO 2230
2330 IF Y<=26 THEN Y=38:SET(X,Y):RETURN
2340 IF Y>=39 THEN Y=27:SET(X,Y):RETURN
2350 IF X<42 THEN X=78:SET(X,Y):RETURN
2360 IF X>=79 THEN X=42:SET(X,Y):RETURN
2370 SET(X,Y):RETURN
2380 PRINT@192,"L TO LOAD,S TO SAVE,E TO EXIT TO SUPER-DRAW"
2390 A$=INKEY$:IF A$="" THEN 2390
2400 IF A$="E" OR A$="L" OR A$="S" THEN GOTO 2410 ELSE GOTO 2390

2410 IF A$="E" THEN GOTO 260
2420 IF A$="L" THEN 2520
2430 PRINT@192,"SAVE :TYPE FUNCTION FILE ";
2440 A$=INKEY$:IF A$="" THEN 2440
2450 POKE 16396,195:POKE 16397,77
2460 OPEN"O",1,"FUNC"+A$+"/FUC"
2470 FOR X=42 TO 78
2480 FOR Y=27 TO 38
2490 IF POINT(X,Y) THEN PRINT#1,"1";","; ELSE PRINT#1,"0";",";
2500 NEXT Y,X
2510 CLOSE:POKE 16396,175:POKE 16397,201:GOTO 2270
2520 PRINT@192,"LOAD :TYPE FUNCTION FILE ";

2530 A$=INKEY$:IF A$="" THEN 2530
2540 POKE 16396,195:POKE 16397,77
2550 OPEN"I",2,"FUNC"+A$+"/FUC"
2560 FOR X=42 TO 78:FOR Y=27 TO 38
2570 INPUT#2,P
2580 IF P=1 THEN SET(X,Y) ELSE RESET(X,Y)
2590 NEXT Y,X
2600 CLOSE:POKE 16396,175:POKE 16397,201:GOTO 2270
2610 N=PEEK(14440):IF N=0 THEN GOTO 2610
2620 IF N AND 1 THEN FOR V=1 TO 250:NEXT V:GOTO 2230
2630 RESET(X,Y)
2640 IF N AND 8 THEN Y=Y-1
2650 IF N AND 16 THEN Y=Y+1
2660 IF N AND 32 THEN X=X-1
2670 IF N AND 64 THEN X=X+1
2680 GOSUB 2330:GOTO 2610
2690 FOR X=42 TO 78:FOR Y=27 TO 38:IF POINT(X,Y) THEN RESET(X,Y)
ELSE SET(X,Y)
2700 NEXT Y,X:GOSUB 2330:GOTO 2230
2710 PRINT@128,"DONT BE A WISEGUY";
2720 FOR X=1 TO LEN("DONT BE A WISEGUY")
2730 FOR W=1 TO 250:NEXT W:PRINT CHR$(8);:NEXT X:GOTO 2270
2740 DATA 0,6,12,18,24,30,36
2750 FOR Q=1 TO 8:READ O:IF Y=0 THEN 2770 ELSE NEXT Q
2760 GOTO 2780
2770 IF POINT(X,Y) THEN Z=Z+1:RESTORE:RETURN
2780 DATA 1,7,13,19,25,31,37
2790 FOR Q=1 TO 8:READ O:IF Y=0 THEN 2810 ELSE NEXT Q
2800 GOTO 2820
2810 IF POINT(X,Y) THEN Z=Z+2:RESTORE:RETURN
2820 DATA 2,8,14,20,26,32,38

```

Introduction

Variable	Purpose
R	Number of points to light up on screen
X	How far over each point should be
Y	How far down each point should be
L	Timer loop between each lit point
S	Whether to blink "Press any key to begin"
A\$	The letter entered

Main Program

Variable	Purpose
N	Input bytes entered from keyboard
A	Input bytes entered from joystick
S	Sketch pad
X	Position of sketcher across
Y	Position of sketcher down
A\$	Command entry from keyboard
E	Takes place of X when X is being used for something else
F	Takes place of Y when Y is being used for something else
P	Input byte taken from function file
ZX	Counter when bytes are taken from file
Z	Bytes sent to printer
O	Number taken from data statement

Function Creator

Variable	Purpose
X	Position of sketcher across
Y	Position of sketcher down
N	Input byte entered from keyboard
A	Input byte entered from joystick
A\$	Command entered from keyboard
P	Byte taken from function file

Table 1. Variables

Listing continues

Listing continued

```

2830 FOR Q=1 TO 8:READ O:IF Y=0 THEN 2850 ELSE NEXT Q
2840 GOTO 2860
2850 IF POINT(X,Y) THEN Z=Z+4:RESTORE:RETURN
2860 DATA 3,9,15,21,27,33,39
2870 FOR Q=1 TO 8:READ O:IF Y=0 THEN 2890 ELSE NEXT Q
2880 GOTO 2900
2890 IF POINT(X,Y) THEN Z=Z+8:RESTORE:RETURN
2900 DATA 4,10,16,22,28,34,40
2910 FOR Q=1 TO 8:READ O:IF Y=0 THEN 2930 ELSE NEXT Q
2920 GOTO 2940
2930 IF POINT(X,Y) THEN Z=Z+16:RESTORE:RETURN
2940 DATA 5,11,17,23,29,35,41
2950 FOR Q=1 TO 8:READ O:IF Y=0 THEN 2970 ELSE NEXT Q
2960 GOTO 2980
2970 IF POINT(X,Y) THEN Z=Z+32:RESTORE:RETURN
2980 IF POINT(X,Y) THEN Z=Z+1:RESTORE:RETURN
2990 RETURN
3000 PRINT@960,"MODE :BLINK ";
3010 RESET(X,Y):SET(X,Y)
3020 N=PEEK(14440):IF N AND 4 THEN FOR W=1 TO 20:NEXT W
3030 GOTO 3010

```



Top-quality Verbatim® Diskettes from **Tech•Data**, your complete word and data processing supply center. Dealer inquiries invited.

Call Toll Free
1-800-237-8931.
In Florida, call
813-577-2794.

440
Tech•Data Corporation
 3251 Tech Drive North
 St. Petersburg, FL 33702

TWO GIANTS AT YOUR FINGERTIPS . . .

THE MOST POWERFUL & MOST USER-ORIENTED COMMUNICATIONS SYSTEM TERMINAL PACKAGE AVAILABLE FOR TRS-80 MODEL III USERS I

TELETERM will turn any Model III, with at least 32K of memory, single disk drive, and RS-232-C board and modem into an Intelligent Terminal capable of communicating with nearly all types of computer hardware. AND, it will allow you to define its parameters in virtually any way you wish!

Only TELETERM gives you these (plus many more) features, all in a single package.

DIRECT TRS-80 to TRS-80 DISK TO DISK TRANSMISSION*

DIRECT FILE TRANSMISSION FROM DISK**
SUPPORTS PROMPTED OR NON-PROMPTED TRANSMISSION

ON-LINE/OFF-LINE TEXT EDITOR

VIDEO PAGING

SPLIT-WINDOW VIDEO

RECALL SCREEN

WORD WRAPPING

USER-DEFINABLE TRANSLATION TABLES

VIDEOTEX CODES SUPPORTED

*when communicating with another TELETERM system

**to any computer with which you can communicate

Available for MOD II & IBM-PC early in 1983

TELEBOSS — THE COMPREHENSIVE DATA ENTRY/OUTPUT PROGRAM GENERATOR THAT ALSO FORMS A NATURAL FRONT-END FOR TELETERM I

With TELEBOSS, your Model III's become powerful, user-friendly data entry terminals into mini's and mainframes.

TELEBOSS allows you to enter, modify, validate, and store data on inexpensive floppy disks and then transfer these files without tying up expensive communications ports or CPU time on the main computer system.

Best of all, you define all input and output specifiers . . .

- Screen formats
- Data file structures
- Validation criteria
- Report formats

TELEBOSS interfaces with the highly flexible TELETERM communications package, giving you the capability of communicating with virtually any kind of computer hardware.*

*to any computer with which you can communicate.

Requires 48K computer

Available for MOD II & IBM-PC early in 1983

ORDER TODAY: Write or fill in the coupon and mail it with your check, money order, VISA or MasterCharge # to:

TELEXPRESS, INC., P.O. Box 217, Willingboro, New Jersey 08046

TELEXPRESS™ Inc.
 P.O. Box 217
 Willingboro, NJ 08046
 (609) 877-4900

TRS-80 is a trademark of the Tandy Corporation

504

Name _____ Payment: Check ___ Money Order ___
 Address _____ VISA ___ MasterCharge ___
 City, State, Zip _____ **Amount of Payment \$** _____
 Phone _____
 Send me ___ copies of TELETERM @ \$125 per copy including User's Manual. Acct # _____
 Send me ___ copies of the TELETERM User's Manual @ \$10 per copy (Refundable when TELETERM package is purchased). Exp. Date _____
 Send me ___ copies of the TELEBOSS @ \$295.00, including User's Manuals. Credit Card Holders may expedite orders by phoning: (609) 877-4900.



TRS-Turtle

by Larry Brackney
 Second Place
 14-18

I was fascinated by turtle graphics and turtle geometry ever since they were first introduced into the computer industry. I was first exposed to the concept of turtle geometry when I heard about a new package from Terrapin Inc. called Logo. What was this new language that so excited educators?

Turtle geometry is a new math system based on the movements of a turtle. It is oriented to the local area of the turtle, rather than from a central point. The paths the turtle takes are drawn on the monitor—hence, turtle graphics.

The student writes a program for the turtle to follow. Normally this program consists of single command statements such as:

Forward :X—This command tells the turtle to move forward X steps.

Left :X—This instructs the creature to turn left X degrees.

Students using this language are encouraged to “play turtle.” That is, the student pretends he is the turtle.

Not only is Logo good for teaching computer literacy, but it also develops a more organized and logical thought process. It gives students a better chance of learning to program the computer, because Logo is much easier to program than Basic.

There was only one problem keeping me from enjoying turtle geometry and graphics. There were no Logo packages

available for my computer, a Model I.

I enjoy writing Basic programs, but now I had a challenge. I had no Assembly-language background, and I wanted to write a totally new language for the TRS-80. I knew I couldn't write another Logo, but I could write a program that uses turtle geometry/graphics.

Originally TRS-Turtle was nothing

more than Etch-a-Sketch with fancy commands and a function that let the computer memorize the current screen and recall it later. The first method I used was quite slow. I then rewrote the routine to read the screen much more quickly. The second thing I did was put in a Jump command, along with several other commands to erase graphics. Fi-

Program Listing

```

10 REM-----
    ---  TRS - TURTLE  VERSION 1.5  ---
    -----
20 REM          BY LARRY J. BRACKNEY  COLUMBUS EAST HIGH SCHOOL
30 REM TITLE PAGE AND VARIABLE INITIALIZATION  LINES 40-160
40 CLS: CLEAR63
50 T$(1) = "          "+CHR$(184)+STRING$(5,188)+CHR$(144)
60 T$(2) = "          "+CHR$(136)+CHR$(183)+CHR$(191)+CHR$(142)+CHR$(143)+
CHR$(191)+STRING$(3,143)+CHR$(191)+CHR$(143)+CHR$(140)+CHR$(164)
+CHR$(144)
70 T$(3) = STRING$(6,140)+STRING$(2,143)+STRING$(2,140)+STRING$(2,
143)+STRING$(5,140)
80 PRINT@394,"TRS-TURTLE VERSION 1.5 BY LARRY J. BRACKNEY.";
90 PRINT@719,"COLUMBUS EAST HIGH SCHOOL 1982-83";
100 PRINT@976,"PRESS THE SPACE BAR TO BEGIN...";
110 FORT=1TO3:PRINT@469+64*T,T$(T);:NEXTT
120 X$=INKEY$:IFX$<>" "THEN120
130 CLEAR2000:DEFSTRA,B,D,S:DEFINTC,E-R,T-Z
140 DIML$(200),LN(200),LX(200),LY(200),SC(7),CM$(20):FORT=1TO20:
READCM$(T):NEXTT
150 CLS:W=1:T$="HELP":CLS=STRING$(10,128):A="":B="":X=64:Y=24:GO
TO1360
160 CLS:A="":B="":X=64:Y=24
170 REM MAIN INPUT ROUTINE LINES 180-380
180 POKEVARPTR(A),0:PRINT@960,B+CHR$(143)+" ";:A=INKEY$:IFA=" "TH
ENRESET(X,Y):SET(X,Y):GOTO180
190 FORT=9TO10:IFA=CHR$(T)THEN210ELSENEXTT
200 IFA<>CHR$(31)THEN220
210 A="":B="":PRINT@960,STRING$(10,128);
220 IFA=CHR$(13)THENGOTO250:ELSEIFA=CHR$(8)THEN380
230 IFA="["THENB=T$:GOTO250
240 B=B+A:IFLEN(B)>10THEN1930ELSE180
250 L$(W)=B:W=
+1:T$=B
260 FORT=16TO20:IFB=CM$(T)THENW=W-1:NEXTTELTSENEXTT
270 IFB=CM$(1)THENW=W-1
280 IFB=CM$(10)THENW=W-1
290 IFB=CM$(11)THENW=W-1
300 FORCN=1TO20:IFB=CM$(CN)THEN320ELSENEXTCN
310 W=W-1:GOTO1920
320 ONCNGOTO160,400,510,620,730,840,970,1100,1230,1360,1440,1490
,330,350,370,1950,1660,1810,130,1830
330 HT=1:B$="":PRINT@960,CLS;
340 IFR1=1THEN1890ELSE180
    
```

The Key Box

Model I or III
16K, 32K RAM
Cassette or Disk Basic
Printer Opt.

Listing continues

```

350 HT=0:B$="":PRINT@960,CL$;
360 IFRL=1THEN1890ELSE180
370 CLS:PRINT"THE TURTLE SAYS BYE...":END
380 IFLEN(B)>0THENB=LEFT$(B,LEN(B)-1):GOTO180ELSE180
390 REM MOVE TURTLE RIGHT ROUTINE 400-490
400 C$=B
410 IFRL=1THEN440
420 PRINT@960,C$" ?";
430 A=INKEY$:IFA=""THEN430
440 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
450 FORZ=XTOX+VAL(A):IFZ>127THENX=127:GOTO480
460 IFHT=1THENRESET(Z,Y)ELSESET(Z,Y)
470 NEXTZ:X=X+VAL(A)
480 PRINT@960,CL$;:B=""
490 IFRL=1THEN1890ELSE180
500 REM MOVE TURTLE LEFT ROUTINE 510-600
510 C$=B
520 IFRL=1THEN550
530 PRINT@960,C$" ?";
540 A=INKEY$:IFA=""THEN540
550 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
560 FORZ=XTOX-VAL(A)STEP-1:IFZ<0THENX=0:GOTO590
570 IFHT=1THENRESET(Z,Y)ELSESET(Z,Y)
580 NEXTZ:X=X-VAL(A)
590 PRINT@960,CL$;:B=""
600 IFRL=1THEN1890ELSE180
610 REM MOVE TURTLE UP ROUTINE 620-710
620 C$=B
630 IFRL=1THEN660
640 PRINT@960,C$" ?";
650 A=INKEY$:IFA=""THEN650
660 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
670 FORZ=YTOY-VAL(A)STEP-1:IFZ<0THENY=0:GOTO700
680 IFHT=1THENRESET(X,Z)ELSESET(X,Z)
690 NEXTZ:Y=Y-VAL(A)
700 PRINT@960,CL$;:B=""
710 IFRL=1THEN1890ELSE180
720 REM MOVE TURTLE DOWN ROUTINE 730-820
730 C$=B
740 IFRL=1THEN770
750 PRINT@960,C$" ?";
760 A=INKEY$:IFA=""THEN760
770 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
780 FORZ=YTOY+VAL(A):IFZ>44THENY=44:GOTO810
790 IFHT=1THENRESET(X,Z)ELSESET(X,Z)
800 NEXTZ:Y=Y+VAL(A)
810 PRINT@960,CL$;:B=""
820 IFRL=1THEN1890ELSE180
830 REM MOVE TURTLE UP AND RIGHT ROUTINE 840-950
840 C$=B
850 IFRL=1THEN880
860 PRINT@960,C$" ?";
870 A=INKEY$:IFA=""THEN870
880 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
890 FORZ=1TOVAL(A):X=X+1:Y=Y-1
900 IFX>127THENX=127:Y=Y+1:GOTO940
910 IFY<0THENY=0:X=X-1:GOTO940
920 IFHT=1THENRESET(X,Y):RESET(X-1,Y+1)ELSESET(X,Y)
930 NEXTZ
940 PRINT@960,CL$;:B=""
950 IFRL=1THEN1890ELSE180
960 REM MOVE TURTLE UP AND LEFT ROUTINE 970-1080
970 C$=B
980 IFRL=1THEN1010
990 PRINT@960,C$" ?";
1000 A=INKEY$:IFA=""THEN1000
1010 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
1020 FORZ=1TOVAL(A):X=X-1:Y=Y-1
1030 IFX<0THENX=0:Y=Y+1:GOTO1070
1040 IFY<0THENY=0:X=X+1:GOTO1070
1050 IFHT=1THENRESET(X,Y):RESET(X+1,Y+1)ELSESET(X,Y)
1060 NEXTZ
1070 PRINT@960,CL$;:B=""
1080 IFRL=1THEN1890ELSE180
1090 REM MOVE TURTLE DOWN AND RIGHT ROUTINE 1100-1210
1100 C$=B
1110 IFRL=1THEN1140
1120 PRINT@960,C$" ?";
1130 A=INKEY$:IFA=""THEN1130
1140 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
1150 FORZ=1TOVAL(A):X=X+1:Y=Y+1
1160 IFX>127THENX=127:Y=Y-1:GOTO1200
1170 IFY>44THENY=44:X=X-1:GOTO1200
1180 IFHT=1THENRESET(X,Y):RESET(X-1,Y-1)ELSESET(X,Y)
1190 NEXTZ
1200 PRINT@960,CL$;:B=""
1210 IFRL=1THEN1890ELSE180
1220 REM MOVE TURTLE DOWN AND LEFT ROUTINE 1230-1340

```

Listing continues

nally, I added program-writing capabilities such as List, Run, and FIX.

TRS-Turtle starts out with a short title page that prompts the user to press the space bar to begin. Then a small blinking square (the turtle) appears at midscreen, and a block cursor appears at the lower left of the screen.

After typing in the appropriate command, press the enter key as in normal Basic. Do not type in line numbers.

When entering a direction command (for example, Left), the computer will prompt you with a question mark. The computer is asking you for a number from one to nine. This number represents the number of steps in that direction the turtle can take. The direction commands are the only commands that have this format. Two other commands (Jump and List) require optional input after they are entered; these will be explained later.

In addition to the ability to type in

*“Originally TRS-Turtle
was nothing more
than Etch-a-Sketch
with fancy commands. . .”*

commands, two other keys have functions. The clear key erases the entire line. The up arrow will repeat the last command. Thus, instead of typing in 20 Left commands, just one and the up arrow can be used to generate 20 repeated commands.

Now for a brief summary of the commands.

- Right—Moves the turtle right (X) steps. Turtle will leave a trail unless Hide is used.

- Left—Moves the turtle left (X) steps. Turtle will leave a trail unless Hide is used.

- Up—Moves the turtle up (X) steps. Turtle will leave a trail unless Hide is used.

- Down—Moves the turtle down (X) steps. Turtle will leave a trail unless Hide is used.

- <Up—Moves the turtle left and up (X) steps. Turtle will leave a trail unless Hide is used.

- Up>—Moves the turtle right and up (X) steps. Turtle will leave a trail unless Hide is used.

```

1230 C$=B
1240 IFRL=1THEN1270
1250 PRINT@960,C$ " ?";
1260 A=INKEY$:IFA=""THEN1260
1270 IFRL=1THENA=STR$(LN(NU))ELSELN(W-1)=VAL(A)
1280 FORZ=1TOVAL(A):X=X-1:Y=Y+1
1290 IFX<0THENX=0:Y=Y-1:GOTO1330
1300 IFY>44THENY=44:X=X+1:GOTO1330
1310 IFHT=1THENRESET(X,Y):RESET(X+1,Y-1)ELSESET(X,Y)
1320 NEXTZ
1330 PRINT@960,CL$;:B=""
1340 IFRL=1THEN1890ELSE180
1350 REM LEARN THE SCREEN ROUTINE 1360-1420
1360 PRINT@960,CL$;:D="":RESET(X,Y):X1=X:Y1=Y
1370 POKEVARPTR(D),128
1380 FORC=0TO7
1390 POKEVARPTR(D)+1,(15360+C*128)AND255
1400 POKEVARPTR(D)+2,(15360+C*128)/256
1410 SC(C)=D:NEXTC
1420 B="":IFHE=0THEN180ELSE1960
1430 REM REMEMBER THE SCREEN ROUTINE 1440-1470
1440 CLS:X=X1:Y=Y1:FORC=0TO6:PRINTSC(C);:NEXTC
1450 PRINTLEFT$(SC(7),127);CHR$(28);
1460 POKE16383,ASC(RIGHT$(SC(7),1))
1470 B="":GOTO180
1480 REM JUMP ROUTINE 1490-1640
1490 IFRL=1THEN1640
1500 LX=X:LY=Y
1510 IFW=2ORNU=1THENRESET(X,Y)
1520 PP=PEEK(14400)
1530 IFPP=8THENLY=LY-1
1540 IFPP=16THENLY=LY+1
1550 IFPP=32THENLX=LX-1
1560 IFPP=64THENLX=LX+1
1570 IFPP=128THEN1630
1580 PRINT@960,"X=LX,"Y="LY"  PRESS THE SPACE BAR TO STOP.";
1590 IFLX<0THENLX=0ELSEIFLX>127THENLX=127
1600 IFLY<0THENLY=0ELSEIFLY>44THENLY=44
1610 IFOPOINT(LX,LY)THENRESET(LX,LY):SET(LX,LY):GOTO1520
1620 SET(LX,LY):RESET(LX,LY):GOTO1520
1630 A=INKEY$:B="":X=LX:Y=LY:LX(W-1)=LX:LY(W-1)=LY:PRINT@960,STR
ING$(62,128);:GOTO180
1640 X=LX(NU):Y=LY(NU):GOTO1890
1650 REM LIST ROUTINE 1660-1790
1660 CLS
1670 IFL$(1)="LIST"ANDW=1THENB="":W=1:GOTO180
1680 INPUT"ON PRINTER (Y/N)";D$
1690 IFD$="Y"THEN1740
1700 IFD$<>"N"THEN1660
1710 CLS:FORT=1TOW-1:PRINTT":",L$(T),LN(T):FORV=1TO25:NEXTV:IFL$(
T)="JUMP"THENPRINT,"X="LX(T),"Y="LY(T)
1720 IFPEEK(14464)=1THEN1720ELSENEXTT
1730 GOTO1760
1740 CLS:FORT=1TOW-1:LPRINTT":",L$(T),LN(T):IFL$(T)="JUMP"THENLP
RINT,"X="LX(T),"Y="LY(T)
1750 PRINTT":",L$(T),LN(T):IFL$(T)="JUMP"THENPRINT,"X="LX(T),"Y=
"LY(T):NEXTTESENEXTT
1760 PRINT"PRESS ANY KEY..."
1770 X$=INKEY$:IFX$=""THEN1770
1780 B="":CLS
1790 GOTO160
1800 REM FIX ROUTINE 1810
1810 W=W-1:B="":PRINT@960,CL$;:GOTO180
1820 REM RUN ROUTINE 1830-1900
1830 CLS:X=64:Y=24:RL=1:NU=1
1840 IFNU=W+1THEN1900
1850 FORCN=1TO20
1860 IFL$(NU)=CM$(CN)THENPC=CN
1870 NEXTCN
1880 ONPCGOTO160,400,510,620,730,840,970,1100,1230,1360,1440,149
0,330,350,370,1950,1660,1810,10
1890 NU=NU+1:GOTO1840
1900 B="":RL=0:GOTO180
1910 REM ERROR MESSAGES 1920 AND 1930
1920 PRINT@960,"SORRY! THE TURTLE DOESN'T KNOW THAT WORD!";:FORT
=1TO500:NEXTT:PRINT@960,STRING$(41,128);:B="":GOTO180
1930 PRINT@960,STRING$(51,128);:PRINT@960,"YOU TYPED TOO MUCH FOR
THE TURTLE!";:FORT=1TO500:NEXTT:PRINT@960,STRING$(50,128);:B="
":GOTO180
1940 REM HELP ROUTINE 1950-1990
1950 HE=1:GOTO1360
1960 CLS:PRINT"THE TURTLE KNOWS HOW TO..."
1970 FORT=1TO20STEP2:PRINTCM$(T),CM$(T+1):NEXTT
1980 PRINT " ":PRINT"PRESS THE SPACE BAR TO CONTINUE..."
1990 X$=INKEY$:IFX$<>" "THEN1990ELSEHE=0:GOTO1440
2000 REM COMMANDS STORED IN DATA IN LINE 2010
2010 DATA CLEAR,RIGHT,LEFT,UP,DOWN,UP>,<UP,DOWN>,<DOWN,LEARN,REM
EMBER,JUMP,HIDE,FIND,BASIC,HELP,LIST,FIX,FORGET,RUN

```

● <Down—Moves the turtle left and down (X) steps. Turtle will leave a trail unless Hide is used.

● Down>—Moves the turtle right and down (X) steps. Turtle will leave a trail unless Hide is used.

● Clear—Clears the screen. Clear does not effect learned screens or listings in memory.

● Learn—Learns the current screen, and puts it in memory. The learned screen is called back by Remember.

● Remember—Recalls learned screens, and puts them on the screen.

● Jump—Gives the user control of a blinking turtle. Move him around with the arrow keys and press the space bar to stop the turtle. The current X and Y coordinates are given at the bottom of the screen.

● Find—Finds the turtle. The turtle draws instead of erasing as in the Hide command.

● Hide—Hides the turtle. The turtle erases instead of drawing as in the Find command.

● Basic—Returns the program to Basic.

● Help—Gives a directory of all available commands.

● List—Lists the program in memory. Lines can be listed on the screen or on a printer.

● Fix—This deletes the last line typed from the listing, allowing the user to replace the line. Note: The user can only Fix the last line typed.

● Run—Runs the program in memory. The turtle goes through all of the steps drawing the picture the user wrote.

● Forget—Deletes all lines of the user's program and learned screens.

These commands are straightforward with a few exceptions. When typing Jump, a blinking turtle appears. The user moves the turtle by using the arrow keys. When the desired location for the turtle is found press the space bar.

Now for some notes on a sample listing. Listings may be given on either the printer or on the screen. To make a screen listing pause, hold down the shift key. A sample listing might look like this:

```

1: UP          9
2: LEFT       9
3: RIGHT      7
4: RIGHT      7
5: DOWN       3
6: UP         2
7: JUMP       0

```

X=100 Y=33

The numbers to the far left are the line numbers of the user's program.



Rose™

You've Got TOTAL ACCESS™

TO YOUR COMPUTER HARDWARE & SOFTWARE
NEEDS. CALL ROSE TODAY!

*** DISK DRIVES**

Total Access 40 Track.....	\$239
Aerocomp 40T Flippy.....	\$319
Aerocomp 80T.....	\$399
Aerocomp 80T Flippy.....	\$409
Aerocomp 40T Dual Head.....	\$409
Aerocomp 80T Dual Head.....	\$519

For TRS80 Mod I, Mod III & IBMPC external & TI99/4A.
Incl. power supply & enclosure.

NEW! Apple Compatible Drive..... \$309
Apple Comp. Disk Controller Board..... \$99

*** BARE DRIVES**

Total Access 40T.....	\$199
Aerocomp 40T Flippy.....	\$269
Aerocomp 80T.....	\$329
Aerocomp 80T Flippy.....	\$359
Aerocomp 40T Dual Head.....	\$329
Aerocomp 80T Dual Head.....	\$469

*** DRIVE CABLES**

2-drive.....	\$24
4-drive.....	\$34
Extender cable.....	\$13

*** OPERATING SYSTEMS**

TRSDOS 2.3 Disk & Manual.....	\$20
LDOS (I or III).....	\$119
DOSPLUS 3.4.....	\$129
NEWDOS/80 (I or III).....	\$129

*** DISK CONTROLLERS/SEPARATORS**

Aerocomp "DDC" double dens. disk controller for Mod I.....	\$139
w/DOSPLUS 3.3D.....	\$179
w/LDOS.....	\$229
Aerocomp "DDS" double dens. data sep. for Percom or LN Doubler.....	\$49
Aerocomp "SDS" single dens. data sep. for Mod I.....	\$29

MODEL III DRIVES

Complete kits including 40 track disk drives (1 or 2), disk controller board, power supply and all hardware and cables.

One Drive System Kit.....	\$499
Two Drive System Kit.....	\$699

*** ODD STUFF**

Single drive power supply.....	\$44
Drive enclosure (silver).....	\$24
Diskettes (box of 10).....	\$24
MX80 ribbons.....	\$9

120 day warranty on drives. Add \$5 per drive shipping in Cont. US. UPS COD charge \$1.50. There is a 15 day FREE TRIAL ON DRIVES. If not completely satisfied I'll refund your money (less shipping). I'll take exception to improper use or mishandling.

*** RADIO SHACK COMPUTERS**

26-1061 Mill, LI, 4K.....	595
26-1062 Mill, LII, 16K.....	799
26-1065 Mill, 48K, 1 drive.....	1495
26-1066 Mill, 48K, 2 dr RS232.....	1950
26-3004 16K Color Computer.....	299
26-3002 16K CC w/extended BASIC.....	399
26-3003 32K CC w/extended BASIC.....	499

26-3501 PC 1, (Call about accessories).....	129
26-3601 PC 2, (Call about accessories).....	229
26-4002 64K Mill, 1-drive.....	2899
26-6001 128K M16, 1-drive.....	4199
26-6002 128K M16, 2-drive.....	4799
26-6050 DT-1 Terminal.....	599

*** PERIPHERALS - Model III-III-16, CC**

32K LNW E/I w/RS232 complete.....	375
LNDOUBLER 5/8 w/o DOS.....	199
26-1143 Radio Shack DDen board.....	125
26-1125 Mill Hi Res board.....	299
26-1145 MI RS232 fir RS E/I.....	85
26-1148 Mill RS232 with cable.....	89
26-1172 DC Modern I.....	125
26-1173 DC Modern II.....	199
26-1208 CCR-81 Recorder.....	51
26-1130 Mill Hard Disk, primary.....	2099
26-1131 Mill Hard Disk, secondary.....	1599
26-1132 Mod I H/D adapter.....	32
16-0230 13" Color TV, remote control.....	353
26-1162 Mill 1sr drive kit, pure RS.....	629
26-3008 C C Joysticks, pr.....	21
26-3022 CC drive 1, includes controller.....	449
26-4104 Mill/16 Hi-Res board.....	419
26-4150 Mill/16 Hard Disk 8.4Mbyte, pri.....	3799
26-4151 Mill/16 Hard Disk 8.4Mbyte, sec.....	2899
26-4160 1-Drive expansion.....	938
26-4161 2-drive expansion.....	1431
26-4162 3-drive expansion.....	1897
26-4165 1-drive unit.....	1099
26-4166 2-drive unit.....	1699
26-4167 Thinline add-on drive.....	535
26-6010 Mill to M16 upgrade.....	1299
26-6011 128K RAM board.....	599

*** PRINTERS & OTHER ACCESSORIES**

26-1158 Daisy Wheel II, 43 cps.....	1599
26-1447 RS Tractor Assy.....	208
26-1448 Sheer Feeder.....	999
26-1165 Line Printer V 160cps.....	1195
26-1455 Acoustic cover.....	339
26-1250 DWP-410, 25cps.....	1207
26-1459 RS Tractor Assy.....	199
26-1251 DMP-400, 140 cps.....	969
26-1252 DMP-500, 220cps.....	1399
26-1253 DMP-100, 50cps.....	309
26-1254 DMP-200, 120cps.....	679
26-1191 Multi-pen plotter.....	1650
26-1192 CGP-115 Color printer.....	199
26-1193 Flarbed plotter.....	799
26-1195 Digitizer.....	369
26-1196 GT-116 "X-PAD".....	295
ANADIX DP-9260A, 200cps.....	1449
PROWRITER 1, 120cps, 10" F/T.....	469
PROWRITER 2, 120cps, 15" F/T.....	669
STARWRITER F-10, 40cps.....	1399
PRINTMASTER F-10, 55cps.....	1599
Rutishauser tractor feed.....	208
Rutishauser sheer feeder.....	999

*** LNW COMPUTERS**

96K LNW-80 Model I, NTSC/RGB, RS232, 5/8" DDen controller, FREE 12" green phosphor monitor and cable included.....	1695
--	------

128K LNW-80 Mod II, NTSC/RGB, RS232, CP/M compatible, 5/8" controller, FREE 12" green phos monitor/cable included.....	2495
--	------

*** MEDIA & SUPPLIES**

8" disks SSDDen, Guaranteed Forever.....	32
8" disks DSDDen, Same Guarantee.....	39
5" Flipsort, holds 50 disks.....	23
8" Flipsort, same deal.....	29
5" Library Boxes.....	250
8" Library Boxes.....	350
5" or 8" Head Cleaning Kit.....	9
Tract paper ltr size, 2900 sheer 20 lb.....	25

Call for ribbon & printwheel prices.

*** SOFTWARE**

All Radio Shack Software.....	20% off
Aron CP/M, Model II.....	160
Pickles & Trout CP/M, Model II.....	160
Pickles & Trout CP/M, Model 16.....	190
All SNAPPWARE.....	10% off
All MicroPro.....	35% off

*** TRS-80 SPECIAL EQUIPMENT**

CP/M (48K) for Mod III w/hardware and software complete.....	275
CP/M (64K inc) for Mod III with hardware and software.....	440
80 x 24 video board for Mod III.....	299
GREEN Phosphor Antiglare CRT.....	79
AMBER Phosphor Antiglare CRT.....	89
16K Memory 200nsec Guar 1 yr.....	8/\$12
64K Memory 200nsec Guar 1 yr.....	8/\$48
ZVM 121 12" Green Phos. Mon.....	135

ALWAYS CALL FOR THE LATEST PRICES. They may have changed in the 60+ days since this ad was written.

**ORDER NOW!
TOLL FREE
800-527-3582**

Write or call. Toll free lines are for orders only. Texas residents call 214/458-1966 and deduct \$2.00 from your order. If you need technical information or service use the Texas number. Prices are subject to change without notice and are mail order only. I accept VISA or MASTERCARD, you can send a check or money order (allow a couple of weeks for personal or company checks to clear) or order COD (cash, certified check or money order only). Shipping is not included unless otherwise indicated. Texas orders add 5% tax. No tax added on shipments outside Texas. Order up - I need the money!

**TOTAL ACCESS™
P.O. BOX 3002
RICHARDSON, TX 75080
214-458-1966**

NEXT DAY SHIPMENT on all in stock Merchandise.

These line numbers shouldn't exceed 200 unless you wish to modify TRS-Turtle.

The word after the colon is the actual statement. Commands other than directions, Hide, Find, and Jump will not be listed. The numbers to the far right are the command values. This simply means that as a direction is typed, the number of steps the turtle takes is displayed here. Commands other than directions will have a 0 in this place.

The numbers after the Jump command, X=XXX Y=YYY, are the positions to which the turtle jumped. These numbers are only displayed if a Jump command is encountered.

The Fix command will delete the last line of the program. TRS-Turtle draws the picture as you type it in, thus making it easy to spot your mistakes. After spotting an error, type Fix. This gets rid of the last command. Now type in a new command. After the correction run the program and it will draw the corrected picture. You can then continue typing more commands.

The Program

Lines 10-160 handle the title page and variable initialization. Lines 160 and 170 seem to repeat each other, but do not change them or you will run into problems. Many other situations may arise where it appears I have merely repeated myself. Don't be fooled—everything is necessary.

Lines 180-380 control the user input. Line 180 is the main line; it reads the input and assigns it to A\$. A\$ is then added to B\$ after enter is pushed. The computer compares B\$ to CM\$(X). If B\$ is equal to CM\$(X), then it goes to

the appropriate routine. This routine also checks for backspacing and non-existent commands. If a command the computer doesn't know is typed in, the computer branches to the proper error message.

Lines 390-1340 move the turtle in the appropriate direction. Lines 400-490 make the turtle draw to the right. The first few lines control user input and convert the input to a digit. Next a For...Next loop draws the line in the correct direction that number of steps.

Lines 1360-1420 memorize the screen. The screen is stored into seven variables SC(1-7). These variables are called back by the Remember routine.

The Remember routine lies between lines 1440 and 1470. All this does is recall the variables stored in the Learn routine.

The Jump command is controlled from lines 1490-1640. This routine PEEKs keyboard address 14400 for the arrows and the space bar. The numbers received are acted upon in the appropriate fashion.

The List routine (lines 1660-1790) goes through a loop, calling up the array of variables and printing them on either the printer or the screen.

Line 1810 sets the command counter back one to erase the last command. It then jumps back to the input routine.

The Run routine is in lines 1830-1900. This routine goes through the command list that the user typed in and executes each command.

The variable RL is the flag that keeps individual routines from sending control back to the input routine. Instead control is returned to line 1890, which

goes to the next command to be executed.

Lines 1920 and 1930 are the error messages. No language should be without them, and mine is no different. I have only included two messages, but these should be sufficient for most mistakes.

The Help routine is located in lines 1950-1990. This routine sets a variable flag, HE, and memorizes the screen. The flag sends control back to Help instead of line 180. The computer then gives the user a list of available commands, and then restores the previous screen.

Finally, line 2010 is the data statement in which all 20 TRS-Turtle commands are stored. If you don't like the word chosen for the commands, this is the line to change.

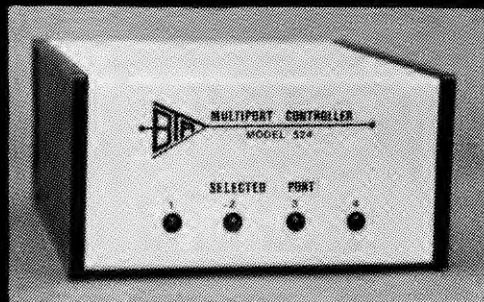
Notes for Tinkerers

Here are a few suggestions for possible modifications. A routine could save the user's program to disk or cassette. A program change could make the left and right commands more realistic (that is, LEFT :X where X is the number of degrees the turtle would turn). Of course this change would require that the turtle's forward movement routines be changed to move at that angle. How about new commands in general? They wouldn't necessarily need to deal with turtle geometry (they could be text commands).

Happy turtling. ■

Larry Brackney (age 15) can be reached at 2525 16th St., Columbus, IN 47201.

Need More Serial Ports ?



Price
\$249.00

Bay Technical Associates

P. O. Box 387, Bay St. Louis, MS. 39520

601 - 467-8231

- ★ Add a BTA smart multipoint controller to your C.P.U.
- ★ The MODEL 524 expands a single RS232 port to four individual ports with port selection and baud rate controlled by user software.
- ★ Buffered inputs permit simultaneous operation increasing data exchange rate.
- ★ 62K spooler model also available.

RUN BASIC PROGRAMS AT SUPER SPEED WITH ZBASIC 2.2.

THE WORLDS FASTEST TRS-80 BASIC COMPILER from **SIMUTEK**

BELIEVE IT OR NOT WE'VE ADDED MORE NEW FEATURES to the ONLY INTERACTIVE BASIC COMPILER for the TRS-80!

- Speed increases of 10-100 times are typical after compilation.
- Compiled code can be RELOCATED to run anywhere in memory. Code is even ROMable!
- ZBASIC 2.2 NOW SUPPORTS BOTH RANDOM and SEQUENTIAL DISK I/O.
- ZBASIC 2.2 is now a super tool for business programmers: RANDOM ACCESS FILES, and PRINT USING statements are supported as well as a HIGH PRECISION MATH package (with no rounding problems).
- Special BUILT-IN MACHINE LANGUAGE COMMANDS to increase program operation by as much as 1000 times! Special commands are implemented for fast memory searching (CPDR, CPIR), block memory moves (LDIR, LDDR), inputting and printing HEX numbers, inserting MACHINE LANGUAGE into COMPILED CODE, disabling and enabling interrupts, inverting memory, 16 bit PEEKs and POKEs, and stack control, debug and much more.
- ZBASIC 2.2 compiles the ENTIRE PROGRAM into to Z-80 machine language. (Not 8080 code or a combination of BASIC and machine language like some other compilers.) Clumsy LINKING LOADERS, and RUNTIME MODULES are not needed; ZBASIC 2.2 creates a ready to run MACHINE LANGUAGE program.
- NO ROYALTIES imposed on registered ZBASIC owners.
- Typical COMPILATION TIME is TWO SECONDS for a 4K program.
- Use TRS-80 Basic to write ZBASIC programs!
- Compile many existing programs with only minor changes. (Some BASIC programming experience is required.)
- Fully compatible with both the Model I and the Model III. Mod I compiled programs work on a MODEL III, and visa-versa. ZBASIC works with NEWDOS-80, NEWDOS+, DOSPLUS, LDOS, MULTIDOS, ULTRADOS, TRSDOS etc.
- BUILT-IN and much improved MUSIC and SOUND EFFECTS commands.
- Improved CHAINING for disk users.
- TIME\$ now available on DISK version.
- ZBASIC 2.2 now has an INPUT @ command (similar to PRINT @).
- The TAB function will now tab 255 columns on a printer. (BASIC cannot tab past column 64.)
- NEWDOS 80 2.0 USERS can use the CMD "dos command" function!
- NEW and EASIER to use USR COMMANDS.
- New math functions to calculate XOR and INTEGER REMAINDERS
- Logical STRING COMPARISONS are now supported.
- The disk commands INSTR, MID\$ ASSIGNMENT are now supported on both DISK AND TAPE ZBASIC.
- DEFSTR is now supported.
- Eight disk files may be opened simultaneously; random, sequential or mixed.
- LINE INPUT#, is now supported
- Invoke the compiler by simply hitting these two keys: ":-"
- NEW 100+ PAGE MANUAL WITH DESCRIPTIONS AND EXAMPLE.
- ZBASIC 2.2 Comes with CMDFILE/CMD program from MISOSYS, to allow appending or merging compiled programs and machine language programs from tape or disk.

ZBASIC 2.2 DOES NOT SUPPORT THESE BASIC COMMANDS:

- ATN, EXP, COS, SIN, LOG, TAN, and exponentiation. (However, subroutines are included in the manual for these functions.)
- ERROR, ON ERROR GOTO, ERL, ERR RESUME.
- No direct commands like AUTO, EDIT, LIST, LLIST ETC, although these commands may be used when writing programs.
- Others NOT supported: CDBL, CINT, CSNG, DEFFN, FIX, FRE.
- Normal CASSETTE I/O. (ZBASIC supports it's own SPECIAL CASSETTE I/O statements.)
- SOME BASIC COMMANDS MAY DIFFER IN ZBASIC. For instance, END jumps to DOS READY, STOP jumps to BASIC READY etc.
- MEMORY REQUIREMENTS: to approximate the largest BASIC program that can be compiled in your machine (at one time), enter BASIC and type: PRINT (MEM-6500)/2. Remember, you can merge compiled programs together to fill memory.

ZBASIC 2.2 SPEED COMPARISON DEMO

To help give you an idea how fast compiled programs are, we have included this demo program:

ZBASIC 2.2 DEMO PROGRAM

Time to compile and run complete program	: 0 MIN. 2 SEC.
BASIC Execution speed MOD 1, LEVEL II	: 7 MIN. 34 SEC.
ZBASIC Execution speed MOD 1, LEVEL II	: 0 MIN. 18 SEC.
BASIC Program size (WITHOUT VARIABLES)	: 895 BYTES
ZBASIC Program size (WITHOUT VARIABLES)	: 2733 BYTES

(Remember that the ZBASIC program includes an 1879 byte sub-routine package.) Program shown exactly as compiled and run in BASIC and ZBASIC.

```

10 '===== ZBASIC 2.2 EXAMPLE PROGRAM AND TIME TEST=====
20 CLS: CLEAR 100: DEFINT A-X: DEFSTR Z: DIM AA(64,24), Z(50): RANDOM
30 AA=100: BB=-1000: CC=3: DD=-3: EE=-9999: ST$="START TIME "+TIME$
40 FOR I=1 TO 127 STEP 2: FOR J=7 TO 127 STEP 3: XX=POINT(I,J): SET(I,J)
50 XX=(I-J)/(2*(7+I+J)): XX=ABS(INT(RND(I*J)-AA)+7): RESET(I,J)
60 XX=PEEK(I+J): POKE 15360+I+J, J: OUT 255, J AND (3*J): XX=INP(I)
70 AB$=STR$(I+J): BA$=LEFT$(AB$, 2): AA(I/2, J/2)=VAL(BA$)+AA*3
80 BA$=BA$+RIGHT$(BA$, RND(3)): XX=INSTR(1, BA$, "9"): XX=SGR(I*J)
90 BA$=MID$(BA$, 2, 2): MID$(BA$, 1, 1)=Z: IF XX THEN 100 ELSE CLS
100 IF LEN(BA$) > 3 OR SGN(XX)=1 AND ASC(BA$)=32 THEN PRINT "+++"
110 IF POS(0) < 62 THEN TRON: TROFF: PRINT ELSE XX=NOT(RND(99))+100
120 AS$=INKEY$: IF AS$="Y" OR AS$="y" AND I < 120 THEN PRINT "TRUE.."
130 RESTORE: READ A, C, Z(J), D: GOSUB 170: GOSUB 170: GOSUB 170: GOTO 210
140 NEXT: PRINT "*": NEXT I: CLS: PRINT @ 512, ST$, "STOP TIME "; TIME$
150 STOP: '===== END OF MAIN TEST LOOP =====
160 DATA 12345, -1, "TEST", -9999
170 ON RND(6) GOTO 180, 190, 200, 180, 190, 200
180 RETURN
190 RETURN
200 RETURN
210 ON RND(9) GOSUB 180, 190, 200, 180, 190, 200, 180, 190, 200
220 GOTO 140
    
```

NOTICE ZBASIC 2.0 OWNERS: you can upgrade your ZBASIC 2.0 for no charge. Just send us your original diskette/cassette and a S.A.S.E with your registered serial number and copy of your invoice. We will send you ZBASIC 2.2 and updates to your manual.

VISA, MASTERCARD, AMERICAN EXPRESS, C.O.D. ORDERS ONLY.

800 528-1149 order line

ZBASIC 2.2 DISK VERSION AND MANUAL	89.95
ZBASIC 2.2 TAPE VERSION AND MANUAL	79.95
ZBASIC 2.2 DISK & TAPE VERSION AND MANUAL	99.99
MANUAL ONLY (APPLIES TO PURCHASE)	25.00

SIMUTEK COMPUTER PRODUCTS INC.

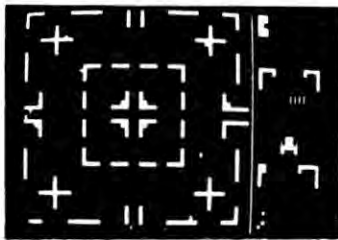
TECHNICAL QUESTIONS PLEASE CALL (602) 323-9391
4897 E. SPEEDWAY, TUCSON, ARIZONA 85712

TRS-80 is tm of Radio Shack, a Tandy Corp.

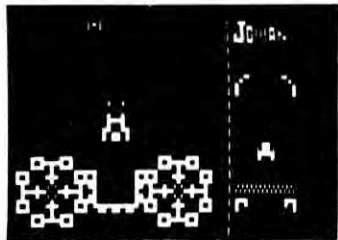
2 NEW GAMES FROM COMPUTER SHACK!

Once again Computer Shack brings you a revolution in computer games. Over the past few years COMPUTER SHACK, has published some of the finest software on the market. Now, with the help of many great programmers and an abundance of public support, we've managed to become one of the best software companies in the country, specializing in the TRS-80.

Computer Shack strives to be the best, to come out with new games, new ideas, and new techniques. We want to be the pacesetters of the industry. We were first with an all graphics Dungeons and Dragons game. Called DUNGEON ESCAPE, it combined spontaneous action and spectacular sound routines with an almost impossible quest. DUNGEON ESCAPE became an immediate success. Written by Bill Dunlevy, DUNGEON ESCAPE is still going strong after two years.

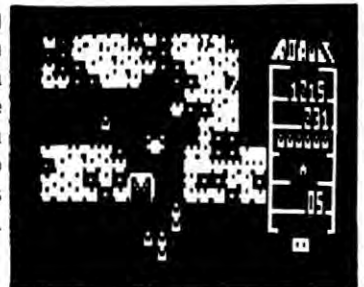


Then in 1982, we peaked with two legendary games that put Computer Shack on the top of the arcade market: CYBORG and JOVIAN. Both written with the combined talents of Bill Dunlevy and Doug Frayer, they became overwhelming successes. CYBORG, a totally original game, uses nine screens at a time with 20 different levels of play. A brilliant contest of skill as well as intelligence, it has been called a "TRS-80 classic" by Bob Lidell in 80 US. JOVIAN, brings to your screen, effects like you've never seen before. you take a trip to JOVIAN space where you maneuver your space sled around mines and fast moving aliens in order to achieve your final goal, the destruction of all JOVIAN life. Both CYBORG and JOVIAN have received rave reviews on a national level, not only because of creativity behind each of them, but because they have used many new programming techniques. One of the most original techniques is a new type of wrap around screen that will amaze and dazzle you.

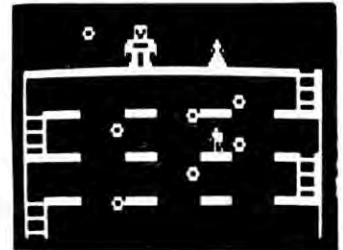
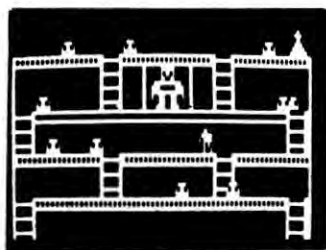
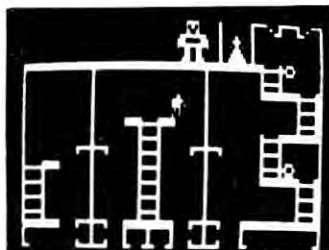


Now, in 1983, Computer Shack reaches new heights with two great new games, sure to storm the market and set the standard for all games that follow.

First we bring you ASSAULT, another great game by Doug Frayer and Bill Dunlevy. Along with their usual array of spectacular graphics and sound, they've given their new creation something rarely found in computer games these days. originality. ASSAULT isn't just a copy of another game. Using total imagination, the programmers have managed to create what promises to be another "Classic". Using a creative concept, the game places you in a mountain haven, surrounded by sparkling gold. Your goal: destroy the monsters trying to steal the gold and zap all the poisonous mushrooms. Fantastic graphics and sound, this program uses Dunlevy and Frayers "wrap around graphics"™ it uses 9 screens at a time. With many different levels.



Next we give to you LIBERATOR, an arcade action game written by John Crane. LIBERATOR is great for all arcade buffs and adventurers, alike. While working on perfecting an automated robot, your creation goes berserk, capturing your five lovely assistants and running off to different locations in the industrial park. Now you must search out your assistants. Being careful of Beer Barrels, Little Robots, Waterfalls, Elevators, flying boulders etc. If you're hit, its all over. LIBERATOR is sure to become popular, with its 5 totally different screens.



COMPUTER SHACK

1691 Eason • Pontiac, Michigan 48054

Info: (313) 673-8700 • Orders: CALL TOLL FREE (800) 392-8861

Master Charge and VISA OK. Please add \$3.00 for shipping in the U.S.A. - \$5.00 for Canada or Mexico - Proper postage outside of U.S. - Canada - Mexico. Dealers: We are distributors for all items in this ad. Write for our catalog and price list.

COMPUTER SHACK

We are constantly adding new programs to our stock. If you don't see what you want call us on our toll free number to see if we have it. We have a new catalog with full descriptions of all our products. Catalogs are free to anyone in the US. Do to the high cost of postage outside of the US we must charge \$1.00 for mailing. This will be refunded on the first order. All in stock items will be shipped within 24 hours. Special Discounts. All software is discounted 10% when you purchase 2 or more. 15% When you purchase three copies, 20% when you purchase four or more.

GAMES MODEL I/III

ASSAULT By Computer Shack	19.95/21.95
ARACHNID PLUS By Computer Shack	19.95/21.95
CYBORG By Computer Shack	19.95/21.95
DUNGEON ESCAPE by Computer Shack	15.95/19.95
BREYMOON by Computer Shack	15.95/19.95
JOVIAN By Computer Shack	19.95/21.95
LIBERATOR by Computer Shack	19.95/21.95
SIMON and MERFUNKEL by Computer Shack	15.95/19.95
ALIEN DEFENSE By Soft Sector	15.95
CATERPILLAR By Soft Sector	15.95/19.95
FORTRESS By Soft Sector	15.95/19.95
OUTHOUSE by Soft Sector	15.95/19.95
RALLY by Soft Sector	19.95/21.95
SUPERVADERS	15.95/19.95
DEVILS TOWER	19.95/24.95
FORBIDDEN CITY	39.95
FORBIDDEN PLANET	39.95
PANIK	19.95/24.95
DEFIANCE	24.95
ASYLUM II	19.95/24.95
DUNZHIN	29.95/29.95
KAIY (DUNZHIN II)	19.95/24.95
LABYRINTH	19.95/24.95
LASER DEFENSE by Med Systems	19.95/24.95
INSTITUTE by Med Systems	19.95/22.95
ARMORED PATROL	19.95/24.95
ELIMINATOR	19.95/24.95
SEA DRAGON	19.95/24.95
DEMON SEED	19.95/24.95
PENETRATOR by Melbourne House	24.95/24.95
STRIKE FORCE by Melbourne House	15.95/19.95
BOUNCEIDS by Cornsoft Group	15.95/19.95
FROGGER by Cornsoft Group	15.95/19.95
CRAZY PAINTER by Cornsoft Group	15.95/19.95
VENTURE by Horizon Software	15.95/19.95

JANUARY TOP TEN

- 1.) CYBORG..... by Computer Shack
- 2.) DEMON SEED..... by Trend Software
- 3.) JOVIAN..... by Computer Shack
- 4.) FROGGER..... By Corsoft
- 5.) OUTHOUSE..... By Soft Sector
- 6.) SEA DRAGON..... By Adventure Int.
- 7.) PENETRATOR..... By Melbourne House
- 8.) BOUNCEIDS..... by Cornsoft
- 9.) CRAZY PAINTER..... By Cornsoft
- 10.) CATAPILLAR..... By Soft Sector

Modem Programs Model I/III

DISK DOWNLOAD SYSTEM (DDS)	75.95
DIRECT FILE TRANSFER (DFT) Disk Version	24.95
INFO EX BULLETIN BOARD AND DOWNLOAD	149.95
MODEM GAMES (Chess, Checkers, & Othello)	19.95/19.95
TAPE DOWNLOAD SYSTEM (TDS)	39.95
ULTRA TERM	59.95

BUSINESS PROGRAMS

EP-SET 80 by Computer Shack	15.95/19.95
MONTHLY BILL SYSTEM by Computer Shack	149.00
LAZY WRITER by ABC Sales	149.95
POSTMAN by Soft Sector Disk only	175.95
Small Business CHECK WRITER	Disk Only 39.90
Small Business BILL SYSTEM	Disk only 39.90
Small Business INVOICE WRITER	Disk only 24.95

Color Computer

COLOR TAPE COPY by Big Systems Tape	15.95
COLOR DFT by Big System - Tape	19.95
COLOR BONANZA by Soft Sector - Tape	39.00
MASTER CONTROL by Soft Sector - Tape	19.95
TAPE DIRECTORY by Soft Sector - Tape	14.95
STAR FIRE by Intellectronics	21.95/26.95
DUNKEY MUNKEY by Intellectronics	21.95/26.95
KEYS OF THE WIZARD by Spectral Assoc	21.95
GHOST GOBBLER by Spectral Assoc	14.95
PLANET INVASION by Spectral Assoc	21.95
PHANTOM SLAYER by Med systems	19.95
INVADERS REVENGE by Med Systems	19.95
ASTRO BLAST by Mark Data Products	24.95
HAYWIRE (Berserk) - By Mark Data Products	24.95
KATTERPILLAR by Tom Mix	24.95
COLORPEDE by Intracolor	29.95

UTILITIES MODEL I/III

EP-SET 80 by Computer Shack	18.90/18.90
PRINTER HELPER by Computer Shack	19.95/21.95
SUPER DIRECTORY by Computer Shack	39.90
SUPER UTILITY PLUS by Powersoft	75.95
POWER DRAW by Powersoft	39.95
SCRIP PLUS by Powersoft	39.95

MISC. MODEL I/III

FAMILY TREE by Computer Shack	29.90/29.90
MULTI DOS Extended Basic	29.95
MULTI DOS NEW version (with zap and Tape Util)	99.95
MULTI DOS New Z Dos	39.95
SUPER DOS	19.95
DOS PLUS version 3.4	149.00
DOS PLUS II (for the Model II)	249.95
LDOS	129.00

HARDWARE

SPACE AGE PRINTER STANDS Clear	27.95
SPACE AGE PRINTER STANDS Smoke	29.95
SPACE AGE PRINTER STANDS for 15 inch Carrage	35.95
EPSON MX-80 FT Printer	529.00
PROWRITER with CS instruction book	467.95
PROWRITER II (15 in with CS Instruction book)	698.95
Ribbon REINKER (Epson or C. Itoh)	49.95
16k Memory Chips Model I or III	25.95

DISKS

Single Density BASF Disks	19.95
DOUBLE DENSITY BASF DISKS	21.95
DOUBLE DENSITY FLIPPY DISKS	29.95
80 TRACK DOUBLE DENSITY DISKS	29.95
DISK SAVERS (vinyl sleeves)	20 for 6.00
COLORD BOXES (holds 10 disks) red, yellow, green	3.45
DISK BOXES (50 Disks-Flip tops)	26.95

COMPUTER SHACK

1691 Eason • Pontiac, Michigan 48054

Info: (313) 673-8700 • Orders: CALL TOLL FREE (800) 392-8881

Master Charge and VISA OK. Please add \$3.00 for shipping in the U.S.A. - \$5.00 for Canada or Mexico - Proper postage outside of U.S. - Canada - Mexico. Dealers: We are distributors for all items in this ad. Write for our catalog and price list.

The Lair of Kraken

by Beth Norman
Second Place
11-13

Program Listing

```

100 CLS:PRINT"      THE LAIR OF THE KRAKEN"
105 FOR T=1 TO 500:NEXT T
110 PRINT
115 PRINT"      AN UNDERWATER ADVENTURE"
120 FOR T=1 TO 500:NEXT T
125 PRINT
130 PRINT"      BY BETH ANN NORMAN"
135 PRINT"      FRAMINGHAM, MASS."
140 FOR T=1 TO 1000:NEXT T
145 PRINT:PRINT
150 INPUT"WOULD YOU LIKE INSTRUCTIONS";A$
155 IF LEFT$(A$,1)="N"THEN 195 ELSE IF LEFT$(A$,1)<>"Y" THEN 150
160 CLS:PRINT" YOU WILL TRAVEL THROUGH AN UNDERWATER PALACE
, BATTLING SEACREATURES AS YOU GO. YOU MUST FIND THE SWORD OF
THE MERMAN ANDON. YOU NEED IT TO KILL THE KRAKEN--A GIANT S
QUID-LIKE MON-STER FREQUENTLY MISTAKEN FOR A SMALL ISLAND!
165 PRINT" THEN YOU WILL BE FREE."
170 PRINT" YOUR COMMANDS ARE N, E, W, ANDS, THE DIRECTIONS; M,
FOR MAP; AND C, TO SEE YOUR INVENTORY, STRENGTH, ETC."
175 PRINT" GOOD LUCK!"
180 PRINT"PRESS ANY KEY TO CONTINUE."
185 I$=INKEY$
190 IF I$=""THEN 185
195 CLS:INPUT"YOUR NAME";B$
200 C=RND(-TIMER)
205 C=RND(6)
210 IF C=1 THEN D$="ELF"
215 IF C=2 THEN D$="DWARF"
220 IF C=3 THEN D$="FIGHTER"
225 IF C=4 THEN D$="HALFLING"
230 IF C=5 THEN D$="CLERIC"
235 IF C=6 THEN D$="GNOME"
240 E=RND(-TIMER):GOSUB 250
245 GOTO 265
250 E=RND(18)
255 IF E<5 THEN 250
260 RETURN
265 F=E:GOSUB 250
270 G=E:GOSUB 250
275 H=E:GOSUB 250
280 I=E:GOSUB 250
285 J=E:GOSUB 250
290 K=RND(-TIMER)
295 K=RND(6):IF K<4 THEN L$="PLATE MAIL ARMOR" ELSE L$="CHAIN MA
IL ARMOR"
300 M=RND(-TIMER)
305 M=RND(6):IF M<4 THEN N$="SWORD" ELSE N$="HAND-AXE"
310 GOSUB 335
315 PRINT:PRINT"PRESS ANY KEY TO CONTINUE."
320 I$=INKEY$
325 IF I$="" THEN 320
330 GOTO 380
335 PRINT:PRINT"YOUR GAME CHARACTER SHALL BE      "B$" THE "D$:PRI
NT"STRENGTH:"F
340 PRINT"INTELLIGENCE:"G:PRINT"WISDOM:"H
345 PRINT"DEXTERITY:"I:PRINT"CONSTITUTION:"J

```

Listing continues

I wrote this game, The Lair of the Kraken, for a 32K Extended Color Basic Color Computer. It is a computerized, underwater Dungeons-and-Dragons game.

The object is to travel through an underwater palace, battling monsters and finding objects. You need one of these objects to kill the Kraken (a type of monster) and set yourself free. The game creates a random character for you.

Monsters with different strengths are randomly placed in the dungeon's rooms. When entering a room containing a monster, you can fight or run. If you run, you may be caught! Your chance to hit a monster is raised or lowered according to your character's ability scores (strength or intelligence). Since Lair of the Kraken is not too difficult to win, it is aimed at kids. If you wish to make the fighting odds tougher or easier, then add:

```
575 IF S<5 THEN W = 10 ELSE W = 13
```

Change the W = 10 and W = 13 to two other numbers from 1 to 20 (the second W should be higher than the first). The lower you make these numbers, the easier it is to hit monsters. If you want to make the fight with the Kraken harder, add ELSE W = W + 4 to the end of line 585, which reads:

```
585 IF PP<>0 THEN W = W-6
```

The Key Box

Color Computer
32K RAM
Extended Color Basic

```

350 PRINT"CHARISMA:"E:PRINT"WEARING "L$" AND":PRINT"CARRYING A "
NS$."
355 IF JJ$=""THEN RETURN ELSE PRINT"ALSO CARRYING:"JJ$
360 PRINT"PRESS ANY KEY TO CONTINUE"
365 I$=INKEY$
370 IF I$=""THEN365
375 RETURN
380 GOTO 510
385 PMODE 4,1:PCLS:SCREEN 1,1
390 LINE (20,92)-(28,104),PSET,B
395 LINE(28,92)-(32,104),PSET,B
400 LINE(32,93)-(36,103),PSET,B
405 LINE(36,94)-(40,102),PSET,B
410 LINE(40,95)-(44,101),PSET,B
415 LINE(44,96)-(48,100),PSET,BF
420 LINE(48,80)-(52,116),PSET,BF
425 LINE(36,64)-(64,80),PSET,B
430 LINE(36,116)-(64,132),PSET,B
435 LINE(48,132)-(52,136),PSET,BF
440 LINE(48,136)-(68,140),PSET,BF
445 LINE(64,108)-(68,140),PSET,BF
450 LINE(60,108)-(68,88),PSET,B
455 LINE(68,96)-(120,100),PSET,BF
460 LINE(64,68)-(80,72),PSET,BF
465 LINE(80,68)-(100,84),PSET,B
470 LINE(88,84)-(92,96),PSET,BF
475 LINE(120,88)-(132,108),PSET,B
480 LINE(132,96)-(156,100),PSET,BF
485 LINE(156,76)-(192,116),PSET,B
490 I$=INKEY$
495 IF I$="" THEN 490
500 SCREEN 0,0
505 RETURN
510 GOTO 555
515 P=RND(-TIMER)
520 P=RND(6)
525 IF P=Q THEN 520
530 FOR R=1 TO P
535 READ R$,S,T
540 NEXT R
545 RESTORE
550 Q=P:RETURN
555 GOTO 655
560 IF L$="PLATE MAIL ARMOR"THEN U=0 ELSE U=1
565 IF T<6 THEN V=15 ELSE V=12
570 IF U=1 THEN V=V-1
575 IF S<5 THEN W=10 ELSE W=13
580 IF (F+G+I)>27 THEN W=W-4
585 IF PP<>0 THEN W=W-6
590 CLS:PRINT"YOU ARE FIGHTING A "R$"
595 PLAY "L1603AL404CL1603AL404C"
    
```

Listing continues

My program makes good use of the RND(-TIMER) command. This line, placed right before a RND command, resets the random-number subroutine and guarantees that the numbers really will be different each time you play.

There is a high-resolution map, drawable at any time except during a fight. You can review your character and what he or she is carrying at any time, also.

I think this game is a good introduction to adventure games, as the maze is not very complicated. Since you always have a chance to run away from a fight, there are no unsuspected deaths to trap the unwary. ■

Beth Norman, age 12, can be reached at 8 Doris Road, Framingham, MA 01701.

Color Computer and TDP-100 Programs

SPELL 'N FIX — Spelling correction program with 20,000+ word dictionary. See 11/82 review in 80 Micro. \$69.29.

HUMBUG — The Ultimate Monitor. Enter, examine, single-step machine language programs, more. \$39.95.

STAR-DOS — Disk Operating System compatible with Disk Extended Basic. \$49.90.

CHECK 'N TAX — Balance checkbook and keep tax data on disk. \$50.

REMOTERM — Operate computer from a remote terminal. \$19.95.

NEWTALK — Voice output program to examine and check memory. \$20.

SHRINK — Our fast version of Eliza. \$15.

OXKO — Our fast version of Othello. \$15.

Send for details and catalog of other programs. We accept cash, check, COD, Visa or MasterCard. NY State residents please include sales tax.

Star-Kits

P.O. Box 209-E
MT. KISCO, N.Y. 10549
(914) 241-0287

✓ 432

THOR symbol of new power for your Model I/III Computer

THOR INTERNAL MODEL III DISK DRIVES

All the hardware and easy directions to install one or two drives—With TRSDOS*—(NEWDOS* for dual drives)

- Kit containing one/two drives.
- Single 40 \$449/\$ 649
- Dual 40 \$599/\$ 875
- Dual 80 \$725/\$1125

THOR WINCHESTER DISK SYSTEM

SPECIAL PRICE

One or two drives—Price includes one drive with NEW-DOS-80*, case and power supply—Slot for second drive

- 4.5 Megabyte \$1799
- 9 Megabyte \$1999
- 13.5 Megabyte \$2299
- 18 Megabyte \$2499

THOR NETWORK CONTROLLER

Connect up to 254 computers of most any make over as much as 5000 feet of cable—Share 4.5 to 60 megabytes or more of disk storage—Call for additional information and prices.

CALL 1-800-641-3885 for orders only.



For technical information or in Colorado call 303-337-5909

WMS Western Micro Systems
• 2760 South Havana, Suite S •
Aurora, Colorado 80014

THOR DIGITAL PORT

14 IN and 15 OUT—Each port a full 8 bits—Connector to attach to Model I/III bus—Complete with cable and case—Requires 5 volts at 150 ma.

- Assembled and tested
- For Model I Only \$ 29.95
- For Model III Only \$ 34.95

THOR VERBOARD

Add a separate control computer to your Model III (For Model I requires above Model I Digital Port)—Verboard attaches to the Model I/III bus—Operates independently while your Model I/III performs other tasks—Has provision for 8K RAM or 16K EPROM—8 input and 8 output parallel ports as well as two serial ports are included.

- With a detailed manual
- Kit with 1K RAM \$ 99.95
- Assembled and tested \$129.95
- EPROM Basic for simplified programming \$ 49.95

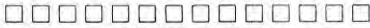
*TRSDOS is a trademark of Tandy Corp. and NEWDOS-80 is a trademark of Apparat, Inc.

Prices are cash—Visa/MasterCard/American Express/COD available on request

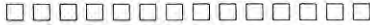
Dealers enquiries welcome

✓ 238

SUPERSCRIPSI PRINTER DRIVERS MODEL I/III



With an ALPS Printer Driver,
you can use your own printer with
Radio Shack's SuperSCRIPSI
word processing system



Each printer driver supports all the normal text features, plus the individual features of the printer itself.

Epson MX-80, MX-100 with GRAFTRAX-PLUS

10 or 16 (condensed) cpi, bold, double bold, underline, italics, or any combination of these, superscript, subscript (also supports non-GRAFTRAX printers) \$59

Smith-Corona TP-1

10 or 12 cpi, bold, underline \$49

Okidata Microline 82

5, 8, 10, 16 cpi, bold \$49

Okidata Microline 84

Correspondence (proportional) or 10, 12, 16 cpi, underline, bold (dp only), superscript, subscript, right margin justification. \$59

Radio Shack Line Printer V

10, 15 cpi, underline, bold, underline and bold. \$49

Mail / Phone Orders Accepted

ALPS

23 Angus Road

Warren, New Jersey 07060

201-647-7230



374



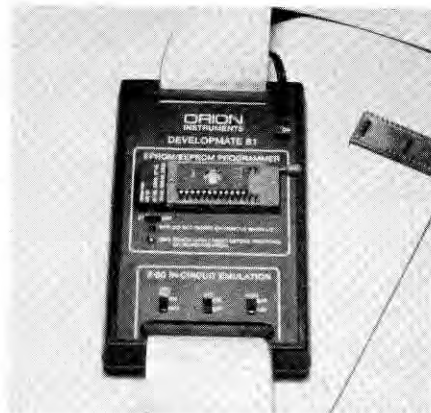
Listing continued

```

600 PRINT"USE THE SPACE BAR":PRINT"TO STRIKE, "B$"!"
605 I$=INKEY$
610 IF I$<>" " THEN 605
615 X=RND(-TIMER)
620 X=RND(20)
625 PRINT:PRINT"YOU STRIKE!":IF X<W THEN 640
630 PRINT"YOU HIT!THE "R$" IS"
635 PRINT"DEAD!":RETURN
640 PRINT"YOU MISS!":X=RND(20)
645 PRINT:PRINT"YOUR FOE STRIKES!":IF X>V THEN 1525
650 PRINT"IT MISSES!":GOTO 600
655 GOTO 660
660 GOTO 695
665 INPUT"YOUR COMMAND";A$
670 IF A$="N" OR A$="E" OR A$="W" OR A$="S"THEN RETURN
675 IF A$="M"THEN GOSUB 385 ELSEIF A$="C"THEN GOSUB 335 ELSE 685
680 GOTO 665
685 PRINT"PLEASE USE N,E,W,S,M,OR C."
690 GOTO 665
695 CLS
700 PRINT" YOU ARE A POOR "D$", "
705 PRINT"BARELY EGING OUT A LIVING AS A FISHERMAN."
710 PRINT" ONE DAY, YOU ARE OUT ROWING WHEN YOU HEAR A SWEET
SOUND COMING FROM BEHIND A ROCK. YOU"
715 PRINT"INVESTIGATE AND FIND THAT IT IS THE SINGING OF A GROUP
OF MER- MAIDS."
720 PRINT"THEY SURROUND YOUR BOAT AND MAKESTRANGE PASSES IN THE
AIR WITH THEIR HANDS. ONE INFORMS YOU THAT THEY HAVE CAST A
WATER- BREATHING SPELL ON YOU."
725 PRINT" PRESS ANY KEY TO CONTINUE."
730 I$=INKEY$
735 IF I$="" THEN 730
740 CLS:PRINT" THEY DRAG YOU UNDER THE SUR- FACE AND YOU FIND
THAT YOU CAN BREATHE, TALK, AND MOVE FREE- LY UNDERWATER."
745 PRINT"THEY TAKE YOU FAR,FAR DOWN TO THE TOP OF A STAIRCASE
LEADING DOWN TO VARIOUS PASSAGEWAYS AND ROOMS."
    
```

Listing continues

CONVERT YOUR TRS-80 MODEL-I OR III INTO A DEVELOPMENT SYSTEM



Now you can develop Z-80 based, stand-alone devices such as games, robots, instruments and peripheral controllers, by using your TRS-80 as a development system. The DEVELOPMATE plugs into the expansion connector of your TRS-80 and adds PROM PROGRAMMING and IN-CIRCUIT-EMULATION capabilities to your system (with or without expansion interface).

Complete instructions and sample schematics are included to help you design your own simple stand-alone microcomputer systems. THESE SYSTEMS CAN BE AS SIMPLE AS FOUR ICs: one TTL circuit for clock and reset, a Z-80, an EPROM, and one peripheral interface chip.

When the In-Circuit-Emulation cable is plugged into the Z-80 socket of your stand-alone system, the system becomes a part of your TRS-80: You can use the full power of your editor/assembler's debug and trace program to check out both the hardware and the software. Simple test loops can be used to check out the hardware, then the system program can be run to debug the logic of your stand-alone device.

Since the program is kept in TRS-80 RAM, changes can be made quickly and easily. When your stand-alone device works as desired, you use the Developmate's PROM PROGRAMMER to copy the program into a PROM. With this PROM, and a Z-80 in place of the emulation cable, your stand-alone device will work by itself.

The DEVELOPMATE is extremely compact: Both the PROM programmer and the In-Circuit-Emulator are in one small plastic box only 3.2" x 5.4". A line-plug mounted power supply is included. The PROM programmer has a "personality module" which defines the voltages and connections of the PROM so that future devices can be accommodated. However, the system comes with a "universal" personality module which handles 2758, 2508 (8K), 2716, 2516 (16K), 2532 (32K), as well as the new electrically alterable 2816 and 48016 (16K EEPROMs).

The COMPLETE DEVELOPMATE 81, for Model I, with software, power supply, emulation cable, TRS-80 cable, and "universal" personality module \$329
 DEVELOPMATE 83, Model III version, same as above \$329
 PM2 PERSONALITY MODULE for 2732A EPROM \$15
 PM3 PERSONALITY MODULE for 2764 EPROM \$15

**ORION
INSTRUMENTS**

151

172 Otis Avenue, Dept. M, Woodside,
CA 94062
(415) 851-1172

Master Charge and Visa phone orders accepted.
California residents please add 6% sales tax.

```

750 PRINT" PRESS <M> TO SEE THE MAP NOW;WHEN YOU HAVE STUDIED
IT, PRESS ANY KEY TO CONTINUE THE GAME."
755 I$=INKEY$
760 IF I$<>"M" THEN 755
765 GOSUB 385
770 CLS:PRINT" ONE MERMAID TELLS YOU THAT YOU MUST FIND THE SWOR
D OF ANDON, THEIR MASTER, AND USE IT TO KILL THE KRAKEN."
775 PRINT"YOU WILL THEN SET YOURSELF FREE."
780 PRINT" LAUGHING, THEY SWIM AWAY."
785 PRINT"CURIOUS, YOU DESCEND THE STAIRS."
790 PRINT"YOU FIND YOURSELF IN AN INTER- SECTION GOING NORTH, S
OUTH, AND WEST."
795 GOSUB 665
800 IF A$="W" THEN 860
805 IF A$="S" THEN 865
810 IF A$="N" THEN 825
815 PRINT"CAN'T GO THAT WAY!":GOSUB 665
820 GOTO 800
825 PRINT"YOU GO 40 FT. NORTH AND COME TO A ROOM."
830 IF L2=0 THEN 840 ELSE PRINT"IT'S EMPTY."
835 GOTO 880
840 GG$="LAMP":HH$="DAGGER":GOSUB 515
845 GOSUB 1420
850 IF LL>6 THEN 880 ELSE 870
855 LL=0
860 PRINT"YOU'RE ON THE TOP OF THE STAIRS.SUDDENLY,THEY CRUMBLE.
":GOTO 790
865 PRINT"YOU GO 40 FT. SOUTH AND COME TO A ROOM.":IF NN=0 THEN
1120 ELSEPRINT"IT'S EMPTY.":GOTO 1150
870 GG$="LAMP":HH$="DAGGER"
875 GOSUB 1485
880 PRINT"THESE ARE EXITS EAST AND SOUTH.":L2=L2+1
885 GOSUB 665
890 IF A$="E" THEN 910 ELSE IF A$="S" THEN 905 ELSE PRINT"CAN'T GO
THAT WAY."
895 GOSUB 665
    
```

Listing continues



Excellence in Technical Software

LINEAR CONTROL SYSTEMS

State Variable Analysis\$25
 Advanced S. V. Analysis.....\$25
 Transfer Function Anal.....\$25

All Three \$60

ACTIVE FILTER DESIGN

Butterworth & Chebychev I\$17
 Chebychev II\$17
 Elliptic\$17

All Three \$40

- *Tape or Disk (Specify)
- Tape Assumes Non-DOS Systems
- *For Disk Specify DOS
- *Model I or III (Specify)
- Minimum 48K RAM

MATRIX SUBROUTINES

These 'callable from BASIC' subroutines provide an extension to the BASIC ROM. Included are MAT +, -, *, /, transpose, inverse and disk & tape I/O. Min 16K RAM. Available on disk or tape. Specify DOS for disk version.

\$19.95

PAB Software, Inc.

P.O. Box 15397

Fort Wayne, Indiana 46885

321

It's that time again!

Prepare and plan your taxes like an expert with FEDTAX*

Orders will be filled in late January to allow TO ORDER: inclusion of new tax laws.

FEDTAX* The income tax program for the layman and the professional.

- Confidential and Convenient
- Automatic error checking and tax minimization
- Prepared by professionals
- Tax deductible
- Fully documented
- Optional text: help for novices, speed for professionals
- Includes powerful "What if?" feature for analyzing and tax planning
- **FEDTAX*1:** Completes long and short forms, residential energy credits, income averaging, tax calculations and more
- **FEDTAX*11:** All the features of FEDTAX 1 plus business income, capital gains/losses, minimum tax and alternative minimum tax
- Discount on yearly updates

Guarantee:

Defective software may be returned for replacement without cost within 30 days of Invoice date. Proof of purchase required.

* T.M. of Specialized Software, Inc. ** T.M. of Tandy Corporation

295

Call our 24 hour order line (519) 432-2865 or mail this coupon to:

Specialized Software, Inc.
 P.O. Box 1004
 Port Huron, MI 48060

Please enroll me as a member and send:

- FEDTAX*1 - @ \$59.95 (16K Min)
 - Disk or
 - Cassette
- FEDTAX*11 - @ \$119.95 (32K Min)
 - Disk only
- Please send more information

My System is (please check one)

- TRS 80** Model I
- TRS 80** Model III

Credit Card orders add \$3.50 processing fee. All prices include postage handling and applicable taxes.

Name _____

Address _____

City _____ State _____ Zip _____

Check Money Order Visa Master Card
 Card No. _____ Exp. Date _____

PUBLISHERS AUTHORS EDITORS

We specialize in typesetting from Model I's and Model III's, either from your disk or through telecommunications. We have hundreds of typefaces to choose from on our high speed digitized typesetting system. **PLUS**, we are graphic designers and are able to assist you in layout and design for the highest quality in books, magazines, periodicals, journals, etc. 24 hour turnaround on most orders. Call or write for price quotations.

CHILES & CHILES, INC.

1351 S. Floyd Rd., Suite 109, Richardson,
TX 75081
(214) 690-4606

✓493

FOR TRS-80 MODEL II & Z80

- CCOS - Real-time Operating System

Intended for:

OEM's, Systems Implementors
& experienced owners

POLL REMOTE TERMINALS, CASH REGISTERS,
DATA ACQUISITION DEVICES CONCURRENTLY
WITH OPERATOR/BACKGROUND ACTIVITIES

CONFIGURED FOR TRS-80 MODEL II
TRANSPARENT OVERLAY TO TRSDOS 2.0A

AVAILABLE FOR STAND-ALONE/BOARD LEVEL SYSTEMS

GIVES YOU ACCESS TO I/O DEVICES
FROM EITHER FOREGROUND OR BACKGROUND

GATHER, PROCESS & STORE DATA WHILE RUNNING
APPLICATION PROGRAMS IN BACKGROUND

- INTERRUPT DRIVEN - MULTI-TASKING - 16 PRIORITIES -

Also -

TRS-80 MODEL II DISASSEMBLER ✓395

TRS-80 MODEL II EXTENDED DEBUG PACKAGE

"Specializing in Supervisory Control & Data Acquisition"

Control Corporation (612) 424-2022

508 THIRD STREET SE - OSSEO, MINNESOTA 55369

OPTIONS-80, NOW FOR
APPLE # & TRS-80 *

OPTION INVESTING

PROGRAM ANALYSES
RETURN FROM LISTED
STOCK OPTION
INVESTING

HANDLES CALLS, PUTS, SPREADS, IN
AND OUT; COMMISSIONS, RISK, COST
OF MONEY, DIVIDENDS. TABLES AND
GRAPHS. PRINTS, STORES TO DISK.
INDEXED MANUAL A COMPLETE GUIDE
TO OPTION INVESTING. M/C & VISA.
\$125. SEND FOR FREE BROCHURE.
OPTIONS-80, BOX 471
CONCORD, MASS 01742

* TRADEMARK TANDY CORP. * TRADEMARK APPLE COMPUTER, INC.

✓206

Listing continued

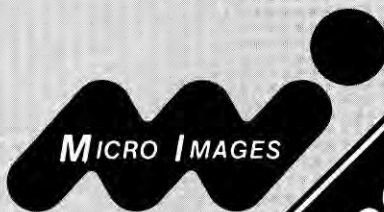
```

900 GOTO 890
905 PRINT"YOU GO 40 FT. SOUTH.":GOTO 790
910 PRINT"YOU GO 40 FT. EAST AND COME TO A ROOM."
915 PRINT"GEE,IT'S DARK IN HERE. TOO DARKTO SEE,AS A MATTER OF
FACT.":EE$="LA":GOSUB 1390
920 IF EE$<>DD$ THEN 925 ELSE 930
925 PRINT"YOU STUMBLE OUT, AND BLINDED BY THE SUDDEN LIGHT, WAND
ER ABOUT.":GOTO 790
930 PRINT"LUCKILY, YOU HAVE A LAMP AND CAN SEE.":GG$="ROPE":HH$="
SHOVEL":GOSUB 515
935 GOSUB 1420
940 IF LL>6 THEN 960
945 LL=0
950 GG$="ROPE":HH$="SHOVEL"
955 GOSUB 1485
960 PRINT"THERE ARE EXITS WEST AND SOUTH":KK=KK+1
965 GOSUB 665
970 IF A$="W"THEN 985 ELSEIF A$="S"THEN 995 ELSE PRINT"CAN'T GO
THAT WAY."
975 GOSUB665
980 GOTO 970
985 PRINT"YOU GO 40 FT. WEST AND COME TO A ROOM.":IF L2=0 THEN
840 ELSE PRINT"IT'S EMPTY."
990 GOTO880
995 PRINT"YOU GO 30 FT. SOUTH."
1000 PRINT"YOU ARE NOW IN AN INTERSECTION GOING EAST,WEST,AND N
ORTH.":GOSUB 665
1005 IF A$="E"THEN 1195 ELSE IF A$="W"THEN 1030 ELSE IF A$="N"TH
EN 1020 ELSE PRINT"CAN'T GO THAT WAY."
1010 GOSUB665
1015 GOTO 1005
1020 PRINT"YOU GO 30 FT.NORTH AND FIND YOURSELF IN A ROOM.":
IF KK=0 THEN 915 ELSE PRINT"IT'S EMPTY."
1025 GOTO960
1030 PRINT"YOU GO 50 FT. WEST AND FIND YOURSELF IN A ROOM.":
IF MM=0 THEN 1040 ELSE PRINT"IT'S EMPTY."
1035 GOTO1080
1040 PRINT"THIS ROOM IS A GIANT PIT!":EE$="RO":GOSUB 1390
1045 IF EE$<>DD$ THEN 1050 ELSE 1055
1050 PRINT"THERE IS NO WAY TO CLIMB DOWN. YOU LEAVE. YOU GO 50
FT.EAST.":GOTO 1000
1055 PRINT"SINCE YOU HAVE A ROPE, YOU MAKE A LADDER AND CLIMB DO
WN.":GG$="LAMP":HH$="SHOVEL":GOSUB 515
1060 GOSUB 1420
1065 IF FF<6 THEN 1080
1070 GG$="LAMP":HH$="SHOVEL"
1075 GOSUB 1485
1080 PRINT"THERE ARE EXITS SOUTH AND EAST.":MM=MM+1
1085 GOSUB 665
1090 IF A$="S"THEN 1110 ELSE IF A$="E"THEN 1105 ELSE PRINT"CAN'T
GO THAT WAY."
1095 GOSUB 665
1100 GOTO 1090
1105 PRINT"YOU' GO 50 FT.EAST.":GOTO 1000
1110 PRINT"YOU GO 70 FT. SOUTH AND THE PASSAGEWAY TURNS WEST
.":PRINT"YOU GO 30 FT. WEST AND IT TURNS NORTH.":PRINT"YOU GO 10
FT. NORTH AND COME TO A ROOM.":IF NN=0 THEN 1120 ELSE PRINT"IT'
S EMPTY."
1115 GOTO1150
1120 GG$="ROPE":HH$="DAGGER":GOSUB515
1125 GOSUB 1420
1130 IF LL>6 THEN 1150
1135 LL=0
1140 GG$="ROPE":HH$="DAGGER"
1145 GOSUB 1485
1150 PRINT"THERE ARE EXITS NORTH AND SOUTH.":NN=NN+1
1155 GOSUB 665
1160 IF A$="N"THEN1180
1165 IF A$="S"THEN1185
1170 PRINT"CAN'T GO THAT WAY!":GOSUB665
1175 GOTO 1160
1180 PRINT"YOU GO 40 FT.NORTH.":GOTO 790
1185 PRINT"YOU GO 10 FT.SOUTH AND THE PASSAGEWAY TURNS EAST
.":PRINT"YOU GO 30 FT.EAST AND IT TURNS NORTH.":PRINT"YOU GO 70
FT.NORTH AND COME TO A ROOM.":IF MM=0 THEN 1040 ELSE PRINT"IT'
S EMPTY."
1190 GOTO1080
1195 PRINT"YOU GO 70 FT.EAST AND COME TO A ROOM.":IF OO=0 THEN 1
200 ELSE PRINT"IT'S EMPTY.":GOTO 1260
1200 PRINT"THE FLOOR IS COVERED WITH MUD WHICH HAS DRIFTED IN
FROM THE OCEAN FLOOR.":PRINT"THEN YOU NOTICE..."
1205 GOSUB 515
1210 GOSUB 1420
1215 IF LL>6 THEN 1260

```

Listing continues

★ **FREE SHIPPING** ★
WITHIN CONTINENTAL 48 STATES



MICRO IMAGES

**ARE YOU A DREAMER?
IMAGINE THIS . . .**

You place your order and it arrives when expected. "What do you know, they did ship that day!" You open your package and SURPRISE, it's what you ordered, not last year's version six times removed. "Wait a minute, I must have paid full retail to get this kind of service. H'mm, that's not it. These prices are among the lowest. What's the catch? I've got it! They charged me large shipping and handling charges. No, not that either. It says here 'Free shipping within the Continental 48 States via UPS ground.' Only the differential is charged for UPS Blue or 1st Class. Now I've got it, it's only a dream!!!"

**TRY
US!**

At Micro Images your dreams become reality! How do we do it? Simple, we tell the truth. If the item you order is not in stock — we tell you. If we can't ship that day — we tell you. Which version? We tell you. Why are we telling you this? The answer is easy. This is what we do best and what separates us from the competition, AND WE WANT YOU TO KNOW.

LAZYWRITER
Latest Version Mod I/III \$159.95
See Below For New Options

MAXI MANAGER
Manager with Utility - \$119.95
Maxi Utility Only - \$44.95

SUPERUTILITY +
Mod I/III-Incls Backup Copy \$59.95
SEE NEW BOOK BELOW

MZAL - Ver. 2
Mdl I or III — \$134.95

MAXI CRAS
Mdl I/III — \$84.95

LDOS 5.1
MDL I or III — \$114.95

GEAP - \$42.95
w/Dot Writer 1.5 - \$89.95

NEW SCRIPT - 7.0- \$114.95
with Mailing Label Opt. \$124.95
Mailing Label Opt. Only \$27.95

MAXI MAIL
Mod III Only
\$84.95

MAXI STAT
Model I/III
\$179.95

MULTIDOS - \$89.95
NEW IMPROVED VERSION
Specify Mdl I or III Single or Dbl Density

DOSPLUS
Version 3.4S/3.4D/3.4III \$119.95
Version II For Model II \$199.95
UNITERM Mod I/III \$74.95
UNITERM/80 Mod I/III \$84.95

MICROSOFT
Fortran 80 or A.L.D.S. \$89.95
Basic Compiler \$179.95
Editor/Assembler + Tape \$27.95 Disk \$45.95

ASPEN Gramatik - Mdl I/III \$69.95
Proofreader - Mdl I/III \$45.95

POSTMAN MASS MAILING SYS.
Standard Ver. Mod I/III \$118.95
with Postwriter Mod I/III \$159.95

DATA-WRITER Mod I/III \$114.95

SFINKS 3.0 Disk Mod I/III .. \$36.95
SFINKS Chess Tutor Mod I/III \$17.95

EDAS Mod II 4.0 \$74.95
Mod I/III 4.1 \$89.95

LAZYWRITER OPTIONS
LAZYDOC \$54.95
LAZY TAB \$13.95
LAZYCALC \$27.95
LAZYDRAW + DO \$18.95
Tab, Calc, Draw + Dq All 4 \$37.95

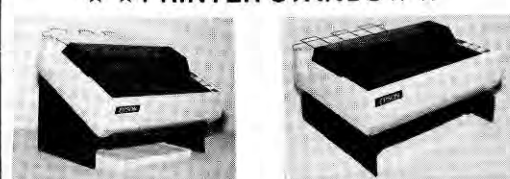
BOOKS
Disk + Other Mysteries — IJG \$20.95
Basic Decoded — IJG \$27.95
Custom TRS-80 — IJG \$27.95
Basic Faster & Better — IJG \$27.95
Mdl II/16 Visicalc — W.C. Brown. \$16.95
Mdl I/III Visicalc — W.C. Brown. \$16.95
Copyright Kit \$11.95
Inside Superutility Plus \$17.95

LNW-Doubler 5/8 \$205.95
Includes Dosplus 3.4D
SYSTEM EXPANSION II - \$375.00

LYNX Auto Dial/Answer Mod I/III - \$239.95

MICROBUFFER - Practical Peripherals
Parallel or Serial (Epson) \$149.95

★ ★ **PRINTER STANDS** ★ ★



SPACE AGE **NO FRILLS**
MX 80 Clear \$27.50 MX 80 Clear \$13.50
MX 80 Bronze \$29.95 MX 80 Bronze \$15.95
Microline 82 A Space Age Bronze w/slot \$29.95
NEC 8023A Space Age Bronze \$29.95
NEC 8023A Space Age Clear \$27.50
C. ITOH Prowriter Same as NEC Above

GREEN SCREENS - Mod I or III \$15.95

C. ITOH PROWRITER \$499.00
Parallel 120 CPS - 10" Carriage

SOOPER SPOOLER - by Compulink
16K Parallel I/O Unit \$334.95
46K Memory Opt - \$149.95 Serial I/O Opt. - \$89.95
Complete Unit - All Options \$549.95

FREEDOM TECHNOLOGY INT'L
Freedom Option \$199.95
Freedom Plus \$399.95

RIBBONS

ZIP BOX RELOADS	1/2 Dz.	Dz.
Epson MX 70/80-20 Yds.	24.00	42.00
Epson MX 100-30 Yds.	30.00	52.00
NEC/Prowriter-14 Yds.	21.00	36.00
LP-III/IV-16 Yds.	18.00	32.00
Centronics 730/737/739 and 779-16 Yds.	18.00	32.00

All ZIP BOXES are individually sealed black nylon and require no rewinding.

CARTRIDGES

	Each	Dozen
Epson MX70/80	8.95	90.00
LP-III/V	6.50	70.00
Centronic 702/03/04/53	11.00	120.00
RS DSY WHL II Multi Strike.	6.50	70.00
Diablo Hytype II Multi Strike.	6.50	70.00
Qume-300,000 chr Multi Strike.	6.50	70.00
Nec SPIN H-Yield Multi Strike.	7.00	75.00
MICRLNE 80/82A/83A Spl.	N/A	24.00
MICRLNE 84 1/2x40 Yds	5.50	60.00

Minimum order 3 cartridges - any mix. For smaller quantities add \$1.50 per order. All our reloads and cartridges are manufactured by one of the oldest and most reputable ribbon Mfg's. in the country.
★ ★ ★ ★ ★ **QUALITY GUARANTEED** ★ ★ ★ ★ ★

GAMES

	Tape	Disk
Sea Dragon or Eliminator	17.95	22.45
Penetrator.	22.45	22.45
Defiance	22.45	22.45
Panik or The Institute.	17.95	22.45
Forbidden Planet or City.	14.50	34.95
Strike Force	14.50	17.95
Dunzhin or Kaiv	26.95	26.95
Wyld	26.95	26.95
Bounceoids or Sp. Castle	14.50	17.95
Caterpillar or Outhouse.	14.50	17.95
Fortress II or Alien Def.	14.50	17.95
Any Big 5 Program	14.50	17.95

TO ORDER
CALL OR
WRITE TO:

MICRO IMAGES
146-03 25th Road
Flushing, N.Y. 11354
(212) 445-7124

PHONE HOURS:
Mon.-Fri.
10 AM-9 PM
Sat.
10 AM-5 PM

ORDERING INFORMATION
No credit cards at these low prices. Add \$2.00 on all COD orders. Certified CK/MO/COD shipped immediately. Please allow 2 weeks for personal checks. For extra fast service phone in your COD order. Free shipping within Continental 48 states via UPS ground. For Canada, Hawaii, Alaska, applicable shipping and insurance charges apply. Prices subject to change without notice. New York State residents please add appropriate sales tax.
The items listed above are a cross-section of our product line. We carry the full line of most companies listed in this ad, plus much more. **SEND FOR YOUR FREE CATALOG.**

COMPUTOR™

No More Waiting For Quality Educational Software... It's Here!

New! Computor "Math & Mystery" is a unique educational program that makes learning fun and exciting.

Features Include:

- * 3 Math Categories
 - * 1 or 2 Student Option
 - * Ideal For Progress Monitoring
 - * Category Selection By Each Student
 - * Mystery Words For Bonus Points
 - * Word Skills Development
 - * Ages 8yrs.- Adult
- Addition-Subtraction, Multiplication,
Basic Algebra

The Mind · Spa™ ✓ 281

PO Box 1464 Maryland Heights, Mo. 63043
Phone 314-576-0047

To order "Math & Mystery" send check or money order plus \$2.00 shipping-handling.

Disk Version Cassette Version Model I
32K Level II \$29.95 16K Level II \$29.95 Model III

Name _____
Street _____
City _____ State _____ Zip _____

NEW! M-68000 SINGLE BOARD COMPUTER FOR TRS-80 USERS



FEATURES:

32 bit Motorola 68000 CPU operating at 5 MHz or 10 MHz, 20K of on board fast static RAM, 16K bytes of on board EPROM space, 7 autovectorred interrupts, 3 memory/device expansion buses, 2 serial communication ports (RS-232 C), 16 bit bidirectional parallel port, 5-16 bit counter/timers with vectored interrupt and time of the day clock. On board monitor allows to download and debug programs generated on TRS-80 using our M68000 Cross Assembler.

PRICE:

M68K Bare board with documentation.....\$ 99.95
M68MON monitor & mapping PROM's.....\$135.00
M68000-6 CPU.....\$ 95.00
M68K Parts Kit.....\$249.00
M68000 Cross Assembler for TRS-80.....\$125.00
M68K Documentation only.....\$ 15.00
Shipping & handling (Domestic)....\$ 3.50
(foreign)....\$ 15.00

✓349 CALIFORNIA RESIDENTS ADD 6% TAX

EMS Educational
Microcomputer (714)
Systems 553-0133
P.O. BOX 16115 IRVINE, CA 92713-6115

Listing continued

```

1220 LL=0
1225 PRINT"YOU TRIP ON SOMETHING HARD UNDER THE MUD.":EE$="
SH":GOSUB 1390
1230 IF EE$<>DD$ THEN 1235 ELSE 1240
1235 PRINT"AS YOU DON'T HAVE ANYTHING TO DIG WITH, YOU MUST LEA
VE.":GOTO 1260
1240 PRINT"GOOD! YOU HAVE A SHOVEL TO DIG WITH. YOU FIND A FIN
E SWORD INLAID WITH GEMS. AN INSCRIP-TION ON THE HILT SAYS
:"
1245 PRINT:PRINT" **SWORD OF ANDON**"
1250 PRINT" **DOWN WITH KRAKENS**"
1255 PRINT" **GOOD LUCK, TRAVELER!**":PRINT
1260 PRINT"THERE ARE EXITS EAST AND WEST.":OO=OO+1
1265 GOSUB 665
1270 IF A$="E" THEN 1285 ELSE IF A$="W" THEN 1280 ELSE PRINT"CAN'T
GO THAT WAY.":GOSUB 665
1275 GOTO 1270
1280 PRINT"YOU GO 70 FT.WEST.":GOTO 1000
1285 CLS:PRINT"YOU GO 60 FT.EAST AND COME TO A ROOM.":R$="KRAKEN
":S=1:T=10
1290 PRINT"AS YOU ENTER THIS GIANT ROOM YOUSEE A LOVELY GIRL IN
A CAGE.":PRINT"SUDDENLY,A HUGE WALL SLIDES SHUT,COVERING YOU
R ONLY ESCAPE!"
1295 PRINT"THEN YOU SEE THE HIDEOUS KRAKEN. YOU PREPARE
TO ATTACK!":PRINT:PRINT"PRESS THE SPACE BAR TO CHARGE.":PRINT BS
"! "
1300 I$=INKEY$
1305 IF I$<>" " THEN 1300
1310 GOSUB 560
1315 PRINTSTRING$(32,"*");:PRINTTAB(15-LEN(B$)/2)B$:PRINT"
THE VICTOR":PRINTSTRING$(32,"*")
1320 FOR T=1 TO 1000:NEXT T
1325 CLS:PRINT" SINCE YOU HAVE KILLED THE KRAKEN, THE CAGE
DISAPPEARS AND THE BEAUTIFUL GIRL IS FREED!"
1330 PRINT"SHE IS THE PRINCESS OF THESE WATERS, AND CAN NOW R
ULE THEM IN PEACE."
1335 PRINT" SHE PRESSES A BUTTON ON ONE WALL AND THE CEILING
SLIDES BACK. WITH A WHISTLING CALL, SHE SUMMONS A GIANT T
ORTOISE."
1340 PRINT" PRESS ANY KEY FOR THE END OF THE STORY."
1345 I$=INKEY$
1350 IF I$=" " THEN 1345
1355 CLS:PRINT" WITH THE TORTOISE'S HELP, SHE MOVES ASIDE A GRE
AT ROCK THAT THE KRAKEN HAD SET IN PLACE, RE-VEALING A WEALTH
OF TREASURE."
1360 PRINT" HEAVILY LADEN WITH RARE TREAS-URES, YOU CLIMB ABOAR
D SIR TORTOISE'S BACK AND HE BRINGS YOU TO THE SURFACE."
1365 PRINT:PRINT" YOU MARRY AND LIVE HAPPILY UN-TIL THE END OF
YOUR DAYS."
1370 PRINT:INPUT"WANT TO PLAY AGAIN";A$
1375 IF LEFT$(A$,1)="Y" THEN CLS ELSE 1385
1380 RUN150
1385 PRINT"CHICKEN":GOTO 1385
1390 BB=LEN(Z$)
1395 FOR CC=1 TO BB-1 STEP 2
1400 DD$=MID$(Z$,CC,2)
1405 IF DD$=EE$ THEN RETURN
1410 NEXT CC
1415 RETURN
1420 PRINT"THERE'S A "R$" IN HERE!"
1425 INPUT"WOULD YOU LIKE TO 1) FIGHT OR 2) RUN";A$
1430 IF A$="1" OR A$="2" THEN 1440
1435 PRINT"PLEASE USE 1 OR 2":GOTO 1425
1440 IF A$="1" THEN GOSUB 560 ELSE 1450
1445 RETURN
1450 FF=RND(-TIMER):FF=RND(10)
1455 IF FF<6 THEN 1460 ELSE 1465
1460 PRINT"YOU GOT AWAY!":RETURN
1465 CLS:PRINT"THE "R$" CAUGHT YOU!":PRINT"YOU'RE FORCED TO FIGH
T ANYWAY!"
1470 FOR T=1 TO 750:NEXT T
1475 GOSUB 560
1480 FF=10:LL=10
1485 PRINT"IN THIS ROOM THERE IS A "GG$" AND A "HH$" ."
1490 INPUT"TYPE IN THE FIRST TWO LETTERS OF THE ONE YOU WISH";A$:
IF A$=LEFT$(GG$,2) OR A$=LEFT$(HH$,2) THEN 1500
1495 PRINT"PLEASE USE "LEFT$(GG$,2)" OR "LEFT$(HH$,2)".":GOTO 1
490
1500 IF A$=LEFT$(GG$,2) THEN I1$=GG$ ELSE I1$=HH$
1505 PRINT"THE "I1$" IS TAKEN."
1510 Z$=Z$+A$
1515 J1$=J1$+I1$+" ,"
1520 RETURN
1525 PRINT"I'M AFRAID YOU'RE DEAD!":GOTO 1370
1530 DATA GIANT CRAB,2,4,GIANT PIRAHNA,6,3,SEA HYDRA,4,5,GIANT O
CTOPUS,7,6,SEA SERPENT,5,7,SEA DRAGON,3,8

```

IT'S MORE FUN THAN A THREE-RING CIRCUS

A
WAYNE GREEN
PUBLICATION

COMPUTER CARNIVAL



By Richard Ramella

EDUCATIONAL FEATURES

- EXPANDS CREATIVITY
- DEVELOPS KEYBOARD SKILLS
- GEOGRAPHICAL QUIZZES
- MATH AND WORD GAMES

YOUR CHILD WILL BE CAPTIVATED

for hours with your gift of the 60 programs in **Computer Carnival**. Tests of skill, haunted houses, mazes, wizards and dragons are all a part of this funhouse book. Written in TRS-80* Level II Basic. Author Richard Ramella creates many characters, from the mysterious Sugar Louie to the mystical Madam Zelda, as he takes your child through his arcade of games, graphics and quizzes.

- LARGE READABLE TYPE
- SPIRAL BINDING
- SHORT, EASY-TO-TYPE PROGRAMS
- READY-TO-LOAD CASSETTE OF ALL THE LISTINGS AND MORE

ORDER INFO.

Toll Free 1-800-258-5473 for your credit card order. Or mail your order with payment or complete credit card information plus \$2 shipping and handling to:
Wayne Green Inc.
Attn: Book Sales
Peterborough, NH 03458
Dealer Inquiries Invited

Carnival Companion™ is a 30-minute cassette of all the listings which eliminates the aggravation of typing and searching for errors, leaving more time to spend on the midway.

All orders shipped UPS if complete street address is provided.

COUPON

Package price: \$24.97
Book only: \$16.97

*TRS-80 is a trademark of the Radio Shack division of Tandy Corp.

COMPUTER CARNIVAL and CARNIVAL COMPANION CC7389 \$24.97

COMPUTER CARNIVAL (book only) BK7389 \$16.97

(Include \$2.00 per order for shipping and handling charges.)

Payment enclosed MC VISA AmEx

Card # _____ Expires _____ MC Bank # _____

Signature _____

Name _____

Address & City _____

State _____ Zip _____ 8C02

Photo-copied coupon is acceptable for ordering.



Byte Cycles

by Nathan Miller
Second Place
10 and under

Byte-Cycles is a one- or two-person joystick game for people of all ages. The object of the game is to fill as much of the screen as you can with the trail of your byte-cycle while avoiding the trail of your opponent's byte-cycle. You can win by forcing your opponent into your trail or into a wall. Variations include a screen filled with an array of stars you must avoid, and a circle-triangle-star maze you must negotiate to win.

After loading Byte-Cycles from the cassette, type Run and press the enter key. The program will print informa-

tion on how to play Byte-Cycles. Whenever there is a pause and you are finished reading, press any key.

After the instructions, you will need to answer a few questions before play begins:

- *1 or 2 players?* Your answer to this question tells whether you want to compete with someone or practice alone.

- *Draw?* If you answer yes to this question, you will be able to cross trails and hit walls. This is usually for fun or practice, not competition.

- *Stars?* If you want the screen to be

filled with a lot of dots, answer yes here. You will be asked for the number of dots to be used. If you hit the dots during play you are destroyed.

- *Circle, triangle, star?* In this option, the screen shows two half circles with gaps at each side. Inside the circles is a triangle with a star inside. The object is to get into the triangle and hit the star. This is very hard!

When using the joystick, you must be very careful to keep the handle against the rim. You can move in any of eight directions: up, down, left, right, and the four diagonals. To change directions, move the handle to the extreme position of the direction you want. Leaving the handle in the middle of the joystick will destroy you. Also, you must not reverse directions. To go the opposite way, make a small corner since reversing directly will explode you. ■

Nathan Miller, age 10, can be reached at 3309 SW Malcolm Court, Portland, OR 97225.

Program Listing

```
0 DIM HF(63),VF(63),FH(63),FV(63),A(50)
20 HF(0)=-1:VF(0)=-1:HF(63)=1:VF(63)=1:FH(0)=-1:FV(0)=-1:FH(63)=
1:FV(63)=1
23 CLS
25 PRINT"WHEN THERE IS A PAUSE AND YOU ARE READY TO CONTINUE, PR
ESS ANY KEY."
27 IF INKEY$="" THEN 27
30 CLS
40 PRINT"WELCOME TO BYTE CYCLES":PRINT"WRITTEN BY NATHAN MILLER"
:PRINT"OCT. 13,1982"
50 IF INKEY$="" THEN 50
60 CLS
70 PRINT"IMAGINE YOURSELF INSIDE A COMPUTER. YOU ARE PLACED ON A
LARGE FIELD IN A CYCLE THAT LEAVES A TRAIL WHEN IT MOVES. YOUR
MAIN CONSIDERATION IS TO DESTROY THE OPPONENT BY MAKING HIM RUN
INTO A TRAIL OR FORCING HIM INTO THE WALL. AT THE SA";
80 PRINT"ME TIME YOU MUST AVOID THE TRAILS AND WALLS. WITH THE S
TAR OPTION, YOU AND YOUR OPPONENT CAN BE DESTROYED BY RUNNING IN
TO A STAR. IN THIS SIMULATION PLAYERS CONTROL THEIR CYCLES WITH
JOYSTICKS BUT THEY MUST HOLD JOYSTICKS ON THE RIM OR EXPLODE
100 IF INKEY$="" THEN 100
110 CLS
```

Listing continues

The Key Box

Color Computer
16K RAM
Extended Color Basic
Two Joysticks

```

120 INPUT"1 OR 2 PLAYERS";NP
130 IF NP<1 OR NP>2 THEN 120
140 INPUT"DRAW";D$
150 IF D$="YES" THEN PMODE 4,1:PCLS:SCREEN 1,1:GOTO 810
160 IF NP=2 THEN INPUT"RIGHT PERSON'S NAME";R$:INPUT"LEFT PERSON
'S NAME";L$
170 INPUT"STARS";S$
180 IF S$="YES" THEN INPUT"HOW MANY STARS";NS
190 IF S$<>"YES" THEN INPUT"CIRCLE,TRI.,STAR";CT$
200 PMODE 4,1:PCLS:SCREEN 1,1
240 LINE(0,0)-(255,191),PSET,B
250 ON NP GOSUB 260,370
260 PCLS:LINE(0,0)-(255,191),PSET,B:X=128:Y=96:IF S$="YES" THEN
270 ELSE 280
270 X=128:Y=96:FOR XZ=1 TO NS:PSET(RND(128)*2,RND(96)*2):NEXT XZ
280 IF CT$="YES" THEN 290 ELSE X=128:Y=96:GOTO 320
290 X=208:Y=171:CIRCLE(128,96),50,,.85,.04,.47:CIRCLE(128,96),50
,,.85,.53,.99:CIRCLE(128,96),49,,.85,.04,.47:CIRCLE(128,96),49,,
.85,.53,.99
300 PSET(128,96)
310 DRAW"BM128,96S8BM-5,+2E5F5BL3L4":DRAW"BM128,96BM-6,+2E6F6"
319 X=208:Y=171
320 H=JOYSTK(0):V=JOYSTK(1)
330 PSET(X,Y)
340 X=X+HF(H):Y=Y+VF(V)
350 IF PPOINT(X,Y)=5 THEN 700
360 GOTO 320
370 X2=88:Y2=96:X=168:Y2=96:IF S$="YES" THEN 380 ELSE 390
380 X=88:Y2=96:X2=168:Y2=96:FOR XZ=1 TO NS:PSET(RND(128)*2,RND(96
)*2):NEXT XZ
390 IF S$<>"YES" AND CT$="YES" THEN 400 ELSE X=88:X2=168:Y2=96:Y2
=96:GOTO 420
400 X=48:Y=171:X2=208:Y2=171:CIRCLE(128,96),50,,.85,.04,.47:CIRC
LE(128,96),50,,.85,.53,.99:CIRCLE(128,96),49,,.85,.04,.47:CIRCLE
(128,96),49,,.85,.53,.99
410 DRAW"BM128,96S8BM-5,+2E5F5BL3L4":PSET(128,96)
419 X=28:Y=171:X2=208:Y2=171:LINE(0,0)-(255,191),PSET,B
420 H2=JOYSTK(0):V2=JOYSTK(1):H=JOYSTK(2):V=JOYSTK(3)
430 PSET(X,Y):PSET(X2,Y2)
440 X=X+HF(H):Y=Y+VF(V):X2=X2+FH(H2):Y2=Y2+VF(V2)
450 IF PPOINT(X,Y)=5 THEN 700
460 IF PPOINT(X2,Y2)=5 THEN 750
470 GOTO 420
480 X=128:Y=96
490 H=JOYSTK(0):V=JOYSTK(1)
500 X=X+HF(H):Y=Y+VF(V)
510 IF X<0 THEN X=0
520 IF Y<0 THEN Y=0
530 IF X>255 THEN X=255
540 IF Y>191 THEN Y=191
550 PSET(X,Y)
560 GOTO 490
570 X=88:Y=96:X2=168:Y2=96
580 H=JOYSTK(0):V=JOYSTK(1):H2=JOYSTK(2):V2=JOYSTK(3)
590 X=X+HF(H):Y=Y+VF(V):X2=X2+FH(H2):Y2=Y2+VF(V2)
600 IF Y2>191 THEN Y2=191
610 IF Y2<0 THEN Y2=0
620 IF X2>255 THEN X2=255
630 IF X<0 THEN X=0
640 IF X>255 THEN X=255
650 IF Y<0 THEN Y=0
660 IF Y>191 THEN Y=191
670 IF X2<0 THEN X2=0
680 PSET(X,Y):PSET(X2,Y2)
690 GOTO 580
700 FOR R=1 TO 20:CIRCLE(X,Y),R,,.85:NEXT
710 ZX=ZX+1:IF ZX<=4 THEN 730
720 IF NP=2 THEN 820 ELSE CLS:ZX=0:C=0:GOTO 120
730 PCLS:IF NP=1 AND CT$="YES" THEN PCLS:LINE(0,0)-(255,191),PSE
T,B:GOTO 290 ELSE IF NP=1 AND S$="YES" THEN PCLS:LINE(0,0)-(255,
191),PSET,B:GOTO 270 ELSE IF NP=2 AND CT$="YES" THEN 400 ELSE IF
NP=2 AND S$="YES" THEN LINE(0,0)-(255,191),PSET,B:GOTO 380
731 IF NP=1 AND CT$<>"YES" AND S$<>"YES" THEN X=128:Y=96:GOTO 32
0 ELSE X=88:Y=96:X2=168:Y2=96:LINE(0,0)-(255,191),PSET,B:GOTO 42
0
740 GOTO 370
750 FOR R=1 TO 20:CIRCLE(X2,Y2),R,,.85:NEXT R
760 FOR D=1 TO 250:NEXT
770 C=C+1:IF C<=4 THEN 730
790 IF NP=2 THEN 820 ELSE CLS:ZX=0:C=0:GOTO 120
800 GOTO 120
810 IF NP=1 THEN 480 ELSE 570
820 IF ZX>XZ THEN 850 ELSE 830
830 CLS:PRINT"CONGRATULATIONS,";L$;R$, "YOU WIN!"
840 IF INKEY$="" THEN 840 ELSE CLS:ZX=0:C=0:GOTO 120
850 CLS:PRINT"CONGRATULATIONS,";R$;L$, "YOU WIN!"
855 PRINT:PRINT:PRINT:PRINT"FOR ANOTHER GAME PRESS ANY KEY."
860 IF INKEY$="" THEN 860 ELSE CLS:ZX=0:C=0:GOTO 120

```

COMPUTER REPAIRS
CONSULTATIONS**E & G UMLOR ENTERPRISES**RFD#1, Box 48A
FITZWILLIAM, NH 03447**DISK DRIVES**

With Power Supply and Case

40 Track Single Side	\$260.00
40 Track Double Side	\$330.00
80 Track Single Side	\$ 345.00
80 Track Double Side	\$420.00

Raw Drives Also Available

For Further Information Call:

(603) 585-3142

✓401

**GO
PIGGYBACK!****CENTRONICS****ADD lowercase with our
PLUG-IN piggyback board!****9WX7H Dot Matrix \$140****5WX7H Dot Matrix \$100****TWO** complete character sets on board:96 character ASCII **PLUS** choice of
128 character APL, TRS-80/H-19 Graphics or
Scientific. (Customer defined: add \$50/set).**Most printers convertible: specify logic board #****Radix
Technologies**Suite 400 Carolyn Building
10400 Eaton Place
Fairfax, VA 22030 (703) 385-0900

VISA, MasterCard, check, CDS accepted

✓269

IEEE-488 TO TRS-80* INTERFACEEverything needed to add *powerful*
BASIC GPIB-488 controller capability
to TRS-80 Model 1 or 3, Level 2 or
DOS with a minimum of 16K.488-80B
For Model 1
Operation488-80C
For Model 3
OperationModel 488-80B or 488-80C Price: \$375.
+ shipping, insurance & tax**WHEN ORDERING SPECIFY DISK OR TAPE****SCIENTIFIC ENGINEERING
LABORATORIES**11 Neil Drive • Old Bethpage, NY 11804
Telephone: (516) 694-3370

*Trademark of Tandy Corp.

There is no affiliation between Scientific
Engineering Laboratories and Tandy Corp. or
Radio Shack.

✓203



Boxer

by Lloyd Kupchanko
Third Place
14-18

Boxer is a machine-language game that will give your reflexes the ultimate challenge. The object is to punch a randomly appearing bag. Use the up- and down-arrow keys to move and the left- and right-arrow keys to punch.

Listing 1 is a Basic version of Boxer. String packing was used to do the animation. After you have played a few games and leave the computer, the game will go into the demonstration mode. To exit the demonstration mode

just hit any key. Even though I did almost everything possible to speed up the game, it still runs pretty slowly.

Listing 2 is an Assembly-language version of Boxer. The only difference between the Basic program has a demonstration mode and the Assembly-language program does not. Boxer requires 32K of memory to assemble. To use this version you have to run Program Listing 3 first. This program POKES random numbers into a large memory block. The machine-language program will then use these numbers to randomly position the bag you are supposed to punch.

My high score is 720 points. ■

Lloyd Kupchanko, age 16, can be reached at 24 Quesnell Circle, Edmonton, Alberta, Canada T5R 5M9.

Program Listing 1

```

1 | *****
2 | *
3 | *           B O X E R           *
4 | *
5 | *           B Y                 *
6 | *
7 | *           L L O Y D   K U P C H A N K O   *
8 | *
9 | *****
10 GOTO470
15 ' ***** TESTS FOR KEYBOARD INPUT
20 A=PEEK(14550)
30 IFT<0THEN320ELSESET=T-1
40 IFV<0THEN230ELSEV=V-1
45 ' ***** IF IN DEMONSTRATION MODE THEN LINE 450
50 IFD=1THEN450
60 IFA=32THEN110
70 IFA=64THEN130
80 IFA=8THEN150
90 IFA=16THEN190
100 GOTO20
105 ' ***** RIGHT HAND SWING ROUTINE
110 V=V-1:T=T-1:PRINT@X,A1$;:PRINT@X,A2$;:PRINT@X,A3$;:PRINT@X,A
4$;:IFPEEK(15370+X)=191THEN250ELSEIFPEEK(15434+X)=191THEN250
115 ' ***** RIGHT HAND MISS ROUTINE
120 PRINT@X,Z$;:PRINT@X,A3$;:PRINT@X,Z$;:PRINT@X,A2$;:PRINT@X,Z$
;:PRINT@X,A1$;:PRINT@X,Z$;:PRINT@X,A0$;:GOTO20
125 ' ***** LEFT HAND SWING ROUTINE
130 V=V-1:T=T-1:PRINT@Y,A6$;:PRINT@Y,A7$;:PRINT@Y,A8$;:PRINT@Y,A

```

Listing 1 continues

The Key Box

**Model I or III
16K, 32K RAM
Cassette or Disk Basic**

```

9$: :IFPEEK(15562+X)=191THEN280ELSEIFPEEK(15626+X)=191THEN280
135 ' ***** LEFT HAND MISS ROUTINE
140 PRINT@Y,Z$;:PRINT@Y,A8$;:PRINT@Y,Z$;:PRINT@Y,A7$;:PRINT@Y,Z$
;:PRINT@Y,A6$;:PRINT@Y,Z$;:PRINT@Y,A5$;:GOTO20
145 ' ***** MOVE UP ROUTINE
150 PRINT@X-1,Z1$;:X=X-64:Y=Y-64
160 IFX<64THENX=X+64:Y=Y+64
170 PRINT@X,M$;
180 T=T-1:GOTO20
185 ' ***** MOVE DOWN ROUTINE
190 PRINT@X-1,Z1$;:X=X+64:Y=Y+64
200 IFX>687THENX=X-64:Y=Y-64
210 PRINT@X,M$;
220 T=T-1:GOTO20
225 ' ***** ERASES BLOCK WHEN BOXER TAKES TO LONG
230 PRINT@P,STRING$(3,128);:S=S-20:GOSUB310:V=10:P=RND(14)*64+14
:PRINT@P,STRING$(3,191);:GOTO20
235 ' ***** DRAWS NEW BLOCK AFTER BOXER HAS HIT
240 V=10:P=RND(14)*64+14:PRINT@P,STRING$(3,191);:GOTO20
245 ' ***** RIGHT HAND HIT ROUTINE
250 PRINT@P," ";:PRINT@X,Z$;:PRINT@P+1," ";:PRINT@X,A3$;:PRINT@P
+2," ";:PRINT@X,Z$;:PRINT@P+6,CHR$(191);:PRINT@X,A2$;:PRINT@P+7,
CHR$(191);:PRINT@X,Z$;:PRINT@P+8,CHR$(191);
260 PRINT@X,A1$;:PRINT@P+6," ";:PRINT@P+9,CHR$(191);:PRINT@X,Z$;
:PRINT@P+7," ";:PRINT@P+10,CHR$(191);:PRINT@X,A0$;:PRINT@P+8," "
;:PRINT@P+11,CHR$(191);:PRINT@P+9," ";:S=S+10:PRINT@P+10," "
270 PRINT@P+11," ";:GOSUB310:GOTO240
275 ' ***** LEFT HAND HIT ROUTINE
280 PRINT@P," ";:PRINT@Y,Z$;:PRINT@P+1," ";:PRINT@Y,A8$;:PRINT@P
+2," ";:PRINT@Y,Z$;:PRINT@P+6,CHR$(191);:PRINT@Y,A7$;:PRINT@P+7,
CHR$(191);:PRINT@Y,Z$;:PRINT@P+8,CHR$(191);
290 PRINT@Y,A7$;:PRINT@P+6," ";:PRINT@P+9,CHR$(191);:PRINT@Y,Z$;
:PRINT@P+7," ";:PRINT@P+10,CHR$(191);:PRINT@Y,A5$;:PRINT@P+8," "
;:PRINT@P+11,CHR$(191);:PRINT@P+9," ";:S=S+10:PRINT@P+10," "
300 PRINT@P+11," ";:GOSUB310:GOTO240
305 ' ***** FLASHES GRAPHICS NEAR THE SCORE
310 PRINT@556,CHR$(191);:PRINT@492,CHR$(191);:PRINT@556,CHR$(128
);:PRINT@492,CHR$(143);:PRINT@556,S;:RETURN
315 ' ***** DELAY LOOP AND GRAPHICS DISPLAY AT END OF GAME
320 FORB=1TO500:NEXT:CLS:PRINT@540,"GAME OVER":FORB=1TO400:NEXTB
:FORX=191TO128STEP-1:POKE15360,X:Q=USR(0):NEXT
330 GOSUB1150:PRINT@528,"YOUR SCORE : "S;:IFS>HSTHENHS=S:PRINT
A NEW HIGH SCORE !";
335 ' ***** AFTER GAME DISPLAY OF SCORE AND HIGH SCORE
340 PRINT@592,"HIGH SCORE : "HS;
350 PRINT@720,"DO YOU WISH TO PLAY AGAIN (Y/N)";
360 C=C+1:IFC=250THEN430ELSEQ$=INKEY$
370 PRINT@747," / ";
380 GOSUB460:PRINT@747,"Y/N";
390 IFQ$="Y"THEN360
400 IFQ$="Y"THEND=0:GOTO1090
410 IFQ$="N"THEN440
420 GOTO360
430 D=1:GOTO1090
440 END
445 ' ***** RANDOM CHOICE FOR DEMONSTRATION MODE
450 Q$=INKEY$:IFQ$<>" "THEN320ELSEQ=RND(4):ONQGOTO110,130,150,190

455 ' ***** DELAY LOOP SUBROUTINE
460 FORB=1TO15:NEXT:RETURN
465 ' ***** START OF TITLE DISPLAY
470 GOSUB1150:PRINT@346,"B O X E R";:PRINT@530,"USE THE "CHR$(91
)" ARROW TO MOVE UP";:PRINT@594,"USE THE "CHR$(92)" ARROW TO MOV
E DOWN";:PRINT@651,"USE THE "CHR$(93)" ARROW TO SWING WITH THE R
IGHT HAND";
480 PRINT@715,"USE THE "CHR$(94)" ARROW TO SWING WITH THE LEFT H
AND";
490 CLEAR200:DEFINTA-Z
495 ' ***** LINES 500 - 1020 POKE THE DATA INTO STRINGS
496 ' ***** 37 X'S
500 Z$="XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX"
510 K=VARPTR(Z$):AD=PEEK(K+2)*256+PEEK(K+1)
520 DATA128,128,128,128,128,128,128,128,128,128,128,128,26,24,24
,24,24,24,24,24,24,24,24,24,24,128,128,128,128,128,128,128,128,1
28,128,128,128
530 FORB=0TO36:READQ:POKEAD+B,Q:NEXT
535 ' ***** 21 X'S
540 Z2$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
550 K=VARPTR(Z2$):AD=PEEK(K+2)*256+PEEK(K+1)
560 DATA128,128,128,128,128,128,128,128,128,128,24,24,24,24,24,2
4,24,24,24,26
570 FORB=0TO20:READQ:POKEAD+B,Q:NEXT
580 Z1$=Z2$+Z2$+Z2$+Z2$+Z2$+Z2$
585 ' ***** 19 X'S
590 A0$="XXXXXXXXXXXXXXXXXXXX"
600 K=VARPTR(A0$):AD=PEEK(K+2)*256+PEEK(K+1)
610 DATA28,176,176,184,188,180,26,24,24,24,24,24,24,24,24,158,167,128
,130,131,129

```

Listing 1 continues

SOFTWARE TECHNOLOGY BREAKTHROUGH FROM XYZT

LIBRARY SUPPORT OPTION... \$79.00/
\$10 ma

Organize your diskettes - put your files in libraries! No more mess in the directory - your files are logically grouped together and can be easily manipulated. Your existing software will access files directly in libraries. Regular DOS commands can be used to DO, LIST, PRINT, KILL, LOAD, COPY library files. Execute/CMD modules and run BASIC programs directly from libraries.

Plus, LSO saves space-in most cases diskette capacity effectively doubles. Not to mention increase speed of operation! Each library can contain up to 240 files. You may have as many libraries as many files as your system allows you to have. Fully documented, includes complete set of utilities and self-relocatable of course.

INTERACTIVE CONTROL LANGUAGE (rel.2-B) \$59.00/\$10 ma

The most powerful control language ever designed for the micro. Intended for control of computer operations, software enhancement and customization. Just check list of features:

- Complete control over computer operation
- Powerful command language processor
- Interaction with computer operator
- Control Interception*
- Queue structure for data manipulation*
- Variables and information passed between programs
- Virtual I/O for keyboard and display operations*
- Interactive program/ICL coexecution*
- Enhances DOS, assemblers, compilers, wordprocessors, databases, etc.*
- Provides data for keyboard input
- Access to display output*
- &RETCODE indicates result of execution*
- Conditional execution of DOS commands and /CMD files

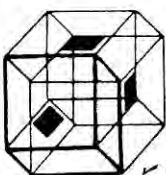
* Exclusive ICL feature

Package includes 65 page manual, self-relocatable ICL and 12 ready to use procedures.

RAM-SLEDGES \$25.00

Have you ever tried to write a self-relocatable program? You know what it takes! No more problems with **RAM-SLEDGES!** Write your program any way you like, then use **RAM-SLEDGES** to make it self-relocatable. It was developed for internal use and production.

Free KEYCOPY/CMD is included.



To order, specify
Mod I/III and DOS:
NEWDOS* - DOSPLUS*
LDOS* - TRSDOS*
MULTIDOS*
Check M.O., C.O.D., VISA,
MC plus \$4.00 s/h.
Foreign orders - extra \$10.00

**XYZT Computer
Dimensions, Inc.**
2 Penn Plaza, Suite 1500
New York, N.Y. 10121
(212) 244-3100



Order by Mail or Check Your Local Dealer

FOR TRS-80 MODEL I OR III IBM PERSONAL COMPUTER

- * MORE SPEED**
10-20 times faster than interpreted BASIC.
- * MORE ROOM**
Very compact compiled code plus VIRTUAL MEMORY makes your RAM act larger. Variable number of block buffers. 31-char-unique wordnames use only 4 bytes in header!
- * MORE INSTRUCTIONS**
Add YOUR commands to its 79-STANDARD-plus instruction set!
Far more complete than most Forths: single & double precision, arrays, string-handling, clock, graphics (IBM low-res. gives B/W and 16 color or 200 tint color display).
- * MORE EASE**
Excellent full-screen Editor, structured & modular programming.
Word search utility
THE NOTEPAD letter writer
Optimized for your TRS-80 or IBM with keyboard repeats, upper/lower case display driver, full ASCII.
- * MORE POWER**
Forth operating system
Concurrent Interpreter AND Compiler
VIRTUAL I/O for video and printer, disk and tape (10-Megabyte hard disk available)
Full 8080 or 8088 Assembler aboard
(Z80 Assembler also available for TRS-80)
Intermix 35- to 80-track disk drives
IBM can read, write and run M.3 disks
M.3 can read, write and run M.1 disks

mmsFORTH

THE PROFESSIONAL FORTH SYSTEM FOR TRS-80 & IBM PC

(Thousands of systems in use)

MMSFORTH Disk System (requires 1 disk drive, 32K RAM)
V2.0 for Radio Shack TRS-80 Model I or III \$129.95*
V2.1 for IBM Personal Computer (80-col. screen) \$249.95*

AND MMS GIVES IT PROFESSIONAL SUPPORT

- Source code provided
- MMSFORTH Newsletter
- Many demo programs aboard
- MMSFORTH User Groups
- Inexpensive upgrades to latest version.
- Programming staff can provide advice, modifications and custom programs, to fit YOUR needs.
- MMSFORTH UTILITIES DISKETTE: includes FLOATING POINT MATH (BASIC ROM routines plus Complex numbers, Rectangular-Polar coordinate conversions, Degrees mode, more); a powerful CROSS-REFERENCER to list Forth words by block and line; plus (TRS-80) a full Forth-style Z80 assembler or (IBM PC/color) Turtle Graphics (requires MMSFORTH V2.0, 1 drive & 32K RAM) \$39.95*
- FORTHCOM: communications package provides RS-232 driver, dumb terminal mode, transfer of files or FORTH blocks, and host mode to operate a remote FORTHCOM system (requires MMSFORTH V2.0, 1 drive & 32K RAM) \$39.95*
- THE DATAHANDLER: a very fast database management system operable by non-programmers (requires MMSFORTH V2.0, 1 drive & 32K RAM) \$59.95*
- FORTHWRITE: fast, powerful word processor w/easy keystrokes, Help screens, manual & demo files, Full proportional w/tabs, outdenting, Include other blocks, documents, keyboard inputs, & DATAHANDLER fields—ideal for form letters (requires MMSFORTH V2.0, 2 drives & 48K RAM) \$175.00*
- MMSFORTH GAMES DISKETTE: real-time graphics & board games w/source code. Includes BREAKFORTH, CRASH-FORTH, CRYPTOQUOTE, FREEWAY (TRS-80), OHELLO & TIC-TAC-FORTH (requires MMSFORTH V2.0, 1 drive & 32K RAM) \$39.95*

Other MMSFORTH products under development

FORTH BOOKS AVAILABLE

- MMSFORTH USERS MANUAL - w/c Appendices \$17.50*
 - STARTING FORTH - best! \$15.95*
 - THREADED INTERPRETIVE LANGUAGES - advanced, analysis of FORTH internals \$18.95*
 - PROGRAM DESIGN & CONSTRUCTION - intro. to structured programming, good for Forth \$18.00*
 - FORTH-79 STANDARD MANUAL - official reference to 79-STANDARD word set, etc \$13.95*
 - FORTH SPECIAL ISSUE, BYTE Magazine (Aug. 1980) - A collector's item for Forth users and beginners \$4.00*
- * - ORDERING INFORMATION: Software prices include manuals and require signing of a single computer license for one-person support. Describe your hardware. Add \$2.00 S/H plus \$3.00 per MMSFORTH and \$1.00 per additional book; Mass. orders add 5% tax. Foreign orders add 20% UPS COD, VISA and M/C accepted; no unpaid purchase orders or refunds.

Send SASE for free MMSFORTH information.
Good dealers sought.

Get MMSFORTH products from your
computer dealer or

MILLER MICROCOMPUTER SERVICES
61 Lake Shore Road, Natick, MA 01760
(617) 853-6136

✓137

Listing I continued

```
620 FORB=0TO18:READQ:POKEAD+B,Q:NEXT
625 ' ***** 22 X'S
630 A1$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
640 K=VARPTR(A1$):AD=PEEK(K+2)*256+PEEK(K+1)
650 DATA128,128,128,128,128,160,176,144,26,24,24,24,24,24,158,
175,131,131,139,143,135
660 FORB=0TO21:READQ:POKEAD+B,Q:NEXT
665 ' ***** 25 X'S
670 A2$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
680 K=VARPTR(A2$):AD=PEEK(K+2)*256+PEEK(K+1)
690 DATA128,128,128,128,128,160,176,144,26,24,24,24,24,24,
24,158,175,131,131,131,131,139,143,135
700 FORB=0TO24:READQ:POKEAD+B,Q:NEXT
705 ' ***** 28 X'S
710 A3$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
720 K=VARPTR(A3$):AD=PEEK(K+2)*256+PEEK(K+1)
730 DATA128,128,128,128,128,160,176,144,26,24,24,24,24,24,
24,24,24,156,175,131,131,131,131,139,143,135
740 FORB=0TO27:READQ:POKEAD+B,Q:NEXT
745 ' ***** 31 X'S
750 A4$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
760 K=VARPTR(A4$):AD=PEEK(K+2)*256+PEEK(K+1)
770 DATA128,128,128,128,128,160,176,144,26,24,24,24,24,24,
4,24,24,24,24,24,156,175,131,131,131,131,131,139,143,135
780 FORB=0TO30:READQ:POKEAD+B,Q:NEXT
785 ' ***** 19 X'S
790 A5$="XXXXXXXXXXXXXXXXXXXX"
800 K=VARPTR(A5$):AD=PEEK(K+2)*256+PEEK(K+1)
810 DATA173,182,128,160,176,144,26,24,24,24,24,128,131,131,
139,143,135
820 FORB=0TO18:READQ:POKEAD+B,Q:NEXT
825 ' ***** 22 X'S
830 A6$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
840 K=VARPTR(A6$):AD=PEEK(K+2)*256+PEEK(K+1)
850 DATA173,190,176,176,184,188,180,26,24,24,24,24,24,128,
128,128,128,130,131,129
860 FORB=0TO21:READQ:POKEAD+B,Q:NEXT
865 ' ***** 25 X'S
870 A7$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
880 K=VARPTR(A7$):AD=PEEK(K+2)*256+PEEK(K+1)
890 DATA173,190,176,176,176,184,188,180,26,24,24,24,24,24,
24,128,128,128,128,128,130,131,129
900 FORB=0TO24:READQ:POKEAD+B,Q:NEXT
905 ' ***** 28 X'S
910 A8$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
920 K=VARPTR(A8$):AD=PEEK(K+2)*256+PEEK(K+1)
930 DATA141,190,176,176,176,176,184,188,180,26,24,24,24,24,24,
24,24,24,128,128,128,128,128,130,131,129
940 FORB=0TO27:READQ:POKEAD+B,Q:NEXT
945 ' ***** 31 X'S
950 A9$="XXXXXXXXXXXXXXXXXXXXXXXXXXXX"
960 K=VARPTR(A9$):AD=PEEK(K+2)*256+PEEK(K+1)
970 DATA141,190,176,176,176,176,184,188,180,26,24,24,24,24,24,
4,24,24,24,24,24,128,128,128,128,128,128,130,131,129
980 FORB=0TO30:READQ:POKEAD+B,Q:NEXT
985 ' ***** 56 X'S
990 M$="XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX"
1000 K=VARPTR(M$):AD=PEEK(K+2)*256+PEEK(K+1)
1010 DATA128,176,176,184,188,180,26,24,24,24,24,24,158,167,128,
130,131,129,26,24,24,24,24,24,24,24,24,170,128,145,157,132,26,24,
24,24,24,173,182,128,160,176,144,26,24,24,24,24,24,128,131,131,
1,139,143,135
1020 FORB=0TO55:READQ:POKEAD+B,Q:NEXT
1025 ' ***** POKE LSB FOR USR ROUTINE
1030 POKE16526,0
1035 ' ***** POKE MSB FOR USR ROUTINE
1040 POKE16527,125
1050 FORB=0TO11:READQ:POKE32000+B,Q:NEXT:PRINT@916,"PRESS <ENTER>
> TO START";
1060 DATA33,0,60,17,1,60,1,255,3,237,176,201
1065 ' ***** IF TO LONG TO PRESS ENTER THAN GOTO DEMO
1070 C=C+1:IFC=500THEND=1:GOTO1090
1080 PRINT@922," ";:GOSUB460:Q$=INKEY$:PRINT@922,"<ENTER>"
;:GOSUB460:IFQ$=" "THEN1070
1085 ' ***** PRINT GAME SCREEN
1090 GOSUB1150:FORX=17TO966STEP64:PRINT@X,STRING$(11,191);:NEXT:
PRINT@977,STRING$(11,191);
1100 FORB=84TO969STEP64:PRINT@B,STRING$(6,128);:NEXT
1110 PRINT@550,"SCORE:";:PRINT@540,STRING$(9,143);:PRINT@549,CHR$
(191);:PRINT@620,CHR$(143);:PRINT@492,CHR$(143);:PRINT@485,CHR$
(191);:PRINT@486,STRING$(6,131);:PRINT@613,CHR$(143);:PRINT@614,
STRING$(6,140);
1120 X=452:Y=644:T=500:S=0:C=0
1130 PRINT@X,M$;
1140 GOTO240
1145 ' ***** SUBROUTINE FOR DRAWING BORDER AROUND THE SCREEN
1150 CLS:FORB=1536TO15423:POKEB,131:POKEB+960,176:NEXT:FORB=153
60TO16320STEP64:POKEB,191:POKEB+63,191:NEXT:RETURN
```


World Wide Data Systems Proudly Presents

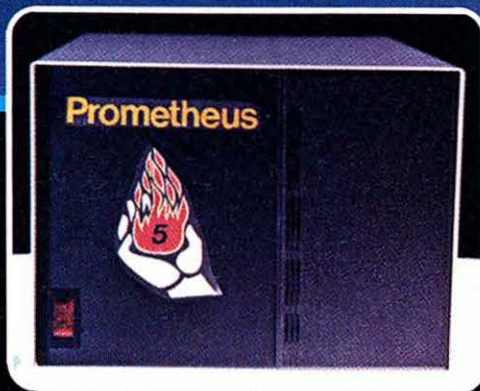


Prometheus

External Winchester Hard Disk Drive Systems

The Prometheus family of external Winchester Systems were designed to put the power of hard disk data storage within the reach of all systems owners—without sacrificing performance, quality or reliability. All Prometheus Systems feature:

- Complete—Ready-to-run
- One year limited warranty (parts/labor)
- Error code correction / CRC generation / Verification
- Automatic micro-processor self test on power up. 12,000 hours mean time between failure
- Commercial power supply with automatic current limit and overload protection
- International AC input (All units easily accept 100, 120, 220 or 240 VAC, 47-440 HZ) Corcom RFI filter with transient suppression



- Error code—LED—alerts operator of system fault

- Expandable to 40 M Bytes

In addition each Prometheus System includes DOS+ 4.0a for the TRS80® Model III, and patches for Apple DOS, CP/M, Pascal, and MSDOS; and CP/M86 for the IBM Personal Computer.

PROMETHEUS - 5 \$1,495.00

Also available 10, 15 & 20 megabytes hard disk systems for Apple, TRS80 & IBM-PC systems.



Prometheus

Call or write:

Worldwide Data Systems, Inc.

17321 El Camino Real
Houston, Texas 77058
713/488-8022

98

What's After Basic?

If you ever wished that you had a better programming language, PASCAL 80 may be the language you dream about. It is a compiled language, faster, more accurate and easier to modify than Basic. Yet it is so easy to use that you can forget the hassles and diskette spinning of other compiled languages, including other versions of Pascal.

Now you can create your own command files that execute from DOS without having to load a language into the computer first, but do it with far less work than machine language. You can sell your compiled programs without any royalty payments!

Although designed for teaching and ideal for that purpose, PASCAL 80 also allows serious applications with a full fourteen digits of accuracy, even on log and trig functions!

Both random and sequential access files are supported, without cumbersome format statements.

PASCAL 80 offers most of the features of ISO Standard Pascal as well as a number of useful extensions, including CLS, PEEK, POKE, CALL and graphics commands. Pascal 80 extensions include the use of READ and WRITE with record oriented files, ELSE in CASE statements, and other useful features.

PASCAL 80 allows you to create files on the TRS-80[®] Model I, Model III, LNW-80, PMC-80, or LOBO MAX-80 that will run on any of the other machines under TRS-DOS[®], LDOS, NewDOS, NewDOS 80, DBL-DOS or DOS Plus.

PASCAL-80

PASCAL 80 is used in dozens of High Schools, Colleges, and Technical Schools, and has been favorably reviewed in Byte, Creative Computing, and other magazines.

You get all of this at a bargain price of only \$99 plus \$2 shipping. If you call and order by MasterCard or VISA, we will even credit you \$1 for the phone call. Call or send your check today!

NEW CLASSICS SOFTWARE

239 Fox Hill Road
Denville, NJ 07834
(201) 625-8838 ✓255

TRS-80[®] and TRS-DOS are trademarks of Radio Shack. LNW-80 of LNW Research, PMC-80 of Personal Micro Computers, LOBO, LDOS, and MAX-80 of Lobo Systems. DOS-Plus of Micro Systems Software, NewDOS and NewDOS 80 of Apparat, and DBL-DOS of Percom. PASCAL 80 is a trademark of New Classics Software. Pointer Variables, Variant Records, NEW, DISPOSE, WITH, GET, and PUT are not implemented in PASCAL 80.

Program Listing 2

```

B000      00100      ORG      0B000H
          00195 ;
          00196 ;
          00197 ;
          SET UP TITLE DISPLAY
B000 CDC901 00200      CALL    01C9H      ;CLEAR SCREEN
B003 21F5B5 00210      LD      HL,INSTR
B006 115A3D 00220      LD      DE,15706
B009 CDE0B5 00230      CALL    PA
B00C 21FFB5 00240      LD      HL,INSTR1
B00F 11123E 00250      LD      DE,15890
B012 CDE0B5 00260      CALL    PA
B015 211AB6 00270      LD      HL,INSTR2
B018 11523E 00280      LD      DE,15954
B01B CDE0B5 00290      CALL    PA
B01E 2137B6 00300      LD      HL,INSTR3
B021 118B3E 00310      LD      DE,16011
B024 CDE0B5 00320      CALL    PA
B027 2164B6 00330      LD      HL,INSTR4
B02A 11CB3E 00340      LD      DE,16075
B02D CDE0B5 00350      CALL    PA
B030 2190B6 00360      LD      HL,PRESS
B033 11943F 00370      LD      DE,16276
B036 CDE0B5 00380      CALL    PA
B039 CD3EB0 00390      CALL    BOX
B03C 1834    00400      JR      BE
          00403 ;
          00406 ;
          00409 ;
          'BOX' DRAWS A BORDER AROUND THE SCREEN
B03E 21013C 00410      LD      HL,15361
B041 11023C 00420      LD      DE,15362
B044 013D00 00430      LD      BC,61
B047 3683   00440      LD      (HL),131
B049 EDB0   00450      LDIR
B04B 21C13F 00460      LD      HL,16321
B04E 11C23F 00470      LD      DE,16322
B051 013D00 00480      LD      BC,61
B054 36B0   00490      LD      (HL),176
B056 EDB0   00500      LDIR
B058 DD21003C 00510      LD      IX,15360
B05C 011000 00520      LD      BC,16
B05F 114000 00530      LD      DE,64
B062 DD3600BF 00540      LD      (IX),191
B066 DD363FBF 00550      LD      (IX+63),191
B06A DD19   00560      ADD    IX,DE
B06C 0B     00570      DEC    BC
B06D 78     00580      LD      A,B
B06E B1     00590      OR     C
B06F C8     00600      RET
B070 18F0   00610      JR      LP1
          00613 ;
          00616 ;
          00619 ;
          TEST FOR GAME START
B072 018813 00620      LD      BC,5000
B075 214038 00630      LD      HL,3040H
B078 7E     00640      LD      A,(HL)
B079 CB47   00650      BIT    0,A
B07B C2AFB0 00660      JP    NZ,START
B07E 0B     00670      DEC    BC
B07F 78     00680      LD      A,B
B080 B1     00690      OR     C
B081 2802   00700      JR    Z,ERASE
B083 18F0   00710      JR    LP2
B085 219A3F 00720      ERASE LD      HL,16282
B088 119B3F 00730      LD      DE,16283
B08B 010600 00740      LD      BC,6
B08E 3680   00750      LD      (HL),128
B090 EDB0   00760      LDIR
B092 018813 00770      LD      BC,5000
B095 210438 00780      LD      HL,3004H
B098 7E     00790      LD      A,(HL)
B099 CB47   00800      BIT    0,A
B09B 2012   00810      JR    NZ,START
B09D 0B     00820      DEC    BC
B09E 78     00830      LD      A,B
B09F B1     00840      OR     C
B0A0 2802   00850      JR    Z,PRNT
B0A2 18F1   00860      JR    LP3
B0A4 21A7B6 00870      PRNT LD      HL,ENTER
B0A7 119A3F 00880      LD      DE,16282
B0AA CDE0B5 00890      CALL    PA
B0AD 18C3   00900      JR      BE
          00903 ;
          00906 ;
          00909 ;
          SET UP THE SCREEN FOR THE GAME
B0AF CDC901 00910      CALL    01C9H
B0B2 CD3EB0 00920      CALL    BOX
B0B5 21113C 00930      LD      HL,15377
B0B8 11123C 00940      LD      DE,15378
B0BB 010B00 00950      LD      BC,11
B0BE 36BF   00960      LD      (HL),191
B0C0 EDB0   00970      LDIR
B0C2 110E00 00980      LD      DE,14
B0C5 DD21513C 00990      LD      IX,15441
B0C9 DD3600BF 01000      LD      (IX),191
B0CD DD3601BF 01010      LD      (IX+1),191
B0D1 DD3602BF 01020      LD      (IX+2),191

```

Listing 2 continues

```

B0D5 DD3609BF 01030 LD (IX+9),191
B0D9 DD360ABF 01040 LD (IX+10),191
B0DD DD360BBF 01050 LD (IX+11),191
B0E1 014000 01060 LD BC,64
B0E4 DD09 01070 ADD IX,BC
B0E6 7A 01080 LD A,D
B0E7 B3 01090 OR E
B0E8 1B 01100 DEC DE
B0E9 20DE 01110 JR NZ,LP4
B0EB 21D13F 01120 LD HL,16337
B0EE 11D23F 01130 LD DE,16338
B0F1 010B00 01140 LD BC,11
B0F4 36BF 01150 LD (HL),191
B0F6 EDB0 01160 LDIR
B0F8 21AFB6 01170 LD HL,SC
B0FB DD21263E 01180 LD IX,15910
B0FF CDE9B5 01190 CALL PB
B102 DD360030 01200 LD (IX),30H
B106 DD360130 01210 LD (IX+1),320H
B10A DD360230 01220 LD (IX+2),30H
B10E 211D3E 01230 LD HL,15901
B111 111E3E 01240 LD DE,15902
B114 010800 01250 LD BC,8
B117 368F 01260 LD (HL),143
B119 EDB0 01270 LDIR
B11B 21253E 01280 LD HL,15909
B11E 36BF 01290 LD (HL),191
B120 21E53D 01300 LD HL,15845
B123 36BF 01310 LD (HL),191
B125 216C3E 01320 LD HL,15980
B128 368F 01330 LD (HL),143
B12A 21EC3D 01340 LD HL,15852
B12D 368F 01350 LD (HL),143
B12F 21653E 01360 LD HL,15973
B132 368F 01370 LD (HL),143
B134 21E63D 01380 LD HL,15846
B137 11E73D 01390 LD DE,15847
B13A 010600 01400 LD BC,6
B13D 3683 01410 LD (HL),131
B13F EDB0 01420 LDIR
B141 21663E 01430 LD HL,15974
B144 11673E 01440 LD DE,15975
B147 010600 01450 LD BC,6
B14A 368C 01460 LD (HL),140
B14C EDB0 01470 LDIR
B14E C380B1 01480 JP BEGIN
01483 ;
01486 ; ROUTINE TO PRINT THE BOXER
01489 ;
B151 21E3B6 01490 PBOXER LD HL,ARM0
B154 CDE9B5 01500 CALL PB
B157 013A00 01510 LD BC,58
B15A DD09 01520 ADD IX,BC
B15C 23 01530 INC HL
B15D CDE9B5 01540 CALL PB
B160 2197B7 01550 LD HL,HEAD
B163 013900 01560 LD BC,57
B166 DD09 01570 ADD IX,BC
B168 CDE9B5 01580 CALL PB
B16B 013C00 01590 LD BC,60
B16E DD09 01600 ADD IX,BC
B170 213DB7 01610 P5 LD HL,ARM5
B173 CDE9B5 01620 CALL PB
B176 23 01630 INC HL
B177 013A00 01640 LD BC,58
B17A DD09 01650 ADD IX,BC
B17C CDE9B5 01660 CALL PB
B17F C9 01670 RET
B180 DD21C43D 01680 BEGIN LD IX,15812
B184 DDE5 01690 PUSH IX
B186 CD51B1 01700 CALL PBOXER
B189 DDE1 01710 POP IX
01713 ;
01716 ; MAIN PROGRAM LOOP
01717 ; TESTS FOR KEYBOARD INPUT
01719 ;
B18B DDE5 01720 MOVE PUSH IX
B18D CDFFB4 01730 CALL NB
B190 DDE1 01740 POP IX
B192 214038 01750 LD HL,3840H
B195 7E 01760 LD A,(HL)
B196 CB5F 01770 BIT 3,A
B198 2017 01780 JR NZ,UP
B19A CB67 01790 BIT 4,A
B19C 2036 01800 JR NZ,DOWN
B19E CB6F 01810 BIT 5,A
B1A0 C22BB3 01820 JP NZ,PRIGHT
B1A3 CB77 01830 BIT 6,A
B1A5 C265B2 01840 JP NZ,PLEFT
B1A8 019411 01850 LD BC,4500
B1AB CD94B3 01860 CALL DLY
B1AE C38BB1 01870 JP MOVE
01873 ;
01876 ; MOVE UP ROUTINE
01879 ;
B1B1 DDE5 01880 UP PUSH IX
B1B3 CD9AB3 01890 CALL EBOXER
B1B6 DDE1 01900 POP IX
B1B8 01C0FF 01910 LD BC,-64
B1BB DD09 01920 ADD IX,BC
B1BD DD7E00 01930 LD A,(IX)

```

```

B1C0 FE83 01940 CP 131
B1C2 2838 01950 JR Z,NUP
B1C4 DDE5 01960 PUSH IX
B1C6 CD51B1 01970 CALL PBOXER
B1C9 DDE1 01980 POP IX
B1CB 01A00F 01990 LD BC,4000
B1CE CD94B3 02000 CALL DLY
B1D1 C38BB1 02010 JP MOVE
02013 ;
02016 ; MOVE DOWN ROUTINE
02019 ; DOWN
B1D4 DDE5 02020 PUSH IX
B1D6 CD9AB3 02030 CALL EBOXER
B1D9 DDE1 02040 POP IX
B1DB 014001 02050 LD BC,320
B1DE DD09 02060 ADD IX,BC
B1E0 DD7E00 02070 LD A,(IX)
B1E3 FEB0 02080 CP 176
B1E5 282A 02090 JR Z,NDOWN
B1E7 0100FF 02100 LD BC,-256
B1EA DD09 02110 ADD IX,BC
B1EC DDE5 02120 PUSH IX
B1EE CD51B1 02130 CALL PBOXER
B1F1 DDE1 02140 POP IX
B1F3 01A00F 02150 LD BC,4000
B1F6 CD94B3 02160 CALL DLY
B1F9 C38BB1 02170 JP MOVE
B1FC 014000 02180 LD BC,64
B1FF DD09 02190 LP5 ADD IX,BC
B201 DDE5 02200 PUSH IX
B203 CD51B1 02210 CALL PBOXER
B206 DDE1 02220 POP IX
B208 01D007 02230 LD BC,2000
B20B CD94B3 02240 CALL DLY
B20E C38BB1 02250 JP MOVE
B211 01C0FE 02260 NDOWN LD BC,-320
B214 C3FFB1 02270 JP LP5
02273 ;
02276 ; PRINT THE ARMS (LEFT)
02279 ;
B217 214BB7 02280 P6 LD HL,ARM6
B21A CDE9B5 02290 CALL PB
B21D 23 02300 INC HL
B21E 013900 02310 LD BC,57
B221 DD09 02320 ADD IX,BC
B223 C321B3 02330 JP FA
B226 215BB7 02340 P7 LD HL,ARM7
B229 CDE9B5 02350 CALL PB
B22C 23 02360 INC HL
B22D 013800 02370 LD BC,56
B230 DD09 02380 ADD IX,BC
B232 C321B3 02390 JP FA
B235 216DB7 02400 P8 LD HL,ARM8
B238 CDE9B5 02410 CALL PB
B23B 23 02420 INC HL
B23C 013700 02430 LD BC,55
B23F DD09 02440 ADD IX,BC
B241 C321B3 02450 JP FA
B244 2181B7 02460 P9 LD HL,ARM9
B247 CDE9B5 02470 CALL PB
B24A 23 02480 INC HL
B24B 013600 02490 LD BC,54
B24E DD09 02500 ADD IX,BC
B250 C321B3 02510 JP FA
B253 219DB7 02520 EA LD HL,BLANK
B256 CDE9B5 02530 CALL PB
B259 013600 02540 LD BC,54
B25C DD09 02550 ADD IX,BC
B25E 219DB7 02560 LD HL,BLANK
B261 CDE9B5 02570 CALL PB
B264 C9 02580 RET
02583 ;
02586 ; LEFT ARM PUNCH ROUTINE
02589 ;
B265 DDE5 02590 PLEFT PUSH IX
B267 01C000 02600 LD BC,192
B26A DD09 02610 ADD IX,BC
B26C DDE5 02620 PUSH IX
B26E DDE5 02630 PUSH IX
B270 DDE5 02640 PUSH IX
B272 DDE5 02650 PUSH IX
B274 DDE5 02660 PUSH IX
B276 DDE5 02670 PUSH IX
B278 DDE5 02680 PUSH IX
B27A DDE5 02690 PUSH IX
B27C DDE5 02700 PUSH IX
B27E DDE5 02710 PUSH IX
B280 DDE5 02720 PUSH IX
B282 CD17B2 02730 CALL P6
B285 DDE1 02740 POP IX
B287 CD26B2 02750 CALL P7
B28A DDE1 02760 POP IX
B28C CD35B2 02770 CALL P8
B28F DDE1 02780 POP IX
B291 CD44B2 02790 CALL P9
B294 1E02 02800 LD E,2
B296 DD7E01 02810 LD A,(IX+1)
B299 FEBF 02820 CP 191
B29B CA47B4 02830 JP Z,HIT1
B29E DD7EC1 02840 LD A,(IX-63)

```

;CHECK FOR HIT

```

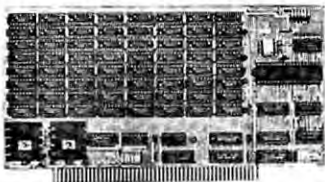
B2A1 FEBF      02850      CP      191
B2A3 CAB2B3   02860      JP      Z,HIT2
B2A6 DDE1     02870      POP     IX
B2A8 CD53B2   02880      CALL   EA
B2AB DDE1     02890      POP     IX
B2AD CD35B2   02900      CALL   P8
B2B0 DDE1     02910      POP     IX
B2B2 CD53B2   02920      CALL   EA
B2B5 DDE1     02930      POP     IX
B2B7 CD26B2   02940      CALL   P7
B2BA DDE1     02950      POP     IX
B2BC CD53B2   02960      CALL   EA
B2BF DDE1     02970      POP     IX
B2C1 CD17B2   02980      CALL   P6
B2C4 DDE1     02990      POP     IX
B2C6 CD53B2   03000      CALL   EA
B2C9 DDE1     03010      POP     IX
B2CB CD70B1   03020      CALL   P5
B2CE DDE1     03030      POP     IX
B2D0 01D007   03040      LD      BC,2000
B2D3 CD94B3   03050      CALL   DLY
B2D6 C38BB1   03060      JP      MOVE
                03063 ;
                03066 ; PRINT ARMS (RIGHT)
                03069 ;
                03070 P0 LD      HL,ARM0
B2DC CDE9B5   03080      CALL   PB
B2DF 23       03090      INC    HL
B2E0 013A00   03100      LD      BC,58
B2E3 DD09     03110      ADD    IX,BC
B2E5 C321B3   03120      JP      FA
B2E8 21F1B6   03130 P1 LD      HL,ARM1
B2EB CDE9B5   03140      CALL   PB
B2EE 23       03150      INC    HL
B2EF 013900   03160      LD      BC,57
B2F2 DD09     03170      ADD    IX,BC
B2F4 C321B3   03180      JP      FA
B2F7 2101B7   03190 P2 LD      HL,ARM2
B2FA CDE9B5   03200      CALL   PB
B2FD 23       03210      INC    HL
B2FE 013800   03220      LD      BC,56
B301 DD09     03230      ADD    IX,BC
B303 C321B3   03240      JP      FA
B306 2113B7   03250 P3 LD      HL,ARM3
B309 CDE9B5   03260      CALL   PB
B30C 23       03270      INC    HL
B30D 013700   03280      LD      BC,55
B310 DD09     03290      ADD    IX,BC
B312 C321B3   03300      JP      FA
B315 2127B7   03310 P4 LD      HL,ARM4
B318 CDE9B5   03320      CALL   PB
B31B 23       03330      INC    HL
B31C 013600   03340      LD      BC,54
B31F DD09     03350      ADD    IX,BC
B321 CDE9B5   03360 FA CALL   PB
B324 01D007   03370      LD      BC,2000
B327 CD94B3   03380      CALL   DLY
B32A C9       03390      RET
                03393 ;
                03396 ; RIGHT ARM PUNCH ROUTINE
                03399 ;
B32B DDE5     03400 PRIGHT PUSH  IX
B32D DDE5     03410      PUSH  IX
B32F DDE5     03420      PUSH  IX
B331 DDE5     03430      PUSH  IX
B333 DDE5     03440      PUSH  IX
B335 DDE5     03450      PUSH  IX
B337 DDE5     03460      PUSH  IX
B339 DDE5     03470      PUSH  IX
B33B DDE5     03480      PUSH  IX
B33D DDE5     03490      PUSH  IX
B33F DDE5     03500      PUSH  IX
B341 DDE5     03510      PUSH  IX
B343 CDE8B2   03520      CALL  P1
    
```

;CHECK FOR HIT

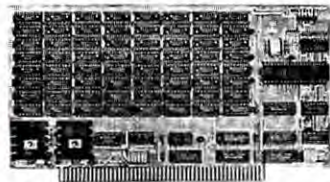
```

B346 DDE1     03530      POP     IX
B348 CDF7B2   03540      CALL   P2
B34B DDE1     03550      POP     IX
B34D CD06B3   03560      CALL   P3
B350 DDE1     03570      POP     IX
B352 CD15B3   03580      CALL   P4
B355 1E01     03590      LD      E,1
B357 DD7E01   03600      LD      A,(IX+1)
B35A FEBF     03610      CP      191 ;CHECK FOR HIT
B35C CA47B4   03620      JP      Z,HIT1
B35F DD7EC1   03630      LD      A,(IX-63)
B362 FEBF     03640      CP      191 ;CHECK FOR HIT
B364 CAB2B3   03650      JP      Z,HIT2
B367 DDE1     03660      POP     IX
B369 CD53B2   03670      CALL   EA
B36C DDE1     03680      POP     IX
B36E CD06B3   03690      CALL   P3
B371 DDE1     03700      POP     IX
B373 CD53B2   03710      CALL   EA
B376 DDE1     03720      POP     IX
B378 CDF7B2   03730      CALL   P2
B37B DDE1     03740      POP     IX
B37D CD53B2   03750      CALL   EA
B380 DDE1     03760      POP     IX
B382 CDE8B2   03770      CALL   P1
B385 DDE1     03780      POP     IX
B387 CD53B2   03790      CALL   EA
B38A DDE1     03800      POP     IX
B38C CDD9B2   03810      CALL   P0
B38F DDE1     03820      POP     IX
B391 C38BB1   03830      JP      MOVE
                03833 ;
                03836 ; DELAY ROUTINE
                03839 ;
B394 0B       03840 DLY DEC    BC
B395 78       03850      LD      A,B
B396 B1       03860      OR      C
B397 20FB     03870      JR      NZ,DLY
B399 C9       03880      RET
                03883 ;
                03886 ; ERASE BOXER ROUTINE
                03889 ;
B39A 010500   03890 EBOXER LD      BC,5
B39D DD2B     03900      DEC    IX
B39F 219DB7   03910 LP6 LD      HL,BLANK
B3A2 CDE9B5   03920      CALL   PB
B3A5 0B       03930      DEC    BC
B3A6 78       03940      LD      A,B
B3A7 B1       03950      OR      C
B3A8 2007     03960      JR      Z,EDONE
B3AA 113600   03970      LD      DE,54
B3AD DD19     03980      ADD    IX,DE
B3AF 18EE     03990      JR      LP6
B3B1 C9       04000 EDONE RET
                04003 ;
                04006 ; ONE OF THE HIT ROUTINES
                04009 ;
B3B2 DDE1     04010 HIT2 POP     IX
B3B4 DDE5     04020      PUSH  IX
B3B6 DD360A80 04030      LD      (IX+10),128
B3BA CD53B2   04040      CALL   EA
B3BD DDE1     04050      POP     IX
B3BF DD360B80 04060      LD      (IX+11),128
B3C3 CB43     04070      BIT    0,E
B3C5 C406B3   04080      CALL   NZ,P3
B3C8 CB4B     04090      BIT    1,E
B3CA C435B2   04100      CALL   NZ,P8
B3CD DDE1     04110      POP     IX
B3CF DD360C80 04120      LD      (IX+12),128
B3D3 CD53B2   04130      CALL   EA
B3D6 DDE1     04140      POP     IX
    
```

Listing 2 continues



Computer Solutions We sell SemiDisk for S-100 IBM Personal Computer TRS-80 Model 2



Computing has entered a new era: The SemiDisk era! No longer are you tied down by the speed of floppies or winchesters. Your computer can operate many times faster with a SemiDisk. And with our self installing software it couldn't be easier. Just plug in and hold on! No kidding! Special pricing: \$1595 for 512K Byte and \$2495 for 1 meg Byte.

Specifications:

- TYPE: Semiconductor Disk Emulator
- CAPACITY: 512k or 1Mb
- POWER REQUIREMENTS: 0.6A (512k) 0.9A (1Mb)
- BATTERY BACKUP: 10-12V Unreg. (optional)

For information contact:

computer Solutions
Robert Pinkham
P.O. Box 931
Hillsboro, OR 97123
(503) 640-5665
DEALERS WELCOME



Computer books and software for the TRS-80s, at your IJG dealer today.

1. *TRS-80 Disk & Other Mysteries* by H. C. Pennington. The "How To" book of data recovery. 128 pages. \$22.50
 2. *Microsoft BASIC Decoded & Other Mysteries* by James Favour. The complete guide to the Level II operating system & BASIC. 312 pages. \$29.95
 3. *BASIC Faster & Better & Other Mysteries* by Lewis Rosenfelder. Microsoft BASIC programming tricks & techniques. 290 pages. Software available on disk. Radio Shack Cat. No. 62-1002. \$29.95
 4. *The Custom TRS-80 & Other Mysteries* by Dennis Bathory Kitsz. A guide to customizing TRS-80 hardware and software. Schematics and listings. 336 pages. \$29.95
 5. *Machine Language Disk I/O & Other Mysteries* by Michael Wagner. The guide to machine language disk software for TRS-80 Models I & III. 288 pages. \$29.95
 6. *TRSDOS 2.3 Decoded & Other Mysteries* by James Favour. The TRSDOS operating system explained. Disassembly of code with commentary. 300 pages. \$29.95
 7. *How To Do It On The TRS-80 & Other Mysteries* by Bill Bardon. The applications guide to the TRS-80 Models I, II, III and Color Computer. 288 pages. \$29.95
 8. *Electric Pencil 2.0z Word Processing System* by Michael Shrayer. Includes operators manual. Available on Disk \$89.95, Stringy Floppy or Cassette \$79.95
 9. *Electric Pencil 2.0z Operators Manual* by Michael Shrayer and H. C. Pennington. 123 pages. \$24.95
 10. *Blue Pencil*. Dictionary - Proofing program for use with Electric Pencil word processing system. Disk only \$89.95
 11. *Red Pencil*. Automatic spelling correction program for use with Electric Pencil word processing system. Disk only. Must be accompanied by Blue Pencil to operate. \$89.95
 12. *BFBLIB - BASIC Faster & Better Library Disk* by Lewis Rosenfelder. 32 demonstration programs, BASIC overlays, video handlers, sorts and more for the Model I & III. Disk only. Radio Shack Cat. No. 260-2021. \$19.95
 13. *BFBDEM - BASIC Faster & Better Demonstration Disk* by Lewis Rosenfelder. 121 functions, subroutines and user routines for the Model I, & III. Disk Only \$19.95
- IJG products are available at computer stores, B. Dalton Booksellers and independent book dealers around the world. BASIC Faster and Better & Other Mysteries, and BFBLIB are available at Radio Shack.
- If IJG products are not available from your local dealer, order direct. Include \$4.00 for shipping and handling. Foreign residents add \$11.00 plus purchase price. Please also enclose the name and address of your local dealer so he may be contacted and made aware of the needs for our products in your area. Prices subject to change without notice. U.S. funds only please.

IJG, Inc. 1953 West 11th Street
Upland, California 91786
Phone: 714/946-5805



Helping You Help Yourself

B3D8 DD3610BF	04150	LD	(IX+16),191	B4E6 1806	05090	JR	PSC
B3DC CB43	04160	BIT	0,E	B4E8 3600	05100	LD	(HL),0
B3DE C4F7B2	04170	CALL	NZ,P2	B4EA 2B	05110	DEC	HL
B3E1 CB4B	04180	BIT	1,E	B4EB 7E	05120	LD	A,(HL)
B3E3 C426B2	04190	CALL	NZ,P7	B4EC 3C	05130	INC	A
B3E6 DDE1	04200	POP	IX	B4ED 77	05140	LD	(HL),A
B3E8 DD3611BF	04210	LD	(IX+17),191		05143 ;		
B3EC CD53B2	04220	CALL	EA		05146 ;	PRINT SCORE ON SCREEN	
B3EF DDE1	04230	POP	IX		05149 ;		
B3F1 DD3612BF	04240	LD	(IX+18),191	B4EE 3AAAB7	05160	PSC	LD A,(SCORE)
B3F5 CB43	04250	BIT	0,E	B4F1 C630	05170	ADD	A,30H
B3F7 C4E8B2	04260	CALL	NZ,P1	B4F3 112C3E	05180	LD	DE,15916
B3FA CB4B	04270	BIT	1,E	B4F6 12	05190	LD	(DE),A
B3FC C417B2	04280	CALL	NZ,P6	B4F7 3AABB7	05210	LD	A,(SCORE+1)
B3FF DDE1	04290	POP	IX	B4FA C630	05220	ADD	A,30H
B401 DD361080	04300	LD	(IX+16),128	B4FC 13	05230	INC	DE
B405 DD3613BF	04310	LD	(IX+19),191	B4FD 12	05240	LD	(DE),A
B409 DD361180	04320	LD	(IX+17),128	B4FE C9	05250	RET	
B40D DD3614BF	04330	LD	(IX+20),191	B4FF 2AADB7	05260	NB	LD HL,(TG) ;CHECK FOR GAME OVER
B411 CD53B2	04340	CALL	EA	B502 2B	05270	DEC	HL
B414 DDE1	04350	POP	IX	B503 22ADB7	05280	LD	(TG),HL
B416 DD361280	04360	LD	(IX+18),128	B506 7C	05290	LD	A,H
B41A DD3615BF	04370	LD	(IX+21),191	B507 B5	05300	OR	L
B41E CB43	04380	BIT	0,E	B508 CA68B5	05310	JP	Z,FIN
B420 C4D9B2	04390	CALL	NZ,P0	B50B 3AACB7	05320	LD	A,(TB) ;CHECK FOR NEW BLOCK
B423 CB4B	04400	BIT	1,E	B50E 3C	05330	INC	A
B425 C470B1	04410	CALL	NZ,P5	B50F 32ACE7	05340	LD	(TB),A
B428 DDE1	04420	POP	IX	B512 FE14	05350	CP	20
B42A DD361380	04430	LD	(IX+19),128	B514 C0	05360	RET	NZ
B42E 01E803	04440	LD	BC,1000	B515 3E00	05370	LD	A,0
B431 CD94B3	04450	CALL	DLY	B517 32ACB7	05380	LD	(TB),A
B434 DD361480	04460	LD	(IX+20),128	B51A 2AA8B7	05390	LD	HL,(RND)
B438 01E803	04470	LD	BC,1000	B51D CD43B5	05400	CALL	MULT
B43B CD94B3	04480	CALL	DLY	B520 DD360080	05410	LD	(IX),128
B43E DD361580	04490	LD	(IX+21),128	B524 DD360180	05420	LD	(IX+1),128
B442 DDE1	04500	POP	IX	B528 DD360280	05430	LD	(IX+2),128
B444 C356B5	04510	JP	EHIT	B52C 2AA8B7	05440	NB	LD HL,(RND)
	04513 ;			B52F 23	05450	INC	HL
	04516 ;	THE OTHER HIT ROUTINE		B530 22A8B7	05460	LD	(RND),HL
	04519 ;			B533 CD43B5	05470	CALL	MULT
B447 DDE1	04520	HITI	POP IX	B536 DD3600BF	05480	LD	(IX),191
B449 DDE5	04530		PUSH IX	B53A DD3601BF	05490	LD	(IX+1),191
B44B DD364A80	04540		LD (IX+74),128	B53E DD3602BF	05500	LD	(IX+2),191
B44F CD53B2	04550		CALL EA	B542 C9	05510	RET	
B452 DDE1	04560		POP IX	B543 7E	05520	MULT	LD A,(HL)
B454 DD364B80	04570		LD (IX+75),128	B544 4/	05530	LD	B,A
B458 CB43	04580		BIT 0,E	B545 114000	05540	LD	DE,64
B45A C406B3	04590		CALL NZ,P3	B548 210000	05550	LD	HL,0
B45D CB4B	04600		BIT 1,E	B54B 19	05560	LP7	ADD HL,DE
B45F C435B2	04610		CALL NZ,P8	B54C 10FD	05570	DJNZ	LP7
B462 DDE1	04620		POP IX	B54E 110E3C	05580	LD	DE,15374
B464 DD364C80	04630		LD (IX+76),128	B551 19	05590	ADD	HL,DE
B468 CD53B2	04640		CALL EA	B552 E5	05600	PUSH	HL
B46B DDE1	04650		POP IX	B553 DDE1	05610	POP	IX
B46D DD3650BF	04660		LD (IX+80),191	B555 C9	05620	RET	
B471 CB43	04670		BIT 0,E	B556 CDDCB4	05630	EHIT	CALL ISCORE
B473 C4F7B2	04680		CALL NZ,P2	B559 21ACB7	05640	LD	HL,TB
B476 CB4B	04690		BIT 1,E	B55C 3600	05650	LD	(HL),0
B478 C426B2	04700		CALL NZ,P7	B55E DDE5	05660	PUSH	IX
B47B DDE1	04710		POP IX	B560 CD2CB5	05670	CALL	NBLOCK
B47D DD3651BF	04720		LD (IX+81),191	B563 DDE1	05680	POP	IX
B481 CD53B2	04730		CALL EA	B565 C38BB1	05690	JP	MOVE
B484 DDE1	04740		POP IX		05693 ;		
B486 DD3652BF	04750		LD (IX+82),191		05696 ;	GAME FINISHED	
B48A CB43	04760		BIT 0,E		05699 ;		
B48C C4E8B2	04770		CALL NZ,P1	B568 E1	05700	FIN	POP HL
B48F CB4B	04780		BIT 1,E	B569 01E8FD	05710	LD	BC,65000
B491 C417B2	04790		CALL NZ,P6	B56C CD94B3	05720	CALL	DLY
B494 DDE1	04800		POP IX	B56F CDC901	05730	CALL	01C9H
B496 DD365080	04810		LD (IX+80),128	B572 3EBF	05740	LD	A,191
B49A DD3653BF	04820		LD (IX+83),191	B574 21003C	05750	LP8	LD HL,15360
B49E DD365180	04830		LD (IX+81),128	B577 11013C	05760	LD	DE,15361
B4A2 DD3654BF	04840		LD (IX+84),191	B57A 010004	05770	LD	BC,1024
B4A6 CD53B2	04850		CALL EA	B57D 77	05780	LD	(HL),A
B4A9 DDE1	04860		POP IX	B57E EDB0	05790	LDIR	
B4AB DD365280	04870		LD (IX+82),128	B580 3D	05800	DEC	A
B4AF DD3655BF	04880		LD (IX+85),191	B581 FE7F	05810	CP	127
B4B3 CB43	04890		BIT 0,E	B583 20EF	05820	JR	NZ,LP8
B4B5 C4D9B2	04900		CALL NZ,P0	B585 CD3EB0	05830	CALL	BOX
B4B8 CB4B	04910		BIT 1,E	B588 21B6B6	05840	LD	HL,YSORE
B4BA C470B1	04920		CALL NZ,P5	B58B 11173E	05850	LD	DE,15895
B4BD DDE1	04930		POP IX	B58E CDE0B5	05860	CALL	PA
B4BF DD365380	04940		LD (IX+83),128	B591 21AAB7	05870	LD	HL,SCORE
B4C3 01E803	04950		LD BC,1000	B594 7E	05880	LD	A,(HL)
B4C6 CD94B3	04960		CALL DLY	B595 C630	05890	ADD	A,30H
B4C9 DD365480	04970		LD (IX+84),128	B597 12	05900	LD	(DE),A
B4CD 01E803	04980		LD BC,1000	B598 23	05910	INC	HL
B4D0 CD94B3	04990		CALL DLY	B599 7E	05920	LD	A,(HL)
B4D3 DD365580	05000		LD (IX+85),128	B59A C630	05930	ADD	A,30H
B4D7 DDE1	05010		POP IX	B59C 13	05940	INC	DE
B4D9 C356B5	05020		JP EHIT	B59D 12	05950	LD	(DE),A
	05023 ;			B59E 13	05960	INC	DE
	05026 ;	INCREASE SCORE		B59F 3E30	05970	LD	A,30H
	05029 ;			B5A1 12	05980	LD	(DE),A
B4DC 21ABB7	05030	ISCORE	LD HL,0B7ABH	B5A2 21C3B6	05990	LD	HL,PLAYA
B4DF 7E	05040		LD A,(HL)	B5A5 11903E	06000	LD	DE,16016
B4E0 3C	05050		INC A	B5AB CDE0B5	06010	CALL	PA
B4E1 77	05060		LD (HL),A	B5AB 210838	06020	LP9	LD HL,3808H
B4E2 FE0A	05070		CP 10	B5AE 7E	06030	LD	A,(HL)
B4E4 2802	05080		JR Z,AS	B5AF CB4F	06040	BIT	1,A

IF YOU'RE GOING TO BE PICKY ABOUT AN OPERATING SYSTEM SEE WHICH WAS PICKED BEST.



The readers of 80 Micro were asked to select their favorite operating system for the TRS-80 Model I&III. LDOS, DOSPLUS, TRSDOS, MULTIDOS, WOBOS I and NEWDOS/80 were all on the ballot. They picked NEWDOS/80.

The editors of 80 Micro have also awarded their Hall of Fame Awards. From among every software package on the market, the editors picked only six that they felt made a lasting and significant contribution to the TRS-80 computer. NEWDOS/80 was one of the six.

Since we first introduced the NEWDOS operating system we've been stating its features, capabilities and advantages. Thank you 80 Micro readers and NEWDOS/80 users for supporting us.

Version 2.0 . . .

High Performance DOS

NEWDOS/80 Version 2.0 is our highest performance system yet. The versatility and sophistication of Version 2.0 includes features like:

- Double density support on the Model I

- Enhanced compatibility between Model I and III
 - Triples directory size
 - Dynamically merge in BASIC (also allows merging of non ASCII format files)
 - Selective variable clearing
 - Can display BASIC listings page by page
 - Automatic repeat function key
 - Routing for peripheral handling
 - Enhanced disassembler
 - Command chaining
 - Superzap to scan files
 - Fast sort function in BASIC
- Hard Disk Support Now Available**
- Support for Appar's and Radio Shack's Model III hard disk (optional-available upon request for additional \$60)

These features make NEWDOS/80 one of the most powerful additions you can make to your system. And Appar's commitment to support assures that you've purchased a superior product, both today and tomorrow. At just \$149.00 it could be the best investment you will make for your TRS-80.

For more information see your local computer store or contact Appar, Inc., 4401 S. Tamarac Parkway, Denver, CO 80237, 303/741-1778.

TRS-80 and TRSDOS are registered trademarks of Tandy Corp., LDOS - Logical Systems, DOSPLUS - Micro Systems Software, MULTIDOS - Cosmopolitan Electronics, WOBOS I - Western Operations, NEWDOS/80 - Appar.

 **Apparat, Inc.**

✓40

B5B1	C2BFB5	06050	JP	NZ,STARTA	B6F0	00	06750	DEFB	0				
B5B4	210238	06060	LD	HL,3802H	B6F1	80	06760	ARM1	DEFB	128			
B5B7	7E	06070	LD	A,(HL)	B6F2	80	06770	DEFB	128				
B5B8	CB77	06080	BIT	6,A	B6F3	80	06780	DEFB	128				
B5BA	C2BFB5	06090	JP	NZ,STARTA	B6F4	80	06790	DEFB	128				
B5BD	18EC	06100	JR	LP9	B6F5	A0	06800	DEFB	160				
B5BF	DD21AAB7	06110	STARTA	LD	IX,SCORE	B6F6	B0	06810	DEFB	176			
B5C3	DD360000	06120	LD	(IX),0	B6F7	90	06820	DEFB	144				
B5C7	DD360100	06130	LD	(IX+1),0	B6F8	00	06830	DEFB	0				
B5CB	DD360213	06140	LD	(IX+2),19	B6F9	9E	06840	DEFB	158				
B5CF	DD360350	06150	LD	(IX+3),80	B6FA	AF	06850	DEFB	175				
B5D3	DD360402	06160	LD	(IX+4),2	B6FB	83	06860	DEFB	131				
B5D7	01E8FD	06170	LD	BC,65000	B6FC	83	06870	DEFB	131				
B5DA	CD94B3	06180	CALL	DLY	B6FD	8B	06880	DEFB	139				
B5DD	C3APB0	06190	JP	START	B6FE	8F	06890	DEFB	143				
B5E0	7E	06200	PA	LD	A,(HL)	B6FF	87	06900	DEFB	135			
B5E1	FE00	06210	CP	0	B700	00	06910	DEFB	0				
B5E3	C8	06220	RET	Z	B701	80	06920	ARM2	DEFB	128			
B5E4	12	06230	LD	(DE),A	B702	80	06930	DEFB	128				
B5E5	23	06240	INC	HL	B703	80	06940	DEFB	128				
B5E6	13	06250	INC	DE	B704	80	06950	DEFB	128				
B5E7	18F7	06260	JR	PA	B705	80	06960	DEFB	128				
B5E9	7E	06270	PB	LD	A,(HL)	B706	A0	06970	DEFB	160			
B5EA	FE00	06280	CP	0	B707	B0	06980	DEFB	176				
B5EC	C8	06290	RET	Z	B708	90	06990	DEFB	144				
B5ED	DD7700	06300	LD	(IX),A	B709	00	07000	DEFB	0				
B5F0	23	06310	INC	HL	B70A	9E	07010	DEFB	158				
B5F1	DD23	06320	INC	IX	B70B	AF	07020	DEFB	175				
B5F3	18F4	06330	JR	PB	B70C	83	07030	DEFB	131				
B5F5	42	06340	INSTR	DEFM	'B O X E R'	B70D	83	07040	DEFB	131			
20	4F	20	58	20	45	20	52	B70E	83	07050	DEFB	131	
B5FE	00	06350	DEFB	0	B70F	8B	07060	DEFB	139				
B5FF	55	06360	INSTR1	DEFM	'USE THE '	B710	8F	07070	DEFB	143			
53	45	20	54	48	45	20	B711	87	07080	DEFB	135		
B607	5B	06370	DEFB	91	B712	00	07090	DEFB	0				
B608	20	06380	DEFM	'ARROW TO MOVE UP'	B713	80	07100	ARM3	DEFB	128			
41	52	52	4F	57	20	54	4F	B714	80	07110	DEFB	128	
20	4D	4F	56	45	20	55	50	B715	80	07120	DEFB	128	
B619	00	06390	DEFB	0	B716	80	07130	DEFB	128				
B61A	55	06400	INSTR2	DEFM	'USE THE '	B717	80	07140	DEFB	128			
53	45	20	54	48	45	20	B718	80	07150	DEFB	128		
B622	5C	06410	DEFB	92	B719	A0	07160	DEFB	160				
B623	20	06420	DEFM	'ARROW TO MOVE DOWN'	B71A	B0	07170	DEFB	176				
41	52	52	4F	57	20	54	4F	B71B	90	07180	DEFB	144	
20	4D	4F	56	45	20	44	4F	B71C	00	07190	DEFB	0	
57	4E	B636	00	06430	DEFB	0	B71D	9C	07200	DEFB	156		
B637	55	06440	INSTR3	DEFM	'USE THE '	B71E	AF	07210	DEFB	175			
53	45	20	54	48	45	20	B71F	83	07220	DEFB	131		
B63F	5D	06450	DEFB	93	B720	83	07230	DEFB	131				
B640	20	06460	DEFM	'ARROW TO SWING WITH THE RIGHT HAND'	B721	83	07240	DEFB	131				
41	52	52	4F	57	20	54	4F	B722	83	07250	DEFB	131	
20	53	57	49	4E	47	20	57	B723	8B	07260	DEFB	139	
49	54	48	20	54	48	45	20	B724	8F	07270	DEFB	143	
52	49	47	48	54	20	48	41	B725	87	07280	DEFB	135	
4E	44	B663	00	06470	DEFB	0	B726	00	07290	DEFB	0		
B664	55	06480	INSTR4	DEFM	'USE THE '	B727	80	07300	ARM4	DEFB	128		
53	45	20	54	48	45	20	B728	80	07310	DEFB	128		
B66C	5E	06490	DEFB	94	B729	80	07320	DEFB	128				
B66D	20	06500	DEFM	'ARROW TO SWING WITH THE LEFT HAND'	B72A	80	07330	DEFB	128				
41	52	52	4F	57	20	54	4F	B72B	80	07340	DEFB	128	
20	53	57	49	4E	47	20	57	B72C	80	07350	DEFB	128	
49	54	48	20	54	48	45	20	B72D	80	07360	DEFB	128	
4C	45	46	54	20	48	41	4E	B72E	A0	07370	DEFB	160	
44	B68F	00	06510	DEFB	0	B72F	B0	07380	DEFB	176			
B690	50	06520	PRESS	DEFM	'PRESS <ENTER> TO START'	B730	90	07390	DEFB	144			
52	45	53	53	20	3C	45	4E	B731	00	07400	DEFB	0	
54	45	52	3E	20	54	4F	20	B732	9C	07410	DEFB	156	
53	54	41	52	54	B733	AF	07420	DEFB	175				
B6A6	00	06530	DEFB	0	B734	83	07430	DEFB	131				
B6A7	3C	06540	ENTER	DEFM	'<ENTER>'	B735	83	07440	DEFB	131			
45	4E	54	45	52	3E	B736	83	07450	DEFB	131			
B6AE	00	06550	DEFB	0	B737	83	07460	DEFB	131				
B6AF	53	06560	SC	DEFM	'SCORE: '	B738	83	07470	DEFB	131			
43	4F	52	45	3A	B739	8B	07480	DEFB	139				
B6B5	00	06570	DEFB	0	B73A	8F	07490	DEFB	143				
B6B6	59	06580	YSCORE	DEFM	'YOUR SCORE : '	B73B	87	07500	DEFB	135			
4F	55	52	20	53	43	4F	52	B73C	00	07510	DEFB	0	
45	20	3A	B6C2	00	06590	DEFB	0	B73D	AD	07520	ARM5	DEFB	173
B6C3	44	06600	PLAYA	DEFM	'DO YOU WISH TO PLAY AGAIN (Y/N)'	B73E	B6	07530	DEFB	182			
4F	20	59	4F	55	20	57	49	B73F	80	07540	DEFB	128	
53	48	20	54	4F	20	50	4C	B740	A0	07550	DEFB	160	
41	59	20	41	47	41	49	4E	B741	B0	07560	DEFB	176	
20	28	59	2F	4E	29	B742	90	07570	DEFB	144			
B6E2	00	06610	DEFB	0	B743	00	07580	DEFB	0				
B6E3	80	06620	ARM0	DEFB	128	B744	80	07590	DEFB	128			
B6E4	B0	06630	DEFB	176	B745	83	07600	DEFB	131				
B6E5	B0	06640	DEFB	176	B746	83	07610	DEFB	131				
B6E6	B8	06650	DEFB	184	B747	8B	07620	DEFB	139				
B6E7	BC	06660	DEFB	188	B748	8F	07630	DEFB	143				
B6E8	B4	06670	DEFB	180	B749	87	07640	DEFB	135				
B6E9	00	06680	DEFB	0	B74A	00	07650	DEFB	0				
B6EA	9E	06690	DEFB	158	B74B	AD	07660	ARM6	DEFB	173			
B6EB	A7	06700	DEFB	167	B74C	BE	07670	DEFB	190				
B6EC	80	06710	DEFB	128	B74D	B0	07680	DEFB	176				
B6ED	82	06720	DEFB	130	B74E	B0	07690	DEFB	176				
B6EE	83	06730	DEFB	131	B74F	B8	07700	DEFB	184				
B6EF	81	06740	DEFB	129	B750	BC	07710	DEFB	188				
					B751	B4	07720	DEFB	180				
					B752	00	07730	DEFB	0				
					B753	80	07740	DEFB	128				

B754 80	07750	DEFB	128
B755 80	07760	DEFB	128
B756 80	07770	DEFB	128
B757 82	07780	DEFB	130
B758 83	07790	DEFB	131
B759 81	07800	DEFB	129
B75A 00	07810	DEFB	0
B75B AD	07820	DEFB	173
B75C BE	07830	DEFB	190
B75D B0	07840	DEFB	176
B75E B0	07850	DEFB	176
B75F B0	07860	DEFB	176
B760 B8	07870	DEFB	184
B761 BC	07880	DEFB	188
B762 B4	07890	DEFB	180
B763 00	07900	DEFB	0
B764 80	07910	DEFB	128
B765 80	07920	DEFB	128
B766 80	07930	DEFB	128
B767 80	07940	DEFB	128
B768 80	07950	DEFB	128
B769 82	07960	DEFB	130
B76A 83	07970	DEFB	131
B76B 81	07980	DEFB	129
B76C 00	07990	DEFB	0
B76D 8D	08000	DEFB	141
B76E BE	08010	DEFB	190
B76F B0	08020	DEFB	176
B770 B0	08030	DEFB	176
B771 B0	08040	DEFB	176
B772 B0	08050	DEFB	176
B773 B8	08060	DEFB	184
B774 BC	08070	DEFB	188
B775 B4	08080	DEFB	180
B776 00	08090	DEFB	0
B777 80	08100	DEFB	128
B778 80	08110	DEFB	128
B779 80	08120	DEFB	128
B77A 80	08130	DEFB	128
B77B 80	08140	DEFB	128
B77C 80	08150	DEFB	128
B77D 82	08160	DEFB	130
B77E 83	08170	DEFB	131
B77F 81	08180	DEFB	129
B780 00	08190	DEFB	0
B781 8D	08200	DEFB	141
B782 BE	08210	DEFB	190
B783 B0	08220	DEFB	176
B784 B0	08230	DEFB	176
B785 B0	08240	DEFB	176
B786 B0	08250	DEFB	176
B787 B0	08260	DEFB	176
B788 B8	08270	DEFB	184
B789 BC	08280	DEFB	188
B78A B4	08290	DEFB	180
B78B 00	08300	DEFB	0
B78C 80	08310	DEFB	128
B78D 80	08320	DEFB	128
B78E 80	08330	DEFB	128
B78F 80	08340	DEFB	128
B790 80	08350	DEFB	128
B791 80	08360	DEFB	128
B792 80	08370	DEFB	128
B793 82	08380	DEFB	130
B794 83	08390	DEFB	131
B795 81	08400	DEFB	129
B796 00	08410	DEFB	0
B797 AA	08420	DEFB	170
B798 80	08430	DEFB	128
B799 91	08440	DEFB	145
B79A 9D	08450	DEFB	157
B79B 84	08460	DEFB	132
B79C 00	08470	DEFB	0
B79D 80	08480	DEFB	128
B79E 80	08490	DEFB	128
B79F 80	08500	DEFB	128
B7A0 80	08510	DEFB	128
B7A1 80	08520	DEFB	128
B7A2 80	08530	DEFB	128
B7A3 80	08540	DEFB	128
B7A4 80	08550	DEFB	128
B7A5 80	08560	DEFB	128
B7A6 80	08570	DEFB	128
B7A7 00	08580	DEFB	0
B7A8 00	08590	RND	0
B7A9 A0	08600	DEFB	0A0H
B7AA 00	08610	SCORE	0
B7AB 00	08620	DEFB	0
B7AC 13	08630	TB	19
B7AD 50	08640	TG	80
B7AE 02	08650	DEFB	2
B000	08660	END	0B000H

10 FORK=-24576TO-20479:POKEX,RND(14):NEXT

Program Listing 3

PRICE BREAKTHRU— BULL! IT'S A MIRACLE!!

TRS-80 Mod I and III hardware		83A	\$749.00
16K RAM upgrade	\$13.50	Okigraph	\$65.00
External Disk Drives inc. p.s. & enclosure**		NEC—7710 RS232	
40tk 1 side	\$215.00	55 CPS	\$2495.00
40tk 2 sides	\$295.00	NEC—7730 parallel	\$2495.00
80tk 2 sides	\$425.00	NEC—7720 KSR	\$2895.00
Signal extender cable for ext. drive	\$12.50	Vertical Tractors	\$229.00
2 drive expansion cable (Mod I or III)	\$20.00	BiDirectional Tractors	\$325.00
4 drive expansion cable (Mod I)	\$25.00	Sheet Feeder	\$1175.00
Bare Drives—		Twin Feeder	\$1595.00
40tk 1 side	\$180.00	Smith Corona—TP1 pitch	
40tk 2 sides	\$245.00	10/12 pitch—Serial/parallel interface	
Drive Service Manuals	\$25.00	Super Deal	\$595.00
Single drive p.s. & enclosure	\$49.95	Standard Cable	\$25.00
Hard Disk (Winchester) for Mod I, LNW—Includes DOSPLUS 4.0		Tabletop Printer stand—12" (holds up to 50 lbs.)	\$17.95
6.3 meg	\$1649.00	Tabletop Printer stand—16" (holds up to 50 lbs.)	\$24.95
9.6 meg	\$1849.00	Diskettes—10 per box	
19 meg	\$2449.00	Verbatim—	
2 x 6.3 meg	\$2449.00	5 1/4" SSDD	\$23.95
2 x 9.6 meg	\$2849.00	5 1/4" DSDD	\$39.95
2 x 19 meg	\$3949.00	Maxell—5 1/4"	\$34.95
Hard Disk 6.3 + 40tk floppy combination	\$1995.00	Elephant by Leading Edge	\$22.95
Percom Doubler—	\$149.00	Disk head cleaners—	
Data Separator—	\$27.00	VR Data (5 1/4")	\$14.95
TRS-80 Mod III		Verbatim 5 1/4" or 8"	\$29.95
16K L III Basic	\$899.00	5 1/4" plastic library case	
16K upgrade	\$13.50	8" plastic library case	
48K—1 disk	\$1349.00	Paper & Labels	
48K—2 disk	\$1549.00	9 1/2 x 11 Fanfold—	
2 sided disk upgrade	\$70.00 ea	2700 ct.	\$27.50
VR RS232C—upgrade	\$70.00	14 1/2 x 11 Fanfold—2700 ct.	\$35.00
Direct Connect 300 baud modem upgrade	\$275.00	3 1/2 x 1 1/8 labels—5M	\$15.00
Hard Disk for Mod III—IBM-PC		Monems	
6.3 meg	\$1599.00	Hayes	
9.6 meg	\$1799.00	Smartmodem	\$229.00
19.0 meg	\$2399.00	Micromodem II	\$278.00
2 x 6.3	\$2399.00	Micromodem 100	\$305.00
2 x 9.6	\$2799.00	Novation	
2 x 19.0	\$3899.00	Auto cat	\$229.00
Coming Soon—Internal Hard Disk for Mod III		D Cat	\$165.00
Floppy Disk III kits for Mod III include p.s. controller & cables		Cat	\$155.00
40tk—1 side	\$440.00	4202B—1200 baud half duplex	\$475.00
40tk—2 side	\$510.00	Apple Cat II	\$339.00
2nd—40tk 1 side	\$190.00	Lexicon	
2nd—40tk 2 side	\$250.00	Lex—II	\$124.00
**We use VR Data hardware upgrades exclusively. They are the best around!.		Monitors—	
Printers—		BMC 12" Mean Green	\$89.00
C.Itoh F-10 40CPS letter quality	\$1399.00	BMC 13" Composite Color	\$325.00
C.Itoh F-10 55CPS letter quality	\$1699.00	Mod I/III software*	
C.Itoh tractor for F10-40	\$200.00	DOSPLUS 3.4 Mod I	\$87.50
F10-55	\$225.00	DOSPLUS 3.4 Mod III	\$87.50
Ribbons for above printers	\$4.50 ea	LDOS 5.1 Mod I, III	\$117.50
Sheet feeder	\$1300.00	Micro Term (Best yet)	\$75.00
C.Itoh Pro-writer		Super utility (Best yet)	\$45.00
parallel	\$475.00	Terms—COD or Prepaid Only	
serial	\$575.00	F.O.B. Shipping Point	
Okidata 80	\$375.00	(215) 461-5437	
82A	\$479.00	Prices Subject to Change Without Notice.	

TRS-80 Trademark of Tandy Corp.

DISK SUPPLY CO.

**Suite 439
111 S. Olive St.
Media, PA 19063**

32 FLAVORS IN LOW COST COMPUTERS



CP/M 64K

The Mod III Plus CX 140 system is an exciting new personal and small business computer that is both CPM & TRS-DOS compatible.

- 80 x 24 Display for CP/M
- 64K Bytes RAM Memory
- Microsoft BASIC language in ROM
- Internal Z80 ROM Diagnostic
- Z80 processor, 2MHz
- 4MHz speed up option
- 64 x 16 screen-TRS-DOS-,DOS+
- Cooling system
- Parallel printer interface included
- Anti-glare screen
- Cassette interface
- 2 Internal 40tk Disk Drives
- Compatible with TRS-80® Model III —RS-232 serial interface option.

CPM applications software such as Wordstar, Datastar and Mailmerge launch this computer system into the small business and word processing marketplace. Includes DOS PLUS 3.3 operating system.

\$2699

Optional CP/M2.2 Operating System Available

MOD III PLUS 140

Computer consists of 48K bytes memory and a double density, dual disk drive system. The system is fully compatible with the Radio Shack® DOS and peripherals. Get 178,000 bytes of memory storage per disk.

**PRICE TOO
LOW TO PRINT
&
INCLUDES
DOS PLUS 3.3**

MOD III PLUS 240/280

Double or Quadruple your storage capacity to 700 or 1.4 megabytes. These machines have all of the features of the MOD III PLUS 140 and expanded storage. The 240 has double headed 40 track drives, while the MOD III PLUS 280 has double headed 80 track drives.

PRICES FROM \$1899

MOD III PLUS B/140

Especially designed for Business applications. Same as Model 140 and includes anti-glare screen, speed-up enhancement, RS-232 interface cooling unit and more. Also includes FREE business software package.

WORD PROCESSING

We are also offering a discount certificate entitling the purchaser to NEW SCRIPT by Pro Soft

FREE SOFTWARE ACCOUNTING PACKAGE

- | | | |
|-----------------------|--|----------------------|
| • ACCOUNTS RECEIVABLE | • INVENTORY/SALES | • GAMES |
| • ACCOUNTS PAYABLE | • ANALYSIS | • EDUCATION SOFTWARE |
| • GENERAL LEDGER | • PAYROLL | • DOS PLUS 3.3 |
| | • INCLUDING AUDIO SELF-LEARNING CASSETTE | |

WINCHESTER HARD DISK

Our desk top business computer system, with approximately 5.7 megabytes of on line storage. The system includes a 5 megabyte Winchester hard disk drive for ultra-fast business requirements. An 80 track dual head disk drive is used for backup and for conventional floppy disk operation.

\$4399

32 FLAVORS IN ADD-ONS AND KITS

MTI DOES IT. Our CP/M 64K turns your TRS-80 Model III into two computer systems, with memory upgrade to 64K and an 80" x 24" column video card, you will convert your computer to a CP/M base machine.

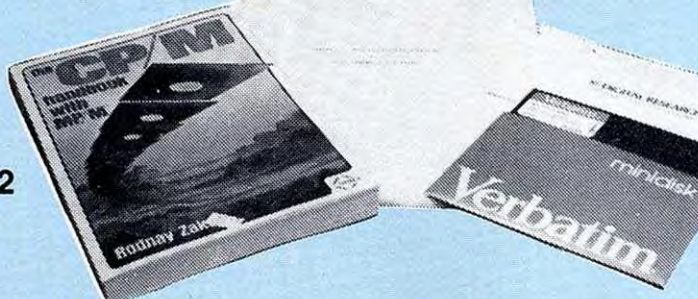
LIKE THE BIG BOYS. That means you can access the single largest body of microcomputer software used by companies like Xerox, Osborne, Eagle, Apple, Cromenco etc. What is better, is that you can switch back forth between TRS-DOS and CP/M modes, and our own Z-80 diagnostic monitor.

SIMPLE INSTALLATION. The CP/M 64K system plugs directly into the TRS-80 CPU board. You are ready to go!

HUNDREDS OF APPLICATIONS. You have available literally hundreds of programs written for many mini and micro computers under CP/M operating system.

CP/M-64K

\$579



CP/M 2.2

\$119

Optional CP/M 2.2 Operating System Available

ADD-ON WINCHESTERS



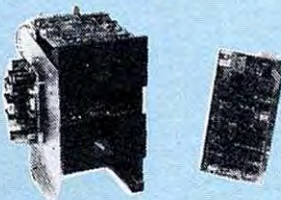
Add 5., 7.5, or 11. megabyte hard disk drive to any Model III. The complete self contained unit includes a Winchester drive, controller, power supply cooling system and cables in an attractive enclosure.

From \$1899

INTERNAL DISK DRIVE KITS

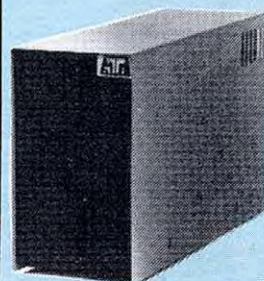
\$459

INCLUDES
DOS PLUS
OPERATING
SYSTEM
\$100 VALUE



A new low cost internal disk kit is available to expand your storage capability. With this kit, you may expand your 16K TRS-80® Mod III computer. Includes: 1-MTI 40 track, double density disk drive, power supply, controller, cables and DOS PLUS operating system.

EXTERNAL DISK DRIVES



Add-on disk drives for the Model I and III are available in 40 and 80 track, single and double head configurations. Contact MTI or a local authorized dealer.

From \$289

Fairbanks, AK	(907) 456-2281
Anniston, AL	(205) 236-6396
Mesa, AZ	(602) 833-8949
Phoenix, AZ	(602) 241-1865
Phoenix, AZ	(602) 866-3233
Tempe, AZ	(602) 831-5376
Anaheim, CA	(714) 773-0240
Burbank, CA	(213) 841-4210
Camarillo, CA	(805) 987-1633
Covina, CA	(213) 332-4088
Goleta, CA	(805) 967-7628
Lancaster, CA	(805) 948-9807
Mission Viejo, CA	(714) 495-3782
Montclair, CA	(714) 626-4813
Orange, CA	(714) 771-0880
Placerville, CA	(916) 622-4640
San Diego, CA	(714) 275-4243
San Jose, CA	(408) 946-1265
Santa Monica, CA	(213) 393-5785
Studio City, CA	(213) 763-3425
Walnut, CA	(714) 594-9760
Groton, CT	(203) 445-5166
Washington, DC	(202) 363-9797
Wilmington, DE	(302) 762-0227
Mary Esther, FL	(904) 243-5793
Panama City, FL	(904) 769-8093
Tampa, FL	(813) 961-5269
West Palm Beach, FL	(305) 689-1200
Norcross, GA	(404) 449-8982
Tifton, GA	(912) 386-8367
Bettendorf, IA	(319) 355-2641
Buckingham, IA	(319) 478-2826
Sioux City, IA	(712) 255-8892
Belleville, IL	(618) 277-2354
Collinsville, IL	(618) 345-5068
Decatur, IL	(217) 429-8510

OVER 100 AUTHORIZED SALES AND SERVICE CENTERS CALL 714-979-9923 for the center nearest you



MICROCOMPUTER TECHNOLOGY, INC.
3304 W. MACARTHUR, SANTA ANA, CA 92704
(714) 979-9923

U.S. PRICES F.O.B. SANTA ANA
CALIFORNIA AND MAY VARY BY AREA
CP/M is a registered trademark of Digital Research Inc.
TRS-80® is a registered trademark of Tandy Corp.
M.T.I. is a registered trademark of Microcomputer Technology, INC.

Mundelein, IL	(312) 362-3440
Shreveport, LA	(318) 865-7189
West Monroe, LA	(318) 322-6479
Hopkinton, MA	(617) 435-4457
Springfield, MA	(413) 737-4562
Baltimore, MD	(301) 944-0200
Beltsville, MD	(301) 953-9600
Towson, MD	(301) 337-3808
Anoka, MN	(612) 427-5783
Minneapolis, MN	(612) 869-3245
Cameron, MO	(816) 632-6528
Columbia, MO	(314) 874-3216
Marshall, MO	(816) 886-6823
Slater, MO	(816) 529-3444
St. Louis, MO	(314) 241-7393
Bozeman, MT	(406) 586-0511
Missoula, MT	(406) 549-9715
Raleigh, NC	(919) 755-1175
Fargo, ND	(701) 280-0580
Paramus, NJ	(201) 342-2284
West Milford, NJ	(201) 728-8080

Las Vegas, NV	(702) 870-4138
Jericho, NY	(516) 333-2266
Lake Grove, NY	(516) 724-4490
Rome, NY	(315) 336-0266
Syracuse, NY	(315) 474-1442
Troy, NY	(518) 273-8411
Utica, NY	(315) 446-1028
White Plains, NY	(914) 761-9283
Mayfield Height, OH	(216) 449-4030
Toledo, OH	(419) 535-5897
Portland, OR	(503) 281-7640
Salem, OR	(503) 581-8056
N. Charleston, SC	(803) 747-5773
Lubbock, TX	(806) 763-5100
Longview, TX	(214) 759-2922
Missouri City, TX	(713) 499-5241
San Angelo, TX	(915) 658-3573
Falls Church, VA	(703) 536-5040
Reston, VA	(703) 471-0305
Anacortes, WA	(206) 293-5154
Bellingham, WA	(206) 647-1814
Spokane, WA	(509) 624-3203
Cheyenne, WY	(307) 632-9132

FOREIGN DEALERS

Argentina	(54) 132-1858
Australia	657-8023
Belgium	1663-2452
Burnaby, Canada	(604) 522-9877
Ottawa, Canada	(613) 741-7937
Helsinki, Finland	9064-4116
France	(341) 773-5493
Holm, Germany	4103-7393
Tel Aviv, Israel	325-8535
Capetown, S. Africa	2145-1047
Papeete, Tahiti	2-5447
Bangkok, Thailand	314-1161

YOU CAN GET MUCH MORE... FROM YOUR SYSTEM

With the MDX SERIES EXPANSION SYSTEMS

for the TRS 80* Model I & III.

MICRO-DESIGN'S Full Line of expansion systems for the TRS 80* offer top quality design, superb craftsmanship and compatibility with all Model I & III hardware and software... AND IT'S AFFORDABLE!!!

MDX-2

Model I expansion system with PHONE MODEM, DISK CONTROLLER, EPROM, 32K Memory and much MORE.

\$74⁹⁵
BARE BOARD &
USERS MANUAL

\$469⁹⁵
Fully Assembled
System with case

MDX-5

FOR THE Model III User who already has floppy disk this is the PHONE MODEM & SERIAL PORT for you!!

\$49⁹⁵
BARE BOARD &
USERS MANUAL

\$159⁹⁵
Fully Assembled
MDX-5 SYSTEM

MDX-3

Model III expansion system featuring the MDX FLOPPY DISK CONTROLLER, DIRECT CONNECT PHONE MODEM, & SOFTWARE PROGRAMMABLE SERIAL PORT. Full Model III Compatibility.

\$74⁹⁵
BARE BOARD &
USERS MANUAL

\$299⁹⁵
Fully Assembled
MDX-3 System

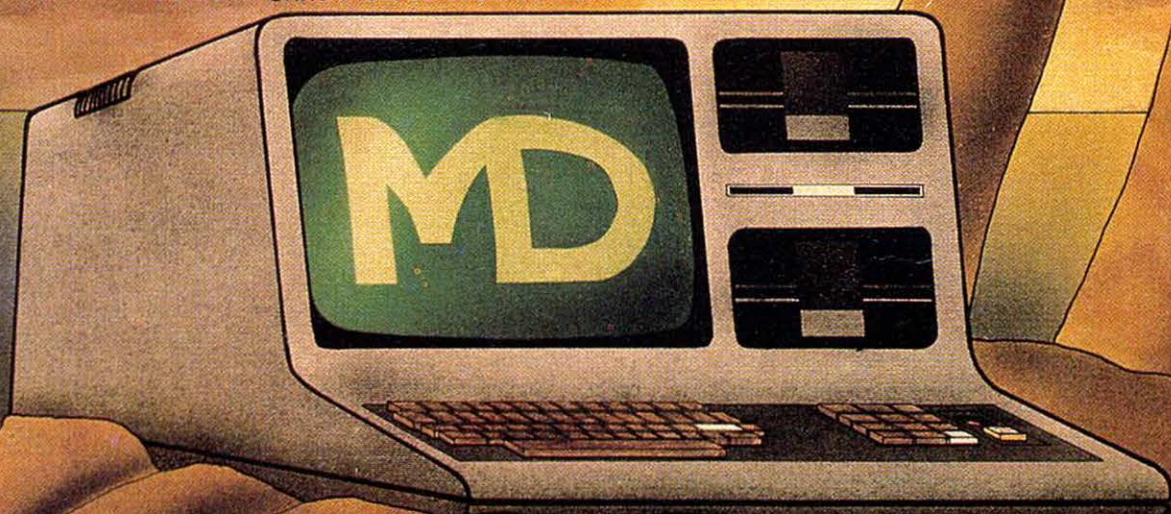
MDX-6

MICRO-DESIGNS STAND ALONE FLOPPY DISK CONTROLLER BOARD for your Model III.

\$49⁹⁵
BARE BOARD &
USERS MANUAL

\$129⁹⁵
Fully Assembled
MDX-6 SYSTEM

You may choose from fully assembled units that offer immediate, inexpensive expansion of your TRS 80* system or bare circuit boards that you may assemble, for even greater savings. ALL MDX units include users manual.



FOR FURTHER INFORMATION CALL (TOLL FREE)
OR WRITE FOR FREE LITERATURE

MICRO-DESIGN

6301 MANCHACA ROAD, SUITE J. AUSTIN TEXAS, 78745

1-800-531-5002

TEXAS RES. CALL 512 441 7890

Foreign Flag Quiz

by Jennifer Neidenbach
Third Place
11-13

This program prints the flags of 10 different countries. The player tries to guess the country to which the printed flag belongs. If the answer is correct, the program continues with the next flag. If the player guesses incorrectly, the program gives the correct answer.

Line Functions

Lines 5-10 hold remark statements. Lines 15-75 are instructions.

Line 80 begins the quiz. Lines 85-100 hold flag 1, Poland. Lines 110-135 hold flag 2, Switzerland. Lines 145-185 hold flag 3, Greece. Lines 190-255 hold flag 4, Jamaica. Lines 260-275 hold flag 5, Thailand. Lines 280-300 hold flag 6, Japan. Lines 305-415 hold flag 7, Great Britain. Lines 420-455 hold flag 8, Czechoslovakia. Lines 480-515 hold flag 10, Kuwait.

Line 9999 directs the program to the goodbye routine. Lines 10000-10020 hold a subroutine to outline the flag and print question.

Lines 11000-11105 hold a subroutine to ask question and check the player's answer. Lines 11200-11240 hold the goodbye routine, and Line 11245 is the end. ■

The Key Box

**Model I or III
16K, 32K RAM
Cassette or Disk Basic**

Jennifer Neidenbach (age 13) can be reached at 3057 Shawnee Lane, Drayton Plains, MI 48020.

Program Listing

```

5 'FOREIGN FLAG QUIZ
10 'INTRODUCTION
15 CLS:PRINT:PRINT:PRINT:PRINT
20 PRINTTAB(20)"FOREIGN FLAG QUIZ"
25 PRINTTAB(14)"WRITTEN BY JENNIFER NEIDENBACH"
30 PRINT:PRINT:PRINT:PRINTTAB(14)"PRESS <ENTER> FOR INSTRUCTIONS";:INPUT Z
35 CLS
40 'INSTRUCTIONS
45 CLS
50 PRINTTAB(13)" THIS IS THE 'FOREIGN FLAG QUIZ'."
55 PRINTTAB(12)" I WILL PRINT THE FLAGS OF TEN DIFFERENT"
60 PRINTTAB(12)" COUNTRIES, AND YOU TYPE IN THE COUNTRY"
65 PRINTTAB(13)"THAT FLAG BELONGS TO.":PRINT
70 PRINTTAB(13)" PRESS ANY KEY TO BEGIN."
75 I$=INKEY$:IF I$="" THEN GOTO 75
80 'BEGINNING OF QUIZ
85 'FLAG ONE -- POLAND
90 CLS:GOSUB 10000
95 FOR I=14 TO 49:PRINT@I+320,CHR$(191);:PRINT@I+384,CHR$(191);:PRINT@I+448,CHR$(191);:NEXT I
100 C$="POLAND":GOSUB 11000
110 'FLAG TWO -- SWITZERLAND
115 CLS:PRINT@653,"WHAT COUNTRY DOES THIS FLAG BELONG TO?"
120 FOR I=14 TO 49:PRINT@I+128,CHR$(191);:PRINT@I+192,CHR$(191);:PRINT@I+256,CHR$(191);:PRINT@I+320,CHR$(191);:PRINT@I+384,CHR$(191);:PRINT@448+I,CHR$(19);:NEXT I
125 FOR I=52 TO 69:RESET(I,13):RESET(I,14):RESET(I,15):NEXT I
130 FOR I=58 TO 63:RESET(I,10):RESET(I,11):RESET(I,12):RESET(I,16):RESET(I,17):RESET(I,18):NEXT I
135 C$="SWITZERLAND":GOSUB 11000
145 'FLAG THREE -- GREECE
150 CLS:GOSUB 10000
155 FOR I=15 TO 18:PRINT@I+128,CHR$(191);:NEXT I
160 FOR I=21 TO 24:PRINT@I+128,CHR$(191);:NEXT I
165 FOR I=30 TO 37:SET(I,9):SET(I,12):SET(I,13):SET(I,14):SET(I,15):NEXT I
170 FOR I=42 TO 49:SET(I,9):SET(I,12):SET(I,13):SET(I,14):SET(I,15):NEXT I
175 FOR I=50 TO 97:SET(I,7):SET(I,10):SET(I,11):SET(I,14):SET(I,15):NEXT I
180 FOR I=30 TO 97:SET(I,18):SET(I,19):SET(I,22):NEXT I
185 C$="GREECE":GOSUB 11000
190 'FLAG FOUR -- JAMAICA
191 CLS:GOSUB 10000
192 PRINT@147,CHR$(140);:PRINT@148,CHR$(140);:PRINT@170,CHR$(140);:PRINT@171,CHR$(140);:PRINT@149,CHR$(176);:PRINT@150,CHR$(176);:PRINT@168,CHR$(176);:PRINT@169,CHR$(176);:PRINT@230,CHR$(131);:PRINT@231,CHR$(131);:PRINT@217,CHR$(140);:PRINT@218,CHR$(140);:PRINT@228,CHR$(140);:PRINT@229,CHR$(140);:PRINT@215,CHR$(131);:PRINT@216,CHR$(131);:PRINT@209,CHR$(176);:PRINT@219,CHR$(176);:PRINT@220,CHR$(176);:PRINT@227,CHR$(176);:PRINT@226,CHR$(176);:PRINT@285,CHR$(131);:PRINT@286,CHR$(131);:PRINT@287,CHR$(140);:PRINT@288,CHR$(140);:PRINT@289,CHR$(131);

```

Listing continues

W..I..D..E REPORT SUPPORT
MOD II/16 and DAISY WHEEL II

Print 15 and 20 Characters/inch

D L P Company
6798 Wetheridge Dr.
Cincinnati, Ohio 45230
513 232-7791 ✓413
VISA OR MASTERCARD ACCEPTED

\$75.00

260 characters in just 13" at 20
CPI; 170 in 7". Excellent qua-
lity 15 CPI printing; 195 Char.
in 13"; 120 in 8". SCRIPSIT™ 2.0
TRSDOS™ 2.0/4.1, VISICALC®, PRO-
FILE™, BASIC, COBOL, etc.

COLOR COMPUTER

PROGRAMMABLE

SOUND MODULE

AT LAST — the COLOR COMPUTER's
audio capabilities even SURPASS its
great graphics! If you can program in
BASIC — plug in the PSM cartridge
and start to create life-like explosions,
engines, animals, wind, water and other
sounds limited only by your imagination.
Complex sound effects are continuously
maintained independently of your
program. The PSM is a power-packed
hardware/software combination and 100%
compatible with ALL models of the
Color Computer.

PSM + complete instructions...\$98.95
Available from:

MAPLE LEAF SYSTEMS
P.O. BOX 2190, STATION C, Downsview
Ontario, CANADA M2N 2S9 ✓92

SEND AND RECEIVE MORSE CODE

- SEND UP TO 40 WPM
- COPY OVER 100 WPM

Your Model I or III becomes a pro-
grammable keyboard keyer that can
send morse from the keyboard or
from stored messages. Keying is done
either by the relay or by the audio
output. Received morse is decoded,
displayed, stored and printed. The
cassette earphone plug connects to
the receiver speaker to copy off the
air. No hardware except patch cords
is required for many setups.

satisfaction guaranteed

Cassette with instruction booklet
only \$19.95 postpaid. Model I or III,
LEVEL II, with at least 16k required.

ROGO Computer Products
4752 DeBeers Drive
El Paso, Texas 79924 ✓343

Listing continued

```
197 FOR I=31 TO 33:PRINT@I+320,CHR$(176)::NEXT I
200 PRINT@413,CHR$(131)::PRINT@414,CHR$(131)::PRINT@418,CHR$(131)
);:PRINT@419,CHR$(131)::PRINT@431,CHR$(140)::PRINT@432,CHR$(140)
;
203 PRINT@218,CHR$(176)::PRINT@219,CHR$(140)::PRINT@409,CHR$(176)
);:PRINT@410,CHR$(176)::PRINT@422,CHR$(176)::PRINT@423,CHR$(176)
;
206 PRINT@471,CHR$(131)::PRINT@472,CHR$(131)::PRINT@488,CHR$(131)
);:PRINT@489,CHR$(131)::PRINT@469,CHR$(140)::PRINT@470,CHR$(140)
;
209 PRINT@491,CHR$(140)::PRINT@411,CHR$(140)::PRINT@412,CHR$(140)
);:PRINT@490,CHR$(140)::PRINT@420,CHR$(140)::PRINT@421,CHR$(140)
;
212 FOR I=15 TO 20:PRINT@256+I,CHR$(191)::PRINT@320+I,CHR$(191)
;:NEXT I
214 FOR I=15 TO 17:PRINT@I+384,CHR$(191)::NEXT I
216 FOR I=21 TO 23:PRINT@I+320,CHR$(191)::NEXT I
218 PRINT@402,CHR$(143)::PRINT@403,CHR$(143)::PRINT@463,CHR$(131)
);:PRINT@404,CHR$(131)::PRINT@405,CHR$(131)::PRINT@207,CHR$(188)
);:PRINT@208,CHR$(188)::PRINT@210,CHR$(176);
220 PRINT@277,CHR$(188)::PRINT@278,CHR$(188)::PRINT@279,CHR$(176)
);:PRINT@280,CHR$(176)::PRINT@344,CHR$(143)::PRINT@345,CHR$(143)
;
225 FOR I=41 TO 48:PRINT@256+I,CHR$(191)::PRINT@320+I,CHR$(191)
;:NEXT I
230 FOR I=37 TO 38:PRINT@256+I,CHR$(176)::PRINT@320+I,CHR$(131)
;:NEXT I
235 FOR I=39 TO 40:PRINT@256+I,CHR$(188)::PRINT@320+I,CHR$(143)
;:NEXT I
240 FOR I=43 TO 44:PRINT@I+192,CHR$(176)::PRINT@384+I,CHR$(131)
;:NEXT I
245 FOR I=45 TO 46:PRINT@192+I,CHR$(188)::PRINT@384+I,CHR$(143)
;:NEXT I
247 PRINT@218,CHR$(140)::PRINT@219,CHR$(176);
250 FOR I=47 TO 48:PRINT@192+I,CHR$(191)::PRINT@384+I,CHR$(191)
;:NEXT I
251 GOSUB 10000
255 C$="JAMAICA":GOSUB 11000
260 'FLAG FIVE -- THAILAND
265 CLS:GOSUB 10000
270 FOR I=14 TO 49:PRINT@128+I,CHR$(191)::PRINT@256+I,CHR$(191)
;:PRINT@320+I,CHR$(191)::PRINT@448+I,CHR$(191)::NEXT I
275 C$="THAILAND":GOSUB 11000
280 'FLAG SIX -- JAPAN
285 CLS:GOSUB 10000
290 FOR I=30 TO 33:PRINT@I+256,CHR$(191)::PRINT@I+320,CHR$(191)
;:NEXT I
295 PRINT@284,CHR$(160)::PRINT@348,CHR$(130)::PRINT@285,CHR$(188)
);:PRINT@349,CHR$(143)::PRINT@290,CHR$(188)::PRINT@354,CHR$(143)
);:PRINT@291,CHR$(144)::PRINT@355,CHR$(129);
300 C$="JAPAN":GOSUB 11000
305 'FLAG SEVEN -- GREAT BRITAIN
310 CLS:GOSUB 10000
315 FOR I=15 TO 49:PRINT@128+I,CHR$(191)::PRINT@192+I,CHR$(191)
;:PRINT@I+256,CHR$(191)::PRINT@I+320,CHR$(191)::PRINT@384+I,CHR$(191)
);:PRINT@448+I,CHR$(191)::NEXT I
320 FOR I=30 TO 61:RESET(I,13):RESET(I,15):NEXT I:FOR I=66 TO 97
:RESET(I,13):RESET(I,15):NEXT I
325 FOR I=7 TO 12:RESET(60,I):RESET(61,I):RESET(67,I):RESET(66,I)
);:NEXT I
327 FOR I=16 TO 22:RESET(60,I):RESET(61,I):RESET(66,I):RESET(67,
I):NEXT I
330 FOR I=34 TO 39:RESET(I,7):NEXT I:FOR I=38 TO 44:RESET(I,8):N
EXT I:FOR I=30 TO 33:RESET(I,8):NEXT I:FOR I=33 TO 37:RESET(I,9)
;:NEXT I:FOR I=44 TO 51:RESET(I,9):NEXT I
335 FOR I=37 TO 43:RESET(I,10):NEXT I:FOR I=50 TO 57:RESET(I,10)
;:NEXT I:FOR I=43 TO 49:RESET(I,11):NEXT I:FOR I=46 TO 48:RESET(I
,11):NEXT I
340 RESET(70,11):RESET(71,11):FOR I=71 TO 77:RESET(I,10):NEXT I:
FOR I=78 TO 84:RESET(I,11):NEXT I:FOR I=84 TO 90:RESET(I,10):NEX
T I:FOR I=77 TO 83:RESET(I,9):NEXT I
345 FOR I=90 TO 96:RESET(I,9):NEXT I:FOR I=83 TO 89:RESET(I,8):N
EXT I:RESET(96,8):RESET(97,8):FOR I=89 TO 93:RESET(I,7):NEXT I
347 FOR I=66 TO 67:RESET(I,12):RESET(I,17):NEXT I
350 FOR I=36 TO 40:RESET(I,22):NEXT I:FOR I=30 TO 35:RESET(I,21)
;:NEXT I:FOR I=40 TO 44:RESET(I,21):NEXT I:FOR I=35 TO 39:RESET(I
,20):NEXT I
355 FOR I=44 TO 48:RESET(I,20):NEXT I:FOR I=39 TO 43:RESET(I,19)
;:NEXT I:FOR I=48 TO 52:RESET(I,19):NEXT I:FOR I=43 TO 47:RESET(I
,18):NEXT I
360 FOR I=52 TO 56:RESET(I,18):NEXT I:FOR I=47 TO 51:RESET(I,17)
;:NEXT I:FOR I=56 TO 58:RESET(I,17):NEXT I:RESET(70,17):RESET(71,
17)
365 FOR I=76 TO 80:RESET(I,17):NEXT I:FOR I=71 TO 75:RESET(I,18)
;:NEXT I:FOR I=80 TO 84:RESET(I,18):NEXT I:FOR I=75 TO 79:RESET(I
,19):NEXT I
370 FOR I=84 TO 89:RESET(I,19):NEXT I:FOR I=79 TO 83:RESET(I,20)
;:NEXT I:FOR I=88 TO 92:RESET(I,20):NEXT I:FOR I=83 TO 87:RESET(I
,21):NEXT I:FOR I=92 TO 95:RESET(I,21):NEXT I
375 FOR I=87 TO 91:RESET(I,22):NEXT I
415 C$="GREAT BRITAIN":GOSUB 11000
420 'FLAG EIGHT -- CZECHOSLOVAKIA
425 CLS:GOSUB 10000
430 FOR I=15 TO 20:PRINT@I+192,CHR$(191)::PRINT@I+384,CHR$(191);
```

Listing continues

```

:NEXT I
435 FOR I=15 TO 26:PRINT@I+256,CHR$(191);:PRINT@I+320,CHR$(191);
:NEXT I
440 PRINT@143,CHR$(191);:PRINT@144,CHR$(191);:PRINT@463,CHR$(191
);:PRINT@464,CHR$(191);:PRINT@465,CHR$(179);:PRINT@466,CHR$(179)
;:PRINT@145,CHR$(179);:PRINT@146,CHR$(179);:PRINT@213,CHR$(188);

445 PRINT@214,CHR$(188);:PRINT@404,CHR$(143);:PRINT@405,CHR$(143
);:PRINT@406,CHR$(131);:PRINT@407,CHR$(131);:PRINT@215,CHR$(176)
;:PRINT@216,CHR$(176);:PRINT@283,CHR$(188);:PRINT@284,CHR$(188);

450 PRINT@347,CHR$(143);:PRINT@348,CHR$(143);:FOR I=58 TO 97:SET
(I,14):SET(I,15):NEXT I
455 C$="CZECHOSLOVAKIA":GOSUB 11000
460 'FLAG NINE -- SOUTH VIETNAM
465 CLS:GOSUB 10000
470 FOR I=30 TO 97:SET(I,12):SET(I,14):SET(I,16):NEXT I
475 C$="SOUTH VIETNAM":GOSUB 11000
480 'FLAG TEN -- KUWAIT
485 CLS:GOSUB 10000
490 FOR I=15 TO 26:PRINT@256+I,CHR$(191);:PRINT@320+I,CHR$(191);
:NEXT I
495 FOR I=15 TO 20:PRINT@192+I,CHR$(191);:PRINT@384+I,CHR$(191);
:NEXT I
500 PRINT@143,CHR$(191);:PRINT@144,CHR$(191);:PRINT@463,CHR$(191
);:PRINT@464,CHR$(191);:PRINT@465,CHR$(179);:PRINT@466,CHR$(179)
;:PRINT@145,CHR$(179);:PRINT@146,CHR$(179);
505 PRINT@213,CHR$(188);:PRINT@214,CHR$(188);:PRINT@215,CHR$(176
);:PRINT@216,CHR$(176);:PRINT@405,CHR$(143);:PRINT@406,CHR$(143)
;:PRINT@407,CHR$(131);:PRINT@408,CHR$(131);
510 FOR I=54 TO 97:SET(I,12):SET(I,17):NEXT I
515 C$="KUWAIT":GOSUB 11000
9999 GOTO 11200
10000 'SUBROUTINE FOR OUTLINE OF FLAG AND PRINTING OF QUESTION
10005 FOR I=28 TO 99:SET(I,6):SET(I,23):NEXT I
10010 FOR I=7 TO 22:SET(28,I):SET(29,I):SET(99,I):SET(98,I):NEXT
I
10015 PRINT@653,"WHAT COUNTRY DOES THIS FLAG BELONG TO?"
10020 RETURN
11000 'SUBROUTINE FOR ASKING OF QUESTION - CHECKING OF ANSWER
11005 PRINT@702,"":INPUT A$
11010 IF A$=C$ THEN H=H+1:PRINTTAB(13)"THAT IS CORRECT.":GOTO 11
025
11015 PRINTTAB(13)"I AM SORRY; THE CORRECT ANSWER IS ";C$;".
11025 PRINT:PRINTTAB(13)"PRESS ANY KEY TO CONTINUE"
11100 I$=INKEY$:IF I$="" THEN GOTO 11100
11105 RETURN
11200 'END OF PROGRAM
11203-CLS
11205 FOR I=6 TO 40:SET(46,I):SET(47,I):NEXT I
11210 FOR I=48 TO 87:SET(I,6):SET(I,17):NEXT I
11215 FOR I=7 TO 16:SET(86,I):SET(87,I):NEXT I
11220 FOR I=48 TO 69:SET(I,20):SET(I,24):NEXT I
11225 FOR I=21 TO 23:SET(68,I):SET(69,I):NEXT I
11230 PRINT@473,"GOODBYE!";:PRINT@219,"YOU IDENTIFIED";
11235 PRINT@280,H;"FLAGS CORRECTLY";
11240 PRINT@896,"";
12000 END
    
```

TRSDOS ↔ CP/M

with

REFORMATTER™

Model II users! Convert files between TRSDOS and CP/M!

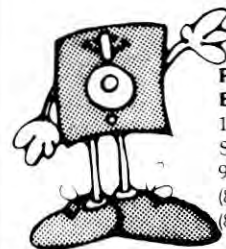
- REFORMATTER runs under TRSDOS
- Operates on single drive system
- Converts in both directions
- CP/M operating system not needed
- All TRSDOS record lengths supported
- Initializes blank CP/M diskette
- Displays or dumps CP/M files
- Manipulates CP/M directory under TRSDOS

✓380

\$249.00 from stock. CP/M ↔ IBM, TRSDOS ↔ DEC, and CP/M ↔ DEC versions of **REFORMATTER** also available at \$249.00 from MicroTech Exports, Inc., 467 Hamilton Ave., Palo Alto, CA 94301
 Tel: 415/324-9114 TWX: 910-370-7457 MUH-ALTOS

MEMOREX FLEXIBLE DISCS

WE WILL NOT BE UNDER-SOLD!! Call Free (800)235-4137 for prices and information. Dealer inquiries invited and C.O.D.'s accepted.



PACIFIC EXCHANGES
 100 Foothill Blvd
 San Luis Obispo, CA 93401. In Cal. call (800)592-5935 or (805)543-1037

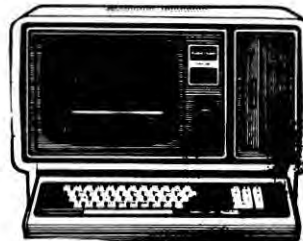
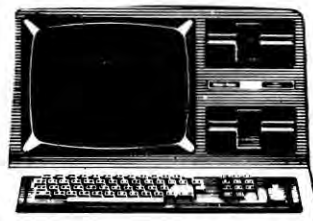
✓207

PRICE BREAKTHROUGH

100% RS COMPONENTS, NO FOREIGN DRIVES OR MEMORY — FULL WARRANTY

MOD III 48K
 2 Drives RS232

\$1795



MOD II 64K
 1 Drive

\$2499

CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS.

(817) 825-4027

NOCONA ELECTRONICS • P.O. Box 593 • Nocona, TX 76255

✓232

CASS-80

by Scott Steele
Third Place
11-13

Program Listing

```

0 CLEAR2400:DIMS(60),DM(60),SD(60),MM(60),MG$(16),CH$(14),UL$(6
0),MT$(60),DT$(60):HP=-29000:DP=-16000
1 ON ERROR GOTO 62000
3 INPUT"DATE : (MM/DD/YR DAY)";DE$:INPUT"CALLER #";A:INPUT"THIS
WEEKS QUIZ QUESTION";Q1$
5 DU$=INKEY$:IF INP(232)<32 THEN7ELSE POKE-186,0:GOTO5
7 NK=1:TF=0:GOSUB11000:GOSUB29000:UL=UL+1:UL$(UL)=NM$
8 GOSUB18995:GOSUB 24900
9 GOSUB 14000
10 PRINT"Welcome to Cass-80 Version 1.6":PRINT"(C).1982 - Scott
Steele":FOR DU=1TO 500:NEXT DU
30 IFBU>0THENGOSUB34:PRINT:PRINT"BULLETINS":PRINT:FORED=1TOBU:P
RINT("ED")."BU$(ED):NEXT
33 GOTO40
34 PRINT"CARE TO SEE THE BULLETINS?";
35 A$=INKEY$:IF A$=" "THEN35ELSEIFA$="Y"ORASC(A$)=97THENPRINT"Yes
":GOTO40ELSEIFA$="N"ORASC(A$)=110THENPRINT"No":RETURNELSE35
57 PRINT"The date is----->>>>>>>"DE$<<<<<<-----":PRINT:PRINT"Y
ou are caller";A=A+1:GOSUB29400:PRINTA:IFBD=2THENPRINT"You are
in the MAIN board."ELSEPRINT"You are in the D&D board."
58 PRINT"Want to skip menu (Y/N)?";
59 DU$=INKEY$:IF INP(232)>32 THEN 5 ELSE IF DU$=" "THEN59ELSEIF D
U$="Y"ORASC(DU$)=121THEN PRINT"Yes":PRINT:PRINT:PRINT:PRINT:PRIN
T:PRINT:PRINT:GOTO 65 ELSE IF DU$="N"OR ASC(DU$)=110THEN PRINT"N
o":GOTO60 ELSE 59
60 PRINT"-->> Cass-80 Commands <<--":PRINT"(A)...Ads":PRINT"(B)...
Bell (On/Off)":PRINT"(C)...Chat":PRINT"(G)...Goodbye":PRINT"(I
)...System info":PRINT"(L)...Line feeds(On/Off)"
61 PRINT"(N)...Null adjustment":PRINT"(O)...Other systems":PRINT
"(P)...Post":PRINT"(Q)...Quiz question":PRINT"(R)...Read a messa
ge":PRINT"(S)...Scan messages":PRINT"(U)...User log":PRINT"(Y)...
Any messages for you?":PRINT"(*)...Switches between MAIN and D&
D
62 PRINT"(%)...Quick log-off":PRINT
65 PRINT"Command (A,B,C,G,I,K,M,N,O,P,Q,R,S,U,Y,*,% or ? for com
mands)-->";ON ERROR GOTO 62000:LN=0:SB$="":F$="":P$="":MG$(1)="
":SM$="":RF=0:PQ$="":PA$=""
67 IFNK=0THEN70ELSEFOR TA=1TO5:PRINTCHR$(7);:NEXT TA
70 A$=INKEY$:IF INP(232)>32 THEN 5 ELSEIF PEEK(14400)=2 THEN 160
00ELSEIFA$=" " THEN 70
71 IF ASC(A$)>95 AND ASC(A$)<127 THEN A$=CHR$(ASC(A$)-32)
80 IFA$="A"THENPRINT"Ads":GOTO1000ELSEIFA$="C"THENPRINT"Chat":GO
TO2000ELSEIFA$="G"THENPRINT"Goodbye":GOTO3000ELSEIFA$="O"THENPRI
NT"Other systems":GOTO4000ELSEIFA$="P"THENPRINT"Post a message":
GOTO5000ELSEIFA$="Q"THENPRINT"Quiz questions":GOTO 6000
81 IFA$="R"THENPRINT"Read a message":GOTO6999ELSEIFA$="S"THENPRI
NT"Scan messages":GOTO 8000ELSEIFA$="L"THENGOTO 10000
82 IF A$="?"THENPRINT:GOTO6000ELSEIFA$="N"THENPRINT"Null adjustme
nt":GOTO31000ELSEIFA$="*"THENPRINT"Board change":GOTO45500ELSEI
FA$="I"THEN18600
83 IF A$="%"THEN3090ELSEIFA$="U"THENPRINT:PRINT"User log":PRINT:G
OTO26000ELSEIFA$="B"THENPRINT:PRINT"Bell adjustment":PRINT:GOTO2
8000ELSEIFA$="Y"THEN29100ELSE70

```

Listing continues

Adding a modem to my Model I, Level II TRS-80 expanded my use of the computer by allowing me to call various bulletin board systems. By locating boards locally and in other parts of the country I made a host of new acquaintances and friends.

I thought it would be great if I had my own bulletin board so people could call *me* from other areas of the country. So, I began to contact different system operators for advice on how I might put my own board together. Unfortunately, the consensus of opinion was that without at least one disk drive, a bulletin board system would be impossible. It looked as though my dream of becoming a system operator would have to be put aside until I could buy a disk system.

The prospects of this happening were pretty dim, and I was not content to be just a user of other peoples' bulletin boards.

I decided to tackle the "impossible" and write my own program for a cassette bulletin board system. I had only 48K of memory to hold the program and the messages, but nothing to lose by trying.

My original program stored the messages in arrays, which worked out okay until I found things that I wanted to change. If the changes required editing

The Key Box

**Model I or III
16K RAM
Cassette Basic
Modem**

You Are Being Attacked by a Raging . . .

Caterpillar



©1982 Soft Sector Marketing, Inc.
Written by Larry Ashmun

The Quality Continues . . .

SSM SOFT SECTOR MARKETING, INCORPORATED

84

P.O. Box 340 • Garden City, MI 48135 • 800-521-6504/(313) 425-4020

Prices per Game: TRS-80* 16K Level II Mod I/Mod III Cassette \$15.95
TRIS-80* 32K Level II Mod I/Mod III Diskette \$19.95

10% discount for 2 items, 15% for 3 or more. Please add \$2.50 per order for postage & handling. Michigan residents add 4% sales tax. Outside USA (except Canada) please add \$10.00 per order for postage & handling.

Talking and sound effects are playable through the cassette AUX plug. High scores are automatically saved after each game on disk version. Joystick compatible.

Call or write for our complete catalog.



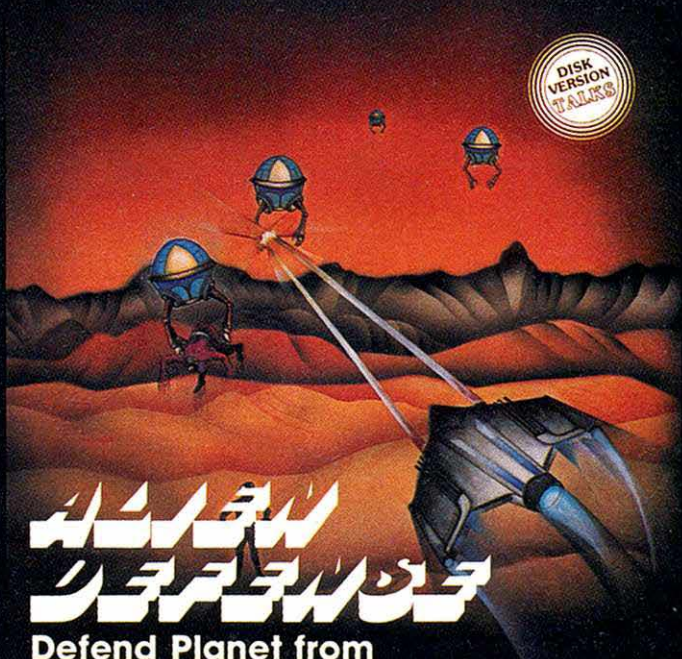
FORTRESS II

Only The Fast Survive!



NEW!

©1982 Soft Sector Marketing, Inc.
Written by Larry Ashmun



NEW DEFENSE

Defend Planet from
6 Different Types of Alien Attacks

©1982 Soft Sector Marketing, Inc.
Written by Larry Ashmun

```

1000 PRINT "If you would like to leave an ad, leave me a comment
when you leave and I'll post it...It's $1 and it stays up at lea
st two months...":PRINT:IF AD=0 THEN PRINT "Sorry, no ads yet
..." ELSE FOR AC=1 TO AD:PRINTAD$(AC):PRINT:NEXT AC:PRINT "That's
al
1010 GOTO 65
2000 IFPG=1THENPRINT:PRINT "SYSOP not here now...Try later":PRINT
:GOTO 65ELSECLS:PRINT "Paging SYSOP...'A' will abort...":FORPQ=1T
O5:PRINT "Paging":PRINT#-1,"*":IFPEEK(14400)=2THEN15000ELSEFORAX=
1TO10:IFINKEY$="A"THEN2005ELSENEXTAX:NEXTPQ
2001 PRINT "He's not here now...Recording attempt...":CH=CH+1:IF
CH>15THEN65ELSECH$(CH)=NM$:IF CH$(CH)=CH$(CH-1) THENCH$(CH-1)=CH$
(CH-1)+"2":CH=CH-1:GOTO65ELSE65
2005 PRINT:PRINT "Chat aborted...":PRINT:GOTO 65
3000 CLS:IF CA=1 THEN GOSUB 22000 ELSE PRINT "Goodbye...Want to l
eave a message to the SYSOP (Y,N,A)?";
3001 A$=INKEY$:IF A$=""THEN3001ELSE GOSUB 27330:IF A$="A"THEN PRI
NT "Abort":PRINT:GOTO 65 ELSE IF A$="N" THEN PRINT "No":GOTO3090EL
SE IF A$="Y"THEN PRINT "Yes":GOTO3002ELSE3001
3002 IFBD=1THENCFL=1:BD=2:GOSUB 45501
3003 PRINT "This message will be marked so only the SYSOP may see
it.":SM(MG+1)=1:RF=1:GOSUB5000:RF=0:CF=0:GOTO3090
3004 LN=LN+1:IF LN>3 THEN LN=LN-1:GOTO 3010 ELSE INPUTSR$(LN):IF
SR$(LN)="" THEN LN=LN-1:GOTO 3010 ELSE 3004
3090 PRINT:PRINT "Goodbye "NM$"...Thanks for calling Cassette 80"
:PRINT "Please call again..."
3095 OUT234,171:OUT234,0:OUT234,165:FORLN=1TO10:NEXTLN:GOTO3095
4000 CLS:PRINT "Other Known Operating Systems":PRINT "Any updates
or changes would be appreciated (Leave SYSOP message)":PRINT "NAM
E","NUMBER","HOURS":PRINT "CHIPMUNK","323-3741","24":PRINT "NORTH-
PARK ","745-0924","24":PRINT "ROGERS PARK","973-2227","24"
4001 PRINT "LAMS","740-9128","24","GAMEMASTER","475-4884","24",,
"PMS/LINK","870-7176","24":PRINT "VIDEO ADVENTURE","475-5282","9A
M TO 9PM",,"CRT","373-8057","24",,"CODE","537-7063","24",,"PIRAT
ES SHIP","935-2933","24",,"APPLE-NET","685-9573","24",,
4002 PRINT "METRO WEST","260-0640","24",,"NAPY","420-7995","6PM-6
AM(9PM FRI)",,"PBBS","359-9450","24",,"WARD AND RANDY'S 545-8086"
,"24",,"MESSAGE-82","622-4442","24",,"NESSY","773-3308","24",,"C
AMS","927-1020","24",,"HIT <ENTER> TO RETURN TO MAIN MENU."
4003 DU$=INKEY$:IF DU$=""THEN 4003 ELSE 65
5000 PRINT:PRINT:PRINT "Post messages":PRINT "This will be message
":MG+1; "...":F$=NM$:PRINT "Please enter the subject":GOSUB 63001
:PRINT
5001 PRINT "Enter your message one line at a time... 15 lines at
63 characters per line...<ENTER> on a new line ends mes
sage.":HL=1:MG=MG+1
5002 PRINTHL).CHR$(14)
5003 A$=INKEY$:IF A$=""THEN 5003 ELSE PRINTA$:IF ASC(A$)=13 THE
N 5004 ELSE IF ASC(A$)=8 AND LEN(MG$(HL))>0 THEN MG$(HL)=LEFT$(M
G$(HL),LEN(MG$(HL))-1):GOTO 5003 ELSE IF LEN(MG$(HL))>63THEN PRI
NTCHR$(8);:GOTO 5003 ELSE 5099
5004 IF LEN(MG$(HL))=0 THEN HL=HL-1:GOTO 5005 ELSEIFLEN(MG$(HL))
=LANDASC(MG$(HL))=10THENHL=HL-1:GOTO5005ELSE IF HL=15 THEN 5005
ELSE MG$(HL)=MG$(HL)+CHR$(13):HL=HL+1:MG$(HL)="" :GOTO 5002
5005 PRINT:PRINT "A-Abort C-Continue E-Edit L-List":PRINT "S-Sav
e":PRINT "Enter choice-->";
5006 A$=INKEY$:IF A$=""THEN 5006 ELSE GOSUB 27330:IF A$="A" THEN
5100 ELSE IF A$="C"THEN 5200 ELSE IF A$="E" THEN 5300 ELSE IF A$
="L"THEN 5400 ELSE IF A$="S" THEN5010 ELSE 5006
5010 PRINT "Save message":GOSUB 39800:FOR NR=1TOLEN(SB$):POKEHP,A
SC(MID$(SB$,NR,1)):HP=HP+1:NEXT NR:POKE HP,255:HP=HP+1:GOSUB 397
00:FOR NR=1TOLEN(PW$):POKEHP,ASC(MID$(PW$,NR,1)):HP=HP+1:NEXT NR
:POKE HP,254:HP=HP+1
5011 FOR HM=1TOHL:FOR MP=1TOLEN(MG$(HM)):AV=ASC(MID$(MG$(HM),MP,
1)):POKE HP,AV:HP=HP+1:NEXT MP:NEXT HM:POKE HP,253:HP=HP+1:PRINT
"MESSAGE SAVED":PRINT:IFRF=1THENRETURNELSE65
5060 HM=HM+1:MG$(HM,LN)=MG$(HM,LN)+"END":PRINT "MESSAGE":HM;"SAVE
D.":PRINT:LN=0:GOTO 65
5099 MG$(HL)=MG$(HL)+A$:GOTO 5003
5100 PRINT "Abort":PRINT:PRINT "Are you sure you want to abort thi
s message (Y/N)?"
5101 A$=INKEY$:IF A$=""THEN5101ELSEGOSUB 27330:IFA$="Y" THEN MG=M
G-1:PRINT "MESSAGE ABORTED":PRINT:PRINT:GOTO 65 ELSE IF A$="N" TH
EN PRINT:GOTO 5005 ELSE 5101
5200 PRINT "Continue":IFHL=15THENPRINT "All lines filled. Can not
continue":GOTO5005ELSEPRINT:FOR ZV=1TO HL:PRINTZV)".":PRINTMG$(Z
V):NEXTZV:HL=HL+1:GOTO 5002
5300 PRINT "Edit a line":PRINT:INPUT "Enter line to edit or 0 to e
nd":VN:IF VN=0 THEN 5005 ELSE IF VN<0 OR VN>HL THEN PRINT:GOTO53
00 ELSE PRINT "Line"VN).":PRINT "Old line.":PRINTMG$(VN):MG$(VN)=""
:PRINT:PRINT "Enter new line
5301 A$=INKEY$:IF A$=""THEN 5301 ELSEPRINTA$:;IFASC(A$)=13THEN53
02 ELSE IF ASC(A$)=8ANDLEN(MG$(VN))>0THENMG$(VN)=LEFT$(MG$(VN),L

```

Listing continues

in Basic or adding lines, all of the variables were cleared. There had to be a way to store messages.

I knew that messages couldn't be stored in variables; there had to be another way. Then I thought of how Basic stores variables by POKEing ASCII values into memory. I recalled that the question "Memory Size?" appears every time the computer is turned on. I knew this had something to do with protecting memory, so I figured that I would write a short subroutine to POKE strings into memory. But, the question was: "Would it work?"

I tried to POKE something into protected memory. I PEEKed at it and printed it, using a PRINT CHR\$(PEEK(X)) instruction (where x is the pointer to the next byte of the message). It worked flawlessly, but my next problem was how to use it in my original program.

I decided that it would be necessary to save four major parts of any message: the subject, the password, the author, and the body of the message. Next, I determined the order in which the parts should be saved. I decided to save the subject and the author first, since only the author and subject are printed when a scan is done. Having these two items first would save time, since the program wouldn't have to search for them if they were placed at the beginning.

The next thing I decided to save was the password, because when I got around to making a routine to kill messages, the program would have to compare passwords to see if the person requesting the kill was indeed the author. By having the password third I could avoid having the program go through entire bodies of messages to find the passwords.

Finally, I placed the body of the message at the end, because when the body is printed, the author and subject appear before it.

Having determined the order of the parts, I proceeded to put them into my program. I used FOR X=1 TO LEN(X\$): POKE HP, ASC(MID\$(X\$,X,1)): HP=HP+1: NEXT X: POKE HP, 255 (x is a dummy variable, X\$ is the string to save, and HP is the pointer to the next highest memory location). I saved the four message parts and the starting location for each message in the MM array, and the whole routine is located at lines 5010-5011 with a GOSUB to line 39700.

I next had to modify the scan and read sections of the program to ensure that they would be compatible with the

sky sweep

MISSION:
Destroy Enemy Base



©1982 Soft Sector Marketing, Inc.
Written by Barlow



The Quality Continues . . .

SSM SOFT SECTOR MARKETING, INCORPORATED

85

P.O. Box 340 • Garden City, MI 48135 • 800-521-6504/(313) 425-4020

Prices per Game: TRS-80* 16K Level II Mod I/Mod III Cassette \$15.95
TRS-80* 32K Level II Mod I/Mod III Diskette \$19.95

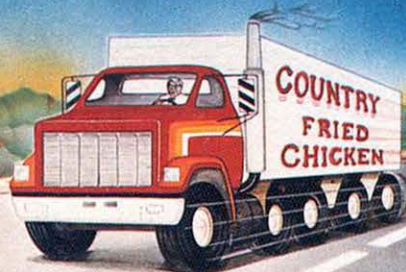
Talking and sound effects are playable through the cassette AUX plug. High scores are automatically saved after each game on disk version. Joystick compatible.

10% discount for 2 items, 15% for 3 or more. Please add \$2.50 per order for postage & handling. Michigan residents add 4% sales tax. Outside USA (except Canada) please add \$10.00 per order for postage & handling.

Call or write for our complete catalog.



NEW!



CHICKEN

Don't Chicken Out!

©1982 Factory Programming, Inc.
Written by J. Weaver, Jr.

OUTHOUSE

Is There Nothing Sacred?

©1982 Factory Programming, Inc.
Written by J. Weaver, Jr.



```

EN(MG$(VN))-1:GOTO5301ELSEIF LEN(MG$(VN))>63THEN PRINTCHR$(8);:
GOTO 5301 ELSE MG$(VN)=MG$(VN)+A$:GOTO 5301
5302 PRINT:GOTO5005
5400 PRINT"List":PRINTCHR$(14):INPUT"Starting line #";NL:IF NL<0
OR NL>HLTHEN PRINT:GOTO 5400 ELSE FOR XH=NL TO HL:PRINTXH".":P
RINTMG$(XH):NEXT XH:PRINT:GOTO 5005
6000 PRINT:PRINT:PRINT"Quiz Questions":PRINT"I will post one que
stion a week. Post answers in comments to me when you hang up. T
hank You."
6001 PRINT"Example:":PRINT" 26=L of the A":PRINT" would be":P
RINT" 26=letters of the alphabet":PRINT"Now for this weeks equa
tion:":PRINT:PRINTQ1$:PRINT:PRINT"Press <ENTER> to return to MAI
N menu"
6002 DU$=INKEY$:IF DU$="" THEN 6002 ELSE PRINT:GOTO 65
6999 PRINTCHR$(14);"Read messages.":IF MG=0THENPRINT"No messages
yet":PRINT:GOTO65 ELSEPRINT"Cass-80 contains messages 1 to"MG
7000 INPUT"ENTER MESSAGE TO READ,OR 0 TO QUIT";DH:PRINTCHR$(14);
:IFDH<0ORDH>MGTHEN7000ELSEIFDH=0THENPRINT:GOTO65ELSEGOTO29700
7001 RJ=PEEK(KH):IF RJ=255 THEN KH=KH+1:GOTO7002 ELSE SB$=SB$+CH
R$(RJ):KH=KH+1:GOTO 7001
7002 RJ=PEEK(KH):IF RJ=255 THEN KH=KH+1:GOTO 7003 ELSE F$=F$+CHR
$(RJ):KH=KH+1:GOTO 7002
7003 RJ=PEEK(KH):IF RJ=254THEN KH=KH+1:GOTO 7004 ELSE P$=P$+CHR$
(RJ):KH=KH+1:GOTO 7003
7004 PRINT:PRINT"MESSAGE"DH".":PRINT"LEFT BY "F$,"SUBJECT:"SB$:P
RINT
7005 RJ=PEEK(KH):IF RJ=253 THEN 7006 ELSE PRINTCHR$(RJ);:KH=KH+1
:GOTO 7005
7006 PRINT:PRINT"END OF MESSAGE"DH".":GOTO 7000
7900 PRINT"I'M SORRY,BUT THERE IS NO MESSAGE #":DH:DH=0:PRINT:GOT
O7000
8000 PRINT:PRINT"Scan messages":IF MG=0 THENPRINT"No messages ye
t.":PRINT:GOTO 65 ELSEINPUT"Enter message # to start scan with";
GI:IF GI<1 OR GI>MG THEN GOTO 8000ELSE FOR SE=GITOMG:KR=MM(SE)
8001 EX=PEEK(KR):IF EX=255 THEN 8002 ELSE SM$=SM$+CHR$(EX):KR=KR
+1:GOTO 8001
8002 KR=KR+1
8003 EX=PEEK(KR):IFEX=255THEN8005ELSEF$=F$+CHR$(EX):KR=KR+1:GOTO
8003
8005 PRINT"MESSAGE"SE".":PRINT"LEFT BY: "F$,"TO: "MT$(SE):PRINT"
SUBJECT: "SM$:SM$="":F$="":PRINT:NEXTSE:PRINT:PRINT"END OF "":IF
BD=1THENPRINT"D&D FILE."ELSEPRINT"MAIN FILE."
8006 PRINT:GOTO65
10000 PRINT"LINE FEEDS":PRINT"LINE FEED MODE IS NOW--->>":IF P
EEK(-182)=1THENPRINT"OFF<<<---":PRINT:POKE-182,0ELSEPRINT"ON<<<
---":PRINT:POKE-182,1:GOTO65
10001 GOTO65
11000 OP$="":PH$="":PQ$="":PA$="":NM$="":QN$="":LN$="":PRINT"We l
come to Cass-80!":PRINT"Hickory Hills, IL"
11001 PRINT"Enter your FIRST name:":GOSUB25000:QZ$=OP$:IF QZ$="
"THENOP$="":GOTO11001ELSEOP$="
11002 PRINT"Enter your LAST name:":GOSUB25000:LN$=OP$:IFLN$="T
HENOP$="":GOTO11002ELSEOP$="
11003 NM$=QZ$+" "+LN$:PRINT:PRINT"You are: ";NM$:PRINT".":CHR$(
13);"Is that correct?";
11004 A$=INKEY$:IFA$="Y"THEN11004ELSEGOSUB27330:IFA$="Y"THENPRINT
"Yes":A$=INKEY$:RETURNELSEIFA$="N"THENPRINT"No":A$=INKEY$:OP$="
":GOTO11001ELSE11004
14000 PRINT"Need line feeds "QZ$" (Y/N)?";
14001 A$=INKEY$:IF A$="Y"THEN 14001 ELSE IF A$="N"OR ASC(A$)=110T
HENPRINT"No":POKE-182,0ELSEIFA$="Y"ORASC(A$)=121THENPRINT"Yes":P
OKE-182,1ELSE14001
14002 RETURN
15000 CLS:PRINTCHR$(14);"CHAT MODE...TYPE 'BYE' TO EXIT":LQ$="YO
U ARE TALKING TO "+NM$:FOR TY=1TOLEN(LQ$):POKE 15807+TY,ASC(MID$
(LQ$,TY,1)):NEXT TY
15001 GOTO 16001
15500 OUT234,165:GOTO5
16000 CLS:PRINT"SYSOP REQUESTS TO TALK WITH YOU":PRINT
16001 PRINT"--":OP$="":GOSUB 25000:IF OP$="BYE"THEN PRINT:GOTO
65 ELSE 16001
16300 MM(1)=HP:FORAB=1TOMG-1:KH=MM(AB)
16301 RJ=PEEK(KH):IFRJ=255THENKH=KH+1:GOTO16302ELSEKH=KH+1:GOTO1
6301
16302 RJ=PEEK(KH):IF RJ=255THENKH=KH+1:GOTO16303ELSEKH=KH+1:GOTO
16302
16303 RJ=PEEK(KH):IFRJ=254THENKH=KH+1:GOTO16304ELSEKH=KH+1:GOTO1
6303
16304 RJ=PEEK(KH):IF RJ=253THENKH=KH+1:GOTO16305ELSEKH=KH+1:GOTO
16304
16305 MM(AB+1)=KH:NEXTAB:HP=KH+1:END
18600 PRINT"System info":PRINT:PRINT"This system is made up of:
":PRINT"A TRS-80 Model 1":PRINT"level 2 computer with 48K of RAM"

```

Listing continues

save routine. The scan and read routines check for the presence of a 255, 254, or 253 to signal the ends of message sections, and then PEEK the various strings out of memory by doing the opposite of the save routine.

The scheme I used was ER = PEEK (KH): IF ER = 255 THEN next line ELSE X\$ = X\$ + CHR\$(ER): KH = KH + : GOTO this line (where X\$ is the string to be PEEKed out of memory, KH is the pointer to next memory location to PEEK out of; and ER is the dummy variable to store the value of the memory location pointed to by KH). KH starts out equalling an element of array MM. The precise element is determined by the message being read or scanned.

There is one large addition to the read routine at lines 7000-7006 that isn't present in the scan routine at lines 8000-8006. This is the routine to print the body of the message. This routine, located at line 7005, checks for a 253 to signal the end of the message body. If it fails to find a 253, it executes a PRINT CHR\$(RJ), where RJ is the value of the memory location presently being PEEKed out of, and the program will keep looping until it finds a value of 253 at the PEEK location pointed to by KH.

After testing this routine and using it for awhile, I decided it would be nice to add another board devoted to playing Dungeons and Dragons.

The addition of the D & D board required another array (DM), another top of memory pointer (DP), another message pointer (DN), and a routine at lines 45500-45551 to exchange the pointers and arrays. When the pointers and arrays are exchanged, the boards are exchanged.

Although this version ran extremely well, users eventually requested the ability to place private messages on both the regular board and the D & D board. Although I knew this would be an enhancement to the system, I was concerned that there just wouldn't be enough memory to make it a reality.

I decided to try putting in another array, MT\$ and adding a subroutine to the read message routine in line 7000, to determine whether the message is private or nonprivate. If the subroutine finds the message is private, it then checks to see if the message is for the user who is trying to read it. If the message is not for the user trying to read it, the program informs the user that the requested message is private. If the program determines that the user is authorized to read the message, than it returns and prints it. A special flag (designated TF) can be set to allow whoever

NOW!

The Ultimate in Mailing Packages POSTMAN MASS MAILING SYSTEM

©1982 Alger Software, Distributed exclusively by Soft Sector Marketing, Inc.

For the serious businessman who has as little as 100 name mailing list or 200,000 names, THERE IS ONLY ONE SYSTEM FOR YOU!

FEATURES OF THE NEW POSTMAN MASS MAILING SYSTEM

The Postman system (version 2) is an almost COMPLETE rewrite, rethink, redesign of the original POSTMAN. The many features of the new POSTMAN system are quickly outlined below:

MULTI-DRIVE - True multi-drive operation is possible. POSTMAN will search all drives for address files and connect them together into one large file for the duration of that session. Once POSTMAN has found the data files on the disks, the operator "sees" just ONE CONTIGUOUS sorted list of addresses. The operator does not need to tell POSTMAN when to "switch" drives or manually "swap" sections of the data file in and out of the computer's memory. This is the foremost among the list of features because of its relative uniqueness among mail list handlers written for the TRS-80.

LARGE LIST SUPPORT - The multi-drive operation allows the user to access data files on ALL configured drives CONCURRENTLY (at the SAME time) for truly large mailing lists. Files need not be sectioned into smaller "byte size" chunks to fit into memory.

HARD DISK SUPPORT - (HARD DISK POSTMAN only) The FULL utilization of the space and speed of the new hard disk drives is possible with POSTMAN. For example, a 7.5 megabyte drive can be configured to hold almost 60,000 labels. Multiple hard drives can be accessed CONCURRENTLY allowing 200,000++ entry mailing lists.

FORM LETTER CAPABILITY - With the purchase of the separate POSTRITE program, the user is provided with an easy to use form letter generator which will merge a generalized letter produced from a word processing system (i.e. LAZY WRITER, etc.), with the name and address information from the POSTMAN MASS MAILER data base. POSTWRITER allows the user to insert any field from a POSTMAN label entry anywhere in the letter.

MENU OPERATION - As you would in a restaurant, choose your dinner from a list (or MENU). POSTMAN will allow you to direct its actions by selecting from various menus that it will display. A complete discussion of each menu is presented in the manual.

INSERT - New names can be quickly added to your list at any time. The new addresses are placed into the file in their proper sorted order eliminating the need for a separate sort operation after entering a stack of new names. POSTMAN will allow the operator to enter a "batch" of labels without returning to the control menu between each label insertion, thus speeding entry and reducing the aggravation of extra menu control keystrokes.

DELETE - Names can be removed at any time when they are no longer needed.

EDIT - Information in any name entry can be quickly changed at will with "word processor" ease. A "transparent" cursor simply is moved to the label displayed on the computer screen and corrections are just typed over the existing label. If you happen to change a field which is also used as a sort key, POSTMAN will automatically move the changed label to its correct position in the list to maintain the sorted arrangement of the labels.

OVERLAY - When identical changes are needed on many addresses, the OVERLAY feature can make them with one keystroke. The needed changes which are common to many labels are entered into the "overlay mask". When you wish to apply these common changes to any label, one command will do it.

SORT - Arrange your list in any alphabetic or numeric order. The ordering may use one or more fields to control the sort. A machine language heap sort assures fast execution. The sort need only be performed once, the sorted list will stay sorted through all subsequent insertions, deletions, and changes to existing labels. NO NEED to leave the POSTMAN program to use a separate program to sort your data. Your data is sorted quickly and after sort completion, POSTMAN is ready for your next command!

SPECIAL STREET ADDRESS SORT - For the user with many addresses on the same street, POSTMAN will sort your entries by the house NUMBER after grouping those on the same street together. Local city lists can be quickly sorted to aid post office dispatching.

PURGE - Unwanted duplicate addresses can be removed from your list automatically or under operator control.

SEARCH - Any address in your list can be quickly found with fast search and positioning commands. Three different types of searches are provided. A "fast" search which uses a hashing technique, a "selective sequential" search for labels with common fields, and "quick" positioning using the first or major sort field to get you into the general "ball park" of a label or sequence of labels.

LABEL PRINTING - One, a few or all addresses in your list can be printed on standard or non-standard label stock. Up to 6 labels across can be printed with a format YOU can easily control. TWO user definable "ATTN" lines are provided for any use. Labels can be printed from many of POSTMAN's menus, search, edit, or during label insertion.

EFFICIENCY - POSTMAN is written in the machine's native language to gain the full advantage of the microcomputer's speed. Extensive use of program segmentation reduces the amount of use RAM needed to hold the program, allowing a greater number of labels to be kept in core, resulting in faster operation. Little used routines need only be brought into memory when they are needed and once through with their task, release their space back to POSTMAN.

REPORT LISTINGS - A special program to produce columnar listings of address data from your label data base is provided. You can easily specify the information to be printed.

DATA DISK MERGING - Labels can be quickly transferred from one disk to another with the POSTMERGE program callable from the main POSTMAN SYSTEM menu. Source and destination drives needed need not be separate drives, prompts to exchange diskettes if the same drive is used, are provided.

DATA DISK PREPARATION UTILITY - Provided with POSTMAN is the DPREP program which allows the user to prepare a floppy/hard disk for use with POSTMAN. This easy to use utility can be told to prepare any portion of the available space on a disk.

DATA INTEGRITY - All data transfers to the disk files are made using special write commands which instructs the operating system to check the validity of EACH write to the disk.

DATA GUARD - Is a special programming technique only offered by Soft Sector Marketing, Inc. If by chance your machine resets while writing information to the disk, you only lose the information that you were writing. Your files are always protected from the danger of losing all the work that you have put in that day. NO OTHER PROGRAM ON THE MARKET OFFERS THIS PROTECTION. If you reset with ANYBODY'S MAILING PACKAGE DURING WRITING you would destroy your ENTIRE data disk. We can't stop your machine from failing but we can protect your data.

Description of Label Record Fields:

Length	Name	Description	Length	Name	Description
10	Code	User defined printable field	15	City	City, township, village
15	Last Name	Last name of addressee	5	State	State, province, territory
15	First Name	First name of addressee	9	Zip	Zip code, zone, route
26	Company	Name of company	2	Data 1	User definable field
26	Address	Street address	5	Data 2	User definable field

IDEAL SYSTEM

Mod III 48K 1-40 Track Drive • 2-80 Track Dual Headed Drives • Dosplus or LDOS Operating Systems

Gives space for over 11,000 names - 5 second average name insertion - time sorts all 11,000 names in less than 4 minutes

*Special version to work on Dosplus 4.0 Hard Disk operating system.

- Overview Available -

The POSTMAN system requires Mod I or Mod III, 48K, 2 disk drives minimum.

Standard Version
Only **\$125.00**

Standard Version with
POSTWRITER form letter writer
\$175.00

For DOSPLUS Hard Disk 4.0 Operating System
& Radio Shack's Hard Drive System
\$225.00

- DEALER INQUIRIES WELCOME -

SSM SOFT SECTOR MARKETING, INCORPORATED

P.O. Box 340 • Garden City, Michigan 48135

Order Line **800-521-6504**

Michigan Orders & Questions 313-425-4020



PAYMENT - payment accepted by charge, personal check or C.O.D. only under the following conditions. **Charges** processed when shipped, usually within 48 hours. **Personal Checks** delay shipping, pending 4 weeks to clear. **C.O.D.**

orders are certified check or cash only, add \$1.50. MI residents must add 4% sales tax. **SHIPPING & HANDLING** - Shipping Charges: Send the larger amount, 2% of \$1.50 unless stipulated otherwise. Any order received without shipping and handling will be shipped; **freight collect**. **Air Mail Shipping** outside of North America, please send the larger amount, 10% of \$10.00. Overpayment will be refunded.

set it to read any message, whether private or nonprivate.

At this same time I added a routine that scans the MT\$ array, allowing users to quickly determine whether any board messages are specifically for them. I also added a user's log so anyone coming into the board could see who had used the bulletin board that day. This log can be reset by setting the value of UL to 0.

The latest version of my bulletin board has been up and running for several weeks now with absolutely no problems. The users are happier than ever with the board, and usage keeps on expanding.

The only negative comment I have had is that sometimes string input is slow. This occurs at times because I cleared only 2,400 bytes in line 0. While I could probably clear 400 more, I decided against it because it would leave no room for further modifications.

Some future enhancements that I anticipate are an expert's users mode, where all menus can be skipped, and a machine-language kill routine to quickly relocate messages and pointers.

The program has run smoothly and flawlessly, serving 933 users in slightly over two months. There have been a tremendous number of favorable comments, and even a number of "I see it running, but I still don't see how it can be done" statements. ■

Scott Steele, age 13, can be reached at 8738 Hillside Drive, Hickory Hills, IL 60457.

Listing continued

```
:PRINT"A Radio Shack Expansion Interface":PRINT"An RS-232 serial
interface":PRINT"A Radio Shack direct connect Modem 2"
18601 PRINT"And a Radio Shack cassette recorder":PRINT:GOTO 65
18990 POKE-183,0:POKE-182,1:POKE-185,1:RETURN
22001 DU$=INKEY$:IFDU$="Y"THEN3090ELSEIFDU$="N"THEN65ELSE22001
24900 PRINT"Need nulls "QZ$" (Y/N)?"
24901 A$=INKEY$:IFINP(232)>32THEN5ELSEIFA$=""THEN24901ELSEIFA$="
N"ORASC(A$)=110THENPRINT"No":RETURNELSEIFA$="Y"ORASC(A$)=121THEN
PRINT"Yes":PRINT:GOTO24902ELSE24901
24902 PRINT"How many, "QZ$" (0-255)?"
24903 A$=INKEY$:IFA$=""THEN24903ELSEPRINTA$;:IFASC(A$)=13ORASC(A
$)=10THEN24904ELSEIFASC(A$)<48ORASC(A$)>57THEN24903ELSEDU$=DU$+A
$:IFLEN(DU$)>3THENPRINT:GOTO24902ELSE24903
24904 NU=VAL(DU$):IFNU<0OR NU>255THEN24902ELSEPOKE-183,NU:PRINT:
RETURN
25000 IP$=INKEY$:IFIP$=""THEN25000ELSEIFIP$=CHR$(95)ORIP$=CHR$(1
27)THEN25479ELSEPRINTIP$;:IFASC(IP$)=8ANDLEN(OP$)>0THENOP$=LEFT$
(OP$,LEN(OP$)-1):GOTO25000ELSEIFASC(IP$)=13THENRETURNELSEIFLEN(O
P$)>253THEN25500ELSEOP$=OP$+IP$:GOTO25000
25479 EC=EC+1:IF EC=5THENEC=0:GOTO3095ELSE25000
25500 RETURN
26000 PRINT"Userlog for: ";DE$:PRINT:FORDU=1TOUL:PRINT("(DU").";
UL$(DU):NEXTDU
26001 PRINT:PRINT"END OF FILE.":GOTO65
27000 MT$(MG+1)="":FORAZ=1TOLEN(DU$):AB=ASC(MID$(DU$,AZ,1)):IFAB
>95THENAB=AB-32
27001 IFAB=95THENNEXTAZELSEMT$(MG+1)=MT$(MG+1)+CHR$(AB):NEXTAZ:R
ETURN
27330 IF ASC(A$)>95AND ASC(A$)<127THENA$=CHR$(ASC(A$)-32):RETURN
ELSERETURN
28000 IFNK=1THENNK=0:NK$="OFF"ELSENK=1:NK$="ON"
28001 PRINT"The bell is now-->"NK$<--":PRINT:GOTO65
29000 FORDU=1TOLEN(NM$):GG=ASC(MID$(NM$,DU,1)):IFGG>95THENG=GG-
32
29001 PH$=PH$+CHR$(GG):NEXTDU:RETURN
29100 PRINT:PRINT"Your messages":PRINT:PRINT"Checking for your m
essages":PRINT"on the ";:IFBD=1THENPRINT"D&D board."ELSEPRINT"MA
IN board."
29101 IF MG=0THENPRINT"SORRY,NO MESSAGES YET.":GOTO65ELSEFORMW=1
TOMG:IFMT$(MW)=PH$ORLEFT$(MT$(MW),LEN(PH$))=PH$THENPRINT"MESSAGE
"MW"MAY BE FOR YOU,"QZ$:NEXTMWELSENEXTMW
29102 PRINT:PRINT:GOTO65
29400 IFA=1000THENPRINT:PRINT"YOU'RE THE 1000TH CALLER!":C1=1000
:C1$=NM$:RETURNELSE RETURN
29700 IFTF=1THEN29707ELSEIFMT$(DH)="ALL"THEN29707ELSEIFMT$(DH)=P
H$THEN29707ELSEIFRIGHT$(MT$(DH),1)=CHR$(16)THEN29707ELSEPRINT"ME
SSAGE"DH"IS A PRIVATE MESSAGE.":PRINT:GOTO7000
29707 KH=MM(DH):PRINTCHR$(14);:SB$="":P$="":GOTO7001
31000 PRINT:PRINT"NULL ADJUSTMENT":PRINT"YOU NOW ARE SET AT"PEEK
(-183)"NULLS.":PRINT"HOW MANY NULLS DO YOU NEED(0-255)";:INPUTNL
:IF NL<0 OR NL>255THEN 31000 ELSE POKE-183,NL:PRINT:GOTO 65
39700 PORWY=1TOLEN(F$):POKE HP,ASC(MID$(F$,WY,1)):HP=HP+1:NEXTWY
:POKE HP,255:HP=HP+1:RETURN
39800 PRINT"Saving message. Please wait...":MM(MG)=HP:RETURN
45500 IFBD=1THEN45550ELSEPRINT"Going to D&D board,Please wait...
":BD=1
45501 DU=DP:DP=HP:HP=DU
45502 IF MG>DN THEN45510ELSEFOR SO=1TODN:DU=DM(SO):DM(SO)=MM(SO)
:MM(SO)=DU:DU=SM(SO):SM(SO)=SD(SO):SD(SO)=DU:DU$=MT$(SO):MT$(SO)
=DT$(SO):DT$(SO)=DU$:NEXT SO:PRINT"DONE.":PRINT
45503 DU=DN:DN=MG:MG=DU
45505 IFCF=1THENRETURNELSEGOTO65
45510 FOR SO=1TOMG:DU=DM(SO):DM(SO)=MM(SO):MM(SO)=DU:DU=SM(SO):S
M(SO)=SD(SO):SD(SO)=DU:DU$=MT$(SO):MT$(SO)=DT$(SO):DT$(SO)=DU$:N
EXTSO:PRINT"DONE.":PRINT:GOTO45503
45550 PRINT"Going to MAIN board...Please wait...":BD=2
45551 GOTO45501
54257 GOTO45501
62000 PRINT"AN ERROR HAS BEEN ENCOUNTERED.PLEASE INFORM THE SYSO
P OF ERROR "ERR/2+1;CHR$(8);"IN LINE"ERL".THANK YOU":PRINT:RESUM
E65
63001 INPUTSB$
63002 INPUT"Enter a password for erase (password must be at lea
st 1 char. long) ";PW$:IF PW$=""THEN63002ELSE63003
63003 IFSM(MG+1)=1THENMT$(MG+1)="SYSP":RETURNELSEINPUT"Who is t
his message to (name must be spelled CORRECTLY) or ALL";DU$:IFDU
$=""THEN63003ELSEGOSUB27000
63004 IFMT$(MG+1)="ALL"THEN63005ELSEINPUT"Is this a private mess
age (Y/N)";YN$:IFYN$="N"ORYN$="n"THENMT$(MG+1)=MT$(MG+1)+CHR$(16
)
63005 PRINT"Message"MG+1".","To:"MT$(MG+1):PRINT"Subject:"SB$;:I
FRIGHT$(MT$(MG+1),1)=CHR$(16)ORMT$(MG+1)="ALL"THENPRINT"Non priv
ate."ELSEPRINT"Private."
63006 INPUT"Is THIS information correct? (Y/N)";YN$:IFYN$="Y"ORY
N$="y"THENRETURNELSEPRINT"PLEASE Enter the subject.":GOTO63001
```

EPROM PROGRAMMER

FOR:
2704
2708
2758
2716
2532
2732



\$144.95
Kit

\$229.95
assembled
& tested

Programmer was featured construction project in July and August 1982 issues of Popular Electronics. Menu style driver program checks EPROM for erasure, lists EPROM and programming buffer contents, programs, copies EPROM to EPROM, and verifies. Specify tape or diskette. All power supplies and ZIF socket included. Connection to Model I or III is by ribbon cable with 40 pin edgecard connectors (add \$21.95). Model III requires additional 40 to 50 pin adapter (add \$15.95). Add \$5.00 postage and handling. California residents add 6% tax.



PARHELION CO. 366
P.O. Box 3602
Stanford, CA 94305



HARDWARE SPECIALS

LYNX MODEM

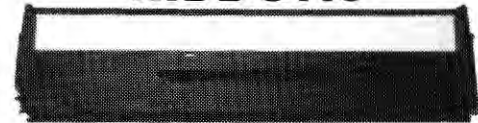
Auto Answer - Auto Dial

Mod I & III
No RS-232
Board Required

Shipping
from Stock
\$218.00



RIBBONS



MX-80 Replacement Cartridges
2 for \$15.00

MX-100 Replacement Cartridges
2 for \$20.00

Offer extended through January, 1983

ORCHESTRA 85/90

Stereo music synthesizer with
percussion for your Mod I or III.

Was \$149.95

SPECIAL \$99.95

Please state Mod I or II & Cass. or Disk version
Offer extended through January, 1983

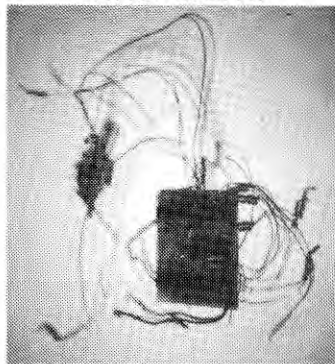
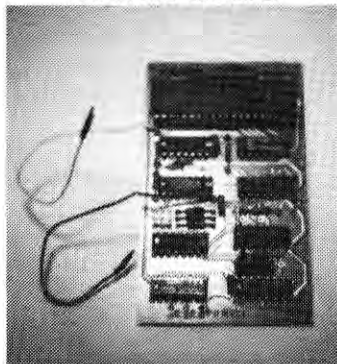
**SUPER
DEAL**

Our Catalog is Now Available!

There Are Only 2 Ways to Increase the Processing Speed of Your Model III

Holmes Board

Other Brand



The Right Way

The Wrong Way

We Offer Only The Quality Product
But the Choice is Yours

They both list for \$99.95 assembled and
Tested.

They both speed up your machine.

	Holmes Board	Other Brand
Installation Time	15 min.	4 hrs.
Requires Soldering	NO	YES
Requires Cutting Traces . . .	NO	YES
Easily Removed if Logic Board Requires Repair . . .	YES	NO

SAVE
\$10.00

List \$99.95

Only \$89.95

Plus Shipping

Offer extended through January, 1983

- DEALER INQUIRIES WELCOME -

SSM SOFT SECTOR MARKETING,
INCORPORATED

P.O. Box 340 • Garden City, Michigan 48135

Order Line **800-524-6504**

Michigan Orders & Questions 313-425-4020



PAYMENT - payment accepted by charge, personal check or C.O.D. only, under the following conditions: **Charges** processed when shipped, usually within 48 hours. **Personal Checks** delay shipping, pending 3 weeks to clear. **C.O.D.** orders are certified check or cash only, add \$1.50. MI residents must add 4% sales tax.

SHIPPING & HANDLING - Shipping Charges: Send the larger amount, 2% or \$2.50, unless stipulated otherwise. Any order received without shipping and handling will be shipped **freight collect Air Mail Shipping** outside of North America, please send the larger amount, 10% or \$10.00. Overpayment will be refunded.

Math Countdown

by Adam Wells
Third Place
10 and under

Lines	Purpose
10	Clears the screen
15	Clears 1000 bytes for string space
20	Makes double-sized letters
30-50	Makes the title page
60	Clears the screen
65	Makes double-sized letters
70	Asks if you need instructions
75	Clears the screen and makes double-sized letters
80-90	Figures out your answer
100	Tells you if you answered incorrectly
105	Clears the screen
110-210	Prints the instructions
220	Asks you if you understand the instructions
230-240	Figures out your answer
250	Tells you if you answered incorrectly
255-256	Clears the screen and asks what operation (+, -, ×, /) you'd like to do
258	Tells you if you were wrong
260	Clears the screen
270-282	Makes the spaceship
285	Clears the screen
290	Prints the spaceship
300-305	Sets up the loop to give 10 problems and prints 10
310	Makes the addition problem
320	Prints the addition problem and figures out if your answer is correct
330	Tells you if you were wrong
340	Returns control
500	Clears the screen and makes the spaceship take off
505	Returns control
510	Clears the screen
520	Prints the ship
530-540	Prints 10
550	Makes the subtraction problem
560	Prints the subtraction problem and figures out if your answer is correct
570	Tells you if you are incorrect
580	Clears the screen
590	Prints the ship
600-610	Makes 10
620	Makes the multiplication problem
630	Prints the multiplication problem and figures out if you are correct
640	Tells you if you are wrong
650	Makes the division problem
670	Prints the division problem and figures out if you are correct
680	Tells you if you are wrong
690	Gets rid of the Ready prompt by creating an endless loop

Table 1. Line Functions

At my computer programming class, I was assigned to write a math program that would help little children learn basic ideas. Since I like astronomy, I decided to put a spaceship in the program.

Math Countdown will ask if you need directions. If you don't, the program goes right to the math. You can choose the operation you want: multiplication, division, addition, or subtraction. Then a spaceship appears at the bottom of the screen, with the number 10 to the left and a math problem above it. If you answer the problem correctly, the 10 will change to 9, and you will see another problem. If you get that one right, the 9 will change to an 8.

When you get all the way down to zero, the spaceship takes off. If you get a problem wrong, the program will say "Try again!" and repeat the problem.

To revise my program, you could add sound, or give a time limit for solution of each problem. ■

(Listing on p. 163)

The Key Box

Model I or III
16K, 32K RAM
Cassette or Disk Basic

Adam Wells, age 9, can be reached at 5229 S. Brentwood Drive, Las Vegas, NV 89120.

Verbatim Datalife™ flexible disks now come in a bold, new storage box. But more important, they now come to you with a five year warranty.*

We can give you a warranty this long because we're confident the way we make Datalife disks will make them perform better, last even longer.

All of our Datalife disks feature seven data-shielding advances for greater disk durability, longer data life. To protect your data from head-to-disk abrasion. To shield your data against loss due to environmental conditions. To insure a longer lifetime of trouble-free data

recording, storage and retrieval.

Every Datalife disk is extensively tested under the most extreme conditions. Critically-certified to be 100% error-free. Assuring you an added margin of performance, no matter what the operating conditions.

And we back it up with a five year warranty. Five times longer than the industry standard. Because Verbatim is the standard of excellence.

For flexible disks you can depend on—a lot longer—call (800) 538-1793. In California, or outside the U.S. call (408) 737-7771

collect for the name of your Verbatim dealer.

If you want longer data life, keep all your data on Verbatim Datalife. Our name is the promise. Our warranty is the proof.



Verbatim® 523

Here's the most exciting part of Verbatim's new packaging.

5 Year Warranty

SUPER PRICES & FREE SHIPPING

COMPUTERS



Complete MODEL III COMPUTER

Model III with 48K memory, 2 disk drives, 370K storage, and ready to run with TRSDOS 1.3 and manual. 120 day Simutek warranty parts and labor. Compatible with all Radio Shack software \$1899.99

Model III with 48K, 2 double sided 40 track disk drives with 750K storage. Comes with MULTIDOS and manual. 120 day Simutek warranty parts and labor. Compatible with Radio Shack software. Complete and ready to run \$2195.99

MODEL III INTERNAL DISK DRIVE KITS

If you can use a phillips screwdriver, you can easily install Simutek's Model III disk drives and controller in less than an hour. Absolutely NO SOLDERING, TRACE CUTTING OR TECHNICAL KNOWLEDGE REQUIRED! The J & M controller is the best on the market today. We've tried others and found J & M's the finest and easiest to install. We warranty the J & M controller for 120 days against defects in workmanship.

ONE 40 TRACK TANDON DISK DRIVE WITH 185K STORAGE, and J & M controller. Radio Shack DOS, manual. No soldering or trace cutting required. Ready to install with instructions \$589.99

TWO 40 TRACK TANDON DISK DRIVES 370K STORAGE, with J & M controller Radio Shack DOS, manual. No soldering or trace cutting. Ready to install and run. Instructions \$849.99

TWO DOUBLE SIDED 40 TRACK DISK DRIVES with 750K storage and J & M controller MULTIDOS and manual and Model III DOS. No soldering or trace cutting. Ready to install and run. Full instructions \$999.99

MODEL III HARD DISK DRIVES

FIVE MEGABYTE hard disk with LDOS disk operating system, all cables, connectors, ready to plug in \$1799.99

TEN MEGABYTE Hard disk with LDOS, all cables, connectors ready to plug in \$1999.99

PRINTERS

DAISY WHEEL PRINTERS:

NEW SMITH CORONA DAISY WHEEL 12 CPS \$699.99

NEW BROTHER DAISY WHEEL 16 CPS \$1199.95

TRACTOR FEED FOR BROTHER \$250.00

C-ITOH STARWRITER II F 10, 40 CPS \$1649.99

C-ITOH STARWRITER III F-10 55CPS \$1999.99

TRACTOR FEED FOR STARWRITERS \$250.00

HIGH QUALITY DOT MATRIX:

C-ITOH PROWRITER I 8510A .2K BUFF. . . PRL. ONLY \$499.99

C-ITOH PROWRITER I 8510ACD. . . 2K BUFF. SER/PRL \$649.99

C-ITOH PROWRITER II 1550. . . 15 INCH. . . 3K BUFFER \$799.99

EPSON MX-80 WITH GRAFTRAX \$479.99

EPSON MX-80/FT WITH GRAFTRAX \$549.99

EPSON MX-100 \$799.99

OKIDATA MICROLINE 80. (80 CPS) \$369.99

OKIDATA MICROLINE 82A (125 CPS) W/TRACTOR \$499.99

OKIDATA MICROLINE 83A (125 CPS) W/TRACTOR \$749.99

OKIDATA MICROLINE 84 (200 CPS) W/TRACTOR \$1199.95

PRINTER CABLE FOR MOD I EXPANSION INTERFACE OR MODEL III (SPECIFY) \$29.95

PROWRITER RIBBONS \$12.99

EPSON MX-80 OR FT RIBBONS \$9.99

OKIDATA RIBBONS. . . (80, 82A, 83A) \$3.49

DISK DRIVES

MODEL I DISK DRIVES

ONE TEC DISK DRIVE 40 TRACK DISK DRIVE with 5ms track to track access time, with power supply chassis, extender cable and shipping for TRS-80. One year warranty on parts and labor. Ten day money back guarantee. Model I or III \$279.00

ONE TEAC 40 TRACK DISK DRIVE, 30 ms track to track, with P/S and chassis, ready to run as drive 0-4. 10 day money guarantee. One year warranty \$279.00

ONE TANDON 40 TRACK DISK DRIVE, 5 ms track to track, with P/S and chassis, ready to run as drive 0-4 or Model III external. 10 day money back warranty \$279.00

ONE 2 DRIVE cable for Model I or III. (Specify) \$25.00

ONE 4 DRIVE cable for Model I only \$35.00

ACCESSORIES/ SOFTWARE, ETC.

16K MEMORY UPGRADE FOR MOD I, III OR COLOR 4K. UNCONDITIONALLY GUARANTEED FOR 2 YEARS \$15.95

DISK OPERATING SYSTEMS

NEWDOS 80 VER. 2 \$139.95

LDOS \$129.95

DOSPLUS \$139.99

MULTIDOS. BEST BUY! SPECIFY DOUBLE OR SINGLE DENS \$79.95

DOUBLE DENSITY MOD I

PERCOM DOUBLER II. (NEW LOW PRICE!) \$139.99

DISKETTE STORAGE

SMOKED PLASTIC HOLDS 50 DISKETTES \$21.95

HARD BOX HOLD TEN \$3.99



MODEMS

LYNX MODEM FOR MOD I OR III \$239.95

OMNITERM SMART TERMINAL PROGRAM \$99.99

SUPER BOOKS FROM IJG MICROSOFT BASIC DECODED AND OTHER MYSTERIES \$29.95

TRS-80 DISK AND OTHER MYSTERIES \$22.50

BASIC FASTER AND BETTER AND OTHER MYSTERIES \$29.95

BASIC FASTER AND BETTER PROGRAMS ON DISKETTE \$19.95

CUSTOM TRS-80 AND OTHER MYSTERIES \$29.95

MONITORS

OLD MOD I SCREEN STARTING TO GIVE YOU HEADACHES? TRY ONE OF THESE HIGH RESOLUTION MONITORS AT SUPER LOW PRICES...

ZENITH GREEN SCREEN 12" \$139.95

BMC 12 INCH GREEN SCREEN \$109.95

BMC 13 INCH COLOR \$299.99

AMDEK 12" BLACK AND WHITE \$97.50

OCI AMBER SCREEN MONITOR 12" \$189.95

CABLE TO CONNECT MONITORS TO MODEL I COMPUTER \$14.95

C.O.D.'S \$5.00 EXTRA. NO C.O.D.'S FOR MODEL III COMPUTERS OR PARCELS THAT CANNOT BE SHIPPED UNITED PARCEL SERVICE. ALL C.O.D.'S REQUIRE CASH OR CERTIFIED CHECK AT TIME OF COLLECTION.

CALL TOLL FREE to order:

1-800-528-1149

WE ACCEPT AMERICAN EXPRESS, VISA and MASTERCARD. NO SURCHARGE FOR CREDIT CARD ORDERS!
SORRY, PERSONAL CHECKS REQUIRE 4-5 WEEKS TO CLEAR.



SIMUTEK

Computer Products Inc.

TRS-80 TM of Radio Shack a Tandy corp.

4897 E. SPEEDWAY BLVD., TUCSON, AZ 85712, (602) 323-9391

```

10 CLS
15 CLEAR 1000
20 PRINTCHR$(23)
30 PRINT@4*64+20,"MATH COUNTDOWN!"
35 PRINT:PRINT:PRINT
40 PRINT"By Adam Wells "
50 FOR X=0 TO 1000:NEXT
60 CLS
65 PRINTCHR$(23)
70 INPUT"Do you need instructions";A$
75 CLS:PRINTCHR$(23)
80 IF A$="YES"THEN 110 ELSE 90
90 IF A$="NO" GOTO 255
100 PRINT"I hope you said 'yes' or 'no' and not 'YES' or 'NO'!":
GOTO 70
105 CLS
110 PRINT"          INSTRUCTIONS!"
115 PRINT"          -*-*-*--*-*--"
120 PRINT"I will give you a math"
130 PRINT"problem.A spaceship will be"
140 PRINT"in the background.It will"
150 PRINT"have a '10' by it.If you"
160 PRINT"solve the problem right the '10'";
170 PRINT"will change to a '9'."
180 PRINT"The '9' will change to an '8'"
190 PRINT"and so on....."
200 PRINT"If you get all the way to '0'"
210 PRINT"the spaceship will take off."
220 INPUT"Now,do you understand";B$
230 IF B$="YES"THEN 255
240 IF B$="NO"THEN 120 ELSE 250
250 PRINT"What did you say?":GOTO 220
255 CLS:PRINTCHR$(23);"Type in the number that          correspon
ds to the type of          problem that you'd like to          practice,
please.":PRINT:PRINT:PRINT"1 => addition":PRINT"2 => subtracti
on":PRINT"3 => multiplication":PRINT"4 => division":PRINT"5 => q
uit
256 GOSUB 270:INPUT "Now, what would you like to          practice";Q
:ON Q GOSUB 285,510,580,1000
258 PRINT "Please enter 1,2,3,4,or 5.":FORQ=1TO500:NEXT:CLS:PRIN
T CHR$(23):GOTO 255
260 CLS
270 SH$=CHR$(176)+STRING$(3,188)+CHR$(176)+CHR$(26)+STRING$(8,24
)+CHR$(176)+CHR$(188)+STRING$(3,131)+CHR$(191)+STRING$(3,131)+CH
R$(188)+CHR$(176)+CHR$(26)+STRING$(14,24)+CHR$(176)+CHR$(188)+ST
RING$(2,191)+STRING$(4,188)+CHR$(191)
280 SH$=SH$+STRING$(4,188)+STRING$(2,191)+CHR$(188)+CHR$(176)+C
HR$(26)+STRING$(10,24)+STRING$(3,191)
282 RETURN
285 CLS
290 PRINT@10*64+30,SH$;
300 FOR I=1TO10
305 PRINT@64*12+15,11-I;
310 S=RND(4):T=RND(5):U=S+T
320 PRINT@6*64+29,S"+"T"="";INPUT X:IF X=U THEN NEXT:GOSUB 500:E
ND
330 PRINT@7*64+20,"SORRY,THAT'S INCORRECT.":FORX=1TO500:NEXT:PRI
NT@6*64,STRING$(64,""):PRINT@7*64,STRING$(64,""):GOTO 320
340 RETURN
500 CLS:FORI=10 TO 0 STEP-1:PRINT@I*64+30,SH$:FORX=1 TO 10:NEXT:
NEXT
505 RETURN
510 CLS
520 PRINT@10*64+30,SH$;
530 FOR I=1 TO 10
540 PRINT@64*12+15,11-I;
550 S=RND(10):T=RND(S):U=S-T
560 PRINT@6*64+29,S"-T"="";INPUT X:IF X=U THEN PRINT@6*64+29,ST
RING$(20,""):NEXT:GOSUB 500:END
570 PRINT@7*64+20,"THAT IS WRONG.":FOR X=1 TO 500:NEXT:PRINT@6*6
4,STRING$(64,""):PRINT@7*64,STRING$(64,""):GOTO 320
580 CLS
590 PRINT@10*64+30,SH$
600 FOR I=1 TO 10
610 PRINT@64*12+15,11-I
620 S=RND(10):T=RND(10):U=S*T
630 PRINT@6*64+29,S"*T"="";INPUT X:IF X=U THEN PRINT@6*64+29,ST
RING$(20,""):NEXT:GOSUB 500:END
640 PRINT@7*64+20,"THAT IS WRONG.":FOR X=1 TO 500:NEXT:PRINT@6*6
4,STRING$(64,""):PRINT@7*64,STRING$(64,""):GOTO 630
650 U=RND(10):T=RND(10):S=T*U
670 PRINT@6*64+29,S"/T"="";INPUT X:IF X=U THEN PRINT@6*64+29,ST
RING$(20,""):NEXT:GOSUB 500:END
680 PRINT@7*64+20,"THAT IS WRONG.":FOR X=1 TO 500:NEXT:PRINT@6*6
4,STRING$(64,""):PRINT@7*64,STRING$(64,""):GOTO 670

```

Program Listing



If you use a Word Processor, you need

GRAMMATIKTM

Beyond Spelling Checking

Grammatik can find **over 15 different** kinds of common errors missed by simple spelling checkers alone, including punctuation and capitalization errors, overworked and wordy phrases, and many others. Use Grammatik with Aspen Software's spelling checker Proofreader, featuring the Random House Dictionary®, or with your current spelling checker for a complete document proofreading system.

Read what the experts say:

"The perfect complement to a spelling checker."

Alan Miller, Interface Age, 5/82

"A surprisingly fast and easy tool for analyzing writing style and punctuation."

Bob Loudon, InfoWorld, 12/81

"Anyone involved with word processing in any way is encouraged to get this excellent program."

A.A. Wicks, Computronics, 6/82

"A dynamic tool for comprehensive editing beyond spelling corrections."

Dona Z. Meilach, Interface Age, 5/82

"A worthy and useful addition to your word processing software."

Stephen Kimmel, Creative Computing, 6/82

Works with CP/M®, IBM-PC®, TRS-80®

**Grammatik \$75.00
Proofreader \$50.00**

Order directly from Aspen Software, or see your local dealer. Specify your computer system configuration when ordering!
Visa, Mastercard accepted.

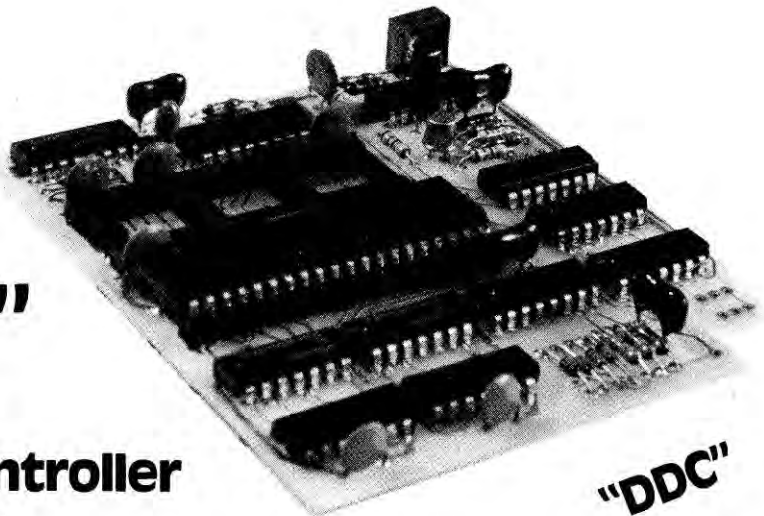
Random House is a registered trademark of Random House, Inc. Other registered trademarks: CP/M: Digital Research -- TRS-80: Tandy Corp. -- IBM: IBM -- Proofreader, Grammatik: Aspen Software Co.

Aspen Software Co.

P.O. Box 339 Tijeras, NM 87059
(505) 281-1634



Aerocomp's Proven Best-By Test! The "DDC"



"DDC"

Double Density Controller

★ Technical Superiority

At last! A double density controller for Model I with HIGHER PROBABILITY OF DATA RECOVERY THAN WITH ANY OTHER DOUBLE DENSITY CONTROLLER ON THE MARKET TODAY! The "DDC" from Aerocomp. No need to worry about the problems that keep cropping up on existing products. AEROCOMP'S new analog design phase lock loop data separator has a wider capture window than the digital types currently on the market. This allows high resolution data centering. The finest resolution available with digital circuitry is 125 ns (nano seconds). The "DDC" analog circuit allows infinitely variable tuning. Attack and settling times are optimum for 5-1/4 inch diskettes. The units presently on the market use a write precompensation circuit that is very "sloppy". Board to board tolerance is extremely wide - in the order of ± 100 ns. The "DDC" is accurate to within ± 20 ns. The bottomline is state of the art reliability!

★ Test Proven

Tests were conducted on AEROCOMP'S "DDC", Percom's "Doubler A" and "Doubler II" and LNW's "LNDoubler" using a Radio Shack TRS80 Model I, Level 2, 48 K with TRS80 Expansion Interface and a Percom TFD100 disk drive (Siemens Model 82). Diskette was Memorex 3401. The test diskette chosen was a well used piece of media to determine performance under adverse conditions. The various double density adapters were installed sequentially in the expansion interface.

The test consisted of formatting 40 tracks on the diskette and writing a 6DB6 data pattern on all tracks. The 6DB6 pattern was chosen because it is recommended as a "worst case" test by manufacturers of drives and diskettes. An attempt was then made to read each sector on the disk once - no retries. Operating system was Newdos/80, Version 1.0, with Double Zap, Version 2.0. Unreadable sectors were totalled and recorded. The test was run ten times with each double density controller and the data averaged. Test results are shown in the table.

★ Features

TRS80 Model I owners who are ready for reliable double density operation will get (1) 80% more storage per diskette, (2) single and double density data separation with far fewer disk I/O errors, (3) single density compatibility and (4) simple plug-in installation. Compatible with all existing double density software.

★ Value

\$139.95 for the BEST double density controller on the market.

\$179.95 for "DDC" complete with DOSPLUS 3.3D

\$229.95 for "DDC" complete with LDOS

★ TEST RESULTS ★

MFR & PRODUCT	SECTORS LOCKED OUT (AVG)
AEROCOMP "DDC"	0
PERCOM "DOUBLER II"	18
PERCOM "DOUBLER A"	250
LNW "LNDOUBLER"	202

Note: test results available upon written request. All tests conducted prior to 8-25-81

Aerocomp's 14 day money back guarantee applies to hardware only.

Specials will be prorated. Shipping \$2.00 in Cont. US. See opposite page for details.

Data Separators

The advances that make the "DDC" great are incorporated in the new AEROCOMP Single Density Data Separator ("SDS") and Double Density Data Separator ("DDS").

★ Has your original manufacturer left you holding the bag?

If you already own a Percom "Doubler A", "Doubler II" or LNW "LNDoubler", the AEROCOMP "DDS" will make it right. Look at the test results:

MFR. & PRODUCT	SECTORS LOCKED OUT	
	WITHOUT "DDS"	WITH "DDS"
PERCOM "DOUBLER II"	18	1
PERCOM "DOUBLER A"	250	0
LNW "LNDOUBLER"	202	0

Note: Same test procedures as "DDC".

* Trademark of Percom Data Co.

** Trademark of LNW

*** Trademark of Tandy Corporation

★ "DDS" \$49.95

(Use 1791 chip from your DD Controller)

★ "DDS" with disk controller

chip included \$79.95

★ Disk controller chip \$34.95

(Shipping \$2.00 Cont. US - see opposite page for details)

Do you need a Single Density Data Separator?

The internal data separator in the WD1771 chip (R/S Expansion Interface) is NOT recommended by WD for reliable data transfer. Do you have any of these problems: Lost data, tracks locked out, CRC errors, disk retry? YOU NEED ONE!

★ "SDS" \$29.95

(For Mod. I; shipping \$2.00)

Plugs directly into your existing Double Density Controller.

See opposite page ▶▶▶▶▶▶



TRS 80*

DISK DRIVES 40 & 80 TRACK

as low **\$199.95**

NEW LOW PRICES

Thanks to you our sales volume has allowed us to cut costs and we're passing the savings along. We offer the best disk drive value in the market place. Reliability, features and cost tough to beat. We deliver...and we stand behind our products. AEROCOMP is the only manufacturer to offer FREE TRIAL! Buy Aerocomp drives today. You deserve the best.

BEST FEATURES

- ★ Fast 5 ms. track-track access time.
- ★ Operates single or double density.
- ★ "FLIPPY" feature for lower media cost (40-1 & 80-1).
- ★ Head load solenoid.
- ★ Disk ejector.
- ★ Easy entry door.
- ★ **NEW** EXTERNAL DRIVE CABLE CONNECTION, (no longer need to remove the cover to hook up cable)

MODEL III DISK DRIVE SYSTEMS

Disk Drive System Kits for your Model III complete with 40 Track Aerocomp Disk Drives (one or two), Disk Controller Board, Power Supply, Mounting Towers and all necessary cables and hardware.

System Kit with One Drive. . . . \$499

System Kit with Two Drives . . . \$699

Convert your cassette-based Model III
to Disk Drives Today!

ORDER TODAY!

- ★ 40-Track Drive. \$259.95
- ★ 80-Track Drive. \$409.95
- ★ 40-Track "FLIPPY" Drive. . . . \$329.95
- ★ 80-Track "FLIPPY" Drive. . . . \$419.95
- ★ 40-Track Dual-Head Drive. . . \$419.95
- ★ 80-Track Dual-Head Drive. . . \$569.95

All above drives are complete with silver enclosure, power supply and external drive cable connection. 115 VAC. 50/60 Hz. 230 VAC. 50/60 Hz available on special order. Add \$15.00.

- ★ 40-Track Bare Drive. \$199.95
- ★ 80-Track Bare Drive. \$359.95
- ★ 40-Track "FLIPPY" Bare Drives \$279.95
- ★ 80-Track "FLIPPY" Bare Drives \$369.95

★ SPECIAL PACKAGES ★

STARTER A. \$299.95
40-Track Drive, 2-drive cable, TRSDOS 2.3 Disk & Manual, Freight & Ins.

STARTER B. \$369.95
40-Track "FLIPPY" Drive, cable, TRSDOS 2.3 Disk & Manual, Freight & Ins.

COMBO C. \$379.00
40-Track Drive, 2-drive cable, LDOS, Freight & Ins.

COMBO D. \$559.00
80-Track "FLIPPY" Drive, 2-drive cable, LDOS, Freight & Ins.

COMBO E. \$639.00
Two 40-Track Drives, 2-Drive cable, TRSDOS 2.3 Disk & Manual, Freight & Ins.

COMBO F. \$989.00
Two 80-Track "FLIPPY" Drives, 4-drive LDOS Ins.

COMBO G. \$889.00
Two 40-Track Dual-Head Drives, cable, smallDOS Disk & Manual, Freight & Ins.

COMBO H. \$1289.00
Two 80-Track Dual-Head Drives, cable, LDOS, Freight & INS.

DOSPLUS 3.4 or NEWDOS / 80.20 available with any package at extra cost. Add \$5.00 per drive for shipping & handling (Cont. US)

FREE TRIAL OFFER

Order your AEROCOMP Disk Drive and use it with your system for up to 14 days. If you are not satisfied for ANY REASON (except misuse or improper handling), return it, packed in the original shipping container, for a full refund. (Hardware only. Special packages will be prorated). We have complete confidence in our products and we know you will be satisfied! **ORDER TODAY!!!**

WARRANTY

We offer you a 120 day unconditional warranty on parts and labor against any defect in materials and workmanship. In the event service, for any reason, becomes necessary, our service department is fast, friendly and cooperative.

100% TESTED

AEROCOMP Disk Drives are completely assembled at the factory and ready to plug in when you receive them. Each drive is 100% bench tested prior to shipment. We even enclose a copy of the test checklist, signed by the test technician, with every drive. AEROCOMP MEANS RELIABILITY!!

ORDER NOW!!

To order by mail, specify Model Number(s) of Drive, cable, etc. (above), enclose check, money order, VISA or MASTERCHARGE card number and expiration date, or request C.O.D. shipment. Texas residents add 5% sales tax. Add \$5.00 per drive for shipping & handling (Cont. US). Please allow 2 weeks for personal checks to clear our bank. No personal checks will be accepted on C.O.D. shipments-cash, money orders or certified checks only. You will receive a card showing the exact C.O.D. amount before your shipment arrives. Be sure to include your name and shipping address. You will be notified of the scheduled shipping date. Your bank credit card will NOT be charged until the day we ship!!

DRIVE CABLES

2-DRIVE \$24.95
4-DRIVE \$34.95

WRITE AEROCOMP TODAY FOR MORE VALUES !!!

CALL TOLL FREE FOR FAST SERVICE (800) 824-7888, OPERATOR 24

FOR VISA / MASTERCHARGE / C.O.D. ORDERS

California dial (800) 852-7777, Operator 24. Alaska and Hawaii dial (800) 824-7919, Operator 24.

TOLL FREE LINES WILL ACCEPT ORDERS ONLY!

For Applications and Technical information, call (214) 337-4346 or drop us a card.

Dealers inquiries invited

AEROCOMP

Redbird Airport, Bldg. 8

P.O. Box 24829

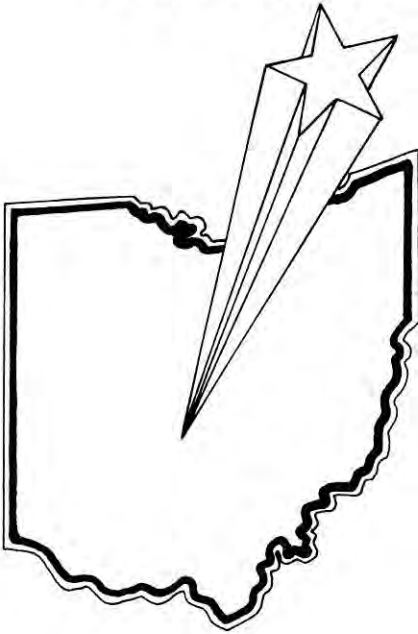
Dallas, TX 75224

✓ 82

States and Capitals

by Dennis Weide

COLUMBUS



The Key Box

Color Computer
32K RAM
Extended Color Basic

Quick—what's the capital of Ohio? If you guessed Cleveland, or Toledo, you'd better use this states program to refresh your memory.

My kids needed to learn the names of the states and their capitals, so I wrote this program to help them. It runs on the Color Computer and requires 32K of RAM and Extended Color Basic. For those of you with only 16K of RAM, I have included a short program that draws the map and leaves enough memory free for you to write your own program.

What Does It Do?

Start by entering PCLEAR 8. This clears all the graphics memory available. When you run the program a menu asks if you want to name the states or their capitals. After you enter your choice, the program draws a map of the continental United States on the screen. One state or one of the five Great Lakes is colored in and a dashed cursor ap-

Program Listing 1. 32K Version

```

10 ' STATES AND CAPITALS
20 '
30 ' BY DENNIS H. WEIDE
40 '
50 ' (C) 1982
60 CLS
70 PMODE4,5:PCLS:PMODE4,1:PCLS
80 PRINT:PRINTSTRING$(32,"%");
90 PRINTTAB(6)"STATES AND CAPITALS"
100 PRINTTAB(14)"BY":PRINTTAB(9)"DENNIS WEIDE":PRINTTAB(11)"(C)
1982"
110 PRINTSTRING$(32,"%")
120 PRINTTAB(6)"1. NAME THE STATES":PRINT
130 PRINTTAB(6)"2. NAME THE CAPITALS"
140 H$="CORRECT":J$="WRONG"
150 DIMA(1):DIMB(1)
160 DIMS$(53):DIMS1(53)
170 DIMS2(53):DIMIC(53)
180 DIMC(1):DIMD(1)
190 DIME(1):DIMF(1)
200 DIMG(1):DIMH(1)
210 DIMI(1):DIMJ(1)
220 DIMK(1):DIML(1)
230 DIMM(1):DIMN(1)
240 DIMO(1):DIMP(1)
250 DIMQ(1):DIMR(1)
260 DIMS(1):DIMT(1)
270 DIMU(1):DIMV(1)
280 DIMW(1):DIMX(1)
290 DIMY(1):DIMZ(1)
300 DIMZZ(1):DIMAA(1)
310 DIMSC$(53)
320 FORY=1TO53:READS$(Y),S1(Y),S2(Y)
330 NEXTY
    
```

Listing 1 continues

Listing 1 continued

```

340 FORY=1TO53:READSC$(Y):NEXTY
350 '      DRAW LETTERS
360 PMODE4,1
370 PCLS5:COLOR0,1:DRAW"BM12,104;U8R4D8U4L4"
380 GET(12,96)-(16,104),A,G
390 PCLS:DRAW"BM12,104;U8R3D4L3R4D4L4"
400 GET(12,96)-(16,104),B,G
410 PCLS:DRAW"BM12,104;U8R4D2BD4D2L4":GET(12,96)-(16,104),C,G
420 PCLS:DRAW"BM12,104;U8R2F2D4G2L2":GET(12,96)-(16,104),D,G
430 PCLS:DRAW"BM12,104;R4L4U4NR3U4R4":GET(12,96)-(16,104),E,G
440 PCLS:DRAW"BM12,104;U4NR3U4R4":GET(12,96)-(16,104),F,G
450 PCLS:DRAW"BM12,104;U8R4BD4NL2D4L4":GET(12,96)-(16,104),G,G
460 PCLS:DRAW"BM12,104;U8D4R4U4D8":GET(12,96)-(16,104),H,G
470 PCLS:DRAW"BM12,104;R4L2U8L2R4":GET(12,96)-(16,104),I,G
480 PCLS:DRAW"BM12,104;U4D4R4U8":GET(12,96)-(16,104),J,G
490 PCLS:DRAW"BM12,104;U8BR4G4E2":LINE-(16,104),PSET:GET(12,96)-(16,104),K,G
500 PCLS:DRAW"BM12,104;NR4U8":GET(12,96)-(16,104),L,G
510 PCLS:DRAW"BM12,104;U8R2ND3R2D8":GET(12,96)-(16,104),M,G
520 PCLS:DRAW"BM12,104;U8":LINE(12,96)-(16,104),PSET:LINE-(16,96),PSET:GET(12,96)-(16,104),N,G
530 PCLS:DRAW"BM12,104;U8R4D8L4":GET(12,96)-(16,104),O,G
540 PCLS:DRAW"BM12,104;U8R4D4L4":GET(12,96)-(16,104),P,G
550 PCLS:DRAW"BM12,104;U8R4D8NH3L4":GET(12,96)-(16,104),Q,G
560 PCLS:DRAW"BM12,104;U8R4D4L4F4":GET(12,96)-(16,104),R,G
570 PCLS:DRAW"BM12,104;NU1R4U4L4U4R4D1":GET(12,96)-(16,104),S,G
580 PCLS:DRAW"BM12,104;BR2U8L2R4":GET(12,96)-(16,104),T,G
590 PCLS:DRAW"BM12,104;U8BR4D8L4":GET(12,96)-(16,104),U,G
600 PCLS:DRAW"BM12,104;BU8D6F2E2U6":GET(12,96)-(16,104),V,G
610 PCLS:DRAW"BM12,104;U8BR4D8L2NU2L2":GET(12,96)-(16,104),W,G
620 PCLS:DRAW"BM12,104;U2E4U2BL4D2F4D2":GET(12,96)-(16,104),X,G
630 PCLS:DRAW"BM12,104;BU8D2F2ND4E2U2":GET(12,96)-(16,104),Y,G
640 PSET:LINE(12,96)-(16,96),PSET:LINE-(12,104),PSET:LINE-(16,104),PSET:GET(12,96)-(16,104),Z,G
650 PCLS:GET(12,96)-(16,104),ZZ,G
660 DRAW"BM12,104;R4":GET(12,96)-(16,104),AA,G
670 PRINT:PRINT
680 PRINTTAB(5)"ENTER ONE OF THE ABOVE";
690 WW=RND(9999):GS$=INKEY$:IF GS$=""THEN690
700 GS=VAL(GSS):CLS:IFGS<10RGS>2THENG$=1
710 NQ=10
720 PMODE4,1:PCLS5:SCREEN1,1:GOTO1090
730 B$=B$+A$
740 RETURN
750 A1=A1+8:A3=A3+8
760 IFA$="A"THENPUT(A1,A2)-(A3,A4),A,PSET:GOTO730
770 IFA$="B"THENPUT(A1,A2)-(A3,A4),B,PSET:GOTO730
780 IFA$="C"THENPUT(A1,A2)-(A3,A4),C,PSET:GOTO730
790 IFA$="D"THENPUT(A1,A2)-(A3,A4),D,PSET:GOTO730
800 IFA$="E"THENPUT(A1,A2)-(A3,A4),E,PSET:GOTO730
810 IFA$="F"THENPUT(A1,A2)-(A3,A4),F,PSET:GOTO730
820 IFA$="G"THENPUT(A1,A2)-(A3,A4),G,PSET:GOTO730
830 IFA$="H"THENPUT(A1,A2)-(A3,A4),H,PSET:GOTO730
840 IFA$="I"THENPUT(A1,A2)-(A3,A4),I,PSET:GOTO730

```

Listing 1 continues

pears in box 1 (see Fig. 1). As you type your answer it appears in this box.

Press enter after completing your answer and you will hear a short musical tune. Then box 2 tells you whether you are correct. If you are wrong, the correct answer appears in box 3; otherwise, this box remains blank. Box 4 is used to display the complement of the correct answer. (If you are naming states, it displays capitals, and vice versa.)

After every 10 questions, the program displays your score and asks if you wish to answer 10 more questions. This will continue until you respond with "no" or name all the states or capitals. There are 48 questions if you choose to name the capitals and 53 questions if you choose to name the states and Great Lakes.

Here's How It Works

To see how the program works, let's look at Program Listing 1 and Table 1. Lines 1150 and 1160 choose which graphics pages are displayed on the screen. While one map is displayed on the screen, another is being drawn on the pages not displayed. After you have answered the question, the program switches graphics pages and the map appears with another state colored in.

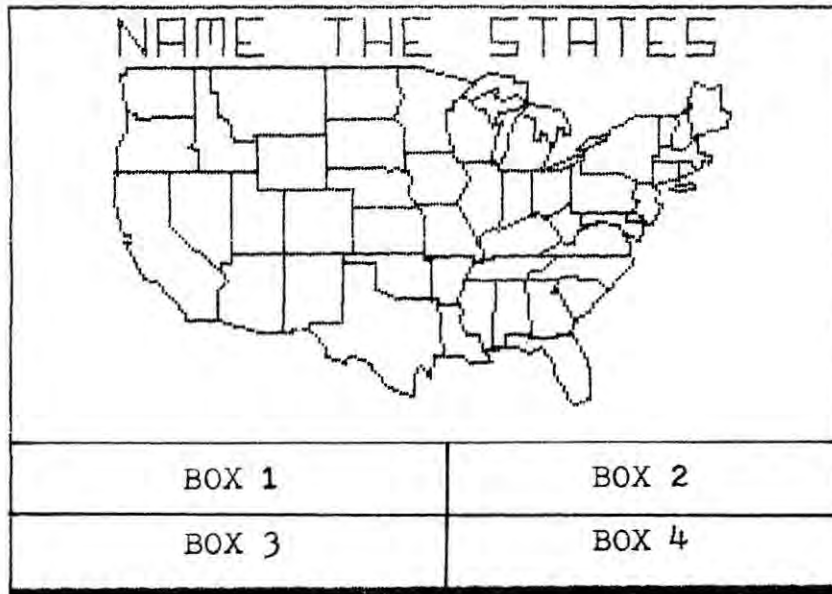


Figure 1

TEACH YOUR CHILDREN

SPANISH DRILL AND PRACTICE—An 18 program set that gives intensive drill and practice for the first or second year spanish student. The complete set consists of verbs, vocabulary, grammar usage, and reading. It costs \$49.95!

ALPHA—Alphabet recognition for pre-schoolers.

ALPHA II—More alphabet exercises.

SIGMA—Addition problems for grades 1-3.

SIGMA-EX—Addition problems for the younger or slower learner.

SIGMA-82—Addition, subtraction, multiplication, and division. Nine speed levels.

Learning to Count Money—A three program system that teaches how to count money.

Available on cassette only for TRS-80 Models I and III \$6.95 each, two for \$12.00, four for \$21.00. Learning to Count Money \$19.95.

Add \$1.00 to total order for first class shipment.

✓ 188

M Mercer Systems, Inc.
87 Scooter Lane
Hicksville, N.Y. 11801

Listing 1 continued

```

850 IFA$="J"THENPUT(A1,A2)-(A3,A4),J,PSET:GOTO730
860 IFA$="K"THENPUT(A1,A2)-(A3,A4),K,PSET:GOTO730
870 IFA$="L"THENPUT(A1,A2)-(A3,A4),L,PSET:GOTO730
880 IFA$="M"THENPUT(A1,A2)-(A3,A4),M,PSET:GOTO730
890 IFA$="N"THENPUT(A1,A2)-(A3,A4),N,PSET:GOTO730
900 IFA$="O"THENPUT(A1,A2)-(A3,A4),O,PSET:GOTO730
910 IFA$="P"THENPUT(A1,A2)-(A3,A4),P,PSET:GOTO730
920 IFA$="Q"THENPUT(A1,A2)-(A3,A4),Q,PSET:GOTO730
930 IFA$="R"THENPUT(A1,A2)-(A3,A4),R,PSET:GOTO730
940 IFA$="S"THENPUT(A1,A2)-(A3,A4),S,PSET:GOTO730
950 IFA$="T"THENPUT(A1,A2)-(A3,A4),T,PSET:GOTO730
960 IFA$="U"THENPUT(A1,A2)-(A3,A4),U,PSET:GOTO730
970 IFA$="V"THENPUT(A1,A2)-(A3,A4),V,PSET:GOTO730
980 IFA$="W"THENPUT(A1,A2)-(A3,A4),W,PSET:GOTO730
990 IFA$="X"THENPUT(A1,A2)-(A3,A4),X,PSET:GOTO730
1000 IFA$="Y"THENPUT(A1,A2)-(A3,A4),Y,PSET:GOTO730
1010 IFA$="Z"THENPUT(A1,A2)-(A3,A4),Z,PSET:GOTO730
1020 IFA$="."THEN4690
1030 IFA$=" "THENPUT(A1,A2)-(A3,A4),ZZ,PSET:GOTO730
1040 IFA$=CHR$(8)THEN1070
1050 A1=A1-8:A3=A3-8
1060 GOTO740
1070 GOSUB4350:GOTO740
1080 B$=B$+A$:GOTO740
1090 ' DRAW MAP
1100 NP=NP+1:NO=NO+1:IF NO>NQ THEN4230
1110 IFNP>53THEN4230
1120 IFGS=2ANDNP>48THEN4230
1130 NR=NR+1
1140 IFV=1THEN1160
1150 PMODE 4,1:PCLS5:GOTO1170
1160 PMODE 4,5:PCLS5
1170 A$="":B$=""
1180 COLOR0,1
1190 LINE(0,0)-(255,191),PSET,B
1200 LINE(135,142)-(135,192),PSET
1210 LINE(0,142)-(255,142),PSET
1220 LINE(0,166)-(255,166),PSET
1230 LINE(34,4)-(42,16),PSET:DRAW"BM34,16;U12BR8D12BR4U12R8D8NL8

```

Line Numbers	Function
10-50	Program header
60-130	Display program menu
140	Define answer string (H\$,J\$)
150-310	Dimension all arrays
320-340	Read data statements
350-660	Draw and save high-resolution graphics letters
670-710	Select game (states or capitals)
720	Display hi-res screen
750-1060	Display letter pressed on hi-res screen
1090-3780	Draw map of U.S.A.
3790	Clear keyboard buffer
3800-3890	Choose state and screen, draw cursor
3900	Scan keyboard buffer for key pressed
4130-4210	Data (name of states)
4220	Additional Paint command for Michigan
4230-4330	End of round—try again?
4410-4450	Data (name of capitals)
4500-4580	Convert INKEY\$ to string for display
4700-4720	Sound routines for right or wrong answer

Table 1. Line Description

Listing 1 continues

FAST EFFICIENT MACHINE LANGUAGE


COLOR COMPUTER Action Games

SEND FOR OUR LATEST FLYER. GET ON OUR MAILING LIST.

ARCAD GAMES

NEW!


Space Raiders



Not just another invaders type game. We think this one is the best—great action, great sound, you'll love it!!

CASSETTE (16K) ... \$24.95
DISK (32K) ... \$29.95


CAVE HUNTER



Outsmart the creatures that pursue you as you hunt for treasure in a maze of cave passages. Lots of colors and sounds!

CASSETTE (16K) ... \$24.95
DISK (32K) ... \$29.95

COLOR HAYWIRE



A new super hi-res space game. Wave after wave of alien attackers, each one a different and unique challenge to your skills.


CASSETTE (16K) ... \$24.95
DISK (32K) ... \$29.95

They're calling this one a "classic". You'll have hours of fast-paced fun zapping robots. Super hi-res action!

CASSETTE (16K) ... \$24.95
DISK (32K) ... \$29.95

ADVENTURE GAMES


Calixto Island



A challenging puzzle with an occasional twist of humor. There's a treasure waiting to be discovered!

CASSETTE (16K) ... \$19.95

The Black Sanctum

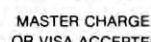



For the player who enjoys suspense. You'll encounter the forces of black magic in this spooky adventure.

CASSETTE (16K) ... \$19.95

MARK DATA PRODUCTS 23802 BARQUILLA, MISSION VIEJO, CA 92691 • (714) 768-1551

We pay shipping on all orders in the continental U.S. and Canada. Overseas add \$3.00. California residents please add 6% sales tax. We are always looking for quality machine language programs. Contact us for details.

TRS-80[®] COMPUTERS

PURE RADIO SHACK EQUIPMENT

BUY BY DIRECT-MAIL

1-800-841-0860
CONVENIENT ORDER ENTRY

MICRO MANAGEMENT SYSTEMS INC.

TRS-80 COLOR COMPUTER



DISCOUNT PRICED
FROM
CALL

BUY DIRECT 26-3004

TRS-80 MODEL III COMPUTER



DISCOUNT PRICES
FROM
\$588

BUY DIRECT 26-1061

TRS-80 MODEL 16 COMPUTER



DISCOUNT PRICED
FROM
\$4098

BUY DIRECT 26-6001

FRANKLIN
ACE 1000
COMPUTER
DISCOUNT PRICED
FROM **\$CALL**

SMITH CORONA TP-I
DAISY WHEEL PRINTER

DISCOUNT PRICED
FROM

\$559

BUY DIRECT



ATARI
HOME COMPUTERS
DISCOUNT
PRICED
FROM **\$629**

TRS-80 MODEL II COMPUTER



DISCOUNT PRICED
FROM
CALL

BUY DIRECT 26-4002

TRS-80 I/III
**HARD
DRIVES** **\$1988**
26-1130

commodore
TEXAS INSTRUMENT
CALL FOR PRICES

TRS-80 PRINTERS MFG BY RADIO SHACK

DWP-410	\$1287.00
DMP-100	\$339.00
DMP-200	\$679.00
DMP-400	\$1015.00
DMP-500	\$1525.00

PLEASE WRITE US FOR
FREE

•COPY OF OUR CUSTOMER DIS-
COUNT PRICE LIST UPON RE-
QUEST

•COPY OF MANUFACTURERS WARRANTY
UPON REQUEST

OKIDATA EPSON

**MICRO MANAGEMENT
SYSTEMS INC.**

PARCEL DIVISION
DEPT. NO. 4
2803 THOMASVILLE RD. EAST
CAIRO, GA. 31728

GA. INFO **912-377-7120**
TM - TANDY CORPORATION

**TRS-80 SOFTWARE
VISICALC, PROFILE,
SCRIPSIT & MORE
SAVE MONEY**

PRICES AND PRODUCTS SUBJECT TO
CHANGE WITHOUT NOTICE. ORDERS
SUBJECT TO VERIFICATION AND AC-
CEPTANCE.

Listing 1 continued

D4BR4U12R4ND8R4D12BR4NR8U4NR4U8R8"
 1240 IFGS=2THEN1260
 1250 DRAW"BR7"
 1260 DRAW"BR12R4ND12R4BR4D12U4R8NU8D4BR4NR8U4NR4U8R8"
 1270 IFGS=2THEN1310
 1280 DRAW"BR7"
 1290 DRAW"BR12BD12R8U4L8U8R8BR4R4ND12R4BR4ND12R8D8NL8D4BR8U12NL4
 R4BR4NR8D8NR4D4R8BR4R8U4L8U8R8"
 1300 GOTO1320
 1310 DRAW"BR12R8ND2L8D12R8NU2BR4U12R8D8NL8D4BR4U12R8D8L8U8R8BR4R
 2NR2D12NL2R2BR8U12NL4R4BR4R8D12BL8U4NR8U8R8BR4D12R8BR4NU2R8U4L8U
 8R8D2"
 1320 LINE(36,20)-(36,22),PSET
 1330 LINE-(34,22),PSET
 1340 LINE-(36,34),PSET
 1350 LINE-(36,41),PSET
 1360 LINE-(33,47),PSET
 1370 LINE-(32,64),PSET
 1380 LINE-(35,75),PSET
 1390 DRAW"R2D2L2"
 1400 LINE-(41,89),PSET
 1410 LINE-(45,90),PSET
 1420 LINE-(54,101),PSET
 1430 LINE-(54,103),PSET
 1440 LINE-(64,103),PSET
 1450 LINE-(77,107),PSET
 1460 LINE-(87,107),PSET
 1470 DRAW"U1R5"
 1480 LINE-(97,112),PSET
 1490 LINE-(97,115),PSET
 1500 LINE-(103,117),PSET
 1510 LINE-(104,115),PSET
 1520 LINE-(109,116),PSET
 1530 LINE-(116,125),PSET
 1540 LINE-(124,128),PSET
 1550 LINE-(124,122),PSET
 1560 LINE-(126,118),PSET
 1570 LINE-(129,122),PSET
 1580 LINE-(130,115),PSET

1590 LINE-(139,115),PSET
 1600 LINE-(141,117),PSET
 1610 LINE-(148,117),PSET
 1620 LINE-(145,113),PSET
 1630 LINE-(156,112),PSET
 1640 LINE-(160,114),PSET
 1650 LINE-(163,112),PSET
 1660 LINE-(167,118),PSET
 1670 LINE-(167,121),PSET
 1680 LINE-(171,127),PSET
 1690 LINE-(171,129),PSET
 1700 LINE-(173,131),PSET
 1710 LINE-(178,129),PSET
 1720 LINE-(178,121),PSET
 1730 LINE-(177,116),PSET
 1740 LINE-(172,107),PSET
 1750 LINE-(175,102),PSET
 1760 LINE-(178,101),PSET
 1770 LINE-(179,98),PSET
 1780 LINE-(191,85),PSET
 1790 LINE-(189,75),PSET
 1800 LINE-(193,77),PSET
 1810 LINE-(194,75),PSET
 1820 LINE-(194,72),PSET
 1830 LINE-(197,72),PSET
 1840 LINE-(200,65),PSET
 1850 LINE-(198,64),PSET
 1860 LINE-(199,61),PSET
 1870 LINE-(197,59),PSET
 1880 LINE-(207,56),PSET
 1890 LINE-(212,53),PSET
 1900 DRAW"U2R2D1"
 1910 LINE-(215,51),PSET
 1920 DRAW"U2L2U1L2U6"
 1930 LINE-(220,40),PSET
 1940 LINE-(221,35),PSET
 1950 LINE-(218,34),PSET
 1960 LINE-(218,26),PSET
 1970 LINE-(215,27),PSET

Listing 1 continues

PRICES YOU CAN'T BEAT!..

SPECIALS THIS MONTH:

LNW-80 Modell \$1295

48K, 5 1/8" DISK CONTR. RGB COLOR
 DOS-PLUS. 3.4. HI RES GRAPHICS

COMPUTERS

LNW-80 **\$1,375** Mod II **\$1,595**
 NEC 8001 32K **\$729**
 PMC-81 16K **\$565**
 SUPER BRAIN II DD **\$1,935**
 TIMEX 1000 **\$85** 16K MEM **\$45**
 NEW: AMI II++ (Apple Clone) **CALL**

EXPANSION INTERFACES

LNW-32K-ASSM/TST/GOLD/CASE **\$349**
 NEC 8012 I/O 32K **\$489**

CRT MONITORS

AMDEK B&W **\$89** GREEN **\$159**
 AMDEK COLOR **\$359** RGB **\$739**
 TECO B&W **\$99** GREEN **\$129**
 TECO COLOR RGB **\$429**
 NEW: BMC COLOR RGB **\$275**

TEAC 1/2 SIZE DRIVES

	Bare	Compl
40 TRK S/S	\$209	\$245
40 TRK D/S	\$290	\$329
80 TRK S/S	\$290	\$329
80 TRK D/S	\$350	\$375

TANDON DRIVES

	Bare	Compl
100-1 40 TRK S/S	\$199	\$235
100-2 40 TRK D/S	\$280	\$319
100-3 80 TRK S/S	\$280	\$319
100-4 80 TRK D/S	\$340	\$375
5 MEG HARD DISC W/REMOVABLE CARTRIDGE		\$1,449

C-ITOH PRINTERS

	PAR	SER
PROWRITER 8510	\$459	\$559
PROWRITER 1550	\$669	\$749
F-10 40 CPS	\$1,365	\$1,365
F-10 55 CPS	\$1,615	\$1,615
F-10 TRACTOR FEED		\$195
NEW: QUME SPRINT 11		\$1,450

MODEMS

SIGNALMAN **\$85**

TRS COLOR COMPUTER EXPANSION BOARD

REAL TIME CLOCK
 PAR PRINTER PORT
 ROM PACK SLOT
 DISK DRIVE CONTR.
 80 x 24 DISPLAY
 EXTRA MEMORY
 HI RESOLUTION **\$350**

COLOR RGB MONITOR

BMC 12" MED RES **\$275**

SOFTWARE

10% OFF **CALL**

**24 HOUR TOLL FREE ORDERS
 VISA/MASTER CHARGE ONLY:
 (800) 633-2252 EXT 720**

ALL QUESTIONS:(313) 538-1112

*MICHIGAN RESIDENTS ADD 4% SALES TAX-POSTAGE
 CALL FOR CHARGES-PRICES ARE DISCOUNTED FOR
 CASH AND MONEY ORDER (NON CERTIFIED CHECKS
 ALLOW 2 WEEKS TO CLEAR). MASTER CARD AND
 VISA ADD 3%. NO C.O.D. NO NET TERMS*

VESPA COMPUTER OUTLET

16727 Patton, Detroit, MI 48219

518

Listing 1 continued

1980 LINE-(210,25),PSET
 1990 LINE-(207,35),PSET
 2000 LINE-(204,36),PSET
 2010 LINE-(192,36),PSET
 2020 LINE-(181,43),PSET
 2030 LINE-(178,43),PSET
 2040 LINE-(174,47),PSET
 2050 DRAW"R2D2L2"
 2060 LINE-(163,54),PSET
 2070 LINE-(168,43),PSET
 2080 DRAW"U3R2D2R2U2"
 2090 LINE-(169,34),PSET
 2100 LINE-(159,32),PSET
 2110 DRAW"U7L4U2"
 2120 LINE-(147,22),PSET
 2130 LINE-(142,25),PSET
 2140 LINE-(126,20),PSET
 2150 LINE-(36,20),PSET
 2160 LINE(36,34)-(39,35),PSET
 2170 DRAW"D2"
 2180 LINE-(48,36),PSET
 2190 LINE-(57,36),PSET
 2200 LINE(57,20)-(57,44),PSET
 2210 LINE-(55,46),PSET
 2220 LINE-(58,47),PSET
 2230 LINE-(58,53),PSET
 2240 LINE(32,54)-(75,54),PSET
 2250 LINE(49,54)-(49,72),PSET
 2260 LINE-(65,87),PSET
 2270 LINE-(67,90),PSET
 2280 LINE-(64,93),PSET
 2290 LINE-(64,103),PSET
 2300 LINE(68,54)-(68,84),PSET
 2310 DRAW"L3D3"
 2320 DRAW"BM62,20;D8R2D8"
 2330 LINE-(67,37),PSET
 2340 LINE-(69,44),PSET
 2350 DRAW"R7U2D2D16R21U40"
 2360 LINE(75,42)-(97,42),PSET

2370 LINE(76,60)-(105,60),PSET
 2380 LINE(84,60)-(84,107),PSET
 2390 LINE(68,81)-(127,81),PSET
 2400 LINE(105,60)-(105,81),PSET
 2410 LINE(102,81)-(102,104),PSET
 2420 LINE-(92,104),PSET
 2430 LINE-(92,106),PSET
 2440 LINE(102,84)-(112,84),PSET
 2450 LINE-(112,93),PSET
 2460 LINE-(119,96),PSET
 2470 LINE-(131,96),PSET
 2480 LINE-(133,115),PSET
 2490 DRAW"BM127,81;D2R2D14"
 2500 LINE(119,20)-(119,26),PSET
 2510 LINE-(121,29),PSET
 2520 LINE-(118,37),PSET
 2530 LINE-(97,37),PSET
 2540 LINE(118,37)-(121,40),PSET
 2550 LINE-(121,54),PSET
 2560 LINE-(118,53),PSET
 2570 LINE-(117,54),PSET
 2580 LINE-(115,53),PSET
 2590 LINE-(97,53),PSET
 2600 LINE(121,53)-(123,56),PSET
 2610 LINE-(122,62),PSET
 2620 LINE-(125,66),PSET
 2630 LINE-(127,69),PSET
 2640 LINE-(127,81),PSET
 2650 LINE(105,66)-(125,66),PSET
 2660 LINE(143,25)-(136,32),PSET
 2670 DRAW"D2L2"
 2680 LINE-(134,40),PSET
 2690 LINE-(137,51),PSET
 2700 LINE-(148,51),PSET
 2710 DRAW"DIR2"
 2720 LINE(121,48)-(135,48),PSET
 2730 LINE(138,51)-(141,57),PSET
 2740 LINE-(137,65),PSET
 2750 LINE-(124,65),PSET
 2760 LINE(149,51)-(150,53),PSET
 2770 LINE-(151,56),PSET

2780 LINE-(151,70),PSET
 2790 LINE-(149,73),PSET
 2800 LINE-(145,75),PSET
 2810 LINE-(143,78),PSET
 2820 LINE(137,65)-(145,81),PSET
 2830 DRAW"D3L3U2L14"
 2840 LINE(142,84)-(137,97),PSET
 2850 DRAW"D1L6"
 2860 LINE(137,97)-(139,100),PSET
 2870 LINE-(138,103),PSET
 2880 LINE-(140,108),PSET
 2890 LINE-(144,108),PSET
 2900 LINE-(145,113),PSET
 2910 LINE(139,90)-(168,90),PSET
 2920 LINE(149,90)-(148,112),PSET
 2930 DRAW"R4U4R8"
 2940 LINE-(158,90),PSET
 2950 DRAW"BM159,109;R9U1R4"
 2960 LINE(173,104)-(168,93),PSET
 2970 DRAW"D1L2"
 2980 LINE-(169,89),PSET
 2990 DRAW"R5D1R6"
 3000 LINE(180,90)-(183,93),PSET
 3010 DRAW"BM144,83;R4U1R41"
 3020 LINE(158,90)-(160,87),PSET
 3030 LINE-(163,87),PSET
 3040 LINE-(168,82),PSET
 3050 LINE(149,73)-(150,74),PSET
 3060 LINE-(153,72),PSET
 3070 LINE-(154,72),PSET
 3080 LINE-(160,69),PSET
 3090 LINE-(160,54),PSET
 3100 LINE(160,67)-(161,69),PSET
 3110 LINE-(162,68),PSET
 3120 LINE-(165,70),PSET
 3130 LINE-(170,78),PSET
 3140 LINE-(173,78),PSET
 3150 LINE-(174,74),PSET
 3160 LINE-(177,73),PSET

Listing 1 continues

UPGRADE

AT LAST!!! A Micro-Design Model III System Upgrade.

The Micro-Design Model III upgrade includes Micro-Designs exceptional MDX-6 disk controller board, one 40 track double density Disk Drive, necessary installation cables and hardware.

FOR MORE INFORMATION & FREE LITERATURE
CALL OR WRITE

MICRO-DESIGN

6301 MANCHACA ROAD
AUSTIN TEXAS, 78745

TOLL FREE

1-800-531-5002

\$399⁰⁰

463

See our ads on pages 148 & 324

3170 LINE-(178,72),PSET
 3180 LINE-(181,71),PSET
 3190 LINE-(187,72),PSET
 3200 LINE-(189,77),PSET
 3210 LINE(163,81)-(168,78),PSET
 3220 LINE(136,31)-(140,30),PSET
 3230 LINE-(144,34),PSET
 3240 LINE-(146,34),PSET
 3250 LINE-(148,40),PSET
 3260 LINE-(151,38),PSET
 3270 LINE-(149,44),PSET
 3280 LINE-(148,51),PSET
 3290 LINE(142,31)-(150,27),PSET
 3300 LINE-(149,30),PSET
 3310 LINE-(152,31),PSET
 3320 LINE-(156,29),PSET
 3330 LINE-(159,33),PSET
 3340 LINE-(155,34),PSET
 3350 LINE-(150,35),PSET
 3360 LINE-(149,39),PSET
 3370 LINE(159,33)-(155,37),PSET
 3380 LINE-(153,43),PSET
 3390 LINE-(153,47),PSET
 3400 LINE-(150,53),PSET
 3410 LINE(157,35)-(161,37),PSET
 3420 DRAW"D7R2U3"
 3430 LINE-(165,42),PSET
 3440 LINE-(166,47),PSET
 3450 LINE(150,54)-(169,54),PSET
 3460 LINE-(176,50),PSET
 3470 LINE-(176,47),PSET
 3480 LINE-(183,44),PSET
 3490 LINE-(184,42),PSET
 3500 LINE(172,52)-(172,68),PSET
 3510 LINE-(191,68),PSET
 3520 LINE-(194,69),PSET
 3530 LINE-(194,72),PSET
 3540 DRAW"BM189,68;D3R6"
 3550 LINE(172,64)-(169,67),PSET

3560 LINE-(164,70),PSET
 3570 DRAW"BM175,68;D4R5"
 3580 DRAW"BM175,51;D4R13"
 3590 LINE-(193,58),PSET
 3600 DRAW"R4U9R2U12"
 3610 LINE(192,58)-(191,63),PSET
 3620 LINE-(193,64),PSET
 3630 LINE-(191,68),PSET
 3640 LINE(197,51)-(209,51),PSET
 3650 LINE-(210,54),PSET
 3660 LINE(205,51)-(205,57),PSET
 3670 LINE(199,46)-(207,47),PSET
 3680 LINE-(210,44),PSET
 3690 LINE(204,36)-(205,39),PSET
 3700 LINE-(203,43),PSET
 3710 LINE-(203,47),PSET
 3720 LINE(209,32)-(208,35),PSET
 3730 LINE-(209,43),PSET
 3740 LINE-(210,43),PSET
 3750 LINE(202,60)-(209,58),PSET
 3760 LINE-(210,60),PSET
 3770 LINE-(206,61),PSET
 3780 LINE-(202,60),PSET
 3790 POKEL35,0
 3800 IFNP>53THEN4230
 3810 IFGS=2ANDNP>48THEN4230
 3820 X=RND(53):IFIC(X)=1THEN3820
 3830 IFGS=2ANDX>48THEN3820
 3840 IFX=35THENGOSUB4220
 3850 IC(X)=1:PAINT(S1(X),S2(X)),0,0
 3860 IFV=0THENV=1ELSEV=0
 3870 SCREEN1,1
 3880 A1=8:A2=152:A3=12:A4=160
 3890 PUT(A1+8,A2)-(A3+8,A4),AA,PSET
 3900 WW=RND(9999):A\$=INKEY\$:IFA\$=""THEN3900
 3910 IFA\$=CHR\$(13)THEN3940
 3920 GOSUB750
 3930 GOTO3890
 3940 TF=TF+1:PUT(A1+8,A2)-(A3+8,A4),ZZ,PSET:IFGS=2THEN4590

Listing 1 continues

TRS-80*

100% Radio Shack Equipment

SAVE A BUNDLE

Order Toll Free 1-800-874-1551

FLA Residents 904-438-6507 collect

EPSON.....OKIDATA.....CITOH etc.



SALES CO.

704 W Michigan Ave; P.O. Box 8098
 Pensacola, FLA 32506

Listing 1 continued

```
3950 IFSS(X)=B$THEN4050
3960 A1=135:A2=152:A3=139:A4=160
3970 GOSUB4700
3980 GOSUB4500
3990 A1=8:A2=172:A3=12:A4=180
4000 GOSUB4530
4010 A1=135:A2=172:A3=139:A4=180
4020 GOSUB4460
4030 FORSA=1TOL00:NEXTSA
4040 GOTO1090
4050 A1=135:A2=152:A3=139:A4=160
4060 GOSUB4720
4070 GOSUB4560
4080 A1=135:A2=172:A3=139:A4=180:GOSUB4460
4090 FORSA=1TO5:NEXTSA
4100 B$="":A$=""
4110 TC=TC+1
4120 GOTO1090
4130 DATASOUTH CAROLINA,176,98,GEORGIA,164,100,FLORIDA,172,116,K
ENTUCKY,160,76,TENNESSEE,160,84,ALABAMA,152,100
4140 DATAMISSISSIPPI,144,100,ARKANSAS,132,88,LOUISIANA,136,108,O
KLAHOMA,120,88,TEXAS,116,108,MONTANA,80,32,IDAHO,64,44
4150 DATAWYOMING,88,52,COLORADO,92,72,NEW MEXICO,92,92,ARIZONA,7
6,92,UTAH,76,72,NEVADA,60,72,WASHINGTON,48,28
4160 DATAOREGON,48,44,CALIFORNIA,44,80,MAINE,212,32,MASSACHUSETT
S,204,48,NEW HAMPSHIRE,204,44,VERMONT,200,40
4170 DATARHODE ISLAND,208,52,CONNECTICUT,200,52,NEW YORK,188,48,
NEW JERSEY,196,64,PENNSYLVANIA,184,64
4180 DATAOHIO,164,60,INDIANA,156,60,ILLINOIS,144,60,MICHIGAN,160
,48,WISCONSIN,140,40
4190 DATAMINNESOTA,128,36,IOWA,128,56,MISSOURI,132,72,NORTH DAKO
TA,108,28,SOUTH DAKOTA,108,44,NEBRASKA,108,60
4200 DATAKANSAS,108,76,DELAWARE,192,70,MARYLAND,184,70,VIRGINIA,
180,76,WEST VIRGINIA,172,72,NORTH CAROLINA,176,84
4210 DATALAKE ONTARIO,180,44,LAKE SUPERIOR,148,24,LAKE MICHIGAN,
152,36,LAKE HURON,164,36,LAKE ERIE,170,52
4220 PAINT(148,32),0,0:RETURN
4230 FORX=1TO1000:NEXTX:PCLS:CLS:PRINT:PRINTTAB(5)"YOUR TEST IS
FINISHED"
4240 PRINT:PRINTTAB(6)"TOTAL QUESTIONS =" ;TF
4250 PRINT:PRINTTAB(7)"YOUR SCORE IS"INT((TC/NR)*100);"% "
4260 IFNP>53THEN4330
4270 IFGS=2ANDNP>48THEN4330
4280 PRINT:PRINTTAB(8)"TRY AGAIN(Y/N)?" ;
4290 D$=INKEY$:IFD$=""THEN4290
4300 IF D$="Y"THEN4310ELSE4330
4310 NP=NP-1:NO=0:V=0:NQ=10
4320 PMODE4,1:PCLS:PMODE4,5:PCLS:GOTO720
4330 PRINT:PRINT:PRINTTAB(10)"GAME IS OVER.":PRINT:PRINTTAB(8)"S
EE YOU LATER!!!"
4340 END
4350 PUT(A1,A2)-(A3,A4),ZZ,PSET:A1=A1-8:A3=A3-8
4360 PUT(A1,A2)-(A3,A4),ZZ,PSET
4370 IFB$=""THENRETURN
4380 L=LEN(B$)-1:C$=LEFT$(B$,L):B$=C$
4390 A1=A1-8:A3=A3-8
4400 B$=C$:RETURN
4410 DATACOLUMBIA,ATLANTA,TALLAHASSEE,FRANKFORT,NASHVILLE,MONTGO
MERY,JACKSON,LITTLE ROCK,BATON ROUGE,OKLAHOMA CITY,AUSTIN,HELENA
,BOISE
4420 DATAHEYENNE,DENVER,SANTA FE,PHOENIX,SALT LAKE CITY,CARSON
CITY,OLYMPIA,SALEM,SACRAMENTO,AUGUSTA,BOSTON,CONCORD,MONTPELIER
4430 DATAPROVIDENCE,HARTFORD,ALBANY,TRENTON,HARRISBURG,COLUMBUS,
INDIANAPOLIS,SPRINGFIELD,LANSING,MADISON,ST. PAUL,DES MOINES,JEF
FERSON CITY
4440 DATABISMARCK,PIERRE,LINCOLN,TOPEKA,DOVER,ANNAPOLIS,RICHMOND
,CHARLESTON,RALEIGH
4450 DATA" "," "," "," "," "," "
4460 L=LEN(SC$(X)):PORT=1TOL:A$=MID$(SC$(X),T,1):GOSUB750
4470 NEXTT
4480 RETURN
4490 RETURN
4500 L=LEN(JS):PORT=1TOL:A$=MID$(JS,T,1):GOSUB750
4510 NEXTT
4520 RETURN
4530 L=LEN(SS$(X)):PORT=1TOL:A$=MID$(SS$(X),T,1):GOSUB750
4540 NEXTT
4550 RETURN
4560 L=LEN(H$):PORT=1TOL:A$=MID$(H$,T,1):GOSUB750
4570 NEXTT
4580 RETURN
4590 IFSC$(X)=B$THEN4660
4600 A1=135:A2=152:A3=139:A4=160
4610 GOSUB4700
4620 GOSUB4500
4630 A1=8:A2=172:A3=12:A4=180:GOSUB4460
4640 A1=135:A2=172:A3=139:A4=180:GOSUB4530
4650 GOTO4030
```

Listing 1 continues

SPOOLIT

THE SOFT SOLUTION

USE YOUR TRS-80 WHILE IT PRINTS!

Don't Spend Hundreds For A Buffer Box, Get The Soft Solution:

SPOOLIT Works Automatically with Almost Any TRS-80 Program!

SPOOLIT uses techniques similar to those used on large computers to allow you to print in the 'Background' while doing other tasks in the 'Foreground.'

SPOOLIT: Only \$40

ORDER NOW

(212) 807-7033

NEVINS MICROSYSTEMS INC.

210 Fifth Ave.

N.Y., N.Y.

10010

PRINTING

150

SUPERVENTURE IS HERE!

An incredible journey awaits you in —

Bazul's Quest

A NEW EXPERIENCE
IN TEXT ADVENTURE!

As BAZUL, the Royal Runner, you will journey through enchanted forests, hidden caves, dismal swamps, and magical lands. Your mission? To recover 26 rare ingredients for a healing potion—the only cure for the deathly ill King Riraf. Can you save the Kingdom, or will it fall under the control of the Evil Jester? Machine Language, Save-a-Game Feature. Over 400 Word Vocabulary. Requires 1 disk drive and 32K. Available for Models I and III.

\$29.95



P. O. Box 502
Florence, Alabama 35631
(205) 766-0030

94

TAX PLANNING PERSONAL FINANCE BUSINESS ACCOUNTING for the Model III Computer

TAX/BUDGET PLANNER—a valuable tool for personal budgeting and tax planning. The program calculates personal cash flow including federal income taxes. It can be used for such things as determining the timing for capital gains/losses, amount of income tax withholdings and more. Using the keyboard, the user fills in six spreadsheets displayed by the computer. The user can go back and change any amounts on the spreadsheets. The program includes the relevant parts of the 1981 Economic Recovery and 1982 Fiscal Responsibility Acts, plus automatic calculation of:

1. tax liability per the tables or schedules.
2. tax liability per the averaging method (uses lower of 1 or 2)
3. capital loss and charity contribution carryforwards
4. new minimum tax and self employment tax

BUSINESS BOOKKEEPER—General journal, general ledger accounting system. Accounts are created by keying in the journal entries. Features automatic posting to the ledger. Automatic report generation includes: (1) Balance Sheet, (2) Income & Expense, (3) General Journal and (4) Chart of Accounts.

MONEY MANAGER—Personal bookkeeping system that allows the user to track and report on his income and expenses plus checking account, savings account and credit card balances. Separate reports for business and personal income and expenses.

TAX/BUDGET PLANNER \$99
BUSINESS BOOKKEEPER/MONEY MANAGER \$49
(with purchase of TB PLANNER) \$39
DEMO (TB PLANNER & MONEY MANAGER) \$7

Capital Software
1627 Peach Ct. E., Seattle, WA 98112

53

Listing 1 continued

```
4660 GOSUB4720:A1=135:A2=152:A3=139:A4=160:GOSUB4560
4670 A1=135:A2=172:A3=139:A4=180:GOSUB4530
4680 GOTO4090
4690 PUT(A1,A2)-(A3,A4),ZZ,PSET:A1=A1+2:A3=A3+2:PSET(A1,A4):PSET
(A1,A4-1):PSET(A1+1,A4):PSET(A1+1,A4-1):A1=A1-4:A3=A3-4:GOTO730
4700 PLAY"V30;T4;O2;L2;C;P255;L4;C;C;L2;C;L4;D#;L4;D;D;C;C;O1;B;
O2;L2;C;"
4710 RETURN
4720 PLAY"T2;V30;L8;O3;C;O2;A;L4;F;A;O3;C;L2;F;L8;A;G;L4;F;O2;A;
B;O3;L4;C;":RETURN
```

Program Listing 2. 16K Version

```
10 ' USA MAP
20 '
30 ' BY DENNIS H. WEIDE
40 '
50 ' (C) 1982
60 '
70 CLS:PRINT:PRINT"1.STATES 2.CAPITALS";GS
80 PMODE 4,1:PCLS5:SCREEN1,1:COLOR0,1
90 LINE(0,0)-(255,191),PSET,B
100 LINE(135,142)-(135,192),PSET
110 LINE(0,142)-(255,142),PSET
120 LINE(0,166)-(255,166),PSET
130 LINE(34,4)-(42,16),PSET:DRAW"BM34,16;U12BR8D12BR4U12R8D8NL8D
4BR4U12R4ND8R4D12BR4NR8U4NR4U8R8"
140 IFGS=2THEN160
150 DRAW"BR7"
160 DRAW"BR12R4ND12R4BR4D12U4R8NU8D4BR4NR8U4NR4U8R8"
170 IFGS=2THEN210
180 DRAW"BR7"
190 DRAW"BR12BD12R8U4L8U8R8BR4R4ND12R4BR4ND12R8D8NL8D4BR8U12NL4R
4BR4NR8D8NR4D4R8BR4R8U4L8U8R8"
200 GOTO220
210 DRAW"BR12R8ND2L8D12R8NU2BR4U12R8D8NL8D4BR4U12R8D8L8U8R8BR4R2
NR2D12NL2R2BR8U12NL4R4BR4R8D12BL8U4NR8U8R8BR4D12R8BR4NU2R8U4L8U8
R8D2"
220 LINE(36,20)-(36,22),PSET
230 DATA6,34,22,36,34,36,41,33,47,32,64,35,75
240 GOSUB1020
250 DRAW"R2D2L2"
260 DATA7,41,89,45,90,54,101,54,103,64,103,77,107,87,107
270 GOSUB1020
280 DRAW"U1R5"
290 DATA2,97,112,97,115,103,117,104,115,109,116,116,125,124,128
,124,122,126,118,129,122,130,115,139,115,141,117,148,117
300 DATA145,113,156,112,160,114,163,112,167,118,167,121,171,127,
171,129,173,131,178,129,178,121,177,116,172,107,175,102,178,101,
179,98,191,85,189,75,193,77,194,75,194,72,197,72,200,65,198,64,1
99,61,197,59,207,56,212,53
310 GOSUB1020
320 DRAW"U2R2D1"
330 LINE-(215,51),PSET
340 DRAW"U2L2U1L2U6"
350 DATA12,220,40,221,35,218,34,218,26,215,27,210,25,207,35,204,
36,192,36,181,43,178,43,174,47
360 GOSUB1020
370 DRAW"R2D2L2"
380 DATA2,163,54,168,43,2,169,34,159,32,4,147,22,142,25,126,20,3
6,20,36,34,39,35
390 GOSUB1020
400 DRAW"U3R2D2R2U2"
410 GOSUB1020
420 DRAW"U7L4U2"
430 GOSUB1020:GOSUB1090
440 DRAW"D2"
450 DATA2,48,36,57,36,57,20,57,44,3,55,46,58,47,58,53
460 GOSUB1020:GOSUB1090:GOSUB1020
470 DATA2,32,54,75,54,49,54,49,72,4,65,87,67,90,64,93,64,103
480 GOSUB1060:GOSUB1020
490 DATA68,54,68,84,2,67,37,69,44,6,75,42,97,42,76,60,105,60,84,
60,84,107,68,81,127,81,105,60,105,81,102,81,102,104
500 GOSUB1090
510 DRAW"L3D3"
520 DRAW"BM62,20;D8R2D8"
530 GOSUB1020
540 DRAW"R7U2D2D16R21U40"
550 GOSUB1060
560 DATA2,92,104,92,106,102,84,112,84,4,112,93,119,96,131,96,133
,115,119,20,119,26
570 GOSUB1020:GOSUB1090:GOSUB1020
580 DRAW"BM127,81;D2R2D14"
```

Listing 2 continues

Computer Peripheral Resources

5 1/4" Disk Drive Power Supplies

- Guaranteed in writing for 120 days.
- Cases accommodate all standard 5 1/4" drives.
- Over current and over voltage protection.
- Dealer inquiries invited.
- Call or write for quantity discounts.



- SPECIAL -
2 New Shugart Drives
1 Dual P/S H or V
1 Two Drive Cable
\$489.95

Dual Power Supplies

- Horizontal — 12x12x3 1/2 \$74.95
- Vertical — 7x12x6 \$74.95
- Open Frame — 7x2x3 w/o-case \$59.95
- Single Horiz. P/S —
 6x12x3 1/2 \$44.95
- Custom 4' 2-Drive Cable \$21.00
- 4-Drive Cable \$32.00
- Dual Case, Horiz. or Vert.
 (w/o P/S) \$24.95
- Single Case, Horiz. (w/o P/S) ... \$18.95
- **Shugart 5 1/4 Disk Drive** **\$204.95**
SA 405 — 6ms T-T, SS, SD or DD

Terms: Personal checks allow 14 days, COD, M.D., Certified Checks... Credit Cards add 3% Shipping and Handling: \$3.00 West and \$6.00 East states. All shipping USP surface other means extra.

Send to:

C.P.R. ✓420 or call...
 P.O. Box 834,
 Oak Harbor, WA 98277 (206) 679-4797

PROTRADE

THE PROFESSIONAL TOOL FOR STOCK AND OPTION TRADING

Includes:

- Black—Scholes Call Valuation
- American Put Option Valuation
- Unrealized Profit and Loss
- Strategy Costs
- And More...

TRS-80 MODEL I OR III

Complete ProTrade Package: \$350

Manual with Demo Disk: \$35

(Applies to Purchase)

ORDER NOW

(212) 807-7033

NEVINS MICROSYSTEMS INC.

210 Fifth Avenue

New York, NY

10010

STOCK/OPTION TRADING

✓ 150

STRANDED?

Can't get the answers you need? *two/sixteen* is more than a magazine. As a subscriber, you may call us any time (days, nights, weekends) to discuss any II/16 related problem. We'll help you or try to find someone who can. And you'll also find the articles in our bi-monthly magazine informative and helpful. We discuss all aspects of II/16 operation, including software running under alternate operating systems (e.g., CP/M) as well as TRSDOS. Rates in the U.S. are \$30/yr. Foreign (in U.S. funds): Canada \$36; Other: surface \$47, air \$67. Check, VISA, or MasterCard accepted.

two/sixteen magazine,

P. O. Box 1216, Lancaster, PA 17603.

Credit card orders: (717) 397-3364.

✓522

Most microprocessors don't generate truly random numbers, and the Color Computer is no exception. At first, the program would always select the states in the same order. I found a very simple solution—human delay. I added the statement `WW=RND(9999)` to lines 690 and 3900. Each time the program scans the keyboard buffer for a key pressed, it must first generate a random number. If no key is pressed, then the line statement repeats. Since it is almost impossible for a person to respond with microsecond accuracy, the program executes these lines a different number of times on each pass.

Hints

The program must convert the keys pressed into graphics characters to be displayed on the hi-res screen. Therefore, use a moderate typing speed. If you make an error, just backspace to the incorrect character using the left arrow and retype from there.

The program will only recognize the letters A-Z, space bar, left arrow (for backspacing), break, enter, and period.

You must spell out names of the states completely (use North Carolina, not N. Carolina). Abbreviate Saint (use St. not Saint).

A 16K Version

The short program in Listing 2 (and Table 2) allows you to choose the game you wish to play and then draws the map for you. By using a lower graphics mode, you can save a lot of memory. (Table 3 shows the modes and how much memory each uses.) By leaving out the sound and graphics text, you should be able to write a workable program using this map. The map will be drawn much slower because the program must read data statements for each line statement, but you can probably live with that. ■

Dennis Weide can be reached at 14201 Marquette NE, Albuquerque, NM 87123.

Command	PMODE	Free Memory
PCLEAR1	0,1	9067
PCLEAR2	2,1	7531
PCLEAR4	4,1	4459

Note: PMODE 4,1 works best. PMODE 2,1 is very good and PMODE 0,1 is acceptable.

Table 3. PMODEs

Listing 2 continued

```

590 GOSUB1090
600 DATA3,121,29,118,37,97,37,118,37,121,40,5,121,54,118,53,117,
54,115,53,97,53,121,53,123,56,4,122,62,125,66,127,69,127,81
610 GOSUB1020:GOSUB1090:GOSUB1020:GOSUB1090:GOSUB1020
620 DATA2,105,66,125,66,143,25,136,32,3,134,40,137,51,148,51,2,1
21,48,135,48,138,51,141,57,2,137,65,124,65,149,51,150,53
630 GOSUB1060
640 DRAW"D2L2"
650 GOSUB1020
660 DRAW"D1R2"
670 GOSUB1060:GOSUB1020:GOSUB1090
680 DATA5,151,56,151,70,149,73,145,75,143,78,137,65,145,81,142,8
4,137,97,137,97,139,100,4,138,103,140,108,144,108,145,113,2,139,
90,168,90,149,90,148,112,158,90
690 GOSUB1020:GOSUB1090
700 DRAW"D3L3U2L14"
710 GOSUB1090
720 DRAW"D1L6"
730 GOSUB1090:GOSUB1020:GOSUB1060
740 DRAW"R4U4R8"
750 GOSUB1050
760 DRAW"BM159,109;R9U1R4"
770 DATA173,104,168,93,169,89,180,90,183,93,158,90,160,87,2,163,
87,168,82,149,73,150,74,4,153,72,154,72,160,69,160,54,160,67,161
,69,10,162,68,165,70,170,78,173,78,174,74,177,73,178,72,181,71,1
87,72,189,77
780 GOSUB1090
790 DRAW"D1L2"
800 GOSUB1050
810 DRAW"R5D1R6"
820 GOSUB1090
830 DRAW"BM144,83;R4U1R41"
840 GOSUB1090:GOSUB1020:GOSUB1090
850 GOSUB1020:GOSUB1090:GOSUB1020
860 DATA2,163,81,168,78,136,31,140,30,6,144,34,146,34,148,40,151
,38,149,44,148,51,142,31,150,27,7,149,30,152,31,156,29,159,33,15
5,34,150,35,149,39,159,33,155,37,3,153,43,153,47,150,53,157,35,1
61,37
870 GOSUB1060:GOSUB1020:GOSUB1090
880 GOSUB1020:GOSUB1090:GOSUB1020:GOSUB1090
890 DRAW"D7R2U3"
900 DATA2,165,42,166,47,150,54,169,54,4,176,50,176,47,183,44,184
,42,172,52,172,68,3,191,68,194,69,194,72,172,64,169,67,164,70,19
3,58,192,58,191,63,2,193,64,191,68,197,51,209,51,210,54
910 GOSUB1020:GOSUB1090:GOSUB1020:GOSUB1090:GOSUB1020
920 DRAW"BM189,68;D3R6"
930 GOSUB1090:GOSUB1050
940 DRAW"BM175,68;D4R5"
950 DRAW"BM175,51;D4R13"
960 GOSUB1050
970 DRAW"R4U9R2U12"
980 GOSUB1090:GOSUB1020:GOSUB1090:GOSUB1050:GOSUB1060:GOSUB1050
990 DATA2,205,51,205,57,199,46,207,47,210,44,204,36,205,39,2,203
,43,203,47,209,32,208,35,2,209,43,210,43,202,60,209,58,3,210,60,
206,61,202,60
1000 GOSUB1090:GOSUB1020:GOSUB1090:GOSUB1020:GOSUB1090:GOSUB1020
1010 GOTO1010
1020 READA
1030 FORX=1TO A:READB,C
1040 LINE-(B,C),PSET:NEXTX:RETURN
1050 READA,B:LINE-(A,B),PSET:RETURN
1060 READA
1070 FORX=1TO A:READB,C,D,E
1080 LINE(B,C)-(D,E),PSET:NEXTX:RETURN
1090 READA,B,C,D:LINE(A,B)-(C,D),PSET:RETURN

```

Line Numbers

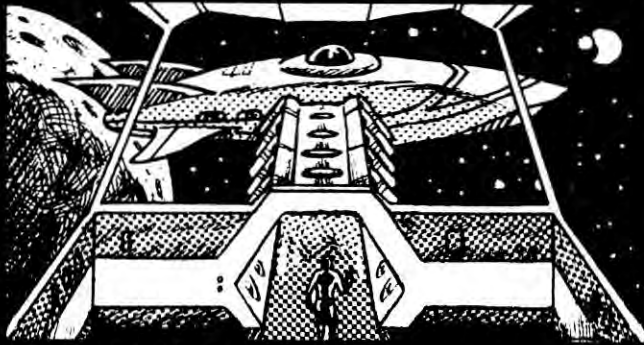
Function

70	Chooses whether you name states or capitals
80	Selects hi-res graphics mode
90-130	Draws screen border and boxes
140	Selects screen title
150-220	Completes title on screen
230-1000	Draws map of U.S.A.
1010	Keeps map on screen-delete when using map in program
1020-1040	Subroutine for LINE(x,y) (multiple statements)
1050	Subroutine for LINE(x,y) (single statements)
1060-1080	Subroutine for LINE(a,b)-(c,d) (multiple statements)
1090	Subroutine for LINE(a,b)-(c,d) (single statements)

Table 2. Map Line Description

THE COLORQUEST EXPERIENCE

For the TRS-80C and the TDP System 100 Color Computers



Written by Kevin Herrboldt & Tim Nelson



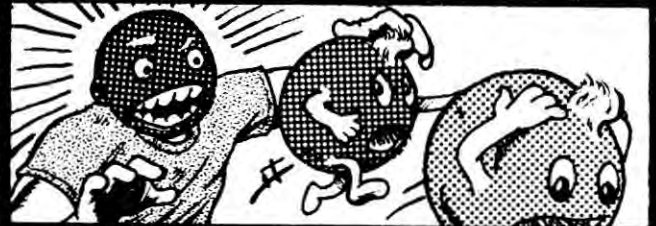
BEYOND THE CIMEEON MOON A real-time science fiction adventure game of mind-blowing magnitude — staged in deep space on a malign, sentient spacecraft. *Written in fast machine code with 3-dimensional high-res graphics and sound. Choose from a myriad of fates. Survive the laser barrage set up by a quartet of robots bent towards your destruction.*



Written by Kevin Herrboldt & Tim Nelson



ADVENTURE TRILOGY A Trilogy of quests featuring 3-D high-res graphics in machine code. First comes ritual combat on the **WORLD UNDER THE CIMEEON MOON**, to test your worthiness as a warrior. Once proven, you will be teleported to **DAZMAR'S UNDERWORLD OF DOOM** to search for the Eye of Dazmar. The **FORSAKEN GULCH** is the final arena, where a wicked idol awaits restoration.



THE NIBBLER & MS. NIBBLER A fast maze chase game featuring the nibbler man and three bumbling predators. *Written in machine code and joystick compatible*, this fun packed game is enjoyed by all. **MS. NIBBLER** is similar to **THE NIBBLER** described above but features a different maze and **MS. NIBBLER** for the ladies.



COMBAT GAMEPACK 3 action packed games featuring lifelike graphics and sound. **EXTENDED BASIC** required **2-1-0 TANK COMBAT** pits two players against each other in 5 different terrains. **STELLAR BATTLE** lets you pilot a flexwing fighter through deep space fighting dorian squadrons. **GALACTIC BLOCKADE** is a favorite two-player arcade game of speed and skill.



VEGAS GAMEPACK The thrills of a Las Vegas casino at home! **Extended BASIC** required. **CASINO CRAPS, 21, ONE ARMED BANDIT, UP AND DOWN THE RIVER, & KENO.** A bank tracks players winnings from game to game.

ORDERING

ALL GAMES ARE \$24.95 for 16K Cassette; \$29.95 for 32K Disk. Include \$3.00 for shipping in the U.S. & Canada, \$6.00 for Foreign orders. C.O.D. add \$2.00

AVAILABLE AT DEALERS EVERYWHERE. IF NOT, ASK WHY!

**NELSON™
SOFTWARE
SYSTEMS**



✓ 128



9072 Lyndale Avenue So. 612/881-2777

A Division of Softlaw Corporation

Minneapolis, Minnesota 55420 U. S. A.

Spelling Challenger

by Larry Krengel

Use these three word games—Scrambler, Three Strikes, and Synonyms—to help your children memorize their spelling words each week.

You'd think that a spelling test would be easy to prepare for. After all, the student only has to memorize a list and repeat it on command.

Program Listing

```

100 REM *****
110 REM *
120 REM *   SPELLING CHALLENGER   *
130 REM *           3/82           *
140 REM *   BY LARRY KRENGEL     *
150 REM *
160 REM * TRS-80 MODEL I  LEVEL II *
170 REM *
180 REM *****
400 CLEAR1000
500 DIM W$(25),S$(25),C(25),WC(25)
520 FORX=1TO10:READW$(X):NEXT:FORX=1TO10:READ S$(X):NEXT
530 DATA FURNISH,TIMBER,SUPPORT,COUNCIL,PORTABLE,FEVER,OBJECT,AU
TOMATIC,COMMAND,VARIOUS
540 DATA TO PROVIDE,LUMBER OR TREES,TO HOLD UP,A GROUP OF DELEGA
TES,MOVABLE,HIGH BODY TEMPERATURE,TO OPPOSE,SELF-WORKING,TELL WH
AT TO DO,DIFFERENT KINDS
550 N=10
590 ON ERROR GOTO6500
600 CLS:PRINTTAB(12)">>>> SPELLING CHALLENGER <<<<":PRINT:PRINT

610 PRINT"1- enter/change words"
620 PRINT"2- missing letter"
630 PRINT"3- synonyms"
640 PRINT"4- 3 strikes"
650 PRINT"5- scramble"
660 PRINT"6- @FREEZE"
665 PRINT"7- save words on tape"
667 PRINT"8- read words from tape"
670 A$="":A$=INKEY$
680 IFA$="1"GOTO1000
690 IFA$="2"GOTO2000
700 IFA$="3"GOTO3000
710 IFA$="4"GOTO4000
720 IFA$="5"GOTO5000
730 IFA$="6"GOTO6000
735 IFA$="7"GOTO7000
737 IFA$="8"GOTO8000
    
```

Listing continues

But it isn't as easy as it sounds. So when the teacher assigned my daughters 20 words a week for the entire school year, I wrote a program to make studying more enticing—enticing enough, I hoped, to beget good grades.

Spelling Challenger is actually three programs. The first scrambles a series of words and then presents them randomly. The child can either play it on the screen or from a printout.

The second, called Three Strikes, presents a word in which the letters have been replaced by asterisks. The task is to guess the letters. Three wrong guesses and you're out.

The third is a synonym quiz. You enter a list of synonyms along with the original spelling list. The child's job is to match the properly spelled word with its synonym.

I developed Spelling Challenger to take advantage of my Exatron Stringy-Floppy's @FREEZE option. Later, I added the option of storing data on tape. You can use the original (and shorter) ESF version by deleting lines 665, 667, 735, 737, and 7000-8080. If you're using a Model I with disks, add 10 CMD" T". ■

Larry Krengel can be reached at P.O. Box 94, Elmhurst, IL 60126.

The Key Box

**Model I or III
16K RAM, 48K RAM
Cassette or Disk Basic
Printer (optional)
Exatron Stringy-Floppy (optional)**

Listing continued

```

740 GOTO670
1000 REM ### enter/correct words ###
1010 FORX=LTO25
1020 CLS:IFW$(X)="GOTO1090
1030 IFW$(X)<>"PRINT"The #";X;"word is ";W$(X);".ELSE GOTO1090

1040 INPUT"Enter change if you wish. ";W$(X)
1050 PRINT:IFW$(X)<>"PRINT"A synonym for ";W$(X);" is ";S$(X);"
.ELSEINPUT"Enter synonym - ";S$(X):GOTO1070
1060 INPUT"Enter new synonym if you wish - ";S$(X)
1080 GOTO1110
1090 PRINT"Enter word ";X;" ('=menu) - ";INPUTW$(X):IFW$(X)="
GOTO1120
1100 INPUT"Enter synonym - ";S$(X)
1110 NEXTX
1120 N=0:FORX=LTO25:IFW$(X)<>"N=N+1:NEXT
1130 GOTO600
2000 REM ### missing letter ###
2010 CLS:RANDOM
2020 W=RND(25):IFW$(W)="GOTO2020
2030 L=LEN(W$(W))
2040 K=RND(L)
2050 FORX=LTO1
2060 IFX=KPRINT"(-)";:GOTO2080
2070 PRINTMID$(W$(W),X,1);
2080 NEXTX
2090 PRINT:PRINT"enter missing letter -";
2100 A$="":A$=INKEY$
2110 IF(A$<>MID$(W$(W),K,1))AND(A$<>"")PRINT"BOO !!! NO...":FORX
=LTO1000:NEXT:CLS:GOTO2050
2120 IFA$=MID$(W$(W),K,1)PRINT"VERY GOOD !!!":FORX=LTO1000:NEXT:
GOTO2140
2130 GOTO2100
2140 PRINT:PRINT"Do you wish another missing letter? y/n";
2150 A$="":A$=INKEY$
2160 IF(A$="n")OR(A$="N")GOTO600
2170 IF(A$="y")OR(A$="Y")GOTO2010
2180 GOTO2150
3000 REM ### synonym ###
3010 CLS:RANDOM
3020 RANDOM:X=RND(N):T=0
3030 PRINTTAB(10)"Synonym spelling practice"
3040 PRINT:PRINT"Write the spelling word that means - ";S$(X)
3050 PRINT:PRINTTAB(10)">>>";:INPUTG$
3060 IFG$=W$(X)PRINT"That is correct...":GOTO3100
3070 IFT=2:CLS:PRINT:PRINT"The correct answer is ";W$(X);".":GOT
O3100
3080 PRINT:PRINT"No... Try again.":T=T+1:GOTO3050
3100 PRINT:PRINT"do you want another synonym?"
3110 A$="":A$=INKEY$
3120 IF(A$="y")OR(A$="Y")GOTO3010
3130 IF(A$="n")OR(A$="N")GOTO600
3140 GOTO3110
4000 REM ### three strikes ###
4010 CLS:RANDOM:X=RND(N)
4020 L=LEN(W$(X)):GC=0:C=1:T$=W$(X)

```

Listing continues

2 OR MORE COMPUTERS TO CONNECT TO YOUR PRINTER(S)?

- STOP PLUGGING AND UNPLUGGING CABLES to change back and forth. It may damage them...or you may damage your computer.
- UNIVERSAL PrinterPicker[®] switching unit lets you select computers at the flip of a switch. One PrinterPicker[®] will switch up to 4 computers and/or printers.
- MULTIPLE PrinterPicker[®] UNITS MAY BE INTERCONNECTED to form a system to interswitch any number of printers and/or computers.
- WORKS WITH ALL STANDARD, PARALLEL-INTERFACED PRINTERS.
- WORKS WITH ALL COMPUTERS with appropriate adaptor cable set (we can provide those listed below).
- ALL CONNECTIONS ARE GOLDPLATED for maximum reliability.

ALL ORDERS add \$3.50 for shipping and handling.

PrinterPicker[®] FOR 2 COMPUTERS.....\$115.00

PrinterPicker[®] FOR 4 COMPUTERS.....\$195.00

Adaptor Cable Set.....\$25.00

- Convert to 4 computer use anytime with expansion kit....\$85.00
- Each PrinterPicker[®] Switching Unit requires an Adaptor Cable Set. Specify type: TRS-80[®] Model I, Model II, or Model III; or EXTENDER (for connection to another PrinterPicker[®] Switch Unit); or NON-TRS-80[®] (for all other computers).
- NOTE: All computer systems require a TRS-80[®] Model I or III Printer Cable Set for each printer (No.26-1401).

TRS-80 is a trademark of the Tandy Corporation.

✓ 263



COMPUWARE Corporation
1008 Abington Road
Cherry Hill, NJ 08034
609-428-2309

New Jersey buyers: ADD 5%
Terms: CASH, MC, or Visa

2 OR MORE PRINTERS TO CONNECT TO YOUR COMPUTER?

- STOP PLUGGING AND UNPLUGGING CABLES to change back and forth. It may damage them...or you may damage your computer.
- UNIVERSAL PrinterPicker[®] switching unit lets you change printers at the flip of a switch. One PrinterPicker[®] will control 3 printers.
- LOCATE PrinterPicker[®] WHEREVER IT'S CONVENIENT FOR YOU... within the 3 ft. reach of the adaptor cable.
- WORKS WITH ALL STANDARD, PARALLEL-INTERFACED PRINTERS.
- WORKS WITH ALL COMPUTERS with appropriate adaptor cable set (we can provide those listed below).
- ALL CONNECTIONS ARE GOLDPLATED for maximum reliability.

ALL ORDERS add \$3.50 for shipping and handling.

PrinterPicker[®] Switch Unit.....\$65.00

Adaptor Cable Set.....\$25.00

- Each PrinterPicker[®] Switching Unit requires an Adaptor Cable Set. Specify type: TRS-80[®] Model I, Model II, or Model III; or EXTENDER (for connection to another PrinterPicker[®] Switch Unit); or NON-TRS-80[®] (for all other computers).
- NOTE: All computer systems require a TRS-80[®] Model I or III Printer Cable Set for each printer (No.26-1401)...our price: \$25.00.

TRS-80 is a trademark of the Tandy Corporation.

✓ 511



COMPUWARE Corporation
1008 Abington Road
Cherry Hill, NJ 08034
609-428-2309

New Jersey buyers: ADD 5%
Terms: CASH, MC, or Visa

SAVE \$

Grand Opening Sale Radio Shack TRS-80™ Complete Line

SAVE \$

The Computer Station (Dealer R-491)

Formerly CBS Electronics

CALL

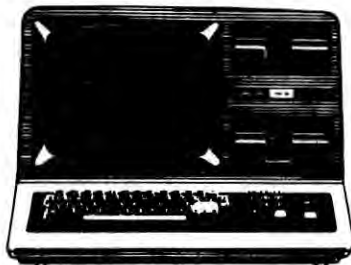
(313) 439-1508

Lowest in the Nation.

32 E. Main St., Milan, Michigan 48160

TRS-80's™

26-1061 Model III 4K Lev. I	\$590.00
26-1062 Model III 16K Lev. II	789.00
26-1065 Model III 48K 1 disk	1490.00
26-1066 Mod. III 48K 2 disk/RS-232	1889.00
26-4002 64K Model II 1 disk	2989.00
26-3001 Color Comp. 4K Lev. I	299.00
26-3002 Color Comp. 16K Lev. II ext.	429.00
26-3003 Color Comp. 32K Lev. II ext.	590.00
26-3022 O-Drive for C.C.	520.00
26-3023 1-3 Drives for C.C.	340.00
26-5000 Videotext 4K	320.00
26-5001 Videotext 16K	420.00
26-3501 Pocket Comp.	135.00
26-3503 Interface	26.00
26-3505 Printer/Interface	115.00



We will beat any price in the United States.

Free cable with any \$100 purchase.

Plus 20% off software.

Colter Comparable Systems

48K 2 disk drive 40 track	\$1599.00
48K 2 disk/RS-232	1689.00

Printers

Comet Printer	340.00
Smith Corona TP-1	595.00
DMP-500	1529.00
Citoh 8510	700.00
DMP-400	999.00
DMP-100	299.00
DMP-200	589.00
Daisy Wheel II	1649.00
Quick Printer	275.00
Quick Printer II	170.00
Plotter	1320.00

Increase discounts with RS catalog sales items

Prices can change without notification. All prices are cash prices; there will be a 4% handling charge for credit card use

✓ 138

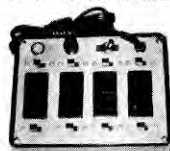
Additional savings in volume
(313) 439-1508

POWER LINE PROBLEMS?



SPIKE-SPIKER® ...THE SOLUTION

Protects, organizes, controls computers & sensitive electronic equipment. Helps prevent software "glitches", unexplained memory loss, and equipment damage. Filter models attenuate conducted RF interference. 120V, 15 Amps. Other models available. Ask for free literature.



DELUXE POWER CONSOLE \$79.95

Transient absorber, dual 5-stage filter, 8 individually switched sockets, fused, main switch, & lite.



QUAD-II \$59.95

Transient absorber. Dual 3 stage filter. 4 sockets, lite.



QUAD-I \$49.95

Transient absorber, 4 sockets.

MINI-II \$44.95

Transient absorber, 3 stage filter, 2 sockets.

MINI-I \$34.95

Transient absorber, 2 sockets.

KAGLO 485
6584 Ruch Rd., Dept. 80
Bethlehem, PA 18017



215-837-0700
Out of State Order Toll Free
800-523-9685

DEALER INQUIRIES INVITED • CODs add \$3.00 + Ship

SCREEN CLEAN™ PUTS THE POWER IN YOUR HAND TO REMOVE COMPUTER DUST

- Printer paper dust
- Dust data processing equipment
- Dust your computer room
"Clean Room" clean

2 CLOTHS FOR \$2⁹⁵ PPD
VISA • MASTER • CHECK

MWB INDUSTRIES, INC.
2013 FRANKLIN STREET
DETROIT, MICHIGAN 48207
(313) 259-1104

DEALERS INQUIRIES INVITED ✓90

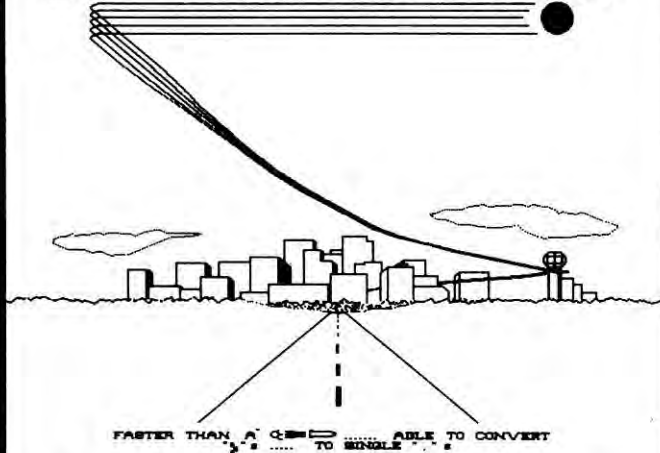
Listing continued

```

4030 PRINTTAB(20) "*** 1 - 2 - 3 STRIKES ***"
4040 S=(480-L):FOR Y=STO(S+2*L)-1STEP 2:PRINT@Y,"*":NEXT
4050 PRINT@602,L;" letters"
4060 PRINT@716,"make a guess - ":A=735
4070 G$="":G$=INKEY$:IF G$=""GOTO4070
4080 PRINT@A,G$:T=0
4090 FOR Y=1TOL:IF G$=MID$(T$,Y,1)PRINT@S+(2*(Y-1)),G$:T=1:C=C+1:T
$=LEFT$(T$,Y-1)+"!"+RIGHT$(T$,L-Y)
4100 NEXT
4110 IFT=0:GC=GC+1:PRINT@923,"STRIKE";GC
4120 IF GC=3:PRINT@832,"YOU LOSE!!! The word was ";W$(X):GOTO415
0
4130 IFC=L+1:PRINT@832,"YOU WIN!!!":GOTO4150
4140 A=A+2:PRINT@A+1," ";:GOTO4070
4150 PRINT"do you wish another word?"
4160 A$="":A$=INKEY$
4170 IF(A$="y")OR(A$="Y")GOTO4010
4180 IF(A$="n")OR(A$="N")GOTO600
4190 GOTO4160
5000 REM ### scramble ###
5010 CLS:RANDOM
5020 PRINT"do you wish the scrambled words on a printer?"
5030 A$="":A$=INKEY$
5040 IF(A$="y")OR(A$="Y")LP=1:GOTO5070
5050 IF(A$="n")OR(A$="N")LP=0:GOTO5070
5060 GOTO5030
5070 IFLP=1:INPUT"Enter when the printer is ready. ";W$:LPRINTCHR
$(14)TAB(4) " ** SCRAMBLED SPELLING WORDS **"CHR$(10)
5080 CLS:FOR X=1TON:C(X)=0:NEXT:C(0)=1
5090 FOR N=1TON
5100 RANDOM:X=RND(N):IF C(X)=1GOTO5100
5110 C(X)=1
5120 L=LEN(W$(X)):SW$=""
5130 FOR Y=1TOL:WC(Y)=0:NEXT
5140 Y=RND(L):IFWC(Y)=1GOTO5140
5150 WC(Y)=1
5160 SW$=SW$+MID$(W$(X),Y,1)
5170 IFL=LEN(SW$)<>LEN(W$(X))GOTO5140
5180 IFLP=1:LPRINTTAB(15)NS;SW$;TAB(35)STRING$(15,".")CHR$(10):GO
TO5320
5190 CLS:T=1:PRINTTAB(20)"SCRAMBLE":PRINTTAB(15)"enter 'G' if yo
u give up"
5200 PRINT:PRINTT,SW$
5210 A$="":PRINT:INPUT"enter unscrambled word - ";A$
5220 IF(A$="G")OR(A$="g"):CLS:FORF=1TO6:PRINT@725,W$(X):PRINT@72
5,STRING$(20," "):FOR E=1TO50:NEXTE:NEXTF:PRINT@725,W$(X):GOTO527
0
5230 IFA$<>W$(X):T=T+1
5240 IFT=4A$="g":GOTO5220
5250 IFA$=W$(X)PRINT:PRINT"good job!!!":GOTO5270
5260 GOTO5200
5270 PRINT:PRINT"Want to try another?"
5280 A$="":A$=INKEY$
5290 IF(A$="y")OR(A$="Y")GOTO5320
5300 IF(A$="n")OR(A$="N")GOTO600
5310 GOTO5280
5320 NEXTNS
5330 CLS:INPUT"you have completed the entire list of words...";W
$:GOTO600
6000 REM ### @FREEZE ###
6010 CLS
6020 INPUT"Has the @FREEZE program been loaded?";A$
6030 IF(LEFT$(A$,1)<>"y")AND(LEFT$(A$,1)<>"Y"):GOTO6000
6040 INPUT"enter file number when wafer is ready...";F
6050 @FREEZE
6060 GOTO6000
6500 PRINT"an error has been encountered - has @FREEZE really be
en loaded?":INPUTW$:GOTO6000
7000 REM ### SAVE ON TAPE ###
7010 CLS:W$=""
7020 INPUT"ENTER WHEN TAPE IS READY (E=ESCAPE)";W$
7030 IFW$="E"GOTO6000
7040 FOR X=1TO25
7050 PRINT#-1,W$(X),S$(X)
7060 IFW$(X+1)="PRINT#-1,"XX","XX":GOTO6000
7070 NEXT
7080 GOTO6000
8000 REM ### READ FROM TAPE ###
8010 CLS:W$=""
8020 INPUT"ENTER WHEN TAPE IS READY (E=ESCAPE)";W$
8030 IFW$="E"GOTO6000
8040 FOR X=1TO25
8050 INPUT#-1,W$(X),S$(X)
8060 IFW$(X)="XX"W$(X)=""S$(X)=""GOTO6000
8070 NEXT

```

POWERDOT



FASTER THAN A GEM TO SINGLE TO CONVERT

NEW! PowerDOT allows you to create HI-RESOLUTION screen prints on EPSON (Grafrax and Graftax+), C.Itoh PROWriter, and Radio Shack LP 8 printers without ANY hardware additions or modifications to your TRS-80! You can draw directly on your screen which is a "picture window" of a much larger drawing area, therefore allowing you plenty of room to work. You are only limited by memory size and your imagination! Great for designers, architects, engineers, etc. Model I or III disk version only. Works on all current operating systems. \$49.95 \$2.50 shipping (U.S./Canada)

POWERSOFT
Products from Breeze/OSD, Inc. ✓306

11500 Stemmons Fwy.
Dallas, Texas 75229
To order call toll free 1-800-527-7432
For product information (214)484-2976

**DISK DRIVE WOES?
PRINTER INTERACTION?
MEMORY LOSS?
ERRATIC OPERATION?**

Don't Blame The Software!



Power Line Spikes, Surges & Hash could be the culprit! Floppies, printers, memory & processor often interact! Our patented ISOLATORS eliminate equipment interaction AND curb damaging Power Line Spikes, Surges and Hash. **MONEY BACK GUARANTEE!**

- ISOLATOR (ISO-1) 3 filter isolated 3-prong sockets; integral Surge/Spike Suppression; 1875 W Maximum load, 1 KW load any socket \$76.95
- ISOLATOR (ISO-2) 2 filter isolated 3-prong socket banks; (6 sockets total); integral Spike/Surge Suppression; 1875 W Max load, 1 KW either bank \$76.95
- SUPER ISOLATOR (ISO-3) similar to ISO-1 except double isolation & Suppression \$115.95
- SUPER ISOLATOR (ISO-11) similar to ISO-2 except double isolation & Suppression \$115.95
- MAGNUM ISOLATOR (ISO-17) 4 Quad isolated sockets; For ULTRA-SENSITIVE Systems \$200.95
- CIRCUIT BREAKER, any model (Add-CB) Add \$10.00
- REMOTE SWITCH, any model (Add-RS) Add \$18.00

AT YOUR DEALERS ✓159

MasterCard, Visa, American Express
ORDER TOLL FREE 1-800-225-4876
(except AK, HI, PR & Canada)

Electronic Specialists, Inc.
171 South Main Street, Box 389, Natick, Mass. 01760
(617) 655-1532

Data-Writer™

**Access
any record
in your data base
in one second flat.**

Data-Writer 2.0 uses a powerful file access method called "two-level sequential direct access." While it sounds complicated, what it does is simple: It permits access to any record in your data base (up to 10,000 records) in one second flat.

Data-Writer is a powerful data base manager. Use it with a word processor or by itself as a complete system for managing textual and numeric data.

DATA ENTRY: You may define up to 20 variable-length fields of up to 240 characters each with your word processor, or 20 fixed-length fields of up to 35 characters with Data-Writer's Entry program. Special features perform validity checks on your data during entry.

FILE ACCESS: Once your data base file is created, use Access to review existing records, make changes and add new records. Access any record in your data base in just one second.

FILE MANAGER: Restructure your data base without editing it. Add new fields, delete fields, rearrange fields, append one field to another.

SELECT: Create a subset of your file by specifying limiting criteria, such as SELECT IF SEX = F or SELECT IF AMOUNT > 100. Several select statements may be combined. Use this powerful feature to send form letters to all the females in your data base or just to the doctors.

SORT: A fast two-level sort, lets you sort on any field without having previously designated it as a key. You can even sort by last name or zip code embedded in a line.

REPORTS: Write reports such as inventories, accounts payable and receivable, insurance coverage, stock issues...the list is endless. Print totals and subtotals of columns of data. Save your format on disk.

MATH PROCEDURES, LABELS, FORM LETTERS.

Use Data-Writer for order tracking, client billing, expense recordkeeping, operational reporting with totals and subtotals, form letter production to a large list or a subset, mailing list maintenance and other business and personal applications. Data-Writer's ease of use appeals to businessmen and secretaries alike.

Data-Writer is both powerful and easy to use.

Here's what Data-Writer users say:

"I would like to congratulate you on your excellent work on Data-Writer...I am a very satisfied user of your systems."

"I enjoy Data-Writer very much and I am finding it very efficient in managing my business accounts."

"It's a very, very useful package."

"I am delighted with Data-Writer. Keep on making the best better."

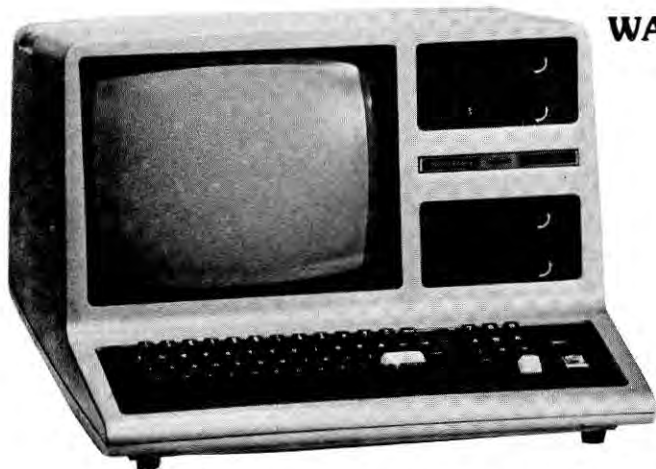
"Why hasn't someone done this before!"

For the TRS-80 Models I, III (48K, 2 disk drives, lower case required). Available at your favorite software store or order from **Software Options**, 19 Rector Street, New York, NY 10006. (212) 785-8285. **Toll-free order line: (800) 221-1624.** Price \$145 (plus \$3 per order shipping and handling). New York State residents add sales tax. Visa/Mastercard accepted.



✓537

**120
DAY
WARRANTY**



"NO YOU'RE NOT SEEING THINGS, THAT'S FOUR INTERNAL DRIVES IN A MODEL III, WITH UP TO 4 MEG. DISK STORAGE AVAILABLE NOW, ONLY FROM DISPLAYED VIDEO!!"

**DISPLAYED VIDEO IS DRIVING DOWN
PRICES ON DISKS!**

DISPLAYED VIDEO is now offering TRS-80* MODEL III with TANDON disk drives, one of the most reliable disk drive systems on the market, for **INCREDIBLY** low prices.

MODEL III with 48K, dual 40 track double density disk drives, complete systems with TRSDOS and ONE BOX OF DISKETTES

PLUG IT IN AND GO. \$1649.00

MODEL III with 48K, dual 40/40 track double density disk drives, complete systems with DOSPLUS and ONE BOX OF DISKETTES

PLUG IT IN AND GO. \$2,049.00

MODEL III with 48K, dual 80 track double density disk drives, complete systems with DOSPLUS and ONE BOX OF DISKETTES

PLUG IT IN AND GO. \$2,049.00

MODEL III with 48K, dual 80/80 track double density disk drives, complete systems with DOSPLUS and ONE BOX OF DISKETTES

PLUG IT IN AND GO. \$2,349.00

MODEL III with 48K, four 40 track double density internal disk drives, complete systems with TRSDOS and ONE BOX OF DISKETTES

PLUG IT IN AND GO....\$2,399.00

MODEL III with 48K, four internal drives of any configuration available to achieve up to 4 meg of disk storage **CALL**

MODEL III Internal Drive Kit: Includes controller board, dual drive mounting bracket, dual power supply, all hardware cables and connectors (gold plated) **\$309.00**

MODEL 16 w/1 drive....**\$4,450.00**.....w/2 drives.....**\$4,850.00**

**Visit Our Two
RETAIL LOCATIONS:**

886 Ecorse Rd., Ypsilanti, MI 48197
(313) 426-5086/(313) 482-4424

111 Marshall St., Litchfield, MI 49252
(517) 542-3280



**DISPLAYED
VIDEO**



IMMEDIATE DELIVERY
120 Days Parts and Labor Warranty
DEALER INQUIRIES INVITED

Free Shipping in the U.S.
48 Contiguous States

Radio Shack Authorized Dealership at:

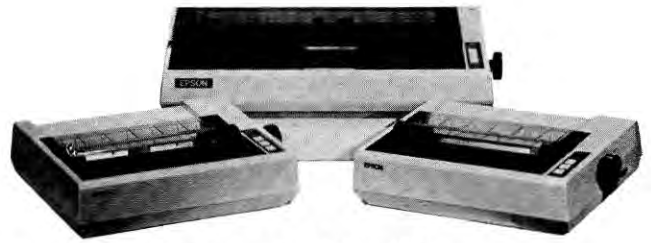
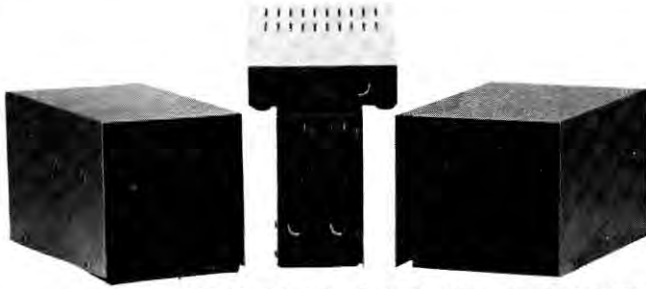
111 Marshall Street, Litchfield, Michigan 49252

#P142

To Order: Call (313) 426-5086 or (313) 482-4424 or (517) 542-3280 or write DISPLAYED VIDEO,
886 Ecorse Road, Ypsilanti, Michigan 48197

*TRS-80 is a trademark of the Tandy Corporation

Prices subject to change without notice



DISPLAYED VIDEO IS DRIVING DOWN PRICES ON DISKS!

- DV'S COLOR COMPUTER FIRST DRIVE..... **\$424.00**
 80 TRACK TEAC DISK DRIVE W/CASE & POWER SUPPLY.... **\$270.00**
 40 TRACK TEAC DISK DRIVE W/CASE & POWER SUPPLY.... **\$225.00**

NEW!

TEAC'S TRUE HALF HEIGHT DRIVES!
 1 5/8 INCH NOT 2 INCH OR 2 7/16 INCH! DIRECT DRIVE!
 NO DRIVE BELT! 3MS TRACK TO TRACK! MODEL I or II COMPATIBLE!

ONE YEAR WARRANTY!

BE WARNED! NOT ALL REDUCED HEIGHT DRIVES ARE MODEL I AND III COMPATIBLE. ONLY A TRUE 1 5/8 INCH HALF HEIGHT LETS YOU INSTALL TWO DRIVES IN THE SPACE ALLOTTED FOR A SINGLE CONVENTIONAL DRIVE.

"YOU CAN BUY THE REST BUT WHY NOT BUY ONE OF THE BEST!"

- TEAC'S NEW 40 TRACK W/SLIM LINE CASE & POWER SUPPLY.... **\$230.00**
 2 DRIVE CABLE **\$23.99**

with gold plated connectors

- DOS PLUS 3-4.....MODEL I OR III..... **\$89.00**
 HAYES SMART MODEM..... **\$220.00**

TANDON DRIVES AVAILABLE AT IDENTICAL PRICES WITH 90 DAY WARRANTY ONLY

PRINTER PRICES

OKIDATA

- | | | | |
|---------------------------------------|-----------------|--------------------------|------------------|
| EPSON | | OKIDATA 80A | \$345.00 |
| MX80 W/GRAPHTRAX PLUS..... | \$439.00 | OKIDATA 82A..... | \$420.00 |
| MX80FT W/GRAPHTRAX PLUS..... | \$505.00 | OKIDATA 83A..... | \$689.00 |
| MX100 W/GRAPHTRAX PLUS..... | \$679.00 | OKIDATA 84AP..... | \$1029.00 |
| | | OKIDATA 84AS..... | \$1209.00 |
| | | OKIGRAPH..... | \$59.00 |
| PRINTER CABLES | \$23.99 | | |
| C-ITOH PROWRITER...8510A | \$459.00 | | |

Stop In Our Two

Retail Locations:

886 Ecorse Rd., Ypsilanti, MI 48197
 (313) 426-5086/(313) 482-4424
 or
 111 Marshall Street,
 Litchfield, MI 49252
 (517) 542-3280

We carry a full line of Daisywheel Printers



Radio Shack Authorized Dealership at:

111 Marshall Street, Litchfield, Michigan 49252 #P142

To Order: Call (313) 426-5086 or (313) 482-4424 or (517) 542-3280 or write DISPLAYED VIDEO,
 886 Ecorse Road, Ypsilanti, Michigan 48197

IMMEDIATE DELIVERY

180 Days Parts and Labor Warranty
 DEALER INQUIRIES INVITED

Free Shipping in the U.S.
 48 Contiguous States

*TRS-80 is a trademark of the Tandy Corporation

Prices subject to change without notice

Math Fun

by David Haan

Your children will have so much fun playing with your micro that they won't even notice they're learning addition and subtraction.

My 5-year old is very interested in simple arithmetic, and even more interested in my TRS-80. It seemed only reasonable to satisfy both his interests by letting him learn arithmetic on the computer.

The Basic and Assembly programs in Listings 1 and 2 form an exercise drill my son can use on his own (after I load it). The Basic program generates the random problems, sets limits of difficulty, checks answers, and keeps score. The Assembly-language program dis-

plays problems in large block letters, produces graphics displays, and plays sound routines.

Although I wrote these programs to run on a Model III disk system with 48K RAM, I've included a version that runs on a 16K Model III tape system.

The Assembly-Language Program

The Assembly-language routine is made up of five USR functions and a data base.

The first USR function, USR0, fills a

400H-byte local buffer with blanks. USR2 will use this blank area later to clear the screen.

USR1 puts the messages LEVEL = and + - × / = on the screen in block letters. Two portions of the data base, starting at the labels LVLSTR and OPRSTR, move to the CRT memory to produce these letters. The LEVEL = message asks for the difficulty of the problems, and the + - × / = message asks for the type of math operation.

USR2 is executed in response to a correct or incorrect answer. When the student enters the correct answer to a problem, this USR saves the contents of the CRT memory (after the Basic program generates a random graphics pattern). Then the routine moves the blank area produced by USR0 to the CRT memory. This clears out the screen. After a short delay, the random pattern is put back into the CRT memory. This process of flashing the random pattern on the screen is repeated eight times, followed by a musical tune. The musical tune indicating a correct answer is part of the data base starting at SNDBFW.

If the answer to the problem is incorrect, the routine plays a tune starting at

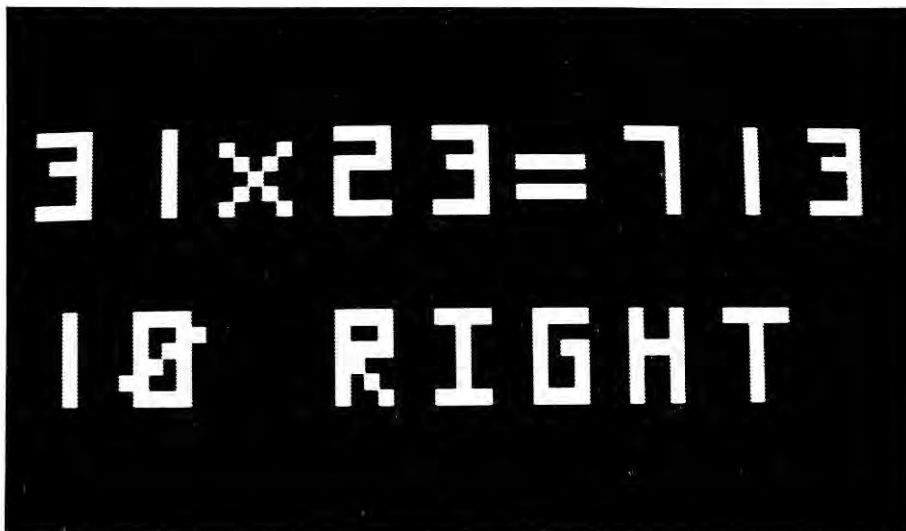


Photo 1

The Key Box

Model III
48K RAM (disk)
16K RAM (cassette)
(with changes in text)
Cassette or Disk Basic
Editor/Assembler
TRSDOS and One Disk Drive
Optional

Extra! Extra!



Volume 4

All The News That's Fit To ZAP!

Users vote no to the same OLD ARCADE GAMES



(DV 1982) Blurry eyed users have turned to **DISPLAYED VIDEO** to answer their need for new and exciting arcade games. In response, **DISPLAYED VIDEO** has announced eight new programs for the TRS-80* Models I-III. These arcade type games feature sound, graphics, joystick compatibility and are written in machine language for maximum speed! Both disk and tape versions allow the user to save high scores, a feature not usually found on cassette based games. Maze enthusiasts seem to like Ghost Hunter and Killer

Beetles, while gun slingers look toward Insect Frenzy, Jungle Raiders, Space Shootout, Alien Cresta and Battle Stations for excitement. A Game that does not fall into these categories is Hoppy. It features wild drivers, sinking turtles, and hungry alligators. These programs are distributed exclusively by **DISPLAYED VIDEO** and written by Dubois and McNamara. Pricing for these programs is \$15.95 for tape and \$19.95 for disk. Reliable sources inside the company indicate Killer Gorilla will be available by the time you read this.

TO ORDER SEND CHECK OR MONEY ORDER OR CALL (517) 542-3280

Visit Our Two
RETAIL LOCATIONS:
111 Marshall St., Litchfield, MI 49252
(517) 542-3280
or
886 Ecorse Rd., Ypsilanti, MI 48197
(313) 426-5086/(313) 482-4424



Joysticks for above programs \$39.95
Add \$2.00 for Shipping
Add \$1.50 for COD
Mich. res. add 4 percent tax

*Authorized Radio Shack Dealership

DEALER DISCOUNTS AVAILABLE

✓62

*TRS-80 is a trademark of the Tandy Corp.
Prices subject to change without notice.

SNDBFL. The storage location WINLOS is used to tell USR2 whether the screen is to be flashed, and which tune is to be played. If the student's answer is correct, 1 is POKEd from Basic into the location WINLOS. If the answer is wrong, a 0 is POKEd into this location. USR2 tests this flag to determine which routine it should execute.

The next USR function is USR3. When 10 problems have been answered either correctly or incorrectly, USR3 puts the word RIGHT in block letters on the bottom of the screen. Basic then calls USR4 to display the number of correctly answered problems (see photo).

USR4 is the routine used most often. Its function is to display in block letters the numbers 0-9 and the symbols for addition, subtraction, multiplication, division, an equal sign, a question mark, and a blank at the correct locations on the CRT.

This routine uses two storage locations into which the Basic program POKEs data. The first of these two locations is PNTLOC, where Basic POKEs an index into a table called LOCTBL. LOCTBL contains addresses of different locations on the CRT. The second storage location, NUMBER, is where the Basic program stores a number used by USR4 as an index into a table called NUMTBL. Each 16-bit entry in NUMTBL points to the data-base address where the character to be displayed starts. Using these two locations, the desired character is put into the correct area of the CRT memo-

ry. The photo shows a problem displayed using USR4.

The Basic Program

The Basic program that calls each of these USR functions is shown in Listing 1.

Lines 140-220 perform initialization and setup. This portion defines the addresses of the entry points of each USR, loads the Assembly program, and defines the addresses of PNTLOC, NUMBER, and WINLOS. This portion also initializes the 400H-byte buffer of blanks via USR0. The variable LO defines the address of PNTLOC, VA defines the address of NUMBER, and WI defines the address of WINLOS.

*“To hear the sound,
I recommend
the audio amplifier
sold by Radio Shack.”*

In lines 280-410, the LEVEL= and + - ×/= questions are displayed by calling USR1. Then a subroutine at line 1870, via USR4, flashes a question mark behind each question. You can answer either question first. The LEVEL= question accepts a difficulty factor from one to four. The shift key is not required to indicate the math operation required, since the program checks for the unshifted value of the key, where necessary.

To put a question mark (or for that matter, any valid character) in the correct screen position, the index corre-

sponding to the character to be displayed is POKEd into NUMBER via POKe VA,15 (15 is the index for the character ?—see NUMTBL in Listing 2). To specify the CRT location where this character is to be displayed, an index value is POKEd into location PNTLOC via a POKe LO,0. An index of 0 indicates the CRT display location behind the question LEVEL= (see LOCTBL in Listing 2). The messages LEVEL=, + - ×/=, and RIGHT are coded to be displayed at specific locations.

The third part of the Basic program, lines 470-810, uses the difficulty level and the type of math function desired to generate and display a random problem. Once the elements of the problem have been determined based on the difficulty desired (lines 470-680), the problem is displayed (lines 690-810).

The fourth part of the program looks for and checks answers (lines 870-1150). Since I used the INKEY\$ function, you need not press the enter key. Simply type in the number or character desired. Each digit of the answer is checked as it is entered. If it is incorrect, the error subroutine at line 1650 POKEs a 0 into WINLOS and USR2 is called to play a tune indicating an error. The student is then given another chance on the same problem. If he enters three wrong answers, lines 1740-1810 display the correct value. The program generates a new problem if this was not the tenth problem.

The fifth part of the Basic code generates the random graphics pattern and musical tune if the answer is correct (lines 1210-1400). Once the graphics pattern is finished, a value of 1 is POKEd into location WINLOS and USR2 is executed to generate the musical tune.

The sixth and last part (lines 1460-1590) tests to see if 10 problems have been answered. If so, the word RIGHT is displayed on the bottom of the CRT (see photo), and the number of problems answered correctly on the first try is flashed on the screen. Then, the whole process starts over at line 280, allowing a new level of difficulty or a different math function.

Tape-System Modifications

In the Basic program, replace lines 10-210 of Listing 1 with lines 10-210 of Listing 3. Depending on the size of your computer memory, you will have to assemble the Assembly program at a different origin address to stay within the confines of your RAM. Also, remember to redefine the locations in lines 180-210 of Listing 3 appropriately.

Notes	Frequency (Hz)	Hex Value
Middle C	261.6	FE
C Sharp	277.2	F0
D	293.7	E0
D Sharp	311.1	D5
E	329.6	C6
F	349.2	BC
F Sharp	370.0	B3
G	392.0	A6
G Sharp	415.3	9C
A	440.0	92
A Sharp	466.2	8D
B	493.8	86
C	523.2	7C
C Sharp	554.4	73
D	587.4	6C
D Sharp	622.2	65
E	659.2	5F
F	698.4	59
F Sharp	740.0	54
G	784.0	4F
G Sharp	830.6	4B

Table 1. Music Parameters

The only other change you need make to the Basic program is in the USR calls. Since a tape system has only one USR function, all the USR calls have to go to the same address. To ensure the correct USR function is executed, I added a new assembly location, as defined by variable RO in line 180 of Listing 3. Each USR call in Listing 1 has to be changed to use this location as follows:

When a USR call in Listing 1 says `X=USRz(A)`, replace it with `POKE RO,z:X=USR(A)`, where `z` is the USR number used in the disk version of Listing 1. For example, you'd rewrite `X=USR4(A)` as `POKE RO,4:X=USR(A)`.

As far as the Assembly program is concerned, the code in Listing 4 must replace lines 10-60 of the code in Listing 2. Location `ROUTIN` is where the `POKE RO,z` will place the number of the USR you wish to execute. Again, make sure your Basic program has defined the variables in lines 180-210 correctly. (Your Basic manual will tell you how under the section discussing the `POKE`.)

Program Execution

To run the programs, set memory size as determined by where you placed the Assembly code. If you have a disk system, just run the Basic program. If you are using a tape system, load the object code of the Assembly program, then the Basic program, and run. To hear the sound, I recommend the audio amplifier sold by Radio Shack. Plug the cassette port output jack into the amplifier input.

Changing Your Tune

Table I lists the parameters needed to generate the music. You can change the tune played by putting the hex value for the notes you want in the least-significant byte of a word. The note duration is in the most-significant byte of the same word. You calculate the duration by taking the frequency of the note in Hz and dividing that by the length in seconds of the duration desired. If you want to play an A above middle C for 1/4 second, divide its frequency (440 Hz) by 4, and place the resulting value in the high-order byte.

To see how this is done, look at the first three notes (G, E, middle C) shown in lines 5980-6030 of Listing 2. The hex value for G (A6) is placed in the low-order byte of the first word in line 5980. The hex value for E (C6) is placed in the low-order byte of the third word in line 6000. Finally the hex value of C (FE) is

placed in the low-order byte of the fifth word in line 6020. The duration of each note is placed in the high-order bytes in lines 5980, 6000 and 6020. The data in lines 5990, 6010, and 6030 are short delays to separate the notes.

Well, that's it. Try the program, and

make whatever changes you want to the limits of difficulty or the tune the program plays. ■

David Haan can be reached at 4361 S. Estes St., Littleton, CO 80123.

Program Listing 1. Basic Program

```

10 REM VARIABLE LO DEFINES ASSEMBLY LOCATION 'PNTLOC'
20 REM VARIABLE VA DEFINES ASSEMBLY LOCATION 'NUMBER'
30 REM VARIABLE WI DEFINES ASSEMBLY LOCATION 'WINLOS'
40 REM USR(0) INITIALIZE BUFFER IN ASSEMBLY ROUTINE
50 REM USR(1) PRINTS "LEVEL=" AND "+-x/ ="
60 REM USR(2) CORRECT ANSWER ROUTINE
70 REM USR(3) PRINT "RIGHT"
80 REM USR(4) PRINTS A NUMBER OR CHARACTER OF THE CRT
90 REM
100 REM*****
110 REM          INITIALIZATION AND SETUP
120 REM*****
130 REM
140 CLS:DEFINT A,F,H,I,L,N,O,P,Q,R,T,V,W,X,Y,Z
150 DEFUSR0=&HF207:DEFUSR1=&HF220
160 DEFUSR2=&HF23D:DEFUSR3=&HF2DE
170 DEFUSR4=&HF2F0
180 CMD"L","PRESKOOL/CMD"
190 LO=&HF201
200 VA=&HF202
210 WI=&HF200
220 X=USR0(A)
230 REM
240 REM*****
250 REM          DISPLAYS "LEVEL=" AND "+-x/ ="
260 REM*****
270 REM
280 L=0:F=0:X=USR1(A)
290 GOSUB 1870
300 IF L>0 GOTO 340
310 L=VAL(A$)
320 IF L>1 AND L<4 GOTO 330 ELSE L=0:GOTO 340
330 POKE LO,0:POKE VA,L:X=USR4(A):GOTO340
340 IF F>0 GOTO 410
350 IF A$="+" OR A$=";" THEN F=1:O=10:GOTO400
360 IF A$="-" THEN F=2:O=11:GOTO400
370 IF A$="X" OR A$="x" THEN F=3:O=12:GOTO400
380 IF A$="/" THEN F=4:O=13:GOTO400
390 GOTO 290
400 POKE LO,1:POKE VA,O:X=USR4(A)
410 IF L=0 GOTO 290
420 REM
430 REM*****
440 REM          GENERATE AND DISPLAY PROBLEM
450 REM*****
460 REM
470 ON L GOTO 480 ,490 ,500 ,510
480 RV=11:GOTO 530
490 RV=21:GOTO 530
500 RV=51:GOTO 530
510 RV=100
520 RANDOM
530 R1=RND(RV)
540 IF R1=RV THEN R1=0
550 R2=RND(RV)
560 IF R2=RV THEN R2=0
570 IF F>2 THEN R1=INT(R1/3):R2=INT(R2/3)
580 ON F GOTO 590 ,610 ,620 ,650
590 IF L=1 THEN L1=10 ELSE L1=999
600 V=R1+R2:IF V>L1 GOTO 530 ELSE 690
610 V=R1-R2:IF V<0 GOTO 530 ELSE 690
620 IF L=1 THEN L1=10 ELSE L1=L*25-1
630 IF L=4 THEN L1=999
640 V=R1*R2:IF V>L1 GOTO 530 ELSE 690
650 IF L=1 THEN L1=10 ELSE L1=L*25-1
660 IF L=4 THEN L1=99
670 IF R2=0 GOTO 530
680 V=R1*R2:IF V>L1 GOTO 530 ELSE V1=R1:N1=V:V=V1:R1=N1
690 N1=INT(R1/10):POKE LO,2:IF N1<1 THEN POKE VA,16:X=USR4(A):N2
=R1:GOTO710 ELSE POKE VA,N1:X=USR4(A)
700 N2=R1-10*N1
710 POKE LO,3:POKE VA,N2:X=USR4(A)
720 POKE LO,4:ON F GOTO 730 ,740 ,750 ,760
730 POKE VA,10:GOTO 770

```

Listing 1 continues

Listing 1 continued

```

740 POKE VA,11:GOTO 770
750 POKE VA,12:GOTO 770
760 POKE VA,13
770 X=USR4(A)
780 N3=INT(R2/10):POKE LO,5:IF N3<1 THEN POKE VA,16:X=USR4(A):N4
=R2:GOTO800 ELSE POKE VA,N3:X=USR4(A)
790 N4=R2-10*N3
800 POKE LO,6:POKE VA,N4:X=USR4(A)
810 POKE LO,7:POKE VA,14:X=USR4(A)
820 REM
830 REM*****
840 REM          LOOK FOR/AND CHECK ANSWER
850 REM*****
860 REM
870 POKE LO,8
880 GOSUB 1870
890 VH=VAL(AS)
900 IF V<10 GOTO 930
910 IF V<100 GOTO 950
920 GOTO 1030
930 IF VH=V POKE VA,VH:X=USR4(A):GOTO 1210 ELSE GOSUB 1650
940 IF TR=3 GOTO 1740 ELSE 870
950 IF VH=INT(V/10)GOTO 970 ELSE GOSUB 1650
960 IF TR=3 GOTO 1740 ELSE 870
970 POKE VA,VH:X=USR4(A)
980 POKE LO,9:GOSUB 1870
990 VT=VAL(AS)
1000 IF VT= V-10*INT(V/10) GOTO 1020 ELSE GOSUB 1650
1010 IF TR=3 THEN GOTO 1740 ELSE 980
1020 POKE VA,VT:X=USR4(A):GOTO 1210
1030 IF VH=INT(V/100)GOTO 1050 ELSE GOSUB1650
1040 IF TR=3 GOTO1740 ELSE 870
1050 POKE VA,VH:X=USR4(A)
1060 POKE LO,9:GOSUB 1870
1070 VT=VAL(AS)
1080 V1=V-100*INT(V/100):IF VT=INT(V1/10) GOTO 1100 ELSE GOSUB 1
650
1090 IF TR=3 GOTO 1740 ELSE 1060
1100 POKE VA,VT:X=USR4(A)
1110 POKE LO,10:GOSUB 1870
1120 VO=VAL(AS)
1130 V1=V-100*INT(V/100):V2=V1-10*INT(V1/10):IF VO=V2 GOTO 1150
ELSE GOSUB 1650
1140 IF TR=3 GOTO1740 ELSE 1110
1150 POKE VA,VO:X=USR4(A):GOTO 1210
1160 REM
1170 REM*****
1180 REM          RANDOM PATTERN AND MUSIC FOR CORRECT ANSWER
1190 REM*****
1200 REM
1210 IF TR=0 THEN NR=NR+1:NT=NT+1
1220 FOR I=1 TO 200: NEXT I
1230 CLS:PRINT CHR$(21)
1240 PRINT @991,CHR$(255)
1250 FOR I=1TO 6
1260 FOR X=1 TO 40
1270 NEXT X
1280 PRINT
1290 NEXT I
1300 PRINT CHR$(21)
1310 CLS:H=0:V=0

```

```

1320 FOR P=1 TO 7
1330 H=H+5:V=V+2
1340 FOR I=1 TO 10
1350 X=RND(H):Q=-X:X=X+64:Y=RND(V):Z=-Y:Y=Y+23
1360 SET (X,Y):SET(Q+64,Z+23):SET(X,Z+23):SET(Q+64,Y)
1370 NEXT I
1380 NEXT P
1390 POKE WL,1
1400 X=USR2(A)
1410 REM
1420 REM*****
1430 REM          TEST IF SESSION DONE / DISPLAY NUMBER CORRECT
1440 REM*****
1450 REM
1460 IF NT=10 THEN X=USR3(A):GOTO1470 ELSE CLS:TR=0:GOTO 470
1470 FOR Z=1 TO 5
1480 POKE LO,11:POKE VA,16:X=USR4(A):POKE LO,12:X=USR4(A)
1490 GOSUB 1570
1500 POKE LO,11:IF NR=10 POKE VA,1:X=USR4(A):POKE LO,12:POKE VA,
0:X=USR4(A):GOTO 1520
1510 POKE LO,12:POKE VA,NR:X=USR4(A)
1520 GOSUB 1570
1530 NEXT Z
1540 NR=0:NT=0:TR=0
1550 FOR I=1 TO 1000
1560 NEXT I:CLS:GOTO280
1570 FOR I=1 TO 50
1580 NEXT I
1590 RETURN
1600 REM
1610 REM*****
1620 REM          PLAY TUNE INDICATING WRONG ANSWER
1630 REM*****
1640 REM
1650 TR=TR+1:IF TR=1 THEN NT=NT+1
1660 POKE WL,0
1670 X=USR2(A)
1680 RETURN
1690 REM
1700 REM*****
1710 REM          DISPLAY CORRECT ANSWER
1720 REM*****
1730 REM
1740 TR=0
1750 POKE LO,8
1760 IF V<10 POKE VA,V:X=USR4(A):GOTO1810
1770 IF V<100 VH=INT(V/10):POKE VA,VH:X=USR4(A):VT=V-10*VH:POKE
LO,9:POKE VA,VT:X=USR4(A):GOTO1810
1780 VH=INT(V/100):POKE VA,VH:X=USR4(A):POKE LO,9
1790 V1=V-100*VH:VT=INT(V1/10):POKE VA,VT:X=USR4(A)
1800 POKE LO,10:VO=V1-10*VT:POKE VA,VO:X=USR4(A)
1810 TR=0:FOR I= 1 TO 1000: NEXT I: GOTO 1460
1820 REM
1830 REM*****
1840 REM          SCAN FOR KEYBOARD RESPONSE
1850 REM*****
1860 REM
1870 POKE VA,15:IF L>0 GOTO 1880 ELSE POKE LO,0:X=USR4(A)
1880 IF F=0 THEN POKE LO,1
1890 X=USR4(A)
1900 AS$="":FOR I=1TO 50

```

Listing 1 continues

Everybody's making money selling microcomputers. Somebody's going to make money servicing them.

New NRI Home Study Course Shows You How to Make Money Servicing, Repairing, and Programming Personal and Small Business Computers

Seems like every time you turn around, somebody comes along with a new computer for home or business use. And what's made it all possible is the amazing microprocessor, the tiny little chip that's a computer in itself.

Using this new technology, the industry is offering compact, affordable computers that handle things like payrolls, billing, inventory, and other jobs for businesses of every size...perform household functions including budgeting, environmental systems control, indexing recipes. And thousands of hobbyists are already owners, experimenting and developing their own programs.

Growing Demand for Computer Technicians

This is only one of the growth factors influencing the increasing opportunities for qualified computer technicians. The U.S. Department of Labor projects over a 100% increase in job openings for the decade through 1985. Most of them *new* jobs created by the expanding world of the computer.

Learn at Home in Your Spare Time

NRI can train you for this exciting, rewarding field. Train you at home to service not only microcomputers, but word processors and data terminals, too. Train you at your convenience, with clearly written "bite-size" lessons that you do evenings or weekends, without going to classes or quitting your present job.

Your training is built around the latest model of the world's most popular computer. It's the amazing TRS-80™ Model III, with capabilities and features to perform a host of personal and business functions. No other small computer has so much software available for it, no other is used and relied on by so many people. And it's yours to keep for personal or business use.

You get plenty of practical experience. Using the NRI Discovery Lab® that also comes as part of your course, you build and study circuits ranging from the simplest to the most advanced. You analyze and troubleshoot using the professional 4-function LCD digital multimeter you keep to use later in your work. Then you use the lab and meter to actually access the interior of your computer...build special circuits and write programs to control them. You "see" your computer at work and demonstrate its power.

(TRS-80 is a trademark of the Radio Shack division of Tandy Corp.)



Computer Assisted Instruction

Your TRS-80 even helps train you. You receive 4 special lesson tapes in BASIC computer language. Using them in your microcomputer, you "talk" to it as you progress. Errors are explained, graphics and animation drive home key points. Within a matter of minutes, you'll be able to write simple programs yourself.

Become the Complete Computer Person

In addition to training in BASIC and advanced machine language, you gain hands-on experience in the operation and application of computers to business and personal jobs. You're trained to become the fully rounded, new breed of technician who can interface with the operational, programming and service facets of today's computers. You're ready to take your place in the new electronic age.

Other Opportunities

NRI has been giving ambitious people new electronic skills since 1914. Today's offerings also include TV/Audio/Video Systems servicing with training on our exclusive Heath/Zenith computer-programmable

25" diagonal color TV...Industrial Electronics, Design Technology...and other state-of-the-art courses.

Rush Coupon for Free Catalog... No Salesman Will Call

Send the coupon for our 100-page catalog showing all courses with equipment and complete lesson plans. There's no obligation other than to yourself. See how NRI can help you grow with the most exciting and important new field of the 80's. If coupon has been removed, please write to NRI Schools, 3939 Wisconsin Ave., Washington, D.C. 20016.



NRI Schools
McGraw-Hill Continuing
Education Center
3939 Wisconsin Avenue
Washington, D.C. 20016

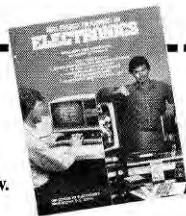
We'll give you tomorrow.

NO SALESMAN WILL CALL.

Please check for one free catalog only.

- Computer Electronics including Microcomputers
- Color TV, Audio, and Video System Servicing
- Electronics Design Technology
- Digital Electronics
- Communications Electronics • FCC Licenses • Mobile CB • Aircraft • Marine

- Industrial Electronics
- Basic Electronics
- Small Engine Servicing
- Appliance Servicing
- Automotive Servicing
- Auto Air Conditioning
- Air Conditioning, Heating, Refrigeration, & Solar Technology
- Building Construction



All career courses approved under GI bill.
 Check for details

Name _____ (Please Print) _____ Age _____

Street _____

City/State/Zip _____

Accredited by the Accrediting Commission of the National Home Study Council

179-023

Listing 1 continued

```

1910 A$=INKEY$
1920 IF A$<>" GOTO 2020
1930 NEXT I
1940 POKE VA,16:IF L>0 GOTO 1950 ELSE POKE LO,0:X=USR4(A)
1950 IF F=0 POKE LO,1
1960 X=USR4(A)
1970 FOR I= 1 TO 50
1980 A$=INKEY$
1990 IF A$<>" GOTO 2020
2000 NEXT I
2010 GOTO 1870
2020 RETURN

```

Program Listing 2. Assembly Program

```

F200      00010      ORG      0F200H
0001      00020      WINLOS  DEFS   1
0001      00030      PNTLOC  DEFS   1
0001      00040      NUMBER  DEFS   1
F203      FF00      00050      DELSTR  DEFW   00FFH
F205      FF00      00060      DELAY   DEFW   00FFH
00070      ;
00080      ;*****
00090      ;      INITIALIZE BUFFER
00100      ;*****
00110      ;
F207      F5        00120      USR0    PUSH   AF      ;SAVE REGISTERS
F208      C5        00130      PUSH   BC
F209      E5        00140      PUSH   HL
F20A      21D3F5    00150      LD      HL,CLRCRT ;GET BUFFER OF BLANKS
F20D      010004    00160      LD      BC,400H   ;LENGTH OF CRT MEMORY
F210      3E00      00170      LD      A,0       ;CLR 'A' REG.
F212      3620      00180      CLRLP  LD      (HL),20H ;FILL WITH BLANKS
F214      23        00190      INC    HL         ;GO TO NEXT BLK LOCATION
F215      0B        00200      DEC    BC         ;DECREMENT COUNTER
F216      B8        00210      CP     B          ;TEST IF B REG CLEAR
F217      20F9      00220      JR     NZ,CLRLP  ;DO AGAIN IF NOT
F219      B9        00230      CP     C          ;TEST IF C REG CLEAR
F21A      20F6      00240      JR     NZ,CLRLP  ;DO AGAIN IF NOT
F21C      E1        00250      POP    HL         ;RESTORE REGISTERS
F21D      C1        00260      POP    BC
F21E      F1        00270      POP    AF
F21F      C9        00280      RET
00290      ;
00300      ;*****
00310      ;      DISPLAY "LEVEL=" AND "+-x/ =" MESSAGES
00320      ;*****
00330      ;
F220      C5        00340      USR1    PUSH   BC      ;SAVE REGISTERS
F221      D5        00350      PUSH   DE
F222      E5        00360      PUSH   HL
F223      11403C    00370      LD      DE,3C40H  ;GET CRT PRINT LOCATION
F226      018000    00380      LD      BC,LVLLN  ;GET LENGTH OF PRNT MSG
F229      2163F4    00390      LD      HL,LVLSTR ;GET START OF PRNT MSG
F22C      EDB0      00400      LDIR
F22E      11003D    00410      LD      DE,3D00H  ;PUT IT ON THE CRT
F231      017000    00420      LD      BC,OPRLEN ;GET START OF CRT LOC
F234      21E3F4    00430      LD      HL,OPRSTR ;GET LENGTH OF OPER MSG
F237      EDB0      00440      LDIR
F239      E1        00450      POP    HL         ;RESTORE REGISTERS
F23A      D1        00460      POP    DE
F23B      C1        00470      POP    BC
F23C      C9        00480      RET
00490      ;
00500      ;*****
00510      ;      FLASH SCREEN AND PLAY MUSIC
00520      ;*****

```

```

00530      ;
F23D      F5        00540      USR2    PUSH   AF      ;SAVE REGISTERS
F23E      C5        00550      PUSH   BC
F23F      D5        00560      PUSH   DE
F240      E5        00570      PUSH   HL
F241      DDE5      00580      PUSH   IX
F243      3A00F2    00590      LD      A,(WINLOS) ;GET TYPE OF SOUND FLAG
F246      FE00      00600      CP     0          ;TEST IF ZERO
F248      2837      00610      JR     Z,SNDRTN  ;JUMP IF 0
F24A      21003C    00620      LD      HL,3C00H  ;START OF CRT
F24D      11D3F9    00630      LD      DE,SAVCRT ;CRT STORAGE BUFFER
F250      010004    00640      LD      BC,400H   ;LENGTH OF CRT
F253      EDB0      00650      LDIR     ;SAVE CRT IMAGE
F255      21D3F5    00660      CLRSN   LD      HL,CLRCRT ;GET START OF BLANK BUFF
F258      11003C    00670      LD      DE,3C00H  ;START OF CRT
F25B      010004    00680      LD      BC,400H   ;LENGTH OF CRT
F25E      EDB0      00690      LDIR     ;CLEAR CRT
F260      CDC4F2    00700      CALL   DELTIM    ;WAIT
F263      21D3F9    00710      LD      HL,SAVCRT ;GET OLD CRT IMAGE
F266      11003C    00720      LD      DE,3C00H  ;START OF CRT
F269      010004    00730      LD      BC,400H   ;LENGTH OF CRT
F26C      EDB0      00740      LDIR     ;RESTORE CRT IMAGE
F26E      CDD9F2    00750      CALL   TIMTST    ;TEST IF FINISHED
F271      B9        00760      CP     C          ;
F272      2805      00770      JR     Z,QUIT    ;QUIT IF DONE
F274      CDD3F2    00780      CALL   DELYLP    ;WAIT
F277      18DC      00790      JR     CLRSN     ;CLEAR SCREEN AGAIN
F279      ED4B03F2  00800      QUIT    LD      BC,(DELSTR) ;GET INITIAL DELAY
F27D      ED4305F2  00810      LD      (DELAY),BC ;RESTORE DELAY COUNTER
F281      3A00F2    00820      SNDRTN LD      A,(WINLOS) ;GET TYPE OF SOUND FLAG
F284      FE00      00830      CP     0          ;TEST IF WRONG ANS FLAG
F286      2809      00840      JR     Z,WRONG   ;
F288      3E64      00850      LD      A,SNLNLW ;GET LENGTH OF BUFFER
F28A      57        00860      LD      D,A       ;PUT A REG. IN D REG.
F28B      DD21D3FD  00870      LD      IX,SNDBFW ;GET START OF BUFFER
F28F      1807      00880      JR     NXTNOT    ;PLAY MUSIC
F291      3E0A      00890      WRONG  LD      A,SNLNL  ;GET LENGTH OF BUFFER
F293      57        00900      LD      D,A       ;PUT A REG. IN D REG.
F294      DD2137FE  00910      LD      IX,SNDBFL ;GET START OF BUFFER
F298      DD6E00      00920      NXTNOT LD      L,(IX)    ;GET DURATION OF NOTE
F29B      DD23      00930      INC    IX         ;GO TO NEXT BUF LOCATION
F29D      15        00940      DEC    D          ;DECREMENT LENGTH COUNT
F29E      DD6600      00950      LD      H,(IX)   ;GET NOTE
F2A1      CDB0F2    00960      CALL   SNDGEN    ;PLAY NOTE
F2A4      DD23      00970      INC    IX         ;GO TO NEXT BUF LOCATION
F2A6      15        00980      DEC    D          ;DECREMENT LENGTH COUNT
F2A7      20EF      00990      JR     NZ,NXTNOT ;PLAY NEXT NOTE
F2A9      DEE1      01000      POP    IX         ;RESTORE REGISTERS
F2AB      E1        01010      POP    HL
F2AC      D1        01020      POP    DE
F2AD      C1        01030      POP    BC
F2AE      F1        01040      POP    AF
F2AF      C9        01050      RET
F2B0      E5        01060      SNDGEN PUSH   HL      ;TRANSFER HL TO BC
F2B1      C1        01070      POP    BC
F2B2      3E01      01080      LDNOTE LD      A,1     ;SET UP FOR PORT OUTPUT
F2B4      69        01090      LD      L,C       ;GET NOTE IN L REG.
F2B5      D3FF      01100      OUT    (0FFH),A  ;OUTPUT A HI TO PORT
F2B7      2D        01110      DEC    L          ;DEC NOTE COUNTER
F2B8      20FD      01120      JR     NZ,OUTH   ;WAIT TILL REG. L=0
F2BA      3C        01130      INC    A          ;SET UP NEXT PORT OUTPUT
F2BB      69        01140      LD      L,C       ;GET NOTE IN L AGAIN
F2BC      D3FF      01150      OUT    (0FFH),A  ;OUTPUT A LO TO PORT
F2BE      2D        01160      DEC    L          ;DEC NOTE COUNTER
F2BF      20FD      01170      JR     NZ,OUTLO  ;WAIT TILL REG. L=0
F2C1      10EF      01180      DJNZ  LDNOTE     ;DO TILL DURATION DONE
F2C3      C9        01190      RET
F2C4      ED4B05F2  01200      DELTIM LD      BC,(DELAY) ;GET CURRENT DELAY CNT
F2C8      3E00      01210      LD      A,0       ;CLEAR A REG.
F2CA      CB39      01220      SRL    C          ;DIVIDE C REG. BY 2
F2CC      ED4305F2  01230      LD      (DELAY),BC ;RESET DELAY CNT
F2D0      B9        01240      CP     C          ;TEST IF DELAY DONE
F2D1      2806      01250      JR     Z,TIMTST  ;RETURN IF ZERO
F2D3      10FE      01260      DELYLP DJNZ  S      ;LOOP HERE 256 TIMES
F2D5      0D        01270      DEC    C          ;DECREMENT C
F2D6      B9        01280      CP     C          ;TEST IF C=0

```

Listing 2 continues

ACCEL3 3/4

NEW

\$99.95

+ \$1.50 Shipping, CA add 6%
specify Mod I or III

Space Frontier

ACCEL3 compiles *big* programs, 30K +. This is by design; subset compilation and use of ROM routines keeps code growth low (and ensures the highest compatibility with the BASIC source program). Also, the NOEXPR option can limit compilation to the program flow operations (GOTO, GOSUB, RETURN, FOR-NEXT, IF, ON) over part of your program, or in toto. 5.5K, all DOS.

EDIT

Full-Screen Editor for TRS-80 Basic, Mod I/III

You need better-than-wordprocessor control when you write and edit BASIC programs. That's why EDIT has lots of better-than-wordprocessor features.

- Full-floating cursor with autorepeat (including function keys).
- Navigation by cursor-controlled scrolling, by line number or by program content.
- Overtyping, Delete or Insert characters of text (including line numbers).
- Join or Split lines. Copy, Delete, Insert, Move, Position or Replicate lines.
- Copy, Delete, Move, Position or Replicate blocks of lines.
- Find and/or Replace occurrences of strings, lower-case.
- Over 30 commands and functions, supports TRSDOS, LDOS overlay version.

You owe it to your programming.

\$40

+ \$2 Shipping, CA add 6%
specify Mod I or III

NEW

ACCEL4, overlay version of ACCEL3, works with TRSDOS, LDOS *only*, no user memory requirements. Anyone for 40K + compilations?

You owe it to your programs.



ALGORIX
(415) 387-3131

Box 11721 San Francisco CA 94101



NEW

ENB

Southern Software's NEW relational database manager. Integrated data dictionary, recursive command structure, more.

\$140

Listing 2 continued

```

F2D7 20FA 01290 JR NZ,DELYLP ;LOOP TILL DONE
F2D9 ED4B05F2 01300 TMTST LD BC,(DELAY) ;GET CURRENT DELAY TIME
F2DD C9 01310 RET
01320 ;
01330 ;*****
01340 ; DISPLAY "RIGHT" MESSAGE
01350 ;*****
01360 ;
F2DE C5 01370 USR3 PUSH BC ;SAVE REGISTERS
F2DF D5 01380 PUSH DE
F2E0 E5 01390 PUSH HL
F2E1 018000 01400 LD BC,RITLEN ;GET LENGTH OF RIGHT SND
F2E4 11C03E 01410 LD DE,3EC0H ;LOC ON CRT FOR PRINT
F2E7 2153F5 01420 LD HL,RITSTR ;GET START OF MSG.
F2EA EDB0 01430 LDIR ;PRINT IT.
F2EC E1 01440 POP HL
F2ED D1 01450 POP DE
F2EE C1 01460 POP BC
F2EF C9 01470 RET
01480 ;
01490 ;*****
01500 ; DISPLAY NUMBER OR CHARACTER
01510 ;*****
01520 ;
F2F0 F5 01530 USR4 PUSH AF ;SAVE REGISTERS
F2F1 C5 01540 PUSH BC
F2F2 D5 01550 PUSH DE
F2F3 E5 01560 PUSH HL
F2F4 DDE5 01570 PUSH IX
F2F6 2139F3 01580 DATLOC LD HL,NUMTBL ;GET ADR OF CHARACTER TBL
F2F9 0600 01590 LD B,0 ;CLR B REG
F2FB 3A02F2 01600 LD A,(NUMBER) ;GET INDEX INTO TABLE
F2FE 4F 01610 LD C,A ;TRANS. A TO C
F2FF CB21 01620 SLA C ;MULT BY 2 FOR 16 BIT OFFSET
F301 09 01630 ADD HL,BC ;OFFSET INTO TABLE
F302 4E 01640 LD C,(HL) ;PLACE 16 BIT ADR POINTED
F303 23 01650 INC HL ;TO BY HL INTO BC
F304 46 01660 LD B,(HL)
F305 C5 01670 PUSH BC ;TRANSFER BC TO IX
F306 DDE1 01680 POP IX
F308 215BF3 01690 CRTLOC LD HL,LOCTBL ;GET ADR OF CRT TABLE
F30B 1600 01700 LD D,0 ;CLR D REG.
F30D 3A01F2 01710 LD A,(PNTLOC) ;GET INDEX OF PRINT LOCATION
F310 5F 01720 LD E,A ;TRANSFER A TO E
F311 CB23 01730 SLA E ;MULT BY 2 FOR 16 BIT OFFSET
F313 19 01740 ADD HL,DE ;OFFSET INTO TABLE
F314 4E 01750 LD C,(HL) ;PLACE 16 BIT ADR POINTED
F315 23 01760 INC HL ;TO BY HL INTO BC
F316 46 01770 LD B,(HL)
F317 C5 01780 PUSH BC ;TRANS BC TO HL
F318 E1 01790 POP HL
F319 113900 01800 PUTUP LD DE,57 ;OFFSET FOR NEXT CRT LINE
F31C 0E02 01810 LD C,2 ;NUMBER OF LINES TO DISPLAY
F31E 0607 01820 USRLP2 LD B,7 ;# OF CHARS. ON EACH LINE
F320 DD7E00 01830 USRLP1 LD A,(IX) ;GET CHARACTER DATA
F323 77 01840 LD (HL),A ;PUT ON CRT
F324 23 01850 INC HL ;NEXT BYTE OF CHARACTER DATA
F325 DD23 01860 INC IX ;NEXT CRT ADDRESS
F327 10F7 01870 DJNZ USRLP1 ;FINISH TOP HALF OF CHAR.
F329 0D 01880 DEC C ;GO TO NEXT CRT LINE
F32A 3E00 01890 LD A,0
F32C B9 01900 CP C ;TEST IF CHARACTER DONE
F32D 19 01910 ADD HL,DE ;GO TO NEXT CRT LINE ADR.
F32E 2802 01920 JR Z,RETPU ;RETURN IF DONE
F330 18EC 01930 JR USRLP2 ;DO NEXT LINE
F332 DDE1 01940 RETPU POP IX ;RESTORE REGISTERS
F334 E1 01950 POP HL
F335 D1 01960 POP DE
F336 C1 01970 POP BC
F337 F1 01980 POP AF
F338 C9 01990 RET ;RETURN TO BASIC
02000 ;

```

```

U2010 ;*****
02020 ; ADDRESS TABLES
02030 ;*****
02040 ;
02050 NUMTBL DEFW ZERO ;THIS TABLE CONTAINS THE
02060 DEFW ONE ;ADDRESSES OF THE DATA
02070 DEFW TWO ;BASE LOCATIONS FOR THE
02080 DEFW THREE ;BLOCK NUMBER & CHARACTERS
02090 DEFW FOUR
02100 DEFW FIVE
02110 DEFW SIX
02120 DEFW SEVEN
02130 DEFW EIGHT
02140 DEFW NINE
02150 DEFW PLUS
02160 DEFW MINUS
02170 DEFW MULT
02180 DEFW DIVIDE
02190 DEFW EQUAL
02200 DEFW QUES
02210 DEFW BLANK
02220 LOCTBL DEFW 3C71H ;THIS TABLE CONTAINS THE
02230 LOC1 DEFW 3D31H ;ADDRESSES OF THE DIFFERENT
02240 LOC2 DEFW 3DC0H ;CRT LOCATIONS THE BLOCK
02250 LOC3 DEFW 3DC7H ;CHARACTERS ARE DISPLAYED
02260 LOC4 DEFW 3DCEH
02270 LOC5 DEFW 3DD5H
02280 LOC6 DEFW 3DDCH
02290 LOC7 DEFW 3DE3H
02300 LOC8 DEFW 3DEAH
02310 LOC9 DEFW 3DF1H
02320 LOC10 DEFW 3DF8H
02330 LOC11 DEFW 3EC0H
02340 LOC12 DEFW 3EC7H
02350 ;
02360 ;*****
02370 ; DATA BASE FOR NUMBERS AND CHARACTERS
02380 ;*****
02390 ;
02400 ZERO DEFW 2020H ;DATA FOR GENERATION OF 0
02410 DEFW 191
02420 DEFW 131
02430 DEFW 179
02440 DEFW 191
02450 DEFW 140
02460 DEFW 20H
02470 DEFW 140
02480 DEFW 191
02490 DEFW 179
02500 DEFW 176
02510 DEFW 191
02520 DEFW 20H
02530 ONE DEFW 2020H ;DATA FOR GENERATION OF 1
02540 DEFW 2020H
02550 DEFW 191
02560 DEFW 2020H
02570 DEFW 2020H
02580 DEFW 2020H
02590 DEFW 191
02600 DEFW 2020H
02610 TWO DEFW 2020H ;DATA FOR GENERATION OF 2
02620 DEFW 179
02630 DEFW 179
02640 DEFW 179
02650 DEFW 191
02660 DEFW 20H
02670 DEFW 2020H
02680 DEFW 191
02690 DEFW 176
02700 DEFW 176
02710 DEFW 176
02720 DEFW 20H
02730 THREE DEFW 2020H ;DATA FOR GENERATION OF 3
02740 DEFW 131
02750 DEFW 179
02760 DEFW 179

```

Listing 2 continues

F3A4 BF	02770	DEFB	191		
F3A5 20	02780	DEFB	20H		
F3A6 2020	02790	DEFW	2020H		
F3A8 B0	02800	DEFB	176		
F3A9 B0	02810	DEFB	176		
F3AA B0	02820	DEFB	176		
F3AB BF	02830	DEFB	191		
F3AC 20	02840	DEFB	20H		
F3AD 2020	02850	DEFW	2020H	;DATA FOR GENERATION OF 4	
F3AF BF	02860	DEFB	191		
F3B0 B0	02870	DEFB	176		
F3B1 B0	02880	DEFB	176		
F3B2 BF	02890	DEFB	191		
F3B3 20	02900	DEFB	20H		
F3B4 2020	02910	DEFW	2020H		
F3B6 2020	02920	DEFW	2020H		
F3B8 20	02930	DEFB	20H		
F3B9 BF	02940	DEFB	191		
F3BA 20	02950	DEFB	20H		
F3BB 2020	02960	DEFW	2020H	;DATA FOR GENERATION OF 5	
F3BD BF	02970	DEFB	191		
F3BE B3	02980	DEFB	179		
F3BF B3	02990	DEFB	179		
F3C0 B3	03000	DEFB	179		
F3C1 20	03010	DEFB	20H		
F3C2 2020	03020	DEFW	2020H		
F3C4 B0	03030	DEFB	176		
F3C5 B0	03040	DEFB	176		
F3C6 B0	03050	DEFB	176		
F3C7 BF	03060	DEFB	191		
F3C8 20	03070	DEFB	20H		
F3C9 2020	03080	DEFW	2020H	;DATA FOR GENERATION OF 6	
F3CB BF	03090	DEFB	191		
F3CC B3	03100	DEFB	179		
F3CD B3	03110	DEFB	179		
F3CE B3	03120	DEFB	179		
F3CF 20	03130	DEFB	20H		
F3D0 2020	03140	DEFW	2020H		
F3D2 BF	03150	DEFB	191		
F3D3 B0	03160	DEFB	176		
F3D4 B0	03170	DEFB	176		
F3D5 BF	03180	DEFB	191		
F3D6 20	03190	DEFB	20H		
F3D7 2020	03200	DEFW	2020H	;DATA FOR GENERATION OF 7	
F3D9 B3	03210	DEFB	131		
F3DA B3	03220	DEFB	131		
F3DB B3	03230	DEFB	131		
F3DC BF	03240	DEFB	191		
F3DD 20	03250	DEFB	20H		
F3DE 2020	03260	DEFW	2020H		
F3E0 2020	03270	DEFW	2020H		
F3E2 20	03280	DEFB	20H		
F3E3 BF	03290	DEFB	191		
F3E4 20	03300	DEFB	20H		
F3E5 2020	03310	DEFW	2020H	;DATA FOR GENERATION OF 8	
F3E7 BF	03320	DEFB	191		
F3E8 B3	03330	DEFB	179		
F3E9 B3	03340	DEFB	179		
F3EA BF	03350	DEFB	191		
F3EB 20	03360	DEFB	20H		
F3EC 2020	03370	DEFW	2020H		
F3EE BF	03380	DEFB	191		
F3EF B0	03390	DEFB	176		
F3F0 B0	03400	DEFB	176		
F3F1 BF	03410	DEFB	191		
F3F2 20	03420	DEFB	20H		
F3F3 2020	03430	DEFW	2020H	;DATA FOR GENERATION OF 9	
F3F5 BF	03440	DEFB	191		
F3F6 B3	03450	DEFB	179		
F3F7 B3	03460	DEFB	179		
F3F8 BF	03470	DEFB	191		
F3F9 20	03480	DEFB	20H		
F3FA 2020	03490	DEFW	2020H		
F3FC B0	03500	DEFB	176		
F3FD B0	03510	DEFB	176		
F3FE B0	03520	DEFB	176		

F3FF BF	03530	DEFB	191		
F400 20	03540	DEFB	20H		
F401 2020	03550	PLUS	DEFW	2020H	;DATA FOR GENERATION OF +
F403 20	03560	DEFB	20H		
F404 BC	03570	DEFB	188		
F405 2020	03580	DEFW	2020H		
F407 2020	03590	DEFW	2020H		
F409 B3	03600	DEFB	131		
F40A B3	03610	DEFB	131		
F40B BF	03620	DEFB	191		
F40C B3	03630	DEFB	131		
F40D B3	03640	DEFB	131		
F40E 20	03650	DEFB	20H		
F40F 2020	03660	MINUS	DEFW	2020H	;DATA FOR GENERATION OF -
F411 2020	03670	DEFW	2020H		
F413 2020	03680	DEFW	2020H		
F415 2020	03690	DEFW	2020H		
F417 B3	03700	DEFB	131		
F418 B3	03710	DEFB	131		
F419 B3	03720	DEFB	131		
F41A B3	03730	DEFB	131		
F41B B3	03740	DEFB	131		
F41C 20	03750	DEFB	20H		
F41D 20	03760	MULT	DEFB	20H	;DATA FOR GENERATION OF x
F41E 8C	03770	DEFB	140		
F41F B0	03780	DEFB	176		
F420 20	03790	DEFB	20H		
F421 B0	03800	DEFB	176		
F422 8C	03810	DEFB	140		
F423 20	03820	DEFB	20H		
F424 20	03830	DEFB	20H		
F425 B0	03840	DEFB	176		
F426 8C	03850	DEFB	140		
F427 B3	03860	DEFB	131		
F428 8C	03870	DEFB	140		
F429 B0	03880	DEFB	176		
F42A 20	03890	DEFB	20H		
F42B 2020	03900	DIVIDE	DEFW	2020H	;DATA FOR GENERATION OF /
F42D 20	03910	DEFB	20H		
F42E 8C	03920	DEFB	140		
F42F 2020	03930	DEFW	2020H		
F431 2020	03940	DEFW	2020H		
F433 B3	03950	DEFB	131		
F434 B3	03960	DEFB	131		
F435 B3	03970	DEFB	179		
F436 B3	03980	DEFB	131		
F437 B3	03990	DEFB	131		
F438 20	04000	DEFB	20H		
F439 20	04010	EQUAL	DEFB	20H	;DATA FOR GENERATION OF =
F43A B0	04020	DEFB	176		
F43B B0	04030	DEFB	176		
F43C B0	04040	DEFB	176		
F43D B0	04050	DEFB	176		
F43E B0	04060	DEFB	176		
F43F 20	04070	DEFB	20H		
F440 20	04080	DEFB	20H		
F441 8C	04090	DEFB	140		
F442 8C	04100	DEFB	140		
F443 8C	04110	DEFB	140		
F444 8C	04120	DEFB	140		
F445 8C	04130	DEFB	140		
F446 20	04140	DEFB	20H		
F447 2020	04150	QUES	DEFW	2020H	;DATA FOR GENERATION OF ?
F449 B3	04160	DEFB	131		
F44A B3	04170	DEFB	179		
F44B B3	04180	DEFB	179		
F44C BF	04190	DEFB	191		
F44D 20	04200	DEFB	20H		
F44E 2020	04210	DEFW	2020H		
F450 20	04220	DEFB	20H		
F451 B3	04230	DEFB	179		
F452 2020	04240	DEFW	2020H		
F454 20	04250	DEFB	20H		
F455 20	04260	BLANK	DEFB	'	;DATA FOR GENERATION OF
F463 20	04270	LVLSTR	DEFB	'	;DATA FOR "LEVEL="
F46C BF	04280	DEFB	191		

Listing 2 continued

F46D 20	04290	DEFM	'	
F473 BF	04300	DEFB	191	
F474 B3	04310	DEFB	179	
F475 B3	04320	DEFB	179	
F476 B3	04330	DEFB	179	
F477 20	04340	DEFM	'	
F47A AF	04350	DEFB	175	
F47B 90	04360	DEFB	144	
F47C A0	04370	DEFB	160	
F47D 9F	04380	DEFB	159	
F47E 20	04390	DEFM	'	
F481 BF	04400	DEFB	191	
F482 B3	04410	DEFB	179	
F483 B3	04420	DEFB	179	
F484 B3	04430	DEFB	179	
F485 20	04440	DEFM	'	
F488 BF	04450	DEFB	191	
F489 20	04460	DEFM	'	
F48F B0	04470	DEFB	176	
F490 B0	04480	DEFB	176	
F491 B0	04490	DEFB	176	
F492 B0	04500	DEFB	176	
F493 20	04510	DEFM	'	
F4AC BF	04520	DEFB	191	
F4AD B0	04530	DEFB	176	
F4AE B0	04540	DEFB	176	
F4AF B0	04550	DEFB	176	
F4B0 20	04560	DEFM	'	
F4B3 BF	04570	DEFB	191	
F4B4 B0	04580	DEFB	176	
F4B5 B0	04590	DEFB	176	
F4B6 B0	04600	DEFB	176	
F4B7 20	04610	DEFM	'	
F4BA 82	04620	DEFB	130	
F4BB A9	04630	DEFB	169	
F4BC 96	04640	DEFB	150	
F4BD 81	04650	DEFB	129	
F4BE 20	04660	DEFM	'	
F4C1 BF	04670	DEFB	191	
F4C2 B0	04680	DEFB	176	
F4C3 B0	04690	DEFB	176	
F4C4 B0	04700	DEFB	176	
F4C5 20	04710	DEFM	'	
F4C8 BF	04720	DEFB	191	
F4C9 B0	04730	DEFB	176	
F4CA B0	04740	DEFB	176	
F4CB B0	04750	DEFB	176	
F4CC 20	04760	DEFM	'	
F4CF 8C	04770	DEFB	140	
F4D0 8C	04780	DEFB	140	
F4D1 8C	04790	DEFB	140	
F4D2 8C	04800	DEFB	140	
F4D3 20	04810	DEFM	'	
F4D7 B3	04820	DEFB	179	
F4D8 20	04830	DEFM	'	
0080	04840	LVLLEN EQU	\$-LVLSTR	
F4E3 20	04850	OPRSTR DEFM	'	;DATA FOR "+-x/" =
F4ED BC	04860	DEFB	188	
F4EE 20	04870	DEFM	'	
F4F9 8C	04880	DEFB	140	
F4FA B0	04890	DEFB	176	
F4FB 20	04900	DEFB	20H	
F4FC B0	04910	DEFB	176	
F4FD 8C	04920	DEFB	140	
F4FE 2020	04930	DEFW	2020H	
F500 2020	04940	DEFW	2020H	
F502 20	04950	DEFB	20H	
F503 B0	04960	DEFB	176	
F504 8C	04970	DEFB	140	
F505 20	04980	DEFM	'	
F50E B0	04990	DEFB	176	
F50F B0	05000	DEFB	176	
F510 B0	05010	DEFB	176	
F511 B0	05020	DEFB	176	
F512 B0	05030	DEFB	176	
F513 20	05040	DEFM	'	
F52B 83	05050	DEFB	131	
F52C 83	05060	DEFB	131	
F52D BF	05070	DEFB	191	
F52E 83	05080	DEFB	131	
F52F 83	05090	DEFB	131	
F530 2020	05100	DEFW	2020H	
F532 83	05110	DEFB	131	
F533 83	05120	DEFB	131	
F534 83	05130	DEFB	131	
F535 83	05140	DEFB	131	
F536 83	05150	DEFB	131	
F537 2020	05160	DEFW	2020H	
F539 B0	05170	DEFB	176	
F53A 8C	05180	DEFB	140	
F53B 83	05190	DEFB	131	
F53C 8C	05200	DEFB	140	
F53D B0	05210	DEFB	176	
F53E 2020	05220	DEFW	2020H	
F540 B0	05230	DEFB	176	
F541 8C	05240	DEFB	140	
F542 83	05250	DEFB	131	
F543 20	05260	DEFM	'	
F54E 8C	05270	DEFB	140	
F54F 8C	05280	DEFB	140	
F550 8C	05290	DEFB	140	
F551 8C	05300	DEFB	140	
F552 8C	05310	DEFB	140	
0070	05320	OPRLEN EQU	\$-OPRSTR	
F553 20	05330	RITSTR DEFM	'	;DATA FOR "RIGHT"
F56A BF	05340	DEFB	191	
F56B B3	05350	DEFB	179	
F56C B3	05360	DEFB	179	
F56D BF	05370	DEFB	191	
F56E 2020	05380	DEFW	2020H	
F570 20	05390	DEFB	20H	
F571 83	05400	DEFB	131	
F572 AB	05410	DEFB	171	
F573 97	05420	DEFB	151	
F574 83	05430	DEFB	131	
F575 2020	05440	DEFW	2020H	
F577 20	05450	DEFB	20H	
F578 BF	05460	DEFB	191	
F579 83	05470	DEFB	131	
F57A B3	05480	DEFB	179	
F57B B3	05490	DEFB	179	
F57C 2020	05500	DEFW	2020H	
F57E 20	05510	DEFB	20H	
F57F BF	05520	DEFB	191	
F580 B0	05530	DEFB	176	
F581 B0	05540	DEFB	176	
F582 BF	05550	DEFB	191	
F583 2020	05560	DEFW	2020H	
F585 20	05570	DEFB	20H	
F586 83	05580	DEFB	131	
F587 83	05590	DEFB	131	
F588 BF	05600	DEFB	191	
F589 83	05610	DEFB	131	
F58A 83	05620	DEFB	131	
F58B 20	05630	DEFM	'	
F5AA BF	05640	DEFB	191	
F5AB 83	05650	DEFB	131	
F5AC 8C	05660	DEFB	140	
F5AD B0	05670	DEFB	176	
F5AE 2020	05680	DEFW	2020H	
F5B0 20	05690	DEFB	20H	
F5B1 B0	05700	DEFB	176	
F5B2 BA	05710	DEFB	186	
F5B3 B5	05720	DEFB	181	
F5B4 B0	05730	DEFB	176	
F5B5 2020	05740	DEFW	2020H	
F5B7 20	05750	DEFB	20H	
F5B8 BF	05760	DEFB	191	
F5B9 B0	05770	DEFB	176	
F5BA B0	05780	DEFB	176	
F5BB BF	05790	DEFB	191	
F5BC 2020	05800	DEFW	2020H	

Listing 2 continues

Put 64K CP/M® 2.2 in your TRS-80 Model III and tap into 2,000 business programs.

Now you can run programs such as WordStar, dBASE II, SuperCalc, MailMerge and virtually thousands of other CP/M-based programs on your TRS-80 Model III.

CP/M 2.2 is the industry standard operating system that gives you access right now to over 2,000 off-the-shelf business programs.

Our plug-in Shuffleboard III comes with 16K of RAM, giving your Model III the power of full 64K CP/M 2.2 without interference of the ROM or video memory. In fact, the Shuffleboard will appear transparent in the TRS-80 mode and will not interfere with any DOS operation.

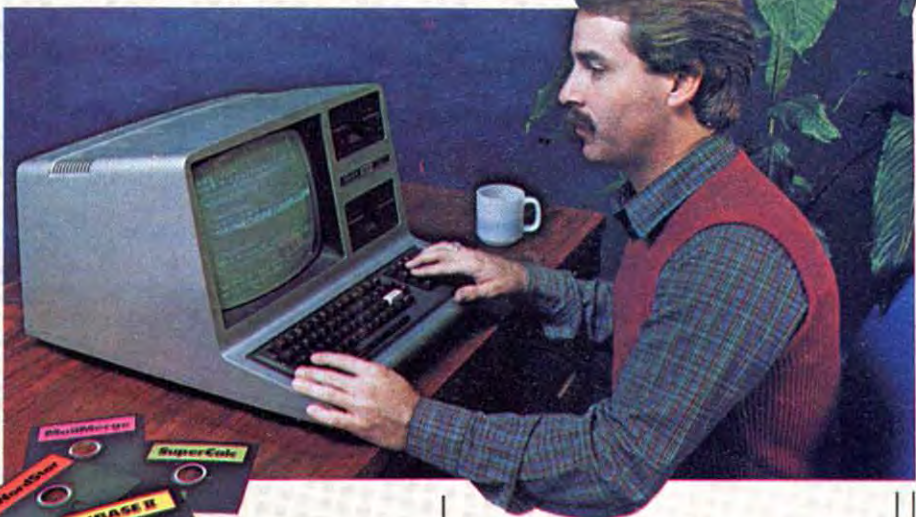
READ and WRITE Osborne, Xerox and IBM personal computer software plus many more popular formats.

Unfortunately, there is no standardized CP/M format for 5 1/4" diskettes. But we have developed a way to READ/WRITE and RUN standard programs under the following single-sided formats: Osborne 1 S/D, Xerox 820 S/D, IBM PC* D/D for CP/M 86 only, Superbrain D/D, Kapro II D/D, HP 125 D/D and TeleVideo D/D.

*Will Read and Write Only.

Easy plug-in installation.

It's so simple. The Shuffleboard III plugs into two existing sockets inside your Model III. There are no permanent modifications, no cut traces and no soldering. You'll be up and running in minutes.



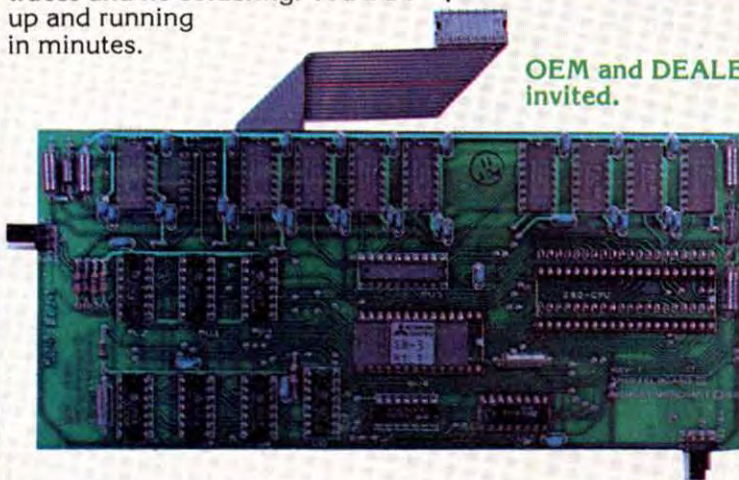
New Products.

80 x 24 VIDEO BOARD: Features dual intensity screen, programmable cursor control for block, underline & blink rate, on-board bell with audible keyclick, battery-operated real time calendar/clock, full ASCII character set plus 256 special character graphics, dual RS-232 outputs and composite video output.

FLOPPY DISK CONTROLLER: Now you can access 5 1/4" and 8" floppy disk drives in any combination up to 4 drives of S/D density, S/D sided. Tap into a wealth of CP/M software which comes on 8" IBM 3740 format or Pickles & Trout CP/M for the Model II.

SOFTWARE: Additional CP/M software programs are available. Call or write for details.

OEM and DEALER inquiries invited.



WordStar & MailMerge are trademarks of MicroPro.
SuperCalc is a trademark of SORCIM.

dBASE II is a trademark of Ashton-Tate.
CP/M is a trademark of Digital Research.

TRS-80 is a trademark of Tandy Corporation.
IBM is a trademark of IBM Corporation.

Introductory price of

\$299.

The Shuffleboard III comes fully burned-in and tested complete with 64K CP/M 2.2 and MBASIC 80 interpreter, plus software manuals and a first class user's manual — with a 1-year limited warranty and 15-day no-risk free trial — for only \$299.

See the Shuffleboard III at your dealer's now.

Once you see what the Shuffleboard can do for your Model III you'll want one at once. If your dealer does not yet stock the Shuffleboard have him give us a call. Or send check, money order, VISA or MASTERCARD number (sorry, no COD's) plus \$5 shipping per board (\$17 outside the USA & Canada)* directly to the address below. Cal. residents please add sales tax. Credit card purchases can be phoned in directly and we'll ship from stock.

(415) 483-1008

*Air mail shipments to Canada & all other countries.

Memory™ Merchant

14666 Doolittle Drive San Leandro, CA 94577
(415) 483-1008

461

Listing 2 continued

```

F5BE 20      05810      DEFB      20H
F5BF BF      05820      DEFB      191
F5C0 2020    05830      DEFW      2020H
F5C2 BF      05840      DEFB      191
F5C3 20      05850      DEFM      ' '
F5C8 BF      05860      DEFB      191
F5C9 20      05870      DEFM      ' '
0080        05880      RITLEN    EQU      $-RITSTR
0400        05890      CLR CRT   DEFS     400H      ;CRT BLANK BUFFER
F9D3        05900      CLREND    EQU      $
0400        05910      SAVCRT   DEFS     400H      ;SAVE CRT BUFFER
FDD3        05920      SAVEND    EQU      $
05930      ;
05940      ;*****
05950      ;          DATA BASE FOR MUSIC
05960      ;*****
05970      ;

FDD3 A631    05980      SNDBFW    DEFW      31A6H      ;NOTE 'G' ABOVE 'MID C'
FDD5 01FF    05990      DEFW      0FF01H
FDD7 C629    06000      DEFW      29C6H      ;NOTE 'E' ABOVE 'MID C'
FDD9 01FF    06010      DEFW      0FF01H
FDDB FE41    06020      DEFW      41FEH      ;NOTE 'MID C'
FDDD 01FF    06030      DEFW      0FF01H
FDDF FE41    06040      DEFW      41FEH      ;NOTE 'MID C'
FDE1 01FF    06050      DEFW      0FF01H
FDE3 FE20    06060      DEFW      20FEH      ;NOTE 'MID C'
FDE5 01FF    06070      DEFW      0FF01H
FDE7 E024    06080      DEFW      24E0H      ;NOTE 'D' ABOVE 'MID C'
FDE9 01FF    06090      DEFW      0FF01H
FDEB C629    06100      DEFW      29C6H      ;NOTE 'E' ABOVE 'MID C'
FDED 01FF    06110      DEFW      0FF01H
FDEF B32B    06120      DEFW      2BB3H      ;NOTE 'F' ABOVE 'MID C'
FDF1 01FF    06130      DEFW      0FF01H
FDF3 A662    06140      DEFW      62A6H      ;NOTE 'G' ABOVE 'MID C'
FDF5 01FF    06150      DEFW      0FF01H
FDF7 A662    06160      DEFW      62A6H      ;NOTE 'G' ABOVE 'MID C'
FDF9 01FF    06170      DEFW      0FF01H
FDFB A662    06180      DEFW      62A6H      ;NOTE 'G' ABOVE 'MID C'
FDFD 01FF    06190      DEFW      0FF01H
FDFE C663    06200      DEFW      63C6H      ;NOTE 'E' ABOVE 'MID C'
FE01 01FF    06210      DEFW      0FF01H
FE03 01FF    06220      DEFW      0FF01H
FE05 01FF    06230      DEFW      0FF01H
FE07 01FF    06240      DEFW      0FF01H
FE09 01FF    06250      DEFW      0FF01H
FE0B 01FF    06260      DEFW      0FF01H
FE0D FE21    06270      DEFW      21FEH      ;NOTE 'MID C'
FE0F 01FF    06280      DEFW      0FF01H
FE11 C629    06290      DEFW      29C6H      ;NOTE 'E' ABOVE 'MID C'
FE13 01FF    06300      DEFW      0FF01H
FE15 A631    06310      DEFW      31A6H      ;NOTE 'G' ABOVE 'MID C'
FE17 01FF    06320      DEFW      0FF01H
FE19 7C21    06330      DEFW      217CH      ;NOTE 'C' ABOVE 'MID C'
FE1B 01FF    06340      DEFW      0FF01H
FE1D 01FF    06350      DEFW      0FF01H
FE1F 01FF    06360      DEFW      0FF01H
FE21 01FF    06370      DEFW      0FF01H
FE23 01FF    06380      DEFW      0FF01H
FE25 01FF    06390      DEFW      0FF01H
FE27 01FF    06400      DEFW      0FF01H
FE29 01FF    06410      DEFW      0FF01H
FE2B 01FF    06420      DEFW      0FF01H
FE2D A618    06430      DEFW      18A6H      ;NOTE 'G' ABOVE 'MID C'
FE2F 01FF    06440      DEFW      0FF01H
FE31 7CFF    06450      DEFW      0FF7CH      ;NOTE 'C' ABOVE 'MID C'
FE33 7CFF    06460      DEFW      0FF7CH      ;NOTE 'C' ABOVE 'MID C'
FE35 7CFF    06470      DEFW      0FF7CH      ;NOTE 'C' ABOVE 'MID C'
0064        06480      SNDLNW    EQU      $-SNDBFW
FE37 BC80    06490      SNDBFL    DEFW      80BCH      ;NOTE 'F' ABOVE 'MID C'
FE39 BC80    06500      DEFW      80BCH      ;NOTE 'F' ABOVE 'MID C'
FE3B 01FF    06510      DEFW      0FF01H
FE3D E080    06520      DEFW      80E0H      ;NOTE 'D' ABOVE 'MID C'
FE3F E080    06530      DEFW      80E0H      ;NOTE 'D' ABOVE 'MID C'
000A        06540      SNDLNL    EQU      $-SNDBFL
0000        06550      END

```

00000 TOTAL ERRORS

```

10 REM VARIABLE LO DEFINES ASSEMBLY LOCATION 'PNTLOC'
20 REM VARIABLE VA DEFINES ASSEMBLY LOCATION 'NUMBER'
30 REM VARIABLE WI DEFINES ASSEMBLY LOCATION 'WINLOS'
35 REM VARIABLE RO DEFINES ASSEMBLY LOCATION 'ROUTIN'
40 REM POKE RO,0:X=USR(A)      INITIALIZES BUFFER IN ASSEMBLY RO
UTINE
50 REM POKE RO,1:X=USR(A)      PRINTS "LEVEL=" AND "+-X/ ="
60 REM POKE RO,2:X=USR(A)      CORRECT ANSWER ROUTINE
70 REM POKE RO,3:X=USR(A)      PRINTS "RIGHT"
80 REM POKE RO,4:X=USR(A)      PRINTS A NUMBER OR CHARACTER OF T
HE CRT
90 REM
100 REM*****
110 REM          INITIALIZATION AND SETUP
120 REM*****
130 REM
140 CLS:DEFINT A,F,H,I,L,N,O,P,Q,R,T,V,W,X,Y,Z
150 PRINT:INPUT"ENTER DECIMAL ADDRESS OF ASSEMBLY LOCATION 'TAPM
OD'";Z#
160 A=Z#/256:POKE 16527,A
170 A=Z#-A*256:POKE 16526,A
180 RO=-3581: REM THIS IS HEX F203
190 LO=-3583: REM THIS IS HEX F201
200 VA=-3582: REM THIS IS HEX F202
210 WI=-3584: REM THIS IS HEX F200

```

Program Listing 3. Changes to Basic Program for a Tape System

```

F200        00001      ORG      0F200H
0001        00002      WINLOS    DEFS     1
0001        00003      PNTLOC    DEFS     1
0001        00004      NUMBER    DEFS     1
0001        00005      ROUTIN    DEFS     1
F204 FF00    00006      DELSTR    DEFW     00FFH
F206 FF00    00007      DELAY     DEFW     00FFH
00010      ;*****
00012      ;          DETERMINE CORRECT USR CALL
00014      ;*****
F208 F5      00016      TAPMOD    PUSH     AF      ;SAVE AF REG
F209 3A03F2  00018      LD        A,(ROUTIN) ;GET ROUTINE TO EXEC.
F20C F800    00020      CP        0          ;IS IT USR0
F20E 2005    00022      JR        NZ,TEST1   ;NO
F210 CD39P2  00024      CALL     USR0        ;EXECUTE USR0
F213 F1      00026      POP       AF         ;RESTORE AF REG.
F214 C9      00028      RET
F215 FE01    00030      TEST1    CP        1          ;IS IT USR1
F217 2005    00032      JR        NZ,TEST2   ;NO
F219 CD52F2  00034      CALL     USR1        ;EXECUTE USR1
F21C F1      00036      POP       AF         ;RESTORE AF REG
F21D C9      00038      RET
F21E FE02    00040      TEST2    CP        2          ;IS IT USR2
F220 2005    00042      JR        NZ,TEST3   ;NO
F222 CD6FF2  00044      CALL     USR2        ;EXECUTE USR2
F225 F1      00046      POP       AF         ;RESTORE AF REG.
F226 C9      00048      RET
F227 FE03    00050      TEST3    CP        3          ;IS IT USR3
F229 2005    00052      JR        NZ,TEST4   ;NO
F22B CD10F3  00054      CALL     USR3        ;EXECUTE USR3
F22E F1      00056      POP       AF         ;RESTORE AF REG.
F22F C9      00058      RET
F230 FE04    00060      TEST4    CP        4          ;IS IT USR5
F232 2003    00062      JR        NZ,ENDTST  ;NO
F234 CD22F3  00064      CALL     USR4        ;EXECUTE USR4
F237 F1      00066      ENDTST   POP       AF         ;RESTORE AF REG.
F238 C9      00068      RET

```

Program Listing 4. Changes to Assembly Program for a Tape System

YOU'VE JUST FOUND THE MISSING LINK!



Computer Shopper is *your link* to individuals who buy, sell and trade computer equipment and software among themselves nationwide. No other magazine fills this void in the marketplace chain.

Thousands of cost-conscious computer enthusiasts save by shopping in Computer Shopper every month through hundreds of classified ads. And new equipment advertisers offer some of the lowest prices in the nation.

Computer Shopper's unbiased articles make for some unique reading among magazines and there's a "help" column to answer difficult problems you may have with interfacing, etc.

For a *limited time* you can subscribe to Computer Shopper with a 6 month trial for \$6 or 12 months for \$10.

You risk nothing, because if you're not 100% satisfied after receiving the first issue, you may cancel and receive a full refund. No questions asked!

If you want faster service, call in your subscription and charge on your MasterCard or VISA account.

Our business office is open from 8 a.m. to 5 p.m. Monday through Friday. Call for charge card orders or send your check or money order TODAY while the offer is still good.

6 month trial, \$6 or 12 months for \$10

 **COMPUTER SHOPPER**

P.O. Box F-577 • Titusville, FL 32780
305-269-3211

The Intersoft C Compiler

by Rowland Archer

Although the C language is an interesting and useful programming tool, this package requires additional software and knowledge of Assembly.

★ ½

Intersoft C
Intersoft Unlimited
Box 383, Station C
Kitchener-Waterloo, Ontario
N2G 3Y9, Canada
\$75
\$15 manual only (can be applied
towards purchase)

The Intersoft C compiler is available for the Model I and III as well as Digital Research Corporation's CP/M and Technical Systems Consultants' Flex system for the 6809. I did most of my testing on a Model I, although I did manage to get some limited test time in under LDOS on a Model III.

The C language was developed at Bell Labs by Dennis Ritchie. Although C was developed on the UNIX operating system, and in turn most of UNIX was rewritten in C, it is not necessary to have UNIX in order to develop and run C programs.

C is usually classified as a medium-level language, meaning that it is a higher level than Assembly language, but lower than languages such as PL/I and Pascal. Functions written in C can perform many operations that are built into other languages, such as conversion between data types and reading and writing to files. This keeps the core of C simple and uncluttered, yet functions

are available to do most of the things that you can do with higher-level languages.

The Program Listing shows a simple C program that accepts a line of text, reverses it, and prints it back out. To me, C feels more like Pascal assembly. The example program is explained in more detail in the sidebar.

Intersoft C is not a complete implementation of the C language. Although there is no standard for C, the de facto standard is described in Brian W. Kernighan and Dennis M. Ritchie's book *The C Programming Language* (Prentice-Hall, Englewood Cliffs, NJ, 1978). Intersoft C is derived from Ron Cain's Small C, which is a subset of the full C language.

Intersoft C is supplied on a TRS-80-formatted data disk with no operating system. You will need to copy these files onto a DOS disk. If you have only one disk drive, you will need a DOS with a single-drive file-copy function. There is an elaborate alternative procedure, described in the manual, that lets you copy the files to a DOS disk on a single-drive system using a text editor, a disk-based editor/assembler, and the DOS Load and Dump commands. If you use this approach, don't waste time looking for the table of program load addresses mentioned in the manual—the addresses you need are printed on the disk labels.

Using Intersoft C

The Intersoft C package, as delivered, is not sufficient by itself for developing and running C programs. In order to use the system, you must own or purchase a disk-based, line-numberless text editor and a Z80 assembler program. To create C programs, you need an editor and an assembler because the C compiler's output is Z80 Assembly code, which must be assembled before it can be run.

Before you can use the package, you must edit, compile, or assemble the support libraries: CSUPP/C and Z8OLIB/MAC or Z8OLIB/ASM, depending on your own version. The editing involves deleting some lines in the CSUPP/C file to make it work with your machine and assembler. I think this should be done by Intersoft since they are already supplying different versions of the system depending on the machine and assembler you own.

Before it can be compiled, a C program has to be typed into a file. I was surprised to find that the manual never describes the format of a C program source file, and it only hints at how you can create one. The first appendix casually mentions that you can use whatever text processing system you have available. It appears that you can use any text editor that creates plain ASCII files without line numbers. I used Radio Shack's Scripsit word processor. You cannot use the TRS-80's Basic text editor or EDTASM's editor because they generate line numbers, which the C compiler does not tolerate.

The recommended assemblers are either a disk conversion of Radio Shack's EDTASM, such as the one provided by Apparat with their NEW-

DOS80, or Microsoft's M80 macro assembler. Any disk-based assembler that is file-compatible with either of these should work, too.

Depending on which text editor, assembler, and operating system you use, life with the Intersoft C compiler can be either fairly smooth or downright tedious. Figure 1 shows the steps required to create, compile, and run a program under what I consider to be the best environment. Figure 2 shows the steps required under the least favorable environment.

In Fig. 1, your text editor allows direct entry of these special characters required by C:

- Braces, { }, used to delimit compound statements in C (like Begin... End in Pascal);
- Brackets, [], used with array variables to delimit the array index;
- Vertical bar, |, the logical "or" operator;
- Tilde, ~, the "one's complement" operator; and
- Caret, ^, the logical "exclusive or" operator.

Although the TRS-80 does not include these special characters on its keyboard, there are several text editors available, such as Apparat's Flextext (a patch to Scripsit), that allow you to enter them directly.

The next step in Figure 1 is to run the C compiler, which produces Z80 assembler source-code statements from your C program. The compiler gives you the option of having the C program source text appear in the output file along with the assembler statements. This lets you determine which assembler lines came from each C program statement.

When you run the compiler, you must decide whether to define globals—allocate memory for global variables. This topic is a bit confusing, and the need to answer this question every time you run the compiler is an unusual requirement. Standard C handles this issue with the EXTERN declaration, which Intersoft C does not support.

Next, using Microsoft's M80 assembler, assemble the file that was generated by the compiler to create a standard "/REL" (relocatable object code) file. Finally, run L80, the linking loader, to combine the /REL file just produced with one or more other /REL files that contain C run-time support programs and library functions. This last step creates an executable code file (a TRSDOS "/CMD" file) which can be run directly from the DOS READY prompt.

Except for the extra step of running the assembler, this involves no more

work than running most compilers. Generating and storing the intermediate assembler source file takes a little more time and disk space. The whole process of compiling, assembling, and loading a C program is made easier if your DOS allows you to create a file of keyboard

commands and then run that file. Most TRS-80 DOSes call this feature the "DO file" or "chaining."

Now we come to Fig. 2. You would have to want to write C programs pretty badly to use this setup. The whole purpose of writing in a language like C is to

continues on page 202

Demo C program to read a line of text from the keyboard (STDIN) and write the reverse of that line to the CRT (STDOUT)

```
#include <stdio.h>
#define strlen 64

revstr(str, rstr)
char str[], rstr[];
{
    int i,j;
    i = strlen(str) - 1;
    j = 0;
    while (i >= 0)
        rstr[j++] = str[i--];
    rstr[j] = EOS;
}
```

```
}
main(argc, argv)
int argc, argv[];
{
    char line[strlen], rline[strlen];

    puts("Type a line: ");
    putchar(EOL);
    gets(line);
    revstr(line, rline);
    puts("The reverse of what you typed is: ");
    putchar(EOL);
    puts(rline);
}
```

Program Listing. Sample C Program

- | | |
|--|-------------------------------------|
| 1. Use a text editor that allows typing of special characters (see text) to produce: | C Program Source |
| 2. Use the M80 version of the C compiler to produce: | Z80 Assembler Source, M80 format |
| 3. Use the M80 macro assembler to produce: | Relocatable Object Code (/REL file) |
| 4. Use the L80 loader to combine the above file with run-time libraries to produce: | Executable Object Code (/CMD file) |

Fig. 1. Steps required to create, compile, and assemble a C program using a text editor that allows the entry of C's special characters, and the M80 macro assembler.

- | | |
|--|--|
| 1. Use a text editor that does not allow the entry of special characters to produce: | C Program Source |
| 2. Use the preprocessor to translate escape sequences to special characters: | Preprocessed C Program Source |
| 3. Use the EDTASM version of the C compiler to produce: | Z80 Assembler Source, EDTASM format, no line #'s |
| 4. Use the postprocessor to add line numbers to the above: | Z80 Assembler Source, EDTASM format, w/line #'s |
| 5. Use EDTASM to combine the above file with run-time libraries to produce: | Executable Object Code (/CMD file) |

Fig. 2. Steps required to create, compile, and assemble a C program using a text editor that does not allow the entry of C's special characters and the EDTASM assembler.

A Closer Look at the Listing

The program Listing is a C program which accepts a line typed at the keyboard, reverses it and prints it out on the CRT. This program demonstrates only a tiny fraction of C's potential, but it may give you a feeling for the C language.

The first statement past the title comment is a compiler directive to "include" the file "stdio/h" at this point in the program. This causes the compiler to open stdio/h and compile its contents. Stdio/h contains "#define" statements for some implementation-dependent constants such as EOL and EOS, described below.

The "#define" statement is another compiler directive. As used here, it tells the compiler to replace the identifier "strlen" everywhere it occurs with the value 64. Using #define statements to establish symbolic constants makes it easier to change the value of a constant that is used in several places in a program.

A C program is a collection of functions, similar to the way a Pascal program is a collection of functions and procedures. Functions can be called from other functions and they can return values, just as SIN(X) returns the sine of X in Basic. They can also change the value of the variables passed as arguments, as you will see in a moment.

The first function defined in the listing is named "revstr". It reverses what is in "str" and stores the result in "rstr". The header line gives the name of the function and its formal arguments or parameters: rstr and str. The header is followed by a declaration that tells the data type of the function's arguments. The declaration "char str[], rstr[];" says that str and rstr are character arrays. Using two brackets [] with no number in between says that these arrays can be of whatever size the calling function uses.

C uses { } like Pascal uses Begin and End, to delimit a compound statement. Right after its opening {, revstr declares two local integer variables, i and j. Memory is allo-

cated for local variables when a function is invoked at run time, and deallocated when the function is exited. C has only local and global variables; it is not a block-structured language. (Block structure means that you can nest one procedure inside another; each procedure can reference variables in itself and all the procedures that enclose it).

The character arrays "str" and "rstr" are used to hold variable length text strings. C builds variable length strings by storing consecutive characters in adjacent elements of an array. An ASCII null (0) character is stored as a terminator after the last character in the string. This terminator is symbolically referred to as EOS—the End-Of-String character. EOS is one of the constants defined in the "included" file, stdio/h.

*"A C program
is a
collection of
functions."*

The first statement of the function revstr assigns the value "strlen(str)-1" to the variable i. This initializes i to be the index of the last character (before EOS) in str. "Strlen" is a C library function which returns the length of its string argument. It counts all the characters up to, but not including, EOS.

The variable j is initialized to zero in the next statement. This makes j the index of the first character of rstr.

The "while" loop is where the bulk of the work is done. It says to execute the loop body as long as i is greater than or equal to zero. In this case, the loop body is only a single statement. A compound statement, delimited by { }'s, can also be used.

The loop body statement, "rstr[j++] = str[i--];", copies the "ith" element of str to the "jth" el-

ement of rstr. The notation "i--" says to subtract 1 from i after using it as an index to str. Similarly, "j++" says to increment j after using it as an index to rstr. If the "--" or "++" appear before a variable, e.g. "--j", it means to decrement or increment the variable before using it.

When i is decremented below zero, the loop is done and the string in str has been copied backwards into rstr. An EOS character is then stored at "rstr[j]" to terminate rstr. The "}" character marks the end of the function.

Every C program must include a function called "Main"; this is where execution begins when the program is run. "Main" always has two arguments, "argc" and "argv[]." "Argc" tells how many arguments are on the command line which invoked the program; "argv[]" is an array containing addresses of the command line arguments themselves.

The example C program's main function defines two character arrays "line" and "rline", both dimensioned to have "strlen" characters. "Puts" is another C library function, standing for "put string." It writes its argument to STDOUT, normally the CRT screen. Here it prompts the user to "Type a line: ". The argument to "puts" is a literal string enclosed with double quote marks. The compiler stores the string and terminates it with an EOS byte.

The next call is to the function "putchar," which writes a single character to STDOUT. In this case, the EOL or End-Of-Line character is written, forcing the cursor to move to the next line on the screen. EOL is defined in stdio/h.

The "gets" function is called to get a string from STDIN. The resulting string is stored in the variable "line." This is followed by a call to revstr to reverse the string in line and store the result in rline.

Finally, "puts" and "putchar" are called again to type the closing message and rline, the reversed string. ■

SPECTACULAR GAMES

For TRS 80
COLOR COMPUTER

\$21.95

Each

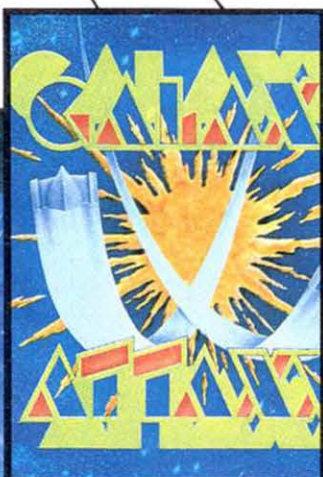
Color Graphics

Arcade Quality

Only 16K Required

Complete Machine Language

Fast Pace



Highest Resolution

No Basic Needed

Super Sound

Free Catalog

High Quality

Continuous Action

Satisfaction Guaranteed

141 Harvard
Tacoma, W.A.
98466

SPECTRAL ASSOCIATES

✓ 119 Local
Information Call
(206) 565-8483

If not available at your local dealer ask why not and

Call Toll Free 800-426-1830

Except WA., AK., HI., (8:00-4:00 Mon.-Fri.)



make program development and maintenance easier. When the hassle of compiling a program outweighs the benefits of using the language, why bother?

You must do the first extra step in Fig. 2 because the text editor, Scripsit for example, doesn't allow you to type in C's special characters. You can have this problem whether you are using EDTASM or M80. Intersoft supplies a preprocessor that translates two-character "escape sequences" into the "special" characters. For example, "(." and ".)" are converted into "[[" and "]]", respectively. The preprocessor executes quickly (it is written in C and compiled to machine language) but it adds an extra step to every compilation. Intersoft has informed me that the next version of their compiler will directly recognize the escape sequences as alternates for the special characters, eliminating the preprocessor step.

The next inconvenience comes when you run the compiler. You must supply a "starting number for labels." The compiler generates assembler source code labels of the form "CCxxxx", where "xxxx" is a sequence number starting with the one you specify. If your program contains separately com-

iled modules, the burden is on you to make sure that there are no duplicate labels in the separate modules that must be assembled all together. There are no guidelines given for how far apart the starting numbers should be. It is totally dependent upon how many labels the compiler has to generate to compile a particular program.

The compiler generates a Z80 source code file that is not yet in EDTASM-compatible format, strange considering this is supposedly the EDTASM-compatible version of the compiler. You must run a postprocessor which adds line numbers and some header and trailer information that EDTASM expects. The postprocessor step takes about as long as compilation. It also produces an output file that is larger than the already big assembler source file. Running it on the 19.5K byte C run-time support library creates an output file of 26.5K bytes. I use two 40-track double-density disks that fit well. A user with one 35-track single-density drive would really be cramped.

The next step is to run EDTASM and load the assembler source code files produced by your separately compiled modules. In the original re-

lease of the compiler, you had to load the sources for the C run-time support library into EDTASM's buffer, too. With a 48K byte machine, I only had 4K bytes of free space left in EDTASM after loading all the sources to assemble the short sample program in the listing. The compiler generates several consecutive blanks in each line of assembler source code it produces. By replacing consecutive blanks with single blanks, I squeezed out an extra 4K bytes of free space.

An update notice to the system describes a procedure that helps alleviate this memory crunch. You make a few minor changes to the support library source code, then compile and assemble the result, producing a core image file containing the executable version of the run-time library. You must also create a file of assembler EQU (equates) statements that associate a symbol with a hexadecimal address—one statement for each of 36 entry points in the run-time library.

When you compile a C program, you load the compiler output together with the EQU file into EDTASM and assemble it. The output of EDTASM is combined with the executable version of the

PION introduces the INTERSTELLAR DRIVE.



A solid state disk emulator for your APPLE*, TRS80, \$100, or SS50 computer**

● A FAST mass storage device. Speeds up any program requiring disk access.

Introductory Price \$1095.
plus tax and shipping



SEND FOR FREE BROCHURE

Identify your model.

✓ 490

- No head seek time, no motor startup time, no moving parts.
- Standard 256K bytes of storage expandable to 1 megabyte.
- Independent regulated power supply.
- Automatic power failure detect and battery backup.
- Hardware error detection and write protect.
- Only 4 bytes-ports of address I/O space used
- Hardware optimized for block transfers and access.
- Drivers, diagnostics, and utilities software provided.

PION, INC. Tel. (617)648-1717
74 Appleton St., Arlington, MA 02174

*Trade Mark Apple **Trade Mark Tandy Corp.

Does Your TRS-80 Deserve The Very Best Software?

EDUCATIONAL
THE MATH PAK'S - The top selling math drill programs. Order MP1 for integers, MP2 for fractions, MP3 for decimals. \$14.95 ea./cass.
WORDPAK - The new standard in vocabulary programs. Make your own wordlists to match your texts. 3 games and many features. \$19.95/cass.
SPEECHZAPPER 1, SPEECHZAPPER 2 - Arcade style language arts programs. Identify parts of speech in actual usage. The two programs cover nouns, pronouns, adverbs, adjectives, prepositions, and interjections. \$16.95 ea./cass.

HOME/BUSINESS
HORKS-A unique single entry accounting system. User assigned codes, many reports, up to 9200 entries. Req. 32 K-1 disc. \$29.95/disc. \$24.95/cass.
INVENTORY + - Complete inventory system, up to 3000 entries. Use as a stand alone system with many reports and features. Req 32K-1 disc Min. \$29.95/disc. \$24.95/cass.
CASH REGISTER 80- The best selling point of sale system for the Mod 1.3. Get all the features of the \$\$\$\$\$\$ systems. Req INVENTORY +. 48K. 1 disc. \$29.95. \$24.95/cass.

GAMES/ADVENTURES
PYRAMID - Makes Mastermind look like a child's game. With sound, high speed graphics, and 3 skill levels. \$11.95/cass.
ARGUS CHRONICLE - An out of this world machine language text adventure. \$24.95/disc. \$19.95/cass.

CASSETTES - CASSETTE DUPLICATING
 Top quality screw cassettes w/boxes, C10/\$9.95, C20/\$10.95 doz. Add \$1.75 shipping 1st doz., \$.75 each additional. Other sizes available. Lower prices on bulk sales. Write for rate sheet.
CASSETTE DUPLICATING - Mod 1.3, color, and audio. Write for rate sheet. Mass. residents add 5% tax. Visa, MC, & phone orders accepted. Call or write for free catalog. Dealer inquiries invited.

sandpiper SOFTWARE
 P.O. BOX 336
 MAYNARD, MA 01754
 (617) 568-8641

support library by loading everything into memory and dumping it back out as a single file using TRSDOS's Dump command. This allows you to write somewhat larger C programs, but still not nearly as large as with M80.

The manual suggests a tedious, unnecessary method of combining assembler source-code files in EDTASM's buffer: Load a file, write down the highest line number, then load previous files and renumber them to avoid line number conflicts, reload the first file, and so on. EDTASM lets you combine files that have conflicting line numbers, as long as you issue the N (renumber) command immediately after loading such a file. This command renumbers the whole file into one with nonconflicting line numbers.

There is a possibility of having multiple End and ORG statements in your file, since one is produced for each separately compiled module. Intersoft suggests searching the entire file using the F (find) command and deleting all but the first ORG and the last End statement. After doing this, you can finally use EDTASM's A command to create an executable code file on disk.

There is considerably more work to

do in Fig. 2 than the diagram suggests. Much of the additional work is manual and tedious. You are limited to compiling much smaller programs if you use EDTASM, and there is a bigger demand on disk space. Keep in mind that you have to go through all these steps every time you have to recompile to correct a bug, or add a feature. I consider the compiler and EDTASM to be a very poor match.

I also take issue with the claim in Intersoft's advertising that no knowledge of Assembly is required. Using the assembler is an integral part of compiling a C program. Only partial instructions are given for using either M80 or EDTASM. At one point, the manual states: "You may find odd errors appearing when you attempt to assemble. A careful examination of the source code in memory will usually reveal the nature of the problem..." How can you examine assembler source code to find a problem if you don't understand Assembly?

On the positive side, no royalty payments are required if you are interested in selling the software you develop with Intersoft C.

Language Features

As I mentioned, Intersoft C is not a complete implementation of the C language. If you are familiar with how Radio Shack's Tiny Pascal compares to full Pascal, you will have some idea of how Intersoft C compares to full C. Intersoft C is ahead of Tiny Pascal in several areas; it supports disk I/O, separately compiled modules, and integrated Assembly code.

Specifically, version 2.0 of Intersoft C does not provide:

- Long (32-bit) integers or floating-point numbers (the only data types supported are characters and 16-bit integers);
- Multi-dimensional arrays (only one-dimensional arrays are allowed);
- Structures, unions, typedefs, and storage classes;
- The "sizeof" operator;
- "Casts" (explicit data type conversions);
- The GOTO statement; and
- Compile-time initialization of external variables.

Intersoft says that version 2.5, not available at the time of this writing,

TRS-80

COLOR COMPUTER

TRS-80

FLEXPLUS DOS

FLEXPLUS is a powerful, easy-to-use disk operating system. Spectral Associates has adapted TSC's FLEX to the best DOS completely compatible with Radio Shack software for use on the Color Computer. Eliminate the need for Radio Shack's TRS DOS - use FLEXPLUS with Editor/Assembler and have the options of a full range of utilities. FLEXPLUS works on the 32K Radio Shack disk system with 64K memory chips with a High Resolution multi-screen format that supports a 24 line by 51 character display! Also included are special enhancements to Radio Shack's Disk system when you are running FLEX with single or double sided, single or double density, 35, 40 and 80 track drives.

Advantages of FLEXPLUS are:

- Best price anywhere
- Easy start-up—just type "RUN FLEX+"
- Allows you to save RS compatible disk files from FLEXPLUS
- All FLEX compatible software will run including INTERRUPT DRIVEN SOFTWARE
- NO HARDWARE MODIFICATIONS NEEDED
- Warranty will not be voided—no need to open computer
- Wide range of available software
- Requires Supercharger board
- \$149.95 for FLEXPLUS, Editor/Assembler and Supercharger

SAVE SAVE SAVE

FLEXPLUS DOS is a *great value* for only \$149.95. FLEXPLUS DOS includes:

FLEXPLUS	\$99.99
SUPERCHARGER	39.95
EDITOR/ASSEMBLER	59.95

You get this \$199.89 value for only \$149.95!

SUPERCHARGER - Allow machine language access to all 64K RAM in a Series E PC board. No hardware mods. \$39.95
DISK BASED EDITOR/ASSEMBLER - MACROS.
CONDITIONAL ASSEMBLY - will work with Supercharger. \$49.95

WE HAVE:

- ★ SUPER BASIC GAMES
- CC POKER
- LASER COMMAND
- GAME PAKS
- ALCATRAZ II
- SUB HUNT
- BATTLE FLEET
- PIRATE AHOY
- ★ BOOKS
- ★ GEOGRAPHY PAK

MEMORY EXPANSION

- EXTEND MEMORY FROM 16K to 32K
- 100% Compatible With Extended Basic
- No Soldering Or Modification
- Fits Inside Computer
- \$79.95

SPECIAL

10% discount on any 3 games over \$50.

16K MACHINE LANGUAGE GAMES

- GHOST GOBBLER \$19.95
- DEFENSE \$21.95
For Missile Command enthusiasts.
- SPACE WAR \$21.95
- GALAX ATTAX \$21.95
- PLANET DEFENSE \$21.95
Like the arcade version of DEFENDER.
- CROID \$12.95
Carry on an intelligent conversation with the computer with this version of the ELIZA artificial intelligence program.
- CC THELLO \$14.95
Super arcade quality OTHELLO game.
- KEYS OF THE WIZARD \$19.95
Best new adventure game! Over 200 rooms filled with creatures, tricks, treasures and magic spells. Cassette save feature built-in.
- COLOR OUT \$9.95
Like Breakout, you must knock out six layers of blocks using your paddle to prevent missiles from escaping. Joysticks optional.

SPECTRAL ASSOCIATES

145 Harvard Ave. 119
Tacoma, Washington 98466

WRITE FOR COMPLETE CATALOG

ADD 3% FOR SHIPPING \$1.00 minimum
Allow 2-3 wks. for delivery

(206) 565-8483

VISA OR MASTERCARD ACCEPTED

TOLL FREE

ORDERS ONLY

800-426-1830

EXCEPT WA, HI, AK

does have the following features, which were not in 2.0:

- The comma operator;
- Assignment operators (you must say $X=X+1$ instead of $X+=1$, $X=X*2$ instead of $X*=2$, and so on);
- Conditional assignment—you must say:

```
if (x>0)
    y=1
else
    y=2
```

instead of full C's conditional expression:

```
y=(x>0)?1:2
```

- The “&&” and “||” logical AND and OR operators, “&” and “|”, C's bitwise AND and OR operators, are provided; in practice, this usually means that you have to use more parentheses, e.g.:

```
((x==0) & (y==0))
```

instead of full C's:

```
(x==0 && y==0)
```

On the plus side, the compiler does support:

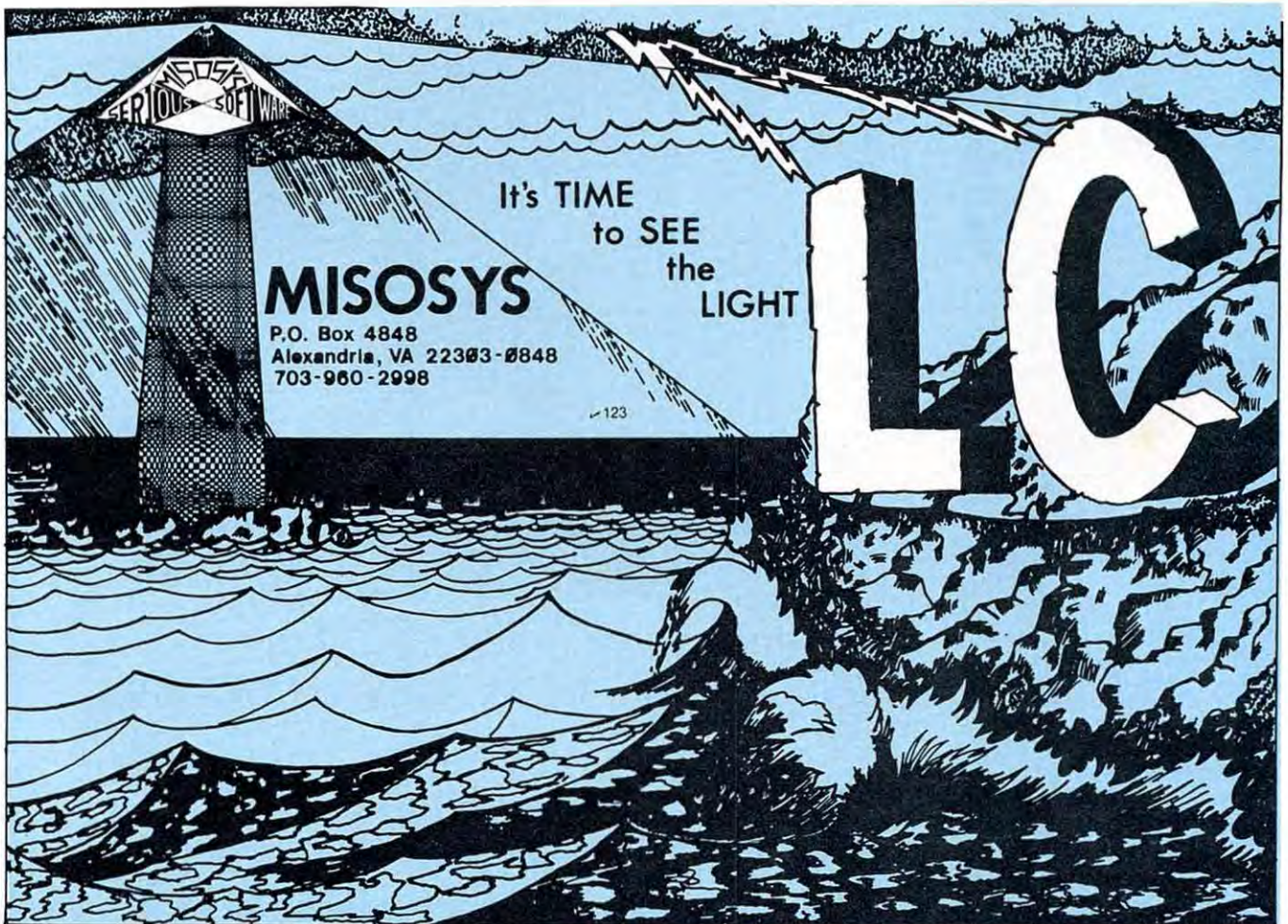
- All the standard C control structures except GOTO: for, while, if...else, do...while, switch, break, continue, and return;
- Pointers to characters and integers and full pointer arithmetic;
- Functions being passed as arguments to other functions;
- Hexadecimal and octal constants entered in a C program;
- #include <file>, a directive to the compiler that can be placed anywhere in a program, telling the compiler to read the specified file, compile its contents, and then resume the original file from the next statement. (#include does not work under TRSDOS on the Model I. Intersoft says this is due to a TRSDOS bug, but I have other compilers that provide an include feature that does work under TRSDOS);
- #define <constant> <value>, allowing definition of a constant at compile time; and
- “#asm” and “#endasm”, directives to the compiler that the code in between these two statements should be passed through unchanged to the assembler. This lets you “drop into” Assembly at any point in a C program. The manual

tells how to pass data between a C statement and Assembly code.

The C compiler distinguishes identifiers as long as they are unique in the first nine characters. External identifiers are limited by whatever your assembler allows (in most cases six characters).

The compiler flags errors as it finds them in a C program and writes English error messages to the output file together with the offending C statement. It seems to do a good job of recovering from detection of an error and continuing compilation, although sometimes one C program error can result in several error messages.

Although there is no cross-reference facility built into the compiler, if you use the M80 assembler, you can use Microsoft's CREF80 cross-reference program. There are no special debugging aids. You can use Put statements to write messages at strategic points in a program, or use an Assembly-language debugger together with the Assembly source-code output produced by the compiler. There is no built-in way to pause a running C program, such as the shift-@ convention of TRS-80 Basic.



program I ran that computes prime numbers using the Eratosthenes sieve algorithm ran in 123 seconds on Intersoft C, compared to 4470 seconds on Disk Basic! This is certainly a big improvement. All the C programs I ran seemed to be snappy, much closer to Assembly than to Basic programs in speed.

Documentation

The documentation for Intersoft C earns a grade of C. The manual says it's not trying to be a tutorial, but I didn't find it to be very successful as a reference manual, either.

It's hard to be harsh on a manual that is written in a friendly, easy-going style, but in my opinion its omissions are unconscionable. For example, even though the manual is 94 pages long, there is no complete description of the Intersoft C language. If you are expected to own or purchase a book in order to use a product, the advertisement for that product should clearly state this. Unless you can write C programs in your sleep, you will absolutely need a book such as Kernighan's (referenced earlier) to use Intersoft C.

About half the manual consists of

source-code listings of the various support libraries and functions provided with the package. However, there are no instructions on how to use these functions. There are some comments in the listings, but you need Kernighan's book to discover how to open a file, use the string functions, and read and write characters.

There is no index and only a very brief table of contents—it's not particularly helpful to know the section number corresponding to each of the five appendices without knowing what's in them!

Enough information is provided for the technically minded to determine how to interface Assembly routines with C programs. Restrictions and enhancements to full C are explained.

Conclusions

Despite its shortcomings, Intersoft C is a useful product. It allows you to build libraries of functions that you can combine to create new programs with relative ease. I have used the package frequently and I have yet to find anything that does not work as documented.

Based on the manual, the folks at In-

tersoft sound sincerely interested in supporting and improving their product. In several places they ask users to send suggestions and notify them of any bugs. They say that updates will be available but no specific update policy is described. Intersoft has stated that a \$15 charge will allow the EDTASM version owner to upgrade to the M80 version of the product.

I feel that Intersoft C is somewhat overpriced considering the other software you must own to use the package, and comparing what you get to what some other TRS-80 compiler packages offer in its price range. If you already have the M80 assembler and linking loader, plus a text editor that lets you enter C's special characters, I can recommend Intersoft C with the reservations noted in this article. I personally consider the combination of Intersoft C and EDTASM to be unacceptable. ■

Contact Rowland Archer at Flint Ridge Apt. 59, Hillsborough, NC 27278.

"Your Business Computer Headquarters"

Compare the Victor 9000 Desktop Business Computer



The Victor 9000 Desktop Business Computer gives you the kind of memory, storage capacity and software that business applications demand. Just compare the Victor 9000 with the competition, and we're confident you'll pick Victor.

VICTOR
Serving American business for 65 years.
VICTOR BUSINESS PRODUCTS
A Division of Victor Inc.
90000

Call For Quotes!!

Compare and you'll pick Victor.

TRS-80[™] Business Computers

128K Model 16

- 1 Drive \$4134
- 2 Drive \$4795



64K Model II
\$2974



Model III

- 48K, 2 Drive \$1950
- 48K, 1 Drive \$1571
- 16K \$839



Call For **QUOTES** On Complete Product Line

800-351-1580
In Texas Call Collect: 915-283-2920

Van Horn Office Supply
701 W. Broadway 169 P.O. Box 1060
Van Horn, Texas 79855

VISA, MasterCard, American Express

OMNITEK COMPUTERS INTERNATIONAL, INC.
1300 MAIN STREET TEWKSBURY, MASS
617-851-4580

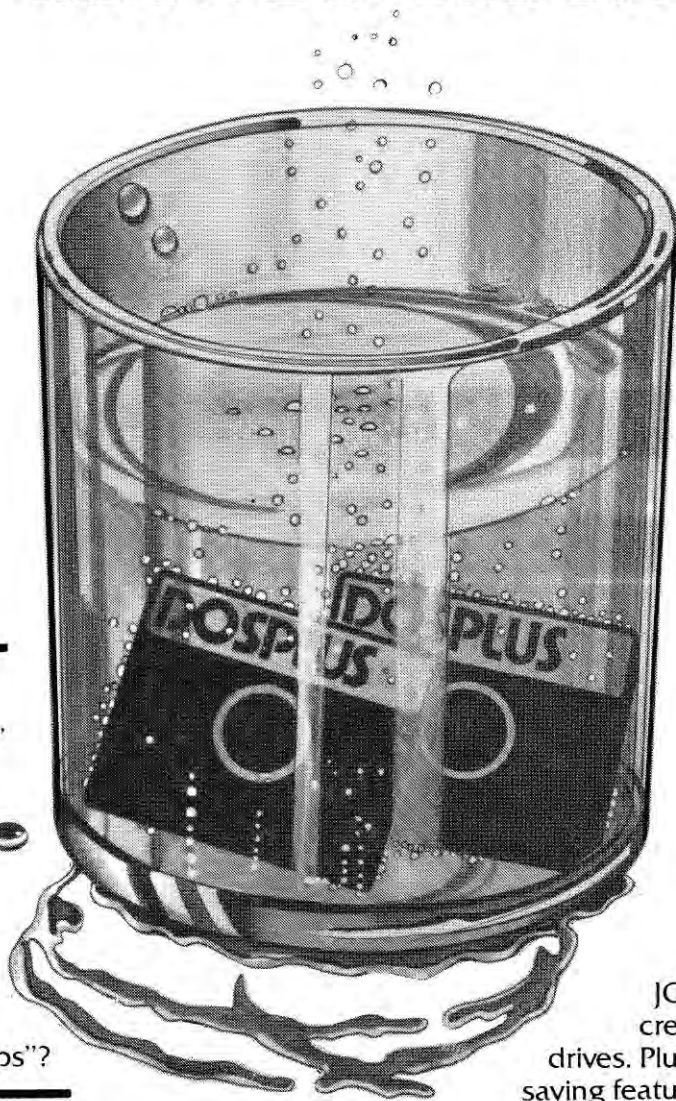
Smith-Corona Daisy Wheel Printer	589.00
Verbatim 5.25" D.L.	25.00
16K RAM KITS	13.00
Okidata Microline 80	309.00
Okidata Microline 82A	419.00
Okidata Microline 83A	649.00
B.M.C. B&G Monitor	89.00
Epson MX-80 FT.	509.00
Epson MX-100	689.00
Radio Shack Mill w/48K	879.00
Radio Shack Mill w/48K and 2 40T dr	1649.00
40 track economy drive Power Supply with case	1739.00
Tandon drives with Power Supply and case	179.00
40 track single head	249.00
dual head	339.00
80 track single head	299.00
dual head	399.00
5.25" Power Supply and case	39.00
8" Power Supply and case	99.00
CENTRONICS 739 Printer	469.00
One Bytewriter D.W.	745.00

Omnitek Computers International Inc.

TRS-80 is a reg. trademark of Tandy Corp.
Prices are for mall order only **TERMS:** Check, money order, Mastercard and Visa accepted.
F.O.B. Tewksbury \$5.00 min. S & H charge extra.
5% sales tax. Write for **FREE CATALOG.**

FOR FAST RELIEF

Take DOSPLUS 3.4



Do you have that tired dragged out feeling known as "DOS Drag" from an operating system that is just **too slow**? Do you have "Computis Interruptous" because you spend more time with your DOS manual than you do at your computer? Has an undependable DOS got you down with the inadvertent "Dumps"?

Then you need DOSPLUS 3.4. DOSPLUS 3.4 contains all the active ingredients for a quick recovery. Dependable fast action features like instant boot-up, BASIC array sort (multi-key, multi-array), Tape/Disk-Disk/Tape utility (with program relocater), Input@ (controlled screen input from BASIC), and complete disk editing features including random access file editing and ASCII modification on sector dump utility.

And who wouldn't feel better with proven features like the ability to use a "DO" (command chaining) file from within a BASIC program, and more reliable BACKUP and FORMAT utilities.

In addition, you have the convenience of repeating the last DOS command with "/" <ENTER>, a single file convert from Model III TRSDOS, file directory supported for Model III TRSDOS disks, complete device routing supported with FORCE and JOIN, and the ability to read or create 40 track disks in 80 track drives. Plus many other time and effort saving features.

Of course, in order for a prescription to work, you've got to follow instructions – in this case the instructions are contained in the new easy to use easy to follow 240 page DOSPLUS users guide with system technical reference section. So, if you're experiencing any DOS related discomfort, get instant relief. **\$149⁹⁵**
Get DOSPLUS 3.4

DOSPLUS

First in the Industry backed by a lifetime warranty.



**MICRO SYSTEMS
SOFTWARE, INC.**

5846 Funston Street • Hollywood, FL 33023

(Outside of Fla.)
CALL TOLL FREE
1-800-327-8724

FOR VISA/MASTERCARD/C.O.D. ORDERS
TOLL FREE LINES WILL ACCEPT ORDERS ONLY!
For Applications and Technical information,
call (305) 983-3390 or drop us a card.
Dealers inquiries invited

Michael's Game

by Nancy Modney

Your children don't have to grow up afraid of micros. Start them off early with this game program that teaches letters and numbers.

Skeptical friends and family members often ask me what in the world I use a home computer for. I have at least one answer—it helps my child learn.

From the time David and I brought our son home from the hospital, his life has been filled with the sights and sounds of our TRS-80. The spare bedroom of our apartment had been the official computer workshop. When I discovered my pregnancy, a small crib and changing table were slipped into one corner. My hopes of a frilly pastel nursery were quickly dashed. Michael's bedroom was decorated in shades of software!

When Michael was an infant, David would prop him up near the computer to watch. It was no wonder that Michael developed an intense interest in the TRS-80. As my son grew older, he was no longer content to remain passive. Michael wanted to play with his father's toy too!

"Why don't you write a program Michael can use?" I suggested to my husband. So he did.

The program is called Hear and See numbers, and the only instructions on the screen display is "Push any Key." Each time Michael pushes a numeric key, that number is shown on the

screen. Then that many boxes appear, one by one. Each rectangular box is accompanied by a beep through an amplifier connected to the cassette-out jack. (This is optional—the program can run without sound.) For example, Michael presses the 5 key. A number 5 appears on the screen, and five boxes are drawn, one at a time (with beeps). When he presses the 0 key, no boxes appear.

Of course, our little boy doesn't press only numeric keys. When Michael pushes a letter key he sees that letter.

How the Program Works

Lines 10-50 are remark statements. Lines 60-90 set up the constants. Line 110 puts the computer into enhanced mode so the letters will be in large type for easy reading. Lines 120-140 name the program Hear and See Numbers, and print the instructions on the screen.

The program then drops through to line 290, beginning the first major routine, which determines if any key is pressed and analyzes what it is. Line 290 strobes the keyboard, looking for a key stroke. Notice that in line 300 there is no space between the quotation marks. If A\$ has no value, then no key has been pushed and the program returns to line 290. Until a key is pushed, the program

continues in this loop between lines 290 and 300.

If a key is pushed, the program then goes to line 310 to check if the key is a number greater than zero. If a letter or zero key was pushed, the computer goes to line 320, prints the letter on the screen, and returns to line 290.

If the key pressed was a number, the program goes to line 160 for the second major routine. Line 180 prints the number on the screen. Line 200 determines the number of boxes needed. Line 220 makes a buzz for each box counted. The program loops through this box-and-buzz routine enough times to equal the value (number) printed. The program then returns to line 290 to await another keystroke.

For Technical Buffs

Here is a more technical description of how the program makes sound. Lines 70 to 90 set up the constants P = 255, U = 9, and D = 10. P is used as a port number. In this case, port number 255 is the cassette port. U and D are numbers sent to port number 255. The number U sends the cassette port output high (up). The number D sends the cas-

The Key Box

Model I or III

16K RAM

Cassette or Disk Basic

Cassette jack amplifier optional

sette port output low (down). If the cassette output is sent low and high in rapid succession, the result is a square wave. When this square wave is amplified, a buzzing sound is created. Line number 220 sets up a sequence of 31 rapid low/highs sent to the cassette port. This occurs for each box counted on the screen. Line 220 is composed of multiple Basic statements (separated by colons) to help speed up the low/high buzz operation. Lines 230 and 240 provide a small time delay between boxes.

Conclusion

The buzzing is optional, but Michael lost interest more quickly when the sound was turned off. The audio is excellent feedback for a young child. If you don't have an amplifier, Radio Shack offers one for \$11.95 (catalog #277-1008).

Not only does Michael (age 2½) like this program, but his cousin (age 5) enjoys using it too. It's a big hit when children come to visit. ■

Nancy Modney, and her son Michael, can be reached at 4144 N. Via Villas, Tucson, AZ 85719.

```

10 REM ** HEAR AND SEE NUMBERS ... FOR TRS-80 MODELS 1 @ND 3 **
20 REM ** NANCY MODNEY, 4144 N. VIA VILLAS, TUCSON AZ 85719 **
30 REM ** WRITTEN BY HUSBAND DAVID FOR SON MICHAEL D. MODNEY **
40 REM ** AUDIO AMPLIFIER IS OPTIONAL **
50 REM ** HOOK UP AUDIO AMPLIFIER TO GRAY CASSETTE OUT JACK **
60 DEFINT B-Z
70 P=255
80 U=9
90 D=10
100 CLS
110 PRINT CHR$(23)
120 PRINT "HEAR AND SEE NUMBERS"
130 PRINT
140 PRINT "PUSH ANY KEY"
150 GOTO 270
160 CLS
170 PRINT CHR$(23);
180 PRINT VAL(A$)
190 PRINT
200 FOR X = 1 TO VAL(A$)
210   PRINT CHR$(191) " ";
220   FOR Y = 0 TO 30 :OUT P,U :OUT P,D :NEXT Y
230   FOR Y = 0 TO 100
240     NEXT Y
250 NEXT X
260 PRINT
270 PRINT
280 PRINT
290 A$ = INKEY$
300 IF A$ = "" THEN GOTO 290
310 IF VAL(A$) > 0 THEN GOTO 160
320 PRINT A$ " ";
330 GOTO 290

```

Program Listing

WORD PROCESSING
ON YOUR TRS-80 BECOMES
CHILD'S PLAY WITH

Using Scripsit

320 pages,
8½" x 11",
Illustrated
Paperbound,
\$21.95, 1983.

Finally, a comprehensive, simple-to-understand book that teaches you how to use SCRIPSIT, the most powerful, easiest to use word processing

program for its price. USING SCRIPSIT shows you exactly how to use SCRIPSIT with your TRS-80 Model III or Model I (separate explanations are provided for each model). Each procedure is broken down into simple-to-follow numbered steps. Exercises, examples, "Common Mistakes" sections, and boxed-off notes to readers all help you learn by doing.

Using Scripsit has an easy-to-use, 4-part format:

I. For first time users, Chapters 1-8 move you through the fundamentals of setting up your TRS-80, using a disk, writing on the video screen, using editing commands, and printing a document. By the time you reach Chapter 8, Chapter 2 will seem like child's play. **II. For the experienced user**, Chapters 9-15 explain SCRIPSIT techniques you'll use again and again—advanced editing methods, block moves, search techniques, hyphenation, creative formatting, filing documents on disks, and using DOS commands.

III. Beyond standard uses, Chapters 16-19 reveal SCRIPSIT's special capabilities—how to merge VISICALC with SCRIPSIT, send text by phone, use SCRIPSIT to control a typesetter, create personalized form letters, write programs in BASIC, and print special formats. **IV. Appendices** help you with troubleshooting, define technical jargon, and provide sources of additional information.

Thoroughly tested, each procedure in USING SCRIPSIT was tried repeatedly by the author and tested by a group of first-time users. If a procedure didn't work, it wasn't included. The consensus? USING SCRIPSIT makes using SCRIPSIT child's play!

WADSWORTH ELECTRONIC PUBLISHING COMPANY

Statler Office Building • 20 Park Plaza • Boston, MA 02116

TOLL FREE 1-800-322-2208

ALL ORDERS MUST BE PREPAID AND SHOULD BE SENT TO: WADSWORTH ELECTRONIC PUBLISHING COMPANY, Statler Office Building, 20 Park Plaza, Boston, MA 02116. Postage and handling will be paid by the publisher.

Please send me _____ copies of USING SCRIPSIT
(at \$21.95) \$ _____
Residents of Massachusetts please add
sales tax \$ _____
TOTAL \$ _____

Enclosed is my check.
 Please charge my VISA MasterCard

Card # _____ Exp Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Signature for Credit Card _____

For credit card orders you can also call
TOLL FREE 1-800-322-2208

Using Scripsit is also available at your local computer dealer. If not, have them contact Wadsworth Electronic Publishing Company.

305

M

ACCESS UNLIMITED



FREE! DOSPLUS 3.4**
disk operating system
with any Percom or
Access Unlimited
1st Drive System
for the Model III*

SAVE \$50.00 on a fully-tested PERCOM Disk Drive for Model III* Reg. \$499.00. Now \$449.00

Percom's internally-mounted drives, with their widely-acclaimed disk controllers, are completely pre-tested with a 48 hour Burn-in. So, you know it works right when you get it. Choose single or double-density storage capacity.

A First-Drive System includes the four-drive disk controller, one drive, power supply, mounting hardware, cables and a fully-illustrated, easy-to-understand owner's manual.

NEW PRINTERS "CENTRONICS" — "C'ITOH" — "OKIDATA" — "STAR" — "TALLY" — "EPSON". VALUES TO \$3500.00. Call for latest price.

Make sure it's done right. Let us install your First-Drive System.

Purchase your Model III* Drives from us and for \$39.95 plus shipping, you can have our experienced professionals perform a 48-hour burn-in of your Model III* computer, install the drive system, and check out your expanded system to make sure everything works correctly. Call for pricing of complete Model III* system with 2 to 4 Access Unlimited or Percom drives.

Get the best! Our own fully-tested drives* for as low as \$275.00

Every Access Unlimited Floppy Disk Drive is electrically and mechanically tested, then burned-in for 48 hours under operating conditions. The signed test list in your shipping carton is proof of that.

Our floppy disk drives offer you either single or double density. With double-density, it stores up to 364 Kbytes, depending on the format.

SATISFACTION GUARANTEED! If you're not completely satisfied with your Access Unlimited Disk Drive, return it within 15 days for a full refund. All our drives have a comprehensive 90-day limited warranty.

We have added approximately \$150,000.00 worth of brand new business and game software with more arrivals daily.
Call or write for our new FREE catalog.

Save \$\$ on our most popular items!

Percom Data Separator (reg. \$29.95)	now \$23.95
Screens for Models I*, II*, III Green, Lt. Blue, Dark blue, and Amber. Bronze for color video (reg. \$24.95)	now \$12.95
Head Cleaning Kit (reg. \$29.95)	now \$19.95
Drive Numbering Tabs, pkg. 0-3 (reg. \$4.50)	now \$3.95
Flip-N-File 5 1/4" (reg. \$39.95)	now \$19.95
Flip-N-File 8" (reg. \$54.95)	now \$28.95

MEDIA FOR LESS

BASF 5 1/4" Single Sided Double Density
Lifetime Limited Warranty. reg. \$44.95 now **\$24.90** bx of 10

ATHANA complete with hub rings & one year limited warranty.
Single sided Single density 5 1/4" **19.90** bx of 10
Single sided Double density 5 1/4" **22.80** bx of 10
Double sided Single density 5 1/4" **29.90** bx of 10
Double sided Double density 5 1/4" **33.50** bx of 10

VERBATIM Single Sided Double Density **30.90** bx of 10

8" Diskettes from \$22.75

LIBRARY CASES — Holds 10 Diskettes Sale **\$2.95 ea.**

Bare Drives for "IBM PC" — Internal or External — \$269.95 ea.

Percom TFD 100 Mod. 1 Drive
Reg. \$439.00 Ea. Now \$278.00 ea.
OR Two for \$540.00. Only 35 left.

DOS + 3.4 Reg. \$159.00. Sale \$99.95

Anti-Static Mats — Colors: Russett, Blue & Gold, Natural Brown, & Golden Brown.
3' x 5' — Reg. \$75.60 Sale: **\$57.00**
4' x 6' — Reg. \$120.90 Sale: **\$91.00**
4' x 8' — Reg. \$161.30 Sale: **\$122.00**

"PAGEMATE" Typing Easels — \$14.95

SAVE on an Arrick Quick Switch‡

Changes a TRS-80* printer port or a peripheral between computers instantly and easily. Available for RS-232 and Centronics. Plugs included.
Now from \$99.95. Cables from \$31.95.

• LIMITED TIME OFFER/LIMITED QUANTITIES •
Prices subject to change without notice.

** Reg. Trademarks

Prices do not include state taxes

MICRO SHOPPING CENTER

Percom Quality for your Model III

Nothing but the best for your Model III Percom internally mounted drive systems: including 4 drive controller with gold edge connectors, double density disk drive or drives, all hardware and cabling. A free copy of DosPlus 3.4 is also included with every first drive purchase.

TFD 340N1	one drive single sided double-density	\$449.00
TFD 340N2	two drive single sided double-density	\$750.00

Brand Spankin' New! SALE Dual Headed Drives for the Price of Flippies!

Now you can have a *dual headed PERCOM Drive System for your Model III !!

TFD344N1	One drive dual headed double-density	\$560.00
TFD344N2	Two disk dual headed double-density	\$860.00

*completely compatible with programs existing on single sided or double sided diskettes.

WE HAVEN'T FORGOTTEN THE MODEL I !!

Upgrade your Model I to Double Density All for 159.95!!

You have a good system and you just don't want to sell out to a Model III-Upgrade with the Percom Doubler II, the overwhelming favorite double density adapter for over 2 years! Simply plug the adaptor into your expansion interface and run either single or double-density programs. Comes complete with FREE DosPlus 3.4 but will also run with LDOS NEW DOS 80 and TRS DOS.

Drives for your storage needs

AFD40-1	40 track single sided drive	\$275.00
AFD42-1	40 track floppy drive	\$329.00
SALE TFD100-1	40 track floppy	\$278.90

Percom Hard Disk—Quality for your System

*works with existing floppy drives Reg. from \$2495
*can be daisy-chained up to four hard disks Now from \$1995
*Dosplus 4.0 included FREE
*Now available for immediate delivery in 5 & 10 megabyte configuration

Check out the benefits of Access Unlimited Hard Disk Drives For TRS-80, "IBM-PC", APPLE II

- ✓ can be used for Model III*, Apple II* or IBM PC* computers.
- ✓ 5, 10 Megabyte and larger drive units.
- ✓ lets controller handle up to 4 drives.
- ✓ works along with existing floppy disk drives.
- ✓ includes host system support software.
- ✓ 15-day FREE trial period.

From
\$1,995
(5 MB)

Your present system too small?

Take advantage of the iBEX company business system and stand alone word processing systems—overbuild mistake—**model No. 7202**

Regular retail \$9070.00
Now for a limited time only—while supply lasts—\$3995.00

Look what you get for \$3995

- Z80
- CP/M compatible
- 64 kilobyte RAM, expandable to 192 kilobytes
- Dual 8" floppies (1.2 megabytes each) switchable to IBM format
- 12" green phosphor monitor (80 x 24 characters)
- Centronics compatible printer interface
- Serial interface
- Full function keyboard
- Clock timer and calendar (with battery)
- With daisywheel printer

Enjoy 1-stop shopping and BIG savings

Order your disks, software, supplies, and accessories from Access Unlimited. We offer low prices on automatic Datamarc*** Sheet and Envelope Feeders for Radio Shack*, QUME, Ricoh, Diablo Daisywheel, and Dot Matrix Printers. And the more you buy at one time, the more you can save.

For more information, call (214) 340-5366 Monday through Friday; (214) 690-0207 after 5 p.m. and Saturdays.

To order or for FREE literature, call TOLL-FREE



1-800-527-3475



Ordering Information

Order by phone or by mail. We accept Visa, MasterCard, cashier's checks, certified checks, and money orders. With personal checks, allow additional time for bank clearance. Your bankcard will not be charged until your order is shipped. On orders over \$1,000, we pay freight (surface only) and insurance; please add \$3.00 shipping and handling under 50 lbs. Over 50 lbs., add \$5.00 for orders under \$1,000.00. Texas residents add 5% sales tax. Allow 2 to 4 weeks for delivery.

EXPLANATION * Trademark of Tandy Radio Shack Corp. ** Trademark of Micro-Systems Software, Inc.
OF SYMBOLS †† Trademark of Aparat Corporation ‡ Trademark of Arrick Products Company
TM Trademark of Access Unlimited ***Trademark of Datamarc, Inc.
‡ Trademark of Percom Data Company, Inc. x Trademark of Digital Research

- Please send me a FREE catalog. I'm not ready to order at this time.
- YES, I'm taking advantage of your Sales prices.

Name _____
Company Name _____
Address _____
City _____ State _____ Zip _____
Phone Number (____) _____

Quantity	Item	Unit Price	Subtotal
Subtotal			
State Sales Tax (Texas residents only)			
handling charge			
Total			

Check one:

- payment enclosed
- Visa
- MasterCard*

*If MasterCard, numbers above name:

Expiration Date: -

Authorized signature, if charged

ACCESS UNLIMITED

DEPT. B/401 N. Central Expwy. #600/Richardson, Texas 75080
Tel. 1-800/527-3475 214/340-5366
214/690-0207—Sat. and Evenings Only

Refrigerator Controller

by Doug Biedenweg

Got an old refrigerator lying around? This unit will let you control its lighting and temperature for all sorts of science projects.

Researchers need to simulate the temperature and light of various natural environments to properly study the lives of plants and animals. This micro-controlled incubator provides a means to do so.

First, you need to build a temperature and light-controlling input/output device. This interfaces a TRS-80 Model I to a standard home refrigerator. The I/O device regulates a heater-fan module and a bank of fluorescent lights.

This system has many possible uses. For instance, botanists can produce the oscillations in temperature that many seeds require to germinate, and can study plant growth under various temperature and light conditions. Bacteriologists and mycologists can study

microbial colonies in situations close to those found in nature. This is particularly useful when studying food spoilage. Herpetologists can control body temperature cycles in snakes or lizards, and measure the effects these cycles have on digestive rates.

At home, the system will produce optimal conditions for terrarium. If connected to a small floor heater, it can save electricity during the winter months.

Materials and Methods

You'll need 16K and Level II Basic. Fig. 1 shows the schematic for the interface device. Table 1 is a parts list.

The device uses a 4047 as an astable multivibrator, with a thermistor in the RC circuit, to produce an output frequency that is a function of temperature. This output of the 4047 feeds into the computer via the cassette port. The thermistor must be calibrated in the circuit, so that the circuit's output frequency can be converted to a temperature.

The cassette auxiliary line is the output line from the computer to the heater circuit. The program (Program

Listing 1) will make this line go high or low. When $V=0$ or 1, OUT 255, V makes the output 0 V dc. When $V=4$ or 5, OUT 255, V gives 0.85 V. When the output is high (0.85 V), the plus input voltage on the 741 rises above the 0.6 V set by the forward biased diode at the minus input. This causes the output of the 741 to go high, which closes the heater relay.

I used a double-relay system to the heater in our incubator to prevent the incubator from becoming too hot if the computer malfunctioned. The second relay was in series with the computer-controlled relay and its state (opened or closed) was determined by a bimetallic thermoregulator housed in the heater/fan assembly. The bimetallic thermoregulator was adjusted so that the relay would open and the heater turn off at temperatures above 40°C. The heater and fan ran independently. The fan ran continuously.

The output line from the computer to the light circuit (Fig. 1) is run from the computer cassette relay. The cassette relay can be closed under program control. When the relay is closed, enough current flows into the base of transistor Q3 to power the closure of the R₂ relay, which will remain on until the cassette relay is opened.

Programming the Computer

The computer reads the temperature of the thermistor by measuring the period of the astable multivibrator using

The Key Box

Model I
16K RAM
Level II Basic
Incubator

the "ear" port to input the signal. A machine-language program (Program Listing 2) allows the computer to determine the period of oscillation. The machine-language program is called from the Basic program (Listing 1), which also controls the incubator. Program Listing 3 is a Basic program that POKes the machine-language program into high memory, where it is

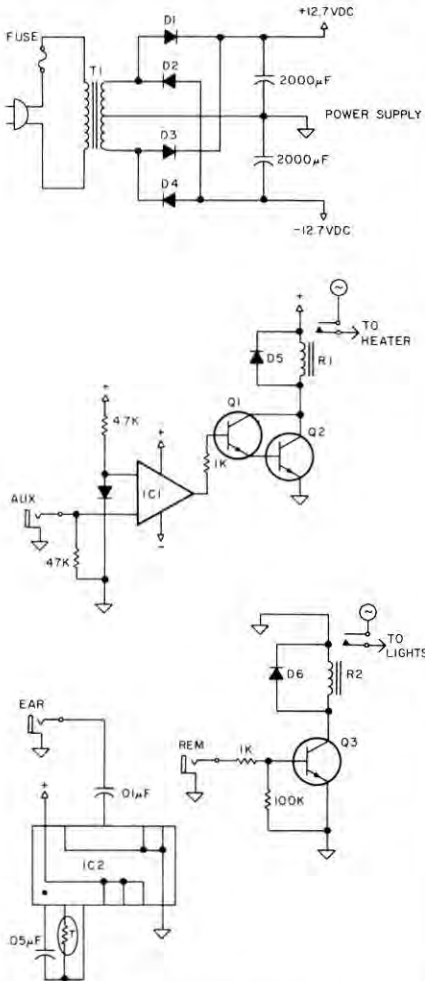


Fig. 1. Schematic of I/O Device that Interfaces the Computer to the Incubator

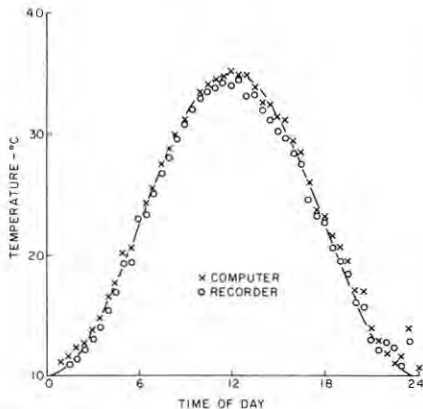
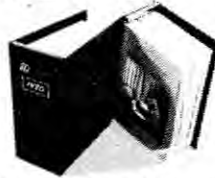


Fig. 2. Comparison of Specified Incubator Temperatures to those Measured by the Computer as an Independent Recorder

See List of Advertisers on Page 387

PRESERVE 80micro BINDERS & FILE CASES



Keep your issues of 80 Micro together, handy and protected in handsome and durable library files or binders. Both styles bound in dark green leatherette with the magazine logo stamped in gold.

Files: Each file holds 6 issues, spines visible for easy reference. \$5.95 each, 3 for \$17.00, 6 for \$30.00

Binders: Each binder holds 6 issues and opens flat for easy reading. \$7.50 each, 3 for \$21.75, 6 for \$42.00 (Postage paid in USA. Foreign orders include \$2.50 per item)

Please state years: 1980 to 1983
Send check or money order to:
JESSE JONES BOX CORP.
P.O. Box 5120
Philadelphia, PA 19141

Please allow 6-8 weeks for delivery

This publication is available in microform.

University Microfilms
International

Please send additional information
Name _____
Institution _____
Street _____
City _____
State _____ Zip _____

300 North Zeeb Road Dept. PR Ann Arbor, Mi. 48106 U.S.A.
30-32 Mortimer Street Dept. PR London WIN 7RA England

Subscription Problem?

80 Micro does not keep subscription records on the premises, therefore calling us only adds time and doesn't solve the problem.

Please send a description of the problem and your most recent address label to:

80micro
Subscription Dept.
PO Box 981
Farmingdale, NY 11737

Thank you and enjoy your subscription.

wabash®

When it comes to
Flexible Disks, nobody
does it better than
Wabash.

MasterCard, Visa Accepted.
Call Free: (800) 235-4137



PACIFIC
EXCHANGES
100 Foothill Blvd.
San Luis Obispo, CA
93401. (In Cal. call
(805) 543-1037.)

207

☆☆ SUPER™ ☆☆☆ ISA's DATABASE

The only DBMS with all these features:

- ★ PROVEN in one year of test marketing
- ★ TOUGH, reliable file structure
- ★ MENU driven for simplicity and easy use
- ★ ARITHMETIC with stored calculations
- ★ FAST set-up and report formatting
- ★ CLEAR user-oriented documentation
- ★ PRINTS totals & subtotals - mail labels
- ★ REFORMATS and merges data files
- ★ MULTI-DISK files: Up to 128K records
- ★ SORTS full disks on up to 40 fields
- ★ PRODUCTION input of repetitive data
- ★ USE existing data files
- ★ COUPLES to word processors
- ★ POSTS transactions to master file
- ★ SEARCH by strings, ranges, comparisons
- ★ DATA COMPRESSION: Over twice as many labels as the other system

For TRS-80* Models I, II, III, E 16 - 250.00
CP/M† - 295.00

Ask your Dealer or Write: 351

Institute for Scientific Analysis, Inc.
P. O. Box 7186, Dept. M-2
Wilmington, DE 19803 (215) 358-3735

*T.M. Tandy Corp. †T.M. Digital Research

™ TRS80 color

From the January 1981 issue of the CSRA Computer Club newsletter:

There was some amusement at the November meeting when the Radio Shack representatives stated that the software in the ROM cartridges could not be copied. This month's 68 Micro Journal reported they had disassembled the programs on ROM by covering some of the connector pins with tape. They promise details next month. Never tell a hobbyist something can't be done! This magazine seems to be the only source so far of technical information on the TRS-80 color computer™. Devoted to SS-50 6800 and 6809 machines up to now, 68 Micro Journal plans to include the TRS-80 6809 unit in future issues.

To get the MOST from your 6809 CPU - This is the BEST SOURCE! The ONLY Magazine for the 6809 Computer. Months Ahead of All Others!

68 MICRO JOURNAL

5900 Cassandra Smith Rd.
Hixson, TN 37343

USA

1 Yr. —\$24.50 2 Yr. —\$42.50 3 Yr. —\$64.50

*Foreign Surface Add \$12 Yr. to USA Price

Foreign Air Mail Add \$35 Yr. to USA Price

*Canada & Mexico Add \$5.50 Yr. to USA Price

213

used by Program Listing 1. You reserve space in memory for the machine-language program by entering 32511 when the computer requests the memory size. You then load and run the machine-language subroutine and the main program.

Program Listing 1 produces a sinusoidal temperature pattern (range 10–35 °C) with 16 hours of light and eight hours of darkness. Line 20 is the start of a one-minute loop that counts to 1,440 minutes, the number of minutes in a day. Lines 22 and 24 are a loop that just wastes time, allowing the

loop that starts in line 20 to equal a minute in duration. Line 30 POKES the address of the machine-language subroutine into the memory for use by theUSR command. Line 40 calls the machine-language subroutine, which tells the Basic program the frequency of the output of the oscillator, X, and allows the computer to convert this output to a temperature in line 100.

The equation in line 100 is simply a polynomial curve fit of the thermistor/oscillator-pulse-output-(X)-versus-temperature (°C) curve. The constants in this equation must be ob-

tained to fit the particular thermistor used. Line 90 defines the 24-hour temperature cycle that you desire in the incubator. In this program, TI, as a function of time, is sinusoidal and oscillates between 10 and 35 °C. The equations in lines 110–140 control the heater and lights in the incubator. If TM is less than or equal to TI, then the heater turns on. If S is less than 960 then the lights turn on. Following logically from this, when lines 110–140 set V to equal five, both the lights and the heater will turn on; when V equals four, the heater will be on while the lights are off; when V equals zero, both the lights and the heater will be off; and when V equals one, the lights will be on and the heater off. This is the information conveyed to the interface via the OUT statement given in line 160.

To modify the temperature cycle in the incubator, you simply change the equation in line 90. If you modify any part of the program, however, change the time-wasting loop in lines 22 and 24 to set the period of the loop that begins in line 20 equal to one minute. If your heater is more powerful than the one used here, or you want to control temperature more precisely, the loop that starts in line 20 can be sped up and TM can be assessed and compared to TI more frequently. The heater will then stay on (and off) for shorter periods of time and temperature fluctuations within the incubator will be smaller. If the loop, which starts at 20, is sped up, obviously you'll have to modify all facets of the program involving S to maintain a 24-hour cycle.

You can create a variety of special effects with the computer. You can simulate sun flecks by throwing random components into the main program that will turn the lights off for brief periods during the day. A random component to the temperature variation can also be simulated, or actual outdoor temperature can be read from a tape and used for control levels. You can also program the computer so that the photoperiod within the incubator will change over time to simulate fluctuations in day length. The number and types of photo and temperature cycles that the computer can set up and control is only limited by the imagination of the programmer.

Results and Discussion

Figure 2 compares setpoint temperature (TI), the temperature measured by the computer (TM), and the temperature measured by a thermistor operating independently inside the incubator.

```

5 CLS
10 V=0
20 FOR S=1 TO 1440
22 FOR J=1 TO 19883
24 NEXT J
30 POKE 16526,0: POKE 16527,127
40 X=USR(V)
90 TI = 12.5*SIN(1/720*3.14159*S-3.1459/2) + 22.5
100 TM = 5128.69-6.37239*X + 2.96413E-3*X^2-6.12687E-7*X^3 + 4.76548E-11*X^4
110 IF TM<=TI AND S>960 THEN V = 4
120 IF TM<=TI AND S<960 THEN V = 5
130 IF TM>=TI AND S>960 THEN V = 0
140 IF TM>=TI AND S<960 THEN V = 1
160 OUT 255,V
170 PRINT S, TM, TI
180 NEXT S
190 GOTO 20

```

Program Listing 1. Basic Program for Control of Temperature and Light Cycles in the Incubator

Item	Quantity	Description
Capacitors	2	2000µf 16 Vdc electrolytic
	1	0.01µf ceramic
	1	0.05µf polystyrene
Diodes	6	1N4003
	1	1N914 (for 741)
Transistors	3	2N2222 NPN
Resistors	1	47000Ω
	2	1000Ω
	1	4700Ω
	1	100,000Ω
Relays	2	100Ω 12 Vdc W88 CPX:6
Transformers	1	Triad F203U Pri 110 Vac Sec 27 Vac-CT
IC chips	1	CD 4047 Monostable/astable multivibrator
	1	741 CP General-purpose operational amplifier
Sockets	1	14 pin IC
	2	8 pin IC
	1	wall
Thermistor	1	1 MΩ @ 25 °C glass probe
Heater/fan assembly	1	Cenco refrigerating incubator—Model 46042 330 W (measured)
Jacks	2	subminiature ¼" phone plug
	1	
Grounded wall plug	1	
Mounting board	1	
Box	1	9" × 6" × 5"

Table 1. Parts List for Interface Device

IT'S YOUR MOVE

MAKE YOUR MOVE NOW ON COMPUTER SUPPLIES
FROM CHECK-MATE™

RIBBONS FOR RADIO SHACK LINE PRINTERS LP I, II, & IV

(Replaces Radio Shack P/N 26-1413)

\$31.99 Doz.

LP III & V

(Replaces Radio Shack P/N 26-1414)

\$6.49 Ea. \$73.99 Doz.

DAISY WHEEL II & DWP-410

(Replaces Radio Shack P/N 26-1419 Multi-Strike)

\$6.49 Ea. \$73.99 Doz.

CARTRIDGE RIBBONS FOR EPSON

MX-80

\$7.99

\$89.99

Doz.

MX-100

\$12.95

\$139.86

Doz.

ZIP PACK RELOAD RIBBONS

FOR

NEC 8023,

APPLE PRINTERS

C. ITOH PROWRITER

DIGITAL LA-50

\$7.99 Ea. \$89.99 Doz.

MEMOREX DISKETTES FOR TRS-80

MODEL II MODEL III

MEMOREX #3090

MEMOREX #3481

\$35.99

\$24.99

Box 10

Box 10

LABEL SPECIAL

1 Across 3 1/2 X 15/16 Continuous Labels

\$2.99/K (5K Min.)

MANY OTHER RIBBONS AVAILABLE — MOST IN FULL RANGE OF COLORS.
MINIMUM ORDER FOR RIBBONS \$29 OR 1 DOZEN

ALL PRICES INCLUDE SHIPPING IN CONTINENTAL U.S. (MASS. RESIDENTS ADD 5% SALES TAX)

* RADIO SHACK IS A REGISTERED TRADEMARK OF THE TANDY CORP.



Check-Mate™



51 DIAUTO DRIVE, POST OFFICE BOX 103, RANDOLPH, MA 02368
CALL TOLL FREE (800)343-7706 / IN MASSACHUSETTS (617)963-7694
ORDER DESK OPEN MON.-FRI. 9:00 AM—7:00 PM EASTERN TIME
(YOU MAY ALSO FIND US SOME SATURDAY MORNINGS)

CALL OR WRITE FOR OUR FREE CATALOG

WIN AT BLACKJACK

JERRY PATTERSON: Author of "Blackjack: A Winner's Handbook," "Blackjack's Winning Formula," syndicated gaming columnist and founder of the Blackjack Clinic (Over 4000 graduates nationwide)

is now making his famous blackjack course available for your TRS 80 Model III Microcomputer. Patterson and his students have won \$million\$ at the blackjack tables. Learn how to get your share with Patterson's Blackjack Tutor. Sample Features:

- How to play the hands for Atlantic City and Nevada casinos.
- How to count cards (high-low)
- Specify one to seven players in practice, party, or simulation mode.
- Package includes Game, Basic Strategy and Counting Modules.

Other features: variable bankroll, cut card placement, table hopping, discard tray.

Order TRS 80 Model III Version (16K Cassette) for \$50.00 and \$3.00 p&h — includes complete user's manual. Or write for details Visa/MC orders **call toll FREE right now**

(800) 257-7130.

JERRY PATTERSON'S BLACKJACK CLINIC

1 BRITTON PLACE • VOORHEES, NJ 08043
(609) 772-2721 (NJ residents) ✓ 198

Let the LETTER-WRITER WORK for YOU



✓383

CREATE: forms, labels and form letters.

This machine code word processor can even ADD/SUBTRACT bookkeeping columns.

Change, delete, add, insert, move, copy (characters/lines/blocks) of text fast.

SELECT: margins, page length, number of copies, tabs, center lines / page, line spacing and LEGAL PAPER LINE NUMBERING.

MODEL I users get: Model III shift key controlled upper / lower case letters!!

EASIER to USE than other systems. Only 8 keys control 96% of the LW features!!

TRY a LW for 3 MONTHS. If not satisfied return it. We will refund all but \$3.50 to cover postage / handling. IF YOU CAN NOT RETURN IT, DO NOT BUY IT.

C. A. of N. Y. rates his LW purchase as "one of the best buys I have made. "!

TAPE 16K Model I/III systems **\$23.99**

DISK 32K Model I/III systems **\$37.99**

WE PAY: tax / US postage on ALL orders.



SPECIALS



Verbatim MD525 01 disks: 10 for \$25.95
Microsette C10 tape+box: 20 for \$13.95

Astro-Star Enterprises 24 HOUR
5905 Stone Hill Dr. Computer Phone
Rocklin, CA 95677 (916) 624-3709

The independent thermistor showed that the I/O device thermistor readout (TM) was within $\pm 3^\circ\text{C}$ of the set point temperature. The timing cycle was within 0.5 s in 24 hours. These results indicate that this interface is capable of

temperature and light control in a simple incubator. ■

Doug Biedenweg can be reached at the Biological Field Station, Lake Itasca, MN 56460.

```

START: CALL 0A7FH;GET USR PARAMETER
        DI;DISABLE INTERRUPT
        LD(STAT),HL;STORE USR PARAMETER
        PUSH BC;SAVE REGISTERS
        PUSH AF
        CALL RESET;RESET CASSETTE LATCH
        LD HL,1000H;LOAD TIMER COUNTER
GB1:   DEC HL;DECREMENT COUNTER
        LD A,H
        OR L;CHECK FOR ZERO
        JR Z,REST;IF NO PULSE, QUIT
        IN A,(255);INPUT FROM PORT
        RLA;GET HI BIT
        JR NC,GB1;TRY AGAIN IF NO PULSE
D1:   LD B,10H;WAIT
        DJNZ $
        CALL RESET;RESET LATCH
        LD HL,1000H;LOAD TIMER COUNTER
D2:   DEC HL;DECREMENT COUNTER
        LD A,H;CHECK FOR
        OR L;ZERO
        JR Z,REST;FINISHED IF ZERO
        IN A,(255); INPUT FROM PORT
        RLA;GET HI BIT
        JR NC,D2;TRY AGAIN IF ZERO
        LD B,H;SAVE REST OF COUNT
        LD C,L;IN B,C
D3:   DEC BC;THIS LOOP IS JUT
        LD A,B;TO WASTE TIME
        OR C;EQUAL TO THE PORT
        JR Z,REST;INPUT TIME UNTIL
        IN A,(255);1000H COUNTS ARE
        RLA;FINISHED
        JR NZ,D3
REST:  POP AF;RESTORE REGISTERS
        POP BC
        JP 0A9AH;RETURN TEMP TO USR
RESET: LD A,(STAT);GET USR PARAMETER
        OUT (255),A;OUTPUT IT
        RET
STAT:  DW OH
        END
    
```

Program Listing 2. Machine-language Subroutine to Measure Incubator Temperature

```

10 FOR I=32512 TO 32581
20 READ A
30 POKE I,A
50 NEXT
60 DATA 205,127,10,243,34,68,127,197,245,205
70 DATA 62,127,33,0,16,43,124,181,40,37
80 DATA 219,255,23,48,246,6,16,16,254,205
90 DATA 62,127,33,0,16,43,124,181,40,17
100 DATA 219,255,23,48,246,68,77,11,120,177
110 DATA 40,5,219,255,23,32,246,241,193,195
120 DATA 154,10,58,68,127,211,255,201,0,0
    
```

Program Listing 3. Basic Program for POKEing Machine-language Subroutine into High Memory

FAST
ARCADE
ACTION

The Rush Is On...
with

TIME RUNNER

An adventuresome space pioneer, you have been selected to participate in the 1st Intergalactic "Space Rush." Newly discovered territory is yours for the taking! All that you have to do is to stake it out as fast as possible. Sounds easy? Well, there are these defender-droids who will block your moves and team up to get you. Also, staking out hyperspace is not so easy. Its value decreases with each additional moment you take to capture it. Are you ready for battle with the defender-droids and incredible space wealth? Take the challenge! Race for it!

All games are 100% machine language for top quality graphics, music and sound effects. Games are also joystick compatible. Games are TRS-80 Lev. 2, MOD I/III compatible. Specify tape (16K) or disk (32K). Tape version will not transfer to disk.

Price per game \$24.95 disk or tape. Please add \$2.00 for postage and handling. Calif. residents add 6% sales tax. Outside USA (except Canada), please add \$5.00. Visa, Mastercharge accepted, write in with card number and expiration date.

FUNSOFT

28611 Canwood
Agoura, CA, USA 91304
213-991-6540

Dealer inquiries invited.

Joystick Compatible.

Written by Y. Lempereur



Son of Pilot

by Randy Hawkins

Son of Pilot is a rewrite of "Pilot—The Language of Computer-Aided Instruction," which appeared in the July 1981 issue of *80 Micro*. The original version was only usable on a cassette-based Model I. Son of Pilot should work on any TRS-80 system—any model, any memory size, and either cassette or disk based.

Pilot (Programmed Inquiry, Learning, or Teaching) is a simple, easy-to-learn language that is useful in education. Pilot lets you construct lessons that present information to students on the computer video display, ask questions to test for comprehension, and jump forward or backward in the lesson. Dr. John Starkweather developed Pilot's structure around 1970, and it has been implemented on many small computer systems.

The Basic Program Listing 1 POKES the Pilot interpreter into high memory of any TRS-80. This program takes the place of the System tape created in the earlier article. To use Pilot, type in the program. Before you run the program, CSAVE it to tape or save it to disk, because any error in the program could cause your computer to return to the memory-size or cassette prompts or reboot the disk.

A method of checksums is used, so if you make a typing error, you are notified which line contains the error. Although the program POKES numbers into high memory, you need not worry about setting the memory size, because it is handled automatically. As the program runs, you can see the line numbers advancing with the on-screen message. The program deletes itself in line 390 when completed.

The Pilot interpreter in Listing 1 is

If you've wanted to use Pilot, but it did not work on your system, try this altered version.

similar to the one from the earlier article—only the method of entry has changed. If you are successfully using the original version, you don't need to discard it and switch to this one. Both interpreters function exactly the same.

If all goes well as you type in the program, what has been accomplished? When you load a Basic program into memory and type run, the Basic interpreter located in ROM examines your program and acts on the individual commands. Basic is an interpreter that translates keywords like Print, For... Next, and If...Then into actions. Similarly, the short machine-language Pilot interpreter located in high memory also translates your Pilot programs into actions. Since Run is already used as the Basic go signal, Pilot uses the Name command as the signal to begin execution. Name is a Basic keyword that is not used for any important function.

Although the Pilot commands are explained in the original article, Program Listing 2 illustrates them and presents a sample program. Type in the program using the standard Level II input and editing features. When the listing is correct, type "NAME" and execute the program.

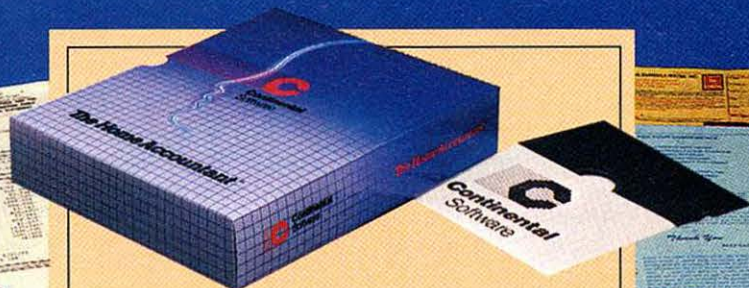
Each Pilot statement is numbered. The numbers can be any value from 0 - 32767, and the gaps between statements need not be regular. The numbers serve

two purposes—to put the commands in order from first to last and to serve as reference points when a jump is made from one point to another. Following each number is a letter and a quotation mark. The letter identifies the type of statement, and the quotation mark isolates it from the rest of the line. (Some versions of Pilot use a colon rather than the quote; if you wish to use Pilot programs written for other systems, simply substitute the quote for the colon.)

The C command means "clear the screen and print the message that follows." The A command stands for "ask the question that follows." When the A command is found, the question is printed on the screen, a question mark is added, and the computer waits for the student to type in his answer and press enter. The student's answer is stored in a special temporary memory of the TRS-80. It can be reprinted on the screen by using the @ symbol in any other message. The W command means "clear the screen, and print the following message in wide letters."

The sample program gets the student's name in line 20, the screen is cleared and switched to wide letters in line 30, and the name is reprinted as "Hi Bobby!" using the @ symbol in the same line. The T command means "type the following message on screen." Following a question in an Ask command, you'll usually want to match the answer with the correct value. This is done in lines 70, 90, and 110. Line 70 illustrates that when several acceptable answers exist, they can be listed in the match statement separated by slashes; if any one answer is correct, then the match is successful.

The Home Accountant™ The #1 best-seller.



At last! Now available for the TRS-80 Model III.

Any home finance package will balance your checkbook. But to become the #1 best-seller you've got to be something special.

The Home Accountant™ is.

It's the only one that prints a net worth statement and a personal finance statement. So you know exactly where you stand financially every day of the year. It will even print your checks, automatically.

Not only that, The Home Accountant™ lets you label every transaction. Just imagine sitting down to do your taxes and having every penny you've spent and earned neatly listed by category — and available at the touch of a button. It's an incredible time-saver.

You can also create bar, line and trend analysis graphs for every category — in color. It's great for realistic budgeting.

Sound amazing? Wait, there's more.

Let's say you write a check to pay your Visa. The Home Accountant™ automatically debits your checking account and credits your Visa account.

And it does this with every one of the one hundred budget categories: credit cards, checking accounts, money markets, cash, rent checks, insurance payments — you customize your own financial package.

Check out The Home Accountant™ soon. You'll find it does a lot more than simply manage your money.

It manages your money simply.



**Continental
Software**
A Division of Arrays, Inc.

It sells the most, because it does the most!

Yes, please send me The Home Accountant™

I enclose **\$74.95** for each package.

Visa, MasterCard, Check or Money Order accepted.

Visa # _____ Exp. Date _____

MasterCard # _____ Exp. Date _____

Signature _____

Total amount enclosed \$ _____
(California residents add 6% sales tax. Postage will be paid by Continental Software.)

Name _____

Address _____

City _____

State _____ Zip _____

Mail to: Continental Software Co., 11223 South Hindry Avenue, Los Angeles, CA 90045.
Or, call toll-free, (800) 421-3930, or, in California, call collect (213) 417-3003.

Continental Software Co.
11223 South Hindry Avenue
Los Angeles, California 90045
Telephone (213) 417-3003



Now the Universal Operating System*, available for the

TRS-80 Model 16[§],

unleashes the 16 bit power of the 68000 microprocessor

—Also available for the TRS-80 Models II & III[§]

Now, with the UCSD p-System*, the first truly Universal Operating System*, you can write programs in

Pascal

FORTRAN

BASIC

or

LISP

on your Model 16 and run them on Altos, Apple, Commodore, DEC, the IBM PC, IBM Displaywriter, TRS-80, Texas Instruments, Vector Graphics, Xerox, Zenith, Osborne, Hewlett Packard, Sage and more . . . without change†.

Hard to believe? Listen to Mr. John Tibbits, Vice President of The Datalex Company in San Francisco discuss their software developed on the UCSD p-System. "I was at a conference recently where one of the speakers was talking about converting a reasonably sized product from CP/M-80 to CP/M-86, and he said it would take six months. We bought our [IBM] PC on a Thursday afternoon and by Friday noon we had our entire system running. [With the UCSD p-System] software conversion only means a media conversion." Not only is program conversion a dead issue, but preservation of your software investment is economically feasible as you upgrade from machine to machine.

Before you write another program or spend agonizing hours converting a Model II or Model III program to run on the Model 16's 68000, take the time to find out why so many Radio Shack users are turning to PCD Systems and the UCSD p-System. Over 100,000 users of the Universal Operating System have discovered true portability. World wide they've made the p-System their choice as THE operating system for software development and marketing.

Well informed software developers who write programs on a Model II or Model 16 to sell them on current or future 8- and 16-bit machines have turned to PCD Systems and the p-System for the solution to their portability needs. Contact PCD Systems about low cost turnkey packages for mass distribution of your programs on the Model 16 and other machines.

IF THESE ARE YOUR CONCERNS:

- Program conversion for other machines
- Marketing your program on other machines
- Planning for the future machines
- Preservation of software investment

Then call or write us for more information.

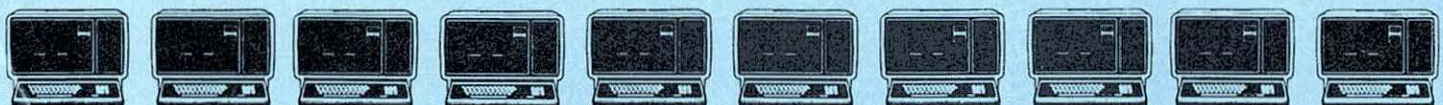
* trademark of the Regents of the University of California and SofTech Microsystems.

§ trademark of Tandy Corporation.

† PCD Supports Systems Software on DEC LSI-II, Radio Shack Models II, III, & 16, Altos, Terak, IBM PC, Apple II+, & Sage.

PCD Systems, Inc.
P. O. Box 143
Penn Yan, N.Y. 14527
(315) 536-7428

✓433



The program can jump forward or backward with the J command. As shown in line 150, the J is followed by the line number that you want to jump to. An E command signals the end of the program.

When a match is made with the M command, the TRS-80 asks itself, in effect, "Does the student's response match the correct values listed here in the M statement?" If the answer is yes, then any command preceded by the letter Y is performed; any preceded by an N for no will be ignored. Conversely, if the match gives a no answer, the N commands are performed. So, if the student answers 2, line 100 will be typed. Any command can be preceded by a Y or N. When they are preceded with the yes/no conditional, the answer to the most recent match statement is used as the basis for skipping or executing that statement.

Pilot is easy to learn. Because it has a simple structure, you don't need to worry about the mechanics of programming. Instead, you can concentrate on the lesson.

Many teachers and parents use Pilot to teach students a wide variety of subjects. However, many students also use Pilot to learn about computer programming. Pilot is an excellent first language for children. Since they are not overwhelmed by a large number of commands and rules, they can begin writing their own programs in less than an hour. Pilot teaches them to break a program idea into a series of smaller steps.

Any time you want to use Pilot to write a new program or to execute an old one, the procedure is the same. First, load the Basic program of Listing 1 and run it. This provides the TRS-80 with the special information it needs to translate Pilot programs into action. Next, load the desired program or type in a new one. Use the Name command to begin Pilot execution. You do not

need to reload the interpreter of Listing 1 unless you return to the memory-size or cassette prompts, or turn off the power. You can even switch over to Basic and run several programs. Unless these programs alter high memory by POKEing into that area, Pilot will still be available for execution with the Name command.

Here are some tips for creating your own Pilot programs. Remember, when another user loads and runs your pro-

gram, he might answer every question in lowercase, uppercase, or a combination of letters. Try to anticipate these combinations in your match statements. For example, even a simple yes or no question might look like this: 100 M"YES/yes/Yes/Y/y

If your program is too long to complete in one session, provide the option to skip over lesson units at the beginning of the program. If units 1, 2, and 3 begin at lines 1000, 2000, and 3000, then

```

10 M1=PEEK(16561)+256*PEEK(16562)-350:MS=M1+65536*(M1>32767)
20 POKE16561,(MSAND255):POKE16562,INT(M1/256):CLEAR50
30 M1=PEEK(16561)+256*PEEK(16562):MS=M1+65536*(M1>32767)
40 S1=M1+45:SS=S1+65536*(S1>32767)
50 POKE16783,(SSAND255):POKE16784,INT(S1/256):MS=MS+2:LI=110
60 CLS:PRINT@266,"Loading PILOT Interpreter ... please wait"
70 LI=LI+10:READA$,CS:IFA$="END"THEN360ELSEFORI=1TOLINE(A$)STEP2
80 MS=MS+65536*(MS>32767):PRINT@403,"Poking DATA of line";LI
90 A1$=MID$(A$,I,1):A1=ASC(A1$)-48+7*(A1$>"@")
100 A2$=MID$(A$,I+1,1):A2=ASC(A2$)-48+7*(A2$>"@"):A3=A1*16+A2
110 POKEMS,A3:X=X+A3:MS=MS+1:NEXTI:IFX<>CSTHEN400ELSEX=0:GOTO70
120 DATA CDC901187BCDC9013E17CD2A03,1296
130 DATA 1871237EFE22205DE5C5237EFE,1552
140 DATA 002803CDA728CDB31BF0E12812,1179
150 DATA C1E1184C2AA4400E59D5D13A40,1435
160 DATA 3BF0E42003C3191A7EFE002320,1045
170 DATA 057EFE0028F2235E2356D5237E,1291
180 DATA FE592822FE4E281EF542826FE,1489
190 DATA 4128B1FE4D285DFA4A2864FE45,1537
200 DATA 2852FE572897FE43288E1838B9,1422
210 DATA 28D5237EFE0020FA2318B1237E,1347
220 DATA FE222026E5C5237EFE002815FE,1514
230 DATA 402806CD2A032318F1E52AA740,1162
240 DATA CDA728E12318E63E0DCD2A03C1,1444
250 DATA E118CB21000CDA728E1CD9A0A,1491
260 DATA CDBD0FCDA728C3191A0E59237E,1331
270 DATA FE2220E5E51830237EFE2220DC,1551
280 DATA 23C5CD5A1E2AA4407DB4281B4E,1277
290 DATA 2346C5237EBB2803E118F0237E,1343
300 DATA BA2803E118E82B2B2BCLC11887,1384
310 DATA C118B223ED5BA7407EFE2F281C,1484
320 DATA FE002818EB46EBB82004231318,1156
330 DATA ED237EFE002806FE2F28DE18F4,1529
340 DATA 0E4EE118874552524F5220494E,1053
350 DATA 204C494E4500,328,END,0
360 MS=MS-65536*(MS<0):MS=MS-14:M2=INT(MS/256):M1=MS-M2*256
370 S1=S1+130:POKE(S1+65536*(S1>32767)),M1
380 S1=S1+1:POKE(S1+65536*(S1>32767)),M2
390 CLS:PRINT"TRS-80 PILOT Interpreter Ready":DELETEL0-400
400 PRINT:PRINT"Checksum error in line";LI:STOP

```

Program Listing 1

```

10 C"This is a PILOT program.
20 A"What is your name
30 W"Hi @! Welcome to PILOT!
40 T"What kind of computer is this:
50 T"1-Apple 2-Atari 3-TRS-80
60 A"What is your answer
70 M"1/One/one/ONE
80 YT"Nope, not an Apple!
90 M"2
100 YT"Sorry, Atari is wrong!
110 M"3
120 YT"That's right! Very good!
130 YJ"160
140 T"Please try again...
150 J"40
160 E"

```

Program Listing 2

```

10 A"Which unit (1, 2, or 3) would you like to begin with
20 M"1
30 YJ"1000
40 M"2
50 YJ"2000
60 M"3
70 YJ"3000
80 T"Please enter only the numbers 1, 2, or 3.
90 J"10
1000 T"This is unit 1.
1010 E"
2000 T"This is unit 2.
2010 E"
3000 T"This is unit 3.
3010 E"

```

Program Listing 3

THE COLOR COMPUTER EDUCATOR

PROGRAMS ARE DESIGNED TO BECOME PRIMARY BUILDING BLOCKS IN YOUR CHILD'S EDUCATION!

PARENT'S TEACHING TOOLS	TAPEDISK
ABC'S IN COLOR	19.95 24.95
BASIC MATH	14.95 19.95
COUNTING	14.95 19.95
EXT COLOR BASIC TRICKS	34.95 39.95
SEE & SPELL	34.95
TEACHING CLOCK	19.95 24.95
TEACHING MAP	34.95

16K EXT. BASIC REQ.

BUS

PROGRAMS INC.

P.O. Box 2477
Gaithersburg MD. 20879 (301) 9633848

HAVE AN EDUCATIONAL NEED WRITE US MAYBE WE CAN HELP!!
ENCLOSE YOUR CHILD'S NAME!

include a section at the beginning of the program like the one shown in Listing 3. Remember that you cannot selectively begin Pilot execution at a particular statement. So, when you are writing and debugging a new program, and have already tested the section from line 10-1990, add a short line 1 J'2000 to jump past the debugged section and skip forward to the section of interest. Then, just before you save the new program to tape or disk, remove line 1.

Because this version of Pilot has only the minimum set of commands, think of it as a tiny Pilot interpreter. If you find Pilot useful, consider investing in a more complete version. Several are available, including one from Radio Shack. They include graphics options, tape and disk input/output commands, and other advanced features.

I would be glad to answer any questions you may have, but please include a self-addressed, stamped envelope with your questions or comments. ■

Randy Hawkins is a chemical engineer. He can be reached at 6214 Hidden Cove, Corpus Christi, TX 78412.

PROFESSIONAL SOFTWARE **TRS-80® MODEL II & 16** NOW AVAILABLE!

BASIC COMPILER BY MICROSOFT • EASY TO USE
• TRSDOS® 2.0 COMPATIBLE • INCLUDES M-80, CREF-80 & EDIT 80
• UP TO 30 TIMES FASTER • AUGMENTED WITH OUR DOCUMENTATION

DISK SORT • YOU DON'T HAVE TO BE A PROGRAMMER TO USE IT!
• MENU DRIVEN • RANDOM FILES • EASY TO USE • SPEC'S SAVED ON DISK
• EASILY INSERTED INTO JOB STREAM FOR NON-STOP RUNNING • FULL DISK CAPACITY
• 1,000 REC'S. SORTING 15 BYTES, INCLUDING ALL DISK I/O = 2 MIN, 45 SEC'S.

BASIC CROSS REFERENCE • SAVE HOURS!
• SEE USED LINE#s/NAMES AT A GLANCE • PRODUCES NICE PROG. LISTING • INDISPENSABLE

EPSON MX-80 \$460⁰⁰ MX-100 \$700⁰⁰* HURRY-LIMITED TIME!
PAPER 9½x11 18lb WHITE STRIPS TO 8½x11 3,000/BOX

MAILING LIST • HIGH CAPACITY • SPANS DISK • NO SORTING
• FAST RETRIEVAL-UPDATE • R/S CONVERSION INCLUDED • LONG/SHORT FORMATS
• ESTIMATED AVAILABILITY - DEC. 1982

*PLUS POSTAGE & HANDLING. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

TRS-80 & TRSDOS ARE REGISTERED TRADEMARKS OF TANDY CORP.

GOOD-LYDDON DATA SYSTEMS
5486 RIVERSIDE DR., CHINO, CA 91710
(714) 980-4563

HARD DISK SUPPORTED
\$339.00*
\$69.99*
DOC. ONLY \$10⁰⁰ DEDUCTIBLE ON PURCHASES
\$59.99*
DOC. ONLY \$10⁰⁰ DED. ON PURCH.
\$25.00*
\$149.95*
DOC. ONLY \$10⁰⁰ DED. ON PURCH.

PRACTICAL PERIPHERALS
BUFFERED PARALLEL INTERFACE
FOR EPSON PRINTERS

\$159.95
Plus Shipping
And Applicable Tax

"VIZ. A. CON."
A CONSOLIDATION SYSTEM FOR VISICALC USERS
NEW PRODUCT ADDS 3-DIMENSIONAL CAPABILITY FOR VISICALC MODELS.

In the past, to do a consolidation with VISICALC, a user had to replicate the model in memory and laboriously build the formulas to sum the cells. The first thing one discovers using this approach is that you quickly run out of memory. The second is that recalculation time gets much longer. The third is that you spend a lot of time operating and controlling the consolidation process.

Now with the help of VIZ. A. CON. you can add a third dimension to your VISICALC models. You can combine multiple "pages" of VISICALC data from a model for hierarchical consolidations (eg. Department, Division, Company, etc.) or for summations over periods of time (eg. Month, Quarter, Year-To-Date, etc.)

VIZ. A. CON. creates data files usable with VISICALC. You can use VISICALC for "what if" games at any level of your consolidation. Then use VIZ. A. CON. to find out what happened at other levels.

VIZ. A. CON. gives you the ability to set up special formulas (eg. ratios, percentages) that can be recalculated after a consolidation process. You can customize titles, row and column headings, footnotes, etc. for each report created by VIZ. A. CON. Reports can be automatically saved in standard ASCII form that can be used with a word processor. VISICALC precision is maintained for all data.

TRS-80 Model III/Disk	\$89.95
TRS-80 Model II 64K	\$119.95
IBM PC 64K and above	\$119.95

ASSET MANAGER

"ASSET SYSTEM" is a completely computerized asset depreciation system, particularly designed for the 48K TRS 80 Model III, DOSPLUS 3.4, and dot matrix printer. The system:

- 1) assigns control numbers to each asset.
- 2) accumulates assets according to General Ledger codes.
- 3) computes depreciation expense on each asset.

The "ASSET SYSTEM" is comprised of six primary programs:

1) Asset System Menu	4) Asset sort
2) Property	5) Search
3) Reports	6) Delete

The "SYSTEM" is configured to handle 500 asset numbers. Counters are displayed on the screen as the data is being entered. This enables you to monitor your progress as data is entered.

TRS80 MOD III Disk only	\$79.95
Also available:	
General Ledger Program Disk Model III	\$125.00

MICRO SOLUTIONS, INC. Software Center Master Charge & Visa 9949 Harwin, Houston, Texas 77036 (713) 789-5443 or **1-800-231-6667**

EXTRA! EXTRA!

50,000 Word Dictionary and Spelling Correction for TRS-80 Model I & III. Electric Pencil 2.0z' Integrated Word Processing System!

Dateline: January 1983.

IJG has done it again.

First, IJG brought the world the Electric Pencil 2.0z Word Processing System. The easy to learn, easy to use word processing system considered by many to be one of the finest available.

Now, IJG brings to the Electric Pencil system . . .

Blue Pencil, the Expandable 50,000 Word Dictionary.

That's right. A 50,000 word expandable dictionary that becomes an integral part of your Electric Pencil.

A virtually unlimited number of new words can be added to your Blue Pencil, making Blue Pencil especially useful for proper names, acronyms and professional terms.

No need to exit the operating system or run any other programs, just a simple two key command and Blue Pencil is quickly checking your text.

It's so simple.

Spelling and corrections are then easily accomplished by using Electric Pencil's search-and-replace feature. Or, if you would like your system to do all the work, there also is . . .

Red Pencil, Easy Spelling Correction.

Red Pencil brings together all the features of Electric Pencil and Blue Pencil, with a flexible spelling correction program that makes copy proofing a breeze.

Instead of dropping you off to edit and correct your own text, your enhanced Pencil will now go down the list of misspelled words with you, word by word, and offer you several options from a menu.

You can type in the correct spelling, leave the word alone, display the word in the sentence and then make your correction, display the dictionary at the nearest location and scroll up or down to find the correct spelling, or add or delete the word in the dictionary.

Then Red Pencil returns you to your Electric Pencil file with all your corrections present in the text, and your new file saved under a special name on the data disk. Your original file is untouched.

Fast and Easy Proofing.

Both Red Pencil and Blue Pencil are available (disk only) for \$89.95 each at computer stores, B. Dalton Booksellers and independent book dealers around the world.

Along with the Electric Pencil 2.0z Word Processing System for \$89.95 (disk version).

If IJG products are not available from your local dealer, order direct from IJG.

Include \$4.00 for shipping and handling. Foreign residents add \$11.00 plus purchase price. U.S. funds only please.

IJG, Inc. 1953 West 11th Street
Upland, California 91786
Phone: 714/946-5805



Helping You Help Yourself.

Cassette Index

by Andrew Sensicle

With some reconstructed cassettes and this index, you can shorten your Color Computer's loading time to less than 20 seconds.

Apart from providing a convenient way to organize your programs on cassette, this article explains how to use the cassette more efficiently for program and data storage. Perhaps it will even help you resist buying that disk drive for another few months.

First, since you have only a few usable kilobytes of RAM use short tapes. I always buy the most inexpensive cassettes that are held together with screws. I take them apart and throw away the tape, saving the hubs. From a supply of good quality tape, I run two minutes worth of tape onto one hub, cut the tape, fasten it to the other hub, and reassemble the cassette. This yields a 16K-per-side "shorty" cassette that rewinds in 10 seconds, yet holds several short programs or a few long ones on each side.

Even with these diminutive tapes, one of my cassettes contains 12 programs and requires an index for rapid loading.

The essence of an index is speed. If an index forces you to wait to see what is on the tape, then forget it! I want to load a short program and about one screenful of characters in less than 20 seconds. The standard technique using PRINT#-1 saves or loads 500 bytes in

9-25 seconds, depending on how the data is presented, because the data is first loaded into a buffer and then dumped to tape in a block. Each block has a leader train of sync bytes as well as a pause to let the drive get up to speed.

This system has some definite advantages, but speed is not the greatest of them. The block can contain up to 254 bytes. However, the buffer often dumps when it is less than full. For large amounts of data the cumulative pauses and sync trains can add up to a significant amount of time. Anyway, I was already over my target.

You must record data in a block, but you can make a direct memory dump or core image of any specified size. This is the normal technique for recording machine-language programs, and it can be borrowed for the data storage as long as you know where the data is.

The program is in two parts. The first, Program Listing 1, is a general-purpose routine that sets up a string array of the desired size and pads it with space characters. It then obtains the memory locations of the array. With this house-keeping done, it loads data into memory or saves it from memory as if it is a machine-language program.

To do this reliably, set up the array in a predictable and immovable manner. Locate the setup routine before the main program, so the Clear statement won't affect other operations and also enable the placement of the array at the top of RAM. By defining the maximum number of records (MX) up front, you

can easily make changes to accommodate more data. The POKE/PEEK in lines 110 and 130 let the value of MX survive the Clear statement. Predefine any variables used in obtaining the data address, since their subsequent creation changes the VARPTR value.

Strings are saved in memory from the top downward, so the lowest memory address is that of the highest element in the array. VARPTR for this element (line 180) then points to a location containing the length of that string element. The third and fourth bytes point to the actual location of the beginning of the string. All you have to do is PEEK those locations, calculate the two-byte address (line 190), then get the end-of-Basic-RAM address that is given in locations 39 and 40 decimal. If the main program makes USR calls to RAM routines or requires protected memory for other reasons, then the required address should be included in the Clear statement on line 120, as shown in the Color Computer manual.

The two parts of the program are shown together in Program Listing 2. In line 220, the data file INDAT is loaded for display and editing. The string data is modified using the MID\$ statement (see line 320). The statement doesn't redefine the string but merely modifies it. It can't change in length, and it remains at the same memory location.

A few words are needed on the machine-language Save statement in line 420. The Color Computer manual is almost misleading in this respect. The only reference to CSAVEM is in the summary on page 192. It states correctly that CSAVEM has four parameters, but it incorrectly indicates that the first is a numeric variable and others are hexadecimal constants. In fact, the first parameter is the filespec and must be a string variable or a string literal en-

The Key Box

Color Computer
16K RAM
Extended Color Basic

PRICES AND SERVICE TOO GOOD TO PASS UP!

PRODUCTS FOR THE TRS-80®

GAMES for Model I/III

	tape	disk
Galaxy Invasion, Super Nova	12.75	15.95
Attack Force, Meteor Mission 2	12.75	15.95
Cosmic Fighter, Robot Attack	12.75	15.95
Weerd (New from Big Five)	15.95	15.95
Forbidden Planet, Forbidden City	n/a	29.95
Hyperlight Patrol	n/a	15.50
Defiance	n/a	19.50
Panik	15.50	19.50
Caterpillar, Alien Defense	13.95	17.25
Scarfman, Bounceoids	13.95	17.25
Penitator	21.75	21.75
Eliminator, Sea Dragon	15.95	19.95
Rear Guard, Armoured Patrol	15.95	19.95
Adv. International Adventures		
Tripac 1-3, 4-6, 7-9, or 10-12	n/a	31.75

COLOR COMPUTER

Color Scarfman	17.25	n/a
Typing Tutor	17.25	n/a
Bugout (Monitor)	16.95	n/a
Adv. Int'l Games #1	15.95	n/a
Deathplanet: The Dogstar Adv.	15.95	n/a
Mean Craps Machine	15.95	n/a
Ghost Gobler	17.50	20.50
Color Cosmic Invaders	17.50	20.50
CCthello	12.75	14.95
Oracle (Graphic Monitor)	n/a	22.95



STICK 80 JOYSTICK

From Adventure International, this joystick is fully compatible with any level II TRS-80 Model I or III system. Assembled & tested, it simply plugs into your present system. Experience true arcade pizzazz and feel from your TRS-80. (Specify Model I or III). List \$39.95.

\$31.75

SUPPLIES

Mailing Labels, 1 up, 5,000 quantity	31.95
2 up, 10,000 quantity	31.60
3 up, 15,000 quantity	47.25
MX-80 Ribbon Cartridges	7.95
MX-100 Ribbon Cartridges	12.95
Verbatim Diskettes, 5 1/4" SS/DD	25.50

LDOS®

A disk operating system so good that Radio Shack has started selling them. A must for every Model I/III owner even if you have other advanced operating systems. Features full keyboard type-ahead, a true print spooler, hard disk support, data transportability between the Model I and III, Job Control Language, communications utility, 400 page manual, customer service number, and so much more!! This is the one. List price \$129.00.

\$114.95

The quality word processor that makes others obsolete. Lazy Writer provides all the features including page breaks before printing, disk directory without going to DOS, user definable function keys, and much, much more. True proportional spacing, automatic decimal alignment, automatic math calculations, and graphics are optional extras. List \$175.00.



\$149.95

OMNITERM

The best "smart" terminal package available for the Model I/III. It's menu driven and includes a text editor, four conversion utilities, and setting files to access all of the popular data bases such as CompuServe, the Source, Dow Jones, etc. User defined keys and automatic reformatting of data to the size of your screen are only two of many extra features. The 76-page manual also has been called the "best in the industry". List \$95.00.

\$79.95

MODEL I, III SOFTWARE

Newdos/80	\$134.95
Electric Webster + Correction	137.95
Electric Webster	84.95
Newscript	99.95
Newscript with Labels	114.95
Newscript Labels	27.75
Micro Clinic (memory/disk diagnostics)	
Model I	24.50
Model III	28.50

MAXI SERIES

The **Maxi Series** from The Business Division offers maximum versatility and ease of operation that is unmatched. Maxi programs are compatible with each other and, where appropriate, will interface with major word processing and spreadsheet programs. A telephone support line is available for technical assistance, if needed.

Maxi Manager

A data base management system for your most demanding business applications. Six different relational search techniques, 20 user-defined fields of 40 characters, record length up to 800 characters, calculated equation fields, and works with any major word processor. Price includes **Maxi Utility**. Requires 1 drive. List \$149.95.

\$119.50

Maxi Mail

The ultimate in low-cost, high performance, mail list management. Menu driven with unlimited storage capacity (each disk holds about 1,000 names and addresses and you can have as many disks as needed). Almost unlimited coding capabilities, up to 13 fields for each record. Use with major word processors to generate form letters. Model III only, 2 disk drives required. List price \$99.95.

\$79.95

Maxi Cras

A **Check Register Accounting System** featuring 223 income/expense accounts, with no limit to the number of transactions. Will print statements showing activity in one or more accounts over a specified period of time, check registers, income and expense sub-totals, and an account distribution statement. If you have been disappointed with other money management systems, it's time to get the best. Requires 2 drives. List \$99.95.

\$79.95

Maxi Stat

A complete statistical package for the TRS-80 that is similar to the well-known SPSS program used on large mainframes. **Maxi Stat** is the most useful statistical analysis package available for the TRS-80. Requires 2 drives. List \$199.95.

\$169.95

- 24-Hour Shipping for Items in Stock
- Defective or Unusable Items Promptly Replaced (and we pay shipping)
- Large Selection—Call for Items Not Listed
- Toll Free Order Line
- Free Shipping on Orders over \$100 (\$2.00 charge on orders under \$100)
- Friendly, Honest, Reliable Service

Visa, MasterCard, check, cash, money orders: COD orders up to \$350.00 are accepted.

Free UPS standard shipping in the U.S. on orders over \$100. Add \$2.00 for shipping and handling on all orders under \$100. All COD orders will be charged \$3.00 plus actual carrier charges and require cash or certified check on delivery.

When ordering by mail, include your telephone number, credit card number and expiration date, computer model, amount of memory, and number of disk drives. Colorado residents add appropriate sales tax (6 1/2% in Denver). Prices are subject to change without notice.



Applied Microsystems, Inc.

612 Washington, Denver, CO 80203

390

ORDER NOW
TOLL FREE

1-800-468-4474

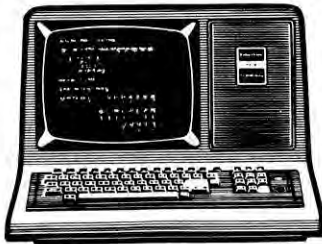
IN COLORADO CALL 861-9250

PLEASE

Give Us
A Chance to Save
You the Largest
Amount Possible on

TRS-80™
Products
Get Your Best
Price - Then Call Us
1-800-762-6661

OUR PRICES
Start
at a 15% Discount



SAVE



We also handle
VIC - 20
Okidata - Atari
RAND'S
COMPUTER CORNER
101 W. FRY BLVD.
Sierra Vista, Az. 85635
In State 602-458-2477

✓130

® TRS-80 is a trademark of Tandy Corporation

closed in quotes. The remaining parameters can be either numeric variables or decimal constants separated by commas. They define the start, end, and execute addresses respectively. None of the parameters are optional, although the filespec can be a null string. For data, the execute address is meaningless; I use 350 (15EH), which contains a return, in case it gets executed by mistake.

Program Operation

After saving a file, as shown in line 600, CLOAD and run the program.

Fourteen lines of index are displayed. Press any key to produce any additional lines. The "Enter Line No." prompt then appears.

If you need to add or change a line, type its number and press enter. If no number is given, the program exits. If additions or changes have been made, the program exits through a cassette save routine. ■

Andrew Sensicle can be reached at
119 Frost Drive, Whitby, Ontario,
Canada L1P 1G1.

```
100 MX=13 'MAX RECORDS -1
110 POKE 500,MX
120 CLEAR MX*28+100
130 MX=PEEK(500)
140 P=0:ST=0:EN=0 'PREDEFINE POINTER AND ADDRESS VARIABLES
150 DIM NX$(MX)
160 FOR X=0 TO MX 'FILL ARRAY
170 NX$(X)=STRING$(27,46):NEXT
180 P=VARPTR(NX$(MX)) 'GET POINTER
190 ST=PEEK(P+2)*256+PEEK(P+3) 'GET START ADDRESS OF ARRAY
200 EN=PEEK(39)*256+PEEK(40) 'GET END ADDRESS OF ARRAY
300 '
400 'END OF PREPARATION ROUTINE NOW SAVE OR LOAD AS REQUIRED.
500 '
600 'CSAVEM"FILESPEC",ST,EN,350
700 '
800 'CLOADM"FILESPEC"
```

Program Listing 1

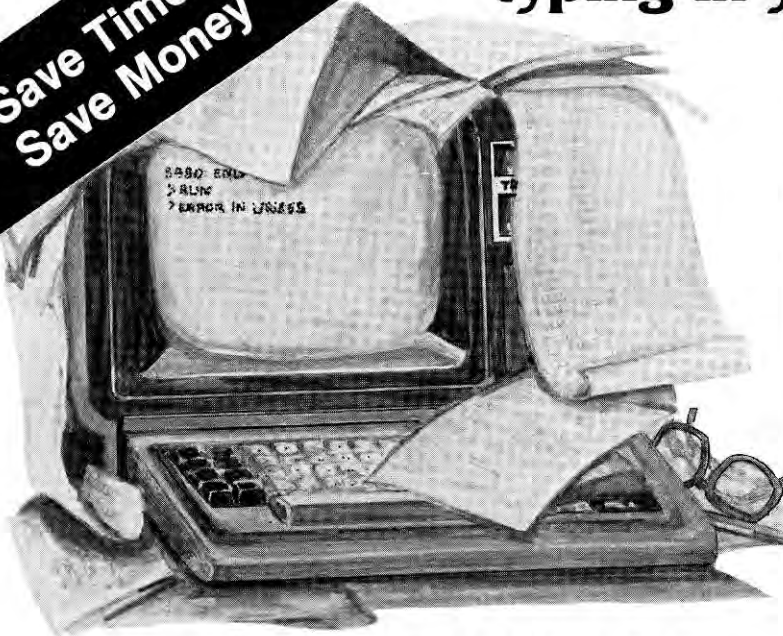
```
10 ' "COCODEX" - CASSETTE INDEX A.SENSICLE
20 ' ***** DEC 1981
100 MX=13 'MAX RECORDS -1
110 POKE 500,MX
120 CLEAR MX*28+100
130 MX=PEEK(500)
140 P=0:ST=0:EN=0 'PREDEFINE POINTER AND ADDRESS VARIABLES
150 DIM NX$(MX)
160 FOR X=0 TO MX 'FILL ARRAY
170 NX$(X)=STRING$(27,46):NEXT
180 P=VARPTR(NX$(MX)) 'GET POINTER
190 ST=PEEK(P+2)*256+PEEK(P+3) 'GET START ADDRESS OF ARRAY
200 EN=PEEK(39)*256+PEEK(40) 'GET END ADDRESS OF ARRAY
210 CLS:PRINT@232,"LOADING INDEX";
220 CLOADM"INDAT"
230 CLS:FOR X=0 TO MX
240 PRINT STR$(X+1);TAB(4);NX$(X)
260 IF (X+1)/14-INT((X+1)/14)=0 THEN A$=INKEY$:IFA$=""THEN260I ELSE
IF ASC(A$)=9THEN280ELSEIFX<MX THEN CLS
270 NEXT
280 INPUT" ENTER LINE NO. ";X
290 IFX=0 THEN 340
300 F=1 'SET SAVE FLAG GET NEW LINE
310 PRINTTAB(3);">";:LINE INPUT NX$
320 MID$(NX$(X-1),1)=NX$ 'SUBSTITUE NEW FOR OLD
330 CLS:GOTO 230
340 IFF=0 THEN 430
350 CLS:PRINT" REWIND TAPE AND PUT CASSETTE"
360 PRINTTAB(10);"ON RECORD."
370 PRINT" PRESS ANY KEY TO CONTINUE";
380 A$=INKEY$:IFA$=""THEN380
390 CLS:PRINT@232,"SAVING PROGRAM";
400 CSAVE"COCODEX"
410 PRINT@232,"SAVING INDEX ";
420 CSAVE"INDAT",ST,EN,350
430 CLS
```

Program Listing 2

Save Time
Save Money

You could spend hours
typing in your programs,

Or you
could get



ALL THE MAJOR
PROGRAM LISTINGS
FROM EACH MONTH
OF *80 MICRO* ON
CASSETTE OR DISK

*FOR SPECIAL ANNIVERSARY
ISSUE CASSETTE SEE AD
ELSEWHERE IN ISSUE.

With **LOAD 80**
you'll avoid all the hassles
while enjoying all the benefits

For information about
Color Load 80 see page
361.

What exactly is **LOAD 80**? Simply put, it is a monthly dump of the major program listings in each issue of *80 MICRO*. Since it was introduced in April of 1981, hundreds of TRS-80* users like yourself have discovered the advantages and benefits of **LOAD 80**. This comes as no surprise to Wayne Green, the innovative publisher who created **LOAD 80**. He knew from experience how frustrating and time consuming it was to keyboard and debug even a single published program, let alone all the major program listings in an issue of *80 MICRO*. He was sure that a great many people were just as frustrated as he was and would jump at the opportunity to have those programs available in "ready-to-load" form.

Wayne couldn't have been more right. **LOAD 80** has been a boom to TRS-80 users, allowing them to spend more time actually using their computers, while at the same time saving them a lot of aggravation and a good deal of money.

And now you can enjoy all the benefits of the major program listings in *80 MICRO* without the aggravation of keyboarding and debugging them. Start your subscription to **LOAD 80** with this month's issue and save close to 30% on the monthly price. And with a year's subscription, your cost per month (for an average of 10 programs per cassette or disk) is about what it would cost you to purchase one program at retail prices. Plus you get the extra added advantage of having the complete documentation for the major programs in that month's issue of *80 MICRO*, so loading your cassette or booting up your disk should present no problem at all.

To order your **LOAD 80** subscription, or this month's issue only, simply fill in the attached card or the coupon below (a photocopy is acceptable) and send it to: **LOAD 80**, 80 Pine Street, Peterborough, NH 03458, or call our toll free number: **1-800-258-5473**. You can also order back issues of **LOAD 80**. For complete details, look for the **LOAD 80** back issues advertisement in this magazine, or see your local dealer.

LOAD 80 disks are TRSDOS 2.3 formatted, single density and floppy-sided. They will not contain an operating system. Single drive users need a copy utility; Model III users need the TRS-DOS 1.2/1.3 Convert utility. Source code files may not be useable on the Model III. **LOAD 80** cassettes run only on the Model I and Model III computers.

Yes, I want February **LOAD 80**

YES, I want this month's **LOAD 80** on disk for \$19.97 each (plus \$1.50 per disk for postage and handling).

Visa Am. Ex MasterCard

YES, I want to save money. I'll subscribe to **LOAD 80** on disk beginning with this month's issue. . . \$199.97

Check/Money order

YES, I want a cassette of this month's **LOAD 80** for \$9.97 each (plus \$1.50 per tape for postage and handling).

YES, I want to save money. Sign me up for a year of **LOAD 80** beginning with this month's cassette. . . \$99.97 for 12 issues.

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Signature: _____ Card# _____ Exp. Date: _____

LOAD 80 is manufactured by Instant Software, a subsidiary of WAYNE GREEN INC., 80 Pine St., Peterborough, NH 03458. There is no warranty expressed or implied that **LOAD 80** will do anything other than save you typing.

Foreign air mail, please inquire.

*TRS-80 is a trademark of Tandy Corp.

The Model 16

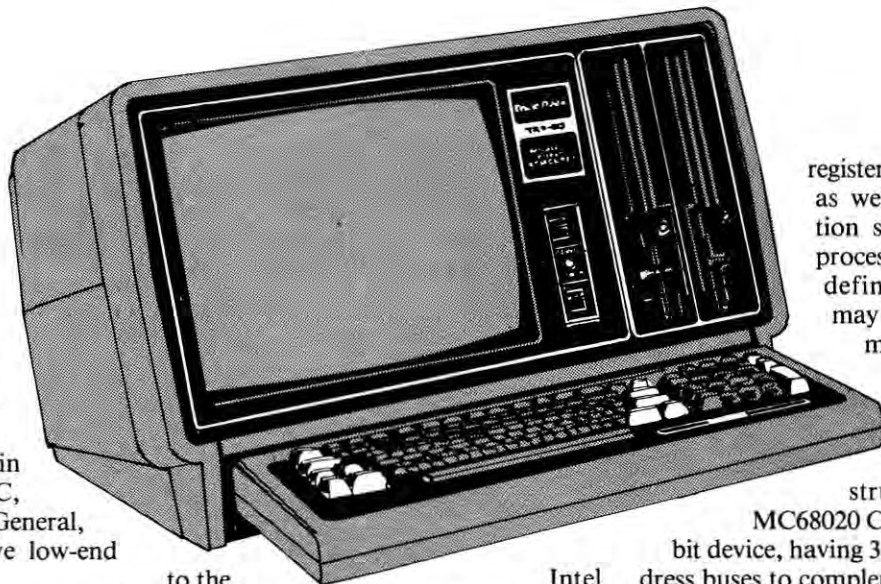
by Jim Hawkes

Radio Shack's 16-bit entry, the Model 16, is a significant computer design. Although the labels micro, mini, and main-frame overlap in today's marketplace, it is safe to say the Model 16 is a mini-computer. The machine has the potential to place the company squarely in competition with IBM, DEC, Burroughs, Wang, Data General, and others in the lucrative low-end minicomputer market.

Radio Shack has approached this market slowly, incorporating more intelligent (or programmable) microprocessors in their designs. Radio Shack's first computer, the Model I, contained only two programmable devices, the disk controller and the CPU. The Model II added keyboard, video, and other I/O controllers. The latest design, the Model 16, incorporates what many consider to be the most powerful of the 16-bit microprocessors, the Motorola MC68000.

It appears that Radio Shack's selection of the MC68000 may be as fortuitous as their selection of the Z80 for the Model I. The parallels of the CPU design decisions between the Model I and Model 16 is striking. When the Model I was in the design stages, the Z80 was just beginning to enter full production. Though there was very little software compared to its cousin the Intel 8080, the Z80 was thought to be a substantial improvement.

The same can be said with respect



to the Intel 8086 family of 16-bit CPUs and the MC68000. The 8086 was released much earlier than the MC68000 and therefore had a substantial lead in software development. However, the Motorola microprocessor is thought to be superior—although it has very little software support.

Motorola was later than its principal competitors, Zilog and Intel, in entering the 16-bit market. By waiting, they were able to complete a design that contains over 68,000 transistors as compared to 29,000 in Intel's 8086.

Radio Shack refers to the MC68000 in the Model 16 as "advanced 16/32 bit technology." What defines a 16-bit machine remains a moot point. A simplistic view would label any processor that simultaneously reads or writes 16 bits to memory as a 16-bit processor; using this definition the MC68000 (68K) qualifies.

A more careful definition considers

register widths and types as well as the instruction set of the microprocessor. Using this definition, the 68K may qualify as a 32-bit machine, since it contains 16 32-bit registers as well as a powerful instruction set. The

MC68020 CPU is the true 32-bit device, having 32-bit data and address buses to complement its 32-bit internal registers.

In addition to processing four times as many bytes as 8-bit devices, the 68K prefetches instructions to the CPU before they need to be executed. When the CPU is ready to perform the next instruction, it is fetched from memory (called a cache) contained within the microprocessor. This type of look-ahead processing is called pipelining and results in faster operation since instruction fetch cycles do not interrupt instruction execution.

Another characteristic that distinguishes the microprocessor is a significantly broader range of instructions than its 8-bit counterparts. In particular, it performs hardware multiply and divide, tasks that require subroutines on most 8-bit CPUs. In addition, several instructions have been added to ease the manipulation of data structures.

Not only does the 68K operate on more bits with more instructions, it also

PROGRAMMING TOOLS FOR YOUR TRS-80™ MODEL I AND MODEL III

INSTANT ASSEMBLER

The **INSTANT ASSEMBLER** is a powerful disk or tape-based assembler and debugger for the TRS-80. Now you can assemble directly to memory and immediately debug your program with the built in single stepping debugger. Quickly switch from assembler to debugger and back again without losing the source code. This feature makes **INSTANT ASSEMBLER** an excellent learning tool for assembly language programming.

INSTANT ASSEMBLER is absolutely unique among tape based assemblers in that it produces relocatable code modules that can be linked with the separate **LINKING LOADER**, which is supplied in two versions for loading programs into either high or low RAM. This lets you build long programs with small modules. **INSTANT ASSEMBLER** also features immediate detection of errors as the source code is entered, a compactly coded source format that uses 1/3 as much memory as standard source, and many operational features including single stroke entry of DEFB and DEFW, pinpoint control of listings, alphabetic listing of symbol table, separate commands for listing error lines or the symbol table, block move function, and verification of source tapes.

INSTANT ASSEMBLER's debugger provides single stepping with full register displays, decimal or hex entry of addresses, forward or backward memory displays, disassembly of object code in memory, memory display in ASCII format, and hex-to-decimal or decimal-to-hex conversion. The single-stepper will step one instruction at a time or at a fast rate to any defined address.

INSTANT ASSEMBLER occupies less than 8400 bytes of memory. In a 16K machine this will leave you enough memory to write assembly language programs of around 2000 bytes. This and its module-linking feature make **INSTANT ASSEMBLER** ideal for users with only 16K machines. The instruction manual may be purchased separately for \$5, which will apply towards the purchase of the **INSTANT ASSEMBLER**. In addition to disk I/O, the disk version includes a stand-alone version of the debugger program **MICROMIND**.

Specify Model I or Model III. **TAPE INTASM** \$29.95 on tape
Specify Model I or Model III. **DISK INTASM** \$35.95 on disk

INSIDE LEVEL II

The Programmers Guide to the TRS-80 ROMS

INSIDE LEVEL II is a comprehensive reference guide to the Model I and Model III ROMs which allows the machine language or Basic programmer to easily utilize the sophisticated routines they contain. Concisely explains set-ups, calling sequences, and variable passage for number conversion, arithmetic operations, and mathematical functions, as well as keyboard, tape, and video routines. Part II presents an entirely new composite program structure which loads under the **SYSTEM** command and executes in both Basic and machine code with the speed and efficiency of a compiler. In addition, the 18 chapters include a large body of other information useful to the programmer including tape formats, RAM usage, relocation of Basic programs, **USR** call expansion, creating **SYSTEM** tapes of your own programs, interfacing of Basic variables directly with machine code, and special precautions for disk systems. **INSIDE LEVEL II** was reviewed in the April 1982 issue of 80 Micro which said "The book has no flaws; it is a perfect gem." Byte Magazine said "I recommend this book to serious machine language programmers."

Includes updates for Model III. **INSIDE LEVEL II** \$15.95

SINGLE STEP THROUGH RAM OR ROM

STEP80 allows you to step through any machine language program one instruction at a time, and see the address, hexadecimal value, Zilog mnemonic, register contents, and step count for each instruction. The top 14 lines of the video screen are left unaltered so that the "target program" may perform its display functions unobstructed. **STEP80** will follow program flow right into the ROMs, and is an invaluable aid in learning how the ROM routines function. Commands include step (trace), disassemble, run in step mode at variable step rate, display or alter memory or CPU registers, jump to memory location, execute a **CALL**, set breakpoints in RAM or ROM, write **SYSTEM** tapes, and relocate to any page in RAM. The display may also be routed to your line printer through the device control block so custom print drivers are automatically supported.

Specify Model I or Model III. **STEP80** \$16.95 on tape, \$21.95 on disk

DUPLICATE SYSTEM TAPES WITH CLONE

Make duplicate copies of almost any tape including Basic, **SYSTEM**, data lists, assembler source, or "custom loaders". The file name, load address, entry point, and every byte (in ASCII format) are displayed on the video screen. Model III version allows changing tape speed so you can make 1500 baud copies of 500 baud programs like **SCRIPST**.

Specify Model I or Model III. **CLONE** \$16.95 on tape, \$21.95 on disk

RESTORE DAMAGED TAPES WITH RESQ2

RESQ2 will repair cassette tapes that can no longer be loaded because of "crashed" data. It can restore **BASIC**, **SYSTEM**, **ASSEMBLER**, and **DATA** tapes. **RESQ2** compares two copies of the damaged tape to attempt a restoration, though restoration can often be accomplished with only one copy. After the damaged data is corrected in memory, a new tape may be recorded and verified which does not contain any errors. The success rate of **RESQ2** will depend on the severity and quantity of errors. **RESQ2** comes with a comprehensive user manual and examples of two types of "crashed" programs to practice on.

Specify Model I or Model III. **RESQ2** \$19.95 on tape

DISK INDEX VERSION 3

Our excellent disk indexing program has now been entirely rewritten in machine language. **DISK INDEX** will assemble a master index of your entire program library by automatically reading the program names and free space from each disk. The index may then be alphabetized or searched for any disk, program, or extension. It will alphabetize 2400 programs in less than 50 seconds and will find any program out of 2400 in less than 3 seconds. Disks or programs may be added or deleted manually, and the whole index or any selected part may be printed on paper in several different formats. The index itself may also be stored on disk for future access and update. A 48K machine will hold up to 255 disks and over 2400 programs in each index, and you may build as many indexes as you need. There is no limit to the number of filenames it can read on any one disk. It will run on either a Model I or Model III and catalog disks for either machine regardless of which one is running it, though Model I owners must have double density to catalog Model III disks. It will automatically recognize any DOS and disk density. **DISK INDEX** works with any operating system written for the Model I or Model III except CP/M, and is extremely fast and easy to use.

Specify Model I or Model III. **DISK INDEX VERSION 3** \$29.95 on disk

TELCOM II

Our popular smart terminal program has just gotten a lot smarter. After two years of experience with **TELCOM** and many requests from customers, we have created **TELCOM II** for the most demanding telecommunications applications. **TELCOM II** maintains the same ease of operation and all the features of our original program (see below), and includes many enhancements. The terminal mode now has a help menu, a large spooler for simultaneous printer output at high baud rates, acknowledges receipt of all commands, and displays control characters. You can now load disk files into the memory buffer from within the terminal mode, transmit the buffer with a single command, and send files a line at a time. You can even view the buffer or data that has already scrolled off the screen. **TELCOM II** has 10 different 40 character programmable messages that can each be sent with a single command, and the messages can now include control codes and delays. It also has 5 different character translation tables for compatibility with different systems. One of the most substantial additions to **TELCOM** is a full protocol file transfer mode which is compatible with the **LYNC** program available on CP/M systems and the IBM PC. **TELCOM II** will exchange disk files with any computer running this protocol (including another TRS-80 running **TELCOM II**), and will automatically correct errors in transmission! Files can be sent to or fetched from an unattended computer with **ZERO** errors. The extreme ease of use **TELCOM** is known for has not been compromised. Reconfiguration of the programmable features is done internally from clear menus for fast, easy operation. **TELCOM II** comes with a comprehensive instruction manual which is available separately for \$5 (which will apply to subsequent purchase of the program). You won't find a smarter or easier to use terminal program at any price.

Specify Model I or Model III. **TELCOM II** \$69.95 on disk

TELCOM I

Our original and popular smart terminal program has most of the features needed to communicate with time share systems or for high speed file transfers between two disk-based micros over modems or direct wire. It is menu driven and extremely simple to use. Functions include terminal mode, save RAM buffer on disk, transmit a disk file, receive a disk file, examine and modify **UART** parameters, 8 programmable log-on messages, automatic checksum verification of accurate transmission and reception, and many more user conveniences. Supports line printers, lowercase characters, Xon/Xoff protocol, programmable character keys, and even saves itself on disk in different configurations. It will also exchange binary files without conversion to ASCII.

Specify Model I or Model III. **TELCOM I** \$39.95 on disk

RAM SPOOLER AND PRINT FORMATTER

This program is a full feature print formatting package featuring user definable line and page length (with line feeds inserted between words or after punctuation), indentation, screen dump, and printer pause. In addition, printing is done from a 4K expandable buffer area so that the **LPRINT** or **LLIST** command returns control to the user while printing is being done. Works with cassette or disk systems. Allows printing and processing to run concurrently. Output may be directed to either the parallel port, serial port, or the video screen. 80 Micro said "I can only give my highest recommendation of Spooler and Mumford Micro Systems."

Specify Model I or Model III. **SPOOLER** \$16.95 on tape, \$21.95 on disk

4 SPEEDS FOR YOUR MODEL I

The SK-2 clock modification allows CPU speeds to be switched between normal, an increase of 50%, or a 50% reduction; selectable at any time without interrupting execution or crashing the program. Instructions are also given for a 100% increase to 3.54 MHz. The SK-2 may be configured by the user to change speed with a toggle switch or on software command. It will automatically return to normal speed any time a disk is active, requires no change to the operating system, and has provisions for adding an LED to indicate when the computer is not at normal speed. It mounts inside the keyboard unit with only 4 necessary connections for the switch option (switch not included), and is easily removed if the computer ever needs service. The SK-2 comes fully assembled with socketed IC's and illustrated instructions.

Model I only. **SK-2** \$24.95

ORDERING: Complete satisfaction is guaranteed or a full refund will be made. Include \$2.00 for postage and handling. California residents add 6% sales tax. Visa, Mastercharge and COD orders accepted. **SPECIFY MODEL I OR MODEL III.** Dealer inquiries invited.

**MUMFORD
MICRO
SYSTEMS** ✓67

Box 400-E Summerland, California 93067 (805) 969-4557

Quality software since 1978

operates with more speed. The 68K, as it is implemented on the Model 16, operates at 6 megahertz compared to the 4-megahertz operation of the Z80 in the Model II and 16. These higher clock speeds translate into the execution of more instructions per second. The exact number of instructions executed at a time depends upon the application, since some instructions execute more rapidly than others. However, as many as 1.5 million instructions per second can be executed at the current clock setting on the Model 16.

Anyone following hardware developments will notice that the 68K runs faster in other manufacturers' products. In fact, you might feel slightly swindled by the slower performance from the CPU. To be fair, however, some consideration must be given to the time frame of the Model 16's design and the supporting ICs built into it. After all, one and a half million instructions per second is quite significant. (Incidentally, the 68K has been run under special conditions at speeds over 16 megahertz.)

Although speed and word size are important characteristics, perhaps the most important feature is the magnitude of addressable memory area. The

*“As many as
1.5 million instructions
per second
can be executed at
the current clock setting
on the Model 16.”*

MC68000 is capable of addressing 16 megabytes (million bytes) of memory. Since Radio Shack did not implement all the address lines, only 524,288 bytes (512K) are available. For most users this should be sufficient, particularly considering the fact that many large multi-user systems have operated on substantially less memory.

Two Systems in One

Essentially, the Model 16 is two computer systems in one. The 68K is augmented with a Z80A, the same microprocessor used by the Model II as the CPU. By designing the system so that

the Z80 could be used as a stand-alone CPU, the Model 16 can duplicate the functions of a Model II. When not being used in the Model II mode, the Z80 serves as a slave processor to the 68K, relieving the 16-bit CPU from time-consuming I/O tasks.

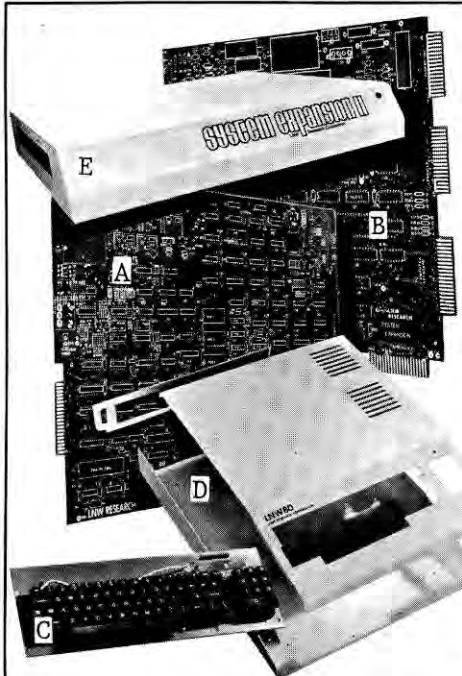
The use of the Z80 in this manner is very important in the initial success of the Model 16, since it permits the use of existing Radio Shack software. This software makes the machine useful while 68K software support is being developed. Without the Z80, the Model 16 would not currently be a marketable product, since there is very little software available that uses the 68K.

External Storage

The disk storage system is substantially different in capacity, physical size, and operation than the Model II. The first thing you will notice is that the disks are inserted in a completely different manner than in the Model II—namely, upside down. The second noticeable operational aspect is the reduction in system noise.

One of the most unattractive features of the Model II is the incessant noise produced by the constant whine of the

COMPUTER KITS – FROM \$69.95



LNW SEMI-KITS can save you hundreds of dollars. By obtaining your own parts at the lowest possible cost and assembling the **LNW SEMI-KITS**, you can have the most highly acclaimed microcomputer in the industry – the **LNW80**. The **LNW SEMI-KITS** are affordable modules. You can start with a modest cassette system and expand to a full 4Mhz TRS-80 compatible system with 5 or 8 inch double density disks and color at any time.

A. LNW80 CPU – Made of high quality FR4 glass epoxy double sided circuit material, with plated-through holes and gold edge connector. It is fully solder-masked and silk screened. Here are just some of the outstanding features you will have when your **LNW80** CPU board is fully assembled:
 • 16K RAM • Color and black and white video • 480 x 192 high resolution graphics • 64 and 80 column video • 4 Mhz Z80A CPU • Upper and lower case display • 500 and 1000 baud cassette I/O – **\$89.95**

B. SYSTEM EXPANSION – Expand the **LNW80** computer board, **TRS-80** and **PMC-80** computer with the following features:
 • 32K memory • Serial RS232C and 20Ma port • Real time clock • Parallel printer port • 5 inch single density disk controller • Expansion bus (screen printer port) • Onboard power supply • Solder-masked and silk screened legend – **\$69.95** (tin plated contacts) – **\$84.95** (gold plated contacts)

C. KEYBOARD – 74 key expanded professional keyboard – includes 12 key numeric keypad. Fully assembled and tested. – **\$99.95**

D. COMPUTER CASE – This stylish instrument-quality solid steel case and hardware kit gives your **LNW80** that professional factory-built appearance. – **\$84.95** Add \$12.00 for shipping.

E. SYSTEM EXPANSION CASE – This stylish instrument-quality solid steel case and hardware kit gives your **SYSTEM EXPANSION** interface that professional factory-built appearance. – **\$59.95** Add \$10.00 for shipping.

F. LNW80 CPU – HARD TO FIND PARTS KIT – \$82.00

G. LNW80 VIDEO – HARD TO FIND PARTS KIT – \$31.00

H. SYSTEM EXPANSION – HARD TO FIND PARTS KIT – \$27.50

I. LEVEL II ROM set. (6 chip set) – \$120.00

VISA and **MasterCard** accepted. Add \$3.00 for shipping plus \$1.00 for each additional item. All shipments via UPS surface. Add \$2.00 for U.S. Mail. Shipments outside continental U.S.: funds must be U.S. dollars. Sufficient shipping costs must be included with payment.

ORDERS & INFORMATION – (714) 544-5744
SERVICE – (714) 641-8850

LNW Research Corp.

2620 WALNUT Tustin, CA. 92680

disk drives and cooling fan. If a Model II is installed in a very quiet location, the noise it creates is frequently more than unpleasant. The Model 16 has solved this problem. Once a drive has been activated it remains rotating for only 30 seconds; if there have been no I/O operations to the drives during this period, then they are turned off. The cooling fan, however, still remains a burden to the eardrum and connecting neural passages. Surely there must have been a quieter fan or better mounting method.

The floppy-disk drives used in the system are thinline double-sided, double-density, permitting approximately 1.25 million bytes of storage per drive. Since the drives are physically much smaller than the Model II units, two can be placed in the same space as the single drive, enabling 2.5 million bytes of storage in the confines of the Model 16 enclosure. Two additional floppy drives can be added, supplying a total capacity of approximately 5 megabytes.

The Model 16 also accepts the Radio Shack hard disk, which provides almost 9 million bytes of storage capacity per drive. Up to four drives can be added providing a total of 33 million bytes of

“The lack of sufficient serial I/O ports is the most serious design flaw in the Model 16.”

hard-disk storage.

I/O Ports

The lack of sufficient serial I/O ports is the most serious design flaw in the Model 16. The input/output devices are exactly the same as the Model II. Namely, two RS-232 serial ports and one parallel port—woefully inadequate for a system designed as a multi-user system. With only two serial ports the system loses one third of its usefulness if a serial printer is utilized, and with two serial devices attached (such as a printer and a plotter), there is no room for terminals. (Radio Shack markets separate-

ly an RS-232C selector switch that lets you connect three peripherals to a single serial output port. Also, the DT-1 data terminals designed to work with the Model 16 in a multi-user configuration have their own serial and parallel printer ports.)

Internal Expansion

The Model 16 has space for only two additional cards on the system bus. This limits the number of options available to the user. For example, expanding to 1/2 megabyte of internal memory and adding a hard-disk controller would completely fill the system bus. This means the hi-resolution graphics board or ARCNET could not be installed when or if it becomes available. (Incidentally, ARCNET was not mentioned in the new September catalog.) (Radio Shack Computer Centers are claiming that ARCNET will be available “around the first of the year.” This contrasts with Radio Shack’s original release date of “second quarter of ’82.”)

Other Features

The Model 16 possesses two features that must have been the byproduct of good market research. No longer will

Readable TRS-80® Books

32 BASIC Programs for the TRS-80® Computer Tom Rugg and Phil Feldman

Here are 32 fully documented programs that are guaranteed to run if entered exactly as shown. Included are practical applications, educational uses, games and graphics. You can type the programs in yourself, or buy a diskette for the TRS-80 model I or model III computers with the programs on it.

Book: ISBN 0-918398-27-4
304 pages \$19.95

Book & Diskette:
Model I \$29.95
Model III \$29.95

The Tenderfoot's Guide to Word Processing Barbara Chirlan

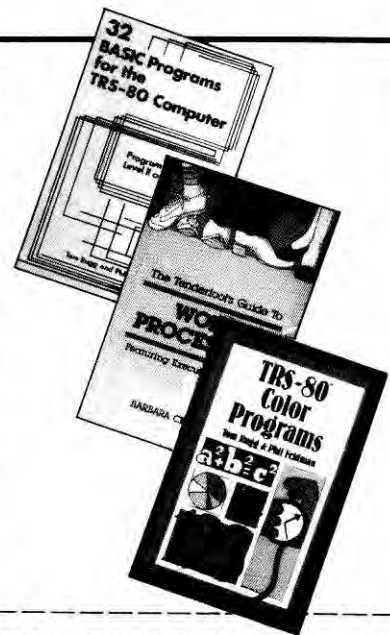
Are you curious about word processing and want some direction? This book gets you started. The first half is a general discussion of word processing, then the rest of the book describes in great detail how to use a specific word processor, *The Executive Assistant*. This gives you a clear idea of what you and a word processor can do.

ISBN 0-918398-58-4
150 pages \$10.95

TRS-80® Color Programs Tom Rugg and Phil Feldman

Chock full of 37 different programs that are ready to run on your TRS-80 color computer, this new book gives you educational uses, practical applications, games and graphics. If entered exactly as shown, the programs are bug-free! Special color section also included showing programs on the computer screen.

ISBN 0-918398-61-4
324 pages \$19.95



 **dilithium Press**
P.O. Box E
Beaverton, OR 97075
(800) 547-1842
(503) 646-2713

✓ Use our toll free number for VISA or M/C orders or to learn the store nearest you that carries our books.

- Please send me the book(s) I have indicated. I understand I may return for a full refund if I am not satisfied.
- | | | | |
|--|-------|--|-------|
| — Tenderfoot's Guide to Word Processing | 10.95 | — TRS-80® Color Programs | 19.95 |
| — 32BASIC Programs for the TRS-80® Computer—book | 19.95 | — 32 BASIC Programs for the TRS-80® Computer—book & diskette—Model | 29.95 |
- Enclosed please find my check which includes \$1 to cover handling. \$ _____

Name _____
Address _____
City, State, Zip _____
Mail to: dilithium Press, P.O. Box E, Beaverton, OR 97075

Please send me your FREE catalog BRAINFOOD

interior decorators be subjected to battleship gray. The system is packaged in an attractive off-white enclosure that is identical in dimensions to the Mod II. In addition, a green-phosphor screen has replaced the old black-and-white CRT. The keyboard is detachable and in all respects seems identical to the Model II.

Current Operating System

The 16-bit operating system provided with the computer is similar in command structure to the Model II's TRSDOS. However, there are two library commands that are not discussed in the documentation. These commands, Assign and Release, appear to reflect Radio Shack's intent to provide multi-user capability. However, according to knowledgeable sources, Radio Shack's plan to develop their own proprietary operating system has been temporarily abandoned. Instead, they have purchased a multi-user, multi-tasking operating system that is a descendant of a well-known operating system, UNIX. The proposed operating system is called MTOS.

Proposed Operating System

There is nothing more useless than a computer without software. Since the Model 16 is capable of running Model II software, it is not useless. However, its "raison d'être" was not to serve as a Model II; after all, Model II two-drive systems are more than \$1,000 less than a comparable Model 16. Radio Shack advertises the Model 16 system as a multi-user system with a small caveat in the September catalog, "available first quarter 1983." Undoubtedly, it is the multi-user features of the 68K that attract buyers.

If the information from Fort Worth is accurate, the multi-user operating system scheduled for release will be vastly more sophisticated than anything heretofore offered by Radio Shack. The proposed release might be called MTOS, Multiple Terminal Operating System, and is designed as a UNIX look-alike. UNIX is the highly acclaimed operating system designed at Bell Labs primarily for minicomputers. Although UNIX has been used predominantly in the academic community, it has been forecasted by many as the dominant operating system of the 16-bit generation of micro/mini computers. However, MTOS will not contain the full set of UNIX utilities and initially will probably not contain any language, except possibly Cobol. One of the best features of MTOS is the pro-

posed cost: free, to all Model 16 owners.

Probably one of the foremost considerations in not initially providing a complete UNIX system is the necessity of royalty payments to Bell Telephone. However, sometime during the first quarter of 1983 a full UNIX development system complete with utilities will be offered, but it will not be free. This system has been licensed from Bell and will be fully supported. Because UNIX is written in C, it would seem reasonable that any development system must incorporate this language. Fortran and Basic will likely be released in the second quarter of 1983.

Supporting an operating system such as UNIX represents a radical departure from previous marketing philosophies, since Radio Shack has never supported any operating system but their own proprietary systems. Whatever their reasons are for making the change, it is a welcome one. By providing UNIX they

"Radio Shack's plan to develop their own proprietary operating system has been temporarily abandoned."

offer a good, well-known, and respected operating system that cannot be easily dismissed by competitors. After all, Radio Shack is entering a very competitive environment, pitting itself against well-known manufacturers such as IBM.

MTOS

MTOS, as currently proposed, is a virtual-memory operating system. Conceptually, virtual memory allows application programs an almost limitless amount of memory, even larger than the total amount of internal memory in the system. Virtual-memory systems have been prevalent in mainframes and large minicomputers for at least a decade. However, this type of architecture has not filtered down into the micro world primarily because of programming complexity, marketability, and performance considerations. Virtual memory systems require substantial CPU overhead; some have estimated approximately 25 percent.

(Motorola's MC68010 CPU, along with the MC68451 Memory Management unit, is designed to process virtual memory without adding processor overhead. Radio Shack has given no indication that it plans to use these parts in the Model 16.—Eds.)

In the 8-bit world, serving two or more users in addition to giving up 25 percent of CPU time to an operating system was just too much to ask, especially with only 64K of memory. Although 8-bit speeds have increased and integrated-circuit technologies have produced larger and less expensive memories, most software developers did not believe there was a real market for extremely sophisticated multi-user systems, particularly since the 16-bit processors were right around the corner.

Paging systems are the most prevalent type of virtual memory system. In a virtual system a program is divided into segments called pages, which are usually stored on disk. When the program is initiated only a portion of the pages necessary to begin execution can be loaded into memory. However, at some point during execution a page that is not in memory will be required. The absence of a necessary page is called a page fault.

When a page fault occurs, program execution must cease, and the missing page must be copied into main memory from disk. If memory is completely used there may not be a place to put this page. Thus, the operating system must decide which page to remove. Pages are continuously swapped in and out of memory until program execution is complete.

Virtual-memory environments usually provide dynamic memory allocation. In a dynamic environment a user's program is not assigned to a fixed amount of internal memory. As memory becomes available, the system distributes it among the various users according to a priority system. Suppose, for example, a system is operating with three users. If one of the users terminates, then the two remaining users would have additional memory allocated and their programs would execute more efficiently since there would be fewer page faults.

Thinking about the virtual environment will lead to a quick conclusion. There is an enormous amount of I/O to disk. This problem in the Model 16 is addressed by both hardware and software. The hardware component consists of the Z80A, which can act as a slave I/O processor for the 68K. When

SPECIAL-PURCHASE

TRS-80 MOD III

48K — 2 Drive
— DISK III
TRSDOS &
Manuals

\$1775



6.3 to 38 MEG

Winchester External Hard
Disk III beginning at

\$1899

Optional HD III:

9.5 meg	\$2099
19 meg	2799
2 x 6.3 meg	2899
2 x 9.5 meg	3199
2 x 19 meg	4399

EXTERNAL FLOPPIES

for MOD I
or III

\$275

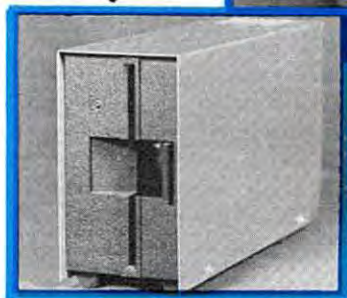
Fully compatible, 120 day warranty

80 TK or 2 sided

\$395

80 TK & 2 sided

\$515



CHECK THESE GREAT BUYS ON OTHER PRODUCTS:

Epson MX-80 w/graphtrax	\$475.00	C.ITOH & Diablo Ribbons	5.95	Novation Cat Modem	175.00	Drive Extender Cable	12.00
Epson MX-80 ft	575.00	DC Hayes Smart Modem	259.00	Novation D Cat Modem	199.00	Head Cleaning Kit 5 1/4"	14.95
Epson MX-100	750.00	DC Hayes Micro Model II	339.00	Percom Doubler II	169.00	Disk & Other Mysteries Book	19.95
MX-80 Ribbons	12.50	OKIDATA Microline 80	359.00	Percom Data Separator	29.95	Basic & Other Mysteries	
MX-100 Ribbons	30.00	OKIDATA Microline 82A	529.00	Paper 9 1/2 x 11 (Fanfold)	29.95	Book	27.50
Epson Graphtrax	75.00	OKIDATA Microline 83A	799.00	Paper 14 1/2 x 11 (Green Bar)	34.95	NEC Ribbons (Min. 6)	5.95
C.ITOH F-10 40 cps	1,695.00	OKIDATA Tractor	75.00	Verbatim 5 1/4" Diskettes	26.90	Printer Cable	25.00
Tractor	200.00	Lexicon Modem	125.00	Maxell 5 1/4" Diskettes	39.00	LDOS Operating Sys.	129.00
				Nashua 8" Diskettes	42.95	DOSPLUS Operating Sys.	149.00

NOW OPEN — VR DATA COMPUTER CENTER 616 Baltimore Pike, Springfield, Pa. (Delaware County)

DISK III

SINGLE DRIVE **\$599**

Disk III Dual Drives	\$864.00
Disk III No Drives	435.00
TRSDOS & Manual	21.90
DOS PLUS & Manual	149.00
LDOS & Manual	129.00

2 Sided or 80 Track Drives add \$120. ea.

2 Sided & 80 Track Drives add \$240. ea.

MODEL III

COMMUNICATIONS

**VR-RS232
\$80**

Direct Replacement For
R.S. RS232, Fully Tested
& Burned-In, Easy
Installation, 120 Day
Warranty, Programmable
Pinout, Prototype Area

**D-CON
\$299**

Integral Modem, NEEDS
NO RS232 — Direct
Connect, Programmable
Dialing, AUTO ANSWER/
ORIGINATE, Easy
Installation

IF YOU DON'T SEE IT ADVERTISED
CALL US AND ASK FOR IT.

Call Toll-Free
800-345-8102

ALL VR DATA PRODUCTS CARRY A 120-DAY
WARRANTY INCLUDING PARTS & LABOR

Published prices reflect cash discount. All prices are subject
to change without notice. TRS-80 and TRSDOS are trademarks
of Tandy Corp. DISK III is a trademark of VR Data Corp.

8:30AM-7PM E.S.T. Mon.-Fri., Sat. 10AM-3PM
CABLE "VRDATA" TELEX 845-124

VRdata

777 Henderson Boulevard N-6
Folcroft, PA 19032 (215) 461-5300

MasterCard

VISA

COTTAGE SOFTWARE

PACKER: Machine language program that edits all or part of your Basic program to run faster, save memory, or ease editing. The 5 options include UNPACK—unpacks multiple statement lines into single statements maintaining logic, inserts spaces and renumbers lines. SHORT—deletes unnecessary words, spaces, and REM statements. PACK—packs lines into maximum multiple statement lines, including all branches. MOVE—moves line or blocks of lines to any new location on program. On 2 cassettes for 16K, 32K, & 48K
 For TRS-80 Mod I or III Level II or Disk Basic ... \$29.95
 SYSTEM TAPE DUPLICATOR: Copy your SYSTEM format tapes. Includes verify routines. The Model III version allows use of both 500 and 1500 baud cassettes speeds. For TRS-80 Model I or III Level II \$15.95
 CASSETTE LABEL MAKER: A mini word processor to print cassette labels on a line printer. Includes 50 peel-and-stick labels on tractor feed paper.
 For TR-80 Model I of III Level II & Printer \$17.95
 PRINT TO LPRINT TO PRINT: Edits your Basic program in seconds to change all Prints to LPrints (except Print@ or Print#) or LPrints to Prints. Save edited version.
 For TR-80 Model I or III Level II \$12.95
 FAST SORT ROUTINES: for use with Radio Shack's Accounts Receivable, Inventory Control I, and Disk Mailing List Systems for Model I Level II Sorts in SECONDS! You'll be amazed at the time they can save. Supplied on data diskette with complete instructions.
 FAST SORT for Accounts Receivable \$19.95
 FAST SORT for Inventory Control I \$19.95
 FAST SORT for Disk Mailing List (specify data diskette of cassette for 1 drive system) \$14.95
 ALL THREE ROUTINES \$44.95
 Prices subject to change without notice. Call or write for a complete catalog. Dealer inquiries invited. VISA and Mastercard accepted. Foreign order in US currency only. Kansas residents add 3% sales tax.
 On-line catalog in Wichita FORUM-80: 316-682-2113
 Or call our 24 hour phone (316) 683-4811 or write:

COTTAGE SOFTWARE 187
 614 N. HARDING
 WICHITA, KANSAS 67208

TRS-80™ is a trademark of Tandy Corporation

*"The Model 16
 should be another
 Radio Shack success."*

a user writes to disk, the 68K gives most of the problem to the Z80. In addition, the operating system contains a system module called the dispatcher, which determines the priority of program execution as characteristics of I/O boundedness change. For example, if a user program begins accessing a disk file, that user will not be serviced by the CPU for the same duration as other users not performing I/O tasks. However, once I/O is completed, normal CPU multi-tasking is restored.

In any kind of virtual system the memory demand can become too high and servicing page faults one after another can completely consume CPU operations. This phenomenon is called thrashing and is probably why Radio Shack suggests implementing the system with a minimum of 256K of memory and a hard disk. Floppy disks are extremely slow when compared to hard disks, and it is a difficult (if not impossible) task to implement a useful virtual-memory system in the floppy environment.

Other Operating Systems

CP/M, originally developed by Digital Research and subsequently adapted to many microcomputers, is currently available from at least two sources for the Model II operating mode of the Model 16. This operating system's vast software library can be used immediately. A 16-bit version of CP/M is being developed by at least one well-known company. In addition, MP/M, the multi-user version of CP/M, will undoubtedly become available sometime within the next 12 months. Although CP/M may be the oldest operating system for microcomputers, it is certainly not the only one.

Phase One Systems has offered, for some time, a multi-user system for the Model II as well as many other micro-based systems. Oasis-16 is their new multi-user system, which is compatible with their other system software. Thus, a program written in their Basic should run without modification under Oasis-16. The current multi-user Oasis should operate in the Model II mode of the Model 16, except for patches to the

disk I/O routines. However, I have not heard an official announcement nor seen a demonstration of this capability. Phase One is a dynamic and growing company that will eventually provide a good alternative operating system for Radio Shack's newest computer.

Xenix, Microsoft's version of UNIX, will eventually be adapted. (See *80 Micro*, September 1982, p. 300.)

Model II Operating Mode

About the only distinguishing characteristic of the Model 16's mimicry of the Model II is the ability to use its double-sided drives to function as a two- or four-drive Model II.

Data and programs can be transferred to the Model 16 by inserting any Model II disk and applying a series of patches contained in a DO file called Thinline. These patches compensate for the different types of disk drives used in the two systems. Occasionally, you may need to move data and programs back to a Model II. In this case, execute the complementary DO file Unthin. The system is now patched to restore Model II compatibility. It takes about two minutes to execute either DO file.

Application Software

Radio Shack has released a 16-bit version of their Cobol compiler. Since this compiler is nearly identical to the corresponding compiler released for the Model II, a large number of programs should become available relatively soon. Since the new Cobol compiler generates object code for the 68K, the additional computing power of the 16 will substantially enhance program speed, especially if the program is not I/O intensive.

Radio Shack has recompiled a number of Cobol software packages including General Ledger, Accounts Receivable, and Accounts Payable. In addition, Order Entry and Sales Analysis are available. Also, all programs advertised by Radio Shack for the Model II can be executed on the new machine.

Conclusion

The Model 16 is a powerful, competitively priced computer. It appears to have a high-quality operating system nearly ready to be released, and software support will undoubtedly be forthcoming.

The machine will satisfy the needs of many small-business users, particularly in the areas of accounting, word processing, and financial planning. The Model 16 should be another Radio Shack success. ■

CANADIANS

HACKER'S PARADISE

ADVENTURE INTERNATIONAL
 ACORN SOFTWARE
 APPARAT INC.
 BIG FIVE
 COMPUTERWARE
 EPSON PRINTERS
 INSTANT SOFTWARE
 MARK DATA
 MED SYSTEMS
 FANTASTIC SOFTWARE
 SPECTRAL
 WORD PROCESSORS
 BOOKS
 DISK DRIVES
 DISKETTES

LOWER CASE MOD — MOD I
 \$29.95 + \$2.00 S & H

AND MORE

MOD I • MOD III • COLOR

Visa & Mastercard

Phone or Write for Catalogue
 (403) 488-7109

CMD MICRO
 10447 - 124 Street
 Edmonton, Alberta
 T5N 1R7

181

POCKET COMPUTER NEWSLETTER



A FRIENDLY NEWSLETTER FOR POCKET COMPUTER USERS!

This is a timely, compact, easy reading publication that provides up to the minute information of vital interest to people who use pocket computers — and who want to know how to better capitalize on their unique capabilities. We concentrate on the Radio Shack PC-2 and Sharp Electronics PC-1500 models. But, we also provide information on the earlier Radio Shack PC-1 (Sharp PC-1211) models. And, we keep you informed about newcomers to the field. We report exclusively on pocket and hand-held computers that are capable of executing a high level language such as BASIC.

Especially for Busy People

This is a newsletter. It is not a magazine. Ten times a year we deliver a compact eight pages of highly condensed, relevant, timely information of immense value to pocket computer enthusiasts. This carefully prepared material is presented in a pleasant format that is readily assimilated by busy people. Now you can have the information you need without having to spend hours of your valuable time browsing through magazines.

Up to the Minute News

If it has to do with pocket computers, we tell you about it. New product releases, current prices, industry speculation, whatever is happening (or about to happen!).

Product and Equipment Reviews

As new models and accessories become available we publish forthright reviews as reported to us by actual users. Books, software packages and support materials also come under our careful scrutiny.

Important Operating Tips and Friendly Advice

Every computing device has its strengths and weaknesses, its ins and outs. Our publication quickly compiles critical information from users and passes this on to you. We show you how to save keystrokes and maximize performance. We often uncover hidden features and are able to tell you about capabilities not discussed in the manufacturer's handbooks (such as machine codes used in the PC-2/PC-1500!).

Practical Programs

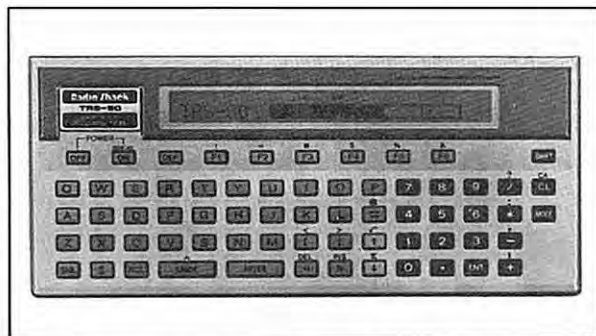
We publish all kinds of practical, useful programs that enhance the use and enjoyment of your own personal unit. In recent issues we have

presented programs that: convert numbers from one base to another, perform linear regression analysis, plot aviation courses, solve for unknowns in triangle problems, tally supermarket purchases, perform polynomial arithmetic, design low-pass filters, display a calendar for any month of any year over a 500 year period, perform linear interpolation, calculate amortization schedules, determine tab locations for columnar reports, tell you the phase of the moon on any given date over a 200 year time span, perform simple animation on the PC-2/

PC-1500, dump memory, perform linear, exponential, logarithmic and power curve fitting, renumber all or part of a BASIC program in a PC-2/PC-1500, and play a variety of entertaining games. We are always on the lookout for the highest quality programs to bring to you.

Its All Delivered with a Simple Guarantee

If, at any time, you become dissatisfied with our publication, you may simply cancel your subscription and receive a refund for unmailed issues.

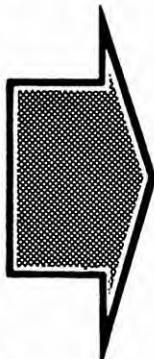


MASTER CARD and VISA credit card holders may subscribe by phoning: (203) 888-1946

FREE BONUS

Order your subscription using the attached form or by calling the number given above and we will include as an absolutely FREE BONUS, a POCKET TOOL! Send your order with proper remittance directly to:

POCKET COMPUTER NEWSLETTER
P.O. Box 232
Seymour, CT 06483



By Subscription Only: for a calendar year period (January — December). You get all issues published to date for the calendar year in which you subscribe, at the time you subscribe.

MC/VISA Phone Subscriptions: (203) 888-1946

- I am interested. Please send me more information. I have a:
 - Radio Shack PC-2
 - Sharp PC-1500
 -
- 1982/83 Subscriber (Issues 11 — 30). \$60.00 in U.S. (U.S. \$72.00 to Canada. U.S. \$90.00 elsewhere.)
- 1983 Regular Subscriber (Issues 21 — 30). \$36.00 in U.S. (U.S. \$42.00 to Canada. U.S. \$50.00 elsewhere.)

Orders must be accompanied by payment in full. We do not issue invoices for the POCKET COMPUTER NEWSLETTER. Thank you for your remittance.

Name: _____
Addr: _____
City: _____ State: _____ Zip: _____
MC/VISA #: _____ Expires: _____
Signature: _____

Choose a Quality Computer Services hard disk system for your old or new microcomputer

1. Because it is ultra-reliable and warranted to stay that way.

A hard disk drive from Quality Computer Services is compatible with just about any microcomputer, including those listed at the right. So rugged that hundreds are operating on five continents—including many remote sites where service is not available. When you buy one you get a free warranty for a full year. (It's free because we don't think you'll ever have to use it.)

Learn more about QuCeS hard disk systems—choice of 6, 12, 20 or 40 megabytes; easy hookup; expansion and backup options; new removable 5 megabyte Winchester disk; high-performance specifications; and name of nearest dealer.* Just return the coupon. Or if you prefer, call or write QuCeS.

* Dealer inquiries invited.

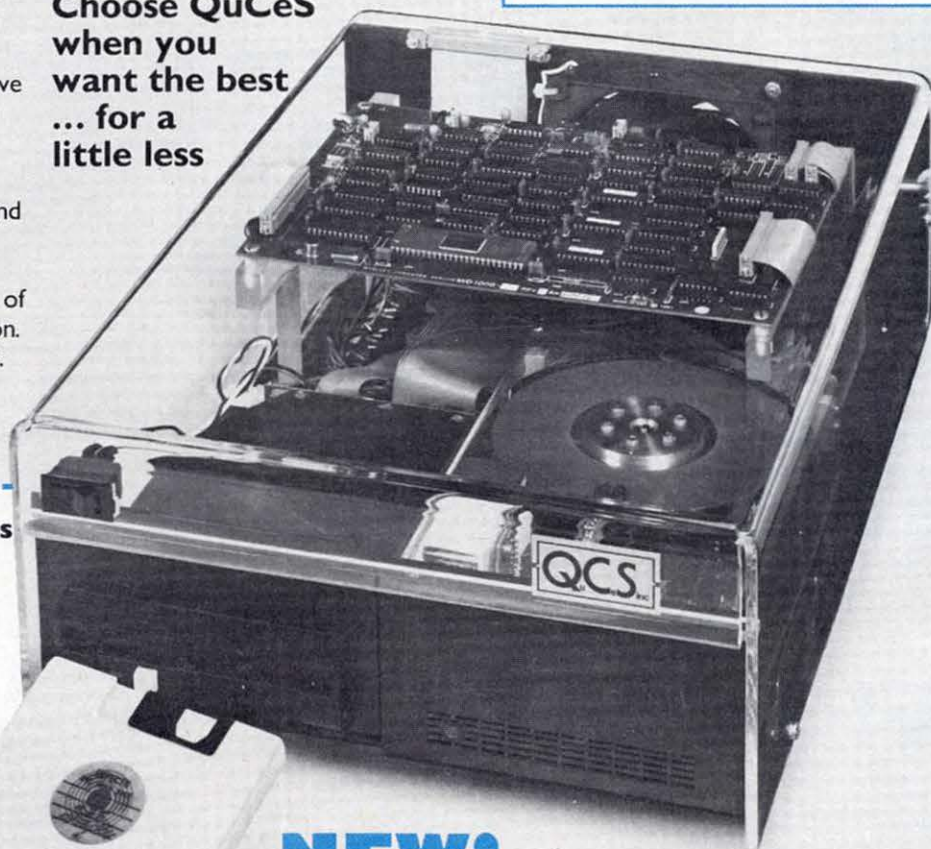
2. Because it offers up to 40 million bytes of high-speed performance.

It's nice to know that QuCeS prices are very competitive. Our price for 20 megabytes for example, including 1-year warranty, attach software and all hardware, is just \$2999.

Choose QuCeS when you want the best ... for a little less

3. Because you'll get the best ... for a little less.

QuCeS hard disk systems are compatible with Apple II®, Epson™, Heath/Zenith™, IBM®, TRS-80® I, II, III, XVI, Osborne™, many S100™ based, and most other popular microcomputers.



NEW!

Optional cartridge disk for on-line/off-line backup storage of up to 5 megabytes per cartridge.

Quality Computer Services

176 Main Street
Metuchen, New Jersey 08840

Please send me:

More information.

Name of dealer.

Call me at

() _____

Name _____

Title _____

Company _____

Address _____

QCS
u ce inc

Quality Computer Services

178 Main Street ■ Metuchen, New Jersey 08840 ■ 201/548-2135
Toll-free number: (800) 631-5944

48

Horse Race II

by Danley Christensen

With this revision of the original Horse Race math program, you can tailor the game to meet the individual needs of your students.

In the September 1981 issue of *80 Micro*, Michael J. Duffin's article entitled "Math Derby" included a program called Horse Race. Horse Race is an educational math game in which each player has a horse on the screen, and the horse moves when the player answers a math question correctly.

Horse Race is ideal for situations in which the players have relatively equal math skills. Each player selects the type of problem he will answer on each turn and, based on the type selected, a correct answer advances that player's horse a predetermined distance. A correct answer to an addition or subtraction question advances the horse one position; a correct answer to a multiplication question advances it two positions; and a

correct answer to a division question advances it four.

I revised the program so players of differing skill levels could compete against each other—a first or second grader could compete against a fourth or fifth grader. This can be done by having the teacher select the type of problem for each player before the game begins, using the following problem codes:

- A—Addition
- S—Subtraction
- AS—Addition or Subtraction
- M—Multiplication
- D—Division
- MD—Multiplication or Division

Mr. Duffin developed an ingenious way of "timing-out" a player if the player takes too long to answer a question. This involves using the INKEY\$ function to accept the keys hit, and then looking at the value of all those keys strung together. The only disadvantage is that the time limit is hard-coded into the program.

I changed this time interval variable so the teacher can further control the

competition. Students with different skill levels can compete using the same type of problem but with different time allowances. I altered the time interval by making the top end of the timer/answer acceptance loop changeable so the teacher can enter the top value for each student before the race begins.

Another change involved the problems themselves. I wanted all the numbers to be randomly chosen. Using random numbers in addition and multiplication gives simple, straightforward answers. However, using random numbers in subtraction is more difficult because a negative answer can result, and using random numbers in division is the most difficult, because an answer can contain decimals. I rewrote the program so the answers to the subtraction and division problems would always be positive, whole numbers.

To guarantee this result, the program performs the opposite operation on the random numbers and uses that answer in the problem for the player. For example, suppose the player selects division and the computer randomly selects the numbers 7 and 9. Neither 9 divided by 7 nor 7 divided by 9 result in a positive whole number. So, the program performs the opposite operation (7×9) and puts that answer into the problem shown to the student: 63 divided by 7 = ?. In subtraction, the random numbers 7 and 9 would produce the

The Key Box

**Model I or III
16K RAM, 48K RAM
Cassette or Disk Basic**

A\$(10,3)—Y or N flag indicating whether or not each fact (0-9) should be used for each student.

B\$(5)—Holds each digit of an answer.

C(3)—Number of correct answers for each player.

D—Player's answer.

DT(3)—Delay timer.

I—Loop index and variable subscript.

J—Loop index and variable subscript.

K—Loop index and variable subscript.

K\$—Last key hit by current player.

L—Loop index and variable subscript.

NS(3)—Name of each player.

NP—Number of players.

P(3)—Current print position of each horse.

Q—Variable used in intermediate calculations to alter problems so that subtraction and division answers are one digit.

R—Random number (1 or 2) used to determine which type of problem to do in Multiplication/Division and Addition/Subtraction selections.

W(3)—Number of wrong answers for each player.

W\$(3)—Which problem code was selected for each player.

X—First random math fact.

Y—Second random math fact.

YS—Counter used to ensure that at least one math fact is selected for use for each student.

Z—Answer to problem.

Table 1. List of variables I used in Horse Race II. Be sure to alter array sizes, if necessary, when customizing the program.

problem $16 - 7 = ?$.

I wanted the teacher to control which numbers are used in the problems so he or she can exercise a student in the student's weak areas (e.g., the multiplication table for a specific number, such as 3 or 6). I set up a two-dimensional array into which a Y or N is stored for each math fact for each student. As the second random number is generated, this array is checked to see if the number generated is desired.

Only the second fact is checked, because if you want the table for 2, the

problem 2×9 is valid so only one random number must qualify. If you selected the multiplication table for 2 and then checked both numbers, 2×2 is the only problem that would ever appear.

This revised game has been used successfully at the school where my wife works. ■

Danley Christensen is a data processing analyst and computer programmer. He can be reached at 17 Walnut Hills, Springfield, IL 62707.

Program Listing

```
1000 REM*****
*****
1010 REM*
*
* HORSE RACE II
1020 REM*
*
* DANLEY E. CHRISTENSEN - OCTOBER 1981
1030 REM*
*
* BASED HEAVILY ON "HORSE RACE (MATH GAME) WR
ITEN
*
1040 REM*
*
* BY MICHAEL DUFFIN, AND PUBLISHED IN 80-MICROCOMP
UTING,
*
1050 REM*
*
* SEPTEMBER 1981, PAGES 244-248.
1060 REM*****
*****
1070 CLS: DIM A$(10,3)
1080 P(1)=328 : P(2)=520 : P(3)=712
1090 FOR I = 1 TO 3
1100 W$(I) = ""
1110 C(I) = 0
1120 R(I) = 0
1130 NEXT I
1140 GOSUB 2530
1150 REM*****
*****
1160 REM*
*
* SET PLAYING FIELD
1170 REM*****
*****
1180 FOR I = 15555 TO 16195 STEP 64
1190 POKE I,191
1200 NEXT I
1210 FOR I = 832 TO 895
1220 PRINT@ I, CHR$(141);
1230 NEXT I
1240 FOR I = 192 TO 255
1250 PRINT@ I, CHR$(156);
1260 NEXT I
1270 FOR I = 15675 TO 16191 STEP 64
1280 POKE I,191
1290 NEXT I
1300 PRINT@ 896, "START"
1310 PRINT@ 951, "FINISH"
1320 FOR I = 1 TO NP
1330 GOSUB 2070
1340 NEXT I
1350 PRINT@ 0, "PRESS ANY KEY WHEN YOU ARE READY FOR
THE FIRST P
ROBLEM."
1360 K$ = INKEY$: IF K$ = "" THEN GOTO 1360
1370 REM*****
*****
1380 REM*
*
* EACH PLAYER'S TURN LOOP
1390 REM*****
*****
1400 FOR I = 1 TO NP
1410 X=RND(10)
1420 IF X = 10 THEN X = 0
1430 Y=RND(10)
1440 IF Y = 10 THEN Y = 0
1450 IF A$(Y,I) = "N" THEN GOTO 1430
1460 PRINT@ 0, "
"
1470 FOR J = 1 TO 6
```

Listing continues

RECORDKEEPING WITH MODEL III

- Database program
- Uses cassette only
- No disks
- Machine language
- Fast
- Flexible format
- Menu-driven
- Home or small business
- \$49.95

LEWSOFT ✓400
P.O. Box 333
Los Alamos, NM 87544

```

1480     B$(J) = ""
1490     NEXT J
1500     IF W$(I) = "S" THEN GOTO 1610
1510     IF W$(I) = "M" THEN GOTO 1730
1526     IF W$(I) = "D" THEN GOTO 1650
1530     IF W$(I) = "A" THEN GOTO 1760
1540     IF W$(I) = "MD" THEN GOTO 1580
1550     R = RND(2)
1560     IF R = 1 THEN GOTO 1610
1570     GOTO 1760
1580     R = RND(2)
1590     IF R = 1 THEN GOTO 1730
1600     GOTO 1650
1610     Q = X + Y
1620     PRINT@ 0, Q "-" Y "="
1630     Z = Q - Y
1640     GOTO 1780
1650     X = RND(9)
1660     Y = RND(9)
1670     IF A$(Y,I) = "N" THEN GOTO 1660
1680     Q = X * Y
1690     Z = Q / X
1700     PRINT@ 0, Q "/" X "="
1710     Z = Q / X
1720     GOTO 1780
1730     PRINT@ 0, X * X * Y "="
1740     Z = X * Y
1750     GOTO 1780
1760     PRINT@ 0, X * Y "="
1770     Z=X+Y
1780     PRINT@ 64, "WHAT IS YOUR ANSWER, ";N$(I);"? "
1790     A$ = INKEY$
1800     J = 1
1810     FOR K = 1 TO DT(I)
1820         B$(J) = INKEY$
1830         IF B$(J) = "" THEN GOTO 1850
1840         J=J+1
1850         FOR L = 1 TO 10
1860             NEXT L
1870         NEXT K
1880         D = VAL(B$(1)+B$(2)+B$(3)+B$(4)+B$(5))
1890         IF Z=D THEN GOTO 1960
1900         W(I) = W(I) + 1
1910         PRINT@ 0, D" IS THE WRONG ANSWER, ";N$(V);"."
1920         PRINT@ 64, "THE CORRECT ANSWER IS ";Z;"."
1930         FOR J = 1 TO 550
1940             NEXT J
1950         GOTO 2020
1960         PRINT@ 0, Z" IS THE CORRECT ANSWER - THAT IS VERY GOOD,
";N$(I);"."
1970         C(I) = C(I) + 1
1980         PRINT
1990         FOR J = 1 TO 550: NEXT J
2000         GOSUB 2070
2010         GOSUB 2070
2020     NEXT I
2030     GOTO 1400
2040     REM*****
*****
2050     REM*                               MOVE HORSE
*
2060     REM*****
*****
2070     PRINT@ P(I),CHR$(32);
2080     PRINT@ P(I)+1,CHR$(32);
2090     PRINT@ P(I)+2,CHR$(32);
2100     PRINT@ P(I)+60,CHR$(32);
2110     PRINT@ P(I)+61,CHR$(32);
2120     PRINT@ P(I)+62,CHR$(32);
2130     PRINT@ P(I)+63,CHR$(32);
2140     PRINT@ P(I)+64,CHR$(32);
2150     P(I)=P(I)+1
2160     PRINT@ P(I),CHR$(170);
2170     PRINT@ P(I)+1,CHR$(140);
2180     PRINT@ P(I)+2,CHR$(132);
2190     PRINT@ P(I)+60,CHR$(160);
2200     PRINT@ P(I)+61,CHR$(134);
2210     PRINT@ P(I)+62,CHR$(151);
2220     PRINT@ P(I)+63,CHR$(131);
2230     PRINT@ P(I)+64,CHR$(171);
2240     IF P(1)>376 OR P(2)>568 OR P(3)>760 THEN GOTO 2290
2250     RETURN
2260     REM*****
*****
2270     REM*                               END OF GAME
*

```

Listing continues

REMSOFT, INC.

Let Your TRS-80® Teach You ASSEMBLY LANGUAGE

Tired of buying book after book on assembly language programming and still not knowing your POP from your PUSH?

REMSOFT proudly announces a more efficient way, using your own TRS-80: to learn the fundamentals of assembly language programming ... at YOUR pace and YOUR convenience.

Our unique package, "INTRODUCTION TO TRS-80 ASSEMBLY PROGRAMMING", will provide you with the following:

- Ten 45-minute lessons on audio cassettes
- A driver program to make your TRS-80 video monitor serve as a blackboard for the instructor.
- A display program for each lesson to provide illustration and reinforcement for what you are hearing.
- Step-by-step dissection of complete and useful routines to test memory and to gain direct control over the keyboard, video monitor, and printer.
- How to access and use powerful routines in your Level II ROM.

for Model 1

REMASSEM-1 (tape) only \$69.95

REMASSEM-1 (disk) only \$74.95

NOW AVAILABLE FOR MODEL 3

REMASSEM-3 (tape) \$74.95

REMASSEM-3 (disk) \$79.95

LEARN TRS-80® ASSEMBLY LANGUAGE DISK I/O

Your disk system and you can really step out with REMSOFT'S Educational Module: REMDISK-1, a "short course" revealing the details of DISK I/O PROGRAMMING using assembly language. Intended for the student with experience in assembly language.

- COURSE INCLUDES:
- Two 45-minute lessons on audio cassette
 - A driver program to make your TRS-80 video monitor serve as a blackboard for the instructor.
 - A display program for each lesson to provide illustration and reinforcement for what you are hearing.
 - A booklet of comprehensive, fully commented program listings illustrating sequential file I/O random-access file I/O, and track and sector I/O
 - A diskette with machine-readable source codes for all programs discussed, in both Radio Shack EDTASM and Macro formats.
 - Routines to convert from one assembler format to the other.

Presently available for model 1 only
REMDISK-1 only \$29.95

Dealer inquiries invited

These courses were developed and recorded by Joseph E. Willis and are based on the successful series of courses he has taught at Meta Technologies Corporation, the Radio Shack Computer Center, and other locations in Northern Ohio. The minimum system required is a Level II 16K RAM.



REMSOFT, INC.
571 E. 185 St.
Euclid, Ohio 44119
(216) 531-1338



SHIPPING CHARGES:
\$2.50 WITHIN UNITED STATES
\$5.00 CANADA AND MEXICO
OTHER FOREIGN ORDERS ADD 20%
OHIO RESIDENTS ADD 6 1/2% SALES TAX

✓129

TRS-80® IS A TRADEMARK OF TANDY CORP.

Coordinated Business Software

D.B. Software Co. announces a new line of coordinated business software designed for the Model III TRS-80. The BASE system consists of a **General Ledger System with Accounts Receivable and Accounts Payable.** Other modules can be purchased and added as needed.

BASE System (GL-AR-AP) \$200.00

Coordinated Modules:

Payroll	\$ 75.00
Order Entry	\$125.00
Inventory	\$129.95
Purchase Order Entry	\$125.00
Inventory (special for Auto Parts Suppliers)	\$129.95

Also available:

Job Costing with GL and AP (Payroll optional)	\$500.00
Mailing Lister	\$100.00

Coming soon:

Apartment Management System,
Fixed Assets System, Manufacturing
Inventory Management System

Send S.A.S.E. for more information

D.B. Software Co.

11840 NE Brazeo, Portland, OR 97220

Phone (503) 255-7735

DEALER INQUIRIES INVITED

TRS-80 is a trademark of Tandy Corp.

✓410

Sugar
Software

Silly Syntax

A sensational and educational version of a popular party game for the TRS-80* Color Computer. For 1 to ten players. Silly Syntax requires 16K Extended Basic (32K for disk version). For \$19.95, you get a user guide and a tape containing the Silly Syntax game and 2 stories. You can create your own stories or order additional story tapes. Disk is \$24.95 for Silly Syntax and 2 stories or \$49.95 for Silly Syntax and all 62 stories.

Auto Run

Auto Run is a utility program for the TRS-80* Extended Basic Color Computer. Auto Run creates a tape which consists of a machine language loader followed by your Basic or machine language program. With this tape, a simple CLOADM command will load and start the loader and then load and start your program. With the graphics editor, you may design a title screen which will display as your program loads. Basic programs can be set to load anywhere in memory above \$600 (PCLEAR0). Auto Run is \$14.95 and includes complete documentation and an assembly source listing.

Tape Information Management System

A user-oriented, easy to use personal database management system featuring:

- *variable record and field lengths
- *phrase substitution editor
- *up to 8 user-definable fields
- *ML sort, search and delete functions
- *range and item search modes
- *user-definable printer format, for any printer.

For \$24.95 you get the database management system, our full documentation and our 1981 Bibliography of articles relating to the Color Computer. Requires 16K Extended Basic. 32K recommended.

Add \$1.00 per tape or disk for postage and handling. Ohioans add 5.5% sales tax. COD orders and dealer inquiries invited.

Sugar Software, Dept. 2
2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565 ✓144

*TRS-80 is a trademark of Tandy Corp.

Listing continued

```

2280 REM*****
*****
2290 FOR J = 1 TO 200
2300 NEXT J
2310 CLS
2320 PRINT@ 25,N$(I) " WINS "
2330 PRINT : PRINT : PRINT "NAME","RIGHT","WRONG","% RIGHT":PRIN
T
2340 FOR I = 1 TO B
2350   Q = C(I) * 100 / (C(I) + R(I))
2360   PRINT N$(I),C(I),R(I),Q
2370   PRINT
2380 NEXT I
2390 END
2400 REM*****
*****
2410 REM*                               ENTERING GAME PARAMETERS
*
2420 REM*****
*****
2430 PRINT: PRINT "BESIDE EACH NUMBER BELOW, ANSWER 'Y' OR 'N' F
OR WHETHER OR NOT"
2440 PRINT "YOU WANT THAT FACT USED."
2450 FOR Y = 0 TO 9
2460   PRINT Y;: INPUT A$(Y)
2470   IF A$(Y) = "Y" THEN 2500
2480   IF A$(Y) = "N" THEN 2510
2490   PRINT "PLEASE TRY THAT ONE AGAIN.": GOTO 2460
2500   YS = 1
2510 NEXT Y
2520 IF YS = 0 THEN PRINT: PRINT "ALL YOUR SELECTIONS FOR THIS S
TUDENT CANNOT BE 'N'. TRY AGAIN.": GOTO 2430
2530 PRINT
2540 INPUT "HOW MANY PEOPLE ARE PLAYING (1 TO 3)";NP
2550 IF NP<1 OR NP>3 THEN GOTO 2530
2560 FOR I = 1 TO NP
2570   PRINT
2580   PRINT "WHAT IS THE NAME OF PLAYER";I;
2590   INPUT N$(I)
2600   PRINT
2610   PRINT "HOW MANY SECONDS SHOULD THE COMPUTER WAIT FOR ";N
$(I);"S"
2620   INPUT "ANSWERS";DT(I)
2630   DT(I)=DT(I)*13
2640   PRINT
2650   PRINT "WHICH OF THE SIX PROBLEM CODES FOR ";N$(I);: INPU
T W$(I)
2660   IF W$(I) = "A" OR W$(I) = "S" OR W$(I) = "D" OR W$(I) =
"M" OR W$(I) = "MD" OR W$(I) = "AS" THEN GOTO 2710
2670   PRINT: PRINT "USE ONE OF THE FOLLOWING PROBLEM CODES:"
2680   PRINT " 'A' - aDD": PRINT " 'S' - SUBTRACT": PRINT
" 'AS' - ADD AND SUBTRACT"
2690   PRINT " 'M' - MULTIPLY": PRINT " 'D' - DIVIDE": PR
INT " 'MD' - MULTIPLY AND DIVIDE"
2700   GOTO 2650
2710   PRINT : PRINT "BESIDE EACH NUMBER BELOW, ANSWER 'Y' OR '
N' FOR WHETHER OR NOT"
2720   PRINT "YOU WANT THAT FACT USED FOR ";N$(I);"."
2730   YS = 0
2740   FOR Y = 0 TO 9
2750     PRINT Y;: INPUT A$(Y,I)
2760     IF A$(Y,I) = "Y" THEN 2790
2770     IF A$(Y,I) = "N" THEN 2800
2780     PRINT "PLEASE TRY THAT ONE AGAIN.": GOTO 2750
2790     YS = 1
2800     NEXT Y
2810     IF YS = 0 THEN PRINT:PRINT "ALL YOUR SELECTIONS FOR THIS
STUDENT CANNOT BE 'N'. TRY AGAIN.": GOTO 2710
2820     NEXT I
2830     CLS
2840     PRINT: PRINT "W E L C O M E   T O   T R S - 8 0   H O R S E
R A C I N G"
2850     PRINT: PRINT: PRINT "THE RIDERS IN TODAY'S RACE WILL
BE:"
2860     FOR I = 1 TO NP
2870       PRINT TAB(6) N$(I)
2880     NEXT I
2890     PRINT: PRINT "GOOD LUCK TO ALL RIDERS!!"
2900     PRINT
2910     PRINT: PRINT: PRINT TAB(10) "PRESS ANY KEY WHEN READY TO ST
ART THE RACE"
2920     K$ = INKEY$
2930     IF K$ = "" THEN 2920
2940     CLS
2950     RETURN

```


≡ BASIC AID HELP FOR THE BASIC PROGRAMMER

At last, the development tools you need! All available instantly at power-up.

MERGE COMMAND: Insert programs stored on cassette into your Basic program. You can even assign new line numbers to the file you read in. Create your own tape library!

MOVE COMMAND: Lets you renumber any part of your Basic program. GOTO's, GOSUB's, etc. automatically changed.

AUTOMATIC LINE NUMBERING: You'll love this. Never type in another line number.

PLUS 45 common Basic commands available as single key Control characters. Or change ANY OR ALL keys to your own specifications! Comes with convenient, easy to remove, plastic keyboard overlay. All of this in a convenient ROM cartridge that uses almost none of your valuable memory. CARTRIDGE \$34.95

COLORCOM/E SMART TERMINAL PROGRAM

We didn't wait for the competition to catch up with us! We've added even more features to COLORCOM/E, our superb Smart Terminal program.

- Complete upload & download support
- On line cassette reads & writes
- Automatic capture of files
- Pre-enter data before calling
- Send all 127 ASCII characters
- Word mode eliminates split words
- Off line AND on line scrolling
- Selectable RS232 parameters

We've got the best cassette and upload/download support available. And you can conveniently print any portion of the received buffer you want. NOW ON DISK! Reads and writes files from disk. Same great features plus more. DISK OR CARTRIDGE \$49.95

EDITOR ASSEMBLER DEBUGGER \$695

CCEAD: This 8K Basic Program supports cassette files, has full cursor control, line insertion/deletion, and much more. Two pass assembler supports full 6809 instruction set & addressing modes, lists to screen or printer. Debugger allows memory examine / modify, program execution. If not delighted return within 2 weeks for a full refund. You get fully commented Basic source & complete instructions. Requires Ext. Basic & 16K CASSETTE \$6.95

STRIPPER: Three valuable commands: (1) Delete Remarks, (2) Pack Lines, (3) Delete Spaces. Fully automatic, is not fooled by GOTO's, GOSUB's, etc. Your programs will run faster and take up much less memory. CASSETTE \$7.95

CUSTOM CARTRIDGES: Put YOUR Basic program into a convenient ROM Cartridge. Runs instantly at power-up. Use for Ad displays, schools, etc. Call or write for info.

Send check, money order, or Visa/MC Number. Include \$1 for postage and handling. Visa/MC. Phone for fast service.



P.O. Box 10234
Austin, Texas 78766
(512) 837-4665

✓154

CAT CALLS



Make them or take them with LYNX – the total telecommunications system for your TRS-80 Model I or III. Access time-sharing systems. Free “bulletin boards.” Electronic mail and news. Other micros. Gamers. Hardware, software and documentation – all for one price. Get your paws on it!



ESI EMTROL SYSTEMS, INC.

123 LOCUST STREET • LANCASTER, PA 17602
Phone 717/291-1116

- Consult your local microcomputer retailer, or call one of these LYNX handlers today.
- | | | | | |
|--|---|--|---|---|
| THE BOTTOM LINE
Milford, NH
800/343-0726 | THE PROGRAM STORE
Washington, DC
800/424-2738 | SOFT SECTOR MARKETING
Garden City, MI
800/521-6504 | COMPUTER PLUS
Littleton, MA
800/343-8124 | PROGRAMS LIMITED
Jericho, NY
800/645-6038 |
| BREEZE/QSD
Dallas, TX
214/484-2976 | SIMUTEK
Tucson, AZ
800/528-1149 | B.T. ENTERPRISES
Centereach, NY
800/645-1165 | STEVENS COMPUTERS
Phoenixville, PA
800/345-6279 | MICRO-MART
Montreal, Quebec
514/731-9486 |

TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. FCC Registration Number: A909KE-68171-DM-N.

Micro-Grip™

FRICTION FEED FOR YOUR EPSON

MX-70* or MX-80*

*MX-70 and MX-80 are Trademarks of EPSON, Inc.

- Converts your printer for friction feed of SINGLE SHEETS or ROLL PAPER.
- SIMPLE Installation (all you need is a screwdriver, no soldering).
- Tractor feed remains undisturbed.
- Only **\$39⁹⁵** (add \$1.50 for postage)



SATISFACTION GUARANTEED OR YOUR MONEY BACK




✓161

MICRO-GRIP, Ltd.

P. O. Box 4278

Norton AFB, CA 92409

(714) 864-6643

VISA & Master Card Accepted

DEALER
INQUIRIES
WELCOME

contact

POWERSOFT

11500 Stemmons Expressway
Suite 125
Dallas, Texas
75229

CALL:

214-484-2976
Texas residents

**CALL
TOLL
FREE**

800-527-7432

"I BOUGHT IT"

"My biggest loss
of programming
time using
Snappware's
COLLEGE EDUCATED
GARBAGE COLLECTOR
is spent inserting
my diskette."

SCOTT ADAMS - PRES. OF ADVENTURE INTL.



The Snappware College Educated Garbage Collector (SNAPP-VI) is an intelligent processing function which greatly improves performance of typical BASIC applications. And here's why.

Microsoft uses a 'variable length string' in the BASIC interpreter. Each time the string is assigned a new value, it is relocated in a string pool. Periodically the string pool must be reorganized and condensed into a single contiguous area. Performing this string space reclamation is time consuming and inefficient because this approach evaluates and collects each string individually. The time required is roughly proportional to the square of the number of active strings in the resident program. During reclamation the system seems to 'lock-up' and does not respond to the operator until the process is completed.

This time consuming approach requires a better solution. Snappware has developed a solution which takes advantage of the auxiliary memory available. SNAPP-VI requires only four bytes per active string as a work area. When free storage space is available, our system temporarily borrows, uses and returns the space to the free storage pool when completed. If storage is not available, our system will temporarily transfer out to disk enough of the BASIC program to make room for our work area and return the 'paged out' information to its correct location when completed.

Benchmarked times show, in some situations, SNAPP-VI performs one hundred times as fast as the Microsoft approach.

If you consider your programming time to be worth money, call us and let us show you how to get more of it.

MODEL II \$100.00
MODEL III \$ 75.00

*TRSDOS™ Tandy Corporation



**Time saving power
at your fingertips.**

CALL TOLL FREE:

1-800-543-4628

OHIO RESIDENTS CALL
COLLECT: (513) 891-4496

3719 Mantell
Cinti., Ohio 45236



Call or Write Your Nearest Snappware Distributor

MICRO-80
284 Goodwood Road
Clarence Park
Adelaide South Australia
Ph-(08) 2117224

DIGI-TEK SYSTEMS
65 Thornridge Circle
Kitchener Ontario N2M-4V9
Ph-(519) 742-8205

STRAWFLOWER ELECTRONICS
50 North Cabrillo
Half Moon Bay
California 94019
Ph-(415) 726-9128

COMPUTER MAGIC
115 Wiltshire Avenue
Louisville, Kentucky 40207
Ph-(502) 893-9334

E-C DATA
Tornevangsvej 88
P.O.B. 116
DK-3460
Birkerød, Denmark
Ph +45/2/81/ 81 91

SYSTEM SOFT
49, Dunvegan Drive
Rise Park
Nottingham, England
NG5 5Dx
Ph-(0602) 275559

CUSTOM COMPUTING
104 Bushwick Rd.
Poughkeepsie, NY 12603
Ph-(914)-471-9318

AEROCOMP
Redbird Airport
Hanger 8
Dallas, Texas 75232
Ph-(214) 339-5104

NOTICE

Snappware Goes On Trial! You Be The Judge!

Snappware knows your programming time is valuable. That's why we are offering a trial package that will cut your programming time up to 75%!

This unprecedented offer allows you to judge for yourself the value of our software using *your* hardware at *your* convenience. Our five best selling products: EXTENDED BASIC, EXTENDED BUILT IN FUNCTIONS, COLLEGE EDUCATED GARBAGE COLLECTOR, AUTOMAP and AUTOFILE, are all available to you on a trial basis for only \$50.00 for the Model II and \$35.00 for the Model III. We're convinced that after you see how well our software helps you perform programming tasks, you will purchase them like thousands of others have.

Our trial package consists of a master diskette which may be used to create one working copy. Your purchase price for the trial package will be credited toward the purchase of any software Snappware sells.

If for any reason you are not satisfied, just return the trial diskette and working copy and we will refund your money, no questions asked. With an unconditional guarantee like this, you can't lose.

Call our toll free number 800-543-4628 to put us on trial. We're sure your verdict will be: Snappware saves you time and money.

MODEL II Trial Package\$50.00
MODEL III Trial Package\$35.00

SNAPPWARE
SNAPPWARE
SNAPPWARE
SNAPPWARE
SNAPPWARE
SNAPPWARE

**Time saving power
at your fingertips.**

CALL TOLL FREE:

1-800-543-4628

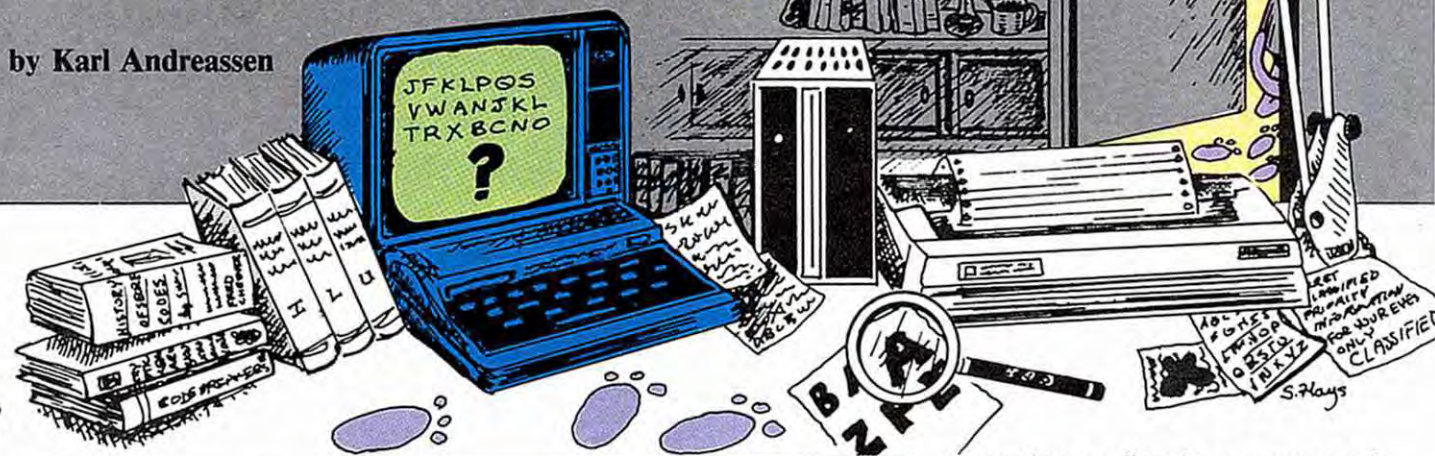
OHIO RESIDENTS CALL
COLLECT: (513) 891-4496

3719 Mantell
Cinti., Ohio 45236



The Art of Encoding and Decoding

by Karl Andreassen



Use your computer to translate your messages into an indecipherable mess; then, with this program, you can translate them back again.

Charles Babbage, the father of the modern computer, was an extraordinary cryptologist.

Cryptanalysis was to him an extension of his interest in statistics and probability; he was the first to apply algebra to the task of deciphering encrypted messages. While all cryptologists of his day considered polyalphabetic ciphers (those using multiple keys) impossible to break, he cracked them and made it appear easy.

Using the computer to encipher and decipher plain language (plaintext) is a natural. Numerous machines have been designed to do this work over the

years, most of them mechanical and electromechanical. There is considerable repetitive, trial-and-error work involved in creating a cipher and returning the cipher to readable form, so this is an ideal application for the computer. And when the truly demanding work of cryptology is involved, when the analyst attempts to discover the key to an encrypted message, the computer can relieve the tedium of searching,

comparing, reading the percentages of letter and multi-letter repetitions, and apply bits and pieces of key after key to the unknown cipher.

There is more to deciphering a cryptic message than turning a machine loose on the ciphertext. There are a number of approaches that sometimes pay off in short order, but more often it takes hours of challenging study and testing of possibilities before the slightest intimation of pay dirt.

The hours spent testing ciphers against possible keys can be reduced to minutes, or even to seconds, by a simple computer program.

The simplest cipher is direct substitution of letters. If you lay out a line of alphabet and put below it another line

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	—Alphabet
B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	—Cipher key

Table 1

The Key Box

Model II or 16
16K RAM
Disk Basic
TRSDOS
Printer optional

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 2

Program Listing 1

```

10 ' This program demonstrates that the
    common trigraph "the"
20 ' requires something over 17,000
    "throws" to be selected at random.
30 CLEAR 1000
40 RANDOM
50 FOR X=1 TO 20
60 FOR Y=1 TO 3
70 A$= CHR$(RND(26)+64)
80 B$=B$+A$
90 NEXT Y
100 IF B$="THE" THEN 170
110 PRINT B$" ";
120 B$=""
130 A=A+1
140 NEXT X
    
```

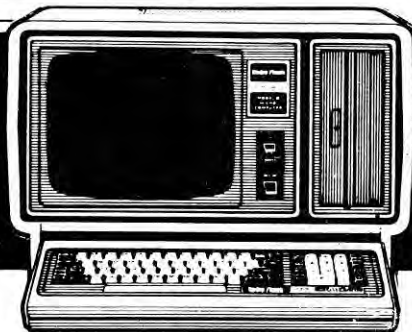
Listing 1 continues

of the same alphabet, you get a cipher key by sliding the lower line one character to the left (or right).

The key to the cipher in Table 1 is wraparound, where the end of a line continues without punctuation onto the next line.

The alphabet slides one letter to the left, and the letter hanging over the edge moves to the other end. If you lay out two alphabets in series, wrap-around takes place unobtrusively (see Table 2).

Now the lower alphabet can slide left quite easily, one letter at a time. The ciphertext is created by substituting, letter for letter, the plaintext in the upper row for the letters in the second row. So, to encode the word computer, C becomes D, O becomes P, M becomes N, and so on. The ciphertext becomes "DPNQVUFS" and is no longer pronounceable.



TRS-80 MODEL II | **TRS-80 MODEL 16**
 64-K \$3000 | 128-K \$4825
 26-4002 | 26-6002

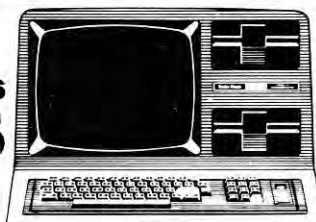
8.4 MEGABYTE HARD DISKS (PRIMARY UNIT) \$400.

WE ALSO CARRY EPSON AND OKIDATA PRINTERS, XEROX 820 AND ALTOS COMPUTERS. NO OUT-OF-STATE TAXES.

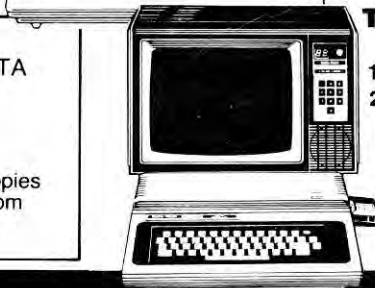
Sold with the manufacturer's limited warranty. Copies of such warranty may be obtained for review from Perry Oil and Gas Co.



DISCOUNT



TRS-80 MODEL III
 48-K \$1950 | 16-K \$819
 26-1066 | 26-1062
 WITH 2 DISK RS-232 | TAPE VERSION
 (ALL RADIO SHACK EQUIPMENT)



TRS-80 COLOR | 16-K \$309 | 32-K \$525
 26-3002 | 26-3004 | 26-3003

COLOR DISK DRIVES
 0- \$475 | 1-2-3- \$315

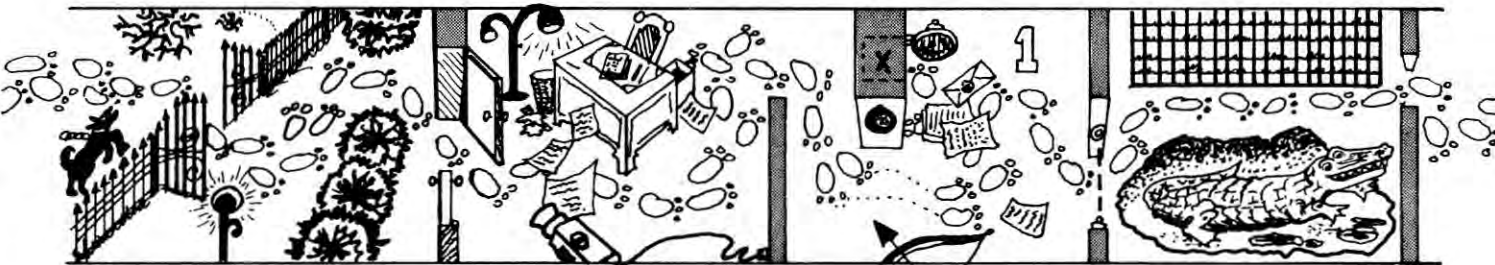
— T.M. TANDY CORP.

WE ACCEPT CERTIFIED CHECKS, CASHIERS CHECKS AND MONEY ORDERS.

PERRY OIL & GAS INCORPORATED

Dept. No. A-1 137 NORTH MAIN ST., PERRY, MICHIGAN 48872
 PHONE (517) 625-4161, MICH.

FOR OUR PRICES, PLEASE CALL TOLL FREE **1-800-248-3823**



Listing 1 continued

```

150 PRINT
160 GOTO 50
170 PRINT :PRINT :PRINT "AT THE "A"th
    THROW, THE COMMON"
180 PRINT "PLAIN LANGUAGE WORD "B$"
    WAS CAST."
190 END
  
```

```

A-Z 1 / ABCDEFGHIJKLMNOPQRSTUVWXYZ
THIS IS REPRESENTATIVE PRINTOUT AS IT APPEARS IN HARD COPY AS YOU CAN SEE
THERE ARE NEITHER SPACES NOR PUNCTUATION THE STRAIGHT ALPHABET WILL PRODUCE
THIS COPY OF PLAIN LANGUAGE TYPE WHEN ENTERED UNDER MENU OPTION
AS A MEANS OF TESTING THE PROGRAM ACTION
  
```

Fig. 1. Option B Printout

Program Listing 2

```

10 CLS : CLEAR 5000
20 DIM A$(255), B$(26)
30 PRINT :PRINT :PRINT :PRINT :PRINTTAB(20) "CRYPTANALYST'S AIDE No. ONE
40 PRINTTAB(24) "by Karl Andreassen
50 PRINTTAB(28) "July 1982
60 FOR X=1 TO 1000 :NEXT X :X=0
70 PRINT :PRINTTAB(5) "Crypto Aide No.1 affords three optional functions:"
80 PRINT :PRINTTAB(30) "< A >"
90 PRINTTAB(5) "The program generates a standard alphabet against which the
100 PRINTTAB(5) "cipher is compared 26 times, each comparison being slid one
110 PRINTTAB(5) "letter along the alphabet. The alphabet is then reversed
120 PRINTTAB(5) "and comparison made at each of 26 positions. " :PRINT
130 PRINT :PRINTTAB(30) "< B >"
140 PRINTTAB(5) "The analyst may enter a unique alphabet from the keyboard.
150 PRINTTAB(5) "It will be tested against the cipher input at 26 succeeding
160 PRINTTAB(5) "positions, reversed and again compared at 26 positions."
170 PRINT :PRINT :PRINTTAB(30) "< C >"
180 PRINTTAB(5) "The analyst may enter a keyword. The program will construct
190 PRINTTAB(5) "the unduped balance of the alphabet, for 26 comparisons in
200 PRINTTAB(5) "forward and 26 in reverse order." :PRINT
210 PRINTTAB(10) "SELECT < A >," SPACE$(10) "NOTE: Program will require up to 60
220 PRINTTAB(10) "..... < B >," SPACE$(10) "seconds preparation time for each
230 PRINTTAB(10) "..... < C >," SPACE$(10) "trial, dependent upon input length.
240 PRINTTAB(10) STRING$(7,46); :INPUT A0$
250 IF A0$="A" OR A0$="a" THEN 280
260 IF A0$="B" OR A0$="b" THEN 510
270 IF A0$="C" OR A0$="c" THEN 580
280 CLS :PRINTTAB(10) "ENTER THE CIPHER UNDER STUDY EXACTLY AS RECEIVED."
290 PRINTTAB(10) "SPACE BAR OK, BUT NO PUNCTUATION PERMITTED." :PRINT
300 PRINT :PRINT "IF ENTRY COMPLETE BEFORE AUTO CLOSE, TOUCH ASTERISK."
310 PRINT :PRINT
320 X=X+1 :I=X
330 IF X>255 THEN 400
340 Z$=INKEY$ :IF Z$="" THEN 340
350 IF ASC(Z$)=32 OR ASC(Z$)=13 THEN PRINT " "; :GOTO 340
360 IF Z$="*" THEN 400
370 A$(X)=Z$
380 PRINT A$(X);
390 GOTO 320
400 CLS :PRINT "TRANSLATION PROCEEDING NORMALLY."
410 FOR X=1 TO 26
420 A$=A$+CHR$(X+64)
430 NEXT X
440 IF A0$="C" THEN 810
450 FOR Y=1 TO 2
460 FOR X=1 TO 26
470 B$=B$+CHR$(X+64)
480 NEXT X
490 NEXT Y
  
```

Listing 2 continues

A line of scrambled text is not easy to key into a typewriter or a computer. Experience has revealed that the keyboard operator handles scrambled text best in five-letter code groups. So virtually all ciphertext is sent and received in five-letter code groups, to obscure the word divisions, and to make the ciphertext easier to work with.

Most 80 Micro readers can look at the two lines in Table 2 and the grey matter starts churning up a suitable Basic subroutine to produce the two lines. Then, you start wondering how to get the computer to substitute a keyed-in letter for one of the cipherkey letters. When you succeed with this, you slide the cipherkey one space after another to the left until all letters have been used, making a total of 25 different cipherkeys (besides the plaintext alphabet that produces a one-to-one key of little value).

“Virtually all ciphertext is sent and received in five-letter code groups.”

At this point you can add 26 more cipherkeys by inverting either the plaintext alphabet or the cipherkey alphabet (but not both). You now have a program that will test ciphertext fragments against 51 different substitution keys. With pencil and paper it would take hours; a TRS-80 can do it in minutes.

Program Listing 1 produces a series of three consecutive letters, each randomly produced from the 26-letter alphabet. I've incorporated a word trap that stops the program when "the" is produced by chance, and screens the total number of three-letter groups formed to that point. Pure chance dictates that only once in $26 \times 26 \times 26 = 17,576$ tries will any given three-letter word appear. The selected word could come up the first try, or the program

If You Do A Lot Of Editing Of Your BASIC Programs, Then This Is The Editor For You!!!

The Full Screen Text Editor for BASIC, we were the first to give the TRS-80 this indispensable ability. What ability? The ability to edit your BASIC program with the ease of word processing. It is a type of word processor specifically designed to handle BASIC programs instead of letters and documents.

■ The capability to change, insert and delete a character or characters:

Simply position the cursor over the character that you wish to change and type in the new one. Another handy feature is Insert Mode, this is used to add text in the middle of a program line.

■ Extend a line or insert new lines:

Extending a line is as simple as two keystrokes, instantly the cursor jumps to the end of the program line and the editor is placed in the insert mode.

■ Delete, copy or move statements:

All you have to do is mark the line or block of lines and then tell the editor where to move or copy them.

■ Global Search and/or change any specified string:

Have you ever needed to change a lot of PRINT statements to LPRINTs?

■ Macro key facility:

Macro keys can cut your programming time in half. You can define each of the 26 letter keys (A-Z) to represent BASIC keywords, or any letter or number combination up to 6 characters per key.

■ Renumber commands:

Whats so special about this renumber facility? Not only can it renumber selected portions of your program, it also checks all GOTO, GOSUB, THEN and ELSE statements and updates them as needed!

You may have seen other Editor programs advertized that give you one, maybe two of these features. You may have also seen some of these features sold as separate utility programs.

Only CAU offers a complete editing system, not just a word processor patched up to handle line numbers.

You can order the BASIC Editor directly from Computer Applications Unlimited or ask your local computer store.

Cat# 1210-20 for **only \$29.95**
TRS-80 Mod 1 & 3

The Editor is supplied on tape with complete instructions to move it to disk. If you wish us to send the editor on disk please add \$5.00 and ask for a DISK DUMP.

Add \$2.00 for shipping in the U.S. and Canada, \$10.00 outside USA

N.Y. State Residents add applicable Sales Tax.
Dealer Inquiries Invited.

Computer Applications Unlimited
P.O. Box 214, Dept FSBE, Rye, N.Y. 10580
(800) 354-5400 (toll free, orders only)
(914) 937-6286 (questions &
NY state residents)



 **COMPUTER APPLICATIONS UNLIMITED**
a div. of CAU, Inc. TM

120

TRS-80 is a TM of Tandy Corp.



Listing 2 continued

```

500 IF A0$="A" OR A0$="B" THEN 810
510 CLS :PRINT "ENTER TEST CIPHER ALPHABET, 26 CAPITAL LETTERS,
520 PRINT "NO SPACES, NUMBERS, OR PUNCTUATION."
530 PRINT STRING$(25,46);"! "
540 LINE INPUT B$
550 B$=B$+B$
560 PRINT B$ :FOR X=1 TO 1000 :NEXT X :X=0
570 GOTO 280
580 CLS :PRINT "ENTER KEYWORD, UPPER CASE ONLY. DO NOT USE A LETTER
590 PRINT "TWICE, AND DO NOT USE THE LETTER 'Z' : ";K1$
600 PRINTSPACE$(40);:LINEINPUT K1$
610 X=LEN(K1$)
620 FOR Y=1 TO X
630 B$(Y)=MID$(K1$,Y,1)
640 B$=B$+B$(Y)
650 NEXT Y :X=X+1:W=0 :GOTO 670
660 X=X+1
670 W=W+1
680 IF W>26 THEN 780
690 A$=CHR$(W+64)
700 B$(X)=A$ '== Assign letter to an array position
710 FOR Y=1 TO X-1 '== Prevent comparison of selection with itself.
720 IF B$(Y)=A$ THEN GOTO 670'== If any letter repeated,
730 NEXT Y '== selection is cancelled and another made.
740 B$=B$+B$(X) '== Accumulate alphabet.
750 IF X<26 THEN GOTO 660'== Cut off selection at full alphabet.
760 IF MID$(B$,26,1)="Z" THEN 780ELSE 770
770 PRINT "PROBABLE DOUBLE LETTER IN KEYWORD -- BEGIN AGAIN." :END
780 B$=B$+B$ :PRINT B$
790 FOR A9=1 TO 1000 :NEXT A9
800 IF A0$="C" THEN X=0 :GOTO 280
810 FOR Y=1 TO 26
820 Z=Y+25
830 FOR X=Y TO Z
840 C$=C$+MID$(B$,X,1)
850 NEXT X
860 GOSUB 960
870 NEXT Y
880 IF D=1 AND Y=27 THEN PRINT "BOTH SERIES UNSUCCESSFUL. RESTART. " :END
890 D=1
900 B$="" :FOR Y=1 TO 2
910 FOR X=26 TO 1 STEP -1
920 B$=B$+CHR$(X+64)
930 NEXT X
940 NEXT Y
950 PRINT "REVERSED ALPHABET" :GOTO 810
960 FOR X1=1 TO I-1 '== I represents total cipher characters input.
970 F=ASC(A$(X1))-64
980 F$=MID$(C$,F,1)
990 C$=C$+F$
1000 NEXT X1
1010 PRINT :PRINT "IF PLAIN LANGUAGE APPEARS, EUREKA!"
1020 PRINT "CIPHER ALPHABET HAS BEEN DISCOVERED: " :PRINT
1030 IF D=0 THEN PRINT "A-Z"
1040 IF D=1 THEN PRINT "Z-A"
1050 PRINT X-26;"/ " ;G$
1060 PRINT :PRINT :PRINT ".....NEXT COMPARISON ? <Y> "
1070 PRINT ".....ANOTHER CIPHER ALPHABET ? <C>"
1080 PRINT "PROCESS SUCCESSFUL DISCOVERY ? <P>"
1090 PRINT STRING$(24,46)"QUIT ? <Q>"
1100 A1$=INKEY$ :IF A1$="" THEN 1100
1110 IF A1$="Y" THEN C$="" :G$="" :CLS :PRINT :RETURN
1120 IF A1$="C" THEN 10
1130 IF A1$="P" THEN 1160
1140 IF A1$="Q" THEN END
1150 PRINT "PROMPTS MUST BE ANSWERED AS LISTED" :GOTO 1100
1160 CLS :PRINT :PRINT "SUCCESSFUL CIPHER ALPHABET IS: "
1170 PRINT :IF D=0 THEN PRINT "A-Z"X-26;"/ "C$ :PRINT
1180 IF D=1 THEN PRINT "Z-A"X-26;"/ "C$ :PRINT
1190 INPUT "PRINT HARD COPY < Y/N > ";A8$
1200 IF A8$="Y" AND D=0 THEN LPRINT "A-Z"X-26;"/ "C$
1210 IF A8$="Y" AND D=1 THEN LPRINT "Z-A"X-26;"/ "C$
1220 IF A8$="N" THEN 1060
1230 INPUT "PRINT HARD COPY OF PLAINTEXT DISCOVERY < Y/N > ";A8$
1240 IF A8$="Y" THEN LPRINT G$ ELSE 1060
1250 GOTO 1060

```

might run for hours without hitting it: A quick look at any text reveals that "the" is a fairly common English word; sooner or later, pure chance will produce a three-letter word.

For the odds against a chance arrangement of letters producing four-letter words, multiply the total above 26.

A message enciphered with the ingenuity of a battery of crypto specialists carries within its framework its own key. It follows that there is no unbreakable cipher, although Stanford University recently announced a computer coding system believed to be virtually impregnable against attack by any analyst.

Thus the challenge: to create the most secure cipher possible that yet can be reasonably easy for the intended addressee to decipher. And the other side of the coin: to crack the most carefully concealed cipher for its key, and ultimately, its message.

The Challenge

The give and take of enciphering and deciphering messages can be called an intellectual "game," although in modern dress it can be a game of life or death, or of fortune played against possible incarceration. For many it can be even more exciting than the "invader from outer space" computer games.

I cannot quite call cryptanalysis a game, but even though it can be a deadly serious undertaking, it is a game to some people.

Computer data security is one of those games. The more effective the security programmer, the more likely it is that he has some kind of experience in cryptology.

An entertaining and educational book on cryptology is David Kahn's *The Codebreakers* (MacMillan, 1967). It is available in most public and university libraries and I highly recommend it.

Cryptaide One

The intent of this series is to use the computer as a ciphertext tool, as well as to create and decipher messages. This first program for reading a cipher with an unknown key explores the computer's ability to assist in solving substitution ciphers. Most ciphers are based

OUR PRICES, SELECTION AND SAME-DAY SHIPPING MAKE US COMPETITIVE. OUR PEOPLE MAKE US EXPERTS.

Red Baron. Home of the Nation's Largest Computer Printer Inventory.

NEC 8023

Outstanding Graphics, Print
Quality & Performance



144 x 160 dots/inch • Proportional Spacing
• Lower case descenders • N x 9 dot matrix
• 8 character sizes • 5 unique alphabets • Greek
character set • Graphic symbols • 100 CPS
print speed • Bi-directional, logic-seeking
• Adjustable tractors • Single-sheet friction
feed • Vertical & horizontal tabbing

NEC 8023List \$795 **\$Call**

IDS Prism 80/132

Affordable Color, Speed



Dot Resolution Graphics • 9-wire staggered
printhead • Lowercase descenders • 200 CPS
• Bi-directional, logic-seeking • 8 character
sizes • 80-132 columns • Proportional
spacing • Text justification • Optional Color

Prism 80Base List \$1,299 **\$Call**
Prism 132Base List \$1,499 **\$Call**

Smith-Corona TP-1

Daisy Wheel Printer For Under \$900



Letter quality • Standard serial or parallel data
interface • Drop-in ribbon • 144 WPM • Various
fonts available • Loads paper like typewriter
• Handles single sheets for forms

Smith-Corona TP-1.List \$895 **\$Call**

CRT's and Monitors

Price, Performance & Reliability

Televideo

910List \$ 699
925List \$ 995
950List \$1195

Amdek

Video 300, greenList \$ 249
Color-IList \$ 499

\$Call
For low
Prices

The Epson Series

High-Quality Printers
at a Low Price.



**WATCH
FOR NEW
FX
SERIES**

Epson MX80FTList \$745 **\$Call**
Epson MX-100List \$995 **\$Call**

Full Line of Epson Accessories.

The Okidata Series

Hi-Res or TRS 80 Block Graphics



120/200 CPS • 9 x 9 Matrix • Bi-directional, logic-
seeking printing • Lower case descenders
• Four print styles • Optional Hi-Res Graphics

Okidata 82AList \$649
Okidata 83A (w/Tractor)List \$995 **\$Call**
Okidata 84 (Parallel)List \$1395 **\$Call**

Other Quality Printers at Red Baron

	List	Discount
Anadex DP-9501A	\$1725	\$1300
Anadex DP-9620A	\$1845	\$1475
Anadex WP-6000	\$3250	\$Call
Brother HR-1	\$1100	\$Call
C. Itoh 8510 Prowriter	\$ 845	\$Call
IDS Microprism 480	\$ 799	\$Call
NEC Spinwriter R0		
Serial Parallel 7700	\$3055	\$2500
Serial 3510	\$1895	\$1700

Interface Equipment

Complete Stock of Options,
Cables and Accessories.

GRAPPLER + APPLE INTERFACE	\$175
BUFFERBOARD	\$175
CCS APPLE SERIAL Interface & Cable	\$150
SIGNALMAN MODEM	\$Call
COMPLETE STOCK OF EPSON ACCESSORIES	\$Call
CUSTOM PRINTER CABLES FOR Apple, Atari, IBM, TRS-80 (all models)	\$Call
HAYES MICROMODEM II	\$300
PRINTER STANDS: Large	\$ 99
Small	\$ 25
PRINTER RIBBONS—Most Types	\$Call



Our People, Our Product: Both Are Specialized.

Red Baron is an organization of computer printer
specialists. They know the capabilities of each
printer, and how to match one to your exact need.
Call for expert consultation today!



Here's How To Order:

Phone orders are welcome; same-day shipment on
orders placed before 11:00 a.m. Free use of Master-
Card and Visa. COD's accepted. Personal checks
require 2 weeks clearance. Manufacturer's warranty
included on all equipment. Prices subject to revi-
sion. APO/FPO Orders Welcome.

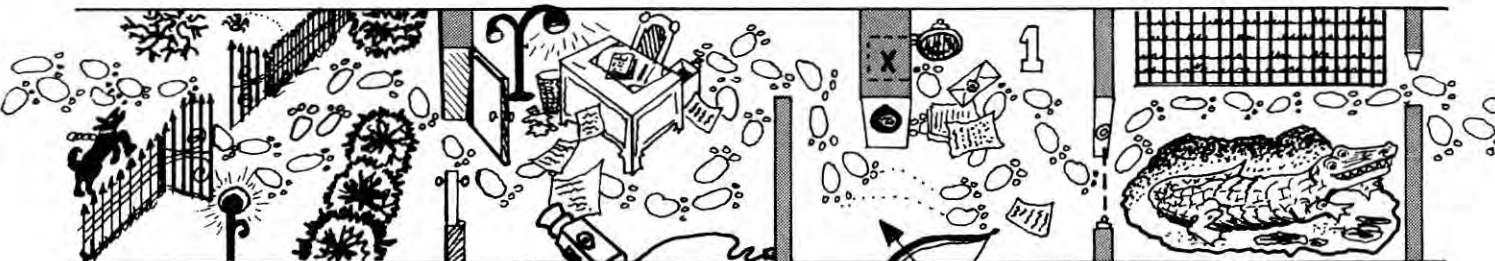
Call For Free Catalog:

(800) 854-8275

CA, AK, HI (714) 630-3322



1100 N. Tustin #207, Anaheim, CA 92807



upon a variation of simple substitution, so before you begin to work on any unknown cipher, examine it for simple substitution.

There are three unknowns that must be addressed. If it uses substitution cipher, is the key one of the 51 common variations of strip cipher? Does the cipher key use a regularly interspersed version of the alphabet such as ANBOCPDQ...Z? Is a keyword used as the initial letters of the cipher alphabet?

Cryptanalyst's Aide 1 produces plaintext and cipher alphabets, so you can examine part of the received ciphertext against the cipherkey, when you make the A menu selection. Then slide the key one space left with each cycle until you have checked all 25 possibilities. Then invert the cipherkey alphabet and examine all 26 reverse-alphabet possibilities one by one.

The text resulting from substituting the ciphertext alphabet for the plaintext alphabet appears on screen, preceded by its serial number. Just above the serial number, either A-Z or Z-A signals the mode, straight or reverse, in which the cipherkey is operating. The resulting text appears without spaces as a solid line. When plaintext appears, it seems to leap out at you, even though at times some of the lines contain only a chance word or two that is recognizable.

The greater the bite of ciphertext that you enter into the program for translation, the more time the computer needs to prepare each of the 51 translations. If you enter a full array of 255 characters, each step takes 55 seconds; this amounts to an hour if none pan out. So only enter from 15-25 letters of the ciphertext initially.

The B menu option allows you to enter an alphabet of your own devising. This is helpful during ciphertext

analysis when clues suggest a certain regular alphabet. The indicated alphabet can be entered and the result tested for generation of plaintext against one or all 51 variations of that alphabet. Further, if you discover plaintext from a selected fraction of the ciphertext in the A option, you can enter the discovered alphabet in the B option and enter up to 255 letters of ciphertext to read the message. This can save 10-50 minutes over entering the entire message in the menu A option.

A variation of the standard alphabet

“With the addition of a subroutine similar to that used in this Scriptsit dictionary, you could enter the ciphertext... and wait for the computer to crack the cipher.”

is the keyword option, choice C on the menu. In this variation, enter a word known to the sender and receiver of the message as the first letters of the cipher alphabet. If any letters are repeated in the word, such as the a in Alaska, omit the redundant letters. The program continues the alphabet from the word's last letter, omitting any letter used in the keyword.

If there is an underlying message in the approach to computer-assisted cryptography, it is to use the computer as a tool, and to increase the creative human effort. Don't rely on the computer to make the critical decisions, although the computer recognizes plain language when it appears, provided the

program and the time are available to incorporate this function into your operation. With the addition of a subroutine similar to that used in the Scriptsit dictionary, you could enter the ciphertext into the keyboard and sit back and wait for the computer to crack the cipher. Such a program has yet to be written.

Program Construction

Following a standard menu-selection routine, enter the ciphertext into the program beginning at line 320, using the INKEY\$ loop. It is easier to enter plain language or ciphertext groups as discrete words or groups using the space bar, even though the spaces aren't used. I include this feature for the operator's convenience, and spaces and carriage returns are bypassed by line 350.

When line 330 detects the 255th character, or when the operator touches the asterisk, the command proceeds to the alphabet-generating subroutines beginning at line 400. These subroutines lay the CHR\$-generated letters in a string for later use.

Variations on the straight alphabet, where letters are interspersed at 1, 2, 3-or-more-space intervals, are entered at line 530 and used as the cipherkey alphabet instead of the standard alphabet.

When you enter a keyword, it is put through the routine beginning at line 650 and ending at 760 to add the missing letters in alphabetical order for a total of 26 letters. If you enter a repeated letter inadvertently in the keyword, line 770 rejects the entry and asks for a re-run. To accomplish this, the letter Z is unusable in the keyword, and if it does not appear as the 26th letter of the cipher alphabet, the rejection goes into effect. Since most keyword alphabets devised by casual cryptographers end in Z and since there is provision for entry of special keyboards through menu B, the automatic feature is a time saver.

With alphabets ready, the program translates the ciphertext into each version of test text as determined by the cipherkey for a total of 51 (52 including the original alphabet). Lines 900-940 invert the ciphertext; the resultant texts

```

QYQDS CDMGD CUYUJ CJQYQ XXMEB XMNXC NMOIB JMZYC EMCLX JMOZS
BXCKZ QEYXC PMLCW DNCOO QYICD QFFSI DEQKQ RIDMY DMUYB QBMZY
QDNPC GGYXJ MZMIY ECZMX CNMOI BJMZI DKQOZ SBXIO EMYEQ KMXJQ
DHWYX XWZDI DKQE Q OJIDM FCCYM CDXJM OIBJM ZXMTX

```

Fig. 2. Unsolved Crypto Message



are produced in subroutine 960-990.

The submenu presents four options, each showing on screen the resultant translated text. If at the 26th reverse-alphabet you decide to enter another test key word, touching C reruns the program. If the first option Y turns up

plain-language text, then the option P prints out that text. The program does not restrict printer width defaults, so if you want 60-character width and no line skipping at the top of the page, type SYSTEM "FORMS P=0 L=0 W=60" and answer the three succeed-

ing prompts. And if your eyes won't stay open any longer, Q awaits your touch. ■

Karl Andreassen (24750 Chianti Rd., Cloverdale, CA 95425) enjoys electronics and jogging.

StarLogic Announces Savings on Tandy Compatible Disk Drives

5 1/4" Winchester Disk Subsystems

Fully compatible with TRS-80-III. Includes Winchester disk drive, cabinet, power supply, cable, controller and I/O adaptor.

5 Megabytes storage	\$1125.00
10 Megabytes storage	\$1275.00

TRS-80-III Internal drives

Standard sized 5 1/4" floppy disk drives that simply plug into a TRS-80 Model III cabinet.

Single-sided drive with 250K bytes	\$165.00
Double-sided drive with 500K bytes	\$235.00
Double-sided drive with 1000K bytes	\$295.00

TRS-80 External Drives

Compatible with Model I and Model III. Choice of standard sized 5 1/4" floppy or the new half-height ThinLine 5 1/4" floppy drive. Includes disk drive, cabinet, power supply and cable.

Standard 5 1/4" Floppy Drives

Single-sided with 250K bytes	\$225.00
Double-sided with 500K bytes	\$305.00
Double-sided with 1000K bytes	\$335.00

ThinLine 5 1/4" Floppy Drives

Single-sided with 250K bytes	\$195.00
Double-sided with 500K bytes	\$275.00
Double-sided with 1000K bytes	\$300.00

Tandy Color Computer

Includes 5 1/4" floppy disk drive, cabinet, power supply and cable.

Standard sized 5 1/4" disk drive with 250K bytes \$225.00

ThinLine 5 1/4" disk drive with 250K bytes \$195.00

Standard StarLogic warranty includes 90 days parts and labor

Telephone Orders Only

MasterCard, VISA or Cashier's Check COD

(213) 883-0587

TRS-80 is a registered trademark of Tandy Corporation

ThinLine is a registered trademark of Tandon Corporation

Prices subject to change without notice

Prices do not include shipping charges which will be added to billing.

StarLogic

Reproduce the video display on paper.

LP VII Screen Printout

Serge Y. Calmettes
1306 Kensington Crescent
Belleville, Ontario
Canada K8P 4T4

routines available for the TRS-80 (such as the built-in shift-down-arrow * of the Model III) reproduce only alphanumerics. They usually translate graphic characters into dots.

The short subroutine shown in the Listing duplicates the video display on the Radio Shack LP VII. With the exception of special characters (codes 1-31 and 192-255 for the Model III) the screen is reproduced on paper (Fig. 1).

The LP VII supports two operating modes: character print mode (ASCII decimal 32-127) and graphic print mode.

Soon after I purchased a Radio Shack Line Printer VII, I needed a routine to duplicate the video display on paper. Most

The control code decimal 18 switches from character print mode to graphic mode and control code 30 switches back to character print mode.

The program scans each line of the video display, first in the alphanumeric mode then in the graphic mode. The printing head faithfully reproduces any character and graphic patterns encountered. This routine repeats until the last line of the display

is printed. Since this program is written in Basic it will take approximately 15 minutes for a complete screen printout. ■

The Key Box

Basic Level II
Model I or III
16K RAM
Line Printer VII



Figure 1

```

10 'True Screen Print for the LP VII
20 'by Serge Y. Calmettes
30 '1306 Kensington Cresc.
40 'Belleville, Ont., Canada K8P 4T4
50 '*****
60 'The subroutine starts at line 50000
70 'The following is a short demo of this subroutine
80 CLS
85 PRINT@527,"True Screen Print for the LP VII";
90 A=0:B=127:C=0:D=47
100 FORX=ATOB:SET(X,C):NEXTX
110 FORY=CTOD:SET(B,Y):NEXTY
120 A=A+2:C=C+2
130 FORX=ATOB:SET(X,D):NEXTX
140 FORY=CTOD:SET(C,Y):NEXTY
150 B=B-2:D=D-2
160 IFB=105GOTO100
170 GOTO100
180 FORX=ATOB:SET(X,C):NEXTX
190 GOSUB50000
200 END
50000 Y=0:FORV=1536@TO16383STEP64
50010 P1=0:FORI=@TO63:P=PEEK(V+I):IFP<33ORP>126THENP=0
50020 P1=P1+P:NEXTI:IFP1=@GOTO50060
50030 FORI=@TO63
50040 P=PEEK(V+I):IFP<32ORP>126THENP=32
50050 LPRINTCHR$(P);:NEXTI:LPRINTCHR$(26);
50060 LPRINTCHR$(18);
50070 FORW=1TO3
50080 P1=0:FORX=@TO127
50090 P=POINT(X,Y):P1=P1+P:NEXTX:IFP1=@GOTO50150
50100 FORX=@TO127
50110 P=POINT(X,Y):IFP=-1THENP=255:GOTO50130
50120 P=128
50130 LPRINTCHR$(P);CHR$(P);CHR$(P);
50140 NEXTX
50150 LPRINTCHR$(10);:Y=Y+1:IFY=48THENEND
50160 NEXTW
50170 LPRINTCHR$(30);
50180 NEXTV
50190 RETURN

```

Program Listing

LOVE AT FIRST BYTE

For as little as 10 bucks,
you'll learn fast, easy ways
to make your software
work so hard it sweats

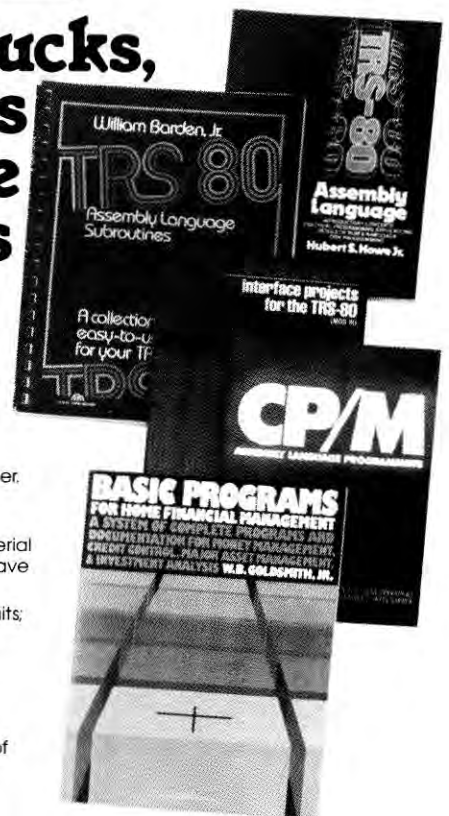
TRS-80 Assembly Language by Hubert S. Howe, Jr. The first-time user can easily understand this, but even the experienced TRS-80 user can delight in its myriad practical programs and subroutines. Comprehensive tables, charts, and appendices reinforce the detailed info on ROM, RAM, disk operating systems and much more. \$9.95, paper.

TRS-80 Assembly Language Subroutines by William Barden, Jr. This handbook courses the speed and compactness of assembly language programming and offers you 65 fully debugged, ready-to-run subroutines that, among others, speed up graphics by a factor of 300, enable you to perform high-speed sorts, or "dump" the video screen to cassette or to read a disk sector. \$18.95, paper.

Interface Projects for the TRS-80 (MOD III) by Richard C. Hallgren. You'll find many fully-tested practice hardware projects—including explanations on the necessary interfacing software—including a review of data transfer formats, analog-to-digital and digital-to-analog conversions with the Mod III, serial applications, biofeedback projects, controlling a video playback device, and more. Readers should have a good grasp of TRS-80 basic to wring every last bit of info from these pages. \$12.95, paper.

CP/M Assembly Language Programming by Ken Barbier. Microcomputers rely on integrated circuits; and now you can rely on the "integrated learning-by-doing" approach in this book. It details the hardware, its operating system, and assembly language programming. Your hands need leave the keyboard only to turn the page. \$12.95, paper.

BASIC Programs for Home Financial Management by W. B. Goldsmith, Jr. If you bought your computer with the hopes of debugging your personal financial picture, you may have found it takes longer to program it than to dig through a shoebox full of records. Here's the simple and fast system of 33 documented programs, including descriptions and sample runs, for money management, credit control, major asset management, and investment analysis. \$12.95, paper.



WITH PRENTICE-HALL BOOKWARE™

✓ 277

SEND NOW

Simply complete and return the coupon for fast service. If you wish to order more than two titles, please write to the same address listing all of the books and their authors. **DEALER INQUIRIES INVITED.**

Spectrum Books

RETURN TO: Prentice-Hall, Inc. / General Publishing Division / Englewood Cliffs, NJ 07632 Attn: Addison Tread

Please send the following:

AUTHOR TITLE

AUTHOR TITLE

I enclose my check or money order for the price of each book plus \$1.00 per title for postage & handling.

Amount enclosed \$ _____ Bill my MasterCard or Visa

* _____ exp. date _____

NAME

ADDRESS

APT #

CITY

STATE

ZIP

BOM

Fun for the Younger Set

by Safi Bahcall

The Key Box

Model I or III
16K RAM Cassette Basic
32K RAM Disk Basic

Introduce your 5-year-old to the TRS-80 with these math and word identification programs.

Program Listing 1. Word Program

```

10 CLS
20 CLEAR 1000
25 DIM A$(50),A2$(50)
30 RESTORE
40 FOR I=1 TO 20 : READ A$(I),A2$(I):NEXT
50 RA=RND(20)
60 B$(1)=A$(RA):B$(2)=A2$(RA)
70 RN=RND(4)
80 P(1)=202:P(2)=242:P(3)=778:P(4)=818
85 PRINTCHR$(23)
90 PRINT@P(RN),B$(2)
100 IFRN<>4THEN PRINT@P(4),B$(1)
110 IFRN<>3THEN PRINT@P(3),B$(1)
120 IFRN<>2THEN PRINT@P(2),B$(1)
130 IFRN<>1THEN PRINT@P(1),B$(1)
140 FOR Y=1 TO 47:SET(64,Y):NEXTY
150 FOR X=1 TO 127:SET(X,23):NEXT
160 Y$=INKEY$:IF Y$="" THEN 160
165 IF Y$="S" THEN 700
180 IF Y$="Y" THEN V=1
181 IF Y$="U" THEN V=2
182 IF Y$="H" THEN V=3
183 IF Y$="J" THEN V=4
190 GOTO 500
200 ' BAD GUESS
210 FORX=62 TO 67:RESET(X,24):NEXT
220 FOR Y=24 TO 26:RESET(60,Y):RESET(61,Y):RESET(68,Y)
230 RESET(69,Y):NEXT
235 B=B+1
240 FOR I=1 TO 999:NEXT:CLS:GOTO 50
499 STOP
500 ' GOOD GUESS
510 CLS
520 T=191
530 PRINT@351,CHR$(176)+CHR$(176)+CHR$(176)
540 PRINT@413,CHR$(176)+CHR$(188)+CHR$(T)+CHR$(T)+CHR$(T)+CHR$(188)+CHR$(176)
550 PRINT@474,CHR$(188)+CHR$(188)+CHR$(T)+CHR$(T)+CHR$(188)+CHR$(T)+CHR$(T)+CHR$(T)+CHR$(188)+CHR$(T)+CHR$(T)+CHR$(188)+CHR$(T)+CHR$(T)+CHR$(188)+CHR$(188)

```

Listing continues

I decided that it was about time for my five-year-old sister to start playing with the TRS-80. A program written for her had to be not only interesting but fun—something she enjoyed. I remembered that she had a book of games for tots that she liked playing very much. One of the games was to try to find the different word among a group of words; for example, finding the word “boy” among 10 “joys.” I put this game on the TRS-80 and made it simple enough so that my sister could use it. (See Program Listing 1.)

The Word Game

When you run the program, the screen clears and is divided into four sections, with one word in each. Three are the same and one (obviously) is different. You have a choice of pressing one of four keys: Y, U, H, J. These form a box in the center of the keyboard. For the corner on the screen that you think contains the different word, press the respective key. For example, if the odd word is in the top left corner, press the top left key, which in this case is Y. If the answer is right, a smiling face appears. If it is wrong, a sad face appears. If at any time you want a score, just press shift and S. A score will be displayed, including a percentage of correct answers.

The Math Program

I also wrote a math program (Program Listing 2) for my sister. It deals with simple addition. The game is really fun and I enjoy playing it too. My sister liked it so much that my mother had to

```

)
560 PRINT@538,CHR$(131)+CHR$(131)+CHR$(143)+CHR$(T)+CHR$(T)+CHR$(
T)+CHR$(T)+CHR$(T)+CHR$(T)+CHR$(T)+CHR$(143)+CHR$(131)+CHR$(131
)
570 PRINT@606,CHR$(131)+CHR$(T)+CHR$(T)+CHR$(T)+CHR$(131)
580 IF V<>RN THEN 200
590 X=57
600 FOR Y=24 TO 26
610 FOR T=1 TO 2:X=X+1:RESET(X,Y):NEXT T
620 NEXT Y
630 RESET(64,26):RESET(65,26)
640 X=65:FORY=26TO24STEP-1:FORJ=1TO2:X=X+1:RESET(X,Y):NEXTJ,Y
645 G=G+1
650 FOR I=1 TO 999:NEXT:CLS:GOTO 50
700 ' SCORE
710 CLS:PRINT"THE SCORE SO FAR IS:"
720 PRINT"GOOD = "G
730 PRINT"BAD = "B
740 PRINT"TOTAL = "(B+G)
745 IF (B+G)=0 THEN 760
750 PRINT"PERCENTAGE = "INT( (G/(G+B))*100 +.5 )
760 FOR I=1 TO 2400:NEXT:CLS:GOTO 85
999 GOTO 999
1000 DATA PUP,CUP , FIT,FAT , PIG,DIG , TAR,BAR
1010 DATA TIP,TOP , SAD,MAD , RUN,FUN , PIT,POT
1020 DATA HOT,HIT , LID,LIP , TOY,BOY , BED,RED
1030 DATA MAN,MEN , BAT,MAT , DAY,PAY , MOW,ROW
1040 DATA BIT,HIT , HAT,RAT , LIP,LAP , BIG,BAG

```

```

10 CLS
15 YC=22
20 FOR Y=0 TO 5:SET(48,Y):SET(52,Y):NEXT
30 FOR Y=11 TO 23:SET(38,Y):SET(67,Y):NEXT
40 FOR X=38 TO 67:SET(X,23):NEXT
50 FOR Y=24 TO 27:SET(56,Y):SET(60,Y):NEXT
60 SET(56,28):FOR X=56 TO 67:SET(X,29):NEXT
70 FOR X=60 TO 126:SET(X,27):SET(X,29):NEXT
80 X1=RND(7):X2=RND(7)
90 PRINT@840,X1:PRINT@856,"+":PRINT@865,X2:PRINT@870,"="
100 V$=INKEY$:IFV$=""THEN 100
105 V=VAL(V$)
110 IF V<1 THEN 100
120 IF V<>1 THEN 160
130 C$=INKEY$:IFC$=""THEN 130
150 V=10+VAL(C$)
160 IF V=X1+X2 THEN GOSUB 200 ELSE GOSUB 500
170 PRINT@832," "
180 GOTO 80
200 ' RIGHT
210 FOR Y=1 TO YC
220 SET(50,Y)
230 FOR Z=1 TO 100:NEXT
240 RESET(50,Y)
250 NEXT Y
260 FOR X=39 TO 66:SET(X,YC):NEXT
265 YC=YC-1
267 IF YC=10 THEN 280
270 RETURN
280 Y=4:SET(88,Y):SET(89,Y):SET(99,Y):SET(100,Y)
290 FORY=6 TO 8:SET(94,Y):SET(95,Y):NEXT
300 FOR X=92 TO 97:SET(X,8):NEXT
310 X=86 :FORY=9TO13:SET(X,Y):X=X+1:NEXT
320 FOR X=90 TO 98:SET(X,13):NEXT
322 X=99:FORY=13TO9STEP-1:SET(X,Y):X=X+1:NEXT
325 FOR Z=1 TO 1000:NEXT
330 RUN
500 'WRONG
501 IF YC=22 THEN RETURN
505 GOTO 570
510 FOR Y=24 TO 28
520 SET(58,Y):FORZ=1TO100:NEXTZ:RESET(58,Y)
530 NEXT
540 FOR X=59 TO 126 STEP2
550 SET(X,28):FORZ=1TO100:NEXTZ:RESET(X,28)
560 NEXT
565 RETURN
570 FOR X=39 TO 66:RESET(X,YC+1):NEXTX
580 YC=YC+1
590 GOTO 510
9999 GOTO 9999

```

Program Listing 2. Math Program

bribe her to quit and come to dinner.

When you run the math program, a cup appears in the middle of the screen, one pipe leads to the cup, and another pipe leads away from the cup. At the bottom of the screen there is an addition problem. The problem is to add the two numbers, each between 1 and 7. If the answer is correct, you see a drop moving slowly through the first pipe, then falling into the cup. When the drop hits the bottom, it spreads out, and another

"My mother had to bribe her to quit."

level of liquid is added. If the answer is wrong, one level of liquid is erased, and a drop starts moving through the second pipe. Just before the cup overflows, when you have answered at least 12 problems correctly, a smiling face appears, and the whole cup is drained. Then the program starts from the beginning with another problem and an empty cup. ■

Contact Safi Bahcall at 21 Adams Drive, Princeton, NJ 08540.

Sophisticated Moving Averages System

SMAS

Stock Market Adviser System

SMAS is a stock market program with a **difference**. SMAS uses both fundamental principles and technical analysis. Its refined algorithms using three moving averages are validated by applications both to individual stocks and to portfolios.

- Sophisticated algorithms yield weekly appraisals of market trend and recommendations to buy, sell, and hold individual stocks.
- Data base consists of 196 stocks and 4 indexes.
- Data base stocks selected for growth history and potential, volatility, and trading activity.
- Data bases are current; you get meaningful results the very first week you use SMAS.
- Data required by SMAS are readily available.
- Program is menu driven, user friendly, with needed utilities and built-in checks for accuracy.
- SMAS is especially suited for those seeking long term capital gains.
- SMAS reduces emotional involvement in the market.
- SMAS works with TRSDOS, NEWDOS/80, LDOS & DOSPLUS with TRS-80 (TM Tandy Corp.) Models I and III. State Model and number of tracks in disk drives.

SMAS \$169.95 — Include \$3.00 for packing and shipping or \$6.50 for Priority Mail. Texans add 5% sales tax. Cashier's check or money order brings prompt shipment; personal check requires three weeks to clear.

Or send SASE for further information.

SPIRAL ENTERPRISES

P.O. Box 5219, Fort Worth, TX 76108
308 Crown Road, Willow Park, TX 76086 ✓ 208
DEALER INQUIRIES INVITED

Convergem

by James A. Sanford

When you need to adjust the resolution of your color television, don't buy a special signal generator. Instead, use your Color Computer.

To obtain all the resolution that is possible with Radio Shack's Color Computer, you must properly adjust your color television. Those familiar with color televisions know that adjusting Convergem requires a special signal generator to produce the required patterns. These generators are available in manufactured or kit form but are not cheap.

The Color Computer can generate suitable patterns at no extra cost. Convergem generates a black-and-white (buff) screen for adjusting gray scale; color bars for adjusting intensity and tint (or hue); and vertical, horizontal, or cross hatch patterns for dynamic convergence adjustments. A dot pattern is available for static convergence, and the

center dot is circled, making it easy to find. A large circle is available for checking linearity.

The program prints a title header and then a menu. Select the desired pattern by pressing the corresponding key. To see another listing of the menu, press M. You don't have to press the enter key, because the program continuously scans the keyboard, allowing display of the pattern without disruption. Next, select the pattern you need for making the adjustment, and adjust the television in accordance with the manufacturer's instructions.

You should first adjust gray scale, centering, and height/linearity. Then check purity followed by static convergence at the center of the screen. After adjusting static convergence, recheck purity. The next adjustment is dynamic convergence, using the vertical, horizontal, or cross hatch patterns. This is a time-consuming process, but is well worth it because it pays off in sharp, well-defined lines free of colored fringes. When adjusting the static or dynamic convergence, set the color intensity to minimum.

A word about safety is in order. The high voltages in a color television *are lethal and will kill you*. If you don't have experience working inside a television, *do not* remove the back. Instead, use this program to determine whether or not adjustment is necessary, and call a

Program Listing

```

4 CLS
5 GOSUB45
6 GOTO50
10 PMODE4,1
20 SCREEN1,1
30 COLOR5,0
40 PCLS
45 RETURN
50 PRINT @ 12,"CONVERGE"
60 PRINT@39,"BY JAMES A SANFORD"
70 PRINT@73,"COPYRIGHT 1981"
75 PRINT:PRINT:PRINT"THIS PROGRAM WILL PROVIDE":PRINT"VARIOUS PA
TTERNS TO AID COLOR":PRINT"TELEVISION ADJUSTMENT."
80 PRINT@327,"PRESS 'M' FOR MENU"
100 A$=INKEY$
110 IFA$="M"THEN GOSUB200
120 IFA$="B"THEN GOSUB300
130 IFA$="C"THEN GOSUB400
140 IFA$="X"THEN GOSUB800
150 IFA$="D"THEN GOSUB900
160 IFA$="H"THEN GOSUB500
170 IFA$="V"THEN GOSUB600
180 IFA$="O"THEN GOSUB1000
185 IFA$="E"THEN GOTO1030
187 IFA$="R"THEN GOSUB1021
190 GOTO100
200 PCLS:CLS
210 PRINT@4,"PRESS":PRINT@16,"TO OBTAIN"

```

Listing continues

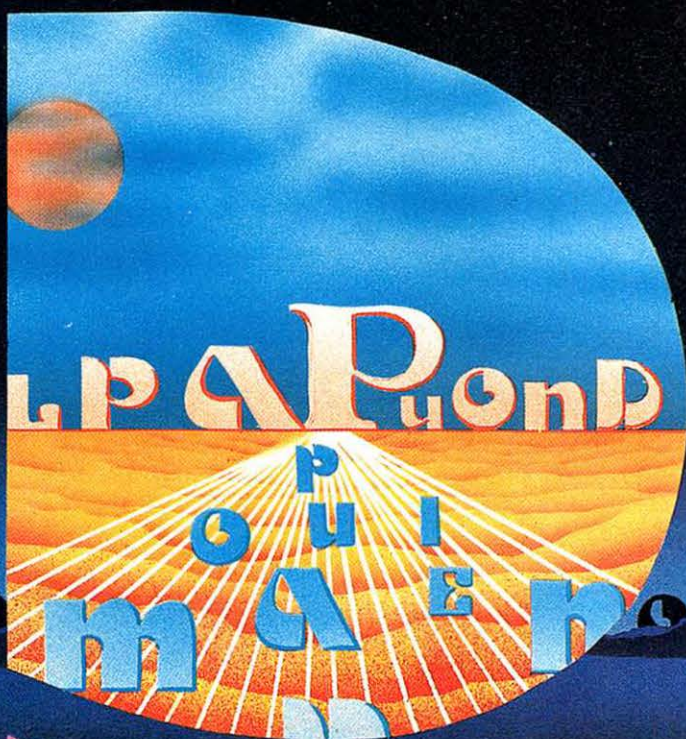
The Key Box

**Color Computer
16K RAM
Extended Color Basic**

PANDEMONIUM

By Norman J. Wazaney Jr.

A word game
for our time.



At last... a computer word game that entertains, challenges, educates! Pandemonium is thoroughly fascinating, stimulating, and highly addictive. Features include a built-in 6000 word dictionary, scoring display and a player selectable clock.

Play it alone! Play it with your kids!
Play it at a party!

The word is out... Pandemonium is in.
Available now for only \$39.95 at
computer stores.

To order by phone, call 800-526-9042
and use your Visa or MasterCard. All
shipments made the same day in
which orders are received. To order
by mail, add \$1 for shipping charges
and send your check to:

Soft images

DIVISION OF DECISION SYSTEMS INC.

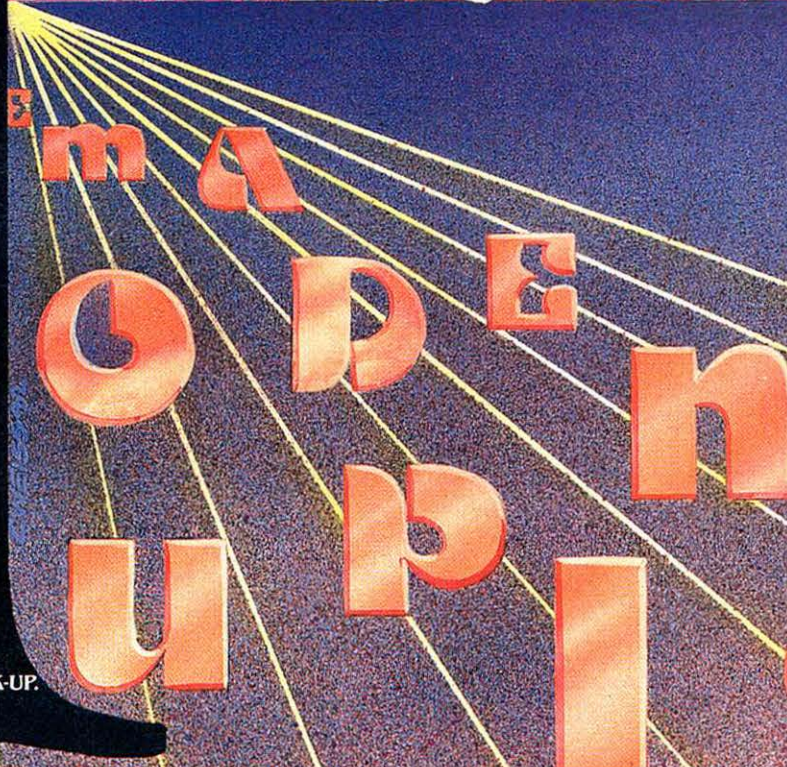
399

200 Route 17, Mahwah, NJ 07430.

TRS-80 MOD I/III 48K TRS-DOS
TRS-80™ Radio Shack/Tandy Corp.

OUR SOFTWARE IS UNPROTECTED PERMITTING CONVENIENT BACK-UP.

PANDEMONIUM



Listing continued

```
215 PRINT@38,"M":PRINT@48,"MENU":PRINT@70,"B":PRINT@80,"COLOR BA
RS":PRINT@102,"C":PRINT@112,"CENTERING"
220 PRINT@134,"X":PRINT@144,"CROSS HATCH":PRINT@166,"D":PRINT@17
6,"DOTS":PRINT@198,"H":PRINT@208,"HORIZONTAL LINES"
230 PRINT@230,"V":PRINT@240,"HORIZONTAL LINES":PRINT@262,"O":PRI
NT@272,"CIRCLE":PRINT@294,"E":PRINT@304,"END":PRINT@326,"R":PRIN
T@336,"RASTER"
240 RETURN
300 CLS:SCREEN0
310 FORY=0TO31
320 FORX=0TO63
330 SET(X,Y,(INT(X/8)+1))
340 NEXTX
350 NEXTY
351 PRINT@97,"G";:PRINT@129,"R";:PRINT@161,"E";:PRINT@193,"E";:P
RINT@225,"N";:PRINT@101,"Y";:PRINT@133,"E";:PRINT@165,"L";:PRINT
@197,"L";:PRINT@229,"O";:PRINT@261,"W";:PRINT@105,"B";:PRINT@137
,"L";:PRINT@169,"U";:PRINT@201,"E";:PRINT@109,"R";
352 PRINT@141,"E";:PRINT@173,"D";:PRINT@113,"B";:PRINT@145,"U";:
PRINT@177,"F";:PRINT@209,"F";:PRINT@117,"C";:PRINT@149,"Y";:PRIN
T@181,"A";:PRINT@213,"N";:PRINT@121,"M";:PRINT@153,"A";:PRINT@18
5,"G";:PRINT@185,"E";:PRINT@217,"N";:PRINT@249,"T";
353 PRINT@281,"A";:PRINT@125,"O";:PRINT@157,"R";:PRINT@189,"A";:
PRINT@221,"N";:PRINT@253,"G";:PRINT@285,"E";
360 RETURN
400 GOSUB10
410 DRAW"BM128,96U95D190U95L127R254BL127E127G254BM128,96F127H254
"
430 RETURN
500 GOSUB10
510 FORY=12TO180STEP14
520 LINE(0,Y)-(256,Y),PSET
530 NEXTY
540 RETURN
600 GOSUB10
610 GOSUB700
620 RETURN
700 FORX=2TO254STEP14
710 LINE(X,0)-(X,192),PSET
720 NEXTX
730 RETURN
800 GOSUB500
810 GOSUB700
820 RETURN
900 GOSUB10
910 FORX=2TO254STEP14
920 FORY=12TO180STEP14
930 PSET(X,Y,5)
940 NEXTY,X
950 CIRCLE(128,96),7,5
960 RETURN
1000 GOSUB10
1010 CIRCLE(128,96),92,5
1020 RETURN
1021 GOSUB10:PCLS5:RETURN
1030 CLS:END
```

professional.

Even if you have worked on televi- sions, but have never done convergence, either call a professional or do it under the supervision of someone who knows how. These adjustments are critical, in- teractive, and time consuming, and a great deal of practice is necessary to be- come proficient. If in doubt, get help.

The program consists of several sub- routines. Each pattern is generated by a subroutine, and pattern selection is also accomplished by a subroutine. The pat- terns for centering and color bars are similar to those in the Radio Shack owner's manual.

When the program is first run, it prints the title and then goes to the pat- tern selection subroutine. It then prints the menu and waits for input from the keyboard. Control is then passed to the pattern-generator subroutine and is then returned to the input routine. Once the pattern is generated in memory for continuous display, the program waits for input from the keyboard. This is ac- complished by using the INKEY\$ func- tion. If you select a new pattern, it will be displayed until replaced. The pro- gram runs continuously until termi- nated by pressing E or break.

You can easily add custom patterns or displays. Add the appropriate char- acters to the keyboard input routine and write the appropriate subroutines to generate the display. ■

James Sanford (509 Forest Drive, Casselberry, FL 32707) works for the U.S. Navy. His hobbies include ama- teur radio and photography.

DISCOUNT COMPUTERS

100% RS COMPONENTS, NO FOREIGN DRIVES OR MEMORY—FULL WARRANTY

16K COLOR COMPUTER	427.00	DMP-500 PRINTER.....	1398.00
32K COLOR COMPUTER	497.00	DMP-100 PRINTER.....	299.00
16K MODEL III.....	815.00	DMP-200 PRINTER.....	599.00
48K MODEL III, 1 DR.....	1549.00	DWP-410 DAISY	1195.00
48K MODEL III, 2 DR. RS232	1795.00	DAISY WHEEL II.....	1599.00
64K MODEL II, 1 DR.	2499.00	1 DR. EXPANSION MODEL II.....	919.00
128K MODEL 16, 1 DR.	3898.00	8.4 MEG HARD DISK MODEL II/16.....	3599.00
128K MODEL 16, 2 DR.	4510.00	ALL RS SOFTWARE	20% OFF

CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS.

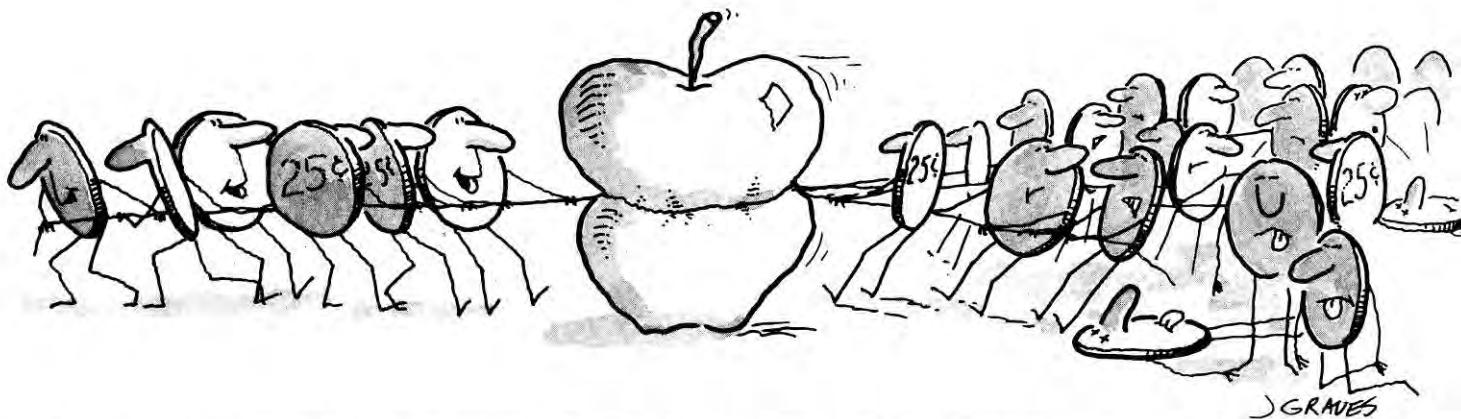
(817) 825-4027

NOCONA ELECTRONICS • Box 593 • Nocona, TX 76255

✓232

Apple Users!

Now your dollar can outmuscle three times its weight in cold cash.

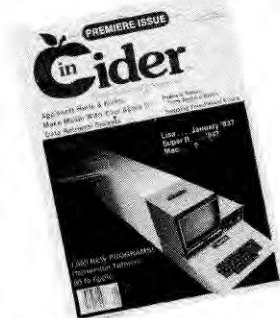


Your computing needs are *Apple-specific*. And you're still only subscribing to that general interest computer magazine? Fact is it would take three such publications to provide you with the same amount of Apple information you'll find in one issue of **inCider**.

inCider promises to expand the limits of your Apple like its sister publication **80 Micro** has *blown the lid off the TRS-80*.

Not just another Apple magazine—but a comprehensive monthly filled with...

- programs
- software applications
- hardware modifications
- reviews
- new product announcements
- advertising
- tutorials
- games



Want to know the easiest way to get the kinks out of your programs? **inCider** will show you. Want to know which peripherals have the best history and the brightest future? **inCider** will tell you.

Want to expand your knowledge of hardware? Or become an expert programmer? Want to discover which word processors give you the most for your money? Or how your Apple can better manage your financial affairs? **inCider** will answer these and many other questions each month.

No matter what you use your Apple for—no matter where your machine is—you'll want the latest copy of **inCider** propped up beside it each month.

You get a full year's subscription to **inCider**—12 monthly

issues for only \$24.97. And if you send your money now you will receive a 13th issue **free!**

Simply send in the subscription coupon to:

inCider

P.O. Box 911

Farmingdale, NY 11737

or call toll free:

1-800-258-5473

and start receiving more usable information about your Apple than you ever dreamed possible.

Why settle for a little Apple information from those other magazines when you can get a lot from **inCider**?

Be an **inCider**. *Subscribe today.*

YES! I want a subscription to **inCider** for one year at \$24.97 *Apple is a trademark of Apple Computer, Inc.

I understand that with payment enclosed or credit card order I will receive a 13th issue FREE.

Check Enclosed MC VISA AE Bill me

Signature _____

Card# _____

Exp. Date _____ Interbank _____

Name _____

Address _____

City _____ State _____ Zip _____

Canada & Mexico \$27.97, 1 year only, US funds
Foreign Surface \$44.97 1 year only, US funds drawn on US bank

Please allow 6-8 weeks for delivery
Box 911 • Farmingdale, NY 11737

332R8

APL Primer—Part III

by Margaret M. Grothman

This month's installment contains a bonanza of functions: Logical operators, shaping, indexing, and reduction are just a sample.

APL programs (user-defined functions) can be niladic, monadic, or dyadic. A niladic program is called by entering its name only. The programs *Fahren* and *Cone* (from Part I of this series) were of this type.

```
)DEF FAHREN
1: 32+(9%5)X CEL
)DEF CONE
1: 'THE AREA OF THE BASE IS'
2: 3.1416X RAD * 2
3: 'THE VOLUME OF THE CONE IS'
4: (3.1416%3)X (RAD * 2)X HT
```

A monadic program requires one argument. Let's rewrite the program *Fahren* in monadic form. The first name in the title line is the name of the function, the second is the variable name for the data that will be input.

```
)DEF FAHREN CEL
1: 32 + (9%5)X CEL
```

To call a monadic program, type the name followed by the value or values of *CEL*.

```
Enter: FAHREN 0
```

```
Result: 32
Enter: TEMP←0 2 4 6 8 10
Enter: FAHREN TEMP
Result: 32 35.6 39.2 42.8 46.4 50
```

Notice that typing the name *Fahren* alone without a value produces a syntax error.

A dyadic program requires two arguments, one before and one after the name. Let's rewrite *Cone* in dyadic form. In this form, the title line contains three names. The first and the third are the variable names and the middle one is the function name.

```
)DEF RAD CONE HT
1: 'THE AREA OF THE BASE IS'
2: 3.1416X RAD * 2
3: 'THE VOLUME OF THE CONE IS'
4: (3.1416%3)X (RAD * 2)X HT
```

To find the area and volume of a cone with radius of 3 and height of 4,

```
Enter: 3 CONE 4
Result: THE AREA OF THE BASE IS
28.2744
THE VOLUME OF THE CONE IS
37.6992
```

Local and Global Variables

Fahren as written above does not save the Fahrenheit temperature that it computes in line 1. You can correct this by assigning the results of the computation to a variable. That value is then available outside *Fahren*—it can be used in another operation or called by another program. Change the program to read:

```
)DEF FAHREN CEL
1: F←32+(9%5)X CEL
2: F
```

The second statement is needed to display the value of *F*, since the assignment statement does not do that.

Since the variable *F* is used inside *Fahren*, and is also available to other programs, it is called a global variable. The variable *CEL* in this program is a local variable; its value is not available outside *Fahren*. Prove that to yourself by entering *CEL*.

In the niladic version of *Fahren*, the value of *CEL* must be assigned before calling *Fahren*. Since it is assigned elsewhere, it can be used elsewhere. It is a global variable.

Another example of a niladic program is the *Turtles* program presented in Part II of this series. No data is required for *Turtles*, so it can't be rewritten in monadic or dyadic form. The program uses three variables: *ROW1*, *ROW2*, and *INDEX*. Although they originate inside the program, they are

global variables and carry values out of the program when it has been executed.

)DEF TURTLES

```
1: ROW1←184 190 191 191 188 184 140
2: ROW2←130 129 128 128 131
3: INDEX←1
4: # ROW1
5: # ROW2
6: INDEX←INDEX + 1
7: →(INDEX < 8)/4
```

If you want the three variables to be treated as local variables, change the form of the title line to)DEF TURTLES; ROW1; ROW2; INDEX.

It's a good idea to treat any variables as local unless you have a specific global purpose in mind. In this way, you can use the variable names in another program without danger that they will carry in unwanted values.

Programs with Explicit Results

Fahren as written can be called directly, but it cannot be used within another operation. To do that, you must rewrite Fahren to produce an explicit result. At first this seems like the version above, but in a program with an explicit result, the form of the title line is different.

)DEF Z←FAHREN CEL

```
1: Z←32+(9%5)X CEL
```

Unlike F in the last example, the variable Z is local; it does not pass its value outside of the function Fahren. Now that the program has an explicit result, you can call it directly (you could do this with the above version, too), or you can use it in another operation or program.

Enter: TEMP←FAHREN 10

Enter: TEMP

Result: 50

When a program is written with an explicit result, that result will be displayed. A separate line naming it is not needed.

Reduction

The reduction function is used only with vectors. It uses the slash symbol preceded by another symbol. When combined with a plus sign, all elements of the vector are added. For example, + / 5 3 9 7 is evaluated in the same way as 5 + 3 + 9 + 7. The following example computes the mean of five numbers.

Enter: VEC←2 4 6 8 10

Enter: N←5

Enter: (+ / VEC) % N

Result: 6

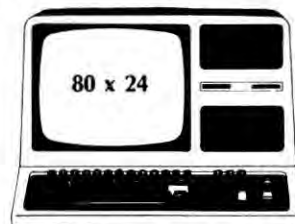
TRS-80®
MOD. III

FINALLY

TRS-80®
MOD. I

80x24 VIDEO DISPLAY PLUS! 112 K AND CP/M®

Others offer you CP/M or 80x24.
We give you what you've been waiting for.



SPRINTER™ "Double Your Speed"

Speed-up cuts computer operation time for accounting, word processing, etc., in half. Saves Time and Money.

- Automatic Slow-down for disk I/O (defeatable).

SPRINTER III (MOD. III) \$99.50
SPRINTER I (MOD. I) \$99.50

"DOUBLE DENSITY ADAPTER" \$129.50

- Run 5 1/4 or 8" drives
- Adapter utilizes new technology for high performance at a lower price.

"MODEL III Disk Controller/Clock"

- Double density, 8" capability, battery powered, **clock calendar**. Assembled board only (DX-3D) \$229.50
- Complete Drive O package — DX-3D, drive, power supply, brackets \$599.00

SPECIAL!!! HOLMES EXPANSION INTERFACE SYSTEM (Mod. I) \$399.00

- Includes: Double Density Disc Controller (DX-2D), RS232 w/32K RAM (RX-232M), Metal enclosure (MF-1).

Double Density Disk Controller
w/8" drive capacity (DX-2D) \$189.95
RS232 (RX-232) \$119.50
RS232 w/32K
(RX-232M) \$199.50
Case/power supply — for
4 plug-in boards (MF-1) \$99.50
Case — for
2 plug-in boards (MF-2) 79.50

VID 80™ "80 Character Video"

- Adds all the extra ram and logic necessary to convert to an 80 character, 64K or 112K CP/M system.
- Functions in 80x24 or 64x16 character mode.
- Software patches available for many programs.†
- Reverse video (full screen).
- Improved graphic resolution.
- Easy plug-in installation inside case.
- Two models available:
Model III (VX-3) and
Model I (VX-1)
- CP/M system requires purchase of Holmes CP/M package.
- VX-1 requires upgraded monitor for 80x24.
- VX-1 requires purchase of MF-1 or MF-2.

VID 80 (VX-3, VX-1) \$279.95
VID 80 plus 64K CP/M
(Holmes package) \$399.00
VID 80, Holmes CP/M package
and 64K added memory
(112K total) \$499.00

"48K MEMORY
WITHOUT AN INTERFACE"

- Adds memory INSIDE keyboard up to 48K

IM-2 w/16K (32K total) \$119.50
IM-2 w/32K (48K total) \$139.50
†Call or write for price

holmes
engineering inc.

Peripherals Division
3555 South 3200 West
Salt Lake City, Utah 84119
(801) 967-2324



153

DISTRIBUTORS:

Bi-Tech, N.Y. (800) 645-1165
Level IV Products, MI (800) 521-3305
M & M Micro Mart,
Quebec, Canada (514) 731-9486
Soft Sector Marketing,
MI (800) 521-6504
DEALERS:
CIE, CA (714) 757-4849
OK Electronics, CA (714) 749-0299
Bond Exchange, CA (213) 681-6797
Dimensional Software,
CA (714) 275-4243
Ebert Personal Computers,
CO (303) 693-8400
Apparat, Inc., CO (303) 741-1778
Ace Computer Products,
FL (305) 427-1257
Comptek, FL (305) 267-6414
Commtek, GA (404) 396-0034
EBG & Associates, IL (312) 782-9750
Radio Shack, IL (309) 944-4111
Stephen-Christopher Co.,
IL (312) 662-2356
A-Computer Store, IN (317) 898-0331
Projects of America, KS (316) 231-3670
Microware, KS (913) 631-2029
Perry's Computer System,
KY (502) 754-5313

Software Support, MA (617) 872-9090
Computontix, MA (617) 533-8433
Vespa Computer Outlet,
MI (313) 538-1112
Alternate Source, MI (517) 482-8270
Compute Unlimited,
MI (517) 631-3090
Computer Shack, MI (313) 673-2224
Cosmopolitan Electronics,
MI (313) 397-3126
Computer Place, MN (612) 869-3245
Cosmopolitan Electronics,
MI (313) 397-3126
Micro Support Services,
MO (314) 474-6064
I Compute, MO (314) 449-7880
Micro Innovations,
MO (314) 962-1638
Mountain Data, MT (406) 622-5651
Computer Stuff, NM (505) 256-9708
Hewitt's Computer,
NM (505) 883-0984
Info Inc., NY (516) 924-9229
Jerry's Computer, OH (216) 579-0648
Micro Data Supplies,
OH (216) 951-6502
Progressive Electronics,
OH (614) 653-1329
Heart to Heart Computer Services,
OH (513) 663-4558

Golden Fantasies, OR (503) 484-2834
Stevens Radio Shack,
PA (215) 933-3441
Montezuma Micro, TX (214) 339-5104
CTL Associates, TX (713) 444-5405
Micro Mart, TX (512) 349-9741
East Coast Data, VA (804) 484-6636
Tidewater Data, VA (804) 397-9636
Freedom Micro-Systems,
VA (703) 228-5800
WCS, WA (206) 747-3495
ABC Computer, WA (206) 775-6944
FOREIGN DEALERS:
National Management Services,
Quebec, Canada (514) 387-2609
International Software,
Victoria B.C., Canada
382-1344
MicroDeal, Bodmin,
England (0726) 850821
Victor Saleh, Middlesex, England
Graphie France, Paris, France
ASP Microcomputers,
East Malvern, Australia 211-8555
Computerware,
Koeln, West Germany
Computer Service,
Buerstadt, West Germany
Moonbase Computer,
Scotland (041) 883-1189

TRS-80 is a registered trademark of Tandy Corporation. CP/M is a registered trademark of Digital Research.
One year warranty on all products. Add Shipping/Handling — MF-1, MF-2, \$9.00 U.S., \$15.00 Canada, Overseas \$30.00.
Other products add \$5.00 U.S. & Canada. All others add 15%. Prices subject to change without notice. **DEALER INQUIRIES INVITED. FOR INFORMATION SEND SELF ADDRESSED STAMPED ENVELOPE.** Reader service takes 8 weeks.

If the parentheses are omitted, each element of the vector is divided by five before reduction is done. In the example above, the result is the same either way. Usually, however, a reduction operation should be enclosed by parentheses to ensure that reduction is done before the other operations.

Reduction can also be used with multiplication, using the symbols shift X/.

```
Enter: CUBE←2 3 4
Enter: ■X/CUBE
Result: 24
```

Reduction can also be used with subtraction and division, but it is probably better not to try. Because reduction is performed in right-to-left order, the results are hard to predict. For example, % / 36 24 12 6 would be executed in the following way:

```
12%6=2
24%2=12
36%12=3
```

It is difficult to think of an application for this computation where the hazards do not outweigh the benefits.

Reduction with Maximum and Minimum Functions

Reduction in combination with the maximum function returns the highest number in the vector. Minimum reduction returns the lowest number.

```
Enter: VEC←1 2 3 4 5 6 7 8 9 10
Enter: ■H/VEC
Result: 10

Enter: ■L/VEC
Result: 1
```

Reduction with Logical Operators

AND reduction yields a result of one only if all elements of a vector are one. OR reduction yields zero only if all elements are zero. NAND reduction produces zero if all elements are one; NOR reduction produces one if all elements are zero.

Here is an example of AND reduction:

```
→(1=&/B)/5
Read: "Go to statement 5 if all elements in vector
B are true."
```

Index Generator (Monadic)

The index generator, which uses the

symbol shift L, produces a vector consisting of the integers one through the argument.

```
Enter: ■L 5
Result: 1 2 3 4 5
```

The next example combines the sum reduction and the index generator functions. First, a five-element vector is produced, and then its elements are added together.

```
Enter: +/■L 5
Result: 15 (sum of 1 through 5)
```

Shape Function (Monadic)

The shape function produces the number of elements in a vector. When applied to a literal vector, shape works like LENS in Basic. It counts the number of characters, including embedded spaces. The symbol is shift P.

```
Enter: ■P'JOHN JONES'
Result: 10
```

The following example computes the mean of the elements in a vector. It is more efficient than the mean done earlier because you don't have to count and enter the number of elements as a separate value.

```
Enter: VEC←2 4 6 8 10
Enter: +/VEC%■P VEC
Result: 6
```

Reverse Function (Monadic)

This function reverses the elements in a vector. Shift R is the symbol. The example below uses both the reverse function and the index generator. Working from right to left, the index is generated, then it is reversed.

```
Enter: ■R■L 9
Result: 9 8 7 6 5 4 3 2 1
```

Reshape Function (Dyadic)

Reshape (shift P) constructs a vector consisting of identical elements. Its size is indicated by the first argument.

```
Enter: 5■P5
Result: 5 5 5 5 5
```

Reshape can also create a vector consisting of graphics characters. Try 5■P#191.

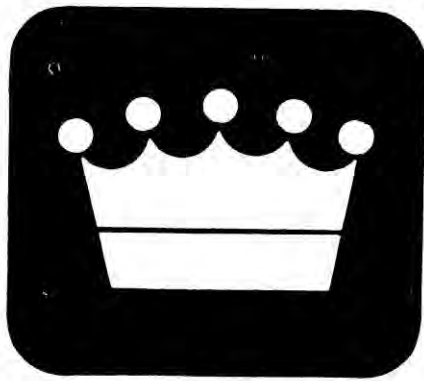
If more than one number or character follows the symbol, they will alternate in the vector that results. Try 60■P'%'.

The next example shows how the

```
)DEF TEST
1: #28; #31
2: I←1
3: SCORE←0
4: 'FOR EACH STATEMENT, ENTER T OR F.'
5: 'APL STANDS FOR ALL-PURPOSE LANGUAGE.'
6: ANSWER
7: 'ON A STANDARD APL KEYBOARD, THE GREEK LETTER RHO'
8: 'IS USED FOR THE SHAPE AND RESHAPE FUNCTIONS.'
9: ANSWER
10: 'APL CANNOT BE USED TO PRODUCE SCREEN GRAPHICS.'
11: ANSWER
12: 'A USER-DEFINED FUNCTION MUST HAVE AN EXPLICIT RESULT'
13: 'IF IT IS TO BE CALLED BY ANOTHER FUNCTION.'
14: ANSWER
15: 'VARIABLES USED IN A USER-DEFINED FUNCTION ARE'
16: 'LOCAL UNLESS THEY ARE INCLUDED IN THE TITLE LINE.'
17: ANSWER
18: 'YOUR SCORE IS';SCORE;'RIGHT OUT OF';P KEY;'QUESTIONS.'

)DEF ANSWER; RES
1: KEY←1 1 0 1 0
2: RES←■M
3: →(RES='T')/TRUE
4: RES←0
5: →COMPARE
6: TRUE: RES←1
7: COMPARE→(KEY(I) $ RES)/ WRONG
8: 'CORRECT!'
9: SCORE←SCORE + 1
10: →INDEX
11: WRONG: 'THAT IS NOT THE RIGHT ANSWER.'
12: I←P 1
```

Program Listing



**THE KING
OF
UTILITIES
SUPER UTILITY PLUS**

*"I believe
SUPER UTILITY or
SUPER UTILITY PLUS
should be present at
every TRS-80 disk
installation."*

*We didn't say this; Paul Wiener did in 80
Microcomputing, Jan. '82...but we sure
agree with him!*

You heard about it! You read about it (80
Microcomputing). Now get the "cadillac"
at a special price!

Compatible with MOD I, and MOD III, and
all the current operating systems! Copy
files from any DOS to any DOS, MOD I or
III, without converting!

- Zap
- Purge
- Format
- Special Format
- Disk Repair
- Memory
- File Utility
- Tape Copy
- Format without erase
- Disk Copy
- Special Disk Copy
- Configurable System

MUCH MORE Mod I & Mod III on Same Disk

For MOD I/III . . . \$74.95

NEW

Back up copy **NOW** included.

Also Available:
Super Utility Plus Tech. Manual . . . \$14.95
"Inside Super Utility Plus" . . . \$19.95



**THE MOST POWERFUL, FLEXIBLE
DISK MAILING SYSTEM FOR THE TRS80
*SUPPORTS 65,000 NAMES***

PowerMAIL is a highly sophisticated
mass mailing system designed to run
under all of the popular DOS's currently
available for the Mod I or III. The program
is written entirely in machine language for
maximum operation speed, and occupies
only 4K of the available RAM in your
computer. There are no 'slow' periods
when PowerMAIL is running. New
features have been added to the program
that others have always lacked. You now
have the ability to keep track of mailings
using the 24 'flags' that are incorporated
into the PowerMAIL program. The
PowerMAIL system will handle a file up to
8 megabytes, or 65535 names, whichever
is smaller. The program will run in as little
as 32K and one disk drive, although 48K
and 2 drives are desirable. The program
will also sort the entire maximum file size
and open up to 168 files simultaneously
during the process. Author Kim Watt.

For MOD I/III...\$99.95

**Hundreds of Satisfied
Users...Scriplus 3.0**

Scriplus is a modification to
Scripsit*™ which enables you to take
advantage of the special functions,
features, and print formats of your
printer while your document is being
printed. Allows you to:

change expanded print
change no. of lines per inch
or underline in mid-line;

Features:

- Compatible with all current DOS's (I or III)
- Modifies ALL versions of SCRIPSIT*™
- Allows usage of MOD I version on MOD III
- Allows MOD III versions to be BACKED UP for your protection.
- Files can be killed, loaded, merged, or chained from the Scriplus directory.
- Scriplus supplies an ALPHABETIZED directory with FREE space shown.
- "END" returns to DOS READY instead of rebooting.
- Printer can be stopped for insertion of text or forms alignment. Inserted text can be edited prior to resumption of printing.
- Specifically written for the MX-80 but will work with any printer that accepts CHR3 codes for control.
- Optionally select line feed after carriage return.

For MOD I/III . . . \$39.95



This Special Limited Edition Package will be in high demand as only 500 copies will be made. They will be numbered 1-500 and will be personally signed by the author, Kim Watt. YOUR name will be embedded in the program as the serial number. The following is included with this SPECIAL LIMITED PACKAGE:

- 1) SUPER UTILITY PLUS S/E in /CMD File Format. Both MOD I and III versions are included, and your NAME will be the serial number. This will NOT be a protected disk, and you may make as many BACKUPS as you wish. The serial number is NOT changeable.
- 2) TWO attractive SU*/SE binders.
Binder #1 will include:
Three manuals in LARGE format (8 1/2 x 11")
(a) SUPER UTILITY+ Manual
(b) INSIDER SUPER UTILITY by Paul Wiener/
foreword by Kim Watt
(c) SUPER UTILITY TECH Manual by Kim Watt &
Pete Carr
- 3) Binder #2 will include THE SOURCE CODE for SUPER UTILITY PLUS.

Yes...the SOURCE CODE to this MAJOR program will be available to 500 programmers. This is FULLY commented by the author, Kim Watt, and is a machine language programmer's dream come true! After reading this, your machine language programming skill should increase tremendously. All of Kim's knowledge in ONE book! All at your disposal and for YOUR use.*

- 4) The license to USE Kim Watt's sub-routines... will be granted to those 500 registered owners! These 500 ONLY will be able to apply all of Kim's magic to THEIR programs. NO royalty fee necessary. In other words, IMPROVE YOUR PROGRAMS! Take Kim's ideas and expand on them! Never has anything EVER been done like this before. These 500 ONLY have the right to use our sub-routines. This information is NOT being put in the public domain. We are allowing these 500 to use our routines by buying our special package...All copy rights and trademarks are retained by Breeze/QSD, Inc.
- 5) SU*/SE is NOT available from any dealer, but only directly through Breeze/QSD, Inc. Customers will be handled on a one-on-one basis. Confirmed orders will be pre-registered and a matching card must be returned by purchaser for full support from Breeze/QSD, Inc. We will know who each and every owner is, so full support can be given. We DO want you to sign and return our registration card for this support to commence, however. No exceptions will be made.
- 6) This is a very important step that we are taking, and only a select group can appreciate the value in a package like this. This is NOT for the general mass market. It is a college education in machine language written by a recognized expert. It IS SU* in /CMD file form. It is a license to use Kim Watt's sub-routines. It is an opportunity to vastly improve your product. It is a collector's item, also. Limited. Indeed. Last, but not least, it is expensive. On the surface only, however, as this product will make you an expert programmer if that is what you want. You can literally write a DOS from studying the code! It will also make you a member of an elite group that has access to Kim's knowledge and can USE that knowledge to YOUR benefit.

Source Code is FULLY Commented.

**Price for the Super Utility Plus-
Special Edition is
\$500**

Available later this year
Call or write for more information

*Credit to Kim Watt and Breeze/QSD must be given in the program and in the documentation for sub-routines used. There is NO royalty fee to pay however.



A DIVISION OF BREEZE/QSD, INC.

11500 STEMMONS FWY.
SUITE 125
DALLAS, TEXAS 75229
(214) 484-2976

315

ORDER TOLL-FREE 1-800-527-7432

reshape function can be used to duplicate the Basic LEFT\$ function.

Enter: NAME←'1. MISS PIGGY'
 Enter: NUMBER←2■P NAME
 Enter: NUMBER
 Result: 1.

Indexing Function (Monadic)

This function is written like a subscript following a vector name, that is, a value is enclosed in parentheses. The value within parentheses indicates which elements of the vector will be returned. Thus, VEC(4) returns the fourth element of the vector VEC.

More than one value can be accessed. VEC(2 3) produces a vector consisting of the second and third elements of VEC. An expression can also be used within the parentheses. VEC(1+2) returns the third element of the vector VEC.

The next example combines multiplication reduction with indexing.

Enter: VEC←1 2 4 8 16 32 64
 Enter: ■X/VEC(2 4)
 Result: 16

The next example selects a random character from a literal.

Enter: LETTERS←'ABCDEFGH'

JKLMNOPQRSTUVWXYZ'
 Enter: LETTERS(2/26)

An index variable may be assigned a new value. You can change selected elements of a vector in this way.

Enter: NAME←'MISS PIGGY'
 Enter: NAME(2 3 4)←'RS.'
 Enter: NAME
 Result: MRS. PIGGY

The indexing function and the index generator can be used together as another way to duplicate the LEFT\$ function.

Enter: LETTERS(■1 5)
 Result: ABCDE

One more example:

)DEF WORDSCRAMBLE
 1: QUESTION←'ZUEPZL'
 2: QUESTION
 3: ANSWER←QUESTION (4 2 1 5 6 3)

To play, enter the name Wordscramble. To see the answer, type "answer."

Quad

I introduced the quad symbol in Part

I as a way to perform a computation and print the result in a single statement.

Enter: ■Q←-3+4■X7■X2
 Result: 53

When quad is used on the right side of an assignment statement, it produces an input prompt.

)DEF MULT; ANS
 1: START:'10X3='
 2: ANS←■Q
 3: →(ANS=30)/RIGHT
 4: 'WRONG';→START
 5: RIGHT:'YOU ARE RIGHT.'

Line 4 contains two statements separated by a semicolon. If you use multiple-statement lines, be sure the first statement is not a branch or a conditional statement.

To improve the appearance of this program, press the down arrow after 'WRONG'. The repeat question will then appear on a separate line.

Note the format of the title line. ANS is a local variable because it is named in the title line and separated from the program name by a semicolon.

DISCOUNT PRINTER RIBBONS

Brand New, Top Quality, Exact Replacement Ribbons & Cartridges. These Ribbons Produce **Super Jet** Black Impressions and Ultra Reliable Print Life. They Are Delivered to Your Door Promptly for Much Less Than Most Retail Stores

★SPECIAL! BUY 10 and GET ONE FREE!

40% OFF!! OR MORE!



YOUR PRINTER	PACK SIZE	RETAIL LIST**	YOUR WHOLESALE PRICE	SIZE	COMMENTS	CAT. ORDER#
ANADIX 9000 Series	1/pk	14.00 ea	14.00	500	Nylon Jet Bk	C-777
CENTRONICS 700-703, 737, 779	3/pk	18.95/3 pk	11.95/3 pk	563" x 45'	Nylon Jet Bk	C-700
CENTRONICS 100, 101A, 102, 103, 300, 301, 306, 308, 330, 358, 398, 500, 501, 503, 508, 588, 620, 820.	3/pk	26.33/3 pk	17.55/3 pk	1" x 108'	Nylon Jet Bk	C-100
CENTRONICS 704-705	1/pk	16.95 ea	13.95/Giant Cart	5/16" x 210'	Giant Cart	C-7045
DEC 1/2 x 40YD	3/pk	17.77/3 pk	12.95/3 pk	1/2" x 120'	Double Spools	R-600
DEC 1/2 x 60YD	3/pk	20.12/3 pk	14.25/3 pk	1/2" x 180'	Double Spools	R-644
DIABLO HYTYPE II (M/S BLK) HI YIELD FITS 70 PRINTERS!	1/pk	9.31 ea	6.87 ea	5/16" x 300,000 plus imp.		C-511
EPSON MX70 80	1/pk	16.00 ea	16.00 ea	500" x 60	Nylon Jet Bk	C-522
IBM "SILVER DOLLAR" Sys 34, Sys 32 MDLA, Series IMDL4974, 5256, 3287, 3770, 3771-3774, 4974, 5100, 5103, 5110, 5228, 5256, 5320MDLA	5/pk	5.80 ea	14.90/5 pk	9/16" x 30'	Nylon Jet Bk	R-300
IBM - HARMONICA 1/2" SERIES I, MOD 4973/II, 3200, 3289, MOD 2.	3/pk	9.42 ea	20.85/3 pk	1 2" x 108'	Nylon Jet Bk	C-350
NEC SPINWRITER	4/pk	23.40/3 cart	23.60/4 pk rb. reload	1 2" x 51'	Nylon/Ex Lng Life	R-400
QUME (FITS 80 PRINTER MODES)	3/pk	18.00/3 pk	13.95/3 pk	1 4" x 310'	Multistrike Film	C-525
RADIO SHACK DAISY WHEEL II	1 pk	24.95/3pk	8.25	250"	Mylar Multistrike	C-789
RADIO SHACK LP1II, LPV	one. pk	13.95/cart	8.95/Reload rib only	500" x 45'	Nylon Incl Instr	R-73
RADIO SHACK LP1I, LPV	3/pk	18.95/3 pk	11.95/3 pk	563" x 45'	Nylon Jet Bk	C-700
TELETYPE MOD 33, 28, 35, 37, 38, 88	10/pk	2.40 ea	13.90/10 pk	1 2" x 36'	Nylon Jet Bk	R-450
WANG M/S 5541W, WC, 5581 WD, 6581W, 2281W	1/pk	6.85 ea	5.95 ea	5/16" x 393'	Multistrike Film	C-550

TERMS:
 MINIMUM PURCHASE - \$20
 PAYMENT BY: C.O.D. (UPS), CHECK, MASTER CARD, OR VISA CHARGE CARD.
 VOLUME DISCOUNTS:
 20 - 50 PACKS 10%
 51 - 100 PACKS 15%
 *UNDER \$20, ADD \$5 HANDLING.
 **APPROX. RETAIL. PRICE VARIES.

ANCIE LABORATORIES
 5200-J Philadelphia Way 301-345-6000 (Wash. D.C. Local)
 Lanham, Maryland 20706 301-792-2060 (Balto, MD Local)
800-638-0987 (National)

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

QTY _____

CAT.# _____

AMT. _____

Check Enclosed

C.O.D.

VISA

MASTER CHARGE

ACCT. # _____

EXP. DATE _____

MIN. ORDER \$20

PRICES SUBJECT TO CHANGE

ANCIE Laboratories 284 301-345-6000 (Wash. D.C. Local)
 5200-J Philadelphia Way 301-792-2060 (Balto, MD Local)
800-638-0987 (National)



THE COMPUTER CONNECTION

Controller Boards that give you the time of day!

Upgrade Kit

Putting Disk drives into your TRS-80 Model III will turn it into the powerful computer it was designed to be. The B.T. Enterprises DISK DRIVE INSTALLATION KIT is easy to do and represents a substantial savings over the cost if done by Radio Shack.

The kit was designed to be installed by a non-technical person, and takes an average of 45 to 75 minutes to complete. The only tools necessary are a phillips and flat head screw driver and a pair of diagonal cutters. No cutting of traces or soldering is necessary.

KIT CONSISTS OF:

- The NEW HOLMES Controller Board with real Time Clock & battery included completely assembled & tested
- Switching power supply
- Disk drive mounting brackets
- All cables and hardware
- Instructions with diagrams
- Drives are optional

*Controller Board supports 8 inch external drives and extended density 5-1/4 inch drives (dual headed and 80 track)

203104	*Upgrade Kit	\$329.50
203114	*Upgrade Kit w/2 40tk	\$729.50
203115	*Upgrade Kit w/2 40tk DH	\$949.50
203116	*Upgrade Kit w/2 80tk	\$949.50
203117	*Upgrade Kit w/2 80tk DH	\$1149.50

*INTRODUCTORY SPECIAL — NOW AVAILABLE WITH DOS PLUS 3.4 FREE

203004	Controller Bd. w/Real Time Clock & Battery	\$229.50
200500	Switch Power Supply (3 voltages)	\$75.00
203010	Controller Assembly Kit	\$50.00
203510	Controller Assembly Kit w/Power Supply	\$110.00
213001	16K Memory Kit	\$19.95
213002	32K Memory Kit	\$34.95
DH	Dual Headed	
Add \$2.00 Shipping and Handling		

B.T. Hard Disk Model III

Starting with a basic TRS-80 Model III, add one Tandon 40 Track Dual Sided Disk Drive, 48K of High Grade NEC Memory, the famous Holmes Engineering Disk Controller System with Real Time Clock and the security of B.T. Enterprises engineering, assuring long life, and dependability!

Then we really get started; include a 4 MHZ Module installed to make the Model III Microprocessor operate at twice the speed of a standard Radio Shack Model III. Also include the use of a Superdense Disk Drive for extra Floppy disk storage. Then have installed a Hard Disk Drive (Winchester Technology). When the system is configured, the Hard Disk Drive contains the operating system and becomes the master (primary) drive. The Hard Disk has 40 times the speed of data transfer as compared to a normal floppy disk as well as containing the storage capacity of more than 30 standard floppy disk drives.

Each unit is built and tested in our Long Island, New York assembly plant and delivered to your dealer complete with a Dos Plus 4.0 Hard Disk Operating System which we consider to have the finest features of any Operating System available.



TRS-80 is trademark of Tandy Corp.

AVAILABLE CONFIGURATIONS

4 x 5	5 Megabyte Formatted Storage	\$3995.00
4 x 10	10 Megabyte Formatted Storage	\$4145.00
4 x 15	15 Megabyte Formatted Storage	\$4295.00
Add \$20.00 Shipping & Handling		

B.T. Hard Disks

We want you to have all the power that your TRS-80 is capable. These Five, Ten and Fifteen Megabyte units are easy to use, just plug them into the expansion buss of your Model I or Model III. Comes complete with the fantastic DOS PLUS 4.0 Operating System!

SYSTEM PRICING

5 Megabyte Winchester Fixed Disk		
201505	Model I Version	\$2399.95
203505	Model III Version	\$2399.95

10 Megabyte Winchester Fixed Disk		
201510	Model I Version	\$2549.95
203510	Model III Version	\$2549.95

15 Megabyte Winchester Fixed Disk		
201520	Model I Version	\$2699.95
203520	Model III Version	\$2699.95

Add \$10.00 shipping and handling



B.T. Enterprise Dept. 1B
10B Carlough Road
Bohemia, N.Y. 11716
(516) 567-8155 (voice)
(516) 588-5836 (modem)

B.T. Enterprises is a division of Bi-Tech Enterprises Inc.

Dealer Inquires Welcome
Prices Subject to Change
N.Y.S. Residents Add Tax

✓300

Orders Only
800 645 1165
N.Y. Call (516) 567-8155

American Express, Carte Blanche, Diners Club, MasterCard and VISA accepted.

Literals can be used with quad, but they must be enclosed in single quotes. A variation of quad is quote quad, produced by typing shift M. Quote quad allows the use of literals without single quotes. No prompt is displayed.

Membership Function (Dyadic)

The membership function (shift E) is a way of asking whether a character or a variable is a member of a set. For example, 'A' E 'ABCDE' asks if A belongs to the set 'ABCDE'. Since it does, a one is returned.

```
4 E I 9
Read: "Is 4 a positive integer between 1 and 9?"
4.2 E I 9
Read: "Is 4.2 a positive integer between 1 and 9?"
```

In the second example, a zero will result, because 4.2 is not a member of the set.

If the argument to the left of E is a vector, then the resulting vector will consist of ones and zeros, indicating for each element of the original vector whether it is a member of the vector following E.

```
Enter: DIGITS ← '0123456789'
Enter: 'R2D2' E DIGITS
Result: 0 1 0 1
```

Take Function (Dyadic)

The take function (up arrow) strips elements off the left side of a vector.

```
Enter: LEFT ← I 5
Enter: 2 ↑ LEFT
Result: 1 2
```

Although you have seen two other ways of duplicating the Basic LEFT\$ function, this is the most direct method.

Take can also be used with literals. It could be used, for example, to restrict names in a mailing list to a certain length.

```
Enter: NAME ← 'YOUR NAME IS TOO LONG'
Enter: 18 ↑ NAME
Result: YOUR NAME IS TOO L
```

Characters can be taken off the right side by using a negative integer with take.

```
Enter: -18 ↑ NAME
Result: R NAME IS TOO LONG
```

Drop Function

Drop (shift, down arrow) also removes elements from a vector, but it re-

turns the remainder of the vector, not the stripped-off items.

```
Enter: INDEX ← I 5
Enter: 2 ↓ INDEX
Result: 3 4 5
```

Used with a negative number, drop removes elements from the right side.

```
Enter: -2 ↓ INDEX
Result: 1 2 3
```

The last example appears to be the same as 3 ↑ INDEX. However, there are situations in which only one of the two functions will work. For example, if the length of INDEX is not known, and you want to remove two elements from the left side, only drop would do the job.

Grade-up (Monadic)

The grade-up function, like the take function, uses the up-arrow symbol. Use it to arrange the elements of a vector from lowest to highest. The ordering is not done directly by grade-up. Instead, a vector is produced that is the index of the correct order. Here is an example:

```
Enter: VEC ← 2 1 -4 7 3 9 -8
Enter: ↑ VEC
Result: 7 3 2 1 5 4 6
```

The lowest element of VEC is -8. Since that number would appear first if the vector were rearranged, a seven is the first digit in the index vector, indicating that the seventh element would be the first listed if the vector were reordered from low to high.

To do the actual reordering, use ↑VEC to index VEC, as follows:

```
Enter: VEC(↑VEC)
Result: -8 -4 1 2 3 7 9
```

Grade-down (Monadic)

Grade-down is the reverse of grade-up. Its symbol is produced by typing shift, down arrow, and it produces an index vector for rearranging the elements of a vector from highest to lowest.

```
Enter: ↓ VEC
Result: 6 4 5 1 2 3 7
Enter: VEC(↓VEC)
Result: 9 7 3 2 1 -4 -8
```

Both grade-up and grade-down can be used with literals.

```
)DEF YOURNAME
1: 'ENTER YOUR NAME'
```

```
2: NAME ← M
3: NAME(↑NAME)
4: NAME(↓NAME)
```

Index Of (Dyadic)

This function is used to locate a value within a list. The argument before the symbol, shift I, is the name of the list; the argument following the symbol is the name of the value or variable being searched. When the search is for a literal, it must be enclosed in single quotes.

```
Enter: NAME ← 'GEORGE P. SMITH'
Enter: NAME I '.'
Result: 9
```

The resulting integer indicates the position of the period character within NAME. If the character appears more than once, only the first position is returned.

```
Enter: NAME I 'E'
Result: 2
```

The next example removes the middle initial from a name. Line 1 locates the initial. Lines 2 and 3 isolate the first and second names through the use of the take and drop functions.

```
)DEF SHORTNAME; I; F; S
1: 'ENTER A NAME CONTAINING AN INITIAL'
2: NAME ← M
3: I ← NAME I '.'
4: F ← (I_2) ↑ NAME
5: S ← (I + 1) ↓ NAME
6: F, S
```

The last program (see the listing) is a true-false test. The main program is called Test, and it uses a subprogram called Answer. The questions are put into the main program, and the answer key is entered in Answer as a vector assigned to the variable KEY. KEY contains ones and zeros corresponding to true and false answers.

Answer receives the student's response in line 2, converts the letter response to a one or a zero in lines 4 and 6. The response is compared to the answer key in line 7 to determine the appropriate message. In line 11, RES is added to SCORE to accumulate the number of correct answers.

The questions and responses will be easier to read if lines are inserted between them. To do this, press the down arrow before the second single quote in statement 4 of Test, and in statements 8 and 11 of Answer. ■

Contact Margaret Grothman at 5117 Denton Place, Madison, WI 53711.

Quatrk Computer Systems, Inc.
P.O. Box 638
Bixby, Oklahoma 74008-0638
(918) 369-1359

TAX PROGRAMS FOR TRS-80 MOD III
Complete programs for tax preparers only.
Programs (screen print only) for anyone who wants to do their taxes on the TRS-80 MOD III.

BASIC PACKAGE

SMAL LDOS OPERATING SYSTEMS
FORM 1040 - U.S. INDIVIDUAL TAX RETURN
SCHEDULE A & SCHEDULE B
TAX PREPARER'S WAIVER & INVOICING

FEATURES

MENU DRIVEN PROGRAMS
DIRECT PRINTING OF THE FORMS & SCHEDULES WHEN USED WITH MOST
DOT MATRIX PRINTERS
THE 1040 FORM REQUIRES PROPER SETUP TO BE ACCEPTED BY THE IRS
ALL TAX RECORDS ARE STORED ON DISK

COST

TAX PREPARER'S BASIC PACKAGE \$320.00
SCREEN PRINT ONLY 170.00
MANUAL & PRINT OUTS ON THE IDS PRINTER 50.00

ADDITIONAL SCHEDULES (*requires extended system)

SCHEDULE C \$ 80.00
SCHEDULE D 90.00
SCHEDULE E 110.00
SCHEDULE F 75.00
SCHEDULE G 80.00

BASIC SYSTEM REQUIREMENTS

TRS-80 MOD III WITH 48K & TWO DISK DRIVES

***EXTENDED SYSTEM REQUIREMENTS**

TRS-80 MOD III WITH 48K & THREE DISK DRIVES

TRS-80 - TRADEMARK OF TANDY CORP.

SMAL LDOS - TRADEMARK OF LOGICAL SYSTEMS, INC.

PRICE OF MANUAL & PRINTOUTS APPLICABLE TOWARD COST OF PACKAGE PURCHASED.

✓ 116

NC SFTWARE INC.:::

Model III terminal COMMUPAC is the name COMMUNICATION PACKAGE is the game

If you would like to be able to use your modem for business or pleasure in a simple and efficient manner without a lot of fuss and three weeks training out of the manual then read on... **NC SOFTWARE** has something for you.

The **COMMUNICATIONS** part is the smart terminal software to compliment the **HAYES SMARTMODEM** in ease of use and overall efficiency. A thorough and easy to use **MENU** enables verification of all program features without being unclear or confusing as to the intent. A quickscan **MINI-MANUAL** is always available (on the screen) for further reference or clarification. An **AUTO-DIAL/LOGON** feature allows the kind of use the **SMARTMODEM** was meant for. There is also a **38 K CAPTURE BUFFER** and **DOS** commands and a **FILE EDITOR** feature. **SPECIAL** characters can be generated from the keyboard as well as full control of the transmitting speed rate. A zero **ELAPSED TIME** clock will keep you informed as will the **VIEW STATUS** feature and the quickscan of a **HELP** file. Printer, RS-232 and **ECHO** toggles plus a **WARM RESTART** will keep you in control of all the capabilities **COMMUPAC** is currently running under **TRSDOS**, **NEWDOS-80** and **DOSPLUS** commands, and together with the **SMARTMODEM** makes an unbeatable combination.

The **PACKAGE** comes with a **SMARTMODEM** auto-dial and auto-answer modem. This unit not only offers simple phone hookups, pulse dialing or touch-tone, programming control via **ASCII** strings, audio monitoring, variable dialing parameters and visual signal **LED** indicators but a name, reputation, and quality in the industry that is unquestioned.

Modem & Software \$310.00 Commpac & Source \$110.00 Commpac Software \$59.95

Allow 2 extra weeks for personal checks.
\$2.50/C.O.D. ADD \$3.50 Shp/Hndl.
MINNESOTA RESIDENTS - ADD 5%

621-533-8862-Voice 612-533-1957-Modem

NC SOFTWARE INC.
7216 Boone Avenue
Minneapolis, Minnesota 55428

✓ 539



96K MODEL 1

BIGMEM* replaces the 16K keyboard RAM with 64K chips. A custom memory controller mounts inside the keyboard case to give you

- 48K keyboard memory on power-up
- plus access to 32K E/I memory.
- 2.7K RAM above ROM is available.
- Optionally overlay ROM with RAM.
- **BIGMEM** works with TRS-80** DOS or
- remaps kybd/video for 64K CP/M***

..\$180 post paid with check or money order. COD add \$3. NYS residents add sales tax. **BIGMEM** incl. 64K RAM chips, A&T controller board, internal cable, wire, solder and instructions.

MICROHATCH

PO Box 501

DeWitt, NY 13214

(315)446-8031 after 6PM

✓419

Trademarks of *Microhatch, **Tandy Corp. and ***Digital Research.

Need More Serial Ports ?



- ★ Add a BTA smart multiport controller to your C.P.U.
- ★ The **MODEL 524** expands a single RS232 port to four individual ports with port selection and baud rate controlled by user software.
- ★ Buffered inputs permit simultaneous operation increasing data exchange rate.
- ★ 62K spooler model also available.

Price
\$249.00

Bay Technical Associates

P. O. Box 387, Bay St. Louis, MS. 39520

601 - 467-8231

✓243

TAXAID

Your Federal Income Tax & estimates with less pain, strain and time!

Great for April 15; terrific for keeping up with changes all thru the year. Change any items and new tax is recalculated for you. "What if" all you please to make better financial decisions!

Use your copy of Visicalc (tm) with our data files — over 80K.

Form 1040, Sched A,B,D, Forms 2106, 2441 and 5695 for \$13.95, add \$5.00 for Sched C,E,G,SE & Forms 3468, 4562.

Mod I/III 48K Disk, on 35 trk SD diskettes
Printer w/15CPI desirable for 8" paper
Check/MO, 1st Class Mail Ppd.
Deductible, of course.

OCR Associates

Rt. 1, Mount Dr., Sevierville, TN 37862
(tm) VisiCorp 615-453-1892

COLOR COMPUTER® GAMES!!

Machine language, fast-action, high-resolution color graphics with sound. 16 K and joysticks required.

	disk	cassette
UFO flying saucers	15.95	12.95
AERIAL ATTACK scrolling	15.95	12.95
STAR VOYAGER		
relative motion	15.95	12.95
CREATURE FEATURE		
defend yourself	15.95	12.95
COLOR BLAST 3-D action	15.95	12.95
BOXING 2-player game	15.95	12.95

All prices postpaid.

COLOR SOFTWARE
4247 MAKYES
SYRACUSE, NY 13215

©Trademark of Tandy Corporation

✓ 267

MEMORY JOGGER™ DATA BASE MANAGEMENT SYSTEM \$34.00

A Powerful, **INEXPENSIVE**, Relational **DBMS** For Home, Personal and Business use.

- Extremely user friendly
- Completely menu driven
- Multiple keyword retrieval
- For TRS-80 Models I & III
(minimum configuration 48K, 1 drive and TRSDOS)

For disk, source code & manual, send check or money order for \$34.00 ppd (specify model) or write for information brochure.

MICRO SOFTWARE™

205 Dumaine Court
Ft. Walton Beach, FL 32548 ✓209
(904) 862-5588

TRS-80 & TRSDOS — trademarks of Tandy Corp.

reputation: a place in the public esteem or regard; a good name.

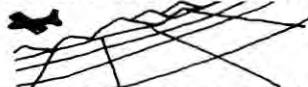
The Program Store, one of the original software companies of the '70s, began to develop its solid reputation for selection and service right from the start. Today, it offers the largest selection of TRS-80 software in America, and backs every piece of inventory with the trusted Program Store name.

DEVIL'S TOWER



By John Olsen, Jr. from Fantastic Software
It's up to you to save your planet from the aliens. They've reached the other side of DEVIL'S TOWER. Robot Scouts come at you from the mountain; their war machines fire from the valley, and their protector ships put up force fields to protect them. Your skill and reflexes may protect you. Machine language; good graphics and sound effects. For 1 or 2 players.
16K Tape, \$15.95 Save 20% 32K Disk, \$19.95
Now Thru Feb. 10: Tape \$12.76; Disk \$15.96

Unbelievable Realtime 3-D Graphics!



FLIGHT SIMULATION

By Bruce Artwick from Sub-Logic
A graphic tour de force that will truly captivate you. If you haven't seen this brilliant program, you haven't fully utilized the capabilities of your computer! During FLIGHT SIMULATION, you instantly select instrument flight, radar, or a breathtaking pilot's-eye-view. But be sure to strap yourself in—you're liable to get dizzy!

Once you put in some air time learning to fly your computer head for enemy territory and try to bomb the fuel depot while fighting off five enemy warplanes. Good Luck! Please specify Model I or III.

16K Tape, \$25.00
32K Disk, \$33.50

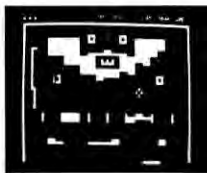
LOST COLONY



By David Feitelberg from Acorn
You are the Economic Manager of the world's first space colony. The next support ship from Earth isn't due for another 15 years, and you have instructions to make things go better or get out of office in shame. You must allocate labor, explore new territories, decide on production quotas, determine pay scales and taxes for the most productivity. You're armed with maps and charts. 10 levels of difficulty; "save the game" feature on disk.

16K Tape or 32K Disk, \$29.95

KING OF THE JUNGLE



By Vandewalle from Acorn
An unusual combination of fast pinball action plus the challenges and dangers of an arcade game. Keep the ball in play, scoring points as it caroms from obstacle to obstacle, while wandering through the jungle searching for the hidden crown. And try to avoid the deadly Cobra. Lots of action, sound and fun! Choice of 3 screens. Can be used with Trisstick joystick.

16K Tape or Disk, \$19.95

DEMON SEED



By Sorensen & MacKensie from Trend
This arcade-style game is only for the strong at heart, who are persistent enough to try and try again until the Demonic Forces have been destroyed. Your powerful star cruiser has high energy missiles and defensive shields. Can you develop the skill to defeat the Demons, and conquer the 3 special challenge levels?
16K Tape, \$19.95 Save 20% 32K Disk, \$24.95
Now Thru Feb. 10: Tape \$15.96; Disk \$19.96

ELECTRIC NOTEBOOK



From Algorix
This is a general purpose, relational data-base manager. Its data handling power far exceeds conventional indexed record file managers, and enables you to retrieve data that might be lost with conventional systems. You can enter any item: number, word, fact, sentence or relationship — up to 110 characters in length. It will support inter-dependencies of any complexity, and permits insertion and retrieval of any field. You can add new fields after working your program for a while without re-blocking of existing records; without re-writing of entire program. Although useful as is for most home and educational needs, there's a high level interface supplied in BASIC for adding your special requirements.

Will run on any DOS which supports standard TRSDOS I/O calls.

\$140.00 Requires 48K memory; Disk Drive

FROGGER



From On-Line; Cornsoft
One of the most popular arcade games ever... now available for your home computer! Just as in the arcade game, you must dodge heavy traffic and jump the moving logs in the stream to get home. Fantastic graphics! Requires joystick.

16K Tape, \$19.95 32K Disk, \$22.95

LASER DEFENSE



By Simon Smith from Med Systems
As ground controller for our Laser Satellite Defense System, you can view Eastern Europe or North America. Your job is to knock out enemy missile silos, or falling that, to zap the missiles themselves before they destroy our cities. You must be fast because the enemy is developing an anti-satellite laser of their own!

16K Tape, \$14.95 16K Disk, \$17.95

WEERD



By Arthur Gieckler from Big Five
Maybe you think you've seen some pretty strange things on your computer screen already. But you haven't seen ANYTHING until you've tried WEERD! It's you against the WEERDEST set of space craft ever! But don't just stare at them... get your shields up before they wipe out your planet! Disk version has voice sound effects and permanent high scores. Both are Trisstick compatible.
16K Tape or 32K Disk, \$19.95 Save 20%
Now Thru Feb. 10 You Pay Only \$15.96

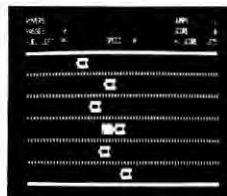
ELIMINATOR



By Westmoreland & Gilman from A.I.
You'll need all your keyboard manipulative skills to keep up with the action in this arcade game. You travel across the planet's low-altitude airspace in an effort to prevent the marauding enemy from capturing your energizer cells. All manner of alien craft await your arrival with destructive forces. For 1 or 2 players, with sound.

16K Tape, \$19.95
32K Disk, \$24.95

ENEMY EVASION



By Raul Rivera from Acorn
An original fast-paced arcade style game requiring quick mental and physical reflexes. You must control your Rover to avoid oncoming Rovellan Ramcraft. You gain points for each successful pass through the "death lanes", but the Ramcraft speed increases as you play. If you reach the double bonus mode, watch out for the land pellets they drop! Joystick compatible.

32K Disk, \$19.95

Over 1500 Programs for TRS-80,

ATARI 400/800, APPLE & IBM.

For Information Call
202-363-9797



To Order Call Toll-Free
800-424-2738

MAIL ORDERS: Send check or M.O. for total purchase price, plus \$2.00 postage & handling. D.C., MD. & VA.: add sales tax. Charge cards: include all embossed information
© 1983 The Program Store, Inc.

4200 Wisconsin Avenue, NW, Dept. 14-02-3 Box 9582 Washington, D.C. 20016

Beasts, Battles & Books



VISICALC HOME AND OFFICE COMPANION



By Castlewitz and Chisausky from Osborne/McGraw-Hill

Fifty VisiCalc models for home and office, including: investments, inventory, sales forecasts, payroll, personal net worth, home budget planning, family insurance needs. Each comes with model listings, sample printed reports and narrative. **A must for every VisiCalc owner!**
Softcover, \$15.99

TRS-80 INTERFACING, Book 1



By Jonathan Titus from Howard W. Sams

This book is written for the reader who is familiar with commands in Level II BASIC, half-way between the beginning user and the advanced programmer/designer. It introduces you to the signals available within the TRS-80 and how they are used to control external devices. You'll quickly be able to write beginning level I/O programs, and later to construct and test interface circuits used in the experiments described.
Softcover, \$10.95

TRS-80 INTERFACING, Book II



Advanced interfacing techniques for home, school, research.

Softcover, \$11.95

COMPUTERS FOR KIDS TRS-80 Edition



By Sally Larsen from Creative Computing
The BASIC programming manual written for kids, from flowcharts to color graphics. Detailed instructions and sketches plus glossary of statements and commands. With lesson plans and tips for parents and teachers.

Softcover, \$4.95

TRS-80 DISK & OTHER MYSTERIES



By H. C. Pennington from IJG
"The 'How To' Book of Data Recovery" contains information on TRS-80 disk organization and file management not available *anywhere else*. It covers: how disks are organized, how space is allocated, how files are located on disk. **Plus** information on how to *fix* disk problems like lost files or Electric Pencil bugs.

Softcover, \$22.50

SOME COMMON BASIC PROGRAMS



TRS-80 Level II Edition

By Poole, Borchers & Koessel from Osborne
76 practical programs written specifically for the TRS-80 with 4K or more user memory. Topics include: investments, loan and mortgage payment schedules, depreciation, taxes, statistics, and many mathematical applications. Each is explained; portions of programs that might be useful for other applications are identified.

Softcover, \$14.95

PRACTICAL BASIC PROGRAMS



TRS-80 Level II Edition

40 more programs for personal/business finances, math, statistics — even musical transposing.

Softcover, \$15.95

BASIC FASTER AND BETTER & OTHER MYSTERIES



By Lewis Rosenfelder from IJG

One of the most useful books ever published for TRS-80 owners. Contains a wealth of information on how to optimize your programs with special techniques. Includes libraries of functions and subroutines that can eliminate most of the drudgery of writing programs — you can write complete programs as a series of subroutine calls! With the optional library and demonstration disks, you'll have all these tools at hand without having to type them from the text.

Softcover, \$29.95

Library Disk, \$19.95 Demo Disk, \$19.95

THE CUSTOM TRS-80 & OTHER MYSTERIES



By Dennis Kitsz from IJG

The hardware hacker's delight! This book contains many, many useful modifications that could make your TRS-80 model I more reliable, easier to use, faster, and more capable! Clear, concise instructions, along with many useful construction tips, guide your way through the computer's innards. Some unique software ideas are included as well.

WARNING: some of the hardware modifications in this book will void any warranties and may cause Radio Shack to refuse repairs on modified equipment.

Softcover, \$29.95

THE SOFTSIDE SAMPLER



TRS-80 Entertainment Programs

Edited by Joan Witham from Hayden

A varied collection of ready-to-type programs for games and adventures, originally published in *SoftSide* magazine. They range from the short and simple to the long and complex, so they are ideal for a wide range of readers. You'll find battles, puzzles, mazes, even musical games!

Softcover, \$8.95

TRS-80 BASIC



A Self-Teaching Guide

By Albrecht, Inman & Zamora from John Wiley
Great idea! A self-teaching manual that teaches you the BASIC language in simple, sequential steps. Relaxed, humorous style with games, graphics and lots of practical applications.

Softcover, \$10.95

MORE TRS-80 BASIC, A Self-Teaching Guide



Picks up where TRS-80 BASIC ends.

Softcover, \$12.95

MICROSOFT BASIC DECODED & OTHER MYSTERIES



By James Farvour from IJG

At last! A complete, clear, detailed explanation of the workings of the Microsoft BASIC interpreter and operating system — in "real" English. No programmer's "jargon"; no cryptic remarks. This is an easy-to-follow book, covering every single area of the software system's operation, with tables, flow charts and *over 7000* comments.

Softcover, \$29.95

MACHINE LANGUAGE DISK I/O & OTHER MYSTERIES



By Michael Wagner from IJG

Written for the beginner or experienced user, this book explains what the floppy disk drive system is; how it works; how the disk I/O and interrupt functions should be incorporated into a working system, and how you can use it more easily and efficiently. Each function and operation described is illustrated with source code and flow chart. Includes information on complete disk I/O driver routines (Model I and III); small disk operation systems (S/OS); all about TRSDOS file I/O.

Softcover, \$29.95

16K Tape or 32K Disk, \$29.95

THE PROGRAM STORE • Dept. 14-02-3 • Box 9582 • 4200 Wisconsin Avenue, NW • Washington, D.C. 20016

Item	Tape/Disk/Book	Price	Postage	\$2.00	Name	_____
_____	_____	_____	_____	_____	Address	_____
_____	_____	_____	_____	_____	City	_____ State _____ Zip _____
_____	_____	_____	_____	_____	Card #	_____ Exp _____
_____	_____	_____	_____	_____	Computer	_____ For Models I & III unless otherwise specified.

Twinkle, Twinkle, Little Star

by Bill Grout

Who says a computer can't write? With a little bit of help from you, and some imaginative graphics, the TRS-80 becomes a poet.

Program Listing 1. "In a World Like This One"

```

5 CLS
10 PRINT"IN A WORLD LIKE THIS ONE"
20 PRINT "By Bill Grout"
30 FOR X=1 TO 800:NEXT X
40 CLS
45 PRINT"For my parents"
46 FOR X=1 TO 800:NEXT X
47 CLS
50 FOR X=1 TO 800:NEXTX
60 PRINT"                You don't believe you
                        did much in life"
70 FOR X=1 TO 1000: NEXT X
80 PRINT"                But it isn't true"
90 FOR X=1 TO 700: NEXT X
100 PRINT"                in a world like this one"
110 FOR X=1 TO 1000:NEXT X
120 CLS
130 FOR X=1 TO 200:NEXT X
140 PRINT"                You raised six honest and hard
                        working sons and a daughter"
150 FOR X=1 TO 1200:NEXT X
160 CLS
170 FOR X=1TO400:NEXT X
180 PRINT "                who are not perverts or criminals"
190 FOR X=1 TO 800:NEXT X
200 PRINT"                Nor who have psychological problems"
210 FOR X=1 TO 800:NEXT X
220 CLS
230 FOR X=1 TO 500: NEXT X
240 PRINT"                nor who love power";:FOR X=1 TO 400: NEXT X
:PRINT:PRINT"                money";: FOR X=1 TO 200:NEXT X

PRINT:PRINT"                or"
250 FOR X=1 TO 400:NEXT X

```

Listing 1 continues

Computers can read poems to you with surprisingly effective results. In fact, a computer can inject motion and graphics into a poem, offering avenues of expression not yet explored.

Professional poets may soon look into writing computer poems if for no other reason than to prove they can be technological, too. All you need to know is a little about programming in Basic.

Select a poem that you like; I selected a poem called "The Star" because I thought the computer could easily add graphics. When I began programming "The Star" on the computer, I discovered several things.

First, lines of the poem should appear on the screen, stay there long enough for the reader to understand them without being rushed, then they should go off and new lines appear. How much of the poem appears on the screen at a time varies to make the reading more inter-

The Key Box

**Models I & III
16K RAM
Level II**

QWERTY DAISYWHEEL II



At last! QWERTY 3.0 is available for the DAISY WHEEL III! Finally, owners of the Daisy Wheel II can make their printers do what they were **designed** to do. Produce scores of special symbols and accents! Add footnotes and borders to text! Bold print, double underline, even underline spaces! Print superscripts and subscripts, simultaneously! Print a single page of text without resorting to copy-markers! Stop printing to change wheels or insert text!

Once you use DAISY, you'll wonder how you worked without it. We **guarantee** you will agree! If not, return DAISY within fourteen days for a prompt refund. That's how confident we are!

DAISY FEATURES

Easy transition between the three print pitches. One command changes pitch and resets formats for optimum appearance in that pitch.

Over 100 new symbols, including foreign language accents, Greek letters, and mathematical symbols, all using the standard Courier wheel. Allows tildes, carats, and overbars to be placed over any character.

Any character can be used as a superscript or subscript, singly or simultaneously. Extra high superscripts for integrals. Fine space controls to make superscripts and subscripts look perfect.

Underlining, double underlining, and bold printing, with our without underlining of spaces.

Special provision for printing ratios of one long expression over another (as in algebra).

Provision for putting FOOTNOTES on a page in such a way that they remain on that page despite later editing.

TABLE and MABLE commands enable exact positioning of the print head anywhere on the line. Invaluable in printing neat data tables, columnar material, etc.

PRETTY command enables one to print repetitions of a chosen character; combined with TABLE or MABLE, it becomes easy to produce attractive borders, even in headers and footers.

PAGE END allows the user to discover where pages will end, when they are printed, without actually printing.



Special commands allow the printing of a single page anywhere in the text, with correct page number, footer, and header, without the use of copy-markers. A special command will reset the default format parameters, to allow use of copymarkers without having to insert a format line to adjust for format changes.

FOLIO format enables one to produce print-outs in two or three columns per page, as for newsletters, indices, etc. FOOTNOTES, footers, headers, and PAGE END will work correctly.

Access to disk directory and ability to kill files from within DAISY, without losing any text.

Special code in the text will stop printing until user restarts it; use it to change print wheels. One can insert up to 60 characters of text at this point, as for form letters.

Special print-outs allow one to keep records of DAISY commands used to create a certain effect.

Flaws in SCRIPSIT's widow suppress are corrected. SCRIPSIT's problem with typing two spaces after a period is fixed. SCRIPSIT's scrolling speed is doubled, with instructions for user modification.

CAUTIOUS BUYERS: We invite you to buy the DAISY manual. This is without a doubt one of the clearest, most well-written manuals ever produced for **any** piece of software. Over 110 pages. **Indexed**. In a custom 3-ring binder. We will credit the full \$10.00 price when you decide to buy DAISY.

DAISY REQUIRES: A TRS-80 Model I or Model III with 48K, at least one disk drive, and a copy of **Model I SCRIPSIT**. Please specify which machine and how many drives in your system.

QWERTY 3.0 is also available for the Centronics 737, 739, and Lineprinter IV.

DAISY complete package. \$74.95
DAISY manual alone. 10.00
QWERTY 3.0 complete package. 74.95
QWERTY 3.0 manual alone. 10.00

Please add \$2.00 for shipping and handling. Add \$4.00 for first class postage or UPS. Overseas orders add \$4.00 for surface mail, \$12.00 for air mail.



MED SYSTEMS SOFTWARE
P.O. BOX 3558 CHAPEL HILL, NC 27514
TO ORDER, CALL 1-800-334-5470

esting. Displaying long blocks of words was less interesting to read than short segments of the poem that change regularly.

By programming the lines in a certain rhythm, you can imitate the way a poem might actually be read. It also allows you to project movement on the screen, something that no printed page allows.

The main programming problem is getting the rhythm of the display to read correctly. You can alter the length of time a line stays on the screen by using a print statement, then creating a pause using a For...Next loop. By experimenting, you can space the lines of poetry with different lengths of pauses. I found that I frequently use the following For...Next statements:

```
FOR X=1 TO 1000:NEXT X
FOR X=1 TO 800:NEXT X
```

Because I was typing in these two statements quite often, I made them into subroutines and referred to them with GOSUB statements.

If you refer to lines 10-40 of "The Star" program you will see that I begin with the title and my name, and then use the pause subroutine twice. This gives the viewer time to read the title and to create a short pause before the poem begins. In essence, determining how long the viewer will see the lines

Listing 1 continued

```
260 PRINT "
270 FOR X=1TO 1000:NEXT X
280 CLS
290 FOR X=1 TO 400:NEXT X
299 PRINT:PRINT:PRINT:PRINT
300 PRINT" You did not conquer continents"
310 FOR X=1 TO 800:NEXT X
330 PRINT" in a world like this one"
340 FOR X=1 TO 800:NEXT X
355 PRINT
360 PRINT " You set six people free."
370 FOR X= 1TO 2000:NEXT X
380 CLS
390 FOR X= 1TO 2000: NEXT X
400 END
```

displayed on the screen is the major programming task. Because the length of the lines of poetry change, you have to experiment with different sizes of For...Next loops.

You must also consider where the lines will appear on the screen. Lines 10 and 20 place the title and author of the poem in the upper left corner. With lines 50 and 70, you can position the poem's lines to the right, toward the center, by adding blank spaces within the quotes of the print statement. By using a statement like:

```
10 PRINT:PRINT" THE STAR"
```

you could print the poem's title two lines down and 10 spaces to the left. In

this way you can position the lines where you want them vertically and horizontally. You can also use PRINT@ statements as in line 310 to print "Venetian blind." Because I was unfamiliar with the display positions of PRINT@ statements, I just typed blank spaces between quotes to put text where I wanted. PRINT@ statements are invaluable if you want certain graphics effects, and I use a number of PRINT@ statements in "The Star."

Graphics effects are part of the fun of putting a poem on the screen. Because the poem is about stars, I thought a star or two falling out of the sky would be interesting. This happens in lines 130 and 140.

You'll find a second attempt at graphics in lines 290-340. Here I tried to compare looking through falling snow to looking through a Venetian blind. You decide if this graphics display is effective. Whatever the result, your imagination and your programming abilities can add motion and interest to a poem.

One thing worth mentioning is what you don't see on the screen. Because things turn on and off, the reader has to be assured that there will be enough time to understand the text before it scrolls off screen. And, when it disappears, the reader may need time to think about it. Therefore, between segments of the poem, you can place For...Next loops that leave the screen blank and give the reader time to reflect. Just as a comedian needs timing to tell a joke and get a laugh, you can improve the punch lines of your poem by lengthening or shortening the time before the next lines appear.

"The Star" may not be a masterpiece, but if you're like me, you will enjoy experimenting with the computer and seeing your name in lights. ■

Program Listing 2. "Storm Poem"

```
5 CLS
10 PRINT "STORM POEM"
20 PRINT"By Bill Grout"
30 FOR X=1 TO 800:NEXT X
40 CLS
45 PRINT "For Kearney in Algeria"
46 FOR X=1 TO 800: NEXT X
47 CLS
50 FOR X=1 TO 800:NEXT X
60 PRINT" She rides it out easily"
70 FOR X=1 TO 800:NEXT X
80 PRINT"My wife eating chocolates"
90 FOR X=1 TO 800:NEXT X
100 PRINT "licks her fingers like a cat"
110 FOR X=1 TO 1000:NEXT X
115 FOR X=1 TO 2
120 PRINT "LIGHTENING FLASH"
130 CLS
140 NEXT X
150 PRINT "LIGHTENING FLASH"
160 FOR X=1 TO 800: NEXT X
170 CLS: FOR X=1 TO 300:NEXT X
175 FOR X=1 TO 3
180 PRINT"White cheese cloth curtains light up"
190 PRINT"with the blink of flourescent tube coming on"
191 CLS:NEXT X
192 PRINT "White cheese cloth curtains light up"
193 PRINT "with the blink of flourescent tube coming on"
200 FOR X=1 TO 2100: NEXT X
210 CLS
220 FOR X=1 TO 600:NEXT X
230 PRINT"Empty barrel rolling on its side"
```

Listing 2 continues

Bill Grout can be reached at 380 Channing Way, #171, San Rafael, CA 94903.

Peripherals

FANTASTIC PRICES!

Unlimited...

OUR FAST SERVICE, PRODUCT SELECTION AND OUR CUSTOMERS' SATISFACTION MAKE US #1.

NEC PRINTERS

7710 Spinwriter R/O	\$2295
7720 Spinwriter KSR	\$2649
7730 Spinwriter R/O	\$2295
7700 Bi-directional Tractor	\$250
7700 Ribbons	\$5
3510 Spinwriter	\$1689
3515 Spinwriter	\$1699
3530 Spinwriter	\$1689
3550 Spinwriter	\$2149
3500 Bi-directional Tractor	\$225
3500 Ribbons	\$14
NEC Thimbles—All Styles	\$18

NEC DOT MATRIX

PC-8023 A-C	\$474
PC-8023 Ribbons	\$14

EPSON PRINTERS

MX-80 w/Graphtrax Plus	\$469
MX-80FT w/Graphtrax Plus	\$529
MX-100 (15" Carriage)	\$699
Grappler Plus Interface	\$129
MX-80 Ribbons	\$12
MX-100 Ribbons	\$18

Call for prices on interfaces & cables

IDS PRINTERS

IDS Microprism	\$539
IDS Prism 132	\$1449
IDS Prism 132 Color	\$1659
IDS Grappler	\$129

AMDEK

Amdek 12" 300 GRN Phosphor	\$149
Amdek 13" Color I	\$319
Amdek 13" Color II	\$739
Amdek 13" Color III	\$429
Amdisk 3	\$749

3" Dual Micro Floppy storage for the
APPLE II & IBM PC

OKIDATA PRINTERS

Okidata Microline 82A	\$459
Okidata Microline 83A	\$699
Okidata Microline 84P	\$1069
Okidata Microline 84S	\$1099
Tractor (Oki 80 & 82 Only)	\$60
Okidata Okigraph	\$85

Call for prices on ribbons

DIABLO PRINTERS

Diablo 620	\$1349
Diablo 620 Bi-Directional Tractor	\$175
Diablo 630 RO	\$1999
Diablo 630 KSR	\$2700
Diablo 630 Bi-Directional Tractor	\$275
RS232 Cable	\$35

Call for prices on ribbons

NEC MONITORS

NEC JB1201 GRN Phosphor	\$149
NEC JC1201 Color	\$339

FOR SERVICE, QUALITY & DELIVERY CALL TOLL FREE 1-800-343-4114

ORDERING INFORMATION

Our order lines are open 9 AM to 5:30 PM EST Monday thru Friday. Phone orders are welcome; Free use of Mastercard and VISA. Personal checks require 2 weeks clearance. Manufacturer's warranty included on all equipment. Prices subject to revision. C.O.D.'s accepted. All U.P.S. shipments are subject to a shipping charge of 1% of the total purchase, with a minimum charge of \$5.00.

PERIPHERALS UNLIMITED (617) 655-7400

62 N. Main St. • Natick, MA 01760 ✓272

```

260 FOR X=1 TO 1000: NEXT X
270 CLS
280 FOR X=1 TO 200:NEXT X
290 PRINT "Unruly radio: clicks and"
291 FOR X=1 TO 800:NEXT X
295 FOR X=1 TO 20: PRINT@30,"*";:PRINT@50,"*"
296 CLS: PRINT@32,"electric drizzle":CLS
297 NEXT X
300 FOR X=1 TO 1200:NEXT X
310 CLS
320 FOR X=1 TO 300:NEXT X
330 PRINT "In storm weather"
340 FOR X=1 TO 500:NEXT X
350 PRINT " read history"
360 FOR X=1 TO 500:NEXT X
370 PRINT " short poems"
380 FOR X=1 TO 400:NEXT X
390 PRINT "a catalogue"
400 FOR X=1 TO 800:NEXT X
410 CLS
420 FOR X=1 TO 400: NEXT X
421 PRINT:PRINT
430 PRINT " One candle burning on the table waiting"
440 FOR X=1 TO 1000: NEXT X
    
```

```

5 CLS
10 PRINT"PROBLEMS"
20 PRINT "By Bill Grout"
30 FOR X=1 TO 800:NEXT X
40 CLS
50 FOR X=1 TO 800: NEXT X
60 PRINT@90,"GEE,"
70 PRINT
80 FOR X=1 TO 800:NEXT X
90 PRINT@210," From the prices
you'd think"
100 FOR X=1 TO 800:NEXT X
110 CLS
120 PRINT@340, "The Zulus have
taken over the"
130 PRINT
140 FOR X=1 TO 500:NEXT X
150 PRINT@465,"Phone company"
160 FOR X=1 TO 1000:NEXT X
175 FOR X=1 TO 30
180 PRINT@512+X, "The long distance spear."
200 NEXT X
210 FOR X=1 TO 800:NEXT X
220 CLS
230 FOR X=1 TO 1000:NEXT X
240 END
    
```

Program Listing 4. "Problems"

```

5 CLS
10 PRINT "TIME"
20 PRINT"By Bill Grout"
30 FOR X=1 TO 800: NEXT X
40 CLS
50 FOR X=1 TO 800: NEXT X
60 PRINT "You put your head on"
80 PRINT"the rail road track and"
85 FOR X=1 TO 1000:NEXT X
90 PRINT "listen": FOR X=1 TO 800:NEXT X:PRINT@145,"Your heart"
95 FOR X=1 TO 300:NEXT X
96 PRINT"beating quick as a bird's"
100 FOR X=1 TO 1000:NEXT X
110 PRINT"The train is two inches away."
120 FOR X=1 TO 500:NEXT X:CLS
130 PRINT@ 200,"Do you have time to be special?"
140 FOR X=1 TO 800:NEXT X
150 FOR X=200 TO 230:
160 PRINT@X, " ":NEXT X
170 FOR X=1 TO 1500:NEXT X
180 END
    
```

Program Listing 3. "Time"

Program Listing 5. "Master"

```

5 CLS
10 PRINT"MASTER"
20 PRINT"By Bill Grout"
30 FOR X=1 TO 800:NEXT X
40 CLS
50 FOR X=1 TO 800:NEXT X
60 PRINT@20,"I was walking beside"
70 PRINT@84,"a railroad track"
80 FOR X=1 TO 1000:NEXT X
90 PRINT@148,"And I found an
ear of cactus"
100 FOR X=1 TO 800:NEXT X
110 PRINT
120 PRINT" someone had knocked off"
130 FOR X=1 TO 1000:NEXT X
140 CLS
    
```

Listing 5 continues

Q: What is the hardest thing in the world? A: Tearing yourself away from an EPYX game.



Nobody but nobody builds more lasting playing value into their computer games than EPYX.

EPYX—computer games thinkers play. EPYX—producers of award-winning games (including "Crush, Crumble and Chomp"; "Dragon's Eye"; "Temple of Apschai"...and dozens of other thinking games.) For Atari,* Apple,* Commodore,* Radio Shack,* and IBM* personal computers. EPYX—the leader in computer game quality, creativity, innovation.

You will love them all. Write or phone for our latest catalog; it's absolutely free...we even pay the postage. Or stop in at your favorite computer dealer. He should have a supply of catalogs and he can also show you some of those marvelous EPYX games in action.

*The trademarks, respectively, of Atari, Inc.; Apple Computer, Inc.; Commodore International; Tandy Corp.; International Business Machines. And EPYX is the trademark of Automated Simulations, Inc., just so you don't forget.



AUTOMATED SIMULATIONS
1043 Kiel Court
Sunnyvale, California
(408) 745-0700

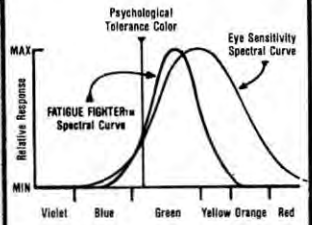
—ATTENTION ALL TRS-80® OWNERS—

No matter how your Model I, II or III is used, whether it be business or pleasure, this product can benefit you.

The **FATIGUE FIGHTER™** reduces the operator fatigue (irritated, watery eyes and headaches) caused by the harsh white video display thereby making computer use more efficient and/or enjoyable. The graph at the right will help explain how it works. Superimposed on the standard eye sensitivity curve is the band pass curve of the **FATIGUE FIGHTER™** as recorded by a spectrophotometer. A marker is also on the graph at the ideal psychological tolerance color. As you can see, the green color of the **FATIGUE FIGHTER™** takes advantage of both eye sensitivity and psychological tolerance to make the display less irritating.

The **FATIGUE FIGHTER™** is made of tough 1/8 inch thick acrylic sheet which adds absolutely no distortion or fuzziness to the display and is industry proven to be an excellent material for optical filtering (e.g. lenses for laser safety goggles). It installs easily on all three TRS-80® models with a pressure sensitive adhesive which will not let the filter fall off yet allows easy removal if necessary. Finally, the black and silver border design makes it a perfect match for the computer styling.

If you want a **FATIGUE FIGHTER™** of your own but prefer not to order by mail, check with your local computer stores to see if they have them in stock. Otherwise follow the ordering instructions below.



TRS-80 IS A TANDY CORP. TRADEMARK.

TO ORDER:

Send Name & Address Typed or Clearly Printed with Check or Money Order (U.S. FUNDS) for \$14.95 Each, Including Shipping. Canadian Orders add \$1.00 Each. All Other Foreign Orders Add \$2.00 Each for Shipping. **NO CREDIT CARD ORDERS. COD'S (U.S. ORDERS ONLY)** are \$2.50 Additional Per Order & are Accepted by Mail or by Calling 904-378-2494 9-5 M-F. Florida Residents Add 4% Sales Tax. **MAIL ORDERS MUST BE SENT TO THE U.S. ADDRESS.**



SOUTHERN INNOVATIVE DESIGN
1520 NORTHEAST 12TH STREET
GAINESVILLE, FLORIDA 32601 ✓35

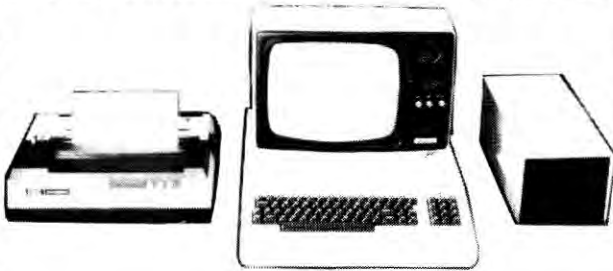
—CANADIAN DEALERS ONLY—

For pricing and ordering information contact:
MICRO-COMP ENTERPRISES INC., 955 Brock Rd. S., Unit 3
Pickering, Ontario L1W 2X9 Phone: 416-839-4561

—DEALER INQUIRIES INVITED—



LNW80 COMPUTERS



• IN STOCK NOW!! CALL FOR SPECIAL PRICES ON LNW80s, NEC PRINTERS, RGB COLOR MONITORS, AND TANDON DISK SYSTEMS.

******* NEW LNW SOFTWARE! *******

EXCELLONIX

7180 WOODROW WILSON DR
LOS ANGELES, CA 90068

(213) 650-5754 - (714) 973-1939

mecasoft

ANNOUNCES ECONOMICAL BUSINESS AND EDUCATIONAL SOFTWARE FOR TRS-80 MODEL I AND III COMPUTERS.

MANAGEMENT COMPONENT INFORMATION SYSTEM (M.C.I.S.) \$49.95.

- Fast access, easy entry, update and installation
- Up to 12,000 items catalogued.
- Cross references up to 8 categories per item
- Produces printed reports.

ENHANCEMENT TO TANDY MFG. INVENTORY CONTROL PROGRAM #26-1559 \$49.95.

- Maintains records on 3 Vendors per part, price breaks, purchase history and minimum inventory levels.
- Generates Purchase Orders and maintains status of each.
- Automatic updates of inventory and price.

Following **EDUCATIONAL PROGRAMS** written by **D. Wittwer, 19 Year Science/Math Educator.**

BASIC LANGUAGE PROGRAMMING TUTORIAL I \$39.95.

- 10 Lessons which advance student to Intermediate Competency

BASIC LANGUAGE PROGRAMMING TUTORIAL II \$39.95.

- 8 Lessons which advance the student to Advanced Competency

Software is available on cassette or diskette (please specify).
Terms Prepaid or C.O.D. VISA or Mastercharge accepted.

Write MECA for complete details.

meca

56677 Sunset Avenue - Yucca Valley, CA 92284 ✓304



DEALERS • DISTRIBUTORS • OEM'S

- Enclosures and power supplies with or without drives.
- Low minimum orders.
- Attractive quantity pricing.
- Durable, textured, color compatible finish looks great on your display counter!
- Fully engineered product, high reliability design.
- All standard configurations, plus: Canon 2/3 height, TEAC 1/2 height, mini-Winchester and Tandon 8" 1/2 height.
- Available only through your local computer dealer.

Call or write for the name of the dealer in your area.

Ann Arbor Precision
7536 Jackson Road
Ann Arbor, MI 48103
Order Desk: 9-5 EST
(313) 426-5477 Mon-Thu



"Precision—Since 1977"

```

150 FORX=1 TO 300:NEXT X
160 PRINT@20,"It was stranded"
170 FOR X=1 TO 800:NEXT X
180 PRINT@84,"like a stick in a
      dry river"
190 FOR X=1 TO 800:NEXT X
195 PRINT
200 PRINT"      With one little prickly pear fruit"
210 FOR X=1 TO 500:NEXT X
220 PRINT"      holding on for dear life"
230 FOR X=1 TO 800:NEXT X
340 PRINT:PRINT"      I took pity."
350 FOR X=1 TO 800:NEXT X
360 CLS:PRINT:PRINT"      I carried the piece home to"
370 FOR X=1 TO 900:NEXT X
380 PRINT"      be my slave."
390 FOR X=1 TO 1000:NEXT X
400 CLS
410 FOR X=1 TO 1500:NEXT X
420 END
    
```

Program Listing 6. "The Star"

```

10 CLS:PRINT"THE STAR"
20 PRINT"By Bill Grout"
30 GOSUB 8000
40 CLS:GOSUB8000
50 PRINT "      At midnight" 'First line of poem
60 FOR X=1 TO 500:NEXT X
70 PRINT"      a star"
80 GOSUB8000
90 PRINT"Perhaps my star or your star, we are not sure"
100 FOR X=1 TO 1600:NEXT X
110 CLS:PRINT "Plummeted from the sky"
120 GOSUB8000
130 FOR X=1 TO 800 STEP 64 'First starfall
140 PRINT@8X,"*":CLS:NEXT X
150 PRINT"      Leaving behind it the sparkling streak of
      a match chipped across sandpaper"
160 FOR X=1 TO 2000:NEXT X
170 CLS:PRINT "Where the star fell": FOR X=1 TO 1000:NEXT X:PRIN
T"was undetermined"
180 GOSUB8000
190 PRINT"And so we have gone searching
      in the opposite direction
      in which the trees fell"
200 FOR X=1 TO 2200:NEXT X
210 CLS:PRINT "But some were thrown up like jack straws"
220 FOR X=1 TO 1300:NEXT X:PRINT"by the impact":FOR X=1 TO 700:N
EXT X
230 PRINT"And came down every which way and other craters"
240 GOSUB 1000
250 PRINT "from previous stars confuse the issue."
260 FOR X=1 TO 1200:NEXT X:CLS:FOR X=1 TO 800:NEXT X
270 PRINT"And then the snow comes abrupt
      as pulling down"
280 GOSUB1000
290 FOR X=1 TO 6 'Snowfall
300 FOR Y=1 TO 50:NEXT Y
310 PRINT@400+(X*64),"a venetian blind"
320 IF X=6 GOTO 350
330 PRINT@600+(X*64),"*****"
340 NEXT X
350 GOSUB1000
360 CLS:FOR X=1 TO 300:NEXT X
370 PRINT"And this is how we lost you."
380 GOSUB1000
390 CLS:PRINT"Another star fell"
400 GOSUB8000
410 FOR X=1 TO 10 'Starfall #2
420 PRINT@30+(X*64),"*":CLS
430 NEXT X
440 PRINT "      Perhaps yours..."
450 FOR X=1 TO 1200:NEXT X
460 PRINT "You stopped to gaze out over the line
      where you were picking clothespins"
470 FOR X=1 TO 1400:NEXT X
480 CLS:FOR X=1 TO 500:NEXT X
490 PRINT"Many of us were still in the tops of the trees
      in the postures of men drinking from bottles,
      binoculars to our eyes,
      getting the angles, getting the degrees"
500 FOR X=1 TO 2900:NEXT X
510 CLS:FOR X=1 TO 400:NEXT X
520 PRINT "      And it was at that moment that you conceived the s
acrifice"
530 GOSUB1000
540 CLS:FOR X=1 TO 300:NEXT X
550 PRINT"      to let go"
560 GOSUB8000
570 PRINT"to not try to possess the star"
580 GOSUB1000
590 PRINT "      to create a final beauty"
600 FOR X=1 TO 900:NEXT X
610 FOR X=800 TO 1 STEP -67 'Sparklerfall
620 PRINT@8X,CHR$(42)
630 IF X<400 GOTO 650
640 CLS:NEXT X
650 FOR X=400 TO 600 STEP 67
660 FOR Y=1 TO 3
670 IF X>410 PRINT@(X-X*.15),CHR$(42)
680 NEXT Y
700 CLS:NEXT X
710 PRINT@448,"( ( ) )":PRINT@449,"( ( ) )"
720 PRINT@448,"( ( ) )":PRINT@449,"( ( ) )"
730 CLS:GOSUB8000
    
```

```

740 PRINT@454," like children throwing sparklers
      out into the sea"
750 FOR X=1 TO 1200:NEXT X
760 CLS:FOR X=1 TO 1200:NEXT X
770 END
1000 FOR X=1 TO 1000:NEXT X
1010 RETURN
8000 FOR X=1 TO 800:NEXT X
8010 RETURN
    
```

```

10 CLS
20 PRINT"DON'T READ THIS POEM"
30 PRINT "By Bill Grout"
40 FOR X=1 TO 800:NEXT X:CLS:FOR X=1 TO 800:NEXT X
50 PRINT:PRINT:PRINT
60 PRINT "Do not read this there you did it, damn."
70 FOR X=1 TO 1000:NEXT X
80 CLS: PRINT "Now please": FOR X=1 TO 300:NEXT X: PRINT "don't
finish this line"
90 FOR X=1 TO 900:NEXT X
100 CLS: PRINT "You're screwing up my poem, you're supposed"
120 FOR X=1 TO 700:NEXT X: PRINT"to leave one line unread try ag
ain,"
130 FOR X=1 TO 500:NEXT X
140 PRINT "Don't finish this!": FOR X=1 TO 700:NEXT X: PRINT "
      Hell, you did!"
150 FOR X=1 TO 800: NEXT X:CLS: FOR X=1 TO 1000:NEXT X
155 PRINT:PRINT
160 PRINT "      DON'T READ THIS! "
170 FOR X=1 TO 900:NEXT X: CLS: FOR X=1 TO 500:NEXT X
175 PRINT:PRINT
180 PRINT "      Thanks for your cooperation"
190 FOR X=1 TO 1000:NEXT X
200 CLS: FOR X=1 TO 800:NEXT X
210 END
    
```

Program Listing 7. "Don't Read This Poem"

```

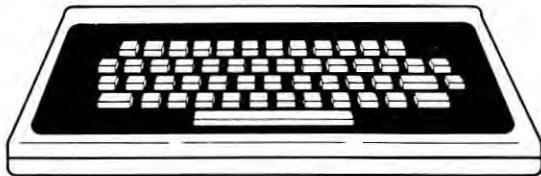
10 CLS
20 PRINT "POEM OF HOPE"
30 PRINT "By Bill Grout"
40 FOR X=1 TO 800:NEXT X
50 CLS: FOR X=1 TO 800:NEXT X
60 PRINT"      I sleep with a tree beside my bed,"
70 FOR X=1 TO 900:NEXT X
80 PRINT "      a tree for you":FOR X=1 TO 800:NEXT X
90 PRINT "      next to my pillow"
100 FOR X=1 TO 900:NEXT X
110 PRINT "      a tree as big as your wrist"
120 FOR X=1 TO 900:NEXT X
130 CLS:FOR X=1 TO 400:NEXT X
140 PRINT" A tree full grown the size of an Easter chick"
150 FOR X=1 TO 10100:NEXT X
160 PRINT " an oak in a teacup"
170 FOR X=1 TO 900:NEXT X
180 PRINT " and its limbs don't blow in the wind"
190 FOR X=1 TO 1000:NEXT X
195 CLS:PRINT:PRINT
200 PRINT"      they blow in the prayers."
210 FOR X=1 TO 1000:NEXT X: CLS: FOR X=1 TO 800:NEXT X
220 END
    
```

Program Listing 8. "Poem of Hope"

```

10 CLS
20 PRINT "MY POETRY"
30 PRINT "By Bill Grout"
40 FOR X=1 TO 800:NEXT X:CLS:FOR X=1 TO 800:NEXT X
60 PRINT "      Your poems lack"
70 FOR X=1 TO 500:NEXT X: PRINT "      CONTENT!"
80 FOR X=1 TO 800:NEXT X
90 PRINT "      everybody tells me"
100 FOR X=1 TO 500:NEXT X:
120 PRINT:
130 A$="barstool":B$="foxglove":C$="iron on patches"
140 GOSUB2000
150 CLS: FOR X=1 TO 300:NEXT X
160 PRINT "      What can I do?"
170 FOR X=1 TO 400:NEXT X
180 PRINT "      I think "
190 FOR X=1 TO 300:NEXT X
200 A$="potato peelings": B$="scotch tape " : C$="living bras
210 GOSUB2000
220 CLS:FOR X=1 TO 300:NEXT X: PRINT "      I need to talk"
230 PRINT "      to one of the masters"
240 FOR X=1 TO 900:NEXT X
250 PRINT "      What if it's my heart?"
260 FOR X=1 TO 300:NEXT X
270 A$="asparagus?":B$="turnstile? " :C$="backdoor? "
280 GOSUB2000
290 CLS:FOR X=1 TO 400:NEXT X
300 PRINT "      I try to put the stuff"
310 PRINT"      I think "
320 FOR X=1 TO 700:NEXT X
340 A$="barley": B$="pig iron": C$="mistletoe"
    
```

Radio Shack and TDP-100



Box 668 •
6809 Specialists Encinitas, CA 92024
(714) 436-3512

Computerware is a trademark of Computerware

Micro Power Bench™



- Single Switch Control of CPU and Peripherals
- Built in circuit breaker protects your system
- Four power expansion outlets
- Choice of high quality oak or walnut
- Compatible with IBM, APPLE, TRS-80 and others



Order Direct

800-343-4311

Master Charge and Visa Accepted

CAB-TEK, Inc.

Riverside St., Nashua NH 03062

CIVILIZING COMPUTERS

MX 80

✓249 ACOUSTIC ENCLOSURE \$99!

DEALER INQUIRIES INVITED

TELCOM

Our Smart Terminal Just Got A Lot Smarter!

TELCOM I

TELCOM was released over two years ago, and has been called "the best value on the market". It is menu driven, very easy to learn and use, and has all the features most people need:

- Upper and lower case support
- Full or half duplex
- Can send all control characters
- Ten programmable character keys
- Eight programmable automatic messages
- Printer output with built-in spooler
- Reset clock command
- Save data in buffer
- Save buffer on disk
- Send or receive ASCII or binary files
- Xon/Xoff protocol
- Checksum verification of file transfers
- Works with all operating systems

TELCOM II

TELCOM II is the new generation of our earlier program. It includes all of the features of TELCOM I shown above, with many improvements and enhancements. The terminal mode has a help menu and will communicate as fast as 4800 baud. You can even receive data while you are at the main menu or in other modes. You can load a disk file into the buffer, type into the buffer, open, close, transmit, print, or reset the buffer. You can view the buffer (or data that has already scrolled off the screen). There are ten different automatic messages which can include control characters and delays. They allow you to log-on or auto dial with a single command. There are five different character translation tables. Finally, there is an intelligent file transfer mode that detects and CORRECTS ERRORS in transmission. It will also SEND and FETCH files with an unattended computer, and is compatible with the LYNC program for CP/M and the IBM PC.

If you need a smart terminal program to communicate with large computers, information services, bulletin boards, or another microcomputer, TELCOM is the intelligent choice. TELCOM will work with all operating systems and requires at least 32K and one disk drive. For a more thorough comparison of the two versions, send \$5 for the documentation to both of them. This will be refunded if you purchase either version of TELCOM within 30 days.

TERMS: TELCOM I is \$39.95. TELCOM II is \$69.95. Include \$2 for postage, and California residents add 6% sales tax. VISA, MASTERCARD, and COD orders are accepted. Satisfaction is guaranteed or a full refund will be made. Be sure to specify Model I or Model III.

MUMFORD MICRO SYSTEMS

Box 400-T Summerland, California 93067 (805) 969-4557

Quality software since 1978

✓67

```

350 GOSUB2000
360 FOR X=1 TO 500: NEXT X:CLS
370 PRINT " are the real necessities"
380 FOR X=1 TO 400:NEXT X
390 CLS:AS="":B$="& rubber bands": C$="splayed toes "
400 GOSUB2000
410 FORX=1 TO 200:NEXT X:CLS
420 PRINT " into it, & well"
430 FOR X=1 TO 600:NEXT X
440 PRINT "here it is, me"
450 PRINT " & half empty"
460 FOR X=1 TO 900:NEXT X:CLS
470 AS="rainbow":B$="spiderweb":C$="kitchen sink"
475 GOSUB2000
480 FOR X=1 TO 1000:NEXT X
490 CLS: FOR X=1 TO 800:NEXT X
500 END
2000 FOR X=1 TO 3
2200 PRINT:IF X=1 PRINT@270,AS
2300 IF X=2 PRINT@270,B$
2400 IF X=3 PRINT@270,C$
2450 FOR Y=1 TO 300:NEXT Y
2500 NEXT X
2600 RETURN
    
```

```

10 CLS:PRINT "CHICKENS"
20 PRINT "By Bill Grout"
30 GOSUB 8000
40 CLS:GOSUB 8000
50 PRINT:PRINT" Chickens"
60 FOR X=1 TO 100:NEXT X:PRINT" are":FOR X=1 TO 40
0:NEXT X
70 PRINT@ 217,"creeps"
80 GOSUB8000
90 FOR X=1 TO3
100 FOR Y=1 TO80:NEXT Y
110 PRINT@328," Blinky-eyed":FOR Z=1 TO 80:NEXTZ "
111 IF X=3 GOTOL21 ELSEPRINT@328,"
120 NEXT X
121 FORX=1TO 600:NEXT X
130 CLS:FOR X=1 TO 400:NEXT X:PRINT@400," They wouldn't believe
it"
150 PRINT" even if you told them you"
155 PRINT" were frying"
160 FOR X=1 TO1200:NEXT X
170 PRINT" their mother"
180 FOR X=1 TO 1200: NEXT X
190 CLS:GOSUB8000
200 END
8000 FOR X=1 TO 900:NEXT X
8100 RETURN
    
```

Program Listing 11. "Chickens"

```

10 CLS
20 PRINT "Get 'EM"
30 PRINT "By Bill Grout"
40 FORX=1 TO 100:NEXT X
50 CLS:FOR X=1 TO 800:NEXT X
60 XS="There!"
70 FOR X=1 TO 5
80 PRINT@300+(X*88),XS
90 FOR Y=1 TO 300:NEXT Y
100 CLS:NEXT X
110 XS="ANT!"
120 CLS: FOR X=1 TO 5
130 PRINT@400 +(X*2),X$
140 FOR Y=1 TO
00:NEXT Y
150 CLS:NEXT X
160 PRINT@410,"FOOT!"
170 FOR X=1 TO 800:NEXT X
180 CLS: FOR X=1 TO 800:NEXT X
190 END
    
```

Program Listing 10. "Get 'Em"

```

10 CLS
20 PRINT "TIME MAGAZINE ARTICLE"
30 PRINT "By Bill Grout"
40 FOR X=1 TO 800:NEXT X:CLS:FOR X=1 TO 800:NEXT X
50 PRINT:PRINT
60 PRINT "The newest thing in the United States is:":PRINT:PRINT
:
70 FOR X=1 TO1000:NEXT X
80 PRINT" PET-SEX ."
90 FORX=1 TO 800:NEXT X: CLS
100 FOR Y=1 TO 15
110 PRINT@ 400,"H":PRINT@400+Y,"ooray!!"
120 NEXT Y
130 FOR X=1TO1000:NEXT X
140 CLS: FOR X=1 TO 1000:NEXT X
150 END
    
```

Program Listing 12. "Time Magazine Article"

PRODUCTS FOR YOUR RADIO SHACK

COLOR COMPUTER

MACRO-80C

The Micro Works is pleased to announce the release of its **disk-based editor, macro assembler and monitor**, written for Color Computer by Andy Phelps. THIS IS IT — The ultimate programming tool!

The powerful 2-pass macro assembler features conditional assembly, local labels, include files and cross referenced symbol tables. MACRO-80C supports the complete Motorola 6809 instruction set in standard source format. There are no changes, constraints or shortcuts in the source language definition. Incorporating all of the features of our Rompack-based assembler (SDS80C), MACRO-80C contains many more useful instructions and pseudo-ops which aid the programmer and add power and flexibility.

The screen-oriented text editor is designed for efficient and easy editing of assembly language programs. The "Help Key" feature makes it simple and fun to learn to use the editor. As the editor requires no line numbers, you can use the arrow keys to position the cursor anywhere in the file. MACRO-80C allows global changes and moving/copying blocks of text. You can edit lines of assembly source which are longer than 32 characters.

DCBUG is a machine language monitor which allows examining and altering of memory, setting break points, etc.

The editor, assembler and monitor — as well as sample programs — come on one Radio Shack compatible disk. Extensive documentation included. **MACRO-80C Price: \$99.95**

SDS80C — Our famous editor, assembler and monitor in Rompack. Complete manual included. **Price: \$89.95**

PARALLEL PRINTER INTERFACE — Serial to parallel converter allows use of all standard parallel printers. You supply printer cable. **PI80C Price: \$69.95**

MICROTEXT — Get printouts while using your modem! Also download to cassette. General purpose terminal Rompack. **Price: \$59.95**

YOU NEED COLOR FORTH!!

- Why?
- Forth is faster to program in than Basic
 - Forth is easier to learn than Assembly Language
 - Forth executes in less time than Basic

Forth is a highly interactive language like Basic, with structure like Pascal and execution speed close to that of Assembly Language. The Micro Works Color Forth is a Rompack containing everything you need to run Forth on your Color Computer.

Color Forth consists of the standard FORTH Interest Group (FIG) implementation of the language plus most of FORTH-79. It has a super screen editor with split screen display. Mass storage is on cassette. Color Forth also contains a decompiler and other aids for learning the inner workings of this fascinating language. It will run on 4K, 16K, and 32K computers. Color Forth contains 10K of ROM, leaving your RAM for your programs! There are simple words to effectively use the Hi-Res Color Computer graphics, joysticks, and sound. The 112-page manual includes a glossary of the system-specific words, a full standard FIG glossary and complete source listing. **COLOR FORTH ... THE BEST!** From the leader in Forth, Talbot Microsystems. **Price: \$109.95**

GAMES

Star Blaster — Blast your way through an asteroid field in this action-packed Hi-Res graphics game. Available in ROMPACK; requires 16K. **Price: \$39.95**

Pac Attack — Try your hand at this challenging game by Computerware, with fantastic graphics, sound and action! Cassette requires 16K. **Price: \$24.95**

Berserk — Have fun zapping robots with this Hi-Res game by Mark Data Products. Cassette requires 16K. **Price: \$24.95**

Adventure — *Black Sanctum and Calixto Island* by Mark Data Products. Each cassette requires 16K. **Price: \$19.95** each.

Cave Hunter — Experience vivid colors, bizarre sounds and eerie creatures in hot pursuit as you wind your way through a cave maze in search of gold treasures. This exciting Hi-Res game by Mark Data Products requires 16K for cassette version. **Price: \$24.95**

California Residents add 6% Tax
Master Charge/Visa and COD Accepted

THE MICRO WORKS

Also available: Machine language Monitor ★ 2-pass Disassembler ★ Books ★ Memory Upgrade Kits ★ Parts and Services ★ Call or write for information

P.O. BOX 1110 DEL MAR, CA 92014

619-942-2400

TCS Heart of TEXAS COMPUTER SYSTEMS

LEADER in MAIL ORDER DISCOUNTS!

800 433-5184

Texas 817/274-5625

IBM Personal Computer

ATARI

INTERNAL DISKS FOR IBM
Complete IBM Disk Systems \$CALL
Tandon Internal Disk .. single sided 160k
Tandon Internal Disk .. double sided 320k

HARD DISKS FOR IBM
Complete 5 meg. Systems ... from \$1585
Multi-computer Network Systems available

MONITORS FOR IBM
Green - hi resolution from \$89
Matching PGS Color - super hi res. . \$Call

QUADBOARD FOR IBM
Includes 64k to 256k additional Memory,
Serial & Parallel Port and Calendar Clock

ADDITIONAL MEMORY FOR IBM
16k Chips each \$2
64k Chips \$Call

PRINTER FOR IBM
Epson, Star & other matrix printers . \$Call
NEC 3550 Spinwriter IBM version .. \$Call

ATARI 800 COMPUTER
ATARI 810 DISK DRIVES
Percom Double Density EXT. DRIVES
ATARI 850 Interface and Cable
Compatible PRINTERS and Cables

APPLE

First DISK DRIVE w/controller, DOS 3.3,
cables and manual \$419
Second DISK DRIVE with cable \$319
APPLE to EPSON card and cable

Z 80 Card \$Call
RAM Card \$Call
Printer Interface Cards \$Call
Graphic Printer Interface Card \$139
Graphic Spooler Interface Card/16k to 64k

TRS-80

TCS MODEL III 48k 2 DISK

Systems come with 180 day TCS limited warranty.



\$1695

With standard 40 track
double density drives.
Over 340,000 bytes.
Includes TDOS.

\$1995

With 2 dual headed 40
track dbl.density drives.
Over 730,000 bytes.
Includes DOSPLUS 3.4
(\$150 value)

Fully assembled and tested systems that are software compatible and functionally identical to Radio Shack units sold at computer stores for \$hundreds more.

- CONTROLLER BOARDS are high quality double sided epoxy boards with gold plated contacts.
- POWER SUPPLY is the finest switching type available.
- MOUNTING HARDWARE includes power and data cables.
- DISK DRIVES are Tandon, the same ones used by Radio Shack ... 40 track, double density, with a 5 millisecond stepping rate.

TANDON DRIVES

TCS DRIVE CABINET is industrial grade heavy gauge metal, safely fused, and comes with gold plated external connector with extender cable.

2 DRIVES/Double Cabinet

40 track single sided \$489
80 track (dual sided 40 tracks) \$639
160 track (dual sided 80 tracks) \$849

Drives in cabinets come assembled/tested with power supply. Order cable separately.

1 DRIVE in Cabinet

40 track single sided \$249
80 track (dual sided 40 track) \$329
160 track (dual sided 80 track) \$449

1 DRIVE/Double Cabinet

40 track single sided \$289
80 track (dual sided 40 track) \$369
160 track (dual sided 80 track) \$499

BARE DRIVES ONLY

40 track single sided \$CALL
80 track (dual sided 40 track) \$CALL
160 track (dual sided 80 track) \$CALL
8 inch Slimline sgl/dbl sided \$CALL
Winchester hard drives 5-30 meg. . \$CALL

CORVUS HARD DISK

CORVUS HARD DISKS

Call for '83 prices - lowest anywhere

Add 5, 10 or 20 megabytes of storage to your TRS80, IBM, Apple, Atari, Heath, Zenith, Intertec, S-100 and many others. One or several computers can share a hard disk. Get simultaneous access to data for multiple users. AVAILABLE NOW at SUPER SAVINGS.

PRINTERS

TCS has the LOWEST PRICES on IN STOCK PRINTERS!

LETTER QUALITY PRINTERS

STAR GEMINI
Better than Epson and costs less!
100 cps .. 180 day warranty
Bit Image AND Block Graphics
Friction Feed and Pin Feed paper

STAR GEMINI 10 (10 inch carriage) \$Call
STAR GEMINI 15 (15 inch carriage) \$Call
C.I.TOH 8510 / TEC / PMC \$Call
DMP 100 \$349
DMP 200 \$689
DMP 400 \$1029
DMP 500 \$1584
ANADEX 9501-A \$1395
CENTRONICS 352 / 353 \$Call
OKIDATA printers .. \$Call for Low Prices

MATRIX PRINTERS

C.I.TOH F-10 (40 cps) \$1585
DAISY WHEEL II (RS) \$1695
NEC 3510 / 3530 / 3550 \$Call
NEC 7710 / 7730 \$Call
SMITH CORONA TP-1 \$849
BROTHER / COMREX \$829

EPSON PRINTERS

EPSON MX 80 \$CALL
EPSON MX 80 FT \$CALL
EPSON MX 100 FT \$CALL

GRAPHTRAX PLUS come free in EPSONS
Cables and interfaces available
for most popular computers

TCS MODEL III DISK EXPANSION KITS

- | | |
|--|--------|
| 1 Controller, Power Supply, Mounting Hardware & Instructions | \$379 |
| 2 Controller, Power Supply, Hardware & one 40 track Tandon drive | \$577 |
| 3 Controller, Power Supply, Hardware, two 40 track Tandon drives, 32k memory (everything you need for 2 drive 48k upgrade) | \$799 |
| 3a Kit 3 but with two 80 track drives (dual sided 40s) | \$999 |
| 3b Kit 3 but with two 160 track drives (dual sided 80s) | \$1169 |

MODEL III SYSTEMS

Original 90 day manufacturer's warranty.

MODEL III 4k \$598
MODEL III 16k \$Call
MODEL III 32k \$Call
MODEL III 48k \$Call
MODEL III 48k 2 Drive RS232 \$Call

COLOR COMPUTER

Original 90 day manufacturer's warranty.

COLOR COMPUTER 16k \$249
COLOR COMPUTER 16k ext \$335
COLOR COMPUTER 32k ext \$Call
COLOR COMPUTER DISK 0 \$479
COLOR COMPUTER DISK 1 \$349

TCS MODEL III Systems use original RS hardware and quality TCS memory.
180 day limited warranty.

TCS MODEL III 16k \$Call
TCS MODEL III 32k \$798
TCS MODEL III 48k \$828

Green or Amber Langley Sinclair CRT for your customized Model III \$Call

TCS COLOR COMPUTERS use original RS hardware & TCS memory.
180 day warranty.

TCS COLOR COMPUTER 32k ext .. \$379
TCS COLOR COMPUTER DISK 0 ... \$449
TCS COLOR COMPUTER DISK 1 ... \$249
TCS 32k MEMORY \$79

Model II . . Model 16 . . Accessories . . \$CALL

TCS is an authorized TRS-80 dealer F701 in Brady, Texas

DEALER INQUIRIES invited on all TCS MODEL III Systems and Kits

CUSTOM SOFTWARE FROM TCS

BTREE Scratchpad	BTREE Library	BTREE Mail List
\$39.95	\$39.95	\$49.95

TCS Exclusive THE PRODUCER \$199

The ultimate solution in creating your own custom software. If you're in a jam and can't find a program to fit your needs, use this fast and simple Program Development System to tailor make a solution to your problem. Custom design your own screen format with complete control over the number of characters assigned to each field. Fully view and edit all fields at all times. Create a B-Tree structured file allowing you to access data rapidly and without sorting. One key access to user-designed self-help or prompt information. Expand your program to support up to 8 calculations for each data field. AND MUCH MORE.

This system comes complete with its own Disk Operating System. It will make you a master of your software needs without hiring a programmer. Or if you are a programmer, this system will save you hundreds of hours in design work for your clients. Saving time is saving money!

WRITE FOR FREE BROCHURE ON TCS PROGRAM GENERATOR

For fast, efficient service **Heart of** we can air freight from Dallas

TEXAS COMPUTER SYSTEMS

P.O. Box 1327 Arlington, Texas 76004-1327

TEXAS ORDERS 817/274-5625

TECHNICAL ASSISTANCE 817/274-9221
ORDER STATUS 817/277-1913
TELEX/TWX/Easylink ELN 62100790



800 433-5184

No tax out of state. Texans add 5%. Prices subject to change at any time.

A description of how it really works

Mod II Random Access

Terry Kepner
P.O. Box 481
Peterborough, NH 03458

While writing programs for the Radio Shack Model II recently, I have developed a few migraine headaches and discovered some disquieting facts about its Basic and TRSDOS's Random Access (also called Direct Access) files interaction. The facts giving me these headaches deal with Field statements, buffers, and how TRSDOS and Basic mishandle these items.

When I began using the buffers Model II Basic uses to place and then retrieve information from the disk random-access files, I followed the instructions in the Tandy manual. These instructions explain how to use the Field statement to tell Basic how to divide the buffer into separate fields of information, and determine how many different items are in the buffer, as well as how many bytes are in each of these items through the RSET and LSET commands. Once Basic is told how to divide the buffer, you can put data into it or remove data from it.

When you have filled the buffer, transfer the data to the disk

file. To use that information later, Get a sector (256 bytes of data) and Basic will place it into the buffer. You can change the Fielding of the buffer as often as you want; however, to divide the buffer and recover your information, you must use the same Field arrangements (not necessarily the same Field statement) you used when you Put that information on disk in the first place.

Fielding Buffers

I was storing a rather large inventory of items on disk, arranged by product number, name, price and a set of eight

file back into memory to verify the program and my data were correct I discovered errors.

Even though I had not initialized the prices or quantities to any values, the files contained outrageous numbers, seven and 16 digits in length, with incredible exponents.

It took a few minutes to trace the problem. When Basic assigns a space in memory to be a buffer, it does not set the buffer to zero, but leaves the memory unchanged. This means the buffer contains garbage, usually alternating sets of 00 and FF.

Fielding a buffer assigns a variable name to a number of

C\$, and D\$ remain unaffected. When you transfer the data in this buffer onto the disk, all four chunks are written. If you put data into B\$ without clearing the buffer, the next time you transfer this buffer to the disk the information in A\$ will be written to disk again. Unless you are writing to the same sector as before you will have problems with your data.

When you Set new data into A\$, it replaces the information already there. Likewise, when you Get a sector of information from the disk and place it into the buffer it replaces the data there. Altering the buffer when Getting a new buffer of information or Setting data into specific portions of the buffer allows you to load a sector from the disk, make the necessary changes and put the information back on disk. A problem arises only when you perform a series of Put operations which involve changing parts of the buffer, such as when you build a mailing list, or use the buffer for the first time after initializing Basic.

In these cases remember to set the buffer equal to nothing—(CHR\$(0)). Use blanks (CHR\$(32)) only if you are not using numbers—in the buffer: blanks are interpreted as numbers and not

numbers, some single precision and some double precision. At this point I was loading the file with only the product names and their respective numbers. Rather than manipulate the numbers, I ignored them and Fielded only the portions of the buffer needed. When I read this contiguous bytes in the buffer. When information is Set in this buffer, only the Field names used in the LSET or RSET commands are affected. If you Field a 256 byte buffer into four 64-byte chunks with the variable names A\$, B\$, C\$, and D\$, and put information into A\$, then B\$,

“Fielding a buffer assigns a variable name to a number of contiguous bytes in the buffer.”

as zeros, CHR\$(0) is interpreted as the number zero for integer, single precision, and double precision numbers.

Discovering that I had to set the buffer to nothing led directly to my next headache and the next problem.

According to the Model II manual the variable names in the Field statement are called Field names, and the manual explains: "Most string variables point to an area in memory called the string space. This is where the value of the string is stored. Field names, on the other hand, point to the buffer area assigned in the Field statement."

Since the buffer contains 256 bytes and Field names in the Field statement identify buffer space and not string variables elsewhere in memory, it seems logical to Set a buffer equal to 256 bytes of any character, for example, CHR\$(0).

This is not so, however; you must use two or more Field names to cover the entire buffer, such as:

```
FIELD #1, 255 AS D1$, 1 AS D2$
LSET D1$ = STRING$(255,CHR$(0))
LSET D2$ = CHR$(0)
```

Another Problem

I wanted an indication as to when I had reached an empty record in the file. I checked to see if D1\$ = "" (the null set, nothing). I found 255 bytes of nothing (length of D1\$, according to the function LEN(D1\$), was zero) was *not* equal to the null set: Surprise!

I tested to see if D1\$ was equal to CHR\$(0); this worked.

My program lists a series of sectors to the video as an array. This array is spread over five sectors, and contains 19 elements. The first 64 bytes of the first sector is a general information area, and not part of the array. The second, third and fourth 64-byte chunks of the first sector are array elements one, two, and three. The remaining four sectors are divided into four chunks of 64 bytes each and comprise the other 16 elements of the array.

To save time I stored the number of active elements as a piece of data in the general area of the first sector. Only the necessary

sectors are read when listing to the video. This is a real time saver when the last 17 elements are all blanks.

Several places require the array be listed to the video, so I made the listing routine into a general purpose subroutine. Without specifically setting a flag and testing for it, I did not know how many elements had been listed to the video after returning from that subroutine. My program simply returned to sector 1 each time the subroutine was executed.

That was where the problem came up. Whenever I returned from the listing routine, I set the buffer equal to zero to eliminate the possibility of contaminating my data and reloaded the buffer with sector 1.

As long as I had four or more entries from my array listed on the video, my update routine worked well. If less than four were listed to the video, not only did it not update as I wanted, but the routine erased much of the information in the first sector. I traced the problem—TRSDOS and Basic will not let you Get the same sector consecutively.

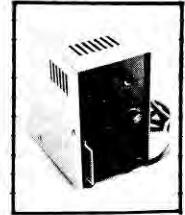
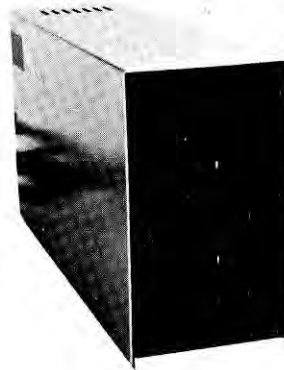
If you Get sector 1, use the data and decide to set the buffer to zero (or blanks), and then try to Get sector 1 again, it will not work! To save processing time, TRSDOS intercepts the Get command and won't return you to the same sector twice. You are left with a buffer of spoiled data you cannot replace unless you load the buffer with dummy information and then return to the sector you want and load it on top of the unneeded data. You end up using twice as much processing time as intended, not to mention the extra coding necessary to determine if you have to use this dummy load technique to get your data into the buffer.

I have not had any further troubles with this null set complication. With this article as a guide, you shouldn't have any problems either. ■

Terry Kepner is a free lance programmer and writer. He writes a column in Programmer called "Overbyte" and a column in 80 Micro called "Feedback Loop."

DISCOUNT

TRS 80™ Model I & III External Mini Disk Drives



Single Chassis w/Power Supply:

Fully assembled silver chassis with external card edge connector for easy cable installation. Chassis includes power supply & one Tandon drive.

- **TM100-1 w/chassis** **\$245**
- **TM100-2 w/chassis** **\$315**
- **TM100-4 w/chassis** **\$409**

Tandon Bare Drives:

- **TM100-1** **\$189**
5 1/4", single sided, 40 TRK, 48 TPI. Capable of single or double density
- **TM100-2** **\$259**
5 1/4", double sided, 40 TRK, 48 TPI. Capable of single or double density
- **TM100-4** **\$349**
5 1/4", double sided, 80 TRK, 96 TPI. Capable of single or double density

FREE SHIPPING

ORDER NOW — TOLL FREE

1-800-531-5475

(512) 250-1523 in Texas

"If we can't ship the next working day, we won't take the order."

CompuAdd Corp.
13010 Research Blvd.
Suite 218
Austin, Texas 78750

Visa, MasterCard, Money Order or Cashier's Check. Add 5% sales tax if Texas Resident.

TRS 80 is a Trademark of Tandy Corp.

All hardware has a 120 Day Limited Warranty.

252

There may be more than one way to go.

Drop Your Color Computer Into Disk Drive

Robert F. Nicholas
2-B Lennox Heights
Lenox, MA 01240

Philip Martel
748 Tyler St.
Pittsfield, MA 01201

Radio Shack's disks for the Color Computer cost \$599. You get a ROM pack, a 35 track double density disk drive, a two-drive cable, a reasonably well-written manual and a free (?) disk.

The ROM pack is about 6¼" by 4¼" and slips into the ROM cartridge slot on the right of the computer (where the games go). The disk cable connects to the end of the pack and runs to the drive(s).

Inside the ROM pack (see Fig. 1) is a printed circuit board approximately 5" by 3⅞". The screw to the ROM pack is concealed beneath the label just after the period in "CAT NO." You will discover a ROM for the entire disk operating system (*nothing* resides on the disk at all) a double density disk controller, a few pots (which you probably should not touch), a crystal and some auxiliary circuitry.

The disk drive is 35 track dou-

ble density. Imagine our surprise when we discovered that this Color Computer mini disk also worked fine on our Model I computers. Not only that, but our Model I disk drives worked fine on the Color Computer—and double density at that! Wow! This raises an interesting question: Will Radio Shack ever start selling the ROM pack by itself for those of us who already own disk drives? Apparently they do not at the present time.

The system is shipped with a two-drive cable, but it can handle four. The four-drive cables are available from the Shack.

The manual is well put together. It covers setting up the disk system, general description of how programs/files are stored on a disk, sequential files, direct access (random) files and some technical information.

Each of the 35 tracks on the disk is divided into 18 sectors of 256 bytes. The system assigns disk space in granules—blocks of nine sectors (half a track). Therefore each granule contains 2,304 bytes, each track 4,608 bytes and the entire disk contains 161,280 bytes. The user

available disk space (excluding the directory) consists of 156,672 bytes. If Radio Shack had given us 40 track double density drives, we would have had 179,712 bytes. And if they had given us 80 tracks...

Unlike the Models I and III, the Color Disk system does not have a DOS (Disk Operating System) mode. You are always in Disk Basic. The operating system uses about 2K of RAM leaving a 16K system with 6439 bytes and a 32K system with 22823. If you will not be using any high resolution graphics, you can do "PMODE0,1: PCLEAR1" and have 11047 (16K) or 27431 (32K).

The lack of a DOS mode poses some inconveniences. You cannot list data files and you cannot run a particular program automatically. A partial solution to the former problem is our program Colorzap included in this article. There seems to be no software solution to the latter problem.

System Software

The system software on the ROM pack consists of DSKINI, Backup and Copy. The phrasing of these commands is:

DSKINI drive number
BACKUP source drive (TO destination drive)
COPY file name-1 TO file name-2

DSKINI is the equivalent of Format on the Model I. For instance, DSKINI0 formats the disk in drive zero (in about 40 seconds).

You can back up a disk on a single drive or from one drive to another. A back-up with a single drive 32K system requires six disk swaps.

Copy, as the name implies, copies a file. For example:

COPY "COLORZAP/BAS" TO "COLORZIP/BAS"
COPY "COLORZAP/BAS:0" TO "COLORZAP/BAS:1"

Incidentally, as the manual indicates, *all* files *must* have an extension. The system assigns default extensions of BAS to Basic programs, BIN to machine-language software and DAT to data files. You may use your own extensions instead. If you saved a Basic program as COLORZAP, it would appear in the directory as COLORZAP.BAS. (Note that the slash does not explicitly appear in the directory. You may use either a slash or a period as the extension separator.) You could run or load the program as just COLORZAP. However, when copying the program, be sure to specify the extension in both the source file name and the destination file name because the Copy utility will not assign them for you. As an example, suppose we had COLORZAP/BAS in the directory. COPY "COLORZAP" TO "COLORZIP/BAS" would produce an NE (no such file in directory) error. We forgot the extension in the source file name. COPY "COLORZAP/BAS" TO "COLORZIP" would work just fine. Unfortunately, LOAD "COLORZIP" will not work since it does not have an extension on the disk. We omitted the extension during Copy. You could retrieve it with LOAD

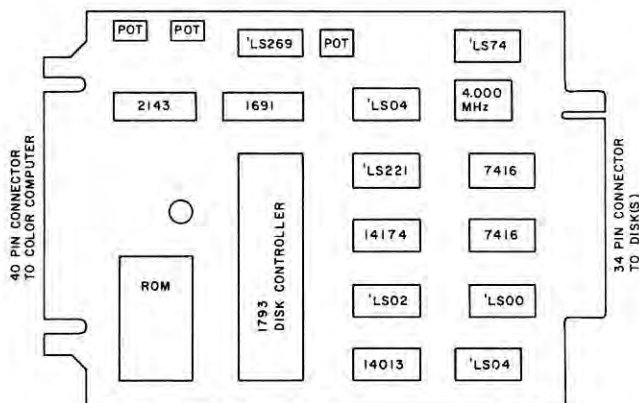


Fig. 1. Color Computer ROM Pack

The Key Box

Color Disk Basic
Color Computer
16K RAM
One disk drive

"COLORZIP".

Interactive Disk Commands

I will now describe those commands you use to interact with the disk drive(s). If you are familiar with other systems you will recognize these to be a mixture of DOS and Basic commands. However, in the Color Computer environment, these are all Basic commands. Most, if not all, can be used within Basic programs to add zip to your software which was not always possible with the Model I. For instance, you can display the directory, ask for the amount of free space, rename a data file, and so on.

Many of these commands are fairly similar to their Model I and III counterparts. However, there are some specific differences.

The command Drive followed by a drive number allows you to change the default drive the system uses—provided that you have more than one drive. The drives are numbered from 0 to 3 (maximum). Under normal circumstances, the computer will look at drive 0 (the default drive) when loading, saving, and so on. By using the Drive command, you can specify that the system use a different drive. It is important to note that the Color Disk system looks at only one drive. For instance, in a multi-drive Model I system, if you request LOAD "COLORZAP", the computer will look through all of the drives starting with drive 0 until it finds the program. This is not true with the Color system. If it does not find it on the default drive, it is not there! (Unless you include a drive number with the file name.)

The command Save followed by a file name ,A saves the program in memory to the disk using the file name given. Remember that if your file name does not contain an extension, the computer will assign /BAS. Note that the file name can include a drive number. For instance, SAVE "COLORZAP" would save the program in memory as COLORZAP/BAS on the default drive, whereas SAVE "COLORZAP/V15:1" would save it as COLORZAP/V15 on drive number one.

The optional ",A" appendage will save the program in ASCII format. This is necessary if you intend to merge the program with another program later.

You load a program with the command Load followed by a file name ,R. Remember to include the drive number in the file name if the program you want is not on the default drive (normally drive 0). The optional ",R" appendage will run the program after it has been loaded into memory. In addition, any files which were open before you issued this command will remain open.

The command Run followed by a file name ,R loads and runs the given file name from the disk. The optional ",R" leaves open files open as above. You need not specify the extension when loading or running unless you assigned an extension other than /BAS. In other words, even though the program is saved to disk as COLORZAP/BAS, you can LOAD "COLORZAP" or RUN "COLORZAP" without the extension.

You cannot load or run a string. If you let A\$ = "COLORZAP", you cannot then RUN A\$.

When you want to save machine language programs presently held in memory, use the command SAVEM followed by a file name, first address, last address and execution address. As indicated, you must supply the first, last and execution addresses for the program. If you do not specify an extension in the file name, the computer will assign /BIN for binary.

The command LOADM followed by a file name, offset address loads the machine language program from disk. You would then run the program by typing EXEC to execute it. If you specify the optional offset address, the computer will locate it at the original first address plus the offset address. The program must be relocatable if it is going to be able to function at this new location.

The default in the Color system is VERIFY OFF, whereas in the Model I the default is ON. Verify double-checks all writes to the disk. This provides greater reliability, but it takes about twice as long. Unless you are ex-

periencing problems with loading files, you probably do not need VERIFY ON.

DIR lists the directory for the disk (default drive.) To see the directory on a specific drive, include the drive number appendage. A sample directory is shown below:

```
COLORZAP BAS 0 B 2
MENU      BAS 0 A 2
DRAGON    DAT 1 A 1
VIDEOTEX  BIN 2 B 1
```

The first eight characters are the file name. Then there is a space followed by the extension. (As mentioned above, the slash or period before the extension is not indicated on the disk itself.) There are then three col-

umns of information.

The first column shows the file type.

- 0—Basic program
- 1—data file
- 2—machine-language program
- 3—editor/ assembler source program

The next column indicates the storage format of the file:

- A—ASCII
- B—Binary

And the last column shows the number of granules assigned to the file.

There are some problems with the directory. The directory keeps scrolling on the screen. In order to stop it, you have to press shift, @. A disk can contain up to 68 files, so on a really

Keywords (8183)	Tokens (Hex)	Addresses (81F0)
DEL	B5	8970
EDIT	B6	8533
TRON	B7	86A7
TROFF	B8	86A8
DEF	B9	8871
LET	BA	AF89
LINE	BB	93BB
PCLS	BC	9532
PSET	BD	9361
PRESET	BE	9365
SCREEN	BF	9670
PCLEAR	C0	968B
COLOR	C1	9546
CIRCLE	C2	9E9D
PAINT	C3	98EC
GET	C4	9755
PUT	C5	9758
DRAW	C6	9CB6
PCOPY	C7	9723
PMODE	C8	9621
PLAY	C9	9A22
DLOAD	CA	8C18
RENUM	CB	8A09
FN	CC	----
USING	CD	----

Notes:
 1) DLOAD and DLOADM are commands which download programs to the Color Computer via the RS-232 port. They are not supported and apparently do not work.
 2) FN and USING are stored as tokens but there are no execute addresses in the table.

Table 1. Extended Basic Keywords

Function Name (831E)	Token	Location (8257)
ATN	FF94	83B0
COS	FF95	8378
TAN	FF96	8381
EXP	FF97	84F2
FIX	FF98	8524
LOG	FF99	8446
POS	FF9A	86AC
SQR	FF9B	8480
HEX\$	FF9C	8BDD
VARPTR	FF9D	86BE
INSTR	FF9E	877E
TIMER	FF9F	8968
PPOINT	FFA0	9339
STRING\$	FFA1	874E

Table 2. Extended Basic Functions

ComSoft MEANS BUSINESS

Hardware and Software

Products for the TRS 80[®]
Models I & III

TSHARE 2.0 MULTI-USER SYSTEM TRS-80[®]



MODELS I & III

SPECIFICATIONS:

TSHARE is a multi-tasking operating system for two users. It patches itself to your NEWDOS or TRSDOS SYSTEM. TSHARE allows simultaneous and separate operations for two users within a single computer.

AVAILABLE USER MEMORY ABOVE 7F80 HEX

- 32K TRS-80: 16K FREE
- 48K TRS-80: 32K FREE

TIMESHARING MODES:

- SIMPLEX MODE: With TSHARE 1.3 and 2A Only
- STANDARD MODE: With All Systems

SUPPORT EQUIPMENT:

- One + Disk Drive
- 32K + Memory
- A Printer
- A Terminal
- TRS-232 (optional)
- RS-232 or MPR-232

EXECUTION SPEED STANDARD MODE:

(Without Clock Speedup Mods)

- BENCHMARK executed by 2 simultaneous users: 37 sec.
- BENCHMARK executed once by standard TRS-80: 14 sec.

FEATURES:

- Type-ahead during Disk I/O (V2.0 Only)
- Communications between users
- Concurrent execution of single program
- Foreground/background task design
- Address up to two printers

PRICES:

#TS-13 for TRSDOS 2.3	\$89 (MOD I)
#TS-13 for NEWDOS 2.1	\$89 (MOD I)
#TS-2A for NEWDOS V1	\$99 (MOD II)
#TS-2B1 for NEWDOS V2	\$99 (MOD II)
#TS-2BIII for NEWDOS V2	\$99 (MOD III)



AT LAST! A serial input/output interface designed for connection to the TRS80 Model I with or without an expansion interface.

SERIAL I/O
MPR-232

MPR232 Specifications

- Glitch free operation
- Connects with card edge connector
- Baud rates 75-19,200 are switch selectable
- Integral Power Supply included!
- May be daisy chained with other MPR 232s

PRICES:

#MPR232I	\$129.00 (MOD I)
#MPR 232III	\$139.00 (MOD III)

CSTOCK \$99

- A) CSTOCK maintains a securities data base
- Maintains data on up to 3 stock market indexes
 - Weekly Stock Data (Price, Vol., P/E, and Yield)
 - Weekly Stock Option Data
 - Two years of continuous data per stock
- B) CSTOCK is a professional technical tool
- Stock and market averages, highs, and lows with respect to any time span
 - Linear regression analysis of stock behavior versus any of 3 market indexes
 - Short term betas computed (stock volatility in terms of market return)
 - Data plotting capabilities
- C) CSTOCK provides a parametric portfolio selection system as an aid in evaluating investment strategies in relation to risk.



For Ease of Use THE FILE CLERK TRS-80[®] Models I & III Version 5.5

SPECIFICATIONS:

- A multi-feature file manager
- Plus a simple data base (multi-file data sets)
- File handling capacity for 12000 records
- Up to 20 data fields/record
- MAX record and field length 255
- MAX effective record length w/indexing 7905
- Assembly language sorts on single and combined data fields
- Multiple search parameters and chained queries
- Fast (KSAM) record retrieval on sorted key fields
- Flexible report generator with Pagination & User titles
- Computational fields
- Files can extend over several diskettes
- All diskettes need not be on line
- AUTO MOUNT REQUESTS
- Fields can be redefined, deleted, or added
- 140-page manual

VIEW 3.0 \$49

A SCREEN FORMATTER FOR DBMS

- Full CURSOR control for MASK design
- Screen design with keyboard GRAPHICS
- Elegant & professional looks
- File data entry, inquiry, & edit
- Word processor style field editing
- VIEW is a stand-alone data base
- COMPUTED FIELDS
- KSAM Master Keys
- Requires DBM5 for SORTS

MPR-232 & MERLIN TM of Micro Projects Eng.
TRS-80 TM of Radio Shack, Tandy Corp.
NEWDOS80 TM of Apparat, Inc.
TRS232 TM of Small System Software Co.

ComSoft
203 Arden Street
Glendale, California 91203
(213) 649-0369

LOOK

DMB5 provides four data management features:

- A comprehensive FILE MANAGER for defining your records, data entry or edit, and general record retrieval.
- A flexible REPORT GENERATOR for information retrieval.
- A simple data base for advanced applications, where DATA SETS involving file pairs can be defined.
- A COPY file facility to transfer SORTS, SEARCHES, and transfer data to NEW formats.

PRICES:

#DB-5I	\$99 (MOD I)
#DB-5III	\$99 (MOD III)



Merlin

CP/M 86 for the TRS-80[®]

8088 co-processor
128K RAM (Expandable to 256K)
Diskette compatibility with IBM PC

(Available December 1982)
Dealer Inquiries Invited

full disk, you may have to list the directory several times before locating the file you want. Sixty-eight files is the equivalent of five screens zipping by at a good clip. Even speed readers will experience problems. At three in the morning, virtually all programmers will experience problems reading the directory. Radio Shack should have included a stop-between-screenfuls feature.

A reasonable solution to this problem is our Menu program included with this article. It closes up the spacing between the file name and the extension and eliminates three columns of information. Programs are sorted alphabetically. We eliminated scrolling and you can even run a Basic program from the menu.

The Free function requires the drive number. Free by itself is considered a syntax error. PRINT FREE(0) will display the number of free granules on drive 0. Unlike the Model I, the Free command works on only one drive at a time. It does not indicate the free space on all the drives, only the drive you request. Note that this is a function, not a command! You can state:

X = FREE(0)
P = SQR(FREE(0))

and so on.

The command Kill followed by a file name removes the file from the directory and frees up the space which had been assigned to it. You must include the extension when killing a file from the disk. KILL "COLORZAP" would not work—KILL "COLORZAP/BAS" would.

The command Rename followed by old file name to new file name changes the name of a file in the directory. Be sure you include the extension in both the old file name and the new file name. It follows the rules pointed out in the Copy utility above.

The command Merge followed by a file name ,R merges the file from disk with the program currently in memory. You must have saved the file with the "A" (ASCII) appendage. Any duplicate line numbers will be re-

placed by the ones from the merged file. If you include the optional "R", the resulting program in memory will be run and any files open before the merge will remain open.

The manual suggests you type the command Unload followed by a drive number before removing a disk from the drive. It closes any files on the specified drive. The drive number is optional; if not included, the Unload will operate on the default drive.

Disk File Commands

The Color system allows the user both sequential and direct access (random) file formats. The Color system uses commands similar to the Models I and III. They are as follows.

The default values are two buffers (1 and 2) and a buffer size of 256 bytes. If you need a different number of buffers or a different buffer size, use the command Files followed by buffer number and buffer size. The buffer size seems to be the total amount of buffer space available, not the amount per buffer. There is also a File Control Block (FCB) of 281 bytes per buffer.

To open a data file for processing use the command Open followed by "mode", buffer number, file name and record length. The modes are:

"O" Output—Sequential output
"I" Input—Sequential input
"D" Direct—Random Input and/or output

Next is the number of the buffer to be used.

Buffer -0—screen or keyboard
Seems to be opened and closed automatically by ordinary Prints and Inputs. User seems to have no control over this.
Buffer -1—tape recorder
Buffer -2—printer
Buffer 1-15—disk files

Then supply the file name and optionally the record length if using direct access files. You can have record lengths less than 256 or greater than 256 if desired. This eliminates the Model I random file hassle of having to calculate the starting positions of logical sub-records.

THE ULTIMATE IN COLORCOMPUTING

For the TRS-80 Color Computer and TDP System 100 Personal Computer

Super "Color" Writer II

By Tim Nelson

The Rolls Royce of Word Processors

The Super "Color" Writer is a FAST, machine code, full featured, character (screen) oriented word processing system for the TRS-80™ Color Computer and ANY printer. The video display is styled after a professional phosphor (green characters on black background) display for hours of use without eye fatigue (optional orange on black). The unique print WINDOW frees you from 32, 51 or 64 character lines FOREVER! This window can be moved anywhere in the text file, up, down, left or right to display the text as it will be printed without wasting paper. You can create or edit Super "Color" Terminal files, ASCII files, BASIC programs or Editor/Assembler source listings. It's simple enough for beginners with 4K and . . . for the professional writer with a 32K disk system and a lot to say, there's plenty of room to say it!

COMPARISON CHART	SUPER COLOR WRITER			THE COMPETITION		
System Size	4K	16K	32K	4K	16K	32K
TAPE: Text space	N/A	7K	23K	N/A	2K	18K
ROMPAK: Text space	2.5K	16K	31K	N/A	N/A	N/A
DISK: Text space	N/A	5.5K	21.5K	N/A	0.5K	16.5K
Right Justify		YES			NO	
Video Window		YES			NO	
Edit any ASCII File		YES			NO	
Programmable Function		YES			NO	

The figures speak for themselves and with professional features like PROGRAMMABLE function string commands to perform up to 28 commands automatically. PROGRAMMABLE text file chaining, PROGRAMMABLE column insert & delete, and right hand JUSTIFICATION with punctuation precedence, the choice is clear but there's still more! In their September '82 issue, "80 MICRO" says, "The Color Computer has finally come of age. Nothing illustrates that coming of age better than this offering (SUPER "COLOR" WRITER) by Nelson Software". The Super "Color" Writer takes full advantage of the new breed of "smart printers" with Control codes 1-31, 20 Programmable control codes 0-255 for special needs. Works perfectly with all Epson, Radio Shack, Okidata, NEC, IDS, Centronics, Citech, Smith Corona, Diablo Etc., Matrix, or Letter Quality Printers.

CHECK THESE FEATURES!!

User friendly • Easy commands • 32K Compatible • Window • Key beep • HELP table • 128 character ASCII & graphics • Mem left and Mem used • Full cursor control • Quick paging • Scrolling • Word wrap around • Tabs • Repeat all functions • Repeat last command • Insert character & line • Delete character, delete to end of line, line to cursor, line & block • Block move, copy & delete • Global Search, Exchange & Delete • Merge or Append files • Imbed Control Codes in text • Underline • Superscripts • Subscripts • Headers, Footers & 2 Auxiliary footnotes on odd, even or all pages definable position • Flush right • Non-breakable space • 4 centering modes: 5, 8.3, 10 & 16.7 (CPI) • Full page & print formatting in text • Single sheet pause • Set Page length • Line length, Line spacing, Margins, Page numbers • Title pages • Printer baud: 110, 300, 600, 1200, 2400 • Linefeeds after CR • Soft & hard formfeed • Works with 8 bit printer fix • and more!

Super "Color" Writer II Disk

The Disk version of the Super "Color" Writer works with the TRS-80C Disk System and has all the features listed above plus many more! Use with up to four Disk Drives. Includes an extended HELP table you can access at any time. Call a directory, print FREE space, Kill disk files and SAVE and LOAD text files you've created all from the Super "Color" Writer. Print, merge or append any Super "Color" Terminal file, ASCII file, BASIC program or Editor/Assembler source listing stored on the Disk or tape. The Super "Color" Writer Disk version has additional formatting and print features for more control over your printer and PROGRAMMABLE chaining of disk files for "hands off" operation. Print an entire BOOK without ever touching a thing! Includes comprehensive 90 plus page Tutorial manual.

TAPE \$49.95 ROMPAK \$74.95 DISK \$99.95
Tutorial only \$15.00 (Refundable with purchase)

ORDERING INCLUDE \$3.00 for shipping in the U.S. & Canada,
\$6.00 for Foreign orders. C.O.D. add \$2.00.

**NELSON™
SOFTWARE
SYSTEMS**



✓ 128

9072 Lyndale Avenue So. 612/881-2777



A Division of Sofllaw Corporation

Minneapolis, Minnesota 55420 U. S. A.

Super "Color" Terminal

By Dan Nelson

The Ultimate in Smart Terminals

The Super "Color" Terminal turns the Color Computer into a Super-smart terminal with all the features of VIDEOTEX™ plus much more. COMMUNICATE with Dow Jones & Compuserve and with computers like the TRS-80™ MODEL I, II, III, APPLE etc., via modem or RS-232 direct! Save the data to tape or print it! Reduces ON-LINE cost to a minimum!

FEATURES

10 buffer size settings from 2-30K • Buffer full indicator • Prints buffer contents • Full 128 ASCII keyboard • Compatible with Super "Color" Writer files • UPLOAD & DOWNLOAD ASCII files, Machine Language & Basic programs • Set RS-232 parameters • Duplex: Half/Full • Baud Rate: 110, 300, 600, 1200, 2400, 4800 • Word Lengths 5, 6, 7 or 8 • Parity: Odd, Even or None • Stop Bits: 1-9 • Local linefeeds to screen • Tape save & load for ASCII files, Machine code & Basic programs • Unique clone feature for copying any tape.

Super "Color" Terminal Disk

The disk version of the Super "Color" Terminal works with the TRS-80C Disk system and has all the features listed above plus many more! Use with up to four Disk Drives • Call a directory, print FREE space, kill disk files, save and load text files or BASIC programs • Echo ability in full duplex • Lower case masking • 10 Keystroke Multiplier (MACRO) buffers that can be saved on disk to perform repetitive log-on tasks and send short messages (up to 250 characters each) • Programmable prompt or delay for send next line • Selectable character trapping • Set printer Baud rate to 110, 300, 600, 1200, & 2400 • Operators Manual.

TAPE \$39.95 ROMPAK \$49.95 DISK \$69.95
Operators manual only \$10.00 (Refundable with purchase)

NEW!!

Super "Color" Mailer

Correspondence-Mailmerge

The Super "Color" Mailer is a powerful multi-purpose file merging program that uses files created by the Super "Color" Writer II. One of Super "Color" Mailer's most popular uses is producing customized form letters — at a fraction of the time and expense of individually typed letters. With Super "Color" Mailer you can combine a Super "Color" Writer II file containing a form letter with a file containing a list of names and addresses. You can even insert special words and phrases — unique to each addressee — into the body of the letter. Other Super "Color" Mailer uses include creating invoices, printing mailing labels, addressing envelopes, and producing "boiler plate" legal documents out of many different paragraphs. Features include: the ability to selectively print mailing lists by any of up to 10 user definable fields • automatically prints current date • address • salutation • closing • P.S. etc. • prints any ASCII file • justification.

TAPE \$39.95

DISK \$59.95

NEW!!

Super "Color" Disk-ZAP

The Ultimate in Disk Repair Utilities

A must for ALL Color Computer Disk system owners. A high-speed machine code Disk Utility that can copy sectors and tracks • repair directory tracks and smashed disks, etc. Super "Color" Disk-ZAP has a special screen display that displays sector, track and memory contents in HEXADECIMAL and ASCII at the same time with double cursors that can be moved in any direction. With Super "Color" Disk-ZAP you are able to verify or modify disk sectors at will. You can even type right onto the Disk! You can send sector contents to the printer or any other RS-232 device in either ASCII or HEXADECIMAL listing. Search the entire Diskette for any ASCII or HEXADECIMAL string. Comes complete with comprehensive manual.

DISK ONLY \$69.95

COMING
SOON!!

Super "Color" Calc

Electronic Spread Sheet

The finest electronic spread sheet and financial modeling program available for the Color Computer — A sophisticated yet easy to use, calculating and planning tool. Project figures into the future to answer the "What if?" questions you face. Create files compatible with the Super "Color" Writer II. Combine spread sheet tables with your documents to create ledgers, projections, statistical & financial reports & budgets.

AVAILABLE AT DEALERS EVERYWHERE. IF NOT, ASK WHY!!

TRS-80 is a registered trademark of the Tandy Corp.

SECURE PROGRAMS

WITH COPY-NOT

COPY-NOT IS A COPY PROTECTION PROGRAM WHICH PERMITS BASIC SOFTWARE AUTHOR TO PROTECT HIS CREATION FROM PIRATES. PROGRAMS ON THE DISK ARE DATA ENCRYPTED. PROGRAMS IN MEMORY RUN IN AN ENCRYPTED MODE FOR MAX-PROTECTION.

COPY-NOT satisfies external security needs by forcing the would be pirates into the assembly language code where he must stay for several hundred hours before he can attempt to breach the security of COPY-NOT.

COPY-NOT is an external security program for "BASIC" software authors. It is a menu-driven tutorial program that comes with a 41 page owners manual and technical support registration card. COPY-NOT significantly modifies TRSDOS 2.3 by killing off three TRSDOS modules thus achieving a net disk overhead of less than 2565 bytes. COPY-NOT stores all "/BAS" compressed files on the disk in encrypted form. COPY-NOT significantly modifies "DOS READY" function, but still allows library command execution. It's "DO/JCL" file allows up to nine DOS sequence commands. It has no impact on available memory during execution, and renders "BASIC*" equal to "GARBAGE". Furthermore, it allows the software author to place his 128 character title line on each diskette and has an AUTO serial number feature that places your 10 digit serial number on each application program diskette, and increments the serial number by one. It even has a simultaneous manufacturing feature that allows you to make up to three application programs at once. COPY-NOT error checks during execution and forces frustrated pirates into the assembly language code.

COPY-NOT'S MANUAL AVAILABLE FOR \$8.00. MANUAL PRICE APPLIED TO COPY-NOT ORDER.

**\$275.00
OR
CODE4**

CODE4 is an internal security encryption program that is undecryptable by a micro-computer with its 1.6×10^{19} keys. CODE4 is a MICROSOFT COMPILED BRUN utility program that handles ASCII files with FIELD lengths of 256 characters or less. Generally, the file must not be longer than 29,140 bytes or 300 lines. CODE4 will handle small SCRIPSI/UC REV01 compressed files of 10 pages or so. CODE4 comes with its list source which will allow easy customizing of its RANDOM NUMBER GENERATOR by selecting a prime number between 11 and 999991. CODE4 can be used with multiple keys. If time would allow 25 master keys of 1.6×10^{19} each, (2.56×10^{44}) keys then CODE4 would give the CRAY an undecryptable problem. There are no file protects so CODE4 disks can be backed-up, but if you don't know the pass number (EX. 125125, 125125, 3, 200, 255), bulk erase and start over, you have just lost the file. The program is MENU driven and features five run modules: ENCODE, DECODE, SAVE FILE, ZERO FILE, and RETURN TO DOS. Like its big brother COPY-NOT, CODE4 is for use on a 48K, two-disk Model I system. It is available on a single density TRSDOS 2.3 disk, and comes with a sample ASCII file, and start up INSTRUCTIONS.

\$19.95

T0: H P B VECTOR CO.



130 CENTER STREET
E. STROUDSBURG, PA. 18301

Allow Two Weeks for Delivery

P.S. MONEY ORDERS ARE RUSH ORDERS.

487

The command Close followed by a buffer number closes the files specified. Close by itself closes all open files.

The command Write followed by a buffer number and your data list writes the data list to the specified buffer. Write does not directly place the data onto the disk. In the case of sequential files, the information in the buffer is placed on the disk either when the buffer is full or when you close the buffer. With direct access files, you place the information on the disk by the Put statement following the Write.

The command Print followed by a buffer number and data list is similar to the Write command but avoid it unless you know exactly what you are doing. This is the old Model I way of putting information onto the disk. It requires the user to specify explicitly the commas, semicolons and quotation marks. The problems inherent in using this command probably kept most Model I users from ever attempting random access files.

Print followed by a buffer number, Using format and data list is another leftover command from the Model I that you want to avoid unless you have very pe-

culiar needs! Print and Print Using can be very useful for particular file requirements. The problem is that you definitely have to understand how the information is stored physically on the disk. If you want to experiment with these commands, we urge you to use our COLORZAP program so that you examine what was actually put on the disk.

The command Input followed by a buffer number and variable name loads data from the specific buffer. The command Line Input followed by a buffer number and your data loads an entire block of data from the specific buffer until it encounters the first <ENTER> (0D hex).

Other Functions

Use the EOF (buffer) function to detect if you have reached the end of the file. Use the LOC (buffer) function to determine the correct record number. Use the LOF (buffer) function to determine the last record number in the file.

Use the function Field followed by a buffer number and field size as field name with direct access files to format the buffer. Use the function Get followed by a buffer number and record number with direct ac-

Program Listing 1

```
10 REM COLORZAP
20 REM BOB NICHOLAS
30 REM 10/22/81
40 REM
50 CLS: CLEAR500: DIM MS(1), AS(16), K(22): BL$=CHR$(128): BL=159
60 FORX=1 TO 16: READ AS(X): NEXT
70 DATA D, #, @, " , T, #, #, " , S, #, #, " , " , " , "
80 FORX=1 TO 22: READ K(X): NEXT
90 DATA 8, 9, 10, 12, 13, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 65, 66, 67, 68, 6,
9, 70, 94
100 CLS: INPUT "HOW MANY DRIVES DO YOU HAVE"; MD: MD=INT(MD-1): IF MD<
00RMD>3 THEN GOTO100
110 CLS
120 CLS: IF MD=0 THEN DN=0: GOTO150
130 PRINT@320, "": PRINT@320, "DRIVE #";: INPUT DN: DN=INT(DN): IF DN<0
OR DN>MD THEN GOTO 130
140 AS(3)=STR$(DN): AS(3)=RIGHT$(AS(3), 1)
150 PRINT@352, "": PRINT@352, "TRACK # (0 - 34)":: INPUT TN: TN=INT(T
N): IF TN<0 OR TN>34 THEN GOTO150
160 PRINT@384, "": PRINT@384, "SECTOR # (1 - 18)":: INPUT SN: SN=INT(
SN): IF SN<1 OR SN>18 THEN GOTO 160
170 MN=0
180 REM MAIN ROUTINE
190 CLS: DSK IS DN, TN, SN, MS(0), MS(1)
200 AS(7)=STR$(INT(TN/10)): AS(8)=STR$(TN-10*INT(TN/10))
210 AS(7)=RIGHT$(AS(7), 1): AS(8)=RIGHT$(AS(8), 1)
220 AS(12)=STR$(INT(SN/10)): AS(13)=STR$(SN-10*INT(SN/10))
230 AS(12)=RIGHT$(AS(12), 1): AS(13)=RIGHT$(AS(13), 1)
240 GOSUB410
250 IN$=""
260 IN$=INKEY$: IF IN$="" THEN 260
270 IF IN$="M" THEN GOSUB 610: GOTO190
280 IN=ASC(IN$)
290 IF IN=9 THEN 360
300 IF IN=12 THEN GOTO120
310 IF IN <> 8 THEN GOTO260
320 IF MN=1 THEN MN=0: CLS: GOTO240
330 SN=SN-1: IF SN<1 THEN SN=18: TN=TN-1
340 IF TN<0 THEN TN=0: SN=1: MN=0: GOTO250
350 MN=1: GOTO190
360 IF MN=0 THEN MN=1: CLS: GOTO240
370 SN=SN+1: IF SN>18 THEN SN=1: TN=TN+1
380 IF TN>34 THEN TN=34: SN=18: MN=1: GOTO250
390 MN=0: GOTO190
```

Listing 1 continues

Listing 1 continued

```

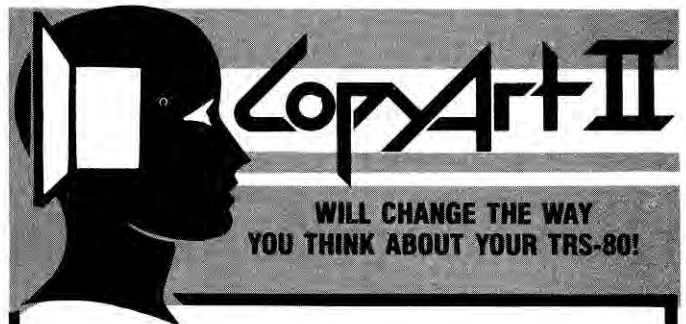
400 REM PRINT FORMAT
410 FORZ=1TO128 STEP 8
420 LS=HEX$(Z/MN*128-1):IFLEN(LS)<2 THEN LS="0"+LS
430 PRINT#32*(Z-1)/8,A$(1+(Z-1)/8);LS;BL$;
440 FORQ=0TO7 STEP2
450 H1$=HEX$(ASC(MID$(M$(MN),Z+Q,1)): H2$=HEX$(ASC(MID$(M$(MN),
Z+Q,1))
460 IFLEN(H1$)<2 THEN H1$="0"+H1$
470 IFLEN(H2$)<2 THENH2$="0"+H2$
480 PRINT#13;H2$;
490 IF Q=6 THEN PRINT#13; ELSEPRINT# " ";
500 NEXT Q
510 J=(Z-1)/8
520 FORQ=0TO7
530 PK=ASC(MID$(M$(MN),Z+Q,1))
540 IF PK<32 THENPK=96:GOTO570
550 IFPK >=32 AND PK<=63 THEN PK=PK+64:GOTO570
560 IFPK>=96 AND PK<=127 THENPK=PK-96
570 POKE1048+J*32+Q,PK
580 NEXT Q
590 NEXT:RETURN
600 REM MODIFY MODE
610 SP=1:CU=1028:CM=0:MM$=""
620 CU=1028 +32*INT((SP-1)/8) + +CM +INT(CM/4)
630 PE=PEEK(CU)
650 POKECU,BL:MM$=INKEY$:POKECU,PE:IFMM$=""THEN650 ELSEMM=ASC(MM
$)
660 FL=0:FORZ=1TO22:IFMK=K(Z)THENFL=Z
670 NEXTZ:IFFL=0THEN650
680 ON FL GOTO 700,730,760,780,800,870,870,870,870,870,870,870,870,870,870,870,870
690 REM BACK ARROW
700 CM=CM-1:IFCM>=0 THEN SP=SP+(INT(CM/2)<CM/2):GOTO620
710 CM=0:IFSP>8 THEN SP=SP-1: CM=15:GOTO620 ELSE GOTO 650
720 REM FORWARD ARROW
730 CM=CM+1:IFCM<=15 THEN SP=SP-(INT(CM/2)=CM/2): GOTO 620
740 CM=15:IFSP<121 THEN SP=SP+1:CM=0:GOTO620 ELSE GOTO650
750 REM DOWN ARROW
760 IF SP<121 THEN SP=SP+8:GOTO620 ELSE GOTO 650
770 REM CLEAR
780 GOTO 190
790 REM MODIFY DISK MEMORY
800 CLS:PRINT"PRESS <X> TO CANCEL MODIFICATIONOR PRESS <ENTER> T
O MODIFY DISK CONTENTS AS INDICATED."
810 VM$=INKEY$:IFVM$=""THEN810
820 IFVM$="X" THENGOTO 190
830 IFASC(VM$)>13 THEN GOTO 810
840 DSKO$ DN,TN,SN,M$(0),M$(1)
850 GOTO190
860 REM MODIFYING HEX VALUE
870 PZ=K(FL):IFPZ<65 THENPZ=PZ+64
880 POKECU,PZ
890 V(0)=0:V(1)=0:VL=0
900 IFINT(CM/2)=CM/2 THEN GOTO 970
910 V(1)=FL-6
920 PN=PEEK(CU-1)
930 IFPN>=112 THENPN=PN-112:GOTO960
940 IFPN>=65THENPN=PN-55:GOTO960
950 IF PN>=48 THENPN=PN-48
960 VL=PN*16+V(1):GOTO1020
970 V(0)=FL-6:PN=PEEK(CU+1)
980 IFPN>=112 THENPN=PN-112:GOTO1010
990 IF PN>=65 THENPN=PN-55:GOTO1010
1000 IFPN>=48 THENPN=PN-48
1010 VL=V(0)*16+PN
1020 MID$(M$(MN),SP,1)=CHR$(VL)
1030 IFVL<32 THEN VL=96:GOTO1060
1040 IFVL>=32 AND VL<=63 THEN VL=VL+64:GOTO1060
1050 IF VL>=96 AND VL<=127 THEN VL=VL-96
1060 SV=INT((SP-1)/8):POKE1047+32*SV+SP-8*SV,VL
1070 GOTO730
1080 REM UP ARROW
1090 IF SP >8 THEN SP=SP-8:GOTO620 ELSE GOTO650

```

Keyword (C17F)	Token	Location (C1DB)
DIR	CE	CBCF
DRIVE	CF	CDE9
FIELD	D0	CFE0
FILES	D1	D080
KILL	D2	C6C2
LOAD	D3	C99A
LSET	D4	D026
MERGE	D5	C98B
RENAME	D6	CF3F
RSET	D7	D025
SAVE	D8	C932
WRITE	D9	CF8A
VERIFY	DA	D65B
UNLOAD	DB	D146
DSKINI	DC	D4AB
BACKUP	DD	D175
COPY	DE	D2CC
DISKIS	DF	D3FF
DISKOS	EO	D474
LOADM		CEE5
SAVEM		CEBC

The last two items are not in the table of names or the table of addresses. They are stored as the token for Load (or Save) followed by 4D (M). The addresses were found by examining the beginning of the Load (and Save) code.

Table 3. Disk Basic Keywords



WILL CHANGE THE WAY
YOU THINK ABOUT YOUR TRS-80!

THE MOST POWERFUL WORD PROCESSOR AND ALL PURPOSE COMPUTER PROGRAM AVAILABLE FOR THE TRS-80.

LOOK AT ALL THESE FEATURES

1. INSERT characters, words, lines, paragraphs or other files.
2. DELETE characters, words, lines, paragraphs.
3. COLUMNS. CopyArt II can be instructed to print your text from one to six columns. Super easy to use! No complicated commands. Great for doing newsletters, magazine layouts etc. NO MORE CUT AND PASTE!
4. SORTING. Sort lines of text by any field. Sorts up to 650 items in less than 7 seconds. Sort indices, table of contents, names, words or whatever in descending or ascending order. Used with CopyArt's math function it is great for small inventories, Receivables, Payables etc.
5. Screen widths from 32-255 characters wide. Screen widths can be changed to allow formatting your text as you want.
6. MATH. Built in MATH function for doing calculations on columns or rows. Used with the SORT command, CopyArt II can do a small inventory of 200-300 items, or keep track of small receivables or payables, general ledgers or home financial reports. Super floating point precision up to 32 digits!
7. *GRAPHICS. CopyArt has a built in graphics program that allows inserting graphics within your text. Drawings, graphs, illustrations, cartoons etc. may be used within newsletters or company reports. Graphics commands include: Plot between points, Circles, Squares, Fill, Erase, Draw, Move, Pixel cursor controls and more.
8. *GRAPHIC CHARACTERS. CopyArt has a built in graphics character generator. Used for typesetting large letters from 3 to 25 times normal size! Yes, you can even print characters down the page as well as across. Black on white or white on black.
9. JUSTIFICATION is fully supported. *Proportional spaced justify is supported.
10. *SUPER or SUB-SCRIPT.
11. UNDERLINING.
12. BOLDFACTING.
13. *CHANGE CHARACTER SIZE or PITCH within your document. Character size changes for dot matrix printers with capability. Pitch change for daisy wheel printers with capability.
14. HELP. Help is available for all the commands at the touch of a key while using the word processor. Super for training inexperienced secretaries. Great reminder for experienced people as well. MENU DRIVEN Help for over 45 commands.

CopyArt II Continues on the next page...



COD and Credit Cards
CALL TOLL FREE to order:
1-800-528-1149

SIMUTEK

Computer Products Inc.

SIMUTEK COMPUTER PRODUCTS INC., 4897 E. SPEEDWAY BLVD., TUCSON, AZ 85712, (602) 323-9391
DEALER, DISTRIBUTOR, & PRINTER/MANUFACTURER INQUIRIES INVITED
TRS-80 and Scriptis are TM of Radio Shack a Tandy corp.
*Indicates printer must have capability to do function.

Speedy Word-Finder REFWARE Thesaurus 2.0

Save TIME.

Improve your WRITING.
Help your SPELLING.

REFWARE Thesaurus 2.0 takes just 7 seconds to find groups of synonyms and related words for any of 24,800 nouns, adjectives, verbs, and adverbs. Substitutes synonyms in your own sentences. And helps you find the correct spelling of hard-to-spell words.

"Anybody who does any sort of writing, whether it be straightforward letters, or an occasional piece of documentation, or notes for a short speech at your local Lion's Club, can use Thesaurus." ---Software Critic, October 1982

"...one of the pioneering reference tool programs."

---Interface Age, August 1982

"...absolutely no programming knowledge whatsoever is required..." ---Computronics, April 1982

REFWARE THESAURUS 2.0: 24,800 adjectives, nouns, verbs, and adverbs speedily find the most accurate words for your ads, letters, reports, and speeches.

REFWARE THESAURUS Builder 1.0: Series of eight Basic utility programs enables physicians, educators, lawyers, businessmen, or other professionals to develop specialized thesaurus disk of hard-to-remember technical words for personal use.

MINIMUM System Required TRS 80* Mod I or Mod III 48K with two disk drives. * A Trade mark of Tandy Corporation

Credit card orders phone (914) 238-8896

Dealers: Write for prices. FREE demo disk with minimum order.

REFWARE Reference Software Division
David C. Whitney Associates, Inc.
P.O. Box 451, Chappaqua, N.Y. 10514 ✓ 114

Specify: Mod I Single Density ()
Mod III Double Density ()

Qty.	Title	Unit Price	Total
	6,200-word Adjectives 2.0	\$24.95	
	6,200-word Nouns 2.0	\$24.95	
	6,200-word Adverbs 2.0	\$24.95	
	6,200-word Verbs 2.0	\$24.95	
	Complete 24,800-word Refware Thesaurus 2.0	\$89.95	
	Thesaurus Builder 1.0	\$149.95	

Sales Tax (N.Y.state residents only)

Postage and handling \$ 3.00

Enclosed \$ () Check () Money Order

Bill: () Visa () MasterCard

TOTAL \$

Card #

Exp. Date Interbank #

Signature

Name Phone ()

Address

City State Zip

Mailed First Class. No C.O.D. orders.

FANTASTIC • REMARKABLE • USEFUL • MEANINGFUL • IMPORTANT • SIGNIFICANT • MARVELOUS • WONDERFUL • OUTSTANDING • EXCELLENT • INCLUSIVE • MATCHLESS

cess files to get the specified record from the disk and place it into the specified buffer. Use the function Put followed by a buffer number and record number with direct access files to place the data in the specified buffer into the specified record on the disk. Use the function LSET field name = data mainly with direct access files. It left justifies the data within the field named. RSET field name = data does what LSET does but right justifies.

MKN\$(number) converts a number to a string for file storage. Use it for direct access files.

CVN(string variable) converts the string created above back into a number.

Brand New Basic Commands

Radio Shack has included two brand spanking new disk commands in the Color system. These commands allow you to examine or modify any sector of any track on any disk—easily! Their formats are:

DSKI\$ drive number,track,sector,string1, string2

DSKO\$ drive number,track,sector,string1, string2

DSKI\$ is for input and DSKO\$ is for output. DSKI\$ takes the information from the specified sector/track/disk and places the first 128 bytes into string1 and the last 128 bytes into string2. Tracks are numbered 0-34 and sectors within tracks are numbered 1-18. For instance DSKI\$0,17,3,A\$,B\$ would read the first sector of file names from the directory (track 17). All you do is PRINTA\$;B\$ and you see it!

To use DSKO\$, you must set up the values of A\$ and B\$ with 128 bytes in each. They will then be written to the specified sector/track/disk. Be very sure you know what you are doing when using this command. You could destroy the contents of the disk if you misuse this command. As a guide, study our programs Menu and Colorzap which use both of these commands.

We are devoting much of the rest of this article to an explanation of what we have learned about the Color Computer and how and where it stores commands and data.

Four tables contain the keywords and functions in both Extended Basic and Disk Basic

Function (C201)	Token	Location (C214)
CVN	FFA2	CD1A
FREE	FFA3	CD0C
LOC	FFA4	CD36
LOF	FFA5	CD5B
MKN\$	FFA6	CD28
AS	FFA7	---

The word AS is in the word table but has no execute address associated with it.

Table 4. Disk Basic functions

Granule numbers in hexadecimal, track and sector numbers in decimal.

G	T	S	G	T	S	G	T	S	G	T	S
00	00	01	11	08	10	22	18	01	33	26	10
01	00	10	12	09	01	23	18	10	34	27	01
02	01	01	13	09	10	24	19	01	35	27	10
03	01	10	14	10	01	25	19	10	36	28	01
04	02	01	15	10	10	26	20	01	37	28	10
05	02	10	16	11	01	27	20	10	38	29	01
06	03	01	17	11	10	28	21	01	39	29	10
07	03	10	18	12	01	29	21	10	3A	30	01
08	04	01	19	12	10	2A	22	01	3B	30	10
09	04	10	1A	13	01	2B	22	10	3C	31	01
0A	05	01	1B	13	10	2C	23	01	3D	31	10
0B	05	10	1C	14	01	2D	23	10	3E	32	01
0C	06	01	1D	14	10	2E	24	01	3F	32	10
0D	06	10	1E	15	01	2F	24	10	40	33	01
0E	07	01	1F	15	10	30	25	01	41	33	10
0F	07	10	20	16	01	31	25	10	42	34	01
10	08	01	21	16	10	32	26	01	43	34	10

Table 5. Granule Map for Use with Colorzap Program

CLEVER • SUPERLATIVE • FIRST-RATE • WORTHY • SPECIAL • IDEAL • INVALUABLE • SUPER • PRAISEWORTHY • SUPERIOR • SKILLFUL • NOTABLE • NIFTY • EXPRESSIVE



TRS-80 MODEL II
 SKYLINE SOFTWARE ANNOUNCES
 A BETTER WAY TO BACKUP

BACKPACK
 FORMAT • BACKUP
 REORGANIZE DISKETTES
 ALL IN ONE FAST STEP!

If you simply 'backup' an inefficient diskette, you end up with TWO inefficient diskettes. BACKPACK gives you a fresh, organized start.

- Formats WHILE backing up.
- Eliminates 'checkerboard' space allocation.
- Reorganizes files into the minimum extents for maximum efficiency.
- Relocates files to the outer, more reliable tracks.
- Allows selective copying and directory relocation.
- Data is fully verified and BACKPACK is FAST!

Includes a program to list the disk directory in filename sort. Model II only, 64K, TRSDOS 2.0, (2 or more drives) ... \$59.00

SKYLINE SOFTWARE

3705 S. George Mason Dr., Suite 2411 South
 Falls Church, Va. 22041
 (703) 578-3940

TRS-80 is a trademark of Tandy Corp.

✓370



**HI-OCTANE IBM PC POWER
 FOR YOUR TRS-80**

WITH
μMERLIN™



Imagine being able to develop 16-bit programs on your TRS80, take that same program diskette, and execute it on an IBM PC. Think of all the powerful software already available to run on CP/M86 and MS-DOS. All you need is your existing TRS80 Model I or III, and μMerlin.

You can install this enhancement simply by connecting one cable from μMerlin to your TRS80. No surgery required! You will still be able to use your TRS80 as you always did or use it as a 16-bit computer.

- Hardware**
- 5MHz 8088 16-bit μP
 - 8087 co-processor
 - 128K - 768K byte RAM
 - 2K - 8K EPROM
 - 8 Vectored Interrupts
 - 3 Programmable Timers
 - RS232C Serial I/O
 - Centronics Printer Port

- Software**
- CP/M 86
 - IPM PC Diskette Format
 - TRSDOS ↔ CP/M86 File Transfer Utilities

WATCH FOR MULTI-TASKING O.S.

Available for TRS-80 Models I or III

Prices start at \$1195

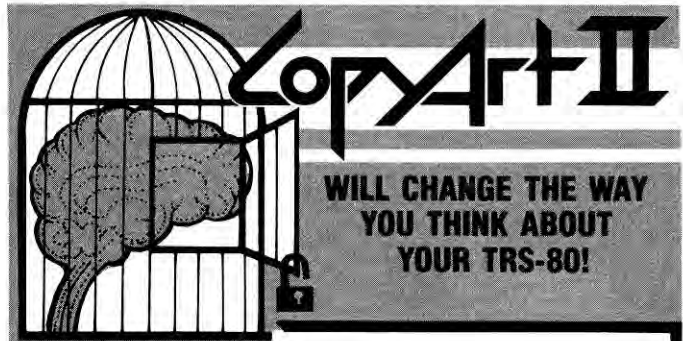
Complete with Power Supply and Enclosure



10810 W. Washington Bl. Suite C
 Culver City, CA 90230
 213/202-1865

✓546

μMERLIN is a registered trademark of Micro Projects Engineering, Inc. CP/M and CP/M 86 are registered trademarks of Digital Research, Inc. IBM PC is a registered trademark of IBM. MS-DOS is a registered trademark of Microsoft Inc. WordStar and CalcuStar are registered trademarks of Micropro International, Inc. TRS-80 and TRSDOS are registered trademarks of Tandy Corp.



**WILL CHANGE THE WAY
 YOU THINK ABOUT
 YOUR TRS-80!**

**MORE REASONS YOU SHOULD CONSIDER
 MOVING UP TO OUR COMPREHENSIVE PROGRAM...**

15. SUPER EASY TO LEARN editing features. Logical key choices.
16. Hyphenation
17. SPELLING checkers like the 74,000 word Scripsit Dictionary work great with CopyArt II.
18. CHAINING. Chain files together to make books or manuals hundreds of pages long.
19. CENTERING.
20. HEADERS and FOOTERS. You can even put graphics within headers for super page layouts.
21. PAGE NUMBERING. Page numbers can appear at the top or bottom of the page.
22. DOS COMMANDS from within the editor. Kill files, check free space or get directories easily.
23. CUSTOMIZED PRINTER driver. Since your printer has features that other printers don't, CopyArt II will be supplied with the printer driver of your choice below. Each printer driver is custom made to provide you with commands for each of your printer's fine capabilities. If you have more than one printer, order other printer drivers for only \$19.95 each. Printer drivers are available for:
 - Radio Shack LP IV, V, VI, VII, VIII and Daisy Wheel II
 - Smith Corona Daisy Wheel TP-1
 - Brother Daisy Wheel
 - Epson MX-80, MX-80/FT, MX-100
 - C-itoh Starwriters and Prowriters all.
 - with or without grafrax.
 - PMC Printer
 - Okidata Microline 80, 82a, 83a and 84
 - Centronics 737, 739
 - NEC 8023
 - Diablo 620

- OTHERS COMING SOON. Call if you don't see your printer!
24. Unprotected diskette. Unlimited backups can be made.
 25. MAILLIST/MAILMERGE INCLUDED. CopyArt II comes with a mailist program that stores over 2,000 names on a MOD III diskette. These names can be sorted by any field and have a special field for your code. You can make PERSONALIZED FORM LETTERS that will take the following codes from the mailist and insert them in your text. FIELDS INCLUDE: Mr. or Ms., Last name, First name, Business name, City, State, up to 9 digit ZIP code and your own special 2 character code. ANY OF THESE fields can be inserted within your form letter wherever you want. You can print form letters or mailing labels to all the people on your list or to specific codes only. CopyArt makes it easy.

CopyArt II Continues on
 the next page...



**COD and Credit Cards
 CALL TOLL FREE to order:
 1-800-528-1149**

SIMUTEK

Computer Products Inc.

SIMUTEK COMPUTER PRODUCTS INC., 4897 E. SPEEDWAY BLVD., TUCSON, AZ 85712, (602) 323-9391
 DEALER, DISTRIBUTOR, & PRINTER/MANUFACTURER INQUIRIES INVITED
 TRS-80 and Scripsit are TM of Radio Shack a Tandy corp.
 *Indicates printer must have capability to do function.

along with their tokens and the locations for their code. A token is the compact way in which these Basics store the keywords, or commands. These tokens are ASCII codes between 129 and 250. The keyword "SCREEN", for example, is stored as BF (hexadecimal) or 191. This takes one byte of memory as opposed to six bytes if "SCREEN" were stored in its expanded, or ASCII, form.

When storing a command, Basic looks through the first column of the tables and determines what token should be stored. When executing a command, Basic takes the token and executes the code starting at the address specified in the third column. In each table at the start of the first and third columns there is a number. This number indicates where in the Color Computer's memory the table containing the keywords or addresses is located.

Table 1 lists Extended Basic keywords and Table 2 lists the locations of the Extended Basic functions. Table 3 shows Disk

Basic keywords and Table 4 lists Disk Basic functions.

You may be able to call some of these routines from within your own programs—Basic or machine language. For instance, Table 1 indicates that the address of the RENUM command is 35337 (8A09 hex). You can renumber any program resident in memory with RENUM starting with line 10 in increments of 10. Or, try EXEC 35337 for the same result!

The Disk Directory

Using the program Colorzap, you can look through the disk and examine any track and sector you desire. You might want to start by looking at track 17 sector 3. This is the beginning of the directory. As indicated in the manual, an entry in the directory consists of the program name, left justified in bytes 0-7, then an extension in bytes 8-10 (see sample directory screen, Fig. 2). The rest of the bytes in the entry specify the file type, whether it is ASCII or not, the starting granule, and the number of bytes

Program Listing 2

```

10 GOTO 70
20 RUN*
30 REM COLOR-MENU
40 REM BOB NICHOLAS
50 REM 10/23/81
60 REM
70 CLS: CLEAR2000
80 DIM P$(72), A$(1), SP(24)
90 FORX=1 TO 12: SP(X)=X*32+32: SP(X+12)=SP(X)+16: NEXT
100 BL$=STRING$(32,175)
110 Z$=CHR$(191)
120 CLS: PRINT "MENU OPTIONS: "
130 PRINT BL$: NN=0: FORX=1 TO 72: P$(X)="": NEXT
140 PRINT " 1 - LIST DISK MENU"
150 PRINT " 2 - DISK NAME AND DATE"
160 PRINT "@384,": PRINT "@384, "WHAT IS YOUR CHOICE";: INPUT CH: IF CH<1
OR CH>2 THEN GOTO 160
170 ON CH GOTO 180, 760
180 CLS: INPUT "WHICH DRIVE"; ND: ND=INT(ND): IF ND<0 OR ND>3 THEN CLS:
GOTO 180
190 DSKIS ND, 17, 18, A$, B$
200 DN$=MID$(B$, 113, 8)
210 DT$=MID$(B$, 121, 8)
220 ND$=STR$(ND): ND$=RIGHT$(ND$, 1)
230 DN$=DN$+" "+ND$
240 FR=FREE(ND)
250 PN=1
260 GOSUB 500
270 PRINT @64, "WHEN DIR. IS PRINTED, USE THE RIGHT AND LEFT ARR
OW KEYS TO SCROLL THRU THE LIST OF PROGRAMSON THE DISK. (<CL
AR> FOR MENU)
280 GOSUB 550
290 S=1
300 GOSUB 500
310 FORT=0 TO 11
320 PRINT TAB(2); P$(S+T); TAB(18); P$(S+T+12)
330 NEXT T
340 PP=1
350 PRINT @P(P), Z$;: IN$=INKEY$: PRINT @P(P), " ";: IF IN$="" THEN 35
0
360 IN=ASC(IN$): IF IN=12 THEN GOTO 120
370 IF IN=13 THEN GOTO 0800
380 IF IN=10 THEN PP=PP+1
390 IF IN=94 THEN PP=PP-1
400 IF PP<1 THEN PP=1
410 NV=INT((S-1)/24)
420 IF PP>(NN-24*NV) THEN PP=(NN-24*NV)
430 IF PP>24 THEN PP=24
440 IF IN=9 THEN 480
450 IF IN<>8 THEN GOTO 350
460 IFS-24<1 THEN GOTO 350

```

Listing 2 continues

CONVERT YOUR SERIAL PRINTER TO PARALLEL

The UPI serial printer interfaces allow an ASCII serial printer to be connected to the parallel printer port on TRS-80 Models I, II and III.

Software compatibility problems are totally eliminated because the TRS-80 "Thinks" that a parallel printer has been attached. No machine language driver needs to be loaded into high memory. VISACALC, SCRIPSIT, BASIC, FORTRAN, etc. all work as if a parallel printer was in use.

The UPI interfaces are completely self contained and ready to use. A 34 conductor cable and connector plugs onto the parallel printer port of the Model I expansion interface or onto the parallel printer port on the back of Models II and III. A DB25 socket mates with the cable from your serial printer. The UPI interfaces convert the parallel output of the TRS-80 printer port into serial data in both the RS232-C and 20 MA. loop formats.

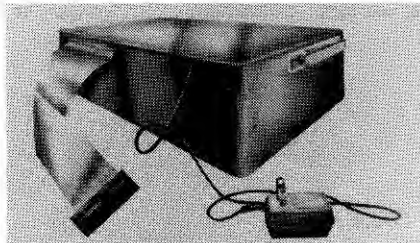


BINARY DEVICES
Formerly SPEEDWAY ELECTRONICS
11560 TIMBERLAKE LANE
NOBLESVILLE, IN 46060
(317) 842-5020

✓ 106

TRS 80 is a trademark of Tandy

VISA MasterCard



Switch selectable options include:

- Linefeed after Carriage Return
- Handshake polarity (RS232-C)
- Nulls after Carriage Return
- 7 or 8 Data Bits per word
- 1 or 2 Stop Bits per word
- Parity or no parity
- ODD or EVEN parity

NEW VARIABLE BAUD RATE MODELS

Switch selectable from 110-9600 BAUD

UPI-3VB for models I or III	\$149.95
UPI-2VB for model II	\$149.95
UPI-3VB-6 for model I or III with 6 ft. cable	\$159.95
UPI-2VB-6 for model II with 6 ft. cable	\$159.95

Shipping and handling on U.S. orders. \$4.00
90 day warranty on all interfaces, ten day return privilege.

Listing 2 continued

```

470 PP=1:S=S-24:GOTO300
480 IF S+24>49 ORS+24>NN THEN GOTO350
490 PP=1:S=S+24:GOTO300
500 CLS:PRINTDN$TAB(12);DT$TAB(21);FR"GRANS":PRINTBL$
510 PRINT@440,BL$;
520 IFNN>0 THEN PRINT@490,NN" PROGRAMS";
530 PRINT@64,"";:RETURN
540 REM SCAN DIRECTORY
550 PRINT@232,"READING DIRECTORY":FORZ=3TOLL
560 DSKIS ND,17,Z,AS(0),AS(1)
570 FORQ=0TOL
580 FORW=0TOL
590 PS=MIDS(AS(Q),W*32+1,32)
600 P1S=LEFT$(PS,1):P1=ASC(P1$);IFP1=0 THEN GOTO 660
610 IF P1=255 THENGOTO680
620 NN=NN+1:PS(NN)=LEFT$(PS,8)
630 IFRIGHT$(PS(NN),1)=" * THENP$(NN)=LEFT$(PS(NN),LEN(PS(NN))-1):GOTO630
640 PS(NN)=P$(NN)+"/"+MIDS$(PS,9,3)
650 IF RIGHT$(PS(NN),1)=" * THENP$(NN)=LEFT$(PS(NN),LEN(PS(NN))-1):GOTO650
660 NEXTW,Q,Z
670 REM SORT ROUTINE
680 PRINT@220,"SORTING THE"NN"PROGRAMS"
690 M=NN
700 M=INT(M/2):IFM=0 THENRETURN ELSE PRINT@302,M;
710 J=1:K=NN-M
720 I=J
730 L=I+M:IFP$(I)<=P$(L) THEN750 ELSE T$=P$(I):P$(I)=P$(L):P$(L)=T$:I=I-M
740 IFI<L THEN750 ELSE730
750 J=J+1:IFJ>K THEN700 ELSE720
760 CLS:INPUT"NAME OF DISK (MAX = 8) " ;DNS:IFDNS="" THEN GOTO760
770 DNS=LEFT$(DNS,8)
780 INPUT"ENTER DATE (MM/DD/YY)";DT$:IFLEN(DT$)<8 THEN CLS:GOTO780
790 IFLEN(DT$)>8 THEN CLS:GOTO780
800 INPUT"DRIVE #";DN:DN=INT(DN):IFDN<0 OR DN>3 THEN CLS:GOTO800
810 DSKIS DN,17,18,AS,BS
820 MIDS$(BS,113,16)=STRINGS(16,32)
830 MIDS$(BS,113,8)=DNS
840 MIDS$(BS,121,8)=DT$
850 DSKOS DN,17,18,AS,BS
860 GOTO120
870 REM POKE PROGRAM NAME INTO SECOND LINE TO BE RUN
880 PN=PP-1+S
890 P$=P$(PN)+": "+NDS+CHRS(34)+": "
900 A=PEEK(25)*256+PEEK(26)
910 B=PEEK(A)*256+PEEK(A+1)+6
920 LE=LEN(P$)
930 FORQ=B TO LE+B-1
940 PE=ASC(MIDS$(P$,Q+1-B,1))
950 REM IF PE>=32 AND PE<=63 THEN PE=PE+64
960 POKEQ,PE
970 NEXT Q
980 GOTO 20
    
```

used in the last sector. When you kill a program or file, the first character of its name is reset to a space.

If you want to look at a particular program, look it up in the directory, and note the starting granule and number of bytes in the last granule. Then look at track 17 sector 2, the file allocation table. The byte in this sector which corresponds to the starting granule will have in it a granule number (00-43 hex) or a last granule marker (C0-C9 hex). If the byte is another granule, write it down and look up its position in the table.

Now you have a list of granules, a last granule marker, and the number of bytes in the last granule. The last granule marker indicates which sector (0-9) of the granule is the last one used, so you now have all the data needed to trace the program, except which tracks and sectors correspond to a given granule. This information is available in Table 5. For example, if you

knew from the directory that the file you want started with granule "2C," Table 5 would inform you to look at track 23 sector 01.

Color Disk Storage

What will you see when you look at a file? If it is a binary format Basic file, the first byte will be FF and the next two bytes will be the program length in bytes. The program lines will be after this in binary format.

Program lines in binary format consist of a two-byte pointer to the next line, a two-byte line number, the program line with the keywords compressed into single-byte equivalents (see Tables 1-4) and a byte 00 to indicate end of line. Three 00 bytes in a row indicate end of program.

If the file is an ASCII format Basic file, it will start with a 0D (carriage return) and consist of the lines written out in full with carriage returns between them. Two 00 bytes occur at the end of the file.



26. SIMPLE CURSOR commands. Simply use the arrow keys to move your cursor around the text. The screen will scroll both vertically and horizontally. Shift arrows take you to the beginning or end instantly.
27. SCREEN DUMP. Prints whatever is on the screen to the printer.
28. COMPLETE MARGINS CONTROL. You tell CopyArt II what margins you desire. You can even change margins within the same text. You may also have parts of your text with 2 columns, some with one etc. It's super easy to use.
29. BASIC PROGRAMS can be edited easily. CopyArt is really useful for inserting graphics within quoted strings to give your programs super animation without the hassle of calculating the CHR\$(of the graphics!
30. VISICALC files can be loaded into CopyArt II to be manipulated easily. Great when you want to accompany your Visicalc reports with written reports, GRAPHS and BOLD FACING etc. Visicalc reports up to 255 lines can be loaded.
31. SPECIAL SCRIPTSIT FILE LOADER. Allows you to load your old Scriptsit files without having to save them in ASCII. Copyart will also load Pencil files and other normal ASCII files.
32. CUSTOM KEYS. Let's you make special keys for special characters. Allows for printing Spanish accents etc.
33. CONTROL CODES. Lets you insert special printer control codes in your text. CODES between 0 and 255.
34. BLOCK MOVE. Simple and powerful block move. Lets you move paragraphs or lines of text around easily. No complicated marker settings required.
35. FIND/REPLACE/REPEAT. Lets you find a string of characters and replace them with any other string of characters up to 20,000 times! WILDCARD search also supported.
36. Professional Manual in easy to understand English. Copyart II requires a TRS-80 Model I or III, (or PMC-80 or LNW), 48k and 2 disk drives with Newdos-80, Ldos, Multidos, Dosplus or TRSDOS. Double density disk drives recommended for the Model I.

CopyArt II THIS PROGRAM DOES IT ALL!

PLEASE SPECIFY which COMPUTER and PRINTER you have when ordering.

Copyart II with one printer driver	149.99
Additional printer drivers	19.95 each
Scriptsit Dictionary	139.95



**COD and Credit Cards
CALL TOLL FREE to order:
1-800-528-1149
Or send check or money
order to:**

SIMUTEK

Computer Products Inc.

SIMUTEK COMPUTER PRODUCTS INC., 4887 E. SPEEDWAY BLVD., TUCSON, AZ 85712, (602) 323-9361
DEALER, DISTRIBUTOR, & PRINTER/MANUFACTURER INQUIRIES INVITED
TRS-80 and Scriptsit are TM of Radio Shack a Tandy corp.
*Indicates printer must have capability to do function.

If the file is a machine-language program, the first byte will be 00. The next two bytes

specify the program's length. The following two bytes specify the beginning address. Next

comes the program followed by the three-byte sequence FF0000. Finally there are two bytes for the starting address.

For data files the data you have saved will be stored on the disk depending upon the type of data (string or numeric) and the output format used (Write, Print or Print Using). The length of the file is determined from the information in the directory. The record length is not part of the file. This is why you are advised to stick to the normal Write format and not fool around with Print and Print Using.

SAM chip. In this display offset area (65478-65491) pairs of addresses correspond to the bits of a register which specify which one of the 64 blocks is displayed on the screen in text mode. One address clears a bit when anything is written to it; the next address sets the bit.

Page 0 is an interesting page to look at. Look at all the flashing characters! Now look at the big orange block (eleventh row) and press a key. Did you see the dark area appear? This area acts like a map of the keyboard. Press the clear key to request another page.

Use this program as a starting point. The computer can display a page while it is doing something else, so:

Look past the end of your program while it is running and watch the variables change; look at the top of memory and see how strings work; and watch page 0 while a program is running and try to see what some of those changing blocks mean.

RAMSET (16K disk) is a program which loads RAM with the

Programs

Pager (16K tape or disk) is a very short routine (see Program Listing 1) which enables you to look through the lower 32K of memory. It will work with any configuration of the Color Computer. It displays on the screen any one of 64 1/2K blocks of memory.

To display these blocks, Pager loads the display offset area of the Color Computer's 6883

```
D00 4D45 4E55 2020 2020 MENU
#08 4241 5300 0020 0019 BAS
010 0000 0000 0000 0000
18 0000 0000 0000 0000
T20 434F 4C4F 525A 4150 COLORZAP
#28 4241 5300 0022 0090 BAS " *
130 0000 0000 0000 0000
738 0000 0000 0000 0000
40 5041 4745 5220 2020 PAGER
S48 4241 5300 001E 008D BAS *
#50 0000 0000 0000 0000
058 0000 0000 0000 0000
360 5654 4D4F 5645 2020 VTMOVE
68 4241 5300 001F 00C5 BAS *
70 0000 0000 0000 0000
78 0000 0000 0000 0000
```

Note that the asterisks (*) above indicate graphic blocks on the video screen.

Fig. 2. Sample Directory Listing from Colorzap

```
10 REM PAGER
20 REM PHIL MARTEL
30 CLS:INPUT"ENTER PAGE #";P
40 FORI=0 TO 6:IFP AND 2*I THENPOKE65479+2*I,0 ELSEPOKE65478+2*I
50 NEXT
60 IN$=INKEY$:IFIN$=""THEN60
70 IN=ASC(IN$):IFIN=12THEN30ELSE60
```

Program Listing 3

Do your own taxes like an expert with TAX/SAVER.™

TAX/SAVER.™ The tax help program for the layman and the professional.

- Privacy.
- Built-in tax aids. Answers questions like "Is my father my dependent?" and "Are my deductions reasonable?"
- Tax regulations programmed in by our team of accountants. Type in your figures and you've done your own tax return.
- Output to video or lineprinter. (Overlays available.)
- Tax deductible.
- Manual: Tax information, lists of deductions, tax glossary.
- **TAX/SAVER™ I**: completes long and short forms, itemized deductions, interest, dividends, income averaging.
- **TAX/SAVER™ II**: all features of **TAX/SAVER™ I** plus business income and capital gains.
- 40% Discount on yearly updates.

Reviews and Users' Comments:

About TAX/SAVER.™:

"This is a very valuable tool"

— R. Perry, Personal Computing Magazine, "Tax Preparation Software", December 1981

"This is the perfect program for those doing taxes for others (. . . good for an individual, too!!)

— B.M., Missoula, MT (Professional Preparer)

About TAX/FORECASTER.™:

"VERY HANDY!" — T. Pettibone, "Software Critic", 1982

✓342

©Copyright 1982

*Registered trademark of Tandy Corp.

TAX/FORECASTER.™, a quick tax planner for 1982-1983, lets you see how financial decisions will affect your taxes. Merely change one or more entries to see your tax refigured.

NEW! PROFESSIONAL TAX/FORECASTER.™

adds disk storage of client files and income averaging.

Orders will be filled in late January to allow inclusion of new tax laws.

TO ORDER:

Call collect **203-324-3009** or **203-544-8777** or mail this coupon to: **Micromatic Programming Co.**
P.O. Box 158, Georgetown, CT 06829

Please enroll me in member's service and send:

- TAX/SAVER™ I @ \$89.95 Manual Included
- TAX/SAVER™ II @ \$139.95 Manual Included
- TAX/FORECASTER™ @ \$59.95
- PROFESSIONAL TAX/FORECASTER™ @ \$99.95 (requires 48K)

(\$15. off any TAX/FORECASTER™ with any TAX/SAVER™)

- Tax Form Overlays (set of 6) @ \$39.95
- Please send me more information

Please check one:

- TRS-80* Model I 32K, 2 drives 48K, 2 drives
- TRS-80* Model III 32K, 2 drives 48K, 2 drives

Add \$3.50 for postage and handling, CT residents add 7½% sales tax.

Name _____

Address _____

City _____ State _____ Zip _____

Check Master Charge Visa

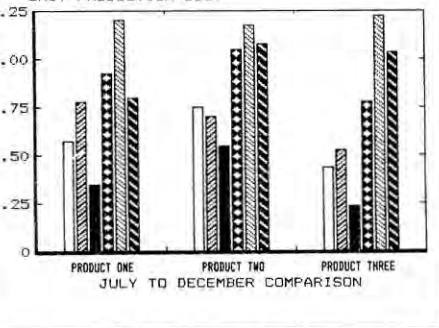
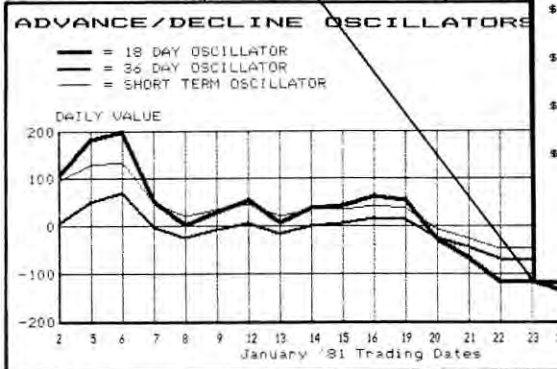
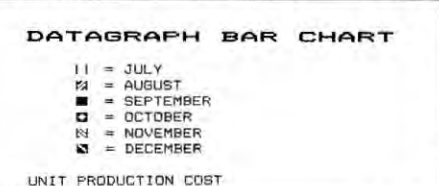
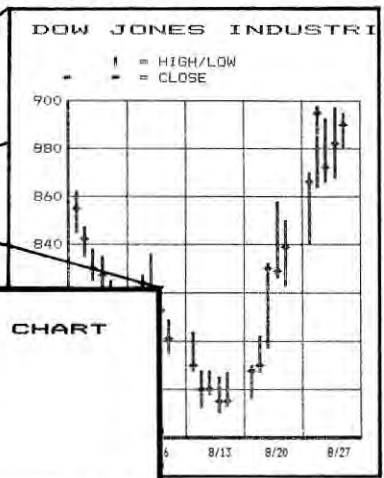
Card No. _____ Exp. date _____

VISIGRAPH™ VISAGRAPH™ DATAGRAPH™ T.M. PRINTER GRAPHICS PROGRAM

TRANSFORM YOUR VISICALC™ FILES INTO HIGH-RESOLUTION CUSTOM GRAPHS ON YOUR TRS-80™ COMPUTER AND GRAPHICS PRINTER.

ELECTRONIC WORKSHEET										
Jan 81	NYCI	DJIA	DJT	DDJ	SLP	500	Advances	Declines	Up Vol	Dr Vol
1231	77.86	963.99	379.10	114.42	135.76	1040	573	24,838	11,366	
102	78.26	972.78	401.43	115.12	136.34	1062	495	17,275	8,465	
105	78.08	972.55	405.77	117.81	137.97	1052	433	41,157	14,669	
106	79.14	1004.69	402.89	117.16	138.12	1049	640	38,463	23,709	
107	77.29	980.39	391.19	115.19	135.08	216	1555	3,944	85,844	
108	76.20	985.70	388.24	114.09	133.06	578	1028	11,759	37,073	
109	75.44	980.69	394.82	112.89	133.48	997	620	28,933	15,739	
110	76.52	968.77	388.34	112.85	133.52	928	633	25,813	19,192	
111	76.35	965.10	387.18	112.49	133.29	578	993	12,407	24,532	
114	76.55	966.47	389.55	112.38	133.47	914	612	23,382	13,773	
115	76.99	969.97	376.10	112.60	134.22	789	691	21,547	13,526	
116	77.33	973.29	401.98	113.22	134.77	880	642	23,22	14,425	
119	75.10	970.79	403.55	114.35	134.37	740	750	16,174	15,338	
120	75.81	950.68	394.89	113.80	131.65	371	1172	5,859		
121	75.39	946.25	392.46	113.80	131.36	547	954	15,737		
122	74.76	940.44	392.03	113.00	130.26	457	1024	11,057		
123	74.72	940.15	391.61	111.76	130.25	683	786	16,604		
126	74.45	938.91	389.19	111.47	129.84	564	898	14,874		
127	75.19	899.44	394.64	111.72	131.12	943	559	28,173		
128	74.79	942.52	395.43	112.49	130.34	624	788	14,453		
129	74.59	948.89	393.94	112.74	130.24	774	710	19,431		
130	74.27	947.27	402.22	112.82	129.55	727	776	16,777		

WORKSHEET				
Days	NYSE Vol	100 NYCI	A-D	ADL
1231	41,21	77.25	447	-1572
102	28,87	77.49	567	-1025
105	28,71	77.78	873	-132
106	67,40	78.92	409	277
107	92,89	77.89	-133	-1052
108	55,35	77.59	-450	-1312
109	50,19	77.38	289	-1223
112	48,76	77.23	295	-928
113	40,82	77.07	-415	-1341

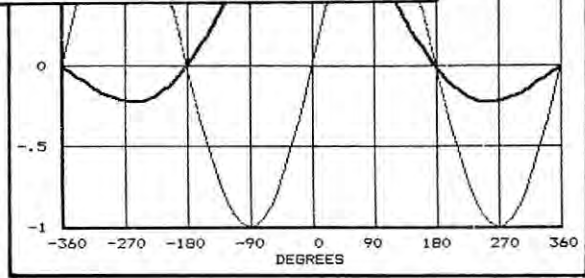


SEE YOUR LOCAL SOFTWARE DEALER OR ORDER DIRECT.

MODEL I
\$59.00*
MODEL III
\$69.00*

*INTRODUCTORY PRICE: ENDS 1 MAR, 83

* HIGH RESOLUTION - 60 x 72 data Points/inch. * LARGE DATA CAPACITY - 1000 Input Data Points per graph. * SELECTABLE GRAPH SIZES - From 1" sq. to 7" x 24" * STANDARD DATA SOURCE - Plots Data from VISICALC or USERS OWN PROGRAMS using the DIF™ Standard Format. * GRAPH FEATURE SELECTION - Fill out Pre-formatted Form on VISICALC screen or in users own program. * MINIMAL ENTRY REQUIREMENTS - Enter only name of Datafile and location therein of data to be plotted. * MULTIPLE FUNCTION GRAPHS - Plots over 10 Data Sets per graph. * DATA SYMBOLS - Plots data with user composed symbol shapes. * DATA INTERPOLATION - connects data points with user composed line shapes. * LINE/SYMBOL LIBRARY - Plots each Data Set with different line/symbol shape chosen from 12 line library. * CUSTOM LINES AND SYMBOLS - Has interactive screen-graphics program for composing symbol shapes. * AUTO SCALING - Selects scale values for ease of graph interpretation. * User adjustable Mantissa Table. * GRID SELECTION - Prints selectable number of vertical and horizontal grid lines. * CALENDAR SCALE - Optionally prints names of month on horizontal scale. * CURVE SELECTION - Plot each data set with Linear, Stair-Step, or Bargraph curves. * OPTIONAL MIN/MAX VALUES - Extends graph beyond the values of the Data Sets. * DATA SET DESCRIPTIONS - Prints text descriptions of each Data Set in graph legend. * TEXT ENTRIES - Prints graph title, axis labels, and date on graph. * USER FRIENDLY - Checks validity of input data and displays cause of errors. * COMPLETE DOCUMENTATION - Comprehensive 75 page Users Manual with examples covering data preparation, graph feature entry, composing lines and symbols, and technical notes.



USER REQUIREMENTS

- | | |
|---|---|
| COMPUTER
• TRS-80 MODEL I 48K
• TRS-80 MODEL III 48K
• LNW80 48K

DOS
• TRSDOS 1.3, 2.3
• NEWDOS, NEWDOS/80
• DOSPLUS 3.4, LDOS

DISK DRIVES
• MODEL I: SINGLE DRIVE
• MODEL III: DUAL DRIVE | GRAPHICS PRINTER:
• MX-80 GRAFTRAX, OR GT +
• MX-100
• LINEPRINTER VIII, DMP 200
• NEC 8023A-C
• C. ITOH 8510
++
++ OTHER VERSIONS IN DEVELOPMENT |
|---|---|

TO ORDER: Send check, purchase order, or request for COD shipment. Specify Model and Printer Type. Include \$2.50 for postage and handling. Calif. residents add 6% tax.

MICRO SOFTWARE SYSTEMS • MICROPLOT, INC. DEALER INQUIRIES WELCOME
 PHONE (714) 526-8435 1815 SMOKEWOOD AVE. • FULLERTON, CA 92631 526

TRADEMARKS: VISIGRAPH, VISAGRAPH and DATAGRAPH are Registered Trademarks of MICRO SOFTWARE SYSTEMS.
 OTHER TRADEMARKS: VISICALC (VISICORP), TRS-80, TRSDOS, LINEPRINTER VIII (TANDY CORP), DIF (SOFTWARE ARTS INC), NEWDOS, NEWDOS80 (APPARAT INC), DOSPLUS (MICRO-SYSTEMS SOFTWARE), MX-80/GRAFTRAX, MX-100 (EPSON OF AMERICA), NEC PC-8023A-C (NEC AMERICA INC), IDS 440-G (INTEGRAL DATA SYSTEMS), LNW80 (LNW RESEARCH CORP)

value you specify (see Program Listing 2). Its heart is a short (22 byte) machine-language routine which gets POKEd just below the top of the first 16K of memory. RAMSET then asks for a value to use in filling memory. All of RAM is filled with this

value except 16370-16383 (3FF2-3FFF) and 32754-32767 (7FF3-7FFF) and then control returns to Basic.

Why do this? It is very useful if you are trying to find out where a piece of machine-language software resides. Run RAMSET,

load the machine-language program, then load Pager. You will know you have found the program when the monotony of the pages you are stepping through suddenly changes.

Find the first byte of the program. Call the page number P and line that the byte appears on L and the column C. Then the beginning address is $P*512 + L*32 + C - 1$. You can find the ending address in a similar fashion. You can find the starting address by: Printing $256*PEEK(157) + PEEK(158)$. You can now use the SAVEM command to save "BLAST THE BEASTIES" onto disk.

However, the program will not necessarily run properly. The disk system reserves addresses 1536-2440 (0600-0988 hex) for its own use. This moves the high-resolution graphics screens up in memory. Any program which relies on the screen's starting at a particular address will not work properly. Any program which runs in the locations that the disk system uses will not run either.

The program VTMOVE (16K disk) takes the tape version of Radio Shack's Videotex terminal program and places it onto disk in such a way that you can run it using LOADM and EXEC (see Program Listing 3). Videotex normally starts at 1728 (06C0 hex). VTMOVE reads it in from tape starting at a location 1000 hex higher (that is the &H1000 after the CLOAD). VTMOVE then appends a 17-byte program which will move Videotex back down where it belongs and saves the program to disk automatically.

Menu (16K disk) will help you clean up the screen listing of the disk directory (see Program Listing 4). Unlike most other directories, the Color disk does not store a name for the disk or the date the disk was created. We find both of these to be rather useful features and have implemented them into Menu. Select option two in the program and supply the name (up to eight characters) and the date (MM/DD/YY). These will be stored in the last sixteen bytes

```
10 'ZERORAM PROGRAM
20 'BY PHIL MARTEL 1981
30 A=&H3FEB
40 READ D: IF D>=0 THEN POKE A,D:A=A+1: GOTO 40
50 DATA 26,80,134,0,142,63,242,167,137,64,0,167,130,140,0,0,38,24
5,126,160,39,-1
60 INPUT "WHAT DO YOU WANT RAM LOADED WITH";D
70 POKE 16366,D
80 EXEC 16363
```

Program Listing 4

```
0 'PATCH FOR SAVING VIDEOTEX ON DISC
20 ' C.1981 BY PHIL MARTEL
30 CLS:PRINT "PUT YOUR VIDEOTEX TAPE INTO YOURCASSETTE, PRESS TH
E SPACE BAR TO READ IN THE TAPE.
40 IF INKEYS<>" " THEN 40
50 CLOADM"VIDEOTEX",&H1000
100 A=&H1EF7
110 READ D: IF D>=0 THEN POKE A,D:A=A+1:GOTO110
120 DATA&HBE,6,&HC0,166,&H89,16,0,167,120,&H8C,14,&HP7,&H26,&HF5
,&H7E,6,&HC0
130 DATA-1
150 CLS:PRINT"PLACE YOUR DISC IN DRIVE 0 AND HIT THE SPACEBAR
160 IF INKEYS<>" " THEN 160
170 SAVEM"VIDEOTEX",&H16C0,&H1F07,&H1EF7
```

Program Listing 5

FREE new Word Processing Catalog

of Letterheads, Forms and Supplies . . .

Featuring Micro-Perf™ . . . continuous Letterheads with a clean, trim edge when detached.

Full color catalog also offers checks, statements and invoices designed to work with programs from over 200 software sources. Plus stock tab paper, labels, diskettes, printwheels, work station furniture and accessories.

- Quality products at low prices.
- No "handling charges" or hidden extras.
- Small quantities — as low as 500 checks, statements, invoices.
- Money Back Guarantee
- One source for your word processing needs.

Fast service . . . buy direct by mail or
PHONE TOLL FREE 1 + 800-225-9550

(Mass residents 1 + 800-922-8560) 8:00 A.M. to 5:00 P.M., ET

NAME		PHONE
COMPANY		
STREET		
CITY, STATE and ZIP		
To help us send you correct information:		
SOFTWARE BRAND	PACKAGE #	<input type="checkbox"/> Do own programming
COMPUTER MAKE	MODEL	<input type="checkbox"/> Not Purchased
LINE OF BUSINESS	Number of Employees	
Neb's Computer Forms		CODE 15151
12 South Street, Townsend, Massachusetts 01469		533
A division of New England Business Service, Inc.		

of track 17 sector 18 which is not used by the disk system at all.

Menu's main function shows you what is in the disk directory (option one). Indicate which drive you want to use. The computer will display the name and date of the disk, the number of free granules left, the number of files on the disk and an alphabetically sorted listing of the directory (see sample menu listing in Fig. 3). The listing will be shown in two columns with a maximum of 24 files per screenful. If the listing extends over more than one screenful, you can go back and forth through your directory using the right arrow for forward and the left arrow for backward.

In addition, you can move a flashing cursor in front of any file in the listing by using the up arrow or down arrow. Simply position the cursor before the Basic program you wish to run and press enter and Menu will load and run that program automatically. Note that only Basic programs can be run from Menu, not machine-lan-

guage programs.

With Colorzap (32K disk) you can do a lot of things, some of which we have indicated earlier in this article. But be careful! There is no danger in examining the contents of your disk, but be sure you know what you are doing before you attempt to modify the contents of the disk.

The program will ask you how many drives you have attached to the computer (1-4). If you indicate that you only have one drive, you will no longer be asked to specify the drive you wish to examine; otherwise, indicate the drive number (0-?). You will then be asked to enter the track number (0-34) and the sector within that track (1-18) to be displayed.

Your disk will now fire up and the first 128 bytes of the drive/track/sector specified will be displayed (see sample screen in Fig. 2). The far left column (going down) indicates the drive number, track number and sector number. The next two columns show the relative byte within the sector for the start of that line of

information. Then the next eight bytes of the sector are shown in hexadecimal in groups of twos. And finally, those eight bytes are shown in ASCII. (Note that ASCII values from 0 to 32 are all displayed as spaces.) You can scroll forward (right arrow) or backward (left arrow) through the disk contents. Pressing clear allows you to specify another disk/track/sector to display.

To alter your disk memory press M for modify. A flashing

cursor will now appear over the hex portion of the screen. You can move this cursor around with the four arrow keys. To alter disk memory, type over old hex values with new hex values.

You have not changed anything on the disk. If you want to abort any alterations now, press clear. To accept the alterations indicated, press enter. You will have one last chance to leave the disk contents unmodified or to finally make the modifications. ■

```
DEVELOP :0 10/24/81 2 GRANS

30DESIGN/BAS      JOY1/BAS
40PIANOS/BAS     JOY2/BAS
ALIGN/BAS        KALEIDO/BAS
BEASTS/BAS       LLIST/BAS
CALC/BIN         MASTER/DV
CANVAS/BAS       MEMORY/BAS
CANVAS/DAT       MENU/BAS
COLORZAP/BAS     MUSIC/BAS
DATABASE/BAS     PAGER/BAS
DISASSEM/BAS     PALETTE/BAS
DRAWING/BAS      PEG/BAS
FIB/BAS          POINTS/BAS

33 PROGRAMS
```

Fig. 3. Sample Directory Listing from Menu

SUPERTAX

FINALLY! PROFESSIONAL QUALITY PERSONAL INCOME TAX PROGRAM FOR UNDER \$30

- Don't wait until April 15. Use SUPERTAX to develop your tax strategy NOW.
- An ABSOLUTE MUST for every personal software library
- Extremely easy to use AND fully deductible on Schedule A or C
- Invaluable for year-end tax planning or for tax return preparation
- Written by C.P.A. with Master's degree in tax

SUPERTAX I: Ideal for tax planning and return checking, this program is simple, comprehensive and very fast. Answer all those "what if" questions throughout the year, and at the same time make your tax return computer-accurate. Using either screen or printer output, it generates summaries of Page 1 and 2 and Schedule A of Form 1040. This program also prints an overall summary of the return showing Adjusted Gross Income, Itemized Deductions, Taxable Income, Regular Tax, Income Averaging Tax, both Minimum taxes, and Payment Due or Refund (all of which are calculated by the program). SUPERTAX I also calculates the moving expense deduction, investment credit, taxable capital gains, political and child care credits, medical limitations and more.

SUPERTAX II: This 2-disk set includes the efficient SUPERTAX I program as well as the more detailed SUPERTAX II program which makes all of the SUPERTAX I calculations, but which also PRINTS THE INCOME TAX RETURN! This program prints Page 1, Page 2, Schedules A, B, and G (income averaging) of the FORM 1040 as well as the Form 3468 (investment tax credit) using tractor-feed income tax forms (one of each is supplied with the program).

- Undeniably one of today's greatest software values
- Available for 2 drive, Radio Shack Models I, II, III and 16, 48K or larger systems.
- Also available on standard 8" CP/M
- Data can be saved on disk
- Subsequent year updates available at 20% discount
- Programs are fully prompted and include manual loaded with valuable tax information and guidance

SUPERTAX III: A 2-disk set which includes both the SUPERTAX I and SUPERTAX II programs PLUS a program to calculate and print Schedule C of the FORM 1040. Also included is a stand alone depreciation program which calculates and prints your depreciation schedule using both the old rules and the new ACRS rules. Output from the depreciation program is designed to serve as a supplement to IRS FORM 4562.

SUPERTAX I — \$24.00

SUPERTAX II — \$31.50

SUPERTAX III — \$36.50

8" diskettes \$2.00 higher Add \$1.50 for postage & handling

ROCKWARE DATA CORPORATION

512 DEPT. 80M • PO BOX 401710 • DALLAS, TX 75240 • (214) 596-0588

CP/M, Radio Shack & Apple II+ are trademarks of Digital Research, Tandy Corp. and Apple Computers, Inc.

Screen Format Program Generator

by Joel Belcher

Save yourself the trouble of figuring screen locations, field prompts, and input fields, and let your computer do the work for you.

One of the most important factors of a program is the readability of the screen displays. Many fine programs have such complex screens that it takes several minutes to find the information you need. Laying out a screen display on a coding form and then counting the spaces to find the print @ position can

take many hours, hours that could have been better spent.

I have a better way. Type the screen layout on your CRT and let your computer count the spaces for you. At the same time, why not let the computer pick up the field prompts and the input fields? If you have that much information, why not let your computer write the program for you? I'll show you just how easy it is to do.

The Program Generated

First, we'll consider the final product. Let's say you've built, loaded, and run a program. (See Listing 1.) The first action the program takes is to clear the display and then prompt the user at line 15 to enter the record number desired or enter a zero to end the program. If you enter 50 as the record number, the program will respond that record 0 (you haven't added any records yet) is the

Variable	Full Name	Description
FS()	Fields	Array for disk buffer
EL\$	Erase line	Prints 63 spaces and 63 backspaces
LR	Last record	Holds last record on file
RN	Record number	Holds current record number
YN\$	Yes/No	Used in all prompts that require a yes/no answer
NE	New	Flag used to indicate a new record is being added
IC	Item to change	Holds number of item (field) to be changed
I	Input location	Holds location of input
IL	Input length	Holds length of input field
IN\$	Input string	String used to hold inputs
PL	PEEK location	Holds video memory location of cursor
VB	Video byte	Byte from location PL
KB\$	Keyboard string	String to hold input from INKEY\$
KB	Keyboard	Holds ASC of KB\$
W	Wait	Used in For . . . Next loop for delay
FNVM(P)	Video memory	PEEKs memory locations used by Basic to retrieve current cursor location
FNST\$(T)	Strip	Strips leading blank from numbers

Table 1. Listing 1 Variables

The Key Box

**Model I or III
48K RAM
Disk Basic**

Two great simulations for the "80s"...



T80-FS1

Flight Simulator

The realism of "out-the-window" flight can be yours with this challenging simulation that will excite beginners and test experienced pilots. On cassette, **\$25.00**.

On enhanced disk (increased world projection rates, 10-frame-per-second approach mode, infinite horizon, hit/crash detection, and more), **\$33.50**. For Model I or III: please specify since the media are different. All versions require 16K.

T80-SG2

Forest Fire Dispatcher

Also challenging and realistic, **Forest Fire Dispatcher** features the ease of operation that lets you concentrate your energy and imagination on the job at hand: saving forests as efficiently as possible. A naturally deep strategy game for years of pleasurable interaction. On cassette, **\$24.95** (16K required). On disk, **\$29.95** (32K required). Specify Model I (Level 2 BASIC) or Model III.



See your dealer!

For direct order, include \$1.50 and indicate UPS or first class mail. Illinois residents add 5% sales tax. Visa and MasterCard accepted. If you don't yet own a disk, don't fret. You can upgrade anytime. Cassette users may send back their cassette (but *not* the manual) along with \$10 (first class shipping included) and receive the disk version.

subLOGIC

Communications Corp.
713 Edgebrook Drive
Champaign, IL 61820
(217) 359-8482
Telex: 206995

highest record on file, and will prompt you again for a record number. Enter 1 as the record number and the program will respond with "Record 1 does not exist. Do you want to add it (Y/N)." Enter Y and the program will display the screen to be filled in, with the cursor over the first character of the first field. Type in your name and press the enter key. (Note: The cursor cannot be moved out of the input field.) The cursor moves to the first character of the second input field.

After the screen is filled in, you are prompted: "Enter the number of the item to change. (0 to store screen.)" If you've made any mistakes, enter the field number and the cursor is positioned there. Type the correct entry or move the cursor over the incorrect character and type the correct character over it. Press enter and the field is updated.

When all entries are correct, enter 0 and the screen is stored on the disk; the program then prompts you for another record number. If you enter 1, record 1 is retrieved from disk storage and displayed. The program then prompts you at line 15 for the item number to be changed. Only when entering new records does the program take you through each input field. When you are finished with the record entry and editing, enter 0 as the record number and the program closes all files and ends.

The variables used and a description of the program are in Tables 1 and 2.

The Program Generator

This is the program that lets you create a screen display by typing the display on the CRT. (See Listing 1.) It will scan the screen and save all prompts and input fields. The fields and prompts will then be used to build a program to allow entry and editing by record number and item number.

When you run the program, it will be in the screen-creation mode and the screen will clear. A flashing cursor will be in the upper right corner of the display. Use the four arrow keys to control cursor movement. Press alphanumeric keys to display the corresponding characters at the current cursor location, and the cursor will move one space forward.

The screen size is limited to 14 lines of 64 characters. The bottom two lines are used for prompting the operator during program execution. The clear key has been defined as a control key. The functions available are: CTRL L, for loading a screen from disk; CTRL S, for saving a screen to disk; CTRL D, to delete a line; CTRL I, to insert a line; and

CTRL M, to move a line.

Once you have composed a screen, save it to the disk by pressing CTRL and S at the same time. The screen will clear and the prompt "Screen name" will be displayed. Enter up to eight characters with no extension, as /SCR will be appended to the file name.

After the screen is saved it will be displayed again. Press CTRL B to build the program. Line 15 will display the status of the program generation. If a numeric field is found as the screen is being scanned, the program will place a graphics block over the first character of the input field and ask you for the precision of the numeric field.

After decoding the screen, the program will ask for the starting line number and then the increment for lines. The program will then ask for the line number for the INKEY\$ routine (50000

is fine). Next the program will ask for the file name (this is for the data file and program file and should only be seven characters long). If two or more data files are needed, the program will append a one or two to the file name and add the extension /DAT.

As the program is generated, the program lines will be displayed on the screen. After generation is completed, the program will be saved to the disk, this time with /PRO appended to the file name. The program will then be loaded and run.

Note: If you have added fields to a program and regenerated it, the file size will be larger, causing a field-overflow error when the program is run. Close and then kill the data file and rerun the program so the proper file size can be established for the disk file.

The program begins by loading PLC

Lines	Function
10-20	Set strings and clear memory, dimension arrays
30-40	Open and field the data files
50-100	Input the record number. If the record is on file, it is retrieved and displayed; if the record number is equal to the last record on file plus one, the program asks if you want to add the record. If so, the buffer is cleared and the flag NE is set. If the record number is greater than the last record plus one, the last record number is printed and the request for the record number is repeated
110-200	Print the disk buffer
210	Check the new flag. If it is set, the user is taken through each input field
220	Enter the item to change, or enter 0 to store the data and return to the record number request
230	Branch to the line to set variables for INKEY\$ routine
240	If 0 is entered, store the screen data then branch to the record-number request
250	Branch into the display routine
260	Just for safety
270-350	Set the variables up for calling the INKEY\$ routine Load the current value of the disk buffer into IN\$ and call line 50000. When execution returns from 50000 IN\$ will hold the edited value
50000	Set the number of characters entered to 1, prints IN\$ at the prompt location, then backs the cursor up to the first character on the input field. Pads IN\$ with blanks to make it equal the input length
50010	PL gets the location of the cursor (the video memory location). PEEK location PL and store character in VB
50020	POKE location PL with CHR\$(252) (the cursor), strobe INKEY\$ 25 times if no key is input, replace character and strobe INKEY\$ again if no character is input, and then branch back to line 50010. If a character is input replace the video character and store ASC of KB\$ in KB
50030	If left arrow is on first character GOTO line 50010, else back cursor up one space and subtract 1 from IN
50040	If key is right arrow and number of characters input (IN) is greater than or equal to input length (IL), GOTO 50010; otherwise, move cursor forward one space and increment IL by one
50050	If key is enter then return
50060	If key is greater than or equal to a space and less than or equal to a lowercase z, and if the number of characters input is greater than the input length GOTO 50010. If IN is less than IL, print KB\$, change IN\$ to match, and increment IN by one. Otherwise, POKE PL with KB and change last character of IN\$ to input character. (Printing the character at the last position of the input field moves the cursor out of the input field)
50070	GOTO line 50010

Table 2. Listing 1 Line Functions



A critic* called my accounting systems “very impressive” and “very reasonable.” That was before I cut the price.

I'm Irwin Taranto, and my programs impressed a lot of people. I sold enough to pay off all my development costs.

So I cut the price 25% on some, 50% on the rest.

Now my Model I and Model III systems cost \$75 each:

- Accounts Payable
- Accounts Receivable
- General Ledger
- Inventory Control
- Invoicing
- Payroll

And my Model II/16 TRSDOS systems cost from \$150 to \$200:

- General Ledger
- Accounts Payable/Purchase Order

*Michael Tannenbaum, the “80 Accountant”

- Accounts Receivable, Open Item or Balance Forward
- Payroll/Job Costing
- Inventory Control

Even at the new price, I still provide what could well be the best support in the microcomputer industry. If you have a problem, call us and we'll fix it. Even if I have to do it myself, personally, right there on the phone.

Considering what you get in these systems, I probably could have raised the prices.

But that wouldn't have been nearly as impressive.

Taranto

& ASSOCIATES, INC. 70

Post Office Box 6216, 121 Paul Drive, San Rafael, CA 94903
Outside California, toll free (800) 227-2868. In California, (415) 472-2670.

Model II Systems are available in CP/M as well as TRSDOS at an additional cost. CP/M is a trademark of Digital Research Corporation. TRSDOS is a trademark of the Tandy Corporation.

Variable	Full Name	Description			
V\$()	Video array	Array pointed to the video display	L()	Location	to 2, and the file length is zeroed
VV\$()	Video verbatim	Array to hold video array during disk I/O	I()	Input	Array to hold Print @ location for prompt
V1\$()	Video one	Array used to hold prompts during screen decoding	IL()	Input length	Array to hold length of input field
FS()	Field start	Holds starting and ending fields that will fit in a 256-byte record. If the subscript is incremented to 2, then a second disk file is needed	L\$()	Line	Array to hold program lines generated
FE()	Field end	Works with above variable	LL	Line	Used as a subscript for array holding prompts, input locations, lengths during screen decoding
NB	Number of buffers	Hold number of buffers needed	LN	Line number	Holds number of line being scanned during screen decoding
M()	Mode	Holds 0 if no input, 1 if string input, 2 if integer input, 3 if single-precision input, 4 if double-precision input	U\$()	Using	Array to hold Using strings for input fields
FL	File length	Keeps sum of field lengths: If file length grows larger than 256, the number of buffers is incremented	Q\$	Quote	Holds CHR\$(34), quote (")
			FNST\$(T)	Strip	Strips leading blank from number
			FNPP(P)	POKE position	Returns location to POKE cursor. Used to point numeric fields out during screen scanning

Table 3. Listing 2 Variables

with the starting line number and J with 1. L\$(J) will hold the program lines. Each statement needs a line number, and L\$(J)=FNST\$(PLC) stores the line number for us. FNST\$ removes the leading blank by converting the number to a string and returning the second through last digits. To start the next line, a GOSUB 1690 is executed. This

Program Listing 1

```

10 ' *****
20 ' *      1982 Joel Belcher / Weller & Associates *
30 ' *      P.O BOX 658 MONTICELLO, AR. 71655 *
40 ' *      (501) 367-5235 *
50 ' *****
60 CLEAR10000:DIMV$(14),VV$(14),V1$(55),L(55),I(55),IL(55),M(55)
,L$(100),U$(55):Q$=CHR$(34):DEFNST$(A)=MID$(STR$(A),2):EL$=STRIN
G$(63,32)+CHR$(29):J=1:DEFNPP(I)={(I-1)*64+B1-1)+15360

```

Listing 1 continues



Hello thayuh. This is Eben Flow, proprietor of the Fish or Cut Bait Company, buyer and seller of lobster bait for 49 years. My hobbies are collecting linoleum samples, squashing flies and playing pac-person on my home computer.

But here on Martinicus Rock, off the coast of Maine, the power can be a tad erratic. So, to cure the brownout and blackout problems, and to keep them spikes and surges off my picture tube, I got me a **MAYDAY** Uninterruptible Power Supply from SUN RESEARCH. Them fellas fixed me up real good and real light on my pocketbook, too. Got me a **MAYDAY** for my mini-calcaputer with a voltage regulator and everything for only 325 clams. They even included the battery in a nice waterproof box. Handy out here, you know. Now, if **MAYDAY** would only keep them sea dogs out of my barrel. . .

MAYDAY - Protection even you can afford!



SUN RESEARCH, INC.
Box 210
New Durham, NH 03855
603/859-7110
TWX 5102974444

285

adds the line increment to the program line counter (PLC) and I to J. When the program is saved to the disk, the program is saved in the ASCII format. If a program line is built using graphics characters between quotation marks instead of an alphanumeric string, the graphics characters are saved as the string. When the program is loaded and listed the graphics string is part of the program.

All prompts must have a colon or exclamation point as the last character. The 64th position of a line must be left blank. Only 14 lines are allowed for screens. The input field must be one or more dashes, pound signs or a pound sign preceded by a dollar sign. The numeric fields are saved in U\$() and placed in a Using statement for the program. If a colon was not found, a scan is made for an exclamation point. If one is found, the line is saved, but no input field is searched for. Field prompts should have a number as the first character (see Fig. 1), because when editing the file the user will need to know the field numbers. ■

Joel Belcher can be reached at P.O. Box 658, Monticello, AR 71655.

Listing 1 continued

```

70 FORII=1TO14:V$(II)=" ":LL=((II-1)*64+15360):V=VARPTR(V$(II)):
POKEV,64:POKEV+1,LLAND255:POKEV+2,LL/256:NEXTII
80 DEFFNV(M)=PEEK(16416)+PEEK(16417)*256:POKE16419,252
90 IL=64:CLS
100 CLS
110 IN=1:LN=1:PRINTCHR$(28);
120 PL=FNVM(P):VB=PEEK(PL):POKEPL,252:FORW=1TO25:KB$=INKEY$:IFKB
$="" THENNEXTW:POKEPL,VB:FORW=1TO25:KB$=INKEY$:IFKB$="" THENNEXTW:
GOTO120 ELSEW=26:NEXTW:KB=ASC(KB$):POKEPL,VB ELSEW=26:NEXTW:KB=
ASC(KB$):POKEPL,VB
130 IFPEEK(14400)=2ANDKB=76 THENGOSUB300 :GOTO110
140 IFPEEK(14400)=2ANDKB=83 THENGOSUB290 :CLS:FORI=1TO14:PRINT@
(I-1)*64,V$(I);:NEXTI:GOTO110
150 IFPEEK(14400)=2ANDKB=90 THENPRINTCHR$(143);:IN=IN+1:GOTO120

160 IFPEEK(14400)=2ANDKB=66 THEN310
170 IFPEEK(14400)=2ANDKB=77 THENPRINT@896,EL$;:INPUT"MOVE LINE ";
F:PRINT@896,EL$;:INPUT"TO ";T:PRINT@896,EL$;:PRINT@(T-1)*64,V$(F
);:GOTO110
180 IFPEEK(14400)=2ANDKB=68 THEN:MS=(FNVM(P)-15360)/64+1:ME=15:FO
RI=MSTOME:PRINT@(I-1)*64,V$(I+1);:NEXTI:GOTO110
190 IFPEEK(14400)=2ANDKB=73 THEN:MS=(FNVM(P)-15360)/64:ME=14:FORI
=METOMSSTEP-1:PRINT@(I)*64,V$(I);:NEXTI:GOTO110
200 IFKB=8 THENIFIN=1 THEN120 ELSEIN=IN-1:PRINTCHR$(24);:POKE1644
4,0:GOTO120
210 IFKB=24 THENPRINTSTRING$(IN-1,24);:IN=1:GOTO120
220 IFKB=25 THENPRINTSTRING$(64-IN,25);:IN=64:GOTO120
230 IFKB=9 THENIFIN>=1 THEN120 ELSEIN=IN+1:PRINTCHR$(25);:POKE16
444,0:GOTO120
240 IFKB=91 THENIFLN=1 THEN120 ELSEPRINTCHR$(27);:LN=LN-1:POKE164
44,0:GOTO120
250 IFKB=10 THENIFLN>=14 THEN120 ELSEPRINTCHR$(26);:LN=LN+1:POKE1
6444,0:GOTO120
260 '
270 IFKB>=32 ANDKB<=123 THENIFIN>=1 THEN120 ELSEIFIN<1 THENPRINTKB
$;:IN=IN+1:GOTO120 ELSEPOKEPL,KB:GOTO120
280 GOTO120
290 FORI=1TO14:V$(I)=V$(I):NEXTI:CLS:INPUT"SCREEN NAME ";SN$:OP
EN"R",1,SN$+"/SCR",64:FIELD 1,64 AS V0$:FORI=1TO14:LSETV0$=V$(I
):PUT1,I:NEXTI:CLOSEL:RETURN

```

Listing 1 continues

MODEL III TECHNICAL MANUAL

- Written by factory technician
- Packed with rare hardware info
- A must if you have F version CPU boards. Written for use with Radio Shack's Tech Ref Manual below.

\$12.00 postage paid, 26 pages.

RADIO SHACK TECH REF MANUAL \$12.00

TANDON DRIVE MANUAL

- Everything you could want to know about Tandon disk drives.

\$12.00 postage paid.

RS-232 (Mod III).....\$70.00
P42 green CRT.....\$85.00
16K NEC MEMORY.....\$12.00

All Radio Shack Hardware and Software 10% OFF.

FAST DELIVERY
PRICES SUBJECT TO CHANGE
SHIPPING EXTRA
OPEN 9 TO 5 DAILY

MODEL III MICROCOMPUTER

- 48K RAM
- 2 Tandon 40 TRK Drives
- Radio Shack Power Supply
- Highest quality controller
- NEC Memory
- 120-day guarantee
- TRSDOS and all manuals
- All for \$1650.00

* Same as above with DUAL HEADED TANDON DRIVES \$1775.00

* Take \$50.00 off for unit with reliable linear power supply and no manuals or TRSDOS.

ALAMO COMPUTER CO.
1234 AVANT
SAN ANTONIO, TX 78210
(512) 534-7782

183

Stock Market and Commodity Investors Trend Analysis Program

Calculates moving averages and deviation from trend. Uses your printer to make linear and log scale graphs. Handy routine to create and maintain data files.

Develop and test your own trading strategies by computer before you risk money in the market.

In BASIC, for TRS-80 Model I or III. Requires 48K, 2 disk drives & printer. TA program and 4½ years of daily NYSE prices supplied on disk, with detailed user's guide.

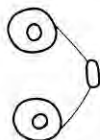
\$37.50 Postpaid in USA.
Add \$2.00 postage elsewhere.

(User's Guide only: \$12.00)

Harley D. Wilbur ✓359
9709 Elrod Road
Kensington, Maryland 20895

9 TRACK TAPE for TRS-80 Mod. II/16

ALDEVCO has available the ACCESS II ANSI std. 9 track mag. tape (1600 bpi) system tailored to the Radio Shack Model II/16 hardware and TRSDOS, providing hard disk backup AND access to mainframe data bases. Other versions are available for the S-100 bus and CPM.



ALDEVCO
5725 Dragon Way
Cincinnati, Ohio 45227
(513) 561-7671

MS

MANAGEMENT
SYSTEMS
SOFTWARE

Business Programs

	TRS-80	
	Model III	Model II
Proforma Cash-Budget	\$125	\$175
Proforma Income and Balance Sheet	125	175
Lease-Purchase Decision	100	150
Business Analysis Package (12 individual programs)	100	150
Procurement	100	150

Educational Programs

College Enrollment Projection	100	150
Gradebook	50	100

All programs on disk with extensive documentation. Send for a brochure which fully describes the programs.

MANAGEMENT SYSTEMS
SOFTWARE, INC.

5200 Brittany Drive #1006
St. Petersburg, FL 33715
(813) 864-4347 ✓457

Listing 1 continued

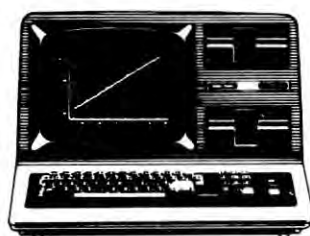
```

300 CLS:INPUT"SCREEN NAME ";SN$:OPEN"R",1,SN$+"/SCR",64:FIELD 1,
64 AS V0$:FORI=1TO14:GET1,I:VV$(I)=V0$:PRINT@(I-1)*64,V0$;:NEXTI
:CLOSE:RETURN
310 '
320 P$(1)="TYPE ? (2)=INTEGER (3)=SINGLE PREC (4)=DOUBLE PREC"
330 FS(1)=1:NB=1
340 '
350 PRINT@896,EL$;"WORKING ON SCREEN";
360 LL=1:FORI=1TO14:I=1
370 FORI=1TOLEN(VV$(I)):IFMID$(VV$(I),I,1)>" THENL(LL)=(I-1)
*64+II-1:AL=II:II=70:NEXTHI ELSENEXTII:I=69:GOTO560
380 A2=INSTR(AL,VV$(I),":"):IF A2=0 THEN A2=INSTR(AL,VV$(I),"!")
-1
390 V1$(LL)=MID$(VV$(I),AL,A2-(AL-1))
400 IFINSTR(A2,VV$(I),"-") THENT1=INSTR(A2,VV$(I),"-") ELSESET1=80
410 IFINSTR(A2,VV$(I),"#") THENT2=INSTR(A2,VV$(I),"#") ELSESET2=80
420 IFINSTR(A2,VV$(I),"$")=T2-1 THENT2=T2-1
430 IFT2<T1 THENB1=T2:D=PEEK(FNPP(I)):POKEFNPP(I),252:PRINT@896,E
L$;I;";";LL:P$(1);:INPUTM(LL):PRINT@896,EL$;:POKEFNPP(I),D:ELSEB
1=T1:M(LL)=1
440 IF T2=T1 AND V1$(LL)=" THEN NEXT I:GOTO 570 ELSE IFT2=T1TH
ENM(LL)=0:I=A2+1:GOTO560
450 I(LL)=(I-1)*64+B1-1
460 B2=INSTR(B1+1,VV$(I),":")
470 IFM(LL)>1 THENU$(LL)=MID$(VV$(I),B1,B2-B1)
480 I1=B2:IL(LL)=B2-B1
490 IFM(LL)=0 THENLA=0
500 IFM(LL)=1 THENLA=IL(LL)
510 IFM(LL)=2 THENLA=2
520 IFM(LL)=3 THENLA=4
530 IFM(LL)=4 THENLA=8
540 FL=FL+LA:IF FL>256 THENFL(NB)=FL-LA:FE(NB)=LL-1:FL=LA:NB=NB+
1:FS(NB)=LL ELSEFL(NB)=FL:FE(NB)=LL
550 '
560 IFI1<64 THENPRINT@896,EL$;"WORKING ON SCREEN LINE" I "ITEM" LL;
:LL=LL+1:GOTO370 ELSENEXTI
570 FL(NB)=FL
580 PRINT@896,EL$;:INPUT"STARTING LINE ";PLC
590 PRINT@896,EL$;:INPUT"INC FOR LINES ";INC
600 PRINT@896,EL$;:INPUT"FILENAME ";DFS
610 '
620 PRINT@896,EL$;:INPUT"LINE NUMBER FOR INKEY SUBROUTINE ";SLC
630 L$(J)=FNST$(PLC)+" CLS:DIM F$( "+FNST$(LL)+" )"
640 GOSUB1690
650 L$(J)=FNST$(PLC)+" EL$=STRING$(63,32)+CHR$(29):DEFNVM(P)=PE
EK(16416)+PEEK(16417)*256:DEFNST$(T)=MID$(STR$(T),2)"
660 GOSUB1690
670 L$(J)=FNST$(PLC)+" "
680 FORI=1TONB
690 L$(J)=L$(J)+"OPEN"+Q$+"R"+Q$+" "+FNST$(I)+" "+Q$+DFS+FNST$(I)
+"/DAT"+Q$+" "+FNST$(FL(I))+": "
700 NEXTI
710 L$(J)=L$(J)+"LR=LOF(1)"
720 FORK=1TONB:FL=0:GOSUB1690 :L$(J)=FNST$(PLC)+" FIELD "+FNST$(
K)
730 FORI=FS(K)TOFE(K)
740 IFM(I)=1 THENL$(J)=L$(J)+" "+FNST$(IL(I))+ASF$("+FNST$(I)+")
":LA=IL(I)
750 IFM(I)=2 THENL$(J)=L$(J)+" "+2ASF$("+FNST$(I)+")":LA=2
760 IFM(I)=3 THENL$(J)=L$(J)+" "+4ASF$("+FNST$(I)+")":LA=4
770 IFM(I)=4 THENL$(J)=L$(J)+" "+8ASF$("+FNST$(I)+")":LA=8
780 IFLEN(L$(J))>240 THENI=I-1:L$(J)=LEFT$(L$(J),L):GOSUB1690 :L$(
J)=FNST$(PLC)+" FIELD "+FNST$(K)+" "+FNST$(FL)+"ASSH$":FL=0 ELS
EFL=FL+LA:L=LEN(L$(J))
790 NEXTI
800 NEXTK
810 GOSUB1690 :CRN=PLC
820 L$(J)=FNST$(PLC)+" ?@ 896,EL$;:INPUT"+Q$+"RECORD NUMBER (0 T
O QUIT) "+Q$+";RN"
830 GOSUB1690
840 L$(J)=FNST$(PLC)+" IF RN=0 THEN CLOSE:CLS:END"
850 GOSUB1690
860 L$(J)=FNST$(PLC)+" IF RN>LR+1 THEN ?"+Q$+"RECORD"+Q$+"LR"+Q$
+" IS THE HIGHEST RECORD ON FILE"+Q$+";:GOTO"+FNST$(CRN)
870 GOSUB1690
880 L$(J)=FNST$(PLC)+" IF RN=LR+1 THEN ?@896,EL$;"+Q$+"RECORD"+Q
$+"RN"+Q$+"DOES NOT EXIST. DO YOU WANT TO ADD IT (Y/N) "+Q$+";:I
NPUTY$:IFYN$="+Q$+"N"+Q$+" THEN"+FNST$(CRN)
890 GOSUB1690
900 L$(J)=FNST$(PLC)+" IF RN>LR THEN NE=-1:IC=0 ELSE"
910 FORI=1TONB
920 L$(J)=L$(J)+"GET"+FNST$(I)+" ,RN:"
930 NEXTI
940 L$(J)=L$(J)+"GOTO":ER=PLC:X=J:JP=2
950 GOSUB1690
960 L$(J)=FNST$(PLC)+" "
970 FORI=1TOLL-1:IFLEN(L$(J))>236 THENI=I-1:L$(J)=LEFT$(L$(J),L):
JP=JP+1:GOSUB1690 :L$(J)=FNST$(PLC)+" " ELSEL=LEN(L$(J))-1

```

Listing 1 continues

TRS-80 MODEL III



16K -----	\$825 ⁰⁰
48K -----	\$849 ⁰⁰
48K, 1 Drive	\$1499 ⁰⁰
48K, 2 Drive	\$1749 ⁰⁰
RS-232 (INSTALLED)	\$92 ⁰⁰

NEW!

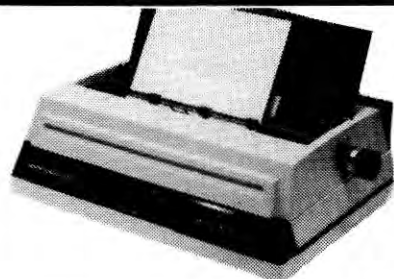
HARD DISK SYSTEM FOR THE MODEL III

6*	MEG.	\$1795 ⁰⁰
12*	MEG.	\$1995 ⁰⁰
19*	MEG.	\$2195 ⁰⁰

COMPLETE, READY TO RUN. NOW AVAILABLE!!

LDOS REQUIRED — \$129

*unformatted capacity



SMITH CORONA TP-1 DAISY WHEEL PRINTER

\$599⁰⁰

•EPSON•

MX-80	\$419
MX-80 F/T	\$499
MX-100	\$645

WE STOCK A COMPLETE LINE
OF EPSON ACCESSORIES

CALL FOR PRICES!!

•C. ITOH• PROWRITER

8510 PARALLEL-10"	\$489
8510 SERIAL-10"	\$639
1550 PARALLEL-15"	\$719
1550 SERIAL-15"	\$769

STARWRITER

F-10 40 CPS, PARALLEL	\$1450
F-10 40 CPS, SERIAL	\$1599
F-10 55 CPS, PARALLEL	\$1699
F-10 55 CPS, SERIAL	\$1850

•OKIDATA•

ML-80	\$350
ML-82A	\$425
ML-83A	\$699
ML-84P	\$1049
ML-84S	\$1149
OKIGRAPH	\$60

THESE ARE OUR CASH DISCOUNTED PRICES. C.O.D. AND CHARGE ORDERS ARE 3% HIGHER. ALL COMPUTERS ARE SHIPPED FREIGHT COLLECT. PRICES, SPECIFICATIONS AND AVAILABILITY ARE SUBJECT TO CHANGE WITHOUT NOTICE. IBM & IBM PERSONAL COMPUTERS ARE TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES, INC. TRS-80 AND RADIO SHACK ARE TRADEMARKS OF TANDY CORPORATION.



918/825-4844

AMERICAN

118 SO. MILL ST
PRYOR, OK 74361

Small

Business

COMPUTERS



231

GRADEBOOK

Disk-based program

Select from 10 menu items:

- create class rolls
- record scores (partial menu)
- print scores
- calculate/print grades
- correct scores

Requires:

- TRS-80 (I or III)
- 32K
- Minidisk
- Printer (optional)

Order From:

MM Computer Club
4732 Fairview Ave.
Downers Grove, IL
60515
312-852-8640

\$34.95 Add \$2 for COD

VIZ. A. CON A CONSOLIDATION SYSTEM for VISICALC users

New product adds 3-dimensional capability to any VISICALC model

Now with the help of VIZ.A.CON you can combine multiple "pages" of data from a model for heirarchical consolidations (eg. Dept., Div., Co.) or for summations over periods of time (eg. Week, Month, Quarter, Year-to-date).

Typical uses are to combine weekly sales reports or departmental budget data. You can create a complete network of consolidation processes and modify it any time (eg. for Merger & Acquisition analysis).

Special formulas (eg. ratios, percentages) can be recalculated after any consolidation. VISICALC precision is maintained for all data. You can customize titles, row and column headings, footnotes, etc. for each report.

VIZ. A. CON creates data files usable with VISICALC. After VISICALC "what if" games, use VIZ. A. CON to find out what happened.

Apple II/II+; TRS-80 I/III; Apple III; TRS-80 II; IBM PC
\$89.95 +\$3.95 shipping \$119.95 +\$3.95 shipping
Toll Free 24-hr. service 800-547-5995 (Ext. 170)

311

Visa/Master Card

Or mail Check to:

ABACUS ASSOCIATES
Suite #240, Dept. 101
6565 W. Loop South, Bellaire, TX 77401

"Creating Simple Solutions to Complex Problems"

COLOR COMPUTER

ONLY \$19.95

TWO FOR \$37.95



★ ★ JOYSTICKS ★ ★

Tired of broken joysticks? Our affordable units are built to last, with good smooth pots, and a strong lever and internal mechanism. These are superior to the Radio Shack design. Get your joystick programs working the way they should!

Up to 20% OFF on software.

We stock excellent programs from Pricky Pear, Tom Mix, Mark Data, and Others.

KONG IS HERE!

Donkey King (32k) (Tom Mix's) \$24.95
4 screens-full action

Write or call for free catalog.

Add \$2.00 shipping on Joysticks. We pay shipping on software. \$1.50 additional for C.O.D.

ENDICOTT SOFTWARE

P. O. Box 12543, Huntsville, AL 35802

205/881-0506

283



Listing 1 continued

```

980 IFM(I)=1THENL$(J)=L$(J)+"LSETF$("+FNST$(I)+")="+Q$+Q$
990 IFM(I)=2THENL$(J)=L$(J)+"LSETF$("+FNST$(I)+")=MKI$(0)"
1000 IFM(I)=3THENL$(J)=L$(J)+"LSETF$("+FNST$(I)+")=MKSS$(0)"
1010 IFM(I)=4THENL$(J)=L$(J)+"LSETF$("+FNST$(I)+")=MKDS$(0)"
1020 IFM(I)>0THENL$(J)=L$(J)+": "
1030 NEXTI
1040 IFRIGHT$(L$(J),1)="" THENL$(J)=LEFT$(L$(J),LEN(L$(J))-1)
1050 L$(X)=L$(X)+FNST$(ER+INC*JP)
1060 GOSUB1690
1070 L$(J)=FNST$(PLC)+" CLS":DL=PLC
1080 GOSUB1690
1090 FORK=1TOLL-1
1100 L$(J)=FNST$(PLC)+" ?@"+FNST$(L(K))+", "+Q$+V1$(K)+Q$+"; "+": ?
@"+FNST$(I(K))+", "
1110 IFM(K)=0THENL$(J)=LEFT$(L$(J),INSTR(L$(J),";"))
1120 IFM(K)=1THENL$(J)=L$(J)+"F$("+FNST$(K)+")"
1130 IFM(K)=2THENL$(J)=L$(J)+"USING"+Q$+U$(K)+Q$+"; CVI(F$("+FNST$(K)+"));"
1140 IFM(K)=3THENL$(J)=L$(J)+"USING"+Q$+U$(K)+Q$+"; CVS(F$("+FNST$(K)+"));"
1150 IFM(K)=4THENL$(J)=L$(J)+"USING"+Q$+U$(K)+Q$+"; CVD(F$("+FNST$(K)+"));"
1160 GOSUB1690
1170 NEXTK
1180 '
1190 L$(J)=FNST$(PLC)+" IF NE THEN IC=IC+1: IF IC>"+FNST$(LL-1)+" THEN NE=0 ELSE"+FNST$(PLC+INC*2)
1200 GOSUB1690
1210 L$(J)=FNST$(PLC)+" ?@896,EL$;:INPUT"+Q$+"ITEM NUMBER TO CHANGE (0 TO QUIT) "+Q$+";IC"
1220 GOSUB1690
1230 L$(J)=FNST$(PLC)+" ON IC GOSUB"
1240 FORI=1TOLL-1
1250 IFM(I)>0THENL$(J)=L$(J)+FNST$(PLC+INC*(3+I))+", "
1260 NEXTI
1270 L$(J)=LEFT$(L$(J),LEN(L$(J))-1)
1280 GOSUB1690
1290 L$(J)=FNST$(PLC)+" IFIC=0THEN":FORI=1TONB
1300 L$(J)=L$(J)+"PUT"+FNST$(I)+",RN:"
1310 NEXTI
1320 L$(J)=L$(J)+"IFRN>LRTHENLR=RN:GOTO"+FNST$(CRN)+"ELSE"+FNST$(CRN)
1330 GOSUB1690
1340 L$(J)=FNST$(PLC)+" ON IC GOTO"
1350 FORI=1TOLL-1
1360 IFM(I)>0THENL$(J)=L$(J)+FNST$(DL+INC*I)+", "
1370 NEXTI
1380 L$(J)=LEFT$(L$(J),LEN(L$(J))-1)
1390 GOSUB1690
1400 L$(J)=L$(J)+FNST$(PLC)+" GOTO"+FNST$(DLC)
1410 GOSUB1690
1420 FORI=1TOLL-1
1430 L$(J)=FNST$(PLC)+" ?@896,EL$;:I="+FNST$(I(I))+":IL="+FNST$(IL(I))+": "
1440 IFM(I)=0THENL$(J)=L$(J)+" "
1450 IFM(I)=1THENL$(J)=L$(J)+"IN$=F$("+FNST$(I)+"):GOSUB"+FNST$(SLC)+" :LSETF$("+FNST$(I)+")=IN$:RETURN"
1460 IFM(I)=2THENL$(J)=L$(J)+"IN$=FNST$(CVI(F$("+FNST$(I)+"))) :GOSUB"+FNST$(SLC)+" :LSETF$("+FNST$(I)+")=MKI$(VAL(IN$)):RETURN"
1470 IFM(I)=3THENL$(J)=L$(J)+"IN$=FNST$(CVS(F$("+FNST$(I)+"))) :GOSUB"+FNST$(SLC)+" :LSETF$("+FNST$(I)+")=MKSS$(VAL(IN$)):RETURN"
1480 IFM(I)=4THENL$(J)=L$(J)+"IN$=FNST$(CVD(F$("+FNST$(I)+"))) :GOSUB"+FNST$(SLC)+" :LSETF$("+FNST$(I)+")=MKDS$(VAL(IN$)):RETURN"
1490 GOSUB1690
1500 NEXTI
1510 PLC=SLC'SUBROUTINE LINE COUNTER
1520 L$(J)=FNST$(PLC)+" IN=1: ?@I,IN$;STRING$(IL-LEN(IN$),32);STRING$(IL,24);:IN$=IN$+STRING$(IL-LEN(IN$),32)
1530 GOSUB1690
1540 L$(J)=FNST$(PLC)+" PL=FNVM(P):VB=PEEK(PL)"
1550 ER=PLC
1560 GOSUB1690
1570 L$(J)=FNST$(PLC)+" POKEPL,252:FORW=1TO25:KB$=INKEY$:IFKB$="+Q$+Q$+" THENNEXTW:POKEPL,VB:FORW=1TO25:KB$=INKEY$:IFKB$="+Q$+Q$+" THENNEXTW:GOTO"+FNST$(PLC)+" ELSEW=26:NEXTW:KB=ASC(KB$):POKEPL,VBELSEW=26:NEXTW:KB=ASC(KB$):POKEPL,VB"
1580 GOSUB1690
1590 L$(J)=FNST$(PLC)+" IFKB=8THENIFIN=1THEN"+FNST$(ER)+"ELSEIN=IN-1: ?CHR$(24); "
1600 GOSUB1690
1610 L$(J)=FNST$(PLC)+" IFKB=9THENIFIN>ILTHEN"+FNST$(ER)+"ELSEIN=IN+1: ?CHR$(25); "
1620 GOSUB1690
1630 L$(J)=FNST$(PLC)+" IFKB=13THENRETURN"
1640 GOSUB1690
1650 L$(J)=FNST$(PLC)+" IFKB>32ANDKB<=123THENIFIN>ILTHEN"+FNST$(ER)+"ELSEIFIN<ILTHEN?KB$;:MID$(IN$,IN,1)=KB$:IN=IN+1ELSEPOKEPL,KB:MID$(IN$,IN,1)=KB$"
1660 GOSUB1690

```

Listing 1 continues

TRS-80 MODEL II



Now Only \$2795

NEW!

HARD DISK SYSTEM FOR THE MODEL III

6* MEG. \$1795⁰⁰
12* MEG. \$1995⁰⁰
19* MEG. \$2195⁰⁰

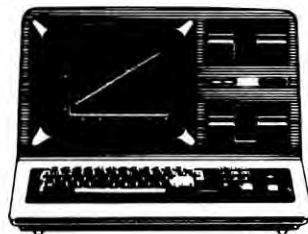
COMPLETE, READY TO RUN. NOW AVAILABLE!!

LDOS REQUIRED — \$129

*unformatted capacity

TRS-80 MODEL III

16K ----- \$825⁰⁰
48K ----- \$849⁰⁰
48K, 1 Drive \$1499⁰⁰
48K, 2 Drive \$1749⁰⁰
RS-232 (INSTALLED) \$92⁰⁰



•EPSON•

MX-80 \$419
MX-80 F/T \$499
MX-100 \$645

WE STOCK A COMPLETE LINE
OF EPSON ACCESSORIES
CALL FOR PRICES!!

•C. ITOH• PROWRITER

8510 PARALLEL-10" \$489
8510 SERIAL-10" \$639
1550 PARALLEL-15" \$719
1550 SERIAL-15" \$769

STARWRITER

F-10 40 CPS, PARALLEL \$1450
F-10 40 CPS, SERIAL \$1599
F-10 55 CPS, PARALLEL \$1699
F-10 55 CPS, SERIAL \$1850

•OKIDATA•

ML-80 \$350
ML-82A \$425
ML-83A \$699
ML-84P \$1049
ML-84S \$1149
OKIGRAPH \$60

THESE ARE OUR CASH DISCOUNTED PRICES. C.O.D. AND CHARGE ORDERS ARE 3% HIGHER. ALL COMPUTERS ARE SHIPPED FREIGHT COLLECT. PRICES, SPECIFICATIONS AND AVAILABILITY ARE SUBJECT TO CHANGE WITHOUT NOTICE. IBM & IBM PERSONAL COMPUTERS ARE TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES, INC. TRS-80 AND RADIO SHACK ARE TRADEMARKS OF TANDY CORPORATION.



918/825-4844


AMERICAN

118 SO. MILL ST
PRYOR, OK 74361

Small
Business

COMPUTERS

RODVILL
Diet Program
\$69.95



"Take a Byte"

includes: Meal Planning
Daily and Weekly Menus
Grocery List & RDA Charts
Over 700 Food Entries

**totals: Calories, Protein, Vitamins,
Minerals, Carbohydrates, Fats, Water**

Available for Disk Models I and III

Rodvill Software
24 Rod Road
Ridgefield, Ct. 06877
(203) 438-5309

Ct. residents add sales tax

Listing 1 continued

```
1670 L$(J)=FNST$(PLC)+" GOTO"+FNST$(ER)
1680 PRINT"DONE----SAVING PROGRAM AS ";F$=DF$+"/PRO":PRINTF$:OP
EN"O",1,F$:FORK=1TOJ:PRINT#1,L$(K):NEXTK:CLOSE1:PRINT"RUNNING "F
$:RUNF$
1690 PRINTL$(J):PLC=PLC+INC:J=J+1:RETURN
```

```
10 CLS:DIM F$(10)
20 EL$=STRING$(63,32)+CHR$(29):DEFFNVM(P)=PEEK(16416)+PEEK(16417
)*256:DEFFNST$(T)=MID$(STR$(T),2)
30 OPEN"R",1,"DEMOL/DAT",77:LR=LOF(1)
40 FIELD 1,16ASF$(2),2ASF$(3),16ASF$(4),1ASF$(5),16ASF$(6),16ASF
$(7),2ASF$(8),8ASF$(9)
50 PRINT@ 896,EL$:INPUT"RECORD NUMBER (0 TO QUIT) ";RN
60 IF RN=0 THEN CLOSE:CLS:END
70 IF RN>LR+1 THEN PRINT"RECORD"LR"IS THE HIGHEST RECORD ON FILE
";:GOTO50
80 IF RN=LR+1 THEN PRINT@896,EL$;"RECORD"RN"DOES NOT EXIST. DO Y
OU WANT TO ADD IT (Y/N) ";:INPUTYN$:IFYN$="N"THEN50
90 IF RN>LR THEN NE=-1:IC=0 ELSEGET1,RN:GOTO110
100 LSETF$(2)="":LSETF$(3)=MKI$(0):LSETF$(4)="":LSETF$(5)="":LSE
TF$(6)="":LSETF$(7)="":LSETF$(8)="":LSETF$(9)=MKD$(0)
110 CLS
120 PRINT@10,"Program Generation Demo Screen";
130 PRINT@128,"(1) Name      ";:PRINT@142,F$(2)
140 PRINT@172,"(2) Age     ";:PRINT@182,USING"###";CVI(F$(3));
150 PRINT@192,"(3) Address  ";:PRINT@206,F$(4)
160 PRINT@236,"(4) Sex     ";:PRINT@246,F$(5)
170 PRINT@256,"(5) Address  ";:PRINT@270,F$(6)
180 PRINT@320,"(6) City     ";:PRINT@334,F$(7)
190 PRINT@384,"(7) State    ";:PRINT@398,F$(8)
200 PRINT@448,"(8) Zip      ";:PRINT@462,USING"#####";CVD(F$(9))
;
210 IF NE THEN IC=IC+1: IF IC>9THEN NE=0 ELSE230
220 PRINT@896,EL$:INPUT"ITEM NUMBER TO CHANGE (0 TO QUIT) ";IC
230 ON IC GOSUB280,290,300,310,320,330,340,350
240 IFIC=0THENPUT1,RN:IFRN>LRTHENLR=RN:GOTO50ELSE50
250 ON IC GOTO130,140,150,160,170,180,190,200
260 GOTO110
270 PRINT@896,EL$;:I=0:IL=0:
280 PRINT@896,EL$;:I=142:IL=16:IN$=F$(2):GOSUB50000:LSETF$(2)=IN
$:RETURN
290 PRINT@896,EL$;:I=182:IL=3:IN$=FNST$(CVI(F$(3))):GOSUB50000:L
SETF$(3)=MKI$(VAL(IN$)):RETURN
300 PRINT@896,EL$;:I=206:IL=16:IN$=F$(4):GOSUB50000:LSETF$(4)=IN
$:RETURN
310 PRINT@896,EL$;:I=246:IL=1:IN$=F$(5):GOSUB50000:LSETF$(5)=IN$
:RETURN
320 PRINT@896,EL$;:I=270:IL=16:IN$=F$(6):GOSUB50000:LSETF$(6)=IN
$:RETURN
330 PRINT@896,EL$;:I=334:IL=16:IN$=F$(7):GOSUB50000:LSETF$(7)=IN
$:RETURN
340 PRINT@896,EL$;:I=398:IL=2:IN$=F$(8):GOSUB50000:LSETF$(8)=IN$
:RETURN
350 PRINT@896,EL$;:I=462:IL=5:IN$=FNST$(CVD(F$(9))):GOSUB50000:L
SETF$(9)=MKD$(VAL(IN$)):RETURN
50000 IN=1:PRINT@I,IN$:STRING$(IL-LEN(IN$),32);STRING$(IL,24);:I
N$=IN$+STRING$(IL-LEN(IN$),32)
50010 PL=FNVM(P):VB=PEEK(PL)
50020 POKEPL,252:FORW=1TO25:KB$=INKEY$:IFKB$=""THENNEXTW:POKEPL,
VB:FORW=1TO25:KB$=INKEY$:IFKB$=""THENNEXTW:GOTO50020ELSEW=26:NEX
TW:KB=ASC(KB$):POKEPL,VBELSEW=26:NEXTW:KB=ASC(KB$):POKEPL,VB
50030 IFKB=8THENIFIN=1THEN50010ELSEIN=IN-1:PRINTCHR$(24);
50040 IFKB=9THENIFIN>=ILTHEN50010ELSEIN=IN+1:PRINTCHR$(25);
50050 IFKB=13THENRETURN
50060 IFKB>=32ANDKB<=123THENIFIN>ILTHEN50010ELSEIFIN<ILTHENPRINT
KB$;:MID$(IN$,IN,1)=KB$:IN=IN+1ELSEPOKEPL,KB:MID$(IN$,IN,1)=KB$
50070 GOTO50010
```

Program Listing 2

TAXPRO

Videotronics of Sarasota, Inc.

4086 Honolulu Dr. - Sarasota, FL
813-953-2332 33583

The most complete and corrective tax program seen yet. Will do schedules: 1040, A, B, C, D, 4197, SE, G

Automatic transfer of figures from one form to another. Make corrections and watch the changes ripple down the lines to readjust all affected figures.

Calculates Taxes Automatically. Also does income averaging. All with printout on Nelco form.

Model 1/111	48K
Disk	199.95
Updates	110.00
Cass/No printout	150.00
Update	60.00

With instructions

DISK DRIVES

For Mod I, III & PC

TANDON

TM100-1	SS,40T	\$195
TM100-2	DS,40T	\$259
TM100-3	SS,80T	\$275
TM100-4	DS,80T	\$349

Terms: Check, MasterCard, VISA
N.J. Residents add tax. Shipping extra.

VLM
Computer Electronics

(201) 267-3268
10 Park Place, Morristown, N.J. 07960

Program Generation Demo Screen!

(1) Name	: -----	(2) Age	: ###
(3) Address	: -----	(4) Sex	: -
(5) Address	: -----		
(6) City	: -----		
(7) State	: --		
(8) Zip	: #####		

Figure 1

FRANKLIN COMPUTERS

Fully Apple Compatible

FRANKLIN ACE 1000 WITH 64K, 8 Expansion Slots

for peripheral cards; a joystick/paddle connector. A full 72-key typewriter-style keyboard that includes 12 key numeric pad, upper/lower case with shift and alpha lock, full cursor control, and special keys for use with Visicalc. Built into the unit is a 50-watt power supply and cooling fans which permit use of all 8 peripheral expansion slots without power or overheating problems.

\$1435.50

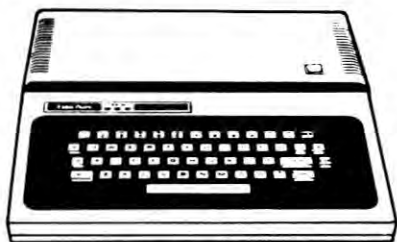
FRANKLIN DISK DRIVE with controller **522**

5.25" disk drive with 143k bytes of storage

FRANKLIN DISK DRIVE only same as above without controller **432**

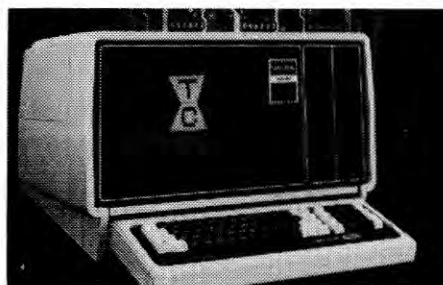
COLOR COMPUTERS

NOW
ON SALE!



16K	LEVEL I	\$279
16K	EXTENDED	\$379
32K	EXTENDED	\$529

TRS-80 MODEL 16



MODEL 16-1 DRIVE	\$4499
MODEL 16-2 DRIVE	\$4899
DT-1 VIDEO DATA TERMINAL	\$620

For use with Model 16 or Mainframe Computer

THESE ARE OUR CASH DISCOUNTED PRICES. C.O.D. AND CHARGE ORDERS ARE 3% HIGHER. ALL COMPUTERS ARE SHIPPED FREIGHT COLLECT. PRICES, SPECIFICATIONS AND AVAILABILITY ARE SUBJECT TO CHANGE WITHOUT NOTICE. IBM & IBM PERSONAL COMPUTERS ARE TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES, INC.



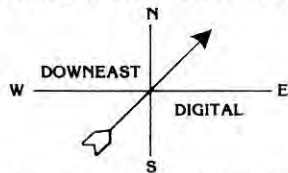
918/825-4844

AMERICAN

118 SO. MILL ST
PRYOR, OK 74361
(918) 825-4844

SMALL
BUSINESS
COMPUTERS

CLINICAL LABORATORY SOFTWARE



LabManager QUALITY CONTROL
LabManager WORKLOAD and FINANCE
LabManager TEST PRICING

TRS-80 Model I or III
Call or write for brochures.

DOWNEAST DIGITAL

P. O. Box 286 • Solon, Maine 04979
(207) 643-2437

Versions for other computers
under development.

✓167

TRS-80 is a registered trademark of Tandy Corporation

two/sixteen magazine

The journal for business, professional, and general microusers in the TRS-80 community.



MODEL I OR III DISK

TAX PLANNING PROGRAM \$99

The **TAX PLANNER** is a personal Federal Income Tax forecasting program to help you manage your financial affairs and minimize your taxes.

- tax deductible ✓501
- menu-driven, easy-to-use
- up to four income and investment strategies at one time
- all calculations done automatically
- hard copy print option
- data saved on disk for later retrieval
- forecasts tax liability plus balance due or refund
- shows tax effect of increasing or decreasing categories of income, deductions, etc.
- calculates tax effect and ROI of investments
- determines true after-tax cost of IRA contributions

For 32K, one disk or larger systems. One disk owners add \$14.95 or send TRSDOS diskette with your order. Specify number of disk drives when ordering. Send check or money order to:

COMPUTER SYSTEMS AND SERVICES, INC.
762 Brown Ave., Churchill, PA 15145
Tel. (412) 823-2179. Dealer inquiries invited.

Lines	Function
60	Clears string storage, dimensions array
70	Points V\$() to video memory so V\$(1) is first line of video display, V\$(2) is second line, and so on
110	Sets number of characters input to 1 and line number to 1, then homes cursor
120	PEEKs cursor location and stores character, then POKEs a graphics block in that location. INKEY is scanned until key is input
130-190	If clear key is depressed (PEEK(14400) = 2) and (L)oad, (S)ave, (I)nsert, (D)elete, (M)ove, or (B)uild depressed then perform function
200-250	If arrow key or shift arrow key depressed then move cursor in proper direction
270	If key is >= blank and key is <= lowercase z, and if the number of characters input is > input length then go to line 120. If number of characters input is < input length then print character input. Otherwise, POKE character input into video memory
290	Save screen to disk
300	Load screen from disk
330	Set field start to 1 (FS(1) = 1) and number of buffers to 1 (NB = 1). Field start and field end (FE()) hold the items that will fit in the 256 characters allowed for a record. If more than 256 characters are needed, FS(2) to FE(2) will hold the item for the second disk file. The program will create as many disk files as are needed to hold the screen
360	LL is a counter for each item read. Loop from first line to 14th line. I1 holds last character checked
370	Loop from I1 to LEN of screen line. If the character is > blank then store location as Print@ position for prompt, store character count in A1, and terminate loop. Otherwise continue loop. If the loop terminates without finding a character > blank then store a number > 64 in I1 so line will not be scanned again
380	Look for : and store its position in A2; if not found look for ! and store its position minus 1 in A2
390	Get prompt from position A1 to A2 and store it in V1\$()
400	Look at characters for last prompt forward for input field -, #, or \$. \$ is only used if followed by #
430	Load B1 with start of input field. If it is a numeric field (T2 < T1) place a graphics block over the first character of the field and prompt for precision for field. Otherwise, load B1 with start of field and set mode to 1 (M() = 1)
440	If T1 equals T2 and no prompt found (V1\$(LL) = " ") then go to the next line. Otherwise, set mode to 0
450	Load I(LL) with input location
460	Find end of input field
470	If mode is > 1 then get using string from position B1 to B2
480	Calculate input length
490-530	Based on mode, load LA with proper size for field statement
540	Sum field size to file length. If file length is > 256 characters then: file length (first buffer) = field length - last amount; file end (first buffer) = LL - 1; field length = last amount; increment number of buffers to 2; file start (second buffer) = LL. Otherwise: file length (first buffer) = field length; and file end (first buffer) = LL
560	If last character checked (I1) <= 64 then print line currently working on and go to 370; else, next line
580-1690	Asks for the starting line number, the increment between lines, and the file names for the program and data files. The program will have /PRO appended to its file name and the data file will have /DAT appended to its name. If more than one file is required, the file name will include the file number
630	Starts building the program. L\$(J) will hold each line built. GOSUB 1690 increments J by one and adds the line increment to the program line counter (PLC). Quotation marks must surround strings in a print statement. They are entered by using Q\$. PRINT "THIS IS A TEST" is built by L\$(J) = "?" + Q\$ + "THIS IS A TEST" + Q\$. Basic requires a string to be surrounded by quote marks, but quote marks cannot be part of a string
680-700	Build the open statements for the data files (like OPEN "R", 1, "FILE-NAME", 196)
720-800	Builds the field statements. If one grows larger than 240 characters a new line is started
810	Stores a pointer for a branch back to "Change the Record Number," used in line 880
910	Stores the array pointer J and the line number. These are used by line 1050 to finish the jump-past-the-buffer nulling statements if the record is already on file
1070	Stores the line number of the start of the display to use later

Table 4. Listing 2 Line Functions

DISK DRIVES

CDC* 40 TRACK
BARE **\$149**
 with POWER SUPPLY..... **\$189**
 and **CABINET**
 *CONTROL DATA CORP.

TEC 40 TRACK
BARE **\$199**
 with POWER SUPPLY..... **\$239**
 and **CABINET**

DISK DRIVES FOR THE TRS-80 MODEL III

DRIVE 0 **DRIVE 1**

Single Side, 40 Track	\$595	Single Side, 40 Track	\$199
Double Side, 40 Track	\$729	Double Side, 40 Track	\$269
Single Side, 80 Track	\$729	Single Side, 80 Track	\$269
Double Side, 80 Track	\$819	Double Side, 80 Track	\$319

The disk drives we sell for the Model III are the Tandon drives. Drive 0 includes the controller board, power supply, cables and all mounting hardware. Complete instructions are included for installation. It takes 30 minutes to an hour to install disk drives in a Model III. No soldering is required. TRSDOS operating system is not included in this low price.

IBM PERSONAL COMPUTER DISK DRIVES

SINGLE SIDE, 40 TRACK **\$209**
DOUBLE SIDE, 40 TRACK **\$269**

These drives are fully compatible with the IBM Personal Computer. They can be used as the first or second drive and come with our exclusive 90 day warranty. DOS and Drive Adapters required. Our disk drives adhere to the high quality standards that IBM demands.

TEAC

BARE		COMPLETE	
		WITH POWER SUPPLY & CABINET	
40 Track, Single	\$199	40 Track, Single	\$239
40 Track, Double	\$289	40 Track, Double	\$340
80 Track, Single	\$289	80 Track, Single	\$340
80 Track, Double	\$349	80 Track, Double	\$399

TANDON

BARE		COMPLETE	
		WITH POWER SUPPLY & CABINET	
40 Track, Single	\$199	40 Track, Single	\$239
40 Track, Double	\$269	40 Track, Double	\$319
80 Track, Single	\$269	80 Track, Single	\$319
80 Track, Double	\$319	80 Track, Double	\$369

We sell two brands of disk drives for the TRS-80: the TEAC and the Tandon. The TEAC disk drive has a 1 year warranty, the Tandon has a 90 day warranty. The TEAC uses a lead screw actuator, the Tandon uses a split band type actuator. The track to track access rate for the Tandon is 5 milliseconds, as opposed to 25 milliseconds for the TEAC. The TRS-80 Model III requires a faster drive speed than the Model I, therefore the Tandon works better with the Model III. With the slower drive speed requirements of the Model I, the TEAC is a more reliable drive. We have both 40 track and 80 track drives with either single or dual head. All drives are capable of double density. These drives are available either bare or complete with power supply and cabinet. A cable is required to hook up the drives. We have both two-drive and four-drive cables. All drives come with complete instructions for hooking up a system. TEACs and Tandon can be intermixed with other drives on the same system.

THESE ARE OUR CASH DISCOUNTED PRICES. C.O.D. AND CHARGE ORDERS ARE 3% HIGHER. ALL COMPUTERS ARE SHIPPED FREIGHT COLLECT. PRICES, SPECIFICATIONS AND AVAILABILITY ARE SUBJECT TO CHANGE WITHOUT NOTICE. IBM & IBM PERSONAL COMPUTERS ARE TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES, INC. TRS-80 AND RADIO SHACK ARE TRADEMARKS OF TANDY CORPORATION.



918/825-4844

AMERICAN

118 SO. MILL ST
 PRYOR, OK 74361

Small

Business

COMPUTERS

Peek Pong

by Charles Gulick

Peek Pong demonstrates that the illusion of speed is possible even in Basic, if the programmer uses all the tools at his command. You'll find it challenging and worth the time it takes to type it in.

The action is like that in ping pong or handball, and your opponent never misses. The object is to return the ball as many times as possible to an unseen adversary who hits it toward you at random angles. Your best score during any playing session is displayed as the "Score to Beat," and the score for your last set is also given.

The Action

I perked up this game with an audio module, so turn on your amplifier/speaker system before loading. Answer CASS? with enter, and answer the

If you thought fast-paced games couldn't be written in Basic, Peek Pong should surprise you.

memory-size prompt with 32746, and then CLOAD and run.

The message "K to play, Q to quit" appears midscreen. A reminder of the paddle control keys appears on the right side of the screen. The three controls were chosen for their convenient positions. Place the first two fingers of your right hand over the < and > keys. These

keys move the paddle left and right. Place a finger of your left hand over the S. This key stops the paddle in its mad dash back and forth. This control is crucial for getting higher scores.

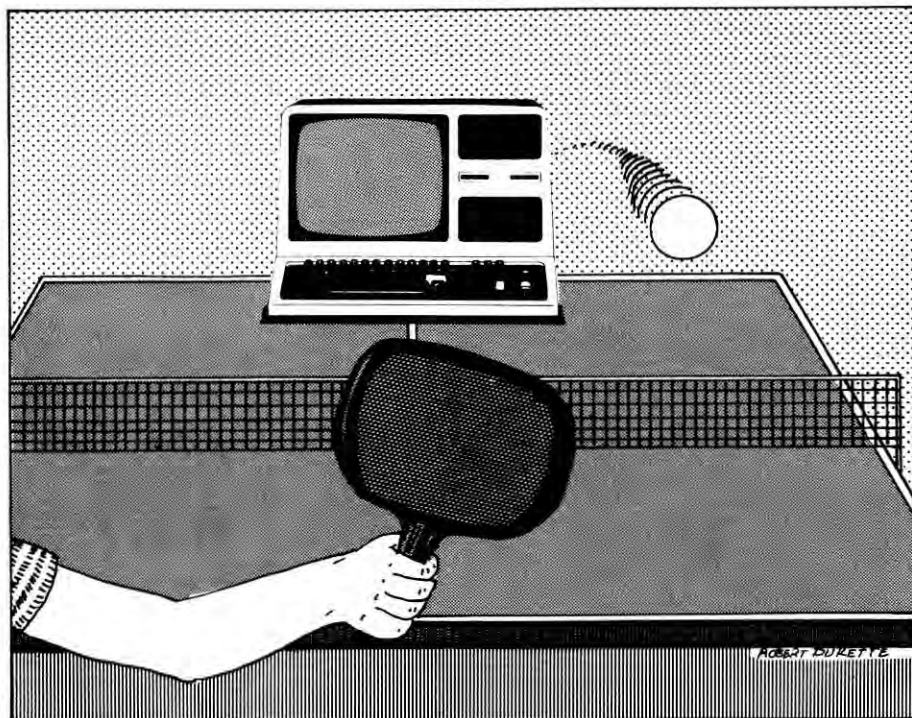
When you miss the ball, you hear a five-note raspberry. On the Model I an 8 shows you where you were; on the Model III an X. To play again, hit K, and immediately get in position for the next serve. That's all there is to playing Peek Pong.

The Program

Lines 330 and 340 POKE the sound subroutine into high memory. Line 310 calls the random sounds. Lines 20-40 POKE the walls into video RAM (VID-RAM), although the top wall is invisible. Line 50 prints the masthead and the midscreen K/Q message.

Line 70 creates the paddle. It must be three 131s wide, because the paddle moves that far for each depression of < or >. This is a key trick for speeding up the action. It also means you will not always be able to position the paddle so the ball hits it in the center. Thus, some judgement comes into play.

The action for each game begins at line 80, which provides for random release of the ball by your unseen opponent. The ball (B = 176) shows up at line 90, to which the play continues to return until you miss. This line also calls forth the bounce sound if the ball and paddle meet. Note S is reinitialized here to zero



The Key Box

Model I or III
 16K RAM
 Cassette Basic
 Cassette Port Amplifier (optional)

DISCOUNT SOFTWARE

NEWDOS, DOSPLUS AND NOW LDOS!!

YOUR CHOICE, ONLY **\$129** EACH.

NEWDOS, DOSPLUS AND LDOS are three of the most advanced operating systems ever available for the TRS-80. After spending thousands of dollars on your computer, why limit yourself by using an inferior operating system?

ATON ATON CP/M for

Radio Shack Hard Disk...**\$235.**

ATON CP/M LEVEL II for

TSR-80 Mod. II...**\$279.**

COLOR COMPUTER GAMES

COSMIC DOGFIGHT OFFENDER, PACKMAN

GET ALL THREE OF OUR NEWEST
COLOR COMPUTER GAMES
EITHER DISK OR CASSETTE.

CASSETTE ...\$44.00
DISK\$59.00

★ ★ NEW RELEASES ★ ★

COSMIC DOGFIGHT	CASSETTE	14.95
	DISK	19.95
OFFENDER	CASSETTE	29.95
	DISK	34.95

— OTHER FAVORITES

PACKETMAN	CASSETTE	24.95
	DISK	29.95
MOONLANDER	CASSETTE	14.95
	DISK	19.95
METEROIDS	CASSETTE	21.95
SPACE INVADERS	CASSETTE	21.95

RADIO SHACK SOFTWARE

MODEL I, III

Cassette Scripsit	26-1505	\$34.95
Cassette Portfolio	26-1506	\$24.95
Stock Pack	26-1507	\$44.95
Disk Mailing List	26-1551	\$34.95
General Ledger I	26-1552	\$87.95
Inventory Control I	26-1553	\$87.95
Accts. Payable	26-1554	\$138.00
Accts. Receivable	26-1555	\$138.00
Disk Payroll	26-1556	\$175.00
Business Mailing List	26-1558	\$87.95
Profile	26-1562	\$69.95
Scripsit	26-1563	\$87.95
Visicalc-Mod I	26-1566	\$87.95
Visicalc-Mod III	26-1569	\$175.00
Project Manager	26-1580	\$87.95
Checkwriter	26-1584	\$87.95
Super Scripsit	26-1590	\$175.00

Scripsit Dictionary	26-1591	\$131.00
Profile III Plus	26-1592	\$175.00
Desktop Plan-80	26-1594	\$175.00
Budget Mgmt.	26-1603	\$22.00
Advanced Stat. Analysis	26-1705	\$39.95

MODEL II

Gen. Ledger 1 Disk	26-4501	\$175.00
Inventory Mgmt. System	26-4502	\$175.00
Mod II Visicalc	26-4511	\$263.00
Profile II	26-4512	\$170.00
Profile II Plus	26-4515	\$275.00
Mod II Scripsit 2.0	26-4531	\$375.00
Scripsit Dictionary	26-4534	\$175.00
Inventory Mod II	26-4602	\$275.00
Order Entry ICS	26-4607	\$465.00

DISCOUNT!!

FARM and RANCH MANAGEMENT

BEEF PROJECTION	\$20.00
BEEF RATION	\$15.00
DAIRY COW	\$15.00
FEED LOT	Models I and III \$35.00
	Model II \$100.00
FARM RECORD	\$35.00
GOVERNMENT PROGRAM	\$15.00
GRAIN STORAGE	\$15.00
LOAN	\$15.00
MACHINE COST	\$20.00
RECORD MANAGEMENT	\$15.00
ESTATE TAX	\$25.00
FEED FORMULATOR	\$35.00
PASTURE PROJECTION	\$20.00

HARDWARE REQUIREMENTS FOR THE ABOVE PROGRAMS. (MINIMUM) TRS-80 Model I or III with 48K and one disk drive. For Model II versions of the above programs, please add \$5.00 per program (Feed Lot Program Add \$65). Buy all the above programs and save even more. Model I and III Versions only \$250.00 (Save \$30). Model II Versions Only \$350 (Save \$55).

LAZY WRITER	\$175
ALCOR PASCAL	\$199
MICRO CLINIC	\$24.95
CHEXTEXT MICROSOFT	\$34.95
LEVEL III BASIC	\$50
TYPING TUTOR	\$15
EDITOR ASSEMBLER +	\$30
ADVENTURE	\$30
MOD I FORTRAN	\$87.95
A.L.D.S.	\$85
MOD I BASIC COMPILER	\$195
MOD I MuMATH	\$75
OLYMPIC DECATHLON	\$24.95
EDITOR ASSEMBLER (Disk)	\$49.95
CP/M FORTRAN-80	\$475
CP/M BASIC COMPILER	\$375
CP/M MuMATH-MuSIMP-80	\$250
CP/M COBOL COMPILER	\$699
CP/M BASIC-80	\$350

BASIC COMPILER II	\$395
COBOL-80 MOD II	\$699
M/SORT	\$195
ASPEN:	
GRAMMATIK I/III	\$75
GRAMMATIK II	\$99
PICKLES & TROUT:	
RANDOM HOUSE PROOF READER	\$50
CP/M FOR MODEL II	\$185
CP/M FOR MODEL 16	\$220
MISC:	
BOOKKEEPER I/III	
Cassette	\$49.95
Disk	\$59.95
MICRO SEABATTLE	
Cassette	\$19.95
Disk	\$24.95
LIST: 1 (Telephone List)	
Cassette	\$9.95
Disk	\$14.95
COMPUTER BASEBALL	
Cassette	\$14.95
Disk	\$19.95

THESE ARE OUR CASH DISCOUNTED PRICES. C. O. D. AND CHARGE ORDERS ARE 3% HIGHER. ALL COMPUTERS ARE SHIPPED FREIGHT COLLECT. PRICES, SPECIFICATIONS AND AVAILABILITY ARE SUBJECT TO CHANGE WITHOUT NOTICE. IBM & IBM PERSONAL COMPUTERS ARE TRADEMARKS OF INTERNATIONAL BUSINESS MACHINES, INC.



918/825-4844

Small

Business

COMPUTERS

118 SO. MILL ST
PRYOR, OK 74361
(918) 825-4844

"Of the eight or nine record-keeping programs we've seen, CLASSFILE is clearly outstanding!"

Electronic Learning Magazine.

CLASSFILE

A comprehensive record-keeping system for the classroom.

- Flexible
- Convenient
- No Programming Background Needed.

Designed in consultation with classroom teachers.

TRS-80 MODEL I/III, 16K Cassette \$19.95
TRS-80 MODEL III, 48K, Two Disk System \$49.95

Write for FREE brochure to: 541

Teach Yourself by Computer Software

40 Stuyvesant Manor • Geneseo, New York 14454
(716) 243-3005

4 MHz FOR THE MOD 3

PC BOARD & DOC. ONLY \$19.95

THIS EASY TO INSTALL KIT WILL DOUBLE THE SPEED OF YOUR MOD-EL III COMPUTER.

COMPLETE KIT \$49.95

ASSEMBLED & TESTED \$99.95

CALL OR WRITE
J.E.S. GRAPHICS
P.O. BOX 2752
TULSA, OK. 74101

PHONE (918) 742-7104 439

WORD GAMES

- CROSWORD • WORD WIZ
- SENTENCEER

Challenging, educational, mind-boggling, entertaining. These word games are designed to run on TRS-80 Model I, III, 16K. Fast paced games for one or two players. (Tape only). Excellent for schools.

CROSWORD \$11.95 Ea.

WORDWIZ & SENTENCEER \$9.95 Ea.

- PERFIN • PERDATA

Personal Data Management

PERFIN computes & compares your wealth or finances in seconds. A quick balance sheet. Runs on model I, III, 16K (Disk only).

PERDATA automatically lists, files, addresses, sorts. Simple to use.

PERFIN \$11.95 PERDATA \$11.95

Add \$1.50 for shipping

All products sold with money back guarantee

Send for free brochure 248

SHIRLEY SOFTWARE

P.O. BOX 417 OLD GREENWICH, CT. 06870

until the sound is needed again.

Lines 100-140 watch for your control keys, and keep busy erasing and re-POKEing the racket according to your instructions. Line 150 erases and moves the ball to its next POKE location at a speed slightly under the speed of light. Lines 170-190 check the top, left, and right walls to see whether the ball is about to bounce, in which event they summon the bounce sound and redirect the ball.

Line 200 is where your paddle contacts and returns the ball and hits are scored. Line 210 records the more likely event that the paddle does not hit the ball, and you get X (8 on Model I) and a little tune to cheer you up for the next round. Line 230 GOSUBs five times to the USR function and randomizes the notes.

Line 250 keeps a permanent record of the highest score achieved. Any number of players can play in rotation trying to top this score.

Whence the Speed?

Peek Pong is fast—sometimes frustratingly so. And this proves that Basic need not be regarded as the arch enemy of graphic games action. Several hurry-up features are incorporated into this

program. PEEKing and POKEing are themselves faster than PRINT @s, and at least in this game environment, faster than Set/Reset techniques. Moving the paddle in increments of three also speeds the action, as does elimination of all spaces between characters. Randomizing the ball's angle off the top (invisible) wall, rather than having it bounce logically (as it does off the side walls) simulates a crafty opponent and adds liveliness to the action. Even the inclusion of sound adds to the feel of fast action.

Here's a tip for when you have trouble making contact with the ball: Use S to stop the paddle in the vicinity of the ball's descending trajectory.

The computer can make an absolute lethal shot that will prevent the game from going on forever. It occasionally wields this blow from a corner, and no amount of dexterity will save you. Also, some of the serves will prove to be aces, unless you're psychic and have speed-of-light reactions. ■

Charles Gulick can be reached at 300 W. Royal Palm Road, Boca Raton, FL 33432.

```

2 'PEEK PONG - by Charles Gulick, Apt. 412C, 300 W. Royal Palm
  Rd., Boca Raton FL 33432. 3/8/82
10 RANDOM:CLS:GOSUB330:GOSUB310:PRINTCHR$(23):PRINT@472,"PEEK PO
  NG":FORT=0TO750:NEXT
20 CLS:GOSUB310:FORX=15424TO15487:POKEX,128:NEXT
30 GOSUB310:FORX=15489TO16257STEP64:POKEX,191:NEXT
40 GOSUB310:FORX=15550TO16318STEP64:POKEX,191:NEXT
50 GOSUB310:PRINT@0,"PEEK PONG          SCORE:          SCORE TO BEAT:
  INKEYS: < S >";GOTO260
60 FORX=16320TO16383:POKEX,128:NEXT
70 R=16339+RND(20):POKER,131:POKER+1,131:POKER+2,131:J=3
80 B=176:W=15509+RND(20):D=61+(2*RND(2))
90 POKEW,B:IFS=1GOSUB310:S=0
100 P$=INKEY$:IFP$="."THENJ=1ELSEIFP$=","THENJ=2ELSEIFP$="S"THEN
  J=3
110 IFJ<>3POKER,128:POKER+1,128:POKER+2,128
120 IFJ=1THENR=R+3ELSEIFJ=2THENR=R-3
130 IFR>16380THENR=16380ELSEIFR<16321THENR=16321
140 IFJ<>3POKER,131:POKER+1,131:POKER+2,131
150 POKEW,32:W=W+D
170 IFPEEK(W-64)=128S=1:D=61+(2*RND(2))
180 IFPEEK(W-1)=191S=1:D=D+2
190 IFPEEK(W+1)=191S=1:D=D-2
200 IFPEEK(W+D)=131S=1:D=D-128:H=H+1:PRINT@24,H;
210 IFPEEK(W+D)=128THEN230ELSE90
230 POKEW+D,120:FORX=0TO10:NEXT:GOSUB310:E=E+1:IFE=5THEN250
240 POKEW+D,32:GOTO230
250 PRINT@24,H;:IFH>BHTHENBH=H
260 PRINT@45,BH;:PRINT@533,"K TO PLAY Q TO QUIT";
270 A$=INKEY$:IFAS="K"THENH=0:E=0:PRINT@533,STRING$(20,"");:PR
  NT@24,H;:GOTO60
280 IFAS="Q"THENCLS:PRINTCHR$(23):PRINT@472,"THANKS!":FORT=0TO75
  0:NEXT:GOTO290ELSE270
290 FORX=1TO4:GOSUB310:FORW=1TO10:NEXTW:NEXTX:CLS:END
310 S=USR(2600+RND(100)):RETURN
330 POKEL6526,235:POKEL6527,127:FORX=32747TO32767:READB:POKEX,B:
  NEXT:RETURN
340 DATA205,127,10,62,5,211,255,69,16,254,62,4,211,255,69,16,254
  ,37,32,239,201
  
```

Program Listing

WE WILL NOT BE UNDERSOLD

SOFTWARE

MICROPRO	
Wordstar	\$239.00
Mailmerge	\$ 89.00
Customization Notes	\$359.00
Spellstar	\$239.00
Datastar	\$199.00
Calcstar	\$199.00
MICROSOFT	
Basic Interpreter	\$349.00
Basic Compiler	\$389.00
Fortran 80	\$499.00
Cobol 80	\$695.00
DATA BASE	
dBase II	\$599.00

IBM PC SOFTWARE

INFORMATION UNLIMITED	
Easy Writer	\$289.00
Easy Speller	\$149.00
Easy Filer	\$319.00
VISI CORP	
VisiCalc 256K	\$199.00
VisiDex	\$209.00
VisiFile	\$219.00
VisiTrend/VisiPlot	\$259.00
VisiTerm	\$99.00
MICROPRO	
Mailmerge	\$119.00
Wordstar	\$239.00
MISCELLANEOUS	
Supercalc by Sorcim	\$229.00
Superwriter by Sorcim	\$289.00
Home Accountant Plus	\$139.00
ENTERTAINMENT	
Deadline	\$39.00
Temple of Apshei	\$29.00
Curse of Ra	\$15.99
Call For More IBM Software And Accessories	

DISK DRIVES

CCI 100 for the TRS-80 Model 1	
5 1/4 40 track	\$299.00
CCI 189 for the Zenith Z-89	
5 1/4 40 track	\$379.00
CORVUS 5M with Mirror	\$3089.00
CORVUS 10M with Mirror	\$4489.00
CORVUS 20M with Mirror	\$5389.00
CORVUS Interfaces	CALL
RANA SYSTEMS add-on Disc Drive for the Apple II	
Elite Two 80 Track	CALL
Elite One 40 Track	CALL
Elite Controller	CALL
Elite Two 80 Track	CALL
Elite Three 80 Track double-sided	CALL

DISKETTES

Maxell 5 1/4 single side	\$39.00
Maxell 8 single side	\$49.00
Maxell 5 1/4 double side	\$45.00
Maxell 8 double side	\$55.00
BASF 5 1/4	\$26.95
BASF 8	\$36.00
Verbatim 5 1/4	\$26.95
Verbatim 8	\$36.00
Wabash 5 1/4	\$21.95

IBM PC ACCESSORIES

64K Card by Microsoft	\$435.00
Joystick by T & G	\$49.00
128K Card	\$579.00
192K Card	\$629.00
256K Card	\$699.00
Combo Card by Apparat	\$249.00
Call for more IBM PC add-ons	

For fast delivery, send certified checks, money orders, or call to arrange direct bank wire transfers. Personal or company checks require one to three weeks to clear. All prices are mail order only and are subject to change without notice. Call for shipping charges.

APPLE SOFTWARE

MICROPRO	
Wordstar	\$199.00
Mailmerge	\$89.00
Spellstar	\$149.00
DataStar	\$199.00
CalcStar	\$189.00
VISI CORP	
VisiCalc	\$199.00
VisiTerm	\$79.00
VisiDex	\$199.00
VisiPlot	\$169.00
VisiFile	\$199.00
VisiSchedule	\$259.00
VisiTrend/Plot	\$239.00
MISCELLANEOUS	
Micro Courier	\$219.00
Screen Director	\$129.00
Executive Briefing System	\$169.00
Supercalc	\$199.00
Personal Filing System	\$115.00
PFS Report Writer	\$75.00
Word Handler	\$169.00
ENTERTAINMENT	
Beer Run	\$28.00
Zork I, II	\$26.95
Deadline	\$39.00
Chop Lifter	\$24.95
Cannonball Blitz	\$29.95
Knights of Diamonds	\$29.95
Midnight Magic	\$32.00
Wizardry	\$45.00
Tuesday Morning Quarterback	\$24.95
Crush, Crumble & Chomp	\$24.95
Datestones of Ryn	\$15.99
Morloc's Tower	\$15.99
Snack Attack	\$23.95
Star Blazer	\$24.95

APPLE ACCESSORIES

ADVANCED LOGIC	
Add-Ram 16K Card	\$99.00
Z-Card CP/M for the Apple II	\$225.00
Smarterm 80 Column Board w/Softswitch	\$249.00
Z-80 Card by Microsoft	\$319.00
16K Card by Microsoft	\$159.00
32K Card by Saturn	\$199.00
Keyboard Enhancer II by Videx	\$125.00
Videoterm by Videx	\$259.00
Game Paddles by TG	\$49.00
Joystick by TG	\$49.00
Numeric Keypad by Keyboard Co.	\$139.00
ALF 9 Voice Board	\$159.00
ALF 3 Voice Board	\$229.00
System Saver by Kensington	\$75.00
Microbuffer II 16K w/graphics	\$259.00
Microbuffer II 32K w/graphics	\$299.00
APPLE INTERFACE CARDS BY CCS	
Serial Asynch. #7710	\$139.00
Centronics #7729	\$149.00
Call for other CCS cards	

RAM

16K Ram Kit for Apple II; TRS80	
200 nano seconds, 4116 chips	\$17.50

**DEALER INQUIRIES
PLEASE CALL
1-800-343-7036**

COMPUTERS

CALIFORNIA COMPUTER SYSTEM	
Mainframe 2200a	\$485.00
Z-80 CPU 2810a	\$265.00
64K RAM 2065	\$569.00
Floppy Controller 2422a	\$359.00
ZENITH	
Z-89 48K	CALL
Z-90 64K	CALL
Z-100	CALL
Call For Prices On The Complete Zenith Line	
CASIO FX702P Pocket Computer	\$179.00
Sanyo MBC 1000 64K	CALL
Call For Prices On Complete Sanyo Computer Line	

PRINTERS

NEC 3550 for the IBM PC	\$2195.00
NEC 7710 Serial	\$2395.00
NEC 7720 KSR	\$2749.00
NEC 7730 Parallel	\$2395.00
NEC 3510 Serial	\$1850.00
NEC 3520	\$2099.00
NEC 3530 Parallel	\$1850.00
Antex "Generic Model of the Prowriter"	\$479.00
Epson MX-80	CALL
Epson MX-80FT	CALL
Epson MX-100	CALL
IDS Micro Prism	CALL
IDS Prism 80	CALL
IDS Prism 132	CALL
Okidata Microline 80	CALL
Okidata Microline 82A	CALL
Okidata Microline 83A	CALL
Okidata Microline 84	CALL
Datasouth 180 cps	CALL

MONITORS

SMD 13" Color	\$329.00
Sanyo 9" B & W	\$135.00
Sanyo 9" Green	\$140.00
Sanyo 12" B & W	\$179.00
Sanyo 12" Green	\$189.00
Sanyo 13" Color	\$359.00
Zenith 12" Green	\$95.00
Zenith 13" Color	\$339.00
Electrohome 13" HI-RES Color Monitor	\$829.00
Electrohome 13" Color	\$349.00
Electrohome 12" B&W	\$179.00
Electrohome 12" Green	\$189.00
Electrohome 9" B&W	\$149.00
Electrohome 9" Green	\$159.00

SPECIAL OF THE MONTH

**SMD 13"
COLOR MONITOR
\$329.00**

TERMINALS

ADDS Viewpoint	\$495.00
Zenith Z-19	\$679.00
Televideo 910	\$595.00
Televideo 925	\$779.00
Televideo 950	\$969.00
Zenith ZT-100	\$595.00

TELECOMMUNICATIONS

Novation Cat Modem	\$139.00
Novation D-CAT	\$149.00
Novation AUTO-CAT	\$199.00
Novation APPLE CAT	\$299.00
Hayes Smart Modem	\$249.00
Smart Modem 1200	CALL
Hayes Micro-Modem	\$295.00
Hayes Chronograph	\$225.00
Signalman Mark I	\$85.00

The CPU Shop

TO ORDER CALL TOLL FREE 1-800-343-6522

420-438 Rutherford Ave., Dept. MI 14, Charlestown, Massachusetts 02129



Hours 9 AM - 9 PM (EST) Mon.-Fri. (Sat. till 6)
Technical information call 617/242-3361

TWX- 710-348-1796

Massachusetts Residents call 617/242-3361
Massachusetts Residents add 5% Sales Tax

Color Life

by Larry F. Perry

Teach your students about the development of communities of organisms with this revised Game of Life for the Color Computer.

As a teacher of environmental biology, I thought the Game of Life could be useful in classroom discussions of communities of organisms. Unfortunately, I found that my Color Computer Life program, written in Basic, bored my students because it was too slow. So, I added some machine-language calls from Basic, and Color Life is the result.

As explained in the program's introduction, John Conway designed the original Life program in the late 1960s. It is a mathematical game that simulates the rise, fall, and alterations of a society of living organisms.

When you run Color Life (Program Listing 1), the title page is displayed while the machine-language subroutines are POKEd into memory. Almost all programs I've seen that POKE machine code into memory use data statements and decimal numbers. Since I use hexadecimal numbers frequently, I decided it would be easier to use strings of hex numbers, read those strings two characters at a time using lines 150-200, and let the computer convert all of the numbers.

After the title page is displayed, you are asked if you need instructions. If you do, press Y. If you don't, press any other key. You are then asked if you want to step through the generations, one generation at a time. Stepping lets you observe each generation carefully. Press Y to activate the step mode. To display the next generation when in the step mode, press the space bar. If you don't want to step, press enter.

After making your step selection, you are asked to select the speed at which the generations are to be displayed. Press 1 or enter for fast, 2 for medium, or 3 for slow. At this point you are told how to change the speed of the display and how to get into the step mode during the game. If you decide to add a glider (a small number of organisms that move while repeating the same series of patterns) or some other pattern to the one on the screen while the game is in progress, press C. If you want to get out of the step mode while the game is in progress, press G.

After selecting a speed, you are given another set of instructions and ques-

tions. You can either start your own colony or let the computer place a random population on the screen. Press 1 if you decide to place your own colony; press 2 for the computer placement.

To speed up the placement of a colony, I incorporated the following time-saving options: for placing an organism, press 0; to delete, position the cursor over the square you want to eliminate, and press clear; to place preprogrammed sample colonies, position the cursor wherever you like and press 1, 2, or 3; and to speed your own insertion you can advance the cursor left, right, up, or down each time you insert or delete by pressing L, R, U, or D. The latter step makes inserting your own colony fast and easy. When you finish placing your colony, press S. You will be greeted by a few notes that might sound familiar to you.

When the program begins, the generation number is displayed at the top left of the screen, and the population number is at the top right. These two items are a must if you want to know what is happening to your colony. Color Life also displays the births and deaths of the organisms. If all the organisms die, Color Life ends and tells you at what generation they died. If the colony stabilizes, or you want to start another colony, press E, and you will be asked the series of questions again. That's it for the Basic program.

Now for the "miracle worker." I wrote this for those of you who know

Program Listing 1

```

5 REM      HX = START ADDRESS OF MACHINE LANGUAGE SUBROUTINE
10 CLEAR500:HX=&H6F7
20 CLS:PRINTSTRING$(32,191);:PRINTSTRING$(32,"*");
30 PRINTSTRING$(64,175);:PRINT"      C O L O R L I F E "
40 PRINTSTRING$(32,159);:PRINT"          VERSION 2.0"
50 PRINTSTRING$(32,239);:PRINT"  WRITTEN BY L.F. PERRY":PRINTS
TRINGS$(32,255);:PRINT"          JANUARY 31, 1982":PRINTSTRING$(64,19

```

Listing 1 continues

The Key Box

**Color Computer
16K RAM
Extended Color Basic
Editor/Assembler (optional)**

OURS DOES ONE THING RADIO SHACK'S DOESN'T;



SAVES YOU \$500.

The Apparat AT-Series hard disk subsystems for the TRS-80 Model III computer gives you the high performance, complete compatibility and value you demand.

The AT-Series hard disks use the most advanced 5-1/4 Winchester technology for reliable operation. Every AT hard disk comes with NEWDOS/80 Version 2.0 which has been updated for hard disk support. Just

plug the AT-hard disk in and you're ready for work. And because compatibility has been designed in, all of your programs can quickly and easily be transferred to the hard disk.

The Apparat AT-Series hard disks are available in storage configuration of 5 megabyte (AT-50), 10 Mb (AT-100) and 20 Mb (AT-200). Your system can grow as your needs do. The AT-50 and AT-100 systems are expandable up to 20

Mb. Priced at just \$1,975 (AT-50), \$2,550 (AT-100) and \$3,075 (AT-200), the AT-Series offers you top value in a hard disk sub-system. Prices include all required components and software.

For more information contact your local dealer or write Apparat, Inc., 4401 S. Tamarac Parkway, Denver, CO 80237, 303/741-1778. Dealer inquiries invited.

Radio Shack and TRS-80 are registered trademarks of Tandy Corp.

 **Apparat, Inc.**

40

nothing about programming in Assembly language and think it is too hard or abstract. I split the program into three parts and wrote them in a form that closely resembles the logic of a Basic program. This is not efficient, and it makes the program execute more slowly, but it demonstrates that writing machine-language subroutines is not as difficult as you might think.

In Program Listing 2, the routine loads in the start address and checks to see if each screen address has a birth or death marker in it. It replaces the black death-marker with a white block and replaces a blue birth-marker with a red block. After looking at all screen addresses, it returns to the Basic program.

The routine in Program Listing 3 is even simpler. The first screen address is loaded in and checked for a red block. If it has one, then the X register has 1 added to it. Then, the next screen position is checked. After all screen addresses are checked, the number in the X register is stored at 6FE and 6FF, and then control returns to Basic.

The most complicated routine is in Program Listing 4. The beginning screen address is loaded and checked to see if it has an organism. If not, then each of the eight surrounding squares are checked to see if they contain red or black blocks. The B accumulator is incremented each time one is found. If at the end of the check the B accumulator equals 3, then a blue block is placed at that position. When a block is placed, or when the B accumulator doesn't equal 3, nothing happens, and the next screen position is checked. When a red block is encountered, a label is stored at address 6FD. (In this case I used the number 1 for the label.) This tells the computer that the square being checked contains an organism. The same series of events happens here. Each address around the central block is checked, but when the program gets to the address 7F9 hex, it finds that a 1 is stored at hex 6FD. Then the program branches to the routine telling it to place a death marker (black block) in the position if less than two or more than three organisms surround the central block. The screen address is then checked for the end, and the program either continues, if the end of screen is not encountered, or returns to Basic. The comments should help you to follow the logic of the program if you aren't familiar with Assembly language.

You might want to change the background color or the colors that are used in this program to show births, deaths, and adults. To change the background color, alter lines 480 and 690 so they

Listing 1 continued

```

1);:PRINTSTRINGS(32,"*");:PRINTSTRINGS(32,175);
55 REM      HEX NUMBERS FOR SUBROUTINE
60 D$="CFAP80BF00000000008E0420A680B106F82705200E121212B606FAA78
28C060025EA39B106F9270320F312B606F7A7828C060025D739121212"
70 E$="108E00008E0420A680B106FA270A8C060025F410BF06FE39312120F21
2121212121212121212"
80 F$="8E0420A6805FF706FDB106F7270FB106FA27031600998601B706FD121
2301EA680B106F92707B106FA270220015C3001A680B106F92707B106FA27022
0015C3088DDA680B106F92707B106FA270220015CA680B106F92707B106FA270
220015CA680B106F92707B106FA270220015C30883DA680"
90 G$="B106F92707B106FA270220015CA680B106F92707B106FA270220015CA
680B106F92707B106FA270220015C3088DEB066FD8101270EC103271930018C0
6001025FF4D39C10227F2C10327EEB066F9A78020E9B066F8A78020E2121212"
95 REM      GET THE SUBROUTINE
100 Z$=D$:GOSUB150
110 Z$=E$:GOSUB150
120 Z$=F$:GOSUB150
130 Z$=G$:GOSUB150
140 GOTO210
145 REM      POKE SUBROUTINE INTO MEMORY
150 FORX=1TO LEN(Z$)STEP2
160 X$=MID$(Z$,X,2)
170 POKEHX,VAL("&H"+X$)
180 HX=HX+1
190 NEXTX
200 RETURN
205 REM      END POKE SUBROUTINE
210 GOTO1170
215 REM      BACKGROUND INFO ON LIFE GAME
220 CLS:PRINT" JOHN CONWAY, A MATHEMATICIAN ATCAMBRIDGE UNIVERSI
TY, CAME UP WITH 'LIFE' IN THE LATE 1960'S. IT IS A MATHEMATIC
AL GAME WHICH SIMULATES THE RISE, FALL, AND ALTERATIONS OF A S
OCIETY OF LIVING ORGANISMS."
230 PRINT" THE IDEA IS TO START WITH A SIMPLE CONFIGURATION O
F ORGANISMS AND OBSERVE THEIR PROGRESS AS CONWAY'S '
LAWS' ARE APPLIED TO BIRTHS, DEATHS, AND SURVIVORS.
PRESS ENTER"
240 EE$=INKEY$:IFEE$=""THEN240
250 CLS:PRINT" THE LAWS WILL PRODUCE THE FOLLOWING RESULTS:
A. THERE WILLBE NO INITIAL CONFIGURATION THATCAN GROW WITHOUT L
IMIT. B. THEREWILL BE INITIAL CONFIGURATIONS THAT WILL APPARENT
LY GROW WITH- OUT LIMIT. C. ALL PATTERNS,"
260 PRINT"AFTER SOME PERIOD OF TIME, WILL FADE AWAY COMPLETELY E
ITHER FROMOVER OR UNDER POPULATION, BECOMESTABLE PATTERNS, OR EN
TER INTO OSCILLATING PHASES IN WHICH THE CONFIGURATIONS REPEAT
THE SAME PATTERNS ENDLESSLY.
PRESS ENTER"
270 EE$=INKEY$:IFEE$=""THEN270
280 CLS:PRINT" THE 'LAWS' ARE SIMPLE. EACH ORGANISM HAS EIGHT
SURROUNDING CELLS (PLACES AN ORGANISM CAN LIVE). THE RULES F
OR LIFE, BIRTH, AND DEATH ARE: 1) SURVIVAL: EACH
ORGANISM WITH TWO OR THREE NEIGHBORS WILL"
290 PRINT"LIVE TO THE NEXT GENERATION. 2) DEATH: EACH ORGANIS
M WITH ONEOR ZERO NEIGHBORS WILL DIE FROM ISOLATION. EACH ORGANI
SM WITH FOUR OR MORE NEIGHBORS DIES FROMOVERPOPULATION.
PRESS ENTER"
300 EE$=INKEY$:IFEE$=""THEN300
310 CLS
320 PRINT"3) BIRTH: EACH EMPTY CELL WITH EXACTLY THREE NEIGHBOR
S WILL GIVE BIRTH TO A NEW ORGANISM. BIRTHS DO NOT AFFECT A
NY OTHER CELLS UNTIL THEY BECOME ADULTS. PRESS ENTER TO START
GAME.
330 EE$=INKEY$:IFEE$=""THEN330
340 CLS:GOTO540
345 REM      BEGINNING OF LOOP TO LOOK AT SCREEN, CHANGE SCREEN, A
ND COUNT ORGANISMS
346 REM      PUT GENERATION NUMBER AND ORGANISM COUNT ON SCREEN
350 PRINT@4,GE,:PRINT@20,PP,:GE=GE+1
355 REM      CHECK FOR STEPPING GENERATIONS
360 IFXX=1GOTO950
370 A$=INKEY$
375 REM      CHECK FOR KEY PRESSED
380 IFAS="F"THENSP=1ELSEIFA$="M"THENSP=300ELSEIFA$="S"THENSP=600
ELSEIFA$="G"THENXX=0ELSEIFA$="E"THEN550ELSEIFA$="C"THEN710ELSEIF
A$="L"THENXX=1
385 REM      DEFINE ADDRESS FOR ROUTINE TO CHECK BIRTHS, DEATHS AN
D PLACE THEM
390 DEFUSR0=&H757
395 REM      DELAY TO SLOW DOWN DISPLAY
400 FORX=1TO SP:NEXTX
405 REM      CALL BIRTH/DEATH ROUTINE
410 BF=USR(0)
415 REM      DELAY TO SLOW DOWN DISPLAY, SET POP TO 0 TO READY FOR
NEXT COUNT
420 PP=0:FORX=1TO SP:NEXTX
425 REM      CALL ROUTINE TO CHANGE BIRTHS TO ADULTS (RED) AND REM
OVE THE DEATHS (BLACK)

```

Listing 1 continues

New Factory Direct Pricing

Save \$800 on a Dual Drive Model-III

Thanks to our high volume production and low overhead, we can provide the highest quality peripherals at Rock Bottom Prices. **MICRO MAINFRAME** challenges the competition to meet our low prices.

MICRO MAINFRAME can save you from \$200 to \$800 on a dual drive Model-III* computer system.

MICRO MAINFRAME can save you from \$50 to \$345 on a disk controller complete with a 40 track TEC disk drive.

MICRO MAINFRAME now makes it possible to bypass the middle man and purchase at our low, **FACTORY DIRECT** prices.

MICRO MAINFRAME can save you from \$60 to \$255 on a disk controller upgrade kit without drives.

MICRO MAINFRAME invites you to check the pages of 80 Micro and compare our prices. We have the lowest advertised prices of all, and we can deliver from stock on most items.

MICRO MAINFRAME PRICE LIST

M32-1	MOD-III COMPUTER W/FDC-3B	\$1495.00
M32-2	MOD-III COMPUTER W/FDC-3C	\$1595.00
FDC-3B	FLOPPY DISK CONTROLLER (5" SS ONLY)	\$ 79.95
FDC-3C	FLOPPY DISK CONTROLLER (5" B 8" DS)	\$ 99.95
FDC-3BK	CONTROLLER UPGRADE KIT	\$ 179.95
FDC-3CK	CONTROLLER UPGRADE KIT	\$ 199.95
FDC-3BKD	DRIVE UPGRADE KIT W/FDC-3BK	\$ 349.95
FDC-3CKD	DRIVE UPGRADE KIT W/FDC-3CK	\$ 369.95
S-BP1	SMALL BUSINESS SOFTWARE PACKAGE	\$ 99.95
SPS-1	SWITCHING POWER SUPPLY	\$ 54.95
M-50FK	5 MB HARD DISK KIT W/DOSx 4.0D	\$1795.00
M-50FM	5 MB HARD DISK W/DOSx 4.0D, DMX-1A	\$2495.00
DS-1A	DATA SEPARATOR	\$ 39.95

DUAL DRIVE MODEL-III COMPUTERS

MICRO MAINFRAME has the lowest advertised prices anywhere on complete Mod-III* computers. The MMF Model-III* (Stock Number M3DD-1) is priced at only \$1495.00 complete with our FDC-3B disk controller, switching power supply, 48K RAM, and two of the incredible new TEC 40 track, single sided disk drives.

To substitute our FDC-3C disk controller and add 8" disk capability, please order **Stock Number M3DD-2**.

BUSINESS SOFTWARE

Our Small Business Software Package (**Stock Number S-BP1**) is a complete business package at an affordable price. The package includes General Ledger, Accounts Payable, and Accounts Receivable programs tailored specifically to meet the needs of small businesses.

DATA SEPARATOR

If you are having data transfer errors and/or would like to run 8" diskettes, **MICRO MAINFRAME** has a new data separator that not only fixes your data separation problems, but also gives you 8" drive capability when used with DosPlus 3.4 or higher. Now even Radio Shack's controller can run 8" disk drives.

MODEL-III* DISK CONTROLLERS

Now you can purchase our FDC-3B floppy disk controller for the unheard of low price of \$79.95. Many of the dealers advertising in 80 Micro sell this controller as their own unit. Please order by the following stock numbers:

FDC-3B

FDC-3BK

FDC-3BKD

FDC-3B Controller only
 FDC-3BK With IK-3 Installation Kit
 FDC-3BKD With TEC 40 Track SS Drive

MMF beats the high cost of 8" disk operation with our FDC-3C disk controller and is fully supported by DosPlus 3.4. This unit has become the industry standard controller. MMF was the first to deliver a Mod-III* controller, the first to use gold plated card edge connectors, the first besides Radio Shack to provide switching power supplies, and the first to deliver affordable hard disks for the complete Radio Shack line of computers.

SWITCHING POWER SUPPLIES

If your disk upgrade kit did not include a switching power supply, MMF has just the fix that you need. We are providing our SPS-1 switching power supply for just \$54.95. Don't let your system overheat with a faulty power supply. Replace with a genuine MMF Switcher today!

MICRO MAINFRAME HARD DISKS

All **MICRO MAINFRAME** hard disk subsystems feature **ERROR CORRECTION**. Most of the systems now advertised for less do not have error correction. **ERROR CORRECTION** is an absolute necessity in a hard disk, since the disk media can become sensitive to certain bit patterns. Systems without ECC will simply give a **DISK SECTOR NOT FOUND** error message. Eventually, you will lose a substantial portion of your storage area. Insist on **MICRO MAINFRAME** and get your money's worth.

MICRO MAINFRAME

11325 Sunrise Gold Building E
 Rancho Cordova, CA 95670
 (916) 635-3997

✓ 60

The prices in the January issue are not current.
 The publisher apologizes for running the wrong ad

produce the color you want. Next, figure out the number that represents that particular solid color block. For instance, CHR\$(207) is the solid block for white and CHR\$(191) is red. Change the number to hex. An example would be, PRINT HEX\$(191). The computer will print BF, the hexadecimal number for 191.

Now that you know the procedure to find the hex number, look at line 60 in the program. The first part of the string is CFAF80BF. The computer looks at this to determine the color of the block with which it compares the screen address or loads the accumulator in the machine-language subroutines. The CF=white block, AF=blue block, 80=black block, and BF=red block. The first one is the screen color, so change it if you don't want a white background. The other three numbers can be changed to other colors to represent the births, deaths, and adult organisms. If you want to change other aspects of the program, the variables are listed in Table 1. ■

Larry F. Perry can be reached at 920 Baldwin St., Denton, TX 76201.

Listing 1 continued

```

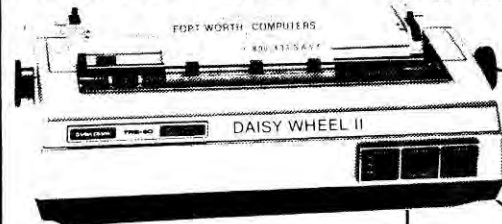
430 DEFUSR0=&H700:BF=USR(0)
435 REM CALL ROUTINE TO COUNT NUMBER OF ORGANISMS - PLACES TH
AT NUMBER AT ADDRESSES 6FE & 6FF
440 DEFUSR0=&H730:BF=USR(0)
445 REM LOOK AT ADDRESSES WHERE POPULATION COUNT IS STORED, C
HANGE TO DECIMAL, GIVE TO PP
450 H$=HEX$(PEEK(&H6FE)):I$=HEX$(PEEK(&H6FF)):PP=VAL("&H"+H$+I$)
455 REM IF POPULATION IS 0 END DISPLAY
460 IFPP=0THEN880
470 GOTO350
475 REM END OF SCREEN LOOP
476 REM PLACE RANDOM POPULATION ON SCREEN
480 CLS(5)
490 FOR X=1056TO1535
500 RN=RND(5)
510 IFRN=2THENPOKEX,&HBF
520 NEXTX
530 GG=0:GOSUB1210:GOTO420
535 REM END OF RANDOM POPULATION ROUTINE
536 REM SET GEN AND POP TO ZERO
540 GE=0:PP=0
545 REM SELECT OPTIONS
550 GOSUB1010:CLS:PRINT" YOU HAVE A CHOICE BETWEEN STARTING
YOUR OWN COLONY OR LETTING THE COMPUTER START ONE. 1) START
OWN COLONY 2) LET COMPUTER START COLONY 3) END G
AME"
560 PRINT:PRINT"A BLUE SQUARE INDICATES A BIRTH,A BLACK SQUARE A
DEATH, AND A RED SQUARE A LIVE ORGANISM.":PRINT:PRINT" NOTE:I
F THE COLONY DIES OR YOU WANT TO START OVER PRESS <E>."
570 PRINT:PRINT"PICK (1), (2), OR (3)."
580 BBS=INKEY$:IFBBS=""THEN580
590 IF BBS="1"THENGE=0:GOTO630
600 IF BBS="2"THENGE=0:GOTO480
610 IF BBS="3"THENEND
620 GOTO580
625 REM INSTRUCTIONS FOR PLACING ORGANISMS
630 CLS:PRINT"PRESS THE UP, DOWN, LEFT, OR RIGHT ARROW TO PO
SITION CURSOR OVER POINT YOU WANT AN ORGANISM TO BE PLACED. PRE
SS <O> AND A RED SQUARE WILL REPLACE THE CURSOR. WHEN YOU
HAVE PLACED ALL";

```

Listing 1 continues

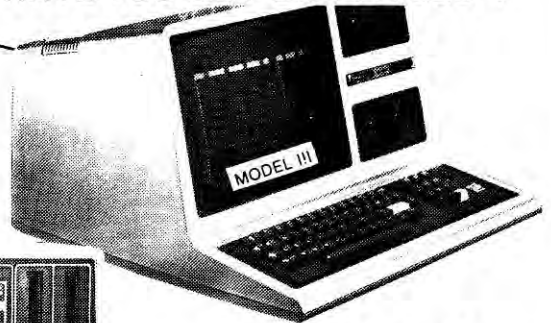
TRS-80™ "CAN YOU BUY DIRECT?"

WILL YOU PAY TOO MUCH?
HAVE YOU GOT OUR PRICES?



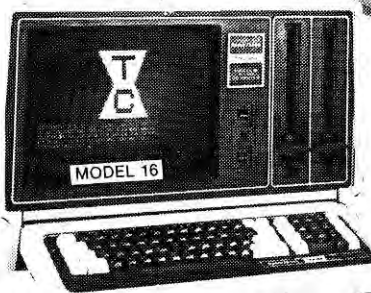
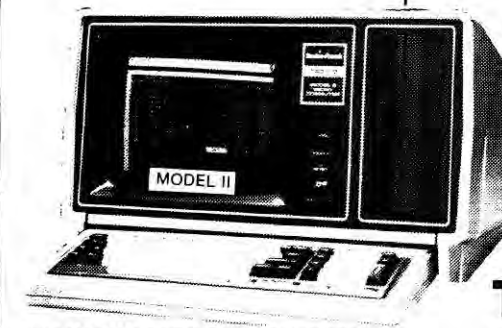
SAVE SALES TAX*
PLUS DISCOUNT

*TEXAS RESIDENTS ADD ONLY 4%



WARRANTY:

ONLY A GENUINE TRS-80 purchased from an Authorized-Outlet can have the Radio Shack Warranty. BUYER BEWARE OF IMITATIONS.



FORT WORTH COMPUTERS

377 Plaza • GRANBURY • NR. FORT WORTH • TEXAS 76048

TOLL FREE NUMBER: 1-800-433-S-A-V-E

IN TEXAS CALL: 817-573-4111

TM: TRADE MARK OF THE TANDY CORPORATION

Listing 1 continued

```
640 PRINT"OF YOUR ORGANISMS PRESS <S> AND THE GAME WILL START.
650 PRINT"IF YOU WANT CURSOR TO MOVE IN A CERTAIN DIRECTION WHEN
    INSERTING OR DELETING PRESS <U>, <D>, <L>, OR <R> AND IT WILL ADV
    ANCE EACH TIME THE <O> IS PRESSED."
660 PRINT"TO DELETE A BLOCK PRESS <CLEAR>, TO PLACE A GLIDER PRES
    S <G>."
670 PRINT" PRESS ANY KEY TO START";
680 CCS=INKEY$:IFCC$=""THEN680
685 REM THIS SECTION ALLOWS USER TO PLACE ORGANISMS ON SCREEN
690 CLS(5)
700 GG=1056
710 IFGG<1056THENGG=1056
720 IFGG>1535THENGG=1535
730 ZG=PEEK(GG):POKEGG,176:FORX=1TO10:NEXTX:POKEGG,207:FORX=1TO1
0:NEXTX:POKEGG,ZG
740 A$=INKEY$:IFA$=""THEN710
750 IFA$=CHR$(12)THENPOKEGG,&HCF:IFPS=1THENGG=GG+1ELSEIFPS=2THEN
GG=GG-1ELSEIFPS=3THENGG=GG-3ELSEIFPS=4THENGG=GG+32
760 IFA$="G"THENPOKEGG,191:POKEGG+1,191:POKEGG+2,191:POKEGG+1-64
,191:POKEGG+2-32,191
770 IFA$=CHR$(9)THENPOKEGG,ZG:GG=GG+1:GOTO710
775 REM SELECTION OF 1,2, OR 3 PUTS SAMPLE POPULATION ON SCRE
EN AT CURSOR LOCATION
780 IFA$="1"GOSUB920
790 IFA$="2"GOSUB930
800 IFA$="3"GOSUB940
810 IFA$=CHR$(8)THENPOKEGG,ZG:GG=GG-1:GOTO710
820 IFA$=CHR$(10)THENPOKEGG,ZG:GG=GG+32:GOTO710
830 IFA$=CHR$(94)THENPOKEGG,ZG:GG=GG-32:GOTO710
840 IFA$="O"THENPOKEGG,191:IFPS=1THENGG=GG+1ELSEIFPS=2THENGG=GG-
1ELSEIFPS=3THENGG=GG-3ELSEIFPS=4THENGG=GG+32
850 IFA$="U"THENPS=3ELSEIFA$="D"THENPS=4ELSEIFA$="R"THENPS=1ELSE
IFA$="L"THENPS=2
860 IFA$="S"THENPOKEGG,ZG:PLAY"O3;D#FC#;O2;C#G#":GOSUB1210:PS=0:
GOTO420
870 GOTO740
875 REM END OF PLACEMENT LOOP
876 REM DISPLAYS GENERATION AT WHICH POPULATION DIED
880 CLS:PRINT@256,"COLONY DIED AT"GE"GENERATIONS"
890 PRINT:PRINT" PRESS ANY KEY TO START AGAIN"
900 E$=INKEY$:IFES$=""THEN900
910 GOTO340
915 REM THREE SAMPLE POPULATIONS
920 POKEGG,191:POKEGG+1,191:POKEGG+2,191:POKEGG+1-32,191:RETURN
930 POKEGG,191:POKEGG+1,191:POKEGG+2,191:POKEGG+32,191:POKEGG+2+
32,191:POKEGG+64,191:POKEGG+2+64,191:RETURN
940 POKEGG,191:POKEGG+32,191:POKEGG+1,191:POKEGG+2,191:POKEGG+3,
191:POKEGG+4,191:POKEGG+5,191:POKEGG+5+32,191:RETURN
945 REM STEPPING ROUTINE
950 DL$=INKEY$:IFDL$=""THEN950
960 IFDL$=CHR$(32)THEN370
970 IFDL$="G"THENXX=0:GOTO420
980 IFDL$="E"THEN550
990 IFDL$="C"THEN710
1000 GOTO950
1005 REM END STEPPING ROUTINE
1006 REM SELECT STEP Y OR N - DEFAULT IS NO
1010 CLS:PRINT@32*3,"DO YOU WANT TO STEP THROUGH THE GENERATIONS
?"
1020 AB$=INKEY$:IFAB$=""THEN1020
1030 IFAB$="Y"THENXX=1:GOTO1050
1040 XX=0
1050 CLS
1055 REM SELECT SPEED - DEFAULT IS FAST
1060 PRINT:PRINT"SELECT THE SPEED YOU WANT."
1070 PRINT" 1) FAST (3 GEN/SEC)
1080 PRINT" 2) MEDIUM (35 GEN/MIN)"
1090 PRINT" 3) SLOW (20 GEN/MIN)"
1100 PRINT@32*6,"NOTE: TO CHANGE SPEED OF DISPLAY WHEN GAME
IS IN PROGRESS PRESS <F> FOR FAST, <M> FOR MEDIU
M, AND <S> FOR SLOW SPEED. TO GET GAME INTO STEP
MODE PRESS <L>."
1110 PRINT" TO ADD ORGANISMS TO THE COLONY PRESS <C
>. TO GET OUT OF STEP MODE PRESS <G>";
1120 SP$=INKEY$:IFSP$=""THEN1120
1130 IFSP$="1"THENSP=1:RETURN
1140 IFSP$="2"THENSP=300:RETURN
1150 IFSP$="3"THENSP=600:RETURN
1160 SP=1:RETURN
1170 CLS:PRINT@32*5,"DO YOU NEED INSTRUCTIONS?"
1180 A$=INKEY$:IFA$=""THEN1180
1190 IFA$="Y"THEN220
1200 GOTO540
1205 REM PRINT AT TOP OF DISPLAY SCREEN - GEN & POP
1210 PRINT@0,STRING$(32,143);:PRINT@0,"GEN:":PRINT@16,"POP:":;RE
TURN
```

Article continues

EARLY GAMES

FOR YOUNG CHILDREN

Nine educational and entertaining games controlled by a single program. Even very young children can select a game, play it, and select a different game...ALL BY THEMSELVES!

- PICTURE MENU GIVES CHILDREN CONTROL
- MATCH NUMBERS AND LETTERS
- COUNT COLORFUL BLOCKS
- ADD AND SUBTRACT STACKS OF BLOCKS
- LEARN THE ALPHABET
- PRACTICE SPELLING NAMES
- COMPARE SHAPES
- DRAW AND SAVE COLORFUL PICTURES

The large numbers and letters fill the screen with color. Children enter single key stroke responses and get immediate visual and musical feedback. Hints are provided when appropriate. Beyond just teaching children basic skills, **EARLY GAMES** makes them feel comfortable as they control the computer. Designed for children ages 2½ to 6 years old.

EARLY GAMES offers the child a diverse selection of activities which stimulate the process of problem solving as well as foster individual creativity.

Pamela Bach, Director
Youth World Day Care Center

I took **EARLY GAMES** home for my kids and they really liked it! It held their attention and they learned from it!

Jeanette Fritze
Computer Saleswoman

EARLY GAMES can help children learn new concepts, information, and skills and also introduce them to the joys and benefits of home computers.

Peter Clark, faculty
Institute of Child Development
University of Minnesota

All nine games for \$29.95
(Minnesota residents add 5% sales tax)

Apple II Plus
IBM Personal Computer
Atari 24K Disk or 16K Cassette
TRS-80 Model I/III 32K Disk or 16K Cassette
TRS-80 Color Computer 16K Disk or Cassette



VISA/MasterCard

EARLY GAMES

educational software

Suite 140E
Shelard Plaza North
Minneapolis, MN 55426
1-800-328-1223

Minnesota residents call:
612-544-4720

402

UNLIMITED SCRIPSIT™ VISICALC™ BACKUP

FOR TRS-80 MODEL III

QUICK AND SIMPLE
SET OF COMMANDS

SCRIPSIT COPY \$7⁰⁰

VISICALC COPY \$7⁰⁰

BOTH PROGRAMS \$10⁰⁰

SEND CASH OR CHECK TO:

LANGIN-HOOPER ASSOCIATES
18 MARVIN LANE

PISCATAWAY, N.J. 08854 ✓340

This product is for personal use only.
It is not meant for distribution or sales.

NASHUA: DISKETTES

GUARANTEED 100% ERROR FREE

Nashua: where quality is
a complete commitment

DEALER
INQUIRIES
INVITED

CAPTAINS
SPECIALS

5% SS-SD
\$19.95 (BOX OF 10)
PER BOX
NO MINIMUM QUANT
ADD 2.00 SHIPPING



RIBBONS

MIN ORDER 3

*MX-80 \$3.75--
CARTRIDGE
*NEC \$4.30 ea.
MULTISTRIKE
*DIABLO \$2.80--
HYTYPE II NYLON
*OKIDATA 82 A \$1.75--
WITH ORDER OF DISKETTES

WESTWORLD
Computer Supplies &
Accessories

4699 S.W. 45th Street
Fort Lauderdale, FL 33314
305-587-1130

HOT LINE 800-327-1013

80-MICRO READERS

If you read Dennis Kitz' December column then you
know that we are the new distributors of his projects.
These are completely assembled.

COLOR COMPUTER

Lower Case Conversion \$69.95

RAM/ROM Expansion Module . . . empty \$39.95

16K RAM \$79.95

single 2732 EPROMs \$7.50

Dual I/O Port Expander \$39.95

NOTE: Unlike some I/O Expanders, this one is
completely transparent to DOS and your disks.

MODEL I

Front Panel Board \$49.95

Dynamic display of all 16 address and 8 data
lines with single stepping control.

SOFTWARE ● SOFTWARE ● SOFTWARE

MAIL LABEL Model III Disk \$19.95

Works from Profile Database - Many options!!!

INVOICE Model III Disk \$19.95

Prints invoice and packing label Profile

WORLD ELECTRONICS

177 27th Street
Brooklyn, N.Y. 11232 ✓234

```

0000 *****
0000 * THIS SUBROUTINE REMOVES THE *
0000 * DEATHS AND CHANGES ANY BIRTHS *
0000 * TO ADULTS *
0000 *****
0700 ORG $700
0700 8E0420 LDY #5420 START OF SCREEN
0703 A680 LDA 0,X+ GET COLOR OF BLOCK
0705 *AT THIS ADDRESS.
0705 CMPA $6F8 IS COLOR BLUE?
0708 2705 BEQ $70F YES, THEN BRANCH
070A 200E BRA $71A NO, THEN BRANCH AND
070C *CHECK FOR BLACK BLOCK.
070C 12 NOP
070D 12 NOP
070E 12 NOP
070F B606FA LDA $6FA GET A RED BLOCK
0712 A782 STA 0, - X PUT THE RED BLOCK
0714 *IN THE ADDRESS BEING CHECKED.
0714 8C0600 CMPX #5600 END OF SCREEN?
0717 25EA BCS $703 NO, GET THE NEXT
0719 *SCREEN ADDRESS.
0719 39 RTS YES, THEN RETURN TO BASIC
071A B106F9 CMPA $6F9 IS COLOR BLACK?
071D 2703 BEQ $722 YES, THEN BRANCH.
071F 20F3 BRA $714 NO, GO CHECK END OF
0721 *SCREEN
0721 12 NOP
0722 B606F7 LDA $6F7 GET A WHITE BLOCK.
0725 A782 STA 0, - X PUT WHITE BLOCK
0727 *WHERE THE BLACK ONE IS.
0727 8C0600 CMPX #5600 END OF SCREEN?
072A 25D7 BCS $703 NO, THEN GET THE
072C *NEXT SCREEN ADDRESS.
072C 39 RTS YES, THEN RETURN TO BASIC
072D 12 NOP
    
```

Program Listing 2

```

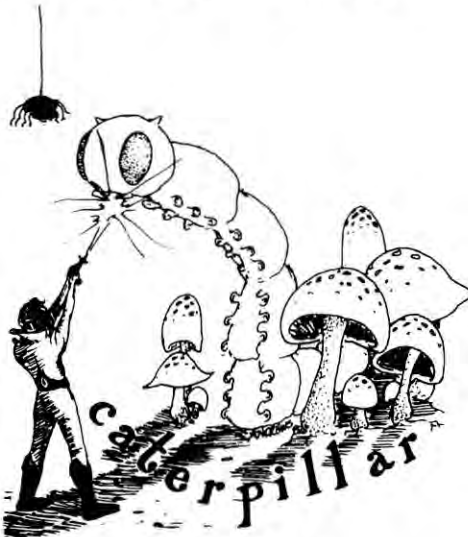
0000 *****
0000 * THIS SUBROUTINE COUNTS THE *
0000 * POPULATION AND STORES THE *
0000 * RESULT AT ADDRESS $6FE & $6FF *
0000 *****
0730 ORG $730
0730 108E0000 LDY #50000 CLEAR Y REGISTER
0734 *TO ZERO
0734 8E0420 LDY #5420 START OF SCREEN
0737 A680 LDA 0,X+ GET COLOR STORED AT
0739 *THIS ADDRESS.
0739 B106FA CMPA $6FA IS THE COLOR RED?
073C 270A BEQ $748 YES, THEN BRANCH.
073E 8C0600 CMPX #5600 END OF SCREEN?
0741 25F4 BCS $737 NO, THEN GET THE
0743 *NEXT ADDRESS.
0743 10BF06FE STY $6FE YES, STORE THE
0747 *COUNT AT $6FE & $6FF
0747 *(THIS IS # OF ORGANISMS.)
0747 39 RTS RETURN TO BASIC.
0748 3121 LEAY 1,Y ADD ONE TO COUNT.
074A 20F2 BRA $73E GO CHECK SCREEN
074C *ADDRESS.
074C 12 NOP
    
```

Program Listing 3

Article continues



QUEST — A NEW IDEA IN ADVENTURE GAMES! Different from all the others. Quest is played on a computer generated map of Alesia. Your job is to gather men and supplies by combat, bargaining, exploration of ruins and temples and outright banditry. When your force is strong enough, you attack the Citadel of Moorlock in a life or death battle to the finish. Playable in 2 to 5 hours, this one is different every time. 16k TRS-80, TRS-80 Color, and Sinclair. 13K VIC-20. \$14.95 each.



CATERPILLAR
O.K., the Caterpillar does look a lot like a Centipede. We have spiders, falling fleas, monsters traipsing across the screen, poison mushrooms, and a lot of other familiar stuff. COLOR 80 requires 16k and Joysticks. This is Edson's best game to date. \$19.95 for TRS 80 COLOR.

PROGRAMMERS!
SEE YOUR PROGRAM IN THIS SPACE!!
Aardvark traditionally pays the highest commissions in the industry and gives programs the widest possible coverage. Quality is the keyword. If your program is good and you want it presented by the best, send it to Aardvark.

ESCAPE FROM MARS
(by Rodger Olsen)
This ADVENTURE takes place on the RED PLANET. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one. A good first adventure.

PYRAMID (by Rodger Olsen)
This is our most challenging ADVENTURE. It is a treasure hunt in a pyramid full of problems. Exciting and tough!

HAUNTED HOUSE (by Bob Anderson)
It's a real adventure—with ghosts and goblins and treasures and problems—but it is for kids. Designed for the 8 to 12 year old population and those who haven't tried Adventure before and want to start out real easy.

DERELICT
(by Rodger Olsen & Bob Anderson)
New winner in the toughest adventure from Aardvark sweepstakes. This one takes place on an alien ship that has been deserted for a thousand years—and is still dangerous!

Please specify system on all orders

ALSO FROM AARDVARK — This is only a partial list of what we carry. We have a lot of other games (particularly for the TRS-80 Color and OSI), business programs, blank tapes and disks and hardware. Send \$1.00 for our complete catalog.



TUBE FRENZY
(by Dave Edson)
This is an almost indescribably fast action arcade game. It has fast action, an all new concept in play, simple rules, and 63 levels of difficulty. All machine code, requires Joysticks. Another great game by Dave Edson. TRS 80 COLOR ONLY. 16k and Joysticks required. \$19.95.



CATCH'EM
(by Dave Edson)
One of our simplest, fastest, funnest, all machine code arcade games. Raindrops and an incredible variety of other things come falling down on your head. Use the Joysticks to Catch'em. It's a BALL! — and a flying saucer! — and a Flying Y! — and so on. TRS 80 COLOR. \$19.95.

BASIC THAT ZOOMMS!!
AT LAST AN AFFORDABLE COMPILER!
The compiler allows you to write your programs in easy BASIC and then automatically generates a machine code equivalent that runs 50 to 150 times faster.

It does have some limitations. It takes at least 8k of RAM to run the compiler and it does only support a subset of BASIC—about 20 commands including FOR, NEXT, END, GOSUB, GOTO, IF, THEN, RETURN, END, PRINT, STOP, USR (X), PEEK, POKE, *, /, +, -, >, <, =, VARIABLE NAMES A-Z, SUBSCRIPTED VARIABLES, and INTEGER NUMBERS FORM 0-64K.

TINY COMPILER is written in BASIC. It generates native, relocatable 6502 or 6809 code. It comes with a 20-page manual and can be modified or augmented by the user. \$24.95 on tape or disk for OSI, TRS-80 Color, or VIC.



ADVENTURES!!!
These Adventures are written in BASIC, are full featured, fast action, full plotted adventures that take 30-50 hours to play. (Adventures are interactive fantasies. It's like reading a book except that you are the main character as you give the computer commands like "Look in the Coffin" and "Light the torch.")
Adventures require 16k on TRS80, TRS80 color, and Sinclair. They require 8k on OSI and 13k on Vic-20. Derelict takes 12k on OSI. \$14.95 each.

AARDVARK - 80

2352 S. Commerce, Walled Lake, MI 48088

(313) 669-3110

Phone Orders Accepted 8:00 a.m. to 4:00 p.m. EST. Mon.-Fri.



Push Your TRS-80* To Its Limits

How? You don't have to add peripherals.

You don't have to add memory.

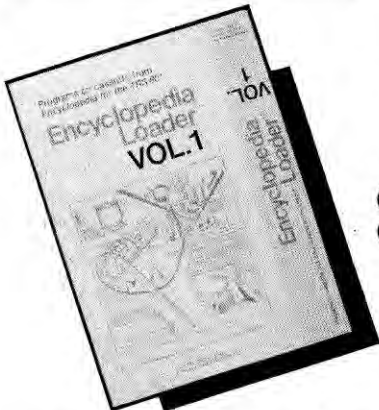
You just have to add information with . . .

ENCYCLOPEDIA FOR THE TRS-80*

The **Encyclopedia for the TRS-80*** is the largest single source of TRS-80 information in the world. All 10 volumes are loaded with practical programs and articles designed to take you and your computer beyond the limits of the manufacturer's documentation into a new and exciting world.

Each volume contains between 15 and 20 articles accompanied by diagrams and program listings. Virtually all of the articles are totally new and cover such topics as utility, tutorial, business, word-processing, education, hardware, graphics, games and more. If you were to purchase individually all the programs contained in a single volume, it would cost you more than the \$109.50 price of an entire 10 volume softcover edition. Think of it—over 150 programs for \$109.50. That's less than 73¢ per program! And, when you buy a complete set, softcover or hardcover edition, we pay the \$15.00 shipping and handling charges. **PLUS** you get Volume 1 of **ENCYCLOPEDIA LOADER™** absolutely free—A \$14.95 value.

*Programs contained on Encyclopedia Loader

VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4
<ul style="list-style-type: none"> • Down the Road • After the Goldrush • Business Forms: The Invoice • How Much Interest?—The Rule of 78 • Computer Education • Measuring Instructional Effectiveness with the TRS-80 • Using a TRS-80 to Tabulate Student Ratings • Swords and Sorcery II • The President Decides • Babe Ruth Is Alive and Well and Hitting Home Runs on My TRS-80 • Four Graphics Methods • TRSpirograph • Adventures in Roseland • Punch Out Your Disks • Build a Snooper/Snubber • Car Pool • Doctor Your Records • Computacar • Bio-Bars: Biorhythms in Bar Graph Form • TTY Interface • Why Bother to Interface Into the 80's, Part I, Part II, Part III • Printer Calibration • Delay Loop 	<ul style="list-style-type: none"> • The Name and Address File • Expense Report • Story Math • Smile—TRS-80 Loves You • Keno • Tie Attack • Worksheet • Curve Plotter • Chip Tester • Build a Light Pen • BASIC Word Processor • States Worked: <ul style="list-style-type: none"> • A Program for Radio Amateurs • Personal Property Inventory • Testing 1, 2, 3 • Decode CW Directly from the Cassette Earplug • Into the 80's, Part IV, Part V • EDTASM for Model III • Put Some Flash into Your Menus • FILEX: A Communication Package for File Exchange 	<ul style="list-style-type: none"> • Flex/Form • Inventory • Algebra Tutor • Supermaze • Micro Basketball • Images • Regulate Your Video Monitor • CTR-80 Modifications • The Great Girl Scout Cookie Caper • Two Energy Savers • Listen To Your Keyboard • A Deluxe Expansion Interface • Interfacing the TRS-80 to the Heath H14 Printer • Saving Machine Language Below BASIC • CISA8—Backwards BASIC • Into the 80's, Part VI, Part VII • Spool and Despool • Renumbering Made Easy 	<ul style="list-style-type: none"> • Mailing List for a Small Business • Business Forms—The Statement • Grade Calculator • Classroom Doodles • Asteroid Adventure • Compukata • Puzzier • On Your Mark, Get Set, and Go • Program an EPROM • Pari-Mutuel • Income Tax Withholding • An Automatic Cassette Tape Interface • Send and Receive RTTY in BASIC • A Better Way • Don't Be a Slow POKE. Take a PEEK at Your Computer • Hairy Bi-Nary and Hexy-Decimal • Instant Indexer: Programming in Disk BASIC • Uni-Key for the Model I • BREAK Disable • Z-80 Disassembler
 <p style="font-size: 2em; font-weight: bold; transform: rotate(-15deg); display: inline-block;">free software</p>		VOLUME 9	VOLUME 10
		<ul style="list-style-type: none"> • Layaway • Your Fair Share • Getting Your Bearings • Do-It-Yourself Maze Package • Munch • Left/Right for the Color Computer • Super Fast Graphics in BASIC • Recreating Graphics • Dynamic Graphics with Pool Ball • EPROM Programmer • Autocost • Your Personal Expense Account • Celestial Software • Model III I/O Port • A Bit of Precision • Computer Number Systems and Arithmetic Operations—Part II • Slow Scroll • TRSDOS Multiple Command Processor • Dandyzap 	<ul style="list-style-type: none"> • Plan Ahead—A Program for Project Planning • Check Storage Program • Loan Amortization • Physics in Motion—Exploring the Projectile Problem • Another Magic Trick • Satan's Square • Card Playing • Unlocking the Color Computer Graphics Character Code • SBLOCK • Graphics and ZBASIC, Part I, Part II, Part III • Heart/BAS Heart/CIM • Planning Your Retirement • Low Resolution Voice for the Color Computer • Atari Joystick to TRS-80 Interface • Screen Status Byte • TRS-80—Cryptographer • Lazy Logic Trainer • Modifying Scripts to Send Control Characters to Printers • Shortstuff • COMPLETE INDEX FOR ALL 10 VOLUMES

and Encyclopedia Loader

What is **ENCYCLOPEDIA LOADER™**? It is a series of 30-minute cassettes of most of the programs contained in **ENCYCLOPEDIA FOR THE TRS-80**. It gives you the ability to load those programs quickly and easily, saving you hours of keying in programs and correcting keyboard errors. **ENCYCLOPEDIA LOADER** helps you realize the full potential of your computing time. Individual cassettes are priced at \$14.95. The entire 10 volume set is only \$119.97. That's a \$149.50 value! And again, we pay the shipping and handling charges.

So push your TRS-80 to its limits and maximize your computing time with **ENCYCLOPEDIA FOR THE TRS-80** and **ENCYCLOPEDIA LOADER**. Use the attached card for ordering, or fill in the coupon and mail today to: Wayne Green Books, Sales Dept., Peterborough, NH 03458

Encyclopedia for the TRS-80*

Encyclopedia Loader
FREE
Volume 1, a \$14.95 value,
when you order the
complete set (Vol. 1-10)
of the Encyclopedia for
the TRS-80*
(Hardcover or
Softcover editions)



VOLUME 5	VOLUME 6	VOLUME 7	VOLUME 8
<ul style="list-style-type: none"> • Hi Ho Silver! • Accountant's Aid • Vocabulary Builder • Numerical Expression Input in Level II • Pre-School Math • A Day at the Races • Star Dreck • Slide Show • Graphs, Plus • Interrupt Mode 1.5 • Reverse Video Hardware Modification • Team Stats • Loans—Do You Really Know the Cost of Yours? • A Home-Brew Interface • A Handle on Programming: Store and Recall • Prime Up Your 80 • The Z.80's Hidden Abilities • KBFIX Your BASIC Programs • File Name • Macros: Let Your Micro Do the Work 	<ul style="list-style-type: none"> • Exponential Smoothing • Voter Registration • Keeping Track—Student Scheduling and Attendance Part I • Part II • Space Mission • Slot Machine • Level II Graphics Code • New Compu-Sketch • As You Like It With the PR-80 • Add PROM Capability to Your TRS-80 • Magazine Index • Money Minder • Groups: A Strategy to Group Like Objects • Stick With It • Easy Selectric(TM) Output for the TRS-80: Take Me to Your Solenoids • On Toward Better Sorts of Things • Random Distribution Graphics • Using LMOFFSET • Extractor: An Ace in the Hole! • Page Print Your Listings • Let Your TRS-80 Do the Typing 	<ul style="list-style-type: none"> • Point and Figure Charting for Stocks and Commodities • Dividend Reinvestment Plan • Keeping Track—Student Scheduling and Attendance Part III • Part IV • Roulette • Five Short Games • Rubik's Cube(TM) Manipulator • Easy CHR5 Graphics and Animation • Memory Size—20K! • Disk BASIC Word Processor • The Big Game • Using the Useful UART • String Problems in the TRS-80 • Hex, Octal, and Binary to Decimal Conversions • EMOD—EDTASM Modifications for the Model III • Remember One • Command 	<ul style="list-style-type: none"> • Business Predictions from the TRS-80 • Stock Valuation • Practical Applications of Classroom Programs • Super Curve Fit • Queen Rama's Cave • TRS-80 Jukebox • Instant Graphics for Everyone • Screen Editor for Graphics Creations • Lowercase Driver for the TRS-80 • Minor Monitor Maintenance • Can You Find that Slide? • Controlling Your Home with Your TRS-80 • Speak for Yourself! • A Speech Synthesizer for the TRS-80 • Computer Number Systems and Arithmetic Operations—Part I • Down in the Dumps: Examining Memory • New Disk Owners' Delight • Generate Professional Looking Listings with a Teletype(TM) • More Patches to EDTASM

Call Toll-Free 1-800-258-5473 for credit card orders



*TRS-80 is a trademark of the Radio Shack division of Tandy Corp.

The ENCYCLOPEDIA FOR THE TRS-80* is a Wayne Green publication.

ENCYCLOPEDIA LOADER™ is manufactured by Instant Software, a division of Wayne Green Inc.

Dealer Inquiries Invited.



Wayne Green Books,
A division of Wayne Green Inc.
Pine St., Peterborough, NH 03458

ENCYCLOPEDIA FOR THE TRS-80* & ENCYCLOPEDIA LOADER™

To Order Complete Sets (and save an extra \$15.00)*	To Order Single Volumes
<input type="checkbox"/> Encyclopedia for the TRS-80*, Volumes 1-10, plus FREE Volume 1 of Encyclopedia Loader™ Hardcover Edition EN8100L \$199.50	Please indicate the Volume Nos. and which edition you prefer <input type="checkbox"/> Hardcover edition @ \$19.95 per vol. Volume(s) # _____
<input type="checkbox"/> Encyclopedia for the TRS-80*, Volumes 1-10, plus FREE Volume 1 of Encyclopedia Loader™ Softcover Edition EN8080L \$109.50	<input type="checkbox"/> Softcover edition @ \$10.95 per vol. Volume(s) # _____
<input type="checkbox"/> SPECIAL OFFER! Encyclopedia Loader™ Volumes 1-10 EL8000 \$119.97 a \$149.50 value	<input type="checkbox"/> Encyclopedia Loader @ \$14.95 per cassette Volume(s) # _____
*Save \$15.00 shipping and handling charge. When you order a complete set of Encyclopedias or Loaders, WE PAY THE SHIPPING!	Shipping and handling: \$1.50 per volume for single volumes of books and cassettes, \$10.00 per item foreign air mail. All Encyclopedias shipped UPS with complete street address, all Loaders shipped 1st class mail.

Payment enclosed
 Master Card
 VISA
 AmEx

Card # _____ InterBank # _____
 Signature _____ Card Expires _____
 Name _____
 Address _____
 City _____ State _____ Zip _____ **8E02**

WAYNE GREEN BOOKS • SALES DEPT. • PETERBOROUGH, NH 03458

AT LAST!

A COMPLETE MDX-EQUIPPED
TRS-80 Model III
SYSTEM
FROM MICRO-DESIGN
\$1695⁹⁵

FEATURING:
THE MICRO-DESIGN MDX-6 Floppy disk
CONTROLLER, LEVEL II: 48k MEMORY AND TWO
40-TRACK TOP QUALITY disk drives

Also
MICRO-DESIGN offers their Model III with the
MDX-3 expansion system.

FOR FURTHER INFORMATION CALL (TOLL FREE)
OR WRITE FOR FREE LITERATURE



MICRO-DESIGN
6301 MANCHACA ROAD, SUITE J, AUSTIN TEXAS, 78745
1-800-531-5002

TEXAS RES. CALL 512 441 7890

See our other ads on pages 148 & 171

HX	Beginning of area used by machine-language subroutine
DS	Machine code to eliminate death cells, change birth cells to adult organisms
ES	Machine code to count number of organisms
FS	Machine code to check for births and deaths and mark them
GS	Machine code to check for births and deaths and mark them
ZS	Temporary variable to load machine code into memory
XS	Number POKEd into memory
GE	Number of generations
PP	Number of organisms in population
XX	If XX = 1, then Step generations
SP	1 = fast display, 300 = medium display, 600 = slow display (delay)
GG	Screen address used in placing organisms on screen
ZG	Temporary storage for number stored at GG
PS	Variable to advance cursor for GG

Important Addresses:

HEX	\$6F7: White Block
	\$6F8: Blue Block
	\$6F9: Black Block
	\$6FA: Red Block

Table 1. Program Variables

Program Listing 4

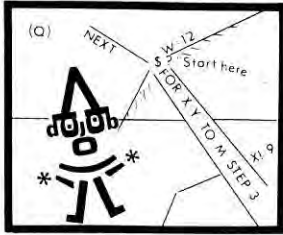
```

0000
0000
0000
0000
0000
0000
0000
0000
0000
0757
0757 8E0420
075A A680
075C
075C 5F
075D F706FD
0760 B106F7
0763 270F
0765
0765 B106FA
0768 2703
076A
076A 160099
076D
076D 8601
076F
076F B706FD
0772 12
0773 12
0774 301E
0776
0776 A680
0778
0778 B106F9
077B 2707
077D B106FA
0780 2702
0782 2001
0784 5C
0785 3001
0787
0787 A680
0789 B106F9
*****
* THIS SUBROUTINE CHECKS THE 8 *
* SURROUNDING SCREEN ADDRESSES *
* FOR EACH SCREEN LOCATION AND *
* PLACES BIRTHS OR DEATHS IF *
* THE PROPER CONDITIONS ARE *
* MET. *
*****
ORG $757
LDX # $420 START OF SCREEN
LDA 0,X+ GET THE COLOR AT
*THIS ADDRESS.
CLRB CLEAR THE B ACCUMULATOR.
STB $6FD CLEAR ADDRESS $6FD
CMPA $6F7 IS IT WHITE?
BEQ $774 YES, THEN BRANCH
*AND CHECK FOR POSSIBLE BIRTH.
CMPA $6FA IS IT RED?
BEQ $76D YES, THEN BRANCH
*AND CHECK FOR POSSIBLE DEATH.
LBRA $806 GO CHECK SCREEN
*FOR END.
LDA # $01 THIS IS A LABEL -
*LOOKING FOR A DEATH.
STA $6FD STORE LABEL HERE.
NOP
NOP
LEAX -2,X SUBTRACT TO GET
*THE ADDRESS OF SQUARE ON LEFT.
LDA 0,X+ GET COLOR OF SQUARE
*AT THE LEFT.
CMPA $6F9 IS IT BLACK?
BEQ $784 YES, THEN BRANCH.
CMPA $6FA IS IT RED?
BEQ $784 YES, THEN BRANCH.
BRA $785 NOTHING FOUND, GO.
INCB ADD ONE TO COUNT.
LEAX 1,X ADD ONE TO SCREEN
*ADDRESS.
LDA 0,X+ GET COLOR OF SQUARE
CMPA $6F9 IS IT BLACK?

```

Listing 4 continues

Lost in the Line Edit Jungle?



Do you get frustrated trying to cage the line you want when listing?

Then, let DCS guide you out of the jungle with our FULL-SCREEN Editor.** It will help you cage the line you want by listing your program 14 lines at a time, forward or backward or one line at a time. You will enjoy other features such as line re-number, block copy and a global search.

MODEL III

Tape version 1.3 \$19.95
* Disk version 2.0 \$24.95

MODEL I

Tape Version 3.0 \$19.95
* Disk version 4.0 \$24.95

These other fine programs are also available for the Model's I and III:

System Tape Copy	\$ 8.95	Tape	Disk
Machine Sort/Basic	\$ 9.95	Bio	\$7.95 \$12.95
Mail List System	\$49.95	Star Command	\$9.95 \$14.95

* Disk versions also available on tape.

** FREE compass with every Editor ordered for those who need extra guidance.

DCS SOFTWARE

86 Mansel Drive, Landing, N.J., 07850
Tel. 201 398-8281



517



WIZARD SOFTWARE

422



ELECTRIC THE NOTEBOOK

THE FASTEST AND MOST VERSATILE DATA MANAGEMENT BASIC LANGUAGE PROGRAM EVER WRITTEN FOR YOUR

TRS-80™

FEATURING:
CONTINUOUS ON SCREEN MENU DELETE OR RESORT RECORDS
FAST USER CREATED RECORDS AUTO LABEL MAKER INCLUDED
UP TO 18 COLUMN RECORDS USER CONTROLLED HARDCOPY
2 SEARCH MODES ANY FIELD MATH TOTALS FOR ANY FIELD
FAST SORT WITHIN A SORT EASY CUSTOM MODIFICATIONS

The Electric Notebook.....\$ 49.95

INVOICE / LOG

Current	
INVOICE #	DATE
STATUS	ALTERNATE DATA
NAME	Name
ADD	Addr
OTHER ADD	Other Addr
CITY & ST.	City
ZIP CODE	St. & Zip Code
PHONE #.	Phone #.
REFERENCE	DELIVERY
	HOW PAID
QUANTITY	ITEM
	PRICE EA. \$

Invoice/Log.....\$ 49.95

(TRS-80 is a registered trademark of The Tandy Corporation)

- * All of the above GRAPHICS were created by THE SCREEN MACHINE
- * EPSON MX-80/GRAFRAX printer required for High Res. Graphics
- * Additional software and utilities also available
- * Write for our latest catalog or circle Reader Service Card

CACTEC

Marketing Company

9520 Chesapeake Dr., #606C San Diego, CA 92123



To Order Call
(619) 268-8886



SCREEN THE MACHINE

FEATURING:
TALL TEXT
LINES
MAGNIFY
SHRINK
INVERSE
5 MEMORIES
SHIFT 4 WAY
ANIMATE R/L
SAVE FILES & DIFFERENT WAYS

NORMAL TEXT
TALL TEXT
MIRROR IMAGE
USER CALL
BUFFER COPY
HIGH RES! GRAPHICS

The Screen Machine.....\$ 49.95

DISCAT

DISK CATALOG INDEX PROGRAM

SPECIAL FEATURES

ASSEMBLY LANGUAGE AUTO DIRECTORY SCANNING
RECORDS DISK NUMBER AUTO OR MANUAL UPDATE
CATEGORIZES PROGRAMS AUTO DENSITY RECOGNITION
SORTS BY DISK NUMBER READS FRONT OR BACK SIDES
SORTS BY FILESPEC INDEX OVER 17888 PROGRAMS

Discat.....\$ 49.95

JFD-III Floppy Disc Controller Kit

NOW ONLY **\$279⁰⁰**

Thousands of our controllers have been installed and the user satisfaction has been tremendous. Those who have compared the rest say that ours is the best.

Kit includes controller board, mounting brackets, cables, power supply for 2 internal drives, and illustrated instructions. This controller has been tested for compatibility with most major operating systems including TRSDOS, LDOS, NEWDOS/80, DOSPLUS, and MULTIDOS. The controller supports any mix of 5 1/4" drives including single or double density, single or double sided, 35, 44, 77 or 80 track drives.

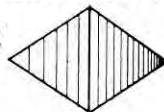
JHD-III Winchester for TRS 80 Model III

5 Mbyte formatted — \$1,795 10 Mbyte formatted — \$1,995

These drives plug into the 50 pin I/O expansion port. System includes host adaptor, cables, fan cooled cabinet. Controller features 11 bit error detection and correction, automatic track remapping and variable sector interleaving. An LDOS compatible driver is included with the kit for those who already own LDOS.

TERMS: Cashier's Check or COD. Personal Checks take 3-4 weeks to clear.

To order call (505) 265-5072
or send order to:



J&M Systems, Ltd.

137 Utah N.E.,
Albuquerque, NM 87108

TRADEMARK CREDITS:

TRSDOS is a Trademark of Tandy Corporation.
LDOS is a Trademark of Logical Systems, Inc.

NEWDOS is a Trademark of Apparat, Inc.

DOSPLUS is a Trademark of Micro-Systems Software, Inc.

MULTIDOS is a Trademark of Cosmopolitan Electronics Corporation.

Dealer inquiries invited. 101

Call for the name of dealer nearest you.

Introducing TYPITALL

The SCRIPSIT™ Compatible Word Processor

TYPITALL is a new word processing program which is upward compatible with SCRIPSIT™ for the Model I and Model III TRS-80. If you already know how to use SCRIPSIT, you will be able to start using TYPITALL immediately. If you don't know SCRIPSIT, you will find TYPITALL easy to learn and far superior to other word processors.

- Assign any sequence of key-strokes to a single control key.
- See the formatted text on the screen before printing.
- Send the formatted text to a disk file for later printing.
- Merge data from a disk file during printing.
- Send ANY control or graphic character to the printer.
- Call up HELP screens at any time.
- Move cursor by character, word, line, section or page.
- Get audible feedback from the keyboard through the cassette recorder.
- Use the same version on the Model I or Model III.
- Reenter the program with all text intact if you accidentally exit without saving the text.
- Enter hard spaces to make a sequence of words indivisible.
- Change words from upper to lower case, or vice versa, without retyping.
- Change key repeat speed.
- Display cursor position, line length, document length, and free space constantly on bottom line of screen.
- Optionally ignore case of letters in string search.

Disk version only — Specify Model I or III \$129.95

MON-5

The ultimate machine language monitor for the TRS-80 Model 1 or 3. Helps you learn assembly language concepts and perform useful operations.

- Complete instruction manual.
- Display memory in ASCII and hexadecimal form.
- Disassemble memory to see machine language commands.
- Move and compare blocks.
- Search through memory to find specific values.
- Modify memory in different ways.
- Relocate object programs.
- Read and write object tapes in SYSTEM format.
- Unload programs in low RAM on disk.
- Print output optionally on video display or line printer.
- Save and load disk files.
- Input and output of disk sectors, bypassing disk operating system.
- RS-232-C commands for terminal mode, send and receive data.
- Complete debugging package including setting and displaying registers, single stepping, setting breakpoints and executing machine instructions.

MON-5 — Specify Model I or III \$59.95

SYSTEM DIAGNOSTIC

Complete diagnostic tests for every component of your TRS-80 Model 1 or 3.

- ROM: checksum test.
- RAM: three separate tests.
- Video Display: character generator, video RAM, and video signal.
- Keyboard: every key contact tested.
- Line printer: character test.
- Cassette Recorder: read, write, verify data.
- RS-232-C Interface: connector fault, data transmission, framing, data loop, baud rate generator.
- Disk Drives: disk controller, read data, formatting, read/write/verify all sectors with or without erasing, disk drive timer, disk head cleaner.

System Diagnostic — Specify Model I or III \$99.95

SMART TERMINAL

The intelligent communications program.

- Automatic transmission of data from memory.
- Automatic storage of incoming data in memory.
- True BREAK key.
- Character mapping, lower case on Model I.
- Cassette and disk files compatible with SCRIPSIT™ and Electric Pencil™.
- Same program supports both cassette and disk systems.

Smart Terminal — Specify Model I or III \$74.95

Model II (CP/M) Version \$79.95

Add \$3.00 postage & handling. NY residents add sales tax.

Howe Software

14 Lexington Road, New City, NY 10956

(914) 634-1406

*TRS-80 and SCRIPSIT are trademarks of Tandy Corp.

✓175

Listing 4 continued

```

078C 2707      BEQ $795 YES, THEN BRANCH.
078E B106FA    CMPA $6FA IS IT RED?
0791 2702      BEQ $795 YES, THEN BRANCH.
0793 2001      BRA $796 NOTHING FOUND, GO.
0795 5C        INCB ADD ONE TO COUNT.
0796 3088DD    LEAX -35,X SUBTRACT TO GET
0799           *NEXT SCREEN ADDRESS.
0799 A680      LDA 0,X+ GET COLOR OF SQUARE
079B B106F9    CMPA $6F9 IS SQUARE BLACK?
079E 2707      BEQ $7A7 YES, THEN BRANCH.
07A0 B106FA    CMPA $6FA IS SQUARE RED?
07A3 2702      BEQ $7A7 YES, THEN BRANCH.
07A5 2001      BRA $7A8 NOTHING FOUND, GO.
07A7 5C        INCB ADD ONE TO COUNT.
07A8 A680      LDA 0,X+ GET COLOR OF SQUARE
07AA B106F9    CMPA $6F9 IS IT BLACK?
07AD 2707      BEQ $7B6 YES, THEN BRANCH.
07AF B106FA    CMPA $6FA IS IT RED?
07B2 2702      BEQ $7B6 YES, THEN BRANCH.
07B4 2001      BRA $7B7 NOTHING FOUND, GO.
07B6 5C        INCB ADD ONE TO COUNT.
07B7 A680      LDA 0,X+ GET COLOR OF SQUARE
07B9 B106F9    CMPA $6F9 IS IT BLACK?
07BC 2707      BEQ $7C5 YES, THEN BRANCH.
07BE B106FA    CMPA $6FA IS IT RED?
07C1 2702      BEQ $7C5 YES, THEN BRANCH.
07C3 2001      BRA $7C6 NOTHING FOUND, GO.
07C5 5C        INCB ADD ONE TO COUNT.
07C6 30883D    LEAX $3D,X ADD # TO GET THE
07C9           *NEXT SCREEN ADDRESS.
07C9 A680      LDA 0,X+ GET COLOR OF SQUARE
07CB B106F9    CMPA $6F9 IS IT BLACK?
07CE 2707      BEQ $7D7 YES, THEN BRANCH.
07D0 B106FA    CMPA $6FA IS IT RED?
07D3 2702      BEQ $7D7 YES, THEN BRANCH.
07D5 2001      BRA $7D8 NOTHING FOUND, GO.
07D7 5C        INCB ADD ONE TO COUNT.
07D8 A680      LDA 0,X+ GET COLOR OF SQUARE
07DA B106F9    CMPA $6F9 IS IT BLACK?
07DD 2707      BEQ $7E6 YES, THEN BRANCH.
07DF B106FA    CMPA $6FA IS IT RED?
07E2 2702      BEQ $7E6 YES, THEN BRANCH.
07E4 2001      BRA $7E7 NOTHING FOUND, GO.
07E6 5C        INCB ADD ONE TO COUNT.
07E7 A680      LDA 0,X+ GET COLOR OF SQUARE
07E9 B106F9    CMPA $6F9 IS IT BLACK?
07EB 2707      BEQ $7F5 YES, THEN BRANCH.
07EE B106FA    CMPA $6FA IS IT RED?
07F1 2702      BEQ $7F5 YES, THEN BRANCH.
07F3 2001      BRA $7F6 NOTHING FOUND, GO.
07F5 5C        INCB ADD ONE TO COUNT.
07F6 3088DE    LEAX -34,X SUBTRACT # TO
07F9           *GET THE ORIGINAL ADDRESS
07F9 B606FD    LDA $6FD GET THE LABEL.
07FC 8101      CMPA #$01 IS LABEL ONE?
07FE 270E      BEQ $80E YES, THEN BRANCH.
0800 C103      CMPB #$03 ARE THERE ONLY 3
0802           *ORGANISMS (POSSIBLE BIRTH).
0802 2719      BEQ $81D YES, THEN BRANCH.
0804 3001      LEAX 1,X NO, ADD ONE TO THE
0806           *SCREEN ADDRESS.
0806 8C0600    CMPX #$600 END OF SCREEN?
0809 1025FF4D  LBCS $75A NO, START AGAIN.
080D 39        RTS YES, RETURN TO BASIC.
080E C102      CMPB #$02 ARE THERE ONLY TWO
0810           *ORGANISMS COUNTED AROUND THE
0810           *CENTER ONE?
0810 27F2      BEQ $804 YES, THEN ORGANISM
0812           *WILL LIVE, BRANCH.
0812 C103      CMPB #$03 ARE THERE ONLY
0814           *THREE ORGANISMS COUNTED AROUND
0814           *THE CENTER ONE?
0814 27EE      BEQ $804 YES, THEN ORGANISM
0816           *WILL LIVE, BRANCH.
0816 B606F9    LDA $6F9 GET BLACK MARKER.
0819           *TOO MANY ORGANISM, OR TOO FEW.
0819 A780      STA 0,X+ PLACE BLACK MARKER
081B           *IN ORIGINAL BLOCK CHECKED.
081B 20E9      BRA $806 GO CHECK FOR THE
081D           *END OF SCREEN.
081D B606F8    LDA $6F8 GET A BIRTH MARKER.
0820 A780      STA 0,X+ PLACE BLUE MARKER.
0822 20E2      BRA $806 GO CHECK FOR THE
0824           *END OF SCREEN.
0824 12        NOP
0825 12        NOP

```

AT LAST!
A PROFESSIONAL JOURNAL FOR ENGINEERS
SCIENTISTS MATHEMATICIANS & STATISTICIANS USING
MICROCOMPUTERS.

PLUG INTO...

ACCESS!
The Journal of Microcomputer Applications
for

- * numerical analysis
- * math modeling
- * statistical analysis
- * computerized design
- * process simulation
- * report generation

The articles in ACCESS are written by working engineers and scientists who share their knowledge of how to make productive use of microcomputers with you. Your subscription to ACCESS will make your microcomputer more useful in all areas where engineers and scientists use microcomputers. And you'll even find ways to use your computer you hadn't thought of. The articles in ACCESS are written with you in mind and are aimed at helping you turn your microcomputer into the most productive tool possible. Sign up NOW be a charter subscriber. Join the other engineers and scientists who make ACCESS their source of information on microcomputer applications. Charter rates are 6 issues for \$16. (Canada & Mexico \$20. Other \$32). Fill out the coupon below TODAY. Send check, money order, purchase order, or use your VISA or MASTER CARD.

(Sign me up. \$16 enclosed Bill me Bill 155
Company Charge VISA MC # _____
Exp _____) Send sample issue here's \$3
Name & address _____
City State and ZIP _____

Mail to ACCESS PO Box 12847 Research Triangle Park,
NC 27709 Published by LEDES Publishing Co., Inc.

HAVE THEY EVER ASKED Why You Bought A Computer?

--- INFO-SCAN WILL SHOW THEM WHY ---

Combines the Features of a Word Processor, Data Base Manager, and Information Retrieval and Display Facility.

Instantly recall and display information of any sort: sales leads; inventories; product data & prices; daily appointments & reminders; names & addresses; diaries; lesson plans & student lists; recipes; index magazine articles, music and program libraries. You create information files using a simple word-processing like entry method. A short key describes the record. Scan the keys on the screen, select one, press a button and the full record displays (or prints). Add, delete, change records in a snap. Written in machine language. Fully self-contained. Simple to operate, you don't need a Ph.D to use it! No programming or other technical knowledge required. 15 page manual.

INFOSCAN Model I/III 48K 1 Drive \$49.95

--- OR SHOW THEM STUNNING GRAPHICS ---

Add the professional touch to your programs. Create complex graphic and text screens effortlessly. Over 30 commands for screen manipulation. Built in 'HELP' facility. Enter 1-1/2 inch graphic letters with a single keystroke (48K required). Save completed screens as a BASIC subroutine, merge with your programs. Full screen displays instantly from your program with a single GOSUB. Do animation. Load existing screens to make changes. Scores of useful features. Written in Machine language. 26 page manual. SCREEN ARTIST II Model I/III 32K 1 Drive \$32.95

Call or write for full brochure, including many educational products. Full money back guarantee. VISA, Mastercard, COD welcome. Add \$2.50 for shipping. Ct. residents add 7.5% sales tax.

The
Smallsystem
Center ✓ 182

Post Office Box 268 New Hartford, CT. 06057 (203) 482-3689

Learn it in a FLASH

michael shroyer's
ELECTRIC

pencil

word processing system

- **Easy to Learn** - Like lightning you'll be using the easy to learn, easy to use ELECTRIC PENCIL word processing system. We say you can be an expert in one hour; our users tell us it takes less than 30 minutes.
 - **Easy to Use** - Process words, not commands. The menus and simple two keystroke commands keeps your mind on your work, NOT on your manual. It's so easy to use you'll want to use it... so sophisticated you'll be glad you did.
 - **Features** - ELECTRIC PENCIL supports disk, tape and Stringy Floppy (disk version)*, has a 36K+ text buffer (48K disk system), and every major feature you want in a word processor. It's "bullet proof" - data recovery is a built-in feature. Our exclusive DICT-A-MATIC gives you the flexibility of dictation play-back controlled from the keyboard.
 - **Flexible** - It's the only word processing system designed like an operating system - add new programs and features to ELECTRIC PENCIL - such as RED and BLUE PENCIL dictionary/correction - with a 50,000 word dictionary (sold separately), dynamic printing formatting, proportional printing, communications, graphics and typesetting - without patches and upgrades.
 - **Versatile** - ELECTRIC PENCIL runs on Model I and Model III TRS-80s under all versions of TRSDOS and NEWDOS without patching (patches supplied for other operating systems). It supports parallel and serial printers as well as single and double density.
- ELECTRIC PENCIL is the choice of thousands - make it yours for only \$89.95 (disk version), \$79.95 (tape and Stringy Floppy versions). Manual only \$24.95.

ELECTRIC PENCIL is available at computer stores, selected B. Dalton Booksellers and selected independent book dealers. If you dealer is out of stock, order direct (specify disk, tape or Stringy Floppy version). Include \$4.00 for shipping and handling. Foreign residents add \$11.00 plus purchase price, in U.S. funds.



1953 West
11th Street
Upland, CA
91786 (714)
946-5805

*Tape and Stringy Floppy versions support tape and stringy files only.

Stringy Floppy is a trademark of EXATRON Corp. NEWDOS is a trademark of APPARAT Inc. TRS80 and TRSDOS are trademarks of TANDY Corp. DICT A MATIC is a trademark of IJG.

Specify your input parameters by setting variables.

The Input Specifier

Program Listing

```

70 REM *****
80 REM *
90 REM *
100 REM*  VARIABLES FOR INPUT DESCRIPTION
110 REM*
120 REM*  X = LINE
130 REM*  Y = COLUMN
140 REM*  Z# = INPUT FIELD
150 REM*  C = IF SET TO 1 - NUMERIC INPUT
160 REM*  C(0) = IF SET TO 1 - CHECK LENGTH OF INPUT FIELD
170 REM*  C(1) = IF SET TO 1 - CHECK FRACTIONAL POINT
180 REM*  C(2) = IF SET TO 1 - CHECK AMOUNT
190 REM*  C(3) = IF > 1 - SPECIAL HANDLING
200 REM*  L = MAXIMAL AMOUNT
210 REM*  L(0) = MAXIMAL LENGTH OF INPUT FIELD
220 REM*  L(1) = MINIMAL LENGTH OF INPUT FIELD
230 REM*  L(2) = DIGITS AFTER FRACTIONAL POINT
240 REM*  Z = NUMERIC INPUT IS STORED IN THIS VARIABLE
250 REM*  A = IF SET TO 1 - DISPLAY WITH EDIT
260 REM*
270 REM*****
280 CLS CLEAR
290 DIM C(3), DIM L(2)
300 PRINT @(0,23), "INPUT DEMONSTRATION FOR MODELL II"
310 PRINT @(1,0), STRING$(80,"_")
320 PRINT @(2,45), "G. SCHWEIZER, 1100 VIENNA, AUSTRIA"
330 PRINT @(19,0), ""
340 INPUT "CONTINUE (Y) :"; H#
350 PRINT @(20,0), CHR$(23)
360 IF H#="N" THEN GOTO 1100
370 IF H#="Y" OR H#="" GOTO 390
380 GOTO 330
390 PRINT @(4,0), "01 SALESNUMBER : ";
400 X=4: Y=25: C=1: C(0)=1: C(1)=1: C(3)=1: L(0)=6: LS=1: GOSUB 790
410 IF X1=1 GOTO 650
420 PRINT @(5,0), "02 PRODUCTNAME : ";
430 X=5: Y=25: C(0)=1: L(0)=20: LS=2: GOSUB 790
440 IF X1=1 GOTO 650
450 PRINT @(6,0), "03 GROUP : ";
460 X=6: Y=25: C=1: C(0)=1: C(1)=1: L(0)=2: LS=3: GOSUB 790
470 IF X1=1 GOTO 650
480 PRINT @(7,0), "04 PRICE : ";
490 C#= " $": X=7: Y=25: A=1: C=1: C(1)=1: C(2)=1: L=100000: L(2)=2: LS=4: GOSUB 790
500 IF X1=1 GOTO 650
510 PRINT @(8,0), "05 MEASUREMENT : ";
520 X=8: Y=25: C(0)=1: L(0)=5: LS=5: GOSUB 790
530 IF X1=1 GOTO 650
540 PRINT @(9,0), "06 SALES TAX : ";
550 C#= " %": X=9: Y=25: C=1: A=1: C(2)=2: L=100: C(1)=1: L(2)=2: LS=6: GOSUB 790
560 IF X1=1 GOTO 650
570 PRINT @(10,0), "07 DISCOUNT : ";
580 C#= " %": X=10: Y=25: A=1: C=1: C(2)=2: L=100: C(1)=1: L(2)=2: LS=7: GOSUB 790
590 IF X1=1 GOTO 650
600 PRINT @(11,0), "08 SUPPLIER : ";
610 X=11: Y=25: C(0)=1: L(0)=20: LS=8: GOSUB 790
620 IF X1=1 GOTO 650
630 PRINT @(12,0), "09 MIN. IN STOCK : ";
640 C#= " +F$(5)": X=12: Y=25: C=1: C(1)=1: C(2)=1: L=100000: L(2)=2: A=1: GOSUB 790
650 PRINT @(19,0), ""
660 H#=""
670 INPUT "DATA OK (Y) :"; H#
680 IF H#="Y" OR H#="" THEN GOTO 280
690 IF H#="N" THEN GOTO 710
700 GOTO 650
710 PRINT @(19,0), ""
720 INPUT "LINE NUMBER :"; X0
730 PRINT @(20,0), CHR$(23)
740 X1=1
750 ON X0 GOTO 400,430,460,490,520,550,580,610,640,710
760 REM *****

```

Listing continues

G. Schweizer
 1100 Vienna
 Theodor-Sickelgasse 16-20/4/21
 Austria

Did you ever enter an alphanumeric character when numeric input was required and have something in the first line of your readout you wanted to keep? If you try it, the program crashes and the computer commands you to Redo From Start. With this input subroutine, you can specify all input parameters by setting some variables. The computer clears all variables at the end of the subroutine. Further, there is no question mark before input and you can edit each input.

The best way to master the program is to type and run it. The examples illustrate its use; alter the program to fit your needs. Remember the variables listed at the beginning of the program; incorporate your changes so you do not forget them.

The input subroutine is in lines 790-990. The line input statement in line 790 allows alphanumeric input with no preceding question mark. The cursor position depends on X and Y.

Which comes first...the software

or the hardware?



THE RIGHT ANSWER IS SOFTWARE

AND YOUR BEST ANSWER IS

PLUS
Computer Technology, Inc.

PCT accounting software will make the hardware produce professional results!

Hardware is basically a machine that must be told what to do. And, it's the software that gives those instructions. It's the brain with the program that directs and determines the end result. So, if it's professional accounting results you expect, start with the software and make it the best...PLUS! Our expertly designed packages provide professional results, yet are easy to use and understand. PLUS is your easy answer for professional financial management results.

PLUS makes software available for the finest hardware!

TANDY MODELS II & III
THE IBM PERSONAL COMPUTER

PACKAGES AVAILABLE:

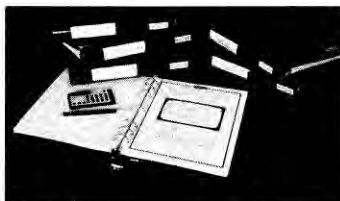
- GENERAL LEDGER
- ACCOUNTS RECEIVABLE
- ACCOUNTS PAYABLE
- FIXED ASSETS
- PAYROLL
- EASYTRAK™ monitoring system

Completely integrated programs with flexible user defined file sizes.



MENU-DRIVEN PROGRAMS

Easy to use! Related processing options and instructions are displayed on screen for easy operation. Built-in prompts and disciplines enhance accuracy.



EXTENSIVE DOCUMENTATION

Professionally prepared manuals make packages understandable. Presents installation, operation and educational facts in easy to follow format.

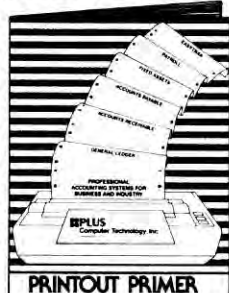


COMPREHENSIVE SUPPORT

We provide the important follow-up technical support you need. Our toll-free "HOT-LINE" helps give answers, the bulletins and newsletter keeps you informed and up-to-date.

SEE FOR YOURSELF HOW PCT ACCOUNTING SOFTWARE ANSWERS YOUR BUSINESS NEEDS!

ORDER YOUR SAMPLE REPORT BOOK, TODAY!



See actual results you can expect with PLUS. The 88-page PLUS Report Book contains sample reports for all packages. It's an invaluable tool to help plan the needs for your business. And, it's only \$20.00! Order yours today by simply filling out this coupon and mail it with a check or money order to:

PLUS
Computer Technology, Inc.



7360 N. Lincoln Avenue • Lincolnwood, Illinois 60646
1-312-647-0988 • 1-800-323-4240

YES!

I want to make the right start. Please send me the information I have checked below:
 PLUS SAMPLE REPORT BOOK @ \$20.00 each.
 Enclosed is my check or money order.
 Charge my VISA or MASTER CARD

Please send more information on PLUS's Professional Accounting Packages.

Account No. _____ Card Expiration Date _____
 Name _____
 Company _____ Title _____
 Address _____
 City _____ State _____ Zip _____ Phone _____

Signature _____
 Please fill-in, clip coupon, insert in a separate stamped envelope addressed to PLUS. Be sure you have included your check or money order if ordering the Report Book.

Lines 800 and 810 check the input: If C is set to 1 the input moves to the numeric field Z. If you input a non-numeric character the length of Z and Z\$ and it is not equal the program jumps to the error subroutine. Any key clears the input and you can try again.

Line 830 compares the length of Z with L(0) and L(1). Lines 850-880 check the digits after the decimal point. A statement like $A\# = \text{ABS}(A\# - \text{FIX}(A\#))$ would be easier but produces truncation errors. The test counts the characters from right to left to a decimal point. Increase line 850 for more than 12 digits after the decimal point.

If C(2) is set to 1 I check the amount in line 900. If A=1 I jump to line 950 and display with Edit.

Special Handling

The special handling variable C(3) stores input in the right variable. For LS=XX, store your input with $F(LS)=Z$ or $LSET P\$(LS)=Z\$$. Write your own subroutines to check for a record

with the same key value or to write a record. In the Listing all jumps are made to 930 (see line 920). If $C(3)>1$ you can jump to your own coded subroutine. Remember to return with GOTO 930.

After all inputs the computer asks if the data is okay. If your answer is Yes press Enter; otherwise type N and then the line number question will appear. Change any input; depending on LS in each input state-

ment, variables change to their new value.

Write programs with multiple inputs and a mask on the screen. Store my routine in one file and edit it to write a new program. ■

Listing continued

```

770 REM ***** I N P U T *****
780 REM *****
790 PRINT @(X,Y), "": LINE INPUT Z$
800 IF C=1 THEN LET Z=VAL(Z$)
810 IF C=1 AND LEN(Z$)<>LEN(STR$(Z))-1 THEN GOTO 1030
820 IF C(0)=0 THEN GOTO 840
830 IF LEN(Z$)<=L(0) AND LEN(Z$)>=L(1) THEN GOTO 840ELSE GOTO 1030
840 IF C(1)=0 THEN GOTO 890
850 FOR W=1 TO 12
860 X$=RIGHT$(Z$,W)
870 IF LEFT$(X$,1)=" " AND W<L(2)+1 THEN GOTO 1040
880 NEXT W
890 IF C(2)=0 THEN GOTO 910
900 IF Z<L THEN GOTO 910ELSE GOTO 1030
910 IF A=1 GOTO 950
920 ON C(3) GOTO 930,930,930
930 K=0: C=0: C(0)=0: C(1)=0: C(2)=0: C(3)=0: L=0: L(0)=0: L(1)=0: L(2)=0
940 RETURN
950 PRINT @(X,Y), CHR$(23);
960 PRINT @(X,Y), USING "***** **": Z;
970 PRINT C$
980 A=0
990 GOTO 920
1000 REM *****
1010 REM ***** ERRORDESCRIPTION TABLE *****
1020 REM *****
1030 PRINT @(20,35), "MIN/MAX ERROR": GOTO 1060
1040 PRINT @(20,35), "ERROR FRACTIONAL POINT": K=0: GOTO 1060
1050 PRINT @(20,35), "ONLY NUMERIC INPUT": GOTO 1060
1060 H$=INPUT$(1)
1070 PRINT @(20,0), CHR$(23);
1080 PRINT @(X,Y), STRINGS(25," ")
1090 GOTO 790
1100 PRINT @(21,0), "END OF THE DEMONSTRATION PROGRAM, THANK YOU"
1110 END

```

UNITED SOFTWARE ASSOCIATES

734 Flamingo Way - North Palm Beach, FL 33408 - (305) 965-3496



INFOEX - 80 Bulletin Board System

This package contains all the software necessary to setup and operate a Bulletin Board System (BBS). The system will automatically answer phone calls, print a welcome message, ask for the callers name and location, and prints bulletins or advertisements. The system then allows the caller to leave messages for other callers, and read or delete messages addressed to them. The system supports downloading of program and text files, and has a chat mode to allow the caller to type directly to the System Operator (SYSOP).

Requires TRS-80 Model 3 (or Model 1 with a double density adapter), two disk drives, 32K RAM, an RS-232 interface, and any auto answer modem.

Regular price: \$149.95
USA special price: \$99.95

ULTRA TERM Communications System

Ultra Term includes both a full featured intelligent terminal program, and a self relocating host program, at prices one half to one third of the competitors'.

- * Exclusive direct to disk file transfer capability permits full control from the transmitting computer, so no one is required at the receiving computer.
- * Unique split screen feature allows simultaneous two way communication eliminating the confusion caused by incoming text mixing with what you are typing.
- * Supports auto dial modems with an easy to use telephone directory.

Requires Model 1 or 3 with 16K, one disk drive, RS-232 port, and modem.

Regular price: \$79.95
USA Special price: \$59.95



ACCEPTING SOFTWARE FOR SALE

DEALER INQUIRIES INVITED

24 HOUR BBS (305) 965-1044

332

Can your VisiCalc® do this?

your choice of title

Centering Option

Decimal Point Alignment

Optional Date, Time, Page

SALES FORECAST FOR 1983

PRODUCT	CODE	UNIT COST
Widgets	A45	50.123
Gadgets	S76	.031
Hatchets	U09	16.785
Flea Flickers	Q234	5.980
Knee Knickers	H-90	19.979

SALES FORECAST FOR 1983

PRODUCT	CODE	July Net
Widgets	A45	6017
Gadgets	S76	33
Hatchets	U09	2106
Flea Flickers	Q234	744
Knee Knickers	H-90	4247

Thu Sep 16, 1982 02.25 PAGE 1

	Feb Net	March Net	April Net	May Net
	5868	5898	5927	5957
	20	22	25	27
	2106	2106	2106	2106
	1260	1134	1021	919
	2637	2901	3191	3510

Thu Sep 16, 1982 02.25 PAGE 2

	Nov Net	Dec Net	1983 Net
	6138	6169	72035
	49	54	406
	2106	2106	25276
	488	439	10053
	6218	6840	51272

Automatic repetition of identifying columns (or rows) on multipage reports

Variable width columns

Automatic segmentation of reports too wide or too long for one page

It can if you add VisiBridge/RPT™, from Solutions, Inc.

\$79 for TRS-80® I, II/16, III, Apple® II or IBM PC™, 802 229 0368. Box 989, Montpelier, VT 05602. MASTERCARD OR VISA/Dealer inquiries welcomed.

VisiBridge/RPT is a trademark of Solutions, Inc. VisiCalc® is a registered trademark of VisiCorp. TRS-80® is a registered trademark of Tandy Corp. IBM PC is a trademark of IBM Corp.

✓ 276

2 in 1 COMPUTER CASES

HEAVY DUTY FOR SHIPPING



CONVERT TO DEMO TABLES



Order these EXTRAordinary cases. Immediately convert to DEMO TABLES. EXTRA sturdy for safe shipping of your Radio Shack TRS-80 MOD. III* Computer and your Line Printer VI*. EXTRA strong locks, latches and hinges. EXTRA storage compartments for supplies and miscellaneous. EXTRA attractive at an EXTRA low price.

TRS-80 MOD. III CASE • LINE PRINTER VI CASE
\$195 FOB SAN DIEGO plus sales tax **\$145**

Computer Division
TRADE SERVICE PUBLICATIONS, INC.
10996 Torreyana Road, San Diego, CA 92121
(619) 457-5920

*Trade Marks of Tandy Corp.



LEVEL IV PRODUCTS, INC. TRS-80® DISCOUNT DEALER



NO AUTHORIZED DEALER BEATS OUR PRICES ON PURE R/8 EQUIPMENT

THIS IS A FAST MOVING INDUSTRY, PRICES CHANGE FASTER THAN ADS, WE HAD A COMPLETE AD LAYOUT FOR THIS MONTH WITH PRICES, BUT BEFORE WE COULD EVEN SEND IT IN THEY CHANGED, BUT THE NEWS IS GOOD, THEY WENT DOWN AGAIN!!!

SINCE THIS AD WAS DESTROYED, AND THERE IS NO TIME TO PREPARE A NEW ONE, LET'S JUST TALK ABOUT A FEW THINGS THAT WE AT LEVEL IV THINK SHOULD BE IMPORTANT.

THERE ARE TWO KINDS OF TRS-80(R) COMPUTERS, THE "PURE RADIO SHACK(R)" VERSION AND THE "BUILT-UP" VERSION, THEY ARE BOTH AVAILABLE FROM A NUMBER OF SUPPLIERS VIA MAIL ORDER, AT PRICES BELOW RETAIL.

THE "PURE" VERSION WILL HAVE THE MANUFACTURER'S LIMITED 90 DAY WARRANTY IN EFFECT, (PROVIDED THE DEALER HANDLED THE SALE PROPERLY), BUT DON'T EXPECT THE LOCAL STORE TO GIVE YOU AN OPEN ARMS WELCOME, THOSE GUYS WORK ON COMMISSION YOU KNOW, SO YOUR CHOICE OF A DEALER HAS SOME IMPORTANCE, SOME OF THEM ARE LITTLE MORE THAN WAREHOUSES, VERY FEW HAVE EITHER SERVICE OR SUPPORT CAPABILITIES AFTER THE SALE, FOR THE USER WITH A PROBLEM. LEVEL IV OFFERS BOTH, WE HAVE A FULL TIME TECHNICAL SERVICE STAFF OF 8, AND A PROGRAMMING STAFF AS WELL, BOTH ARE AVAILABLE TO OUR CUSTOMERS DURING NORMAL BUSINESS HOURS MONDAY THRU SATURDAY, PHONE (313) 525-6200. YOUR HARDWARE PURCHASED FROM LEVEL IV ALSO HAS AN EXTENDED WARRANTY, AFTER THE ABOVE 90 DAYS SEND OR BRING IT BACK TO US FOR AN ADDITIONAL 3 MONTHS OF COVERAGE! (WARRANTY COPIES ARE AVAILABLE ON REQUEST).

YOU MUST RELY ON THE "BUILDER" OF A "BUILT-UP" UNIT TO PUT IN GOOD COMPONENTS, AND PROVIDE BOTH YOUR WARRANTY AND AFTER WARRANTY SERVICE, SELECT HIM CAREFULLY IF YOU GO THIS WAY.

LEVEL IV OFFERS BOTH "PURE" AND "BUILT-UP" UNITS, SEE OUR OTHER ADS IN THIS MAGAZINE.

**CALL FOR OUR CURRENT LOW PRICES (MI) 313-525-6200 OTHERS 800-521-3305
WE ACCEPT (VISA-MC-CHECKS-COD) INQUIRE ABOUT OUR CASH PRE-PAY DISCOUNTS**

- EPSON
- SMITH-CORONA
- HAYES
- MPI
- TANDON
- SOFTWARE
- SUPPLIES



RETAIL STORE NO. P-130

LEVEL IV PRODUCTS, INC.
134 SOUTH FRONT STREET
DOWAGIAC, MICHIGAN 49047
PHONE (616) 792-6600

PHONE/MAIL ORDER CENTER

LEVEL IV PRODUCTS, INC.
32429 SCHOOLCRAFT ROAD
LIVONIA, MICHIGAN 48150
PHONE (MI) 313-535-6200
TOLL FREE: 800-521-3305

Concatenate your programs on tape.

Color Computer Merge

John Heusinkveld
2161 E. Gerrado Brio
Tucson, AZ 85718

Mergers are popular in business these days. This program lets Extended Basic Color Computer users join the fun. This program concatenates 2-10 programs saved on tape in the order they appear on tape and saves the resulting program so you can CLOAD and run it. Radio Shack does not provide any method for merging programs saved on tape on the Color Computer, although Color Disk Basic contains a Merge command. Unless you have the money for a disk drive, however, this will not help you.

Since my bank balance wasn't

quite that healthy, I decided to write my own merge utility. I experimented with various CSAVEMs and CLOADMs, but all I could do was make the computer hang up.

Finally, I discovered that programs saved in ASCII format can be accessed line by line from tape using INPUT #-1. I also found that properly formatted data files can be loaded as programs. Using these two bits of information, I created a simple program that concatenates two programs by reading them into a string array, and then writing that array to tape. I later rewrote the program to accommodate up to 10 files (see the Program Listing).

How To Use Merge

Save all of the programs to be merged on tape in the order they are to appear in the final listing, using CSAVE "file name", A. Neither Radio Shack manual covers the A option for CSAVE; it saves a program on tape as a

string data file so that each line appears as one string. You can CLOAD this and other text files as if they were programs, although they require more tape and take longer to load.

Next, CLOAD and run Merge. The program will ask for the number of programs to be merged and the file name of each. Be sure that none of the programs have overlapping line numbers, as this will cause errors. The program will also ask for the file name under which you want to save the final copy. After you have given all this information, the message "Ready Cassette" appears. Press the play button on the cassette recorder and press enter. The cassette should begin alternately starting and stopping until it has loaded all of the programs (they are listed to the screen as they are loaded).

When it has finished, the computer will display "Rewind". Rewind your cassette or place a new one in the recorder and

press enter. The computer will tell you to press record. Do so and press enter again. The cassette will go on and the merged programs will be saved as one under the file name you gave.

Finally, load this program and make any modifications you wish, and then save it without the A option to speed loading.

Merge should not introduce any errors into your program, with the exception that some programs, especially those which use many read and data statements, may behave differently when combined with others. You will have to work these bugs out of your programs, but be reassured that they do not appear too often. The other, more serious problem is the memory limitation: In a 16K system, the maximum size for the array is about 850. I wrote this program on a 32K machine; 16K users will have to change line 5 to read 5 CLS:PCLEAR1: CLEAR 10000:DIML\$(850). If you run out of memory, you will get an error; I did not protect against this because doing so wastes precious RAM. ■

```

10 CLS:PCLEAR1: CLEAR20000:DIML$(1700)
20 PRINT"MERGE":PRINT"BY JOHN HEUSINKVELD":PRINT"10/1/81"
30 INPUT"HOW MANY FILES TO BE MERGED";NF
40 FORF=1TONF:PRINT"FILE #F":";LINEINPUTF$(F):NEXTF
50 LINEINPUT"NEW FILE NAME :";NNS:LINEINPUT"READY CASSETTE";P$
60 FORD=1TONF:OPEN"1",-1,FT$(D)
70 LINEINPUT#-1,L$(X):PRINTL$(X):X=X+1
80 IFNOTEOP(-1)THEN70
90 CLOSE:NEXTD
100 LINEINPUT"REWIND";P$:LINEINPUT"PRESS RECORD";P$
110 OPEN"O",-1,NNS:FORD=0TOX:PRINT#-1,L$(D):NEXTD:CLOSE
120 PRINT"FILES ";:FORS=1TONF:PRINTF$(S)" ";:NEXTS:PRINTCHR$(8)" MERGED INTO "NNS
130 END

```

Program Listing

The Key Box

Color Computer
32K RAM
Extended Color Basic

STOPPER!

The BASIC Breakpointer
By Roxton Baker
Author of "TRAKCESS"

Stopper is a unique machine language utility for debugging your BASIC programs on a Level II or Disk BASIC Model I or III.

Some of Stopper's many commands allow you to:

- * Single step next instruction or line in full
- * Determine exactly where an error occurred
 - * Set powerful BASIC breakpoints
- * STOP when variable is UNEQUAL to a value
- * STOP when variable is EQUAL to a value
- * Trace a variable value to screen or printer
 - * Pause, slow-step and single step
- * Selectively execute statements and lines

These examples will show how easily STOPPER is used:

```
Break when line 100 is hit for the 5th time <100,5
Break when X1 is equal to 10 <X-10
Break when ST5 in NOT equal to "YES" <ST5="YES"
Execute next statement or full line + or >
Exact statement where program halted P
```

With STOPPER you will know exactly where the error is and why it occurred. Program execution is under YOUR control! Stopper is self-relocating in high memory and respects any high memory utilities.

A special offer from the author and TAS: Stopper is \$90 on tape or disk, BUT you are licensed to make up to four additional copies, making the cost for this valuable utility only \$4. Support co-op purchases by ordering today. BASIC debugging will never be easier, nor a better utility any cheaper. Up to four extra manuals can be purchased for \$1 each and Z80 source code is available (refer to manual).

Tape Users: LOOK!

MAILING MANAGER

This combination Z80/BASIC program has over 18 commands that allow you to effectively manipulate your mailing list using a cassette based Model I and III. All commands are described fully in an excellent manual. MAILING MANAGER supports mailing labels (your choice of formats), file sorting (in fast Z80), searching on your choice of fields (with output going to screen or printer), two types of cassette data input/output:

1. a faster cassette I/O on both Model I and III for minimum cassette saving and loading time, and
2. BASIC I/O routines for compatibility with other programs.

MAILING MANAGER also allows easy maintenance of file data with deletion and editing commands. The MAILING MANAGER manual also includes "Programming Notes" in case you want to modify the screen or printer output. Note that this is NOT required. MAILING MANAGER supports about 60 names on a 16K machine, 398 on a 48K machine. MAILING MANAGER respects high memory if you are using another high memory driver (for lower case, printer, etc.). MAILING MANAGER is available on cassette, complete with documentation for \$89.95.

TCOM: Tape Communications

TCOM is an extremely advanced utility for telecommunications on a tape based Model III. Just look at the features: full uploading and downloading, automatic printer buffer, read ANY tape at high or low baud, automatic open/close buffer, user-definable buffer size, view buffer contents, host mode, and more. TCOM will not interfere with BASIC - you can jump to BASIC without interfering with TCOM buffers, and back to TCOM without destroying your BASIC program. If TCOM is being used at both computers, a BASIC memory to BASIC memory transfer is possible! Many more features - ask for info sheet. Works at half or full duplex, up to 9600 baud. TCOM is \$29.95 or get two TCOM packages for \$50.00 - save \$9.95!

Disk folks!

Our Modem80 telecommunications packages is one of the best bargains available at \$39.95! Send for a free information sheet!

THE ALTERNATE SOURCE

Start the New Year with

CHEKBOOK

A Home/Small Business Tool!

Now is the time to start organizing your checkbook accounts. Chekbook 3.2 is ideal for the home or small business. Categorize each check (over 50 user-definable categories) for easy analysis come April 15th. Chekbook will handle over 1900 entries and allow quick-searching by category, date or name. Special utilities are included that will allow you to sort checks (in under 10 seconds!) and merge monthly check files for a complete year-long picture. Cancelling checks each time you receive a statement is a breeze. Chekbook also handles special charges to (service charges, automatic withdrawals), and interest paid on, your checking account(s) if needed. Please note: Chekbook is compatible with Newdos/80 2.0, LDOS and DOSPLUS ONLY! It uses advanced features of these operating systems for maximum utilization of program space and time. It will NOT work with TRSDOS. Model I and III. Chekbook 3.2 comes in a three-ring binder and includes complete, indexed documentation. Written by Jerry Latham. \$49.95.

The VisiCalc® Formula Printer

Analyze your spreadsheets easily! VCFP allows you to see all formulas entered at one glance. Our program reads your VisiCalc files and creates two main reports (which may be routed to printer for an immediate report or to disk for merging with your text processor) that summarize your spreadsheet. You can instantly know:

1. All global commands in effect (including defaults)
2. Cell contents (with optional pseudo values)

The optional pseudo values mentioned in report two allow you to explain the purpose of the spreadsheet to anyone WITHOUT SHOWING ACTUAL FIGURES.

VCFP gives you the complete picture to view and study to determine what may be right or wrong with an application (helps eliminate wasted space, too!). Spreadsheets up to 64 x 254 are supported. You have the option of defining column width. VCFP also allows for special control characters used by your printer. VCFP is available only on disk and works with Model I and III. Model II users please inquire. VCFP is written by John Campbell and Ken Edwards. Complete with documentation (punched for your VisiCalc manual), \$39.95. VisiCalc is a trademark of VisiCorp.

Spreadsheet Application Planner Pads

Layout your spreadsheet applications quickly and easily with this professionally designed form. This two-sided 16" x 11" form is scored for folding, printed on top quality erasable green paper (preferred by many professional accountants) and is punched for 3-ring binders. Contains room for your entire spreadsheet, documentation about the spreadsheet and technical information (global declarations, etc.). Available only in pads of 20 sheets. One Pad, \$7.95. Two pads, \$15.00.

Need extra memory?

Buy from TAS! Included are step-by-step instructions for both Model I and III; nine chips instead of eight; 150 nanosecond ceramic chips instead of 300ns plastic chips; a full one-year warranty; and a unique memory test program which actually shows you which chip needs replacing! All this, at the unbelievable price of just \$19.95. Additional sets of nine chips are just \$15 at time of purchase.

TRAKCESS for the Model III by Roxton Baker (and Friends)

There is much to tell you about this powerful new utility for the Model III. We'll start by telling you it is the ONLY commercial utility that will allow you to accurately write and manipulate mixed density tracks and zap sectors larger than 256 bytes (seems there are more and more appearing on the marketplace). We suggest that you request our information sheet on this powerful utility. All SASE's will be returned the day we receive them, or check our bingo number. TRAKCESS is available for Model III and Model I SINGLE DENSITY only at the time of this writing. Model III TRAKCESS is \$29.95 and Model I TRAKCESS is \$24.95.

TASORT The Alternate SORT

TASORT is a small (less than 1K) machine language sort routine for your Model I or III system, tape or disk. TASORT is DOS independent, density independent, relocatable, and is easily incorporated into your BASIC programs. TASORT will sort ascending, descending or tag-along; data can be integer, single or double precision or a mixture; sorts on up to 64 arrays! When done, TASORT can disappear and return your memory to you. Amazing program! Your choice of media for \$19.95. Commercial licensing available.

Order Form

Please send me the following:

- | | |
|--|---------|
| <input type="checkbox"/> VCFP (Model III TRSDOS) (disk) | \$39.95 |
| <input type="checkbox"/> VCFP (all other I and III) (disk) | \$39.95 |
| <input type="checkbox"/> Spreadsheet Planner Pads (1) | \$7.95 |
| <input type="checkbox"/> Spreadsheet Planner Pads (2) | \$15.00 |
| <input type="checkbox"/> MAILING MANAGER (tape) | \$29.95 |
| <input type="checkbox"/> Memory Chips 150 ns | \$19.95 |
| <input type="checkbox"/> TRAKCESS (Model I Single) | \$24.95 |
| <input type="checkbox"/> TRAKCESS (Model III Double) | \$29.95 |
| <input type="checkbox"/> TRAKCESS Information | N/C |
| <input type="checkbox"/> Stopper | \$20.00 |
| <input type="checkbox"/> TASORT (tape) | \$19.95 |
| <input type="checkbox"/> TASORT (disk) | \$19.95 |
| <input type="checkbox"/> TCOM | \$29.95 |
| <input type="checkbox"/> TCOM - 2 pack | \$50.00 |
| <input type="checkbox"/> Modem80 | \$39.95 |
| <input type="checkbox"/> CHEKBOOK (disk) | \$49.95 |

TAS Subscription \$24.00

Please add \$3 to your total order for shipping (except TAS subscribers). We ship UPS unless you specify otherwise.

Name: _____

Address: _____

Address: _____

City: _____

State, Zip: _____

Mail order to:

The Alternate Source
704 N. Pennsylvania Ave.
Lansing, MI 48906
Ph. (800) 248-0284
Ph. (517) 482-8270

Master Card, Visa, COD, Checks welcome!

✓69

Transmuter

by Jon Mark O'Connor

Sometimes, you just have to relabel a program's variables. When you do, merge the program with Transmuter; relabelling will be a breeze.

Program Listing

```

62000 CLEAR3000:DEFINTC-Y:DEFSTRB,Z
62001 DIMG%,L%,TN%,YY%,X%,OZ%,SC$,TZ%,Y!,WZ%,OY%,OX%,RR%,OO%
62002 DIMSP$,LL!,TN$,J%,Z9$,Z8$,Z7$,OZ$,XP%,XR!,Z1$,PZ$,FL!
62003 DIMLL$,B9$,FL$,Z6$,ZL$,ZZ$,BJ$,SS%,QM%,PY%,PX%,GJ%
62004 DIMQSS$,T%,B$(125):CLS:GOTO62072
62005 '##### VARIABLE CHANGE AND SEARCH #####
#####
62006 X=PEEK(X)+PEEK(X+1)*256
62007 Y!=PEEK(X+2)+PEEK(X+3)*256:IFY! =>LL!ENDELSEWZ=0
62008 PRINTUSINGZ1,Y!,:FORG%=X+4TOX+255
62009 IFPEEK(G%)=147ORPEEK(G%)=0THEN62006ELSEIFPEEK(G%)=34GOSUB6
2032
62010 IFPEEK(G%)=>128NEXT
62011 ONTZGOTO62012,62016,62017,62015
62012 IFRR=0THEN62014
62013 IFPEEK(G%)=>65ANDPEEK(G%)<=90GOSUB62019:LPRINTZ7;ELSENEXT
62014 IFPEEK(G%)=>65ANDPEEK(G%)<=90GOSUB62019:PRINTZ7;ELSENEXT
62015 IFPEEK(G%)=OZANDPEEK(G%+1)=OYANDPEEK(G%+2)=OXPOKEG%,PZ:POK
EG%+1,PY:POKEG%+2,PX:GOSUB62019:PRINTZ7;:NEXTELSENEXT
62016 IFPEEK(G%)=OZANDPEEK(G%+1)=OYPOKEG%,PZ:POKEG%+1,PY:GOSUB62
019:PRINTZ7;ELSENEXT
62017 IFPEEK(G%)=OZPOKEG%,PZ:GOSUB62019:PRINTZ7;:NEXT
62018 NEXT!
62019 IFWZ=0ANDRR=999LPRINTCHR$(13)TAB(0)USINGZ6;Y!;
62020 IFRR=999LPRINTUSING"%%";CHR$(PEEK(G%));:G%=G%+1:WZ=WZ+1ELS
EPRINTCHR$(PEEK(G%));:G%=G%+1:WZ=WZ+1
62021 IFPEEK(G%)=0THEN62006ELSEIFPEEK(G%)=>65ANDPEEK(G%)<=90THEN
62020
62022 IFPEEK(G%)=400=999:GOTO62020ELSEIFPEEK(G%)=44ANDOO=0RETUR
N
62023 IFPEEK(G%)=4100=0:GOTO62020ELSEIFPEEK(G%)=34GOSUB62032:GOT
O62020
62024 IFRR<>999THEN62029
62025 IFPEEK(G%)=41ANDOO=999:LPRINTCHR$(41);:OO=0:RETURN
62026 IFOO=999ANDPEEK(G%)=>128LPRINTB(PEEK(G%)-128);" ";:G%=G%+1
:GOTO62020
62027 IFPEEK(G%)=>32ANDPEEK(G%)<=57THEN62020ELSERETURN
62028 RETURN
62029 IFOO=999ANDPEEK(G%)=>128PRINTB(PEEK(G%)-128);:G%=G%+1:GOTO
62020
62030 IFPEEK(G%)=>32ANDPEEK(G%)<=57THEN62020ELSERETURN
62031 RETURN
62032 G%=G%+1:IFPEEK(G%)=0THEN62006ELSEIFPEEK(G%)=34THENRETURNEL
SE62032
62033 '##### SPOT CHECKING SECTION #####
#####

```

Listing continues

Transmuter lets you relabel your variables. Normally, you wouldn't relabel them for personal use. But, if you write for a computer magazine, your variables must make sense. For example, instead of using ZS to represent car payment, you should use CP.

Transmuter uses a PEEK and POKE approach, and it can change almost any combination of letters and numbers within a program. Changing mathematical signs (+ - / *) is more difficult, but you can do it. Transmuter can also give you a list of all your variables and can show you the location of any token in your program, as well as send these lists to your printer.

Transmuter also contains a spot-checking function that lets you scan the lines, and upon reaching the desired variable, gives you the option to change it. If you hit Y to change it, the change appears on the screen. If you respond N, the scan continues.

Label changes must be identical in length to the original label. Transmuter has a low-level interpretive algorithm for the change. For instance, Transmuter doesn't know if you DEFSTR A at the top of your program. If you indicate A\$ for change, it won't change a single A. This isn't a drawback, however, because you can change all As later.

Transmuter treats labels as separate entities. Once a matching label is found, the change occurs. If you want to

The Key Box

**Model I or III
16K, or 32K RAM
Cassette or Disk Basic
Printer (optional)**

Baudy House Computer Products

950 Scott Lake Road
Pontiac, Michigan 48054

(313) 683-8388/order & info
(313) 682-9550

UTILITYS (mod I & III)

Super Utility Plus..... \$39.95
Ep-Set 80 \$18.90
Super Directory..... \$39.90

Business Programs

Postman (mass mailing system)
Only..... \$79.95
Lazy Writer..... \$145.00
Small Business invoice & order
Only..... \$24.95

Modem Programs

DDS disk down system... \$75
DFT direct file transfer... \$24.95
Color DFT (for COCO)... \$19.95

Games for Mod I & III

Arachnid Plus... \$19.95/24.95
Cyborg..... \$19.95/24.95
Jovian..... \$19.95/24.95
Assault..... \$19.95/24.95
Outhouse..... \$15.95/19.95
Forbidden City..... \$37.95
Panik..... \$18.95/22.95
Defiance..... \$22.95
Hyperlight Patrol..... \$18.95
Demon Seed... \$15.95/19.95
Asylum II..... \$19.95/24.95
Dunzhin..... \$29.95/29.95
Laser Defense... \$19.95/24.95
Institute..... \$19.95/22.95
Strike Force..... \$15.95/19.95
Bounceoids..... \$15.95/19.95
Venture..... \$15.95/19.95
Leaper..... \$15.95/19.95
Armored Patrol... \$19.95/24.95

Baudy House Computer Products

Most orders are shipped out in 24 hours. Visa & Mastercard, Money Orders, Checks, C.O.D. accepted. Please allow 10 days to clear on all checks. Prices subject to change.



Call or write today!

Dennis Black, owner



Color Computer

Color Bonanza..... \$49.95
Master Control..... \$19.95
Tape Directory..... \$14.95

COCO GAMES

Dunkey Munkey... \$21.95/24.95
Star Fire..... \$21.95/24.95
Keys of the Wizard... \$21.95
Galax Attack..... \$21.95
Space Invaders..... \$21.95
Meteoroids..... \$21.95
Ghost Gobbler..... \$14.95
Phantom Slayer..... \$19.95
Invaders Revenge..... \$19.95

Hardware

Hayes Smartmodem... \$245.00
Lynx Modems..... \$218.00
Epson-80 printer... \$469.00
Epson-80 FT printer... \$549.00
Prowriter printer... \$499.00
Space age printer stand... \$27.95

DISKETTES

Nashua SS/DD..... \$25.00
Walbash SS/DD..... \$27.00

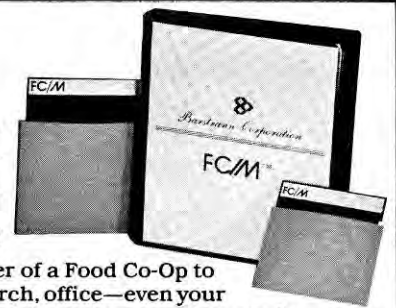
Miscellaneous

Family Tree..... \$29.90/29.90
Multidos Ext. Basic..... \$29.95
MultiDos new version... \$99.95
Multidos new Z dos..... \$39.95
Superdos..... \$19.95
Dosplus 3.4..... \$119.00
Dosplus II for Mod II... \$249.00

Written in COBOL
Tested For Over
A Year for RELIABILITY.

FC/M™ Food Co-Op/ Management

For Model I, II and III



Put the purchasing power of a Food Co-Op to work for your group, church, office—even your computer club. Our complete system teaches you how to:

- Set up a Co-Op
- Use wholesale buying power
- Save money, eat better
- Administer the operation

In addition, our tested software will simplify the paperwork and recordkeeping.

TWO WAYS TO GET STARTED.

1 Order the manual and you'll learn how to set up your Co-Op. Our instructions are so complete you can create your own program or start without our software. \$35.00 (credited to software purchase)

2 Order the complete system, including FC/M™ program and RS COBOL Run Time Package and be on your way to saving money for your group. \$150.00 (Mod I/III) \$200.00 (Mod II)

Barstrann Corporation

P.O. Box 265, Mid City Station

Dayton, Ohio 45402



Need More Information? Use Compuserve. GO PCS-46, TYPE or DOWNLOAD FCM/TXT (70200,123) from ACCESS prompt. Or use Reader Service Card.

REQUIREMENTS: Mod I—48K, 3 drives, Mod II—64K, 1 drive, Mod III—48K, 2 drives, all require 132 character printer. Specify Model Number When Ordering. Add \$5.00 for shipping. Ohio residents add 6% State Tax.

TRS-80® Customers complaining of tape loading blues?

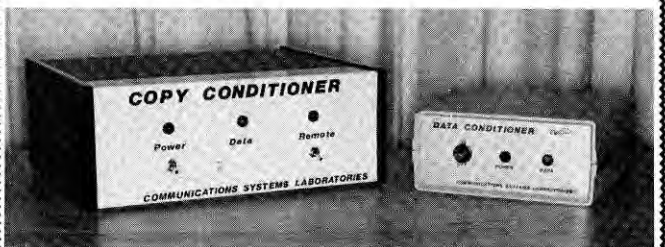
DEALERS HELP THEM!!

With two new products for home enthusiasts and the small volume software producers. The—

DATA CONDITIONER (suggested retail \$ **69.95**)
and
COPY CONDITIONER (suggested retail \$ **149.95**)

COMPLETE COMPUTER/CASSETTE INTERFACES WHICH PRODUCE SUPERIOR RECORDINGS AND ELIMINATE CLOAD ABORTS.

WRITE or CALL FOR DEALER
INFORMATION & PRICES



WE ALSO DO CUSTOM PRODUCT DESIGN & MANUFACTURING

COLE'S CONSULTANTS, INC.
COMMUNICATIONS SYSTEMS LABORATORIES
ELECTRONICS
R & D
DESIGN
MANUFACTURING
CONSULTATION

94-165 LEOKANE STREET
WAIPAHU, HAWAII 96797

PHONE
808-677-3380

FOR RETAIL ORDERS CALL 24 HR. TOLL FREE
1-800-367-5134

* TRS-80 is a trademark of Tandy-Radio Shack

TOOLS & TECHNIQUES FOR ELECTRONICS—by A. A. Wicks is an easy-to-understand book written for the beginning kit-builder as well as the experienced hobbyist. It has numerous pictures and descriptions of the safe and correct ways to use basic and specialized tools for electronic projects, as well as specialized metal-working tools and the chemical aids which are used in repair shops. \$4.95.* BK7348

HOBBY COMPUTERS ARE HERE! If you want to come up to speed on how computers work—hardware and software—this is an excellent book. It starts with fundamentals and explains the circuits and the basics of programming, along with a couple of TVT construction projects, ASCII, Baudot, etc. This book has the highest recommendations as a teaching aid. \$2.97.* BK7322

THE NEW HOBBY COMPUTERS—This book takes up from where *Hobby Computers Are Here!* leaves off, with chapters on Large-Scale Integration, how to choose a microprocessor chip, an introduction to programming, low-cost I/O for a computer, computer arithmetic, checking memory boards... and much, much more! Don't miss this tremendous value! BK7340 Only \$2.97.*

80 micro BOOK SHELF

NEW NEW NEW

INTRODUCTION TO WORD PROCESSING by Hal Glatzer. This book explains in plain language what a word processor can do, how to use one, how it improves productivity—especially in businesses that handle lots of words—and how to buy one wisely. No technical knowledge required, for all first-time users and those considering purchasing a word processor. BK1238 \$12.95

A USER GUIDE TO THE UNIX SYSTEM by Jean Yates and Rebecca Thomas. Here at last is a clearly written book that allows you to use the Unix operating system easily, and at a fraction of the time it previously took. If you're using, evaluating or simply curious about this system, this is your book. BK1242 \$15.99

WORDSTAR MADE EASY by Walter A. Ettlin. Now WordStar is as simple to learn as it is easy to use. This book teaches WordStar in 14 easy lessons, saving hours of hard work, it comes with a convenient pull-out Command Card. BK1239 \$11.95

TRS-80 DATA COMMUNICATIONS SYSTEMS—by Frank J. Derfler. If you are interested in using the TRS-80 as a terminal or message system, this is the book to buy. It covers communications, technical material, software and hardware for the entire TRS-80 family of machines. BK1245 \$12.95

BOTH
VOLUMES FOR \$4.95!
ORDER HC002

KILOBAUD CLASSROOM—by George Young and Peter Stark. Learning electronics theory without practice isn't easy. And it's no fun to build an electronics project that you can't use. *Kilobaud Classroom*, the popular series first published in *Kilobaud Microcomputing*, combines theory with practice. This is a *practical* course in digital electronics. It starts out with very simple electronics projects, and by the end of the course you'll construct your own working microcomputer!

Authors Young and Stark are experienced teachers, and their approach is simple and direct. Whether you're learning at home or in the classroom, this book provides you with a solid background in electronics—and you'll own a computer that you built yourself! BK7386 \$14.95

AN INTRODUCTION TO MICROCOMPUTERS, VOL. 0—The Beginner's Book—Written for readers who know nothing about computers—for those who have an interest in how to use computers—and for everyone else who must live with computers and should know a little about them. The first in a series of 4 volumes, this book will explain how computers work and what they can do. Computers have become an integral part of life and society. During any given day you are affected by computers, so start learning more about them with Volume 0. BK1130 \$12.50.*



AN INTRODUCTION TO MICROCOMPUTERS, VOL. 1—NEW 3rd Edition! Dedicated to the basic concepts of microcomputers and hardware theory. The purpose of Volume 1 is to give you a thorough understanding of what microcomputers are. From basic concepts (which are covered in detail), Volume 1 builds the necessary components of a microcomputer system. This book highlights the difference between minicomputers and microcomputers. BK1030 \$15.95

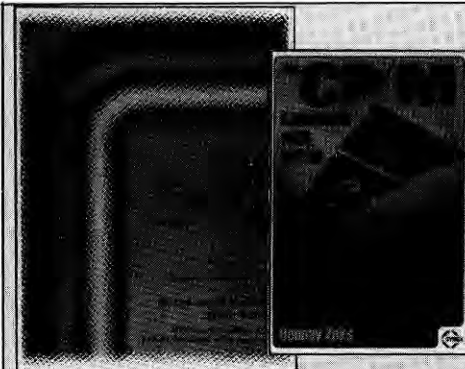


SOME OF THE BEST FROM KILBAUD/MICROCOMPUTING—A collection of the best articles that have recently appeared in *Kilobaud/MICROCOMPUTING*. Included is material on the TRS-80 and PET systems, CP/M, the 8080/8085/280 chips, the ASR-33 terminal. Data base management, word processing, text editors and file structures are covered too. Programming techniques and hardware construction projects for modems, high speed cassette interfaces and TVTs are also included in this large format, 200 plus page edition. BK7311 \$10.95.*

DON'T (or How to Care for Your Computer)—by Rodney Zaks. In plain language, with numerous illustrations, this book tells all the do's and don't's of the care, preservation and correct operation of the small computer system. Specific chapters cover each piece of hardware and software, as well as safety and security precautions and help for problem situations. Have your computer work right the first time and keep it working. No technical background required. For all computer users. BK1237 \$11.95.

YOUR FIRST COMPUTER—by Rodney Zaks. Whether you are using a computer, thinking about using one or considering purchasing one, this book is indispensable. It explains what a computer system is, what it can do, how it works and how to select various components and peripheral units. It is written in everyday language and contains invaluable information for the novice and the experienced programmer. (The first edition of this book was published under the title "An Introduction to Personal and Business Computing".) BK1191 \$8.95*

MICROPROCESSOR INTERFACING TECHNIQUES—by Austin Lesesa & Rodney Zaks—will teach you how to interconnect a complete system and interface it to all the usual peripherals. It covers hardware and software skills and techniques, including the use and design of model buses such as the IEEE 488 or S-100. BK1037 \$17.95.*



DOS RANDOM ACCESS & BASIC FILE HANDLING—by H.J. Muller. This book was written for the nonprogrammer. It is ideal for the businessman or professional who needs to solve and write special programs for in-house business problems, or the hobbyist who wants to go beyond the cassette recorder and into disk storage and file manipulation. It is written as a self-instruction tutorial and will provide anyone with some Level II experience with the ability to write special programs for inventories, mailing list, work scheduling, record keeping, research project data manipulation, etc. 150 pages. BK1236 \$29.50

TRS-80 DISK AND OTHER MYSTERIES—by Harvard C. Pennington. This is the definitive work on the TRS-80 disk system. It is full of detailed "How to use," information with examples, samples and in-depth explanations suitable for beginners and professionals alike. The recovery of one lost file is worth the price alone. BK1181 \$22.50.*

MICROSOFT BASIC DECODED AND OTHER MYSTERIES—by James Farvour. From the company that brought you *TRS-80 DISK AND OTHER MYSTERIES*. Contains more than 6500 lines of comments for the disassembled Level II ROMs and six additional chapters describing every BASIC subroutine, with assembly language routines showing how to use them. Flowcharts for all major routines give the reader a real insight into how the interpreter works. BK1186 \$29.50.*

Special Interests

MOD III ROM COMMENTED—Soft-Sector marketing, 1981. This book is not an instruction course on machine language, but rather an information source that you can use time and time again for writing your own program or patching old Mod I machine language programs. It contains an explanation of ROMs in the latest machine from Tandy, with most every location of the 14K ROMs listed, with comments. BK1235 \$22.50.

THE CUSTOM TRS-80 AND OTHER MYSTERIES—by Dennis Kitz. More than 300 pages of TRS-80 customizing information. With this book you'll be able to explore your computer like never before. Want to turn an 8 track into a mass storage unit? Individual reverse characters? Replace the BASIC ROMs? Make MUSIC? High speed, reverse video, Level I and Level II? Fix it if it breaks down? All this and much, much more. Even if you have never used a soldering iron or read a circuit diagram, this book will teach you how! This is the definitive guide to customizing your 80! BK1218 \$29.95.*

BASIC FASTER AND BETTER AND OTHER MYSTERIES—by Lewis Rosenfelder. You don't have to learn assembly language to make your programs run fast. With the dozens of programming tricks and techniques in this book you can sort at high speed, swap screens in the twinkling of an eye, write INKEY routines that people think are in assembly language and add your own commands to BASIC. Find out how to write elegant code that makes your BASIC really hum, and explore the power of USR calls. BK1221 \$29.95.*

THE CP/M HANDBOOK (with MP/M)—by Rodney Zaks. A complete guide and reference handbook for CP/M—the industry standard in operating systems. Step-by-step instruction for everything from turning on the system and inserting the diskette to correct user discipline and remedial action for problem situations. This also includes a complete discussion of all versions of CP/M up to and including 2.2, MP/M and CDOS. BK1187 \$14.95.*

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

No C.O.D. orders accepted. All orders add \$1.50 for first book, \$1.00 each additional book, for U.S. and foreign surface \$10.00 per book foreign airmail. Please allow 4-6 weeks for delivery. Questions regarding your order? Please write to Customer Service at the following address. Use the order card in this magazine or itemize your order on a separate piece of paper and mail to 80 Micro Book Department • Peterborough NH 03458. Be sure to include check or detailed credit card information.

For Toll Free Ordering Call 1-800-258-5473

80 micro BOOK SHELF

Nanos System REFERENCE CARDS

FOR MODELS I, II, III, COLOR AND
POCKET COMPUTERS! ALSO FOR
APPLE II, APPLE II PLUS AND TIMEX
SINCLAIR 1000



At last! No more flipping through the pages of the BASIC manual! No more working through the maze of machine language instructions! These cards completely summarize the BASIC and Assembler manuals! FEATURES INCLUDE:
memory map, eyeball graphics, math instructions, BASIC commands, store instructions, BASIC func-

tions, load instructions, BASIC statements, move instructions, special keys, exchange instructions, PRINT USING examples, shift instructions, BASIC special characters, compare instructions, BASIC and assembler messages and codes, branch instructions, BASIC facts, data alteration instructions, reserved words, I/O instructions, ROM routines, complete character chart with graphics and space-compression codes, hex-dec chart, control code cross-reference, assembler instructions, commands and operators, screen line layout, editor commands and subcommands, condition code easy access.

Plus—"magic graphics number"—a mystery until you learn how to use it!
Designed as a fold-up, accordion-style card, fits in your pocket. Panels organized for optimum speed for reference.

Apple II and Apple II Plus: BASIC and 6502 FC1008	\$4.95
Apple II and Apple II Plus: BASIC only FC1007	\$3.95
Model I: BASIC and Assembler FC1002	\$4.95
Model II: BASIC and Assembler FC1005	\$5.95
Model II: Commands and Utilities FC1010	\$3.95
Model III: BASIC and Assembler FC1005	\$5.95
Color: BASIC and Extended FC1006	\$4.95
Z-80: Microprocessor FC1011	\$4.95
ZX80, ZX81 and Timex Sinclair 1000: FC1012	\$5.95
Pocket Computer: BASIC FC1009	\$2.95

Z80

INSIDE LEVEL II—For machine language programmers. This is a comprehensive reference guide to the Level II ROMs, allowing easy utilization of the sophisticated routines they contain. It concisely explains set-ups, calling sequences, variable passage and I/O routines. Part II presents an entirely new composite program structure which unloads under the SYSTEM command and executes in both BASIC and machine code with the speed and efficiency of a compiler. Special consideration is given to disk systems. BK1183 \$15.95.*

Z-80 ASSEMBLY LANGUAGE PROGRAMMING—by Lance A. Leventhal. This book thoroughly covers the Z-80 instruction set, abounding in simple programming examples illustrating software development concepts and actual assembly language usage. Features include Z-80 I/O devices and interfacing methods, assembler conventions, and comparisons with 8080A/8085 instruction sets and interrupt structure. BK1177 \$8.99.*

TRS-80 ASSEMBLY LANGUAGE—by Hubert S. Howe, Jr. This book incorporates into a single volume all the pertinent facts and information you need to know to program and enjoy the TRS-80. Included are clear presentations of all introductory concepts, completely tested practical programs and subroutines, details of ROM and RAM and disk operating systems, plus comprehensive tables, charts and appendices. Suitable for the first time user or more experienced users. BK1217 \$9.95.*

PROGRAMMING THE Z-80—by Rodney Zaks. Here is assembly language programming for the Z-80 presented as a progressive, step-by-step course. This book is both an educational text and a self-contained reference book, useful to both the beginning and the experienced programmer who wish to learn about the Z-80. Exercises to test the reader are included. BK1122 \$15.95.*

6809

6809 MICROCOMPUTER PROGRAMMING AND INTERFACING—by Andrew C. Staugaard, Jr. Getting involved with Tandy's new Color Computer? If so, this new book from the Blacksburg Group will allow you to exploit the awesome power of the machine's 6809 microprocessor. Detailed information on processor architecture, addressing modes, register operation, data movement, arithmetic logic operations, I/O and interfacing is provided, as well as a review section at the end of each chapter. Four appendices are included covering the 6809 instruction set, specification sheets of the 6809 family of processors, other 6800 series equipment and the 6809/6821 Peripheral Interface Adapter. This book is a must for the serious Color Computer owner. BK1215 \$13.95.*

MICROCOMPUTING CODING SHEETS *Microcomputing's* dozen or so programmers wouldn't try to work without these handy scratch pads, which help prevent the little errors that can cost hours and hours of programming time. Available for programming is Assembly/Machine Language (PD1001), which has columns for address, instruction (3 bytes), source code (label, op code, operand) and comments; and for BASIC (PD1002) which is 72 columns wide. 50 sheets to a pad. \$2.39.*



WAYNE GREEN BOOKS

THE SELECTRIC INTERFACE—by George Young. You need the quality print that a daisy wheel printer provides but the thought of buying one makes your wallet wilt. **SELECTRIC™ INTERFACE**, a step-by-step guide to interfacing an IBM Selectric I/O Writer to your microcomputer, will give you that quality at a fraction of the price. George Young, co-author of *Kilobaud Microcomputing* magazine's popular "Kilobaud Klassroom" series, offers a low-cost alternative to buying a daisy wheel printer. **SELECTRIC INTERFACE** includes: step-by-step instructions, tips on purchasing a used Selectric, information on various Selectric models, including the 2740, 2980, and Dura 1041, driver software for Z80, 8080, and 6502 chips, tips on interfacing techniques. With **SELECTRIC INTERFACE** and some background in electronics, you can have a high-quality, low-cost, letter-quality printer. Petals not included. BK7388 \$12.97

TEXTEDIT—A Complete Word Processing System in Kit Form

by Irwin Rappaport
TEXTEDIT is an inexpensive word processor that can be adapted to suit your differing needs—from form letters to lengthy texts. Written in TRS-80 Disk BASIC, the system consists of several modules, permitting the loading and use of only those portions needed. A disk is also available which provides the direct loading of the modules, however, the book is required for documentation. For Model I and III with TRSDOS CONVERT, one disk drive (2 disk drives or copy utility needed to transfer to system disk). Runs under TRSDOS 2.2/2.3. May not function under other systems. BK7387 (book, 90 pages) \$9.97 DS7387 (disk) \$19.97

THE NEW WEATHER SATELLITE HANDBOOK—by Dr. Ralph E. Taggart WB8DQT. Here is the completely updated and revised edition of the best-selling *Weather Satellite Handbook*—containing all the information on the most sophisticated and effective spacecraft now in orbit. Dr. Taggart has written this book to serve both the experienced amateur satellite enthusiast and the newcomer. This book is an introduction to satellite watching, that tells you how to construct a complete and highly effective ground station. Not just ideas, but solid hardware designs and all the instructions necessary to operate the equipment are included. An entire chapter is devoted to microcomputers and the Weather Satellite Station, and for the thousands of experimenters who are operating stations. *The New Weather Satellite Handbook* details all the procedures necessary to follow the current spacecraft. Weather Satellite contains Operation Satellite Systems, Antenna Systems, Weather Satellite Receivers, A Cathode Ray Tube (CRT) Monitor for Satellite Picture Display, A Direct-Printing Facsimile System for Weather Satellite Display, How to Find the Satellite, Test Equipment, Microcomputers and the Weather Satellite Station, Station Operations. BK7383 \$8.95.*

*Use the order card in this magazine or itemize your order on a separate piece of paper and mail to *Microcomputing* Book Department • Peterborough NH 03458. Be sure to include check or detailed credit card information. No C.O.D. orders accepted. All orders add \$1.50 for the first book, \$1.00 each additional book for U.S. and foreign surface. \$10.00 per book foreign airmail. Please allow 4-6 weeks for delivery. Questions regarding your order? Please write to Customer Service at the above address.

For Toll Free Ordering Call 1-800-258-5473

Basic & Pascal



THE BASIC HANDBOOK—SECOND EDITION—by David Lien. This book is unique. It is a virtual ENCYCLOPEDIA of BASIC. While not favoring one computer over another, it explains over 250 BASIC words, how to use them and alternate strategies. If a computer does not possess the capabilities of a needed or specified word, there are often ways to accomplish the same function by using another word or combination of words. That's where the HANDBOOK comes in. It helps you get the most from your computer, be it a "bottom-of-the-line" micro or an oversized monster. BK1174 \$19.95.*

LEARNING TRS-80 BASIC—by David A. Lien. Dr. Lien, who is the author of THE BASIC HANDBOOK and the original Radio Shack LEVEL I USER'S MANUAL, has compiled a tutorial which includes portions of the original USER'S MANUAL, and most of LEARNING LEVEL II along with extensive additions. It will completely cover the TRS-80 Models I, II, III, and 16 (sorry, not the color or pocket computers). It is, of course, written in the easy learning style which readers of Dr. Lien's books have come to enjoy. BK1175 \$19.95.

BASIC BASIC (2ND EDITION)—by James S. Coan. This is a textbook which incorporates the learning of computer programming using the BASIC language with the teaching of mathematics. Over 100 sample programs illustrate the techniques of the BASIC language and every section is followed by practical problems. This second edition covers character string handling and the use of data files. BK 1026 \$11.50.*

INTRODUCTION TO TRS-80 LEVEL II BASIC AND COMPUTER PROGRAMMING—by Michael P. Zabiniski. Written by an experienced educator, this is the book for those beginners who want to learn about computers without having to become an expert. It has practical programs, useful line-by-line comments, excellent flowcharts accompanied by line numbers and over 200 exercises which help the reader assess progress, reinforce comprehension, and provide valuable practical experience. BK1219 \$10.95.*

50 BASIC EXERCISES—by J. P. Lamoitier. This book is structured around the idea that the best way to learn a language is through actual practice. It contains 50 completely explained exercises: statement and analysis of the problem, flowcharts, programs and actual runs. Program subjects include mathematics, business, games, and operations research, and are presented in varying levels of difficulty. This format enables anyone to learn BASIC rapidly, checking their progress at each step. BK1192 \$12.95.*

NEW REVISED EDITION

PROGRAMMING IN PASCAL—by Peter Grogono. The computer programming language PASCAL was the first language to embody in a coherent way the concepts of structured programming, which has been defined by Edsger Dijkstra and C.A.R. Hoare. As such, it is a landmark in the development of programming languages. PASCAL was developed by Niklaus Wirth in Zurich; it is derived from the language ALGOL 60 but is more powerful and easier to use. PASCAL is now widely accepted as a useful language that can be efficiently implemented, and as an excellent teaching tool. It does not assume knowledge of any other programming language and therefore suitable for an introductory course. BK1140 \$12.95.*

ADVANCED BASIC—Applications including strings and files, coordinate geometry, area, sequences and series, simulation and graphing and games. BK1000 \$11.50

INTRODUCTION TO PASCAL—By Rodney Zaks. A step-by-step introduction for anyone wanting to learn the language quickly and completely. Each concept is explained simply and in a logical order. All features of the language are presented in a clear, easy-to-understand format with exercises to test the reader at the end of each chapter. It describes both standard PASCAL and UCSD PASCAL, the most widely used dialect for small computers. No computer or programming experience is necessary. BK1189 \$15.95

Money-making

HOW TO MAKE MONEY WITH COMPUTERS—In 10 information-packed chapters, Jerry Felsen describes more than 30 computer-related, money-making, high profit, low capital investment opportunities. BK1003 \$15.00.*

HOW TO SELL ANYTHING TO ANYBODY—According to *The Guinness Book of World Records*, the author, Joe Girard, is "the world's greatest salesman." This book reveals how he made a fortune—and how you can, too. BK7306 \$2.25.*

THE INCREDIBLE SECRET MONEY MACHINE—by Don Lancaster. A different kind of "cookbook" from Don Lancaster. Want to slash taxes? Get free vacations? Win at investments? Make money from something that you like to do? You'll find this book essential to give you the key insider details of what is really involved in starting up your own money machine. BK1178 \$5.95.*

Business

SOME COMMON BASIC PROGRAMS—Published by Adam Osborne & Associates, Inc. Perfect for non-technical computerists requiring ready-to-use programs. Business programs, plus miscellaneous programs. Invaluable for the user who is not an experienced programmer. All will operate in the stand-alone mode. BK1053 \$14.99 paperback.

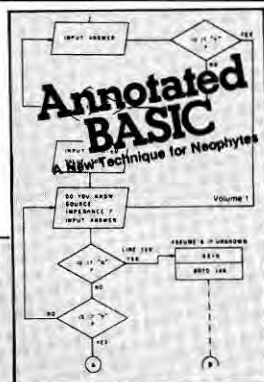
THEORY Z—How American Business Can Meet the Japanese Challenge—by William Ouchi. Why are the Japanese catching up and surpassing American industrial productivity? What allows Japanese industrialists to offer guaranteed lifetime employment to their workforce? This book will help you understand the Theory Z managerial philosophy and its implications for the American corporate future. Examples are given of the American industrial giants already operating under Z-style management, and the impact of this style on the quality of their executives and workers is explored. A must for the alert businessman, large or small. BK1226 \$12.95.*

BUSINESS SYSTEM BUYER'S GUIDE—By Adam Osborne with Steven Cook. When you enter the market place of small business computers, you face a bewildering array of products, prices, features and fables. This guide cuts through the jargon and unravels the task of buying the right computer system. This book provides solid information on how to determine your needs, how to choose software and hardware for all business applications, what to expect from vendors, what to avoid, and what questions you must ask. It also provides a wealth of detailed information on products, manufacturers, retailers and the whole microcomputer market. BK1229 \$9.95

SO YOU ARE THINKING ABOUT A SMALL BUSINESS COMPUTER—by Richard G. Canning and Nancy C. Leeper. For a well-organized manual on the process of selecting the right computer system for your small business, this text can't be excelled. Designed to introduce the novice in data and word processing to the real benefits of computerization, the book is filled with money- and time-saving tips, photos of equipment, lists of suppliers, prices, explanations of computer terminology, and helpful references to additional sources of information. Everyone contemplating a first computer installation should have this book. BK1222 \$14.00*

80 micro BOOK SHELF

NEW
NEW
NEW



ANNOTATED BASIC—A NEW TECHNIQUE FOR NEOPHYTES.—BASIC programming was supposed to be simple—a beginner's programming language which was so near to English that it could be easily understood. But, in recent years, BASIC has become much more powerful and therefore much more difficult to read and understand. BASIC simply isn't basic anymore.

Annotated BASIC explains the complexities of modern BASIC. It includes complete TRS-80* Level II BASIC programs that you can use. Each program is annotated to explain in step-by-step fashion the workings of the program. Programs are flowcharted to assist you in following the operational sequence. And—each chapter includes a description of the new concepts which have been introduced.

Annotated BASIC deals with the hows and whys of TRS-80 BASIC programming. How is a program put together? Why is it written that way? By observing the programs and following the annotation, you can develop new techniques to use in your own programs—or modify commercial programs for your specific use. *Annotated BASIC* Volume 1 BK7384 \$10.95 *Annotated BASIC* Volume 2 BK7385 \$10.95 Order Both Volumes and Save! BK738402 \$18.95

Games

CAPTAIN 80 BOOK OF BASIC ADVENTURES—by Robert Liddil. This book contains 18 of the most popular Adventure programs available today; all in one easy to read book with listings ready to be keyed in to your computer. This unique book also contains an ADVENTURE GENERATOR program, not available from any other source. This generator program will actually write another BASIC ADVENTURE PROGRAM! Although specifically written for the TRS-80 Model I & III, these programs are adaptable to other computers using Microsoft BASIC. BK 1240 \$19.95.

40 COMPUTER GAMES FROM KILOBAUD MICROCOMPUTING—Forty games in all in nine different categories. Games for large and small systems, and even a section on calculator games. Many versions of BASIC used and a wide variety of systems represented. A must for the serious computer gamesman. BK7381 \$7.95.*

BASIC COMPUTER GAMES—Okay, so once you get your computer and are running in BASIC, then what? Then you need some programs in BASIC, that's what. This book has 101 games for you from very simple to real buggers. You get the games, a description of the games, the listing to put in your computer and a sample run to show you how they work. Fun. Any one game will be worth more than the price of the book for the fun you and your family will have with it. BK1074 \$7.50.*

MORE BASIC COMPUTER GAMES—Edited by David H. Ahl. More fun in BASIC! 84 new games from the people who brought you *BASIC Computer Games*. Includes such favorites as Minotaur (battle the mythical beast) and Eliza (unload your troubles on the doctor at bargain rates). Complete with game description, listing and sample run. BK1182 \$7.50.*

WHAT TO DO AFTER YOU HIT RETURN—PCC's first book of computer games... 48 different computer games you can play in BASIC... programs, descriptions and many illustrations. Lunar Landing, Ham-murabi, King, Civel 2, Qubic 5, Taxman, Star Trek, Crash, Market, etc. BK1071 \$16.50.*

*Use the order card in this magazine or itemize your order on a separate piece of paper and mail to *Microcomputing* Book Department • Peterborough NH 03458. Be sure to include check or detailed credit card information. No C.O.D. orders accepted. All orders add \$1.50 for the first book, \$1.00 each additional book for U.S. and foreign surface, \$10.00 per book foreign airmail. Please allow 4-6 weeks for delivery. Questions regarding your order? Please write to Customer Service at the above address.

For Toll Free Ordering Call 1-800-258-5473

NEWS THIS MONTH

ISAAC ASIMOV TALKS ABOUT FUTURE

The famed science fiction author offers his views on the future impact of computers.

PAGE 346

MAJOR LEAGUE REPAIR OF MICROS

A company named TRW has started a pilot program in Dallas that might grow into something big.

PAGE 348

CUSTER PORN ATTACKED

American Indians and women's groups have blasted a California video-game maker for "settling an old score" for the former head of the 7th Cavalry.

PAGE 354

SOFTWARE

Head pat or patronizing bone?

Tandy recognizes outside softwriters but everyone isn't jumping for joy.

Some computer cowboys will be bunking at Tandy's ranch under a program started last October to help independent writers of TRS-80 software.

According to published reports, the Fort Worth firm's Outside Software Support Program will provide independents with:

- Marketing and technical assistance;
- Possible inclusion in a software referral guide sold through Radio Shack stores; and
- Access to TRSDOS and its source code.

The program is Radio Shack's first attempt to provide help to software writers outside Tandy, or who are not writing for in-store sales.

Is the program a big departure from the past? "I would say it is," observed Computer Merchandising Director Ed Juge. "It is a method to allow us to reach vertical markets that are very definitely good markets but which we are not capable of adequately servicing."

Vertical markets, he explained, include software for lawyers, doctors, dentists, print shops, and parts stores.

But is the program for all independents? That question's answer is fuzzy. And that's stirred suspicion of the program among some prominent TRS-80 software writers.

Asked if Tandy would screen out of the program's referral guide software

competing with Tandy's, Juge told *80 Micro*, "The whole point of doing this is to make software available for vertical market applications that we simply can't make available and don't have the expertise to sell and properly demonstrate if we did make them available."

Although Vice President for Computer Merchandising Jon Shirley echoed Juge's remarks, he widened the opening in the corral gate. "We're not very interested in marketing to vertical industries, for example," he told *Computer Business News*. "But there's a lot of TRS-80 software out there for vertical markets, and we want to help those people. It's not limited to vertical market software, though."

"I just think Tandy is just trying to throw a bone to the turkeys," one large software maker said privately. "I have an opinion that it's playing a game, but I don't have any foundation on which to base that other than I distrust Tandy implicitly."

"We were unimpressed with their announcement," said Bob Snapp, head of Snappware in Cincinnati, OH. "We don't feel it is a great step forward for software authors. And we don't intend to participate in the program."

Apparat Inc. will be submitting software to Tandy for review, but it has low expectations. The Denver, CO, company's best seller, NEWDOS80, competes with Tandy's operating system, TRSDOS, and its annointed system, LDOS, made by Logical Systems Inc. in Mequon, WI.

Jason Matthews, Apparat's manager of software research and development, noted, "Tandy's not going to ask us to do anything with our operating system because it will blow LDOS out of the water."

Another maker of software competing with Tandy's questioned the program. The maker, who requested anonymity, said the "theory" behind the program failed to meet the practice.

Interviewed about two weeks after Tandy announced the program, the maker observed, "Right now this looks like it was a press announcement rather than something substantial."

He found the documentation for the program disappointing. "Not one word was in there about Tandy reviewing or recommending software," he said. "What was in there was they'd provide us with information about entrance points into the ROM and how to do a fast INKEY\$ and other really wonderful tidbits of information that were available to the hobby clubs three years ago. But the hobby clubs had a helluva lot more detail than Tandy was willing to give today."

Jim Mendenhall, general manager of

2 DRIVE MODEL II MASS STORAGE FROM INTERNATIONAL INSTRUMENTATION INC.



AT LAST! An Alternative to Radio Shack's Over-Priced, Model II Disk Expansion!

The International Instrumentation FUNDAMENTAL DRIVE ENCLOSURE (FDE022) is the perfect alternative to RADIO SHACK'S expensive disk expansion package for the Model II. The FDE002 is designed to hold 2 Siemens, Shugart or Qume compatible 8" floppy disk drives. The FDE002 has been designed with engineering features that put it far ahead of its class without sacrificing cost or quality. Best of all, the FDE002, with drives, data cable, and internal power cabling, is priced at just **\$795.00!**

88IIFDE002 Cabinet Only \$360.00



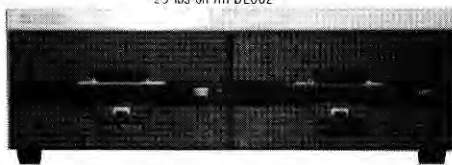
TWO SIEMENS 8" FLOPPY DISK DRIVES ONE IIFDE002 CABINET AND ONE DATA CABLE

OVER 1 MEGABYTE OF ADDITIONAL FLOPPY DISK STORAGE
If Bought Separately: **\$875.00**

\$795.00

88PDBIISIETRS

Shipping Weights: 15 lbs. ea on disk drives (shipped separately)
23 lbs on IIFDE002



FEATURES:

- Connects directly to the disk expansion port on the back of your Model II, no hardware modifications are required - completely Model II compatible
- Positive pressure forced air cooling for reliable disk drive operation
- AC input via 3 wire 7 foot international cord/socket set
- AC input EMI filtered to six amps to help prevent disk crashes due to power spikes and line noise
- 1/8" aluminum rear panel with socketed power pass devices for cool trouble free power.
- 14 gauge main chassis
- Integral power supply with 5V@6A/5V@1A/24V@6A
- Double-sided custom PC power board and supply
- Each DC supply and AC separately fused

III TRSDOS™ UTILITY ENHANCEMENTS

This package of 12 individually selectable utility programs is designed for the sophisticated Model II TRSDOS™ user. Each utility is designed to increase system efficiency by overcoming the limitations of TRSDOS™. Here are three examples:

- Modifies TRSDOS™ 2.0 or 2.0A to run with DC motor disk drives such as the Tandon TM848-1
- Elimination of password protection on TRSDOS™ files to allow total user manipulation of these files
- Changes TRSDOS™ step rate from 20ms to 12ms; user may adjust to as low as 6ms

When purchased with the

special package above: **\$50.00**

If purchased separately:

88IIM2PATCH Supplied on 8" disk \$99.95
TRS80 Model II, TRS80 Model 16, TRSDOS, and Radio Shack are trademarks of Tandy Corp.

MORE PERIPHERALS FOR THE TRS-80 MODEL II*

*Also For Your TRS-80 Models I and III



LINE MONITOR POWER CONDITIONERS



Before you plug in your computer, you'd better consider how you are going to insure or protect your investment from unwanted electrical pollution.

DATAGARD Performance Specifications

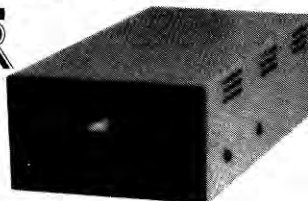
	DG315P, DG315S and DG315R	DG115P and DG115S
Maximum spike energy dissipation	50 joules one time, 25 joules repeated usage, self restoring	50 joules one time, 25 joules repeated usage, self restoring
Maximum spike voltage	7,000 volts	6,000 volts
Clamping spike voltage	55 volts	155 volts
Surge current clamping ratio	No greater than 1.5:1	No greater than 2.03:1
Maximum spike current (For an 8 x 20 microsecond spike pulse)	2,000 amps	2,000 amps
Clamping response time	10 nanoseconds (10 x 10 ⁻⁹ sec.)	10 nanoseconds (10 x 10 ⁻⁹ sec.)
Noise rejection Filter network Frequency range Attenuation	1KHz to 100 MHz 20 to 40 dB (voltage ratio)	—
Mode noise protection	Transverse and common	—
Leakage current	Leakage to ground lead does not exceed 10 microamperes	Leakage to ground lead does not exceed 10 microamperes

DG115 SERIES SINGLE STAGE SPIKE PROTECTION

MODEL	DESCRIPTION	WT.	LIST	1-9	10-24
88WBRODG115P	Wall unit plug in	2	\$49.95	\$39.95	\$34.95
88WBRODG115S	6 outlet strip w/SW<	3	\$61.95	\$49.95	\$42.00

DG315

MODEL	DESCRIPTION	WT.	LIST	1-9	10-24
88WBRODG315P	Wall unit plug in	2	\$153.95	\$119.95	\$99.95
88WBRODG315S	6 outlet strip w/SW<	3	\$193.95	\$149.95	\$119.95
88WBRODG315R	6 outlet rack w/SW<	8	\$193.95	\$149.95	\$119.95



5 1/4" DISK CABINET FOR SINGLE OR DOUBLE DRIVES

	SINGLE	DOUBLE
5V@1A 12V@1.5A	5V@2A 12V@3A	
Shipping Weight 5 lbs	Shipping Weight 9 lbs	
88JMR1C5	Single 5 1/4" Drive Cabinet	\$79.00
88JMR2C5C	Dual 5 1/4" Drive Cabinet	\$99.00
DUAL 5 1/4" CABINET WITH INTERNAL DATA CABLES		
88JMR2C5C	With Internal Data Cable	\$115.00

Tandon

5 1/4" FLOPPY DISK DRIVE 48TPI DOUBLE DENSITY	1	2 or More
88TNDTM1001	Single Sided 250KB	\$249.00 \$220.00
88TNDTM1002	Double Sided 500KB	\$325.00 \$299.00
96 TPI DOUBLE DENSITY		
88TNDTM1003	Single Sided 500KB	\$325.00 \$299.00
88TNDTM1004	Double Sided 1000KB	\$449.00 \$420.00

5" DISKETTES!

SOFT SECTOR 40 TRACK SINGLE SIDED DOUBLE DENSITY WITH HUB REINFORCING RINGS
Package of 10: **\$19.95**

DONUS! FREE!! KASSETTE 10 LIBRARY CASE WITH PACKAGE OF 10 DISKETTES

A \$4.25 VALUE!! 88PRI5500 (Shipping Weight 2 lbs.)
88PRI580 package of 80 less Library Case \$120.00



PRIORITY ONE ELECTRONICS

9161 DEERING AVE • CHATSWORTH, CA 91311

ORDER TOLL FREE (800) 423-5922 - CA, AK, HI CALL (213) 709-5464

Terms: VISA, MC, BAC, Check, Money Order, U.S. Funds Only. CA residents add 6 1/2% Sales Tax. MINIMUM PREPAID ORDER \$15.00. MINIMUM SHIPPING & HANDLING \$3.00 for the first 3 lbs. plus 40¢ for each additional pound. Orders over 50 lbs. sent freight collect. Just in case, please include your phone number. Prices subject to change without notice. We will do our best to maintain prices through February, 1983. Credit Card orders will be charged. appropriate freight. If you have not received your Winter '83 Engineering Selection Guide, send \$1.00 for your copy today! Sale prices are for prepaid orders only.



U.S. ROBOTICS 2 YEAR WARRANTY!! AUTO DIAL 212A MODEM 1200 BAUD DIALING MODEM

The **AUTO DIAL 212A** Modem is a direct connect 0-300 or 1200 baud modem capable of dialing and calling for you. The **AUTO DIAL 212A** is compatible in function to the **DC Hayes SMARTMODEM™**.

Part No.	Description	List Price	SALE Price
88BUSRADIAL212A	0-300, 1200 baud dialing modem	\$599.00	\$495.00



ACCOUSTIC MODEM

The **PHONE LINK** Modem is a 300 baud RS232 compatible acoustic modem capable of operating as either an answer or originate modem. It is BELL 103/113 compatible and will accept most standard phone handsets.

88BUSRPLNK	0-300 Baud acoustic modem	\$149.00	\$129.00
------------	---------------------------	----------	----------



MICRO LINK DIRECT CONNECT MODEMS

The **MICRO LINK** Modems are available in either 0-300 or 1200 baud transmission rates and both are RS232 compatible. Operation can be answer or originate.

88USRMLNK300	0-300 baud direct connect	\$179.00	\$159.00
88USRMLNK1200	1200 baud direct connect	\$449.00	\$399.00

AUTO LINK AUTO ANSWER DIRECT CONNECT MODEM

The **AUTO LINK** Modems are auto answer modems capable of operating at 0-300 baud or 1200 baud transmission rates. The **AUTO LINK** Modems can be operated in either answer or originate modes.

88USRALNK300	0-300 baud auto/direct connect	\$219.00	\$195.00
88USRALNK1200	1200 baud auto/direct connect	\$499.00	\$449.00
88USRALNK1212A	0-300, 1200 baud auto/direct	\$549.00	\$475.00



the Cornsoft Group in Indianapolis, IN, was skeptical of the value of the program's referral guide. He said Tandy currently distributes a "source book" with listings of independent software makers. The makers pay \$10 to be listed in the book.

"People are going to be leary of a buyer's guide—especially if it turns out like the Source Book," he said. "It didn't really tell you anything. It was still a buyer beware sort of thing. Most people are not comfortable dealing in that kind of situation."

He sees the Color Computer market benefiting most from the program.

"I think it has the potential to help Color Computer authors much more than it does the Model I and III authors," he said. "New Color Computer owners are more dependent on Radio Shack for software than Model I and III owners are. The I and III owners are familiar with the independent sources to buy software—software only stores, consumer magazines and that kind of thing."

Dan Nelson, general manager of Nelson Software in Minneapolis, MN, said his enterprise has submitted several of its Color Computer programs to Tandy for review.

"I think it's about time Tandy pursued third-party vendors," he noted. "Third-party vendors usually cover a specific application in greater detail and are able to provide better support to their customers than Tandy has been able to offer."

Nelson said Tandy prepared a software-maker source book last June for distributors of its Color Computer clone, the TDP-100. That listing resulted in a number of distributor inquiries about Nelson's products, but no sales yet.

"The local distributor came in and viewed the software," Nelson said. "He was really interested in games. Apparently, he hasn't landed enough accounts to buy any from us."

He added, "Prior to this third-party announcement, we would submit software to Tandy and they would send us a form letter saying we'd hear from them in 90 days. We never heard anything from anybody, ever."

In the past, said the software maker requesting anonymity, Tandy has taken from a year to a year and a half to review software submitted to it. Juge said that won't be the case under the new program. "I doubt," he replied, "that one of our people will spend more

than a day on any one package. It's not a review as if we're going to resell it."

The software maker also complained about the rates Tandy has paid independents in the past. "The LDOS people are getting \$12 a copy from Tandy," he said, "which is not calculated to make you rich in a hurry."

Another element of the program, TRSDOS access, was rapped by Matthews of Apparat.

"If I were to write a program and put it on the market, I wouldn't put it out under TRSDOS if I knew anything about other operating systems," he said.

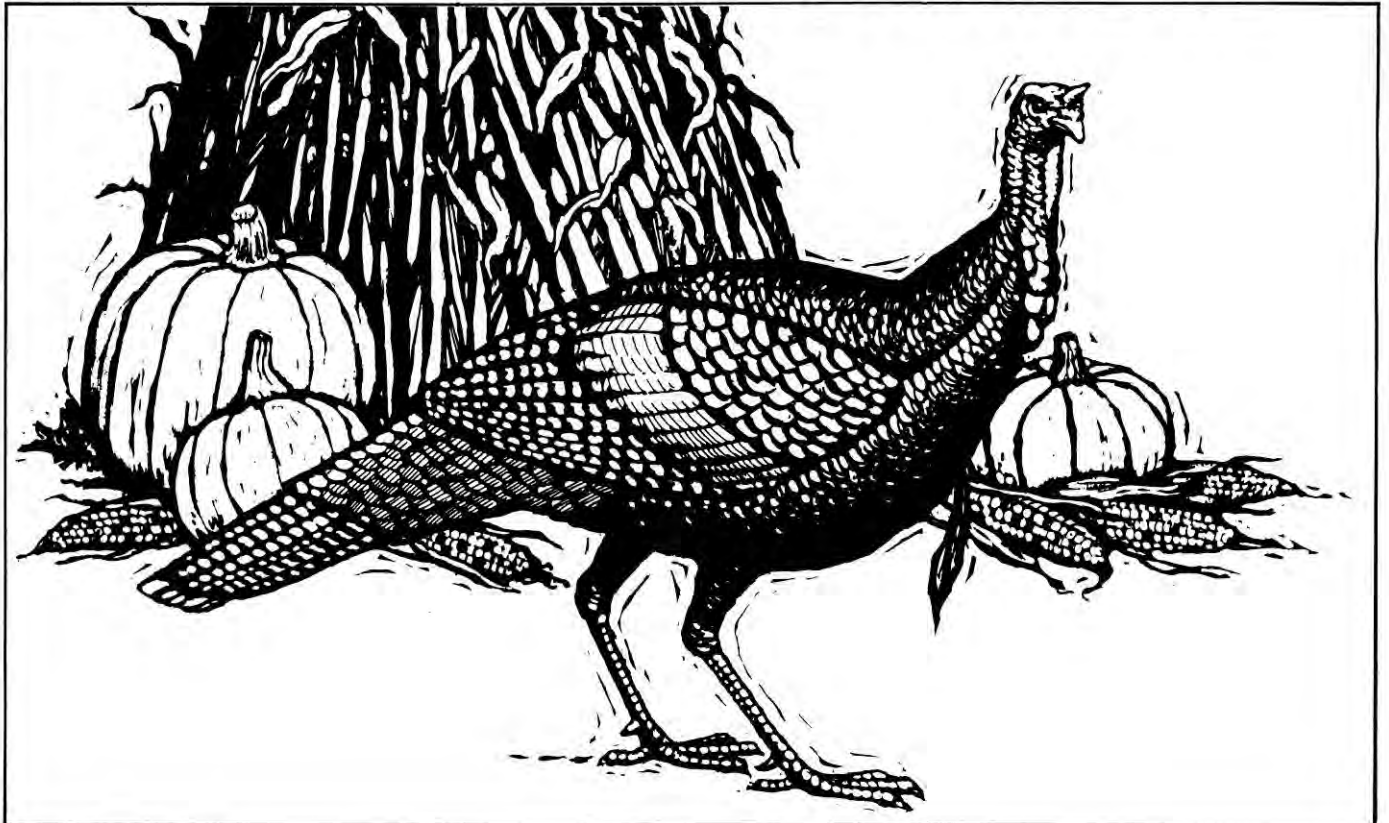
"People have lost confidence in TRSDOS," he added. "If you buy something in TRSDOS this year, next year Tandy changes it, and all your programs are out to lunch."

"TRS-80 users," he declared, "are pretty sophisticated and they're getting pretty tired of this. They're getting tired of Tandy changing its mind every two minutes."

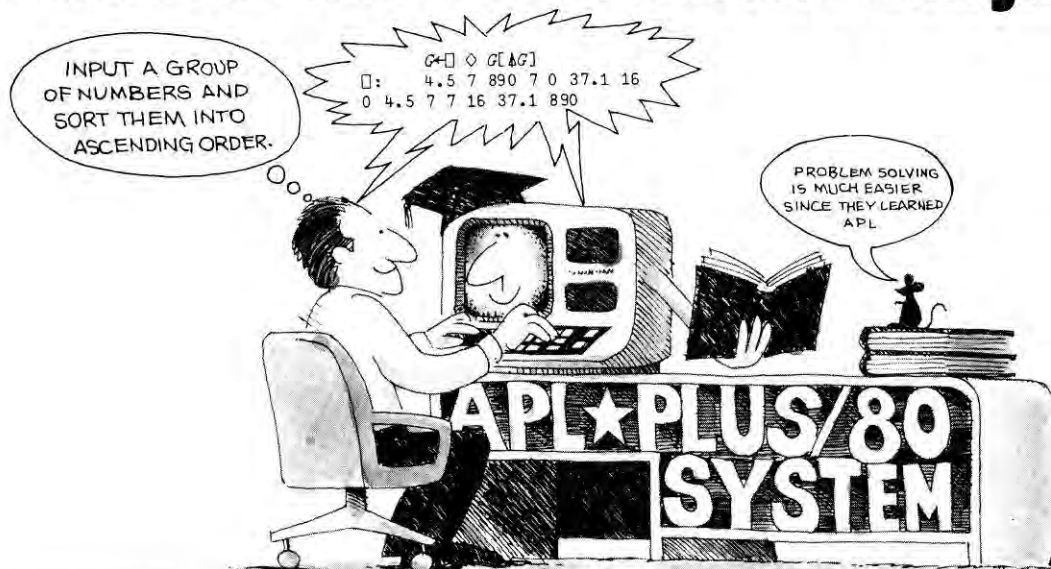
Matthews surmised opening up TRSDOS access is Tandy's reaction to competition from DOSPLUS.

He explained any independent software writer can buy a stripped-down version of DOSPLUS from Microsystems Software for \$2 or \$3 a disk. "By

One major independent software maker: "I think Tandy is just trying to throw a bone to the turkeys."



Teach Your TRS-80® A Second Language.



Your TRS-80 Model III already speaks BASIC and now you can teach it APL too, thanks to STSC's APL★PLUS®/80 Application Development System. Once you've run APL on your TRS-80, we're sure you'll both think of it as your first language.

Our APL★PLUS system features increase the well-known power and productivity of the APL language. You'll develop and maintain programs in one-fourth to one-tenth the time needed with BASIC, and you'll write applications you'd have thought twice about attempting in any other language.

Take a look at the following example. How long would it have taken you to program it in BASIC?

Develop a subroutine which enumerates all the combinations of N things taken from a population P. Its result is a table showing each of the possible combinations in a different row. Examples:

```

3 COMB 4      2 COMB 4      4 COMB 5
1 2 3          1 2          1 2 3 4
1 2 4          1 3          1 2 3 5
1 3 4          1 4          1 2 4 5
2 3 4          2 3          1 3 4 5
                2 4          2 3 4 5
                3 4
    
```

```

▽ S←N COMB P;R
[1] * MAKE SETS OF N ITEMS FROM P CHOICES
[2] * RECURSIVE ALGORITHM BY ALLEN J ROSE
[3] * ((N=P)←R←N=1)P L O S←(R01,P)P L O →0
[4] L: S←1+(0,(N-1)COMB P-1),[1]N COMB P-1
▽
    
```

This example is found in the textbook provided with the APL★PLUS/80, *APL: An Interactive Approach*, by Leonard Gilman and Allen J. Rose. A detailed explanation of this APL solution is included in our free information package.

Your programming may not include a task such as this, but it will certainly benefit from APL's power in expressing algorithms.

Worried that a language with this much power is hard to learn? Don't be. APL is *easy*! The programs have simple structure—the power comes from many built-in functions and operators. And our complete documentation gives you everything you need to make yourself *and* your TRS-80 bilingual. You get *APL is Easy!* (an introductory tutorial), an APL textbook, a set of four detailed user's guides and reference manuals, and two reference cards. That's everything you need, whether you're a beginning user or an experienced APL programmer.

When you buy the APL★PLUS/80, you're getting a complete application development system which includes:

- complete APL language and system features, upwards compatible with our mainframe APL systems
- powerful output formatter

- array-oriented file system
- access to regular TRSDOS® files and subroutines
- communications as a "simple" terminal *and* under APL program control
- traditional APL symbols *or* mnemonic keywords
- utility program libraries
- convenient access to many TRS-80 features.

So if you want to develop and deliver solutions faster and better for yourself or for clients, teach your TRS-80 a second language—APL.

Mail in the coupon below with your payment and we'll send you the APL★PLUS/80 Application Development System—all you need to run APL today on your TRS-80 Model III. If you'd like more details, check the box on the coupon and we'll send you our free information package.

We're STSC, Inc., the leading supplier of professional quality APL software and services in the United States. Our APL★PLUS systems have been serving the business and professional world for more than 12 years.

APL★PLUS/80 runs under TRSDOS 1.3 or LDOS® 5.1 on a 48K RAM TRS-80 Model III with two disk drives. The APL★PLUS/80 comes with custom APL character ROM.

stsc ✓266

Attn: APL★PLUS/80 Distribution
STSC, Inc., 2115 East Jefferson Street
 Rockville, Maryland 20852 (301) 984-5000 (orders only)

Yes, send me the APL★PLUS/80 System (\$295* in U.S. and Canada).

My check is enclosed. (Postpaid in continental U.S.)

Charge my MasterCard Account # _____
 MasterCard Bank # _____

Charge my VISA Account # _____
 MasterCard/VISA expiration date _____

Credit card customers add \$4.00 postage and handling in continental U.S.

*Add applicable state and local sales taxes in CA, CO, CT, IL, MA, MD, MI, NC, NM, NY, PA, TX, WA.

I'd like to know more about the APL★PLUS/80 System.

Send me your free information package.

Name _____

Address _____

City _____ State _____ Zip _____

Phone (____) _____

APL★PLUS is a service mark and trademark of STSC, Inc., registered in the United States Patent and Trademark Office. TRS-80 and TRSDOS are registered trademarks of Tandy Corporation. LDOS is a registered trademark of Logical Systems Corporation. 80-283

WETWARE

The future in Flatbush

Issac Asimov raps on computerized horizons at Brooklyn College conference.

doing that," he said, "DOSPLUS is flooding the market with their operating system. Not only that, but the DOSPLUS name is coming up on screens all over the country."

Publishing the source listing to TRSDOS is a dubious benefit of the program, claimed the software maker who wished his name withheld. "Tandy is willing to sell the source listing for TRSDOS. That's nice," he said, "since IJG is in the process of publishing those listings anyway for the whole world to buy."

When *Computer Business News* asked Shirley of Radio Shack why Tandy had changed so markedly its policy on support of independent software writers, he observed: "We had gotten comments from software developers, saying they'd like a little more help from us, and we got comments from customers who wanted a better way of finding sources for software for their TRS-80s."

"After all, there's a lot of software out there, and there's a lot of software still being written. We felt these policies would be a way of helping the people writing the software get together with the customers."

However, Matthews of Apparat maintained it was more than adherence to a customer feedback loop prompting Tandy to change its policy.

"I think Tandy is realizing if it doesn't do something soon, the wonderful world of IBM is going to blow them out of the water," he said.

"People coming out with microcomputers nowadays," he continued, "most notably IBM, are bending over backwards for people like ourselves, third party manufacturers, to make sure what they do doesn't bump software or hardware outside vendors may have developed."

"Tandy, for instance, in the doubler they made for the Model 1, went to some pretty healthy lengths to make that thing incompatible with just about every piece of software on the market."

"Apple will bend over backwards to help third-party manufacturers. That's probably why Apple has the largest chunk of the market right now."

"I think that Tandy has finally decided that if they don't do something, if they don't do it quick, their market share is going to drop drastically and they're certainly not going to make a living selling CBs." ■

A legislative commission focused on the challenges of living in a computerized society at a conference held at Brooklyn College in New York City.

Issac Asimov, author of 263 books and barker for Radio Shack computers, headlined the speakers at the session.

"There are no limits, in my opinion, to what computers can do...We have had nothing since writing, maybe since fire, with this potential to change our society," said Asimov, sporting his familiar gray muttonchop sideburns and western string tie.

The creator of the Foundation series of science fiction novels predicted computers will change literature. Readers will no longer be "passive receptacles," he maintained, but interact with novels.

Computer simulation will be a significant development for future societies, he told the some 150 conferees attending the forum at the invitation of the New York legislative Commission on Science and Technology and the Humanities Institute of Brooklyn College.

Before legislatures, businesses, or individuals make any decisions, they will create future scenerios via simulations, he said.

No one can predict the future—even with computers—he added. He cited an event in Wethersfield, CT, where a meteor hit a home. The chances of an outer space object doing that are very remote, he noted, yet it's the second occurrence in recent times it's happened in Wethersfield. "That tells me one thing. God is mad at Wethersfield, Connecticut," he quipped.

He predicted future computer games will create the illusion of participating in the contest by use of 3-D holograms. On existing video games, he observed: "You can't play these games without learning something. It's not worth learning, but it's learning."

Asimov said he uses his TRS-80 Model II only for rudimentary word

processing and knows little about the micro. One day, he related, he feverishly searched the machine's documentation to discover how to print a number with an exponent. A quick call to Fort Worth solved his problem. "Did you look up superscript?" the service man asked.

After Asimov's address, panel discussions and workshops were held on privacy, education, and social changes.

Two experts squared off during the panel on protecting individual rights in a computerized age.

James Howard, an attorney and vice president of ICS Group Inc., argued governments threatened privacy more than banks and private sector businesses.

"National financial institutions," he said, "are painfully far from calling up information on customers at will." CitiBank needed to merge 20 data bases to get the information it needed for its home banking pilot project, he noted. The cost was tremendous.

Howard, former acting chief counsel for the National Telecommunications and Information Administration during the Carter years, said: "It is the government agencies that pose the greatest threat to privacy. Government, and not the private institutions, are the driving force behind the invasion of privacy."

That assertion was questioned by George Trubow, a flamboyant professor of information law and policy at John Marshall Law School in Chicago.

"We are losing our ability to define ourselves," he argued. The information about us in computer banks is used to define us, he contended, and to predict how we will behave. If a business can predict human behavior, then it can program human behavior, he maintained.

The biggest private sector threat to privacy, however, may be your next door neighbor, he said. "I'm less worried about Big Brother," he observed,



The **LAZY WRITER** word processing system by **David Welsh**



LAZY WRITER has earned the
Professional Software Programmers
Association Seal of Approval

SIMPLE FACTS ABOUT LAZY WRITER!

It's **FAST!** — written in machine code, not BASIC!

It works with **ANY** printer, not just Radio Shack printers! You can put control codes for your printer anywhere in text (including in the middle of a word) to make use of any type fonts or movements your printer can make.

To make it even easier for you, you get information sheets on using LAZY WRITER with your printer. This extra help is available for these printers: **Epson MX-80** with or without Graftrax, the **C. Itoh F10 Starwriter**, the **C. Itoh 8510 Prowriter** dot matrix, the **Centronics 739**, the **Microline 83**, the **RS Daisy Wheel II**, the **RS Line Printer VIII**.

The manual is written in plain English, and is easy to follow. Because some of you want even more help, we're working on LAZYBOOK, a complete guide to word processing with your TRS-80 and LAZY WRITER.

Want your text proportionally spaced? We have proportional programs for these printers: **RS Daisy II**, **Centronics 739**, **Qume Sprint 5**, **C. Itoh F10 Starwriter**, **C. Itoh 8510 Prowriter**, **RS Line Printer VIII**.

Want extras for your word processor? You can buy LAZYDRAW, LAZYDO, LAZYCALC, LAZYTAB, or LAZYDOC. With all these extras, you can draw pictures, do math, align decimals, and get automatic insertion of words or paragraphs into standard documents. We'll soon be offering LAZYMERGE to merge text files with a mailing list and LAZYFONT to create type fonts for your dot matrix printer. LAZY WRITER is a growing SYSTEM of programs that do what you want!

Every LAZY WRITER owner receives free copies of a newsletter that is full of information on effective word processing, written with the layman in mind.

FAST! EASY! POWERFUL!

"This program enjoys some of the best manufacturer support I've encountered . . . LAZY WRITER is one of the most sophisticated TRS-80 word processing packages around. It has excellent features, documentation and support, and can be expected to provide ongoing utility for even the most demanding user." - **T. A. Daneliuk, InfoWorld**

"LAZY WRITER is GREAT! Our Customers and ourselves all agree that this is the best word processing system to be found for TRS-80 Models I & III. Not only is it powerful, but its straight-forward organization makes it simple to learn and use." - **Winter Garden, Florida**

"Since getting LAZY WRITER, I have thrown away Electric Pencil, Scripsit, Data Merge, and all my other word processors. I find that LAZY WRITER alone will do all that I need." - **Sacramento, California**

"I am as impressed by your continuing support of LAZY WRITER as I am by the program itself. From all I have seen and read, I am glad I passed up Electric Pencil and Scripsit for LAZY WRITER" - **Houston, Texas**

"Thank you for a great product and for your continued support of it. In both capability and support, it surely leaves Scripsit for dead." - **Auckland, New Zealand**

"I have fallen completely, madly in love with it. It is so good that I may not sell my TRS-80 . . ." - **Washington, D.C.**

dealer inquires invited



✓476

For TRS-80 Mod. I & III - \$175.00

ABC SALES, 13349 MICHIGAN AVE., DEARBORN, MI 48126 (313) 581-2896

"than little brother next door with his personal computer."

Fear of a massive central computer containing files on every citizen is misplaced fear, according to Norma Rollins, director of the Privacy Project for the New York Civil Liberties Union. She explained computer networking can create an omniscient data base without a large central computer being built.

Computer size occupied a prominent place in the discussions of the panel on the effects of computers on human values.

Opening the afternoon session on a nostalgic note, Brooklyn College Department of Computer and Information Science Chairman Frank Beckman said during the 1950s, computers were "quite impressive, not the sneaky little machines we have today."

If the old vacuum-tube technology were used to build an IBM 3081 today, the computer would be the size of the Houston Astrodome and require the Gulf of Mexico to cool it, said Denos C. Gazis, assistant director for IBM's Computer Sciences Department.

He claimed he has more computing power in his bedroom than IBM's research department had when he joined it in 1961.

Harvard Associate Vice President for Information Services and Technology Howard Resnikoff told listeners he envisioned a day when a microcomputer would be the size of a bacterium. The micro, he said, could be programmed to alert physicians when something is wrong in a body or even cure the ill.

A few years ago, he observed, people were concerned with creating life arti-

cially. "Now we are on the verge of something more startling," he said. "The creation of thought without any life at all."

Dr. Resnikoff, wearing a gray pin-stripe suit and sporting a beard without moustache, predicted if legislative concern over automation produced limitations on using robots "overseas interests will reap the rewards of our concerns—not American workers."

"The possibility of good [from computers] is limitless," he said, "but the possibility of evil is not negligible."

Despite humanity's penchant for recording knowledge, history's shown old wounds are best healed with the passage of time. But computers will change that, too, according to Gazis. "Computers," he said, "will take away our benign ability to forget." ■

HARDWARE

Nightmares into sweet dreams

A company named TRW plants seed for would-be personal computer service network.

Have you had this nightmare? You sit at your micro, try a cold boot, and nothing happens. Unless you're electronically inclined, you suddenly experience a sick, sinking feeling where your stomach ought to be.

Relax. It was only a dream. But should it become a reality, a company named TRW may be some help to you in the future. The firm's Fairfield, NJ, Customer Service Division has opened a personal computer service center in Dallas, TX, and has its sights set on opening more next year.

John Harnett, the division's director of planning and development, said in a statement the center will offer the general public the high caliber of service historically reserved for large commercial computer users.

"We're taking the hassle out of personal computer repair for the individual consumer," he observed. "The speed and efficiency of service this center will provide are going to set standards for the industry."

The center will service most major brands of computer-related equipment including video games and TRS-80s. "That's not one we're actively seeking," TRW Marketing Communi-

cations Manager David F. Gill said of Tandy's micros, "because Radio Shack has its own service centers. On the other hand, if they bring it in to repair it, we will certainly repair it."

The centers might offer a service alternative to TRS-80 owners who've upgraded their micros with foreign parts and add-ons. "We will service it with whatever parts it has," Gill told *80 Micro*. "The only limitation we have on that is obviously the availability of spare parts to us."

Gene Carson, one of the center's managers, feels short turnaround time will be a major plus for the store. "When your personal computer breaks down," he said in a statement, "you won't have to ship it to a remote service center and wait days or weeks for its return. Just drop the equipment off at our center and in most cases, we will have it ready for you within 24 hours, sometimes even while you wait."

The center will do chiefly component

repair, Marketing Communications Manager Gill explained. Components will be repaired on their original boards. However, there's an exception to this rule when there's heavy traffic in an item. "We'll say, 'Okay, these boards are the ones that typically go bad,'" Gill said. "We'll stock those boards, replace them when they come in, and turn them around in 10 minutes."

He explained, "A lot of things that go wrong with a micro are very common and don't require an exotic part or something of that nature."

"Printers give the biggest problems of the mechanical devices," he continued. "Any mechanical device is subject to wear."

Inside the micro, he noted, problems usually originate with disk drives, which are mechanical, or blown fuses.

He added, "The biggest single problem is mishandling diskettes."

Prices at the center are fixed at \$25, \$50, and \$100, Gill said. If it appears a repair will cost more than \$100, a customer is notified. "We will do an estimate on it," he added, "and stick to that estimate."

Manager Carson said the center warranties repairs for up to 90 days. Future

Which TRS-80* Accounting Software Do I Buy . . .

That's a tough question. I know, I asked it myself not very long ago. I'm Mike Motta. As president of Shawmut Systems, specialists in TRS-80* custom software, my customers were asking me for Model II and 16 Accounting Software — GL, AR, AP and Payroll. But I said "Why write the software. There must be a good package already available." So I searched for the best I could find. And I found it!

Now, when I tell you that these are the best Accounting programs I've seen on a microcomputer, you probably think that you are just listening to another sales pitch. But you're not. You're listening to a businessman with over twenty years combined experience in sales, management, and programming. So when I say that these programs will work for you, it really means something.

Each program, designed for the Model II or 16, will work with one or more floppy or hard disks. With each program, I'll include a 200 page manual written with the first time user in mind, and a set of sample data files so you can start using the program right away.

But I won't stop there. If you have a question, or a problem, call me. You won't get an operator, or order taker. You'll get me. And if I can't talk to you on the spot, I'll call you back. And I'll fix your problem. FAST.

Now I could say a lot more about these programs, but you really won't know how good they are until you try them. So, order the programs you need, and try them for 14 days. If you're not convinced that these are the programs for you, send them back, and I'll refund your money.

My price for these programs is only \$289.00 each, postpaid. I could charge hundreds more, but I want you to have the best programs at the best possible price. So mail or call your order in today. I'll make sure you'll be satisfied.

Model II/16 Accounting Software Packages

Accounts Receivable	\$289	Accounts Payable	\$289
General Ledger	\$289	Payroll	\$289

SHAWMUT SYSTEMS
105 Circle Drive • PO Box 324-A
Somerset, MA 02726
(617) 672-9794

Ask about our Model I and III versions.

Send check, money order or Visa/MC number

*TRS-80 is a Trademark of Tandy Corp.

Mass. residents add 5% sales tax.

✓ 363

Tried and Proven:

LOG

THE ELECTRONIC NOTEBOOK
PROGRAM BY KSoft

LOG Documentation	PAGE 2	08 02 81	16 04 90 P
CONTENTS			
Cursor positioning commands	pages 3-4		
Page positioning commands	pages 5-7		
Write commands	pages 8-11		
Lineprinter commands	page 12		
Special commands	pages 13-14		
Search command	pages 15-20		
New page creation	page 21		
Entry options	pages 22-24		
Exit	page 27		
Technical information	pages 28-33		
Suggestions for use	pages 34-37		
continue to next page			

One year old and a proven success! LOG for the TRS-80 (R) is still the only program on the market that addresses one very obvious problem: Despite data-base managers, word processors, and a dozen brands of spreadsheets, the fact is that most of the information people handle on a day-to-day basis just won't fit into fields, files, and codes.

LOG, on the other hand, is a program that "thinks" like you do! LOG turns your video screen into a one page of a large notebook. Thumb slowly or search like lightning through your previous entries; modify, update, or erase as you desire with the built-in text editor. Append new pages with a single keystroke, up to 170 individual pages on a Model III diskette! Keep a separate LOG notebook on any diskette in any drive.

Yes! LOG supports hardcopy to your lineprinter.
Yes! All commands are single keystroke (no modes to remember).
Yes! You can access LOG while BASIC is running.
Yes! It really works!

People are using LOG to store address lists, programming notes, diaries, personnel files, recipes, record collections, and a hundred other uses. Think up your own applications. You'll probably use it every day.

Model I	48K	\$49.95	(upper case only)
Model III	48K	\$49.95	(upper/lower case)

Minimum system: 48K, 2 disk drives, DOS 2.3 (I) or 1.3 (III) required. Ask about other Operating Systems or hardware configurations.

Write or Call for further information:

KSoft (601) 992-2239
318 Lakeside Drive
Brandon, MS 39042

Master Card and Visa Accepted.
MS Residents pay 5% sales tax.
We pay shipping and handling in USA.

✓ 331

(TRS-80 is a trademark of Tandy Corporation)

FREE EPSON MX-80 PRINTER

With the purchase of a TRS 80, Model III.



For a limited time, Data Services, Inc., will give you a FREE Epson MX-80 Printer (\$645 value), when you buy a TRS 80 Model III, 48k, with 2 PERCOM 40 track drives, at our new low prices of \$2,295.00.

(Includes RS-232, Printer Cable, TRSDOS.)

The perfect system, the perfect price!
TRS 80 Model III, 48k - two PERCOM 40 track drives - EPSON MX-80 Printer.

Data Services offers more — APPARAT'S NEWDOS 80, version VER 2.0, regularly \$ 149.95 — now only \$119.95 (Model III units only.)

Up to 20% savings on TRS computers — accessories — programs, Plus: EPSON / PERCOM / APPARAT / HAYES SMARTMODEM / VERBATIM DISKETTES / MEMOREX DISKS.

*TRS-80 is a trademark of Tandy Corporation.

- FREE SHIPPING in 48 contiguous states.
- No Sales Tax on out-of-state orders.
- Visa/Master Card welcome.
- Personal checks, allow 3 weeks to clear.
- (International orders, freight F.O.B. Wichita, Kansas)

CALL TOLL FREE: 1-800-835-1129
or order by mail from:

DATA SERVICES, INC.

COMPUTER SERVICES SINCE 1970

✓ 118

P.O. Box 1157 Wichita, Kansas 67201-1157
(In Kansas, call 1-316-838-9021)

plans call for service contracts where customers can sign yearly agreements to cover maintenance and service on their equipment.

The center also provides computer supplies, software, publications, and a computer bulletin board.

Gill added the center will upgrade a customer's micro. "We will not recommend anything," he said. "However, if someone comes in and asks if this thing-amajig will work with that gizmo, we will look at it and tell them if it will or won't."

Extensive expertise and a large parts inventory are keys to the center's effectiveness, Carson maintained.

"Our four managers have nearly a half century experience among them," he said. And according to TRW, its service division services more than 700,000 pieces of equipment for 80,000 customers and makes more than 2 million service calls annually.

"We have an extensive parts inventory," Carson added, "and what we don't have we can get overnight from one of our commercial repair centers."

Carson's statement mystified Jon Campbell, press relations manager for Texas Instruments' Consumer Group. "I spoke to the people that run our repair center and they have not heard from TRW about this," he told *80 Micro*. "They were a little puzzled. How could TRW do repairs on the 99/4A if they haven't contacted us for spare parts?"

He said, "We do not have any outside arrangements to repair our units and we are not looking for any."

He added if a 99/4A were still under warranty when TRW repaired it, the TI warranty would be voided.

Texas Instruments has 50 exchange centers in the nation, he explained, where, if a 99/4A breaks down, its owners may exchange it for a new one or have it repaired. Exchanges are free during the warranty period, \$45 after the period ends. Costs for repairs range from \$25 to \$80.

Other computer manufacturers hadn't heard of TRW's efforts in servicing personal computers.

Commodore, whose business systems are serviced by TRW, was unaware the TRW center might be servicing VIC 20s.

A spokesman for Commodore said if something goes wrong during the VIC 20's warranty period, it can be returned to point of purchase for a new machine.

After the warranty expires, he added, VIC 20s are sent to one of Commodore's factories and the user is sent a factory reconditioned unit within 48 hours.

"The Commodore 64," he said, "is only being sold through computer dealers. All computer dealers are required to be service centers as well. The dealers can solve 90 percent of the problems that come up. The other 10 percent will be referred to regional service centers."

An Atari spokeswoman said she recommended Atari computers be brought only to the 1500 service centers the firm has established across the country.

For firms, like Apple, requiring their dealers to provide service, TRW could offer an alternative service channel. A number of dealers and distributors have approached TRW, Marketing Communications Manager Gill claimed, and

said the service center approach was a "great idea." He added, "They'd rather concentrate on selling and let us service it."

The first TRW center opened last October. This month or next, TRW will be assessing it to see if they should start up more of them. "If things are growing and we've got a steady trend upward, we will expand to as many as 15 more places next year," Gill said.

Planning and Development Director Harnett added, "Besides providing first-rate service, I believe these centers will help take some of the mystique out of computer usage.

"The more people realize that computers can be like other equipment they use daily to make life easier, the more computers will be found in the smaller office and home. By repairing them quickly and effectively, we're promoting this message." ■

BUSINESS

Rent-a-computer

If you're in Champaign-Urbana, IL, you don't have to own a micro to use a micro.

By P. GREGORY SPRINGER

SPECIAL TO 80 MICRO

Is rent-a-computer the next big thing, an idea whose time has come? The McDaniel family of Champaign-Urbana, IL, hope so, and they've begun a business to test the theory.

In the heat of summer—in a former typewriter supplies store on the main campus at the University of Illinois—Marvis Jerry McDaniel, his son Myron McDaniel, and other investors opened up Micros Unlimited Inc., a name with a big claim to keep. Twenty-seven computers, most of them TRS-80 Model IIIs, have been stationed in individual four-foot-by-five-foot carpeted cubicles, with printers and paper and all the peripherals anyone would ever need. Epson printers come furnished in each booth, with a daisy wheel letter-quality printout available at an extra charge. There's room for 60 computers in all, and the McDaniels hope not only to expand the business locally, but in other locations as well.

Who wants to rent time on a

computer?

"Students, especially graduate students, are the prime market," explained the senior McDaniel, who graduated in engineering from Illinois in 1953.

"Law students, graduates who need cover letters and resumes written, people who need to swap address blocks and do multiple printing."

"I've been working as an independent consultant for computers for 20 years here," he said, "and we have not yet begun to explore the use of media in getting computer possibilities understood by the students. More than half our customers now are students, but—like the mule—they're going to have to be hit on the side of the head to get it through to them what word processing is all about. They might think it's only for business, they have no clear idea of what they are capable of doing with computers."

To help publicize the initial opening of Micros Unlimited, engineers, com-

MULTIDOS

- IS THE DOS WITH THE MOST EFFICIENT DISK BASIC INTERPRETER
- IS THE DOS WITH THE ORIGINAL & STILL THE BEST SINGLE STEP BASIC
- IS THE MOST COMPATIBLE OPERATING SYSTEM ON THE MARKET
- IS EASY TO LEARN — EASY TO USE!

MULTIDOS does the following AUTOMATICALLY!

- ADJUSTS** for CPU speeds of 1.77 thru 5.32 MHz without the need for slowdown during disk I/O.
- DISABLES INTERRUPTS** when CLOAD, CSAVE, or SYSTEM is entered from the command mode (Model I).
- EXECUTES** the most commonly used Library command, DIR, with one keystroke.
- PREVENTS** system hanging, even without a diskette in drive ZERO.
- READS** single density, double density, Model I and Model III diskettes.
- STEPS** machine language programs for debugging (controlled execute).
- TOTALS** free diskette space on all mounted diskettes.
- SENSES** type of double density hardware (RS or others).

"Nobody Does It Better"



— MAIL ORDERS —

Cosmopolitan Electronics Corporation

P.O. BOX 89 • PLYMOUTH, MICHIGAN 48170

★★★★★★

— TECHNICAL INFORMATION —

Cosmopolitan Electronics Corporation

C/O VERNON HESTER
42403 Old Bridge Road • Canton, MI 48188 • (313) 397-3126

800-392-3785



**VISA & MasterCard
WELCOMED**

Foreign Orders Add \$10.00
For Shipping & Handling

★ For Model I Orders Only ★
Please specify Single, Double
or P Density.

\$99⁹⁵

**\$3.00 For
Shipping & Handling**

Michigan Residents
Add 4% Sales Tax

C.O.D. Orders Add \$1.50

Personal Checks Take
2 Weeks To Clear

puter science students, the liberal arts and science school, and commerce departments were invited to several open house demonstrations of what microcomputers can do for the busy student who's all thumbs at a keyboard.

While McDaniel spoke, a customer walked into the brightly lit reception room and inquired about an IBM Displaywriter to rent. "We'd have to charge \$20 an hour for that!" whispered the younger McDaniel, after the customer is told none is available at the moment. "That's a \$12,000 machine!"

Micros Unlimited might not be able to offer a computer user every model he or she would desire, but it's making an effort to have variety and simple access for inexperienced users.

"There are too many variations of software to deal with for most dealers to be able to explain them properly," Jerry McDaniel continued. "Scripsit is easiest to learn. We teach it in a matter of minutes. Within 30 minutes to an hour, we have people working on it.

"A German student came in this afternoon and composed two letters in 45 minutes. He had no previous computer experience.

"Most software documentation is disappointing, perhaps keeping more people away from computers than drawing them to them. The manuals are written by people who know the hardware and assume that everyone else does too. We tried the AppleWriter for six hours one night and gave up. The manual was terrible.

"Micros Unlimited will write its own instructions for customers. What do you want to do? How do you do it? Books and manuals often don't tell you what will happen when you follow their instructions. It's like a game. How do you turn on the machine in the first place, for example? The switches aren't where you can see them."

For an hourly rental fee averaging \$3.80, students, businessmen, and university faculty have been coming to Micros Unlimited and learning about computers in the process. Word processing software is available for term papers, theses, letters, and reports. VisiCalc, Cobol, Pascal, and Fortran are also available for solving engineering problems, financial projections, and scientific calculations. Programs to check spelling and grammar have helped some students with papers that need reworking before they can be submitted for a



Photo by G. Gregory Springer

Micros Unlimited: Model IIIs with printers, paper, and all the peripherals anyone would ever need.

grade. For the slight fee charged, it can be a reassuring pregrade reading.

When asked what would prevent home computer owners from merely copying these software programs for their own use, McDaniel replied: "The law. Everyone must sign a release when they work here, stating that they are renting the equipment and the software. It's like any recording or duplicating copyright problem. Also, our diskettes are write protected with tabs."

Although Micros Unlimited uses Scripsit for most of its word processing customers, the problem of underlining and superscripts—frequent requirements for college students—hasn't been fully dealt with yet. "Sometimes they will add the underlines manually," McDaniel said. "We aren't using SuperScripsit at this time. We do have Script-Plus available for certain jobs. We also have WordStar and CP/M for other jobs. We have a variety of computers."

In addition to setting up a work space for computer users who can't afford to own their personal machine, Micros Unlimited sells and rents out both hardware and software.

"We rent machines to businesses; it's usually too expensive for individuals. The Democratic congressman team uses

one of our machines 22 hours a day these days. We also rented out Profile III+ to them, although we try to avoid renting software. We encourage people to buy it by charging a hefty amount. We try to be fair to the creators of software."

The McDaniel family stresses Micros Unlimited is basically aimed at the individual who needs a short-term use of word processing or computing capability. To encourage this, they've formed a club. It offers members:

- A disk;
- Four hours of free time;
- Free unlimited use of instruction tape and cassette;
- Discounts on future rentals;
- Free use of a spelling and grammar checker; and
- Discounts of up to 20 percent on the programs, books, disks, and magazines.

The hardest thing to stock so far, they have found, is the magazine rack. For some reason, the local news service has been protective with the distribution of popular computer magazines. "We had to go out and raid his place to get any in here at all," McDaniel explained. "It's about time to go out and make another raid, too." ■

Expensive Expansion



EXPENSIVE – The LNW *System Expansion II* and built-in comes with a full 32K of 200ns RAM, RS232c 20 MA current loop serial interface. That's for starters. Next, consider our heavy gauge steel case, power indicator lamp, gold-plated connectors, FR-2 glass epoxy circuit board with solder mask and silk screen legends. Then there is the parallel printer port, screen printer port, real time clock, and extra heavy duty onboard power supply with over current protection, over voltage protection and thermal shutdown. If that's not enough then there is the floppy disk controller, guaranteed operation at a 4MHz CPU speed and our 6 month warranty. Every one of these features is **STANDARD**. This is true system expansion. You get every 'expensive' feature without spending more.

CHEAP – Our price is \$399.95. Any way you compare, features or price, LNW's *System Expansion II* is the clear winner. The LNW System has been field tested for over two years with thousands of users. It works with any DOS, is 100% TRS-80 Model I compatible and it works 'right out of the box'. If there is any doubt in your mind as to whether you should buy ours or the 'other guys', just ask an LNW owner!

WE ARE #1 – Number one in price, features, reliability, performance and delivery. LNW is committed to 'expensive' features and quality at reasonable prices. LNW is committed to support, thorough documentation, and reliability.

LNW Research Corp.

2620 WALNUT Tustin, CA. 92680
(714) 641-8850 (714) 544-5744

This has made us the number one manufacturer of system expansion units and accessories for the Model I computer. **EXPANSION OPTION** – 8-inch drive capability is as easy as plugging in the *LNDoubler 5/8* option*. Now you can have any combination of single- or double-density, single- or double-sided, 8" and/or 5" disks on-line! 8-inch disk storage increased to 591,360 bytes – 77-track single-sided, double-density or 1,182,720 bytes – 77-track double-density, double-sided.

The *LNDoubler's* unique 5/8 switch allows you to boot from 5- or 8-inch system disks and it's accessible from outside the interface. The \$219.95 *LNDoubler 5/8* comes with a double-density disk operating system (DOS+ 3.3.9), complete with BASIC and utility programs... ready to run your software.

Each of your present 40-track, single-sided 5-inch drives will store up to 184,320 bytes (formatted storage) – that's an 80% increase in storage capacity for only half the cost of just one disk drive. With three 8-inch double-density, double-sided drives your Model I will have 3.75 Megabytes of online storage – that's more storage than a Model II or Model III!



*8" drive operation requires special cable. 8" double-density requires 3.55MHz CPU speed-up modification or LNW-80 4MHz computer.

GAMES

Custer's Lewd Stand

Clad only in hat and boots, Little Big Horn loser chases Indian woman and whips up national imbroglio.

BY JOHN P. MELLO JR.

80 MICRO NEWS EDITOR

From coast to coast, a microcomputer game depicting the alleged rape of an Indian woman by General George Armstrong Custer has been slammed by concerned groups. But the pasting "Custer's Revenge" has taken in public may only fuel sales, according to two blue marketeers.

"I think the controversy is going to accelerate the game's sales considerably," contended Daniel Ellis, publisher of *The Dirty Book*, a twice-a-year listing of "erotic" software.

Asked how the Custer's Revenge flap would affect his games, J. P. Nelson said, "I think it can only help them. Nelson, board chairman of Computer Kinetics Corporation located in Westlake Village, CA, explained his firm makes three coin-op games placed "strictly in adult locations."

Stuart Kesten, president of American Multiple Industries in Northridge, CA, reportedly predicts his firm will sell 750,000 copies of Custer's Revenge. If that prediction proves true, the game would gross more than \$3.7 million for American Multiple.

The corporation makes two other blue games—"Bachelor Party" and "Beat'em and Eat'em"—but neither has sparked the outrage caused by Custer's Revenge.

When American Multiple demonstrated the game last October at the National Video and Audio Conference in New York City, some 100 people representing women's and American Indian groups demonstrated against it.

Since Custer's packaging includes a reference to Atari, the game giant entered the melee, claiming its good name had been sullied. It alleged American Multiple had tried to cash in on Atari's trademark and filed a lawsuit against the American Multiple in federal district court in Los Angeles.

Legal action against American Multiple is also contemplated by the American Indian Movement.

Meanwhile, local governments joined



the controversy. In the Sooner state, the Oklahoma City City Council adopted resolutions condemning the game. And the Los Angeles Board of County Supervisors adopted a three-pronged attack against it.

Opponents of Custer rail the game because they claim it condones rape, is racist, and is sexist.

Betty Rosenstein, head of the Los Angeles County Commission on the Status of Women, declared, "We are horrified that there are games in which entertainment of the players comes from the act of rape and sexual assault against women."

"We are very disturbed at its idea that rape is acceptable, that it's supposed to be fun," observed Helen Parolla, director of New York City's YWCA Center for Public Policy.

The National Organization for Women also found the game offensive. Among its objections: The game trivializes the pain and humiliation suffered by the one in three women raped in her lifetime and promotes the idea a manly man is a rapist.

"It's making the player of the game a

third-party participant in the rape," noted a spokesperson for Women Against Pornography in New York City. "This is a new dynamic. In the past, a person has been a viewer of pornography, not a participant. You are maneuvering Custer over to the Indian woman tied to a post. You're maneuvering him to rape her."

"It rewards a player for rape," she said. "That's how you win the game. It's making rape something to be rewarded for."

The spokesperson's comments become more sobering in light of recent findings in *The Journal of Communication* published by the Annenberg School of Communication at the University of Pennsylvania.

In a study of pornography, Penn researchers discovered male and female students who watched a large number of blue movies found rape less objectionable than similar students who watched nonerotic films over the same period of time.

Repeated attempts by *80 Micro* to reach American Multiple's president by telephone failed. However, Custer's creator, Joel Miller, reportedly denies the 7th Calvary's fearless leader rapes anyone. "He's seducing her," Miller is quoted as saying, "but she's a willing participant."

Kesten told wire service reporters: "Our object is not to arouse; our object is to entertain. When people play our games, we want them smiling. We want them laughing."

"The idea of the game itself is to have fun, not just to have a cheap sexual joke," he said. "These games are not meant to arouse and I would wonder about anyone being sexually aroused by them."

Custer's detractors also found the game racist.

Resolutions adopted by the Oklahoma City City Council stated, "Responsible citizens representing all segments of society are repulsed both by the vulgarity of this video game and its calculated insult to minority groups in

"I Love To Drive My 380Z"

"...And I can drive it at 32 CPS with an Apple, Osborne, TRS 80 and others."

DTC 380Z

The DTC 380Z: A new standard in advanced technology at a dramatically low price

- 48K buffer for high speed throughput
- Diablo 1640/1650/630 software compatible
- Serial and parallel interfaces
- Serial baud rates to 19.2K
- Automatic baud rate selection
- Four CPU's, no cables, belts, wheels or pulleys
- Letter quality daisy wheel printer
- 12 print styles, 15 languages, 96 char. wheel, standard ribbon
- Automatic bi-directional printing
- Proven reliability 100,000 printer mechanisms produced
- Up to 32 CPS print speed in typical applications
- Interconnecting cables for all major micro-computers
- Automatic proportional spacing
- Parallel 6K bytes per sec. transfer rate
- Optional extras: forms tractor, cut sheet feeder.

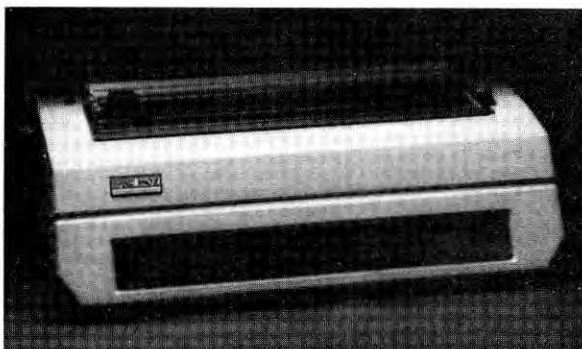
MONEY BACK GUARANTEE

ORDER NOW

VISA • MASTERCARD

800-962-8185

in CA 800-538-9294



The DTC 380Z
DAISY
Wheel Printer

\$

1359

America.”

And in a letter to Kesten, YWCA National President Jewel Freeman Graham and National Executive Director Sara-Alyce P. Wright declaimed:

“It is a sad symbolism in our society when the sexual overpowering of a nude Indian woman by an American general is considered by your company either comedy, victory, or fun. The blatant racism of a white male attacking an Indian woman in this suggestive manner contributes to the continuation of a racist-sexist society.”

The National Organization for Women declared the game promoted the acceptability of raping Indian women, masked and trivialized the racial genocide practiced by the real Custer, and used the new technology to degrade the American Indian community rather than advance ideas of equality and humanity.

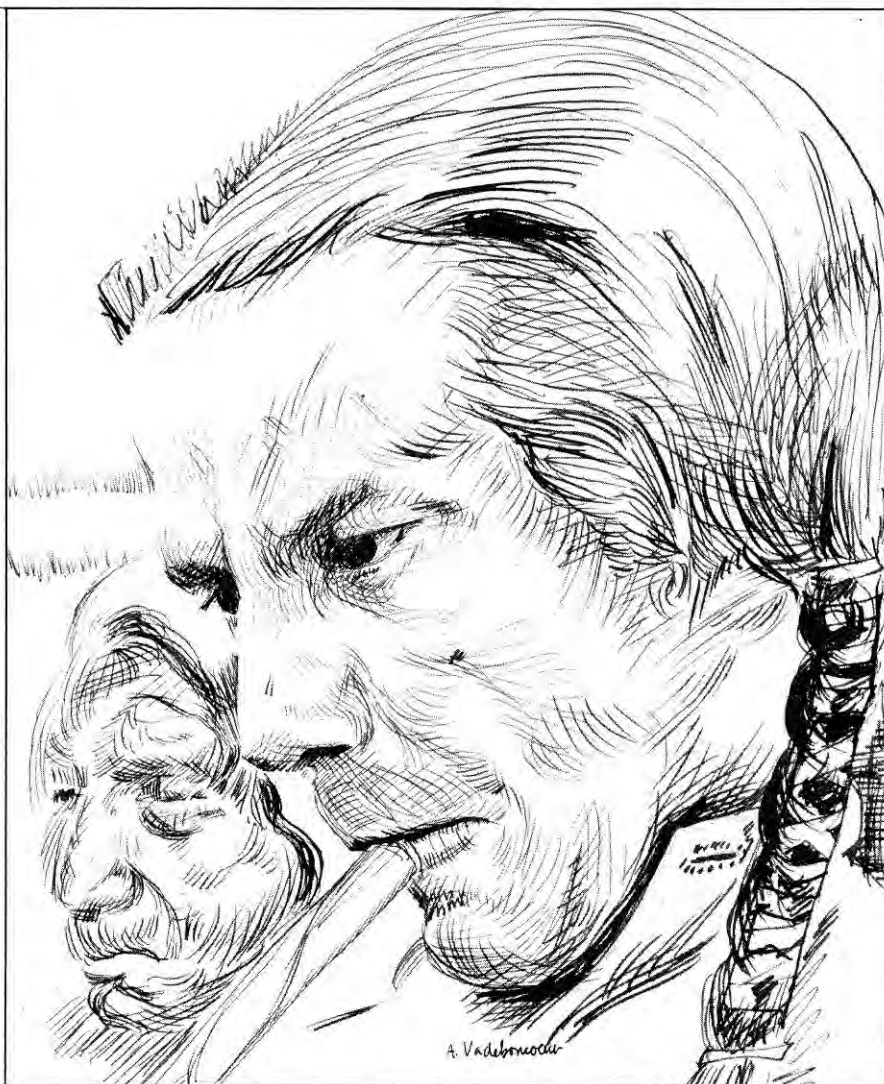
“As American Indians,” said Rudy Martin, public relations director for the American Indian Community House in New York City, “we are vehemently opposed to the exploitive use of our race for the titillation of the public. We see this disgusting video game for what it really is: a sexist, racist, sadistic expression, the sole purpose of which is to fill the pockets of its creators and promoters.”

He asked: “Would the characterization of a people be acceptable if it depicted Begin attacking a Palestinian woman, Prince Charles chasing a female IRA member, or Hitler having his way with a naked Jewish maiden? We think not.”

“Tomorrow it will be an attack against someone black or brown or homosexual,” Rosenstein of L.A. County added. “And then an assassination against a president. Do we want to live in a community with that kind of sickness?”

“The only result this game will have,” Martin said, “will be to promote a casual attitude toward racism, a misguided sense of white, male superiority, and the reinforcing of the stereotyping of American Indians as something less than human.”

He called the game “a statement of the deterioration of what was proclaimed proudly as American society” and said “it serves only to perpetuate the violent and sexist characterization of American people in the eyes of the world.”



Banks: Strung-out lawsuit.

“We have enough sickness and violence in our community without adding more to it,” Rosenstein observed. “I guess the real question is, do we really want to have a community where recreation is based on humiliating and degrading and dehumanizing women.”

Apparently, these issues were less nettlesome to Atari, lambasted for making the medium for Custer’s unsavory video deeds.

“Atari takes a very dim view of this use of our product,” Atari Consumer Products Division President Michael Moone said in a statement.

“We are quite upset,” he continued, “with someone who has chosen to use our product for a purpose which was not intended.

“We intended the product for whole-

some family entertainment, but to say that Atari is responsible for this occurrence would be as illogical as censoring a camera company for making cameras because a few people take pornographic photographs.”

Although Custer’s opponents want the game banned, they realize the law offers them little recourse.

“Unfortunately,” lamented Moone of Atari, “some individuals take refuge behind certain legal precepts to the dismay of the majority of the people.”

“We’re not looking to run into the First Amendment,” Atari attorney Kenneth J. Nussbacher told the *New York Times*. He said American Multiple failed to adequately disassociate itself from Atari and capitalized on Atari’s name and trademark.

Kesten of American Multiple saw

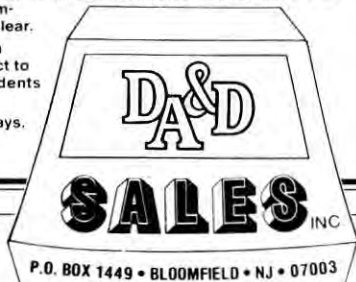
- STAR MICRONICS PRINTER GEMINI 10-Fiction/**
Tractor, 100 CPS, 2.3K Buffer, & Hi-Res Bit Image
Graphics (Parallel)..... \$375.00
- STAR MICRONICS PRINTER GEMINI 15-w/15"** Car-
riage, plus bottom paper feed and all the above
features (Parallel)..... \$470.00
- LNW COMPUTERS Model I** (1 Yr. Warranty)..... **CALL FOR PRICE**
- LNW COMPUTERS Model II** (1 Yr. Warranty)..... **CALL FOR PRICE**
- EPSON MX-100 III, MX 80-FT III, MX 80-III**..... **CALL FOR PRICE**
- Okidata 80 Printer 80 CPS, List \$449**..... \$330.00
- Okidata 82A Printer 120 CPS, List \$649**..... \$440.00
- Okidata 83A Printer 120 CPS, List \$1,119**..... \$675.00
- Okidata 84 Printer (parallel) 132 column, 200 CPS**..... \$980.00
- Smith Corona TP-1 Daisy-wheel printer, parallel or serial,**
10 or 12 pitch, List \$895..... \$615.00

- BMC 12AU 12 inch 15 MHZ, green on black monitor**..... \$95.00
- BMC 12EU 12 inch 18 MHZ, green monitor with**
non-glare screen..... \$129.00
- DC Hayes Smartmodem (300 & 1200 BAUD) List \$699**..... \$505.00
- DC Hayes Smartmodem, List \$279**..... \$219.00
- Practical Peripherals Epson Buffer (parallel 16K) for**
Apple II or Radio Shack, List \$159..... \$135.00
- Percom Doubler II with Dos Plus 3.4**..... \$149.00
- Practical Peripherals Micro Buffer Inline 32K**
(specify serial or parallel)..... \$244.00
- Tandon 40 Track Drive complete w/case & power supply**..... \$280.00

CASH ONLY PRICE INCLUDES money order, certified company & personal
check & COD. Personal and com-
pany checks take two weeks to clear.

Shipping & Handling Charge on
light items \$2.50. Prices subject to
change without notice. NJ residents
add 5% sales tax.

HOURS: 10 AM to 5 PM Weekdays,
After 5 PM and Weekends
Questionable.



**Send for
COMPLETE
CIRCULAR**

201-751-8444 ✓55

A Pot Of Gold For YOUR Color Computer

I buy practically every computer magazine there is, but the RAINBOW is the
only one I read cover-to-cover as soon as it comes in the mail - A subscriber

The RAINBOW gets that sort of response for more reasons than one - but the primary one is simply it
is the premier magazine for TRS-80® Color Computer users. And because it devotes every page of each
monthly issue exclusively to the Color Computer it is the single best source of information for everything
you want to know.

Tired of trying to convert other computer programs to your Color Computer? No worries. Each program
in the RAINBOW is written exclusively for your computer - and many take advantage of all the excellent
graphics commands unavailable on other machines! The nation's leading software authors have contribu-
tions every month.

The RAINBOW's Hints, Tips and Pipeline feature give you the best up-to-the-minute information
available on the Color Computer. If you are looking for ways to do screen prints, alphabetize disk
directories, save machine language programs or print Videotex input on your printer, the RAINBOW has
programs for you! And if you want to know when some promised software will really be available for
purchase, you'll get that answered, too.

Our tutorials have been praised for the clear, concise way they explain - in detail - various functions
of the Color Computer. And the RAINBOW's reviews are an excellent and honest buyer's guide to software
and other purchases.

Whether your Color Computer is 4K, 16K or 32K. Whether you have Color Basic or Extended. Whether
you're into assembly language (or want to get into it) or not. Printers, Disks, Rom packs. The RAINBOW
surveys the whole world of the Color Computer each month and provides what one reader called: "A pot of
gold full of fabulous information."

Because it is journalistically-oriented, the RAINBOW gives fast turnaround to meet its monthly
deadline. So you can expect fresh news when it is news and the latest information available.

If all this sounds like a lot for \$16 per year, it may be. But we'll make one more promise: If, after you see
your first issue you don't agree that the RAINBOW is the premier monthly magazine for Color Computer
users, we'll happily cheerfully and immediately refund your money.

©Rainbow, Inc. 1983, Corp.

the RAINBOW

The RAINBOW
3603 Tinsel Ridge Drive
P.O. Box 209
Riverside, CA 92515

502-228-449

Gentlemen: YES! Sign me up right away for a one-year (12 issues) subscription to the RAINBOW. My \$22.00 is enclosed.

Name: _____
Address: _____
City: _____ State: _____ Zip: _____

Payment Enclosed

Charge my VISA Account #

Charge my MasterCard Account #

Signature _____

Card Expiration Date _____

Interbank # _____

Subscriptions to the RAINBOW are \$22 per year in the United States,
Canadian and Mexican rates are \$29 per year. Surface rates to other
countries are \$39. Air mail to other countries is \$57. All subscriptions
begin with the current issue. Please allow 5-6 weeks for first copy.



MCM MIDWEST
COMPUTER
WHOLESALE

MIDWEST
COMPUTER
WHOLESALE **MCM**

*** DISCLAIMER ***

AS A WHOLESALE, MCM'S SERVICE IS NOT RECOMMENDED FOR EVERYONE. A
WHOLESALE TRANSACTION IS BEST SUITED TO THE INFORMED OR EXPERIENCED
SHOPPER, ONE WHO KNOWS HIS NEEDS. IF YOU ARE A BEGINNER WE ASK THAT
YOU DEAL WITH A RETAILER WHO'S HIGHER MARGIN ALLOWS THE "HAND HOLDING"
LEVEL OF SUPPORT WHICH WE CAN'T PROVIDE AT THESE PRICES. IF HOWEVER
YOU DON'T NEED "HAND HOLDING" WE CAN OFFER YOU TREMENDOUS VALUES AND
SAVINGS ON ALL YOUR COMPUTER SYSTEMS NEEDS. PLEASE READ ON.

✓ CHECK THIS SAMPLE OF OUR PRODUCTS AND PRICES

✓ COMPUTERS ■■■

- TRS-80® MOD3 48K, (2) DRIVES 40T/55/DD..... \$1549
- TRS-80® MOD2 64K, (1) DRIVE 77T/55/DD..... \$2620
- TRS-80® MOD16 128K, (2) DRIVES 77T/D5/DD..... \$4692
- TRS-80® MOD16 256K, (2) DRIVES 77T/D5/DD..... \$4987
- TRS-80® COLOR 32K..... \$ 361
- TRS-80® COLOR 64K..... \$ 472
- VICTOR® 9000 128K, (2) DRIVES 80T/55/DD..... \$3995
- SANYO® MBC-1000 64K, (1) DRIVE 40T/D5/DD..... \$1690

✓ DISK DRIVES ■■■

- TANDON® OR MPI® (CHOICE)..... RAW SINGLE DUAL
- 40 TRACK, 56L SIDE, DBL DENS. \$185..... \$239... \$465
- 40 TRACK, DBL SIDE, DBL DENS. \$252..... \$306... \$599
- 80 TRACK, 56L SIDE, DBL DENS. \$247..... \$301... \$589
- 80 TRACK, DBL SIDE, DBL DENS. \$339..... \$393... \$773
- TANDON® 8" 56L SIDE, DBL DENS. \$478..... \$598... \$1096
- TANDON® 8" DBL SIDE, DBL DENS. \$592..... \$712... \$1324
- 6.4 MEG WINCHESTER PRIMARY H/D W/DOS (MOD3)..... \$1699
- 6.4 MEG WINCHESTER SECONDARY H/D..... \$1399
- 14.5 MEG WINCHESTER PRIMARY H/D W/DOS (MOD3)..... \$1999
- 14.5 MEG WINCHESTER SECONDARY H/D..... \$1699

✓ PRINTERS ■■■

- EPSON® MX-80 TYPE II WITH GRAFTRAX 80..... \$419
- EPSON® MX-80FT TYPE III WITH GRAFTRAX PLUS..... \$525
- EPSON® MX-100 TYPE III WITH GRAFTRAX PLUS..... \$675
- SMITH CORONA® TP1 DAISY WHEEL..... \$539

✓ CABLES ■■■

- (2) DISK DRIVES..... \$18
- (4) DISK DRIVES..... \$26
- PRINTER (STANDARD PARALLEL)..... \$18
- RS232C..... \$15
- SPECIALS CABLES (MADE TO YOUR SPEC' S)..... \$CALL

✓ DISKETTES ■■■ (BOX OF 10) OPUS® VERBATIM®

- 40 TRACK, 56L SIDE, DBL DENS..... \$20..... \$25
- 40 TRACK, DBL SIDE, DBL DENS..... \$30..... \$38
- 80 TRACK, 56L SIDE, DBL DENS..... \$35
- 80 TRACK, DBL SIDE, DBL DENS..... \$43
- 40 TRACK, DBL SIDE, DBL DENS (FLIPPY) \$30.....

✓ ALL PRICES AND SPECIFICATIONS SUBJECT TO CHANGE
WITHOUT NOTICE. MINIMUM ORDER TOTAL VALUE IS \$100.

✓ THE TRS-80® COMPUTERS ABOVE, HAVE BEEN MODIFIED
AND ENHANCED, THEY ARE NOT RADIO SHACK® PRODUCTS.
THEY REMAIN HOWEVER FULLY COMPATIBLE WITH ALL THE
HARDWARE AND SOFTWARE AVAILABLE TO A STANDARD UNIT

*** PAYMENTS ***

WE ACCEPT VISA, M/C, MONEY
ORDERS, C. O. D., AND CHECKS.
NON-CERTIFIED CHECKS REQUIRE (2)
WEEKS FOR BANK CLEARANCE. NO
SALES TAXES COLLECTED ON SALES
OUTSIDE MICHIGAN.

*** DELIVERY ***

SHIPMENTS ARE MADE PROMPTLY
FROM STOCK, VIA U. P. S., (SIZE
PERMITTING). OTHERS BEST WAY.
COST UNLESS NOTIFIED OTHERWISE.
ARE 2% OF THE ORDER TOTAL, BUT
NOT LESS THAN \$3.00.



*** WARRANTY ***

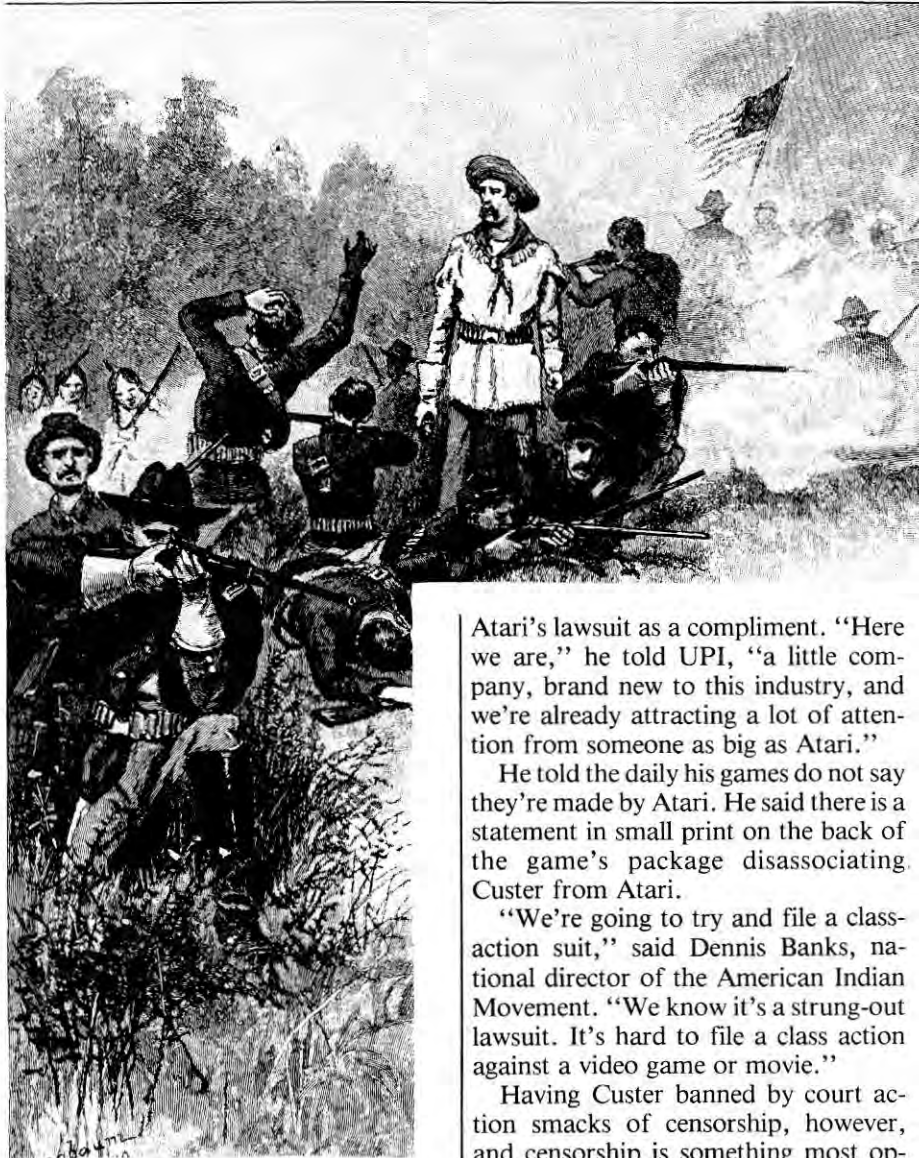
YOUR HARDWARE PURCHASE IS
COVERED BY AN MCM 90 DAY
LIMITED PARTS AND LABOR
WARRANTY. COPIES AVAILABLE
ON REQUEST, OR THE WARRANTY
OF THE ITEM'S MANUFACTURER.
CONFIRM YOUR COVERAGE WHEN
ORDERING.



MIDWEST COMPUTER WHOLESALE

P.O. BOX 39278, DETROIT, MICHIGAN, 48239

TELEPHONE ORDER LINE (313) 525-3040



Atari's lawsuit as a compliment. "Here we are," he told UPI, "a little company, brand new to this industry, and we're already attracting a lot of attention from someone as big as Atari."

He told the daily his games do not say they're made by Atari. He said there is a statement in small print on the back of the game's package disassociating Custer from Atari.

"We're going to try and file a class-action suit," said Dennis Banks, national director of the American Indian Movement. "We know it's a strung-out lawsuit. It's hard to file a class action against a video game or movie."

Having Custer banned by court action smacks of censorship, however, and censorship is something most op-

ponents to the game are shying away from.

"We are not talking of censoring," Rosenstein of L.A. County observed. "We are talking about sensitizing the community."

However, the three-point plan Rosenstein's commission proposed and L.A.'s county supervisors adopted included drafting legislation to prohibit video games like Custer and instructing the county's counsel to study adopting a similar ordinance on the local level.

Glynis Edgar, director of community relations for the Oklahoma Human Rights Commission, said her agency hopes the anti-Custer resolutions adopted by the Oklahoma City City Council "will discourage folks from buying [the game] and discourage stores from wanting to have it."

She added, "By no means are we advocating it be banned."

But Edgar admitted when one adult book store owner in Oklahoma City was contacted by opponents to Custer after the city council's action, it was apparent he wasn't going to be deterred from carrying the game.

Atari called on all concerned parents to write American Multiple and "hope the public outcry will persuade the maker to remove their product from the market."

How effective will that be?

"Stuart Kesten," Banks said, "told our people he has invested too much money in it to bring it off the market." ■

PULSE TRAIN

14 Illini and a robot Rubick solver



"Yes, I refer to Robbie as 'him,' rather than 'it,'" confessed Daniel Talken,

one of 14 engineering students at the University of Illinois responsible for the creation of a robot that solves Rubick's Cube in 'his' own

overhead mechanical hands. "He's really a toy, though."

Apart from giving the machine eyes, nose, mouth, and personality, the creation of Robbie Rubick is especially noteworthy for the team effort which went into his design.

When a member of Tau Beta Pi Engineering Honor Society first came up with the idea, three branches of the fraternity set out indepen-

dently to solve the necessary problems involved. The computer engineers developed the program for solving any scrambled cube. The mechanical engineers worked on the device to manipulate a standard cube with electrical signals. And the electrical engineers were responsible for connecting the computer to the mechanics. Each group worked independently of the others. Five months and \$450

later, Robbie was born.

"Most of the work was done on faith, luck, and hope," Talken said. "None of us knew whether or not the others were going to be able to interface with all the plans."

Using a color-sensing electric eye, computerized brain, and mechanical hands to twist and turn the cube, Robbie accepts a solution from his terminal in about two-

DiskCount Data

WHERE
QUALITY PROGRAMS
MEET COMPETITIVE PRICES

2701-C W. 15th • SUITE 324 • PLANO, TX 75075 • (214) 680-8268

**3 ALL NEW
PROGRAMS**
Never Before Available
ANYWHERE

**SUPER UTILITY PLUS
VERSION 3.0**
By Powersoft

Retail.....\$74.95

Now Only \$65.95

NEW

80 Track Versions Available

VERSION 3.0

The finest disk utility and repair program available now reassembled in a major revision. A necessity for the serious disk user it now supports all known operating systems. TRSDOS, NEWDOS, LDO5 MULTIDOS and DOSPLUS, and another all new feature—limited AUTODOS recognition, AUTODOUBLER recognition, and AUTODENSITY recognition. Both MOD III and MOD I boot the same 3.0 disk. The program now adds support for all doublers including RADIO SHACK, and also supports any double density MOD I or III DOS. All new DOS specifiers by first letter of DOS name. A second disk with a complete backup copy is now included. Hobbyists rave about it... serious users can't be without it.

- Now In Hard Cover
- Loose Leaf 3 Ring Binder

HI-RES GRAPHICS

A brand new concept, POWERDOT allows you to create hi-resolution screen prints on EPSON (GRAFTRAX & GRAFTRAX+), C.I.TOH, PROWRITER, and RADIO SHACK LP8 printers without any hardware additions or modifications to your TRS-80. You can draw directly on your screen which is a "picture window" of a much larger drawing area and move the window to other areas of the drawing. Your only limitations are imagination and memory size. The completed drawing is dumped to the above printers by reducing and transforming the complete graphic pixels to single hi-res dots.

Use the same disk for booting on MOD I, or MOD III. Designers, architects, engineers and artists will love this unique drawing program.

POWERDOT
By Powersoft

**A TRUE HI-RESOLUTION
GRAPHICS BREAKTHROUGH**

INTRODUCTORY
OFFER

**ONLY
49.95**

NEW PRINTER DRIVERS FOR

The New Radio Shack™ Superscript™

This new generation of custom printer drivers allows you to utilize all of SUPERSCRIPSIT'S features with your EPSON, PROWRITER and C.I.TOH F-10 STARWRITER printers. You can now utilize all of the printers custom features such as compressed, expanded and proportional print, underlining, boldface, super-scripting, and sub-scripting. All drivers can be called from within SUPERSCRIPSIT at "document open time." Order by printer designation as follows:

POWERDRIVER E..... EPSON MX70/80/100
POWERDRIVER P..... C.I.TOH PROWRITER
POWERDRIVER S..... C.I.TOH STARWRITER

POWERDRIVER
By Powersoft

**USE ALL CUSTOM
FEATURES OF YOUR PRINTER
WITH THE NEW
SUPERSCRIPSIT™ AND
POWER DRIVER**

**Now
\$29.95**

SPECIALS

PROGRAM NAME	RETAIL	SPECIAL
LDOS 5.1 MOD I/MOD III	129.00	109.95
DOSPLUS 3.4 MOD I/MOD III	149.95	129.95
DOSPLUS II MOD II	249.95	199.95
BASIC/S SYSTEM MOD I/MOD III	89.95	65.95
MZAL MOD I/MOD III	79.95	69.95
POWERDRAW MOD I/MOD III	39.95	34.95
JOVIAN MOD I/MOD III	21.95	18.95
MAKE 80 MOD I	14.95	12.95
MAKE 80 MOD III	29.95	24.95
MICROTERM MOD I/MOD III	79.95	69.95
POWERMAIL MOD I/MOD III	99.95	74.95
MICROCASH MOD I/MOD III	199.95	149.95
SUPER DIRECTORY MOD I/MOD III	39.95	34.95
LDOS UTILITY DISCS MOD I/MOD III	99.95	69.95
POWER TERM MOD I/MOD III	29.95	24.95
FROGGER MOD I/MOD III	19.95	15.95
SCRIPPLUS 3.0 MOD I/MOD III	39.95	29.95
STBO II MOD I/MOD III	150.00	124.95
MULTIDOS WITH EASY ZAP MOD I/MOD III	99.95	84.95
DEMON SEED MOD I/MOD III	21.95	18.95
CATERPILLAR MOD I/MOD III	19.95	17.95
CHICKEN MOD I/MOD III	19.95	17.95
BOOKS & WHATEVER		
SUPER UTILITY TECH MANUAL	14.95	11.95
INSIDE SUPER UTILITY+	19.95	15.95
GREEN WINDOW MOD I	19.95	14.95
GREEN WINDOW MOD II	24.95	17.95
GREEN WINDOW MOD III	19.95	14.95

**Any Order Of \$100.00
Or More From This Ad Will
Receive A Copy Of
POWERDRAW**

Absolutely

FREE

A \$39.95 Value

**DiskCount
Data** 214-680-8268

Phone Your Order In Today Or Mail To

DISKCOUNT DATA
2701-C W. 15th St. Suite 324
Plano, TX 75075

Send Cash, Check or Money Order
We Gladly Accept Visa & Master Card

NAME: _____ PHONE #: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

VISA OR MC#: _____ EXP. DATE _____

Please add \$3.00 for postage and handling.

PULSE TRAIN

tenths of a second. An average of 10 moves is needed to complete the cube, which takes nearly six minutes of twisting and turning. "Most people who can solve the cube can beat the mechanics, but no one has yet been faster than the computer."

So far, Robbie—who made his first public appearance at the annual U of I engineering open house before an applauding audience of 4,000—has been acknowledged nationwide through the *New York Times*, Paul Harvey, and the CBS Evening News.

"The next step is to add color photo sensors," continued Talken, "so that Robbie can read the initial configuration himself and solve the cube in the push of a button. There will be a Robbie Rubick II."

—P. GREGORY SPRINGER



Photo by P. Gregory Springer

Tandy wants your phone business



After waging a guerrilla war against the AT&T monolith (*80 Micro*, January 1983, p. 384), Tandy Corporation has moved to bolster its competitive position in the telephone business.

The Fort Worth, TX, firm has bought a manufacturer of business telephone equipment and announced it's getting into telephone paging.

Acquisition of the assets of Interconnect Telecommunications Systems Inc. of Lexington, KY, was revealed at Tandy's annual stockhold-

ers meeting held in Fort Worth in November. Tandy did not disclose how much cash it paid for the firm.

For its 1982 fiscal year ending June 30, 1982, the Interconnect firm, which serves parts of Kentucky and Ohio, had sales of \$8.5 million, Tandy said in a statement.

During the same fiscal year, Tandy's telephone and related equipment sales increased 35 percent over FY 1981. The sales represent 6.5 percent of the firm's \$2 billion in sales for FY 1982.

Chairman John V. Roach told stockholders Tandy also intends to open "four or five" experimental telephone stores early next year. The stores, which Roach claimed will offer customers "a total-

ly new concept in telephone merchandising," will be opened in Lexington and Louisville, KY, and Fort Worth.

"Since the concept is new," Roach said in a statement, "we will reserve most of the details until the first store opens. The name of the new chain will be Radio Shack Telephone Center. Our primary thrust in the phone business will continue to be through the regular Radio Shack stores."

According to *The Wall Street Journal*, the new stores will "probably" sell devices linking computers and telephones. In existing stores, the *Journal* added, Tandy is expected to begin marketing equipment early this year for

Henry J. Springer and Robbie Rubick toy with a popular puzzle.

electronic mail between personal computers.

Timothy Diachun, chairman of Interconnect, will join Tandy as vice president for telephone marketing.

Roach also announced Radio Shack would start marketing pocket pagers early this year. Although the retail price hadn't been finalized, he said, it would be significantly lower than the \$175 to \$200 being paid for basic units today.

He noted in a statement Tandy has signed contracts with radio common carriers or Bell operating companies in 54 cities. Those include New York, Boston, Chicago, Los Angeles, Houston, Atlanta, San Diego, Fort Worth, Dallas, San Francisco, Philadelphia, Baltimore, and Washington, DC.

Under the agreements, he explained, the carriers would offer paging services at a fraction of the current basic rates for paging. Those rates range from \$10 to \$20 a month.

"We are hopeful that once again," Roach said, "we will be able to take a product from its traditional market (i.e. commercial and emergency use only) and, with a new breakthrough in cost, make it a mass market item."

Tandy's chairman added the move "could open the door to us becoming a factor in the emerging mobile telephone market and the future personal, carry-it-with-you-



ONLY
\$69.95

The Magnificent WORD PROCESSING SYSTEM

For the TRS-80 Model I and III

- Written in fast Z80 machine language.
- Single key control of all editing functions for ease of use.
- Dynamic display of word count, line count, and free memory count.
- Superscripts, subscripts, underlined, bolded, expanded and condensed type styles - combine and intermix within a line.
- Automatically justifies and word-wraps on the screen as you type.
- Search, Replace, and Global Search and Replace.
- Odd and even page user-definable headers, footers, and page number lines.
- User-definable linespacing, sheet size, top, left, and bottom margins.
- Move blocks of text from disk, to disk, and within the text.
- Examine disk directory on any disk and kill files while editing.
- Full screen editing of EDTASM and BASIC text files.
- Automatic renumbering for EDTASM and BASIC files.
- Print contents of screen function.
- Print previewing formats text, inserts headers, numbers pages, etc. on the screen without printing it on paper.
- Page by page pausing capability for sheet fed printers.
- Supports both parallel and serial printers.
- Printer control code access.
- Supports proportional space justifying on Centronics 737, 739, Line Printer IV, Daisy Wheel II, Diablo, Qume, Starwriter, Spinwriter, C. Itch Prowriter, NEC PC-8023A-C, TEC 850R.
- Also supports special functions of Microline, MX-80, MX-100, and Graftrax Plus.
- Any character or symbol your printer can print is accessible with the Special Character feature.
- Works with NEWDOS, NEWDOS80, TRSDOS, LDOS, and DOSPLUS - Single or Double Density.

GUARANTEE

Many word processing systems claim theirs are the best, but few would dare to guarantee them. Not us! We are confident that ZORLOF is the most useful word processing system on the market for under \$200.00. If you don't agree, return it within 30 days for a full refund.

CALL (305) 259-9397

✓141

Add \$2.00 shipping & handling. Florida residents add 5% sales tax. Checks require 3 weeks to clear banks.



ANITEK SOFTWARE PRODUCTS □ P.O. BOX 1136 □ MELBOURNE, FL 32935 □ (305)259-9397

RIBBONS

Low Price • FREE Shipping
SATISFACTION GUARANTEED

MX-80 Cartridge

price each in quantity of

1-2	3-5	6-11	12-23	24-47
8.95	8.41	7.90	7.43	6.99

RIBBON LOOPS

new ribbon for your old cartridge
top quality nylon • standard matrix ink

price each in quantity of

	1-2	3-5	6-11	12-23	24-47
MX-70/MX-80	3.95	3.63	3.34	3.08	2.83
MX-100 double length	7.86	7.23	6.65	6.12	5.63
NEC Spinwriter Nylon	2.92	2.69	2.47	2.27	2.09
Radio Shack 26-1418	2.26	2.08	1.91	1.76	1.62

Loops are available in blue or black ink (same price).
You may mix any combination for quantity price breaks.
Ribbon loops include DO-IT-YOURSELF INSTRUCTIONS.
Florida residents add 5% sales tax • Ask for Free catalog

VISA **DATA SYSTEMS** MasterCard ✓ 99

(305) 788-2145 • Box 99 • Fern Park, FL 32730

COLOR COMPUTERISTS:

NOW YOU CAN ENJOY THE EASE
AND CONVENIENCE OF LOAD 80
CASSETTES WITH



LOAD 80

And to start you off right, we're offering a Special First Edition of COLOR LOAD 80—"The Best of '82." All the best color programs from the 1982 issues of 80 MICRO at the very special price of \$14.97 plus \$1.50 shipping and handling.

To order your Special First Edition COLOR LOAD 80 cassette, fill out the coupon or call toll free:

1-800-258-5473

Order one for yourself and one for a friend. Perfect for holiday gift-giving.

COLOR LOAD 80 will be offered on a quarterly basis (see March '83 80 MICRO for details.)

Color LOAD 80 is manufactured by Instant Software Inc., a subsidiary of Wayne Green Inc., 80 Pine St., Peterborough, NH 03458. There is no warranty expressed or implied that COLOR LOAD 80 will do anything other than save you typing.

Postage paid card on page 227

The Best of '82

YES, I want the Special First Edition of COLOR LOAD 80! Send me _____ cassettes @ \$14.97 ea. plus \$1.50 shipping & handling per cassette.

- MC
 VISA

- AMEX
 CHECK
 MONEY ORDER

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

SIGNATURE _____

CARD # _____

EXP. DATE _____

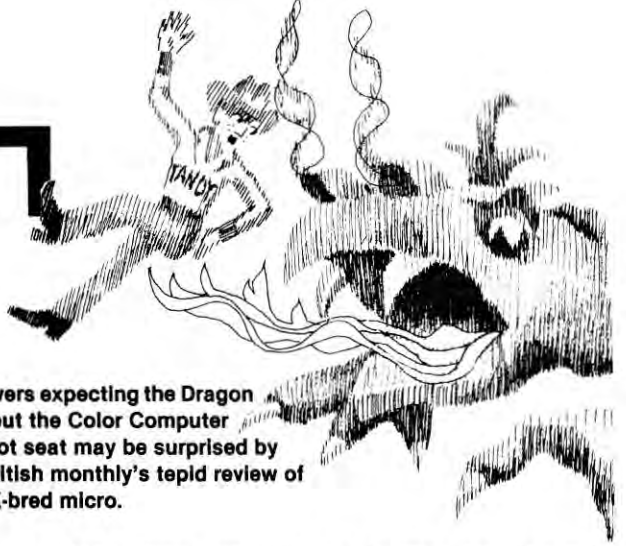


CL-283

LOAD 80

80 Pine St. • Peterborough, NH 03458

PULSE TRAIN



anywhere market. The day is coming, for better or worse, when you cannot avoid communications wherever you are."

"All this," Roach observed, "is designed to help us make good on one of our new trademarks, 'Make Radio Shack Your Telephone Company.'"

British mag gives Dragon tepid review



"The similarity between the Tandy and the Dragon 32 is almost uncanny and the reason is not simply because the same chips have been used."

That's what one reviewer opined in a review of Britain's home-grown micro (*80 Micro*, January 1983, p. 370) appearing in the November 1982 issue of *Computing Today*.

"The first thing that strikes you about the system," the British micro-computer magazine said, "is that it has a 'proper' keyboard although the quality of the particular unit chosen is a little dubious."

"Readers who are familiar with the TRS-80 range of systems," the reviewer said, "might be hoping that the format of the text screen found on the Dragon 32 would be an improvement. No such luck, it's still 16 lines of 32 characters in text mode with no lowercase letters, reversed uppercase being used instead."

The reviewer was critical of the Swansea, Wales, micro's color. He said "the primary colors are not clean; red, blue, and green should be

red, blue, and green and not 'off' shades."

When the Dragon is fired up, a memory check might surprise some users. Although the micro is touted as a 32K machine, only 24K is available for programming.

"The missing 8K of RAM hasn't really vanished," the reviewer explained, "it is being used for the system variables and to create high resolution graphics areas. While this means less space for you to program in, it does mean that when you come to use the high resolution graphics your memory doesn't shrink dramatically like some other systems we could mention!"

"For those into data handling," he continued, "the cassette interface can be used for data files through Basic although the reliability of the system is not particularly good. The interface seems slightly level sensitive, but my main criticism would have to be the lack of decent messages; single letters displayed on the screen don't count as messages in my book!"

The reviewer added there are two interesting cassette commands. Files can be skipped by using SKIPF. Using MOTOR will allow a tape recorder to be controlled from the keyboard. That can save time fiddling with the remote plug.

Programs may be halted during running by pressing shift @. Pressing any key but break will restart the program.

Simple, single-tone noises can be produced from the Dragon using SOUND, the reviewer said. More complex sounds can be created using PLAY. That function, he

Observers expecting the Dragon 32 to put the Color Computer on a hot seat may be surprised by one British monthly's tepid review of the UK-bred micro.

said, is similar to one found in Sharp's computers. A complete note passage, pauses, and changes in tempo, may be programmed into a string made up of a note name, octave, duration, and volume.

The reviewer found the micro's printer port a bit of a mystery. "A quick count of the available peripheral devices inside the Dragon 32 leads one to wonder just how they managed to create this extra parallel port as there simply aren't enough bits available," he observed.

"The only possible explanation of this," he said, "is that the printer shares the same PIA as the joysticks; it uses the port as an output whereas the joysticks use it as an input."

Contrary to the opinion of one Tandy-UK executive and the experience of *80 Micro*'s Jake Commander, *Computing Today* was skeptical of plugging Radio Shack ROM packs into the Dragon.

"The indications are that they should [work]," the reviewer noted, "but without complete information on the pin connections of the Dragon 32, I'd rather not suggest that you plug one in and try!"

Documentation for the micro wrung a tepid response from the reviewer. "The manual... as manuals go," he said, "is not too bad. There are a number of small errors which may well have been cleared up by the time the machine hits the streets

in a big way, but the main feeling is one of missing information.

"There are no details on any of the hardware, interface connections or add-ons. Nor are there any facts about the monitor program and how to get 6809-code into the system."

For those "really interested" in pursuing the Basic on the Dragon, the reviewer suggested they buy two books from Tandy, *Going Ahead with Extended Color Basic* and the *Color Computer Technical Reference Manual*.

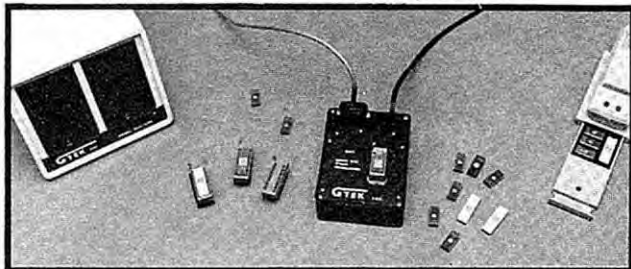
"Just what has the Dragon 32 got over its rivals?" the reviewer asked. "Well, if you were looking for a home computer to play games with and maybe try a little programming on, it does have the advantage of a reasonable amount of RAM and an almost decent keyboard.

"As an alternative to the Tandy Color Computer it wins on price alone although it certainly doesn't look as nice.

"As for its other rivals, the Atari and Texas systems, the choice of ready-to-run games and add-ons possibly tends to weigh against the Dragon 32.

"Another possible source of concern is that Mettoy [the parent company of Dragon Ltd.] has never been in the computer market before whereas both the others have a long pedigree but, in reality, there is little that can go wrong in a system like this that cannot be simply and easily fixed." ■

DEVELOPMENT HARDWARE/SOFTWARE
GTEK MODEL 7128 EPROM PROGRAMMER



- Microprocessor based intelligence for ease of use and interface. You send the data, the 7128 takes care of the rest.
- RS-232 interface and ASCII data formats make the 7128 compatible with virtually any computer with an RS-232 serial interface port.
- Auto-select baud rate.
- Use with or without handshaking. Bidirectional Xon/Xoff supported. CTS/DTR supported.
- Devices supported as of DEC 82.

NMOS	NMOS	CMOS	EEPROM	MPU'S
2758	2508	27C16	5213	8748
2716	2516	27C32	X2816	8749
2732	2532	C6716		8741
2732A	2564	27C64		8742
2764	68766			8751
27128				8755

- Verify erasure command.
- Busy light indicates when power is being applied to program socket.
- Complete with TEXTTOOL zero insertion force socket and integral 120 VAC power supply. (240 VAC/50HZ available also)
- High Performance/Cost ratio.
 - Model 7128 PRICE \$389.00 •••

MODEL 7128 SOCKET ADAPTERS
MODEL 481 allows programming of 8748, 8749, 8741, 8742 single chip processors. Price \$98.00

MODEL 511 allows programming the 8751, Intel's high powered single chip processor. Price \$174.00

MODEL 755 allows programming the 8755 EPROM/I/O chip. Price \$135.00

MODEL 7128/24 - budget version of the 7128. Supports 24 pin parts thru 32K only. Upgradable to full 7128 capacity. Price \$289.00

Non-expandable, very low cost models available for specific devices.
MODEL 7128-L1 for 2716 only \$149.00
MODEL 7128-L2 for 2732 only \$179.00

Also available from stock:
Eeprom Erasers UVP model DE-4 . . . \$78.00
Avocet Systems Cross Assemblers \$200.00
RS-232 Cable Assemblies \$25.00
Programmable Devices call
Complete development systems \$3240.00
Post Office Box 289

Waveland, Mississippi 39576
(601) 467-8048

✓299
GTEK INC.



EPSON
MX-80 AND MX-100
OWNERS

MXPLUS™ GIVES YOU CONTROL OF YOUR PRINTOUT

- SELECT CONDENSED, **BOLD**, OR WIDE PRINT INSTANTLY USING THE PRINTER PANEL BUTTONS. (NO COMPUTER CONTROL CODES REQUIRED)
- ACTIVATE PERF-SKIP AND LEFT MARGIN INDENT TO **AUTOMATICALLY** FORMAT YOUR PRINTOUT INTO NEAT PAGES THAT CAN BE PUNCHED AND BOUND.

MXPLUS™ INSTALLS IN MINUTES, NO SOLDERING!

MXPLUS IS A PLUG-IN MODULE FOR ALL EPSON MX-80/100 PRINTERS AND IS COMPATIBLE WITH ALL INTERFACE BOARDS. MXPLUS HAS A 1 YEAR WARRANTY.

ORDER TODAY

ORDERS CALL 24 HR. 800-835-2246 x441
INFORMATION CALL 213-969-2250

DRESSELHAUS COMPUTER PRODUCTS
BOX 929
AZUSA, CALIFORNIA 91702

✓353

ONLY

\$49.95

POSTPAID CALIF. ADD 6%

SAME DAY SHIPPING WITH MC/VISA



COPY MODEL III, SCRIPSIT / VISICALC®

Only \$20

Works with all model III Visicalc/Scrpsit and allows unlimited backups of master disks. Works even if you're already backed up twice. Simple, 17 line program.

And look at these other outstanding values!

**APPARATS
NEWDOS/80® , 2.0
\$129.95**

Convert Model I Scrpsit and Visicalc to Model III, plus: Renumber program lines - move program lines - move blocks of program lines - duplicate program lines - selective variable clearing - program single stepping - memory sort multi-dimensioned arrays - swap variables - read and write to model I disks - reference keywords - spool printing - change disk speeds - disable BREAK and CLEAR - Much, much more!

FREE "Layman's Guide to Newdos 80" included with this purchase.

Use VISA - Mastercard - Money Orders - Allow 2 weeks for personal checks. Kansas residents add 3.5% sales tax.

This product is for personal use only. Not meant for distribution or sales.

**HAYES SMARTMODEM®..
\$249.95**

Talk with other computers over regular telephone lines. SMARTMODEM can auto dial - auto answer - repeat - allow for audio monitoring - programmable - is FCC approved direct-connect - full or half duplex capability, 0-300 baud - RS-232C interface - seven status LED's.

**VERBATIM®
DATALIFE DISKETTES**

5" diskettes come in a reusable plastic storage box.

**CALL TOLL FREE!
1 - 800 - 835-0071**

**IN KANSAS:
316 - 665-3611**

ST80 III®..\$129.95

Smart terminal communications package. Allows file uploading/downloading. Emulates many different terminals. Total operator control. (Written by Lance Micklus.)

**FREE
Catalog price list**

of all Sales Data Direct-Order merchandise available upon request. Super prices . . . Rapid delivery . . . Quality products.



526 E. 4th Hutchinson, Kansas 67501
316/665-3611

Dealer Inquiries Invited.
Phone or write Sales Data, Inc.

Let's talk about exercise physiology this month. I'll use the regression program published in December 1982's "Copernica Mathematica" to create an equation for aerobic points based on distance and time. I'll also develop the concepts of moving averages and autocorrelation of time series data to monitor the heart rate and look for periodicities and trends.

Basic Physiology

The heart functions as a pump to move blood (which carries oxygen and food to the muscles and carbon dioxide and waste products away from the muscles). There are two major controls of the heart: nervous and the so-called "Starling's Law of the Heart."

Nervous control of the heart is mediated through both the sympathetic and parasympathetic nervous systems. The sympathetic pathway passes through the spinal cord, synapses in a group called a ganglia, and then continues on to innervate the heart. When excited, these fibers stimulate the heart rate (tachycardia) as well as the strength of the contraction (controlled by altering the myocardial contractility). The parasympathetic innervation is mediated through cranial nerve X, called the vagus, which originates in a portion of the medulla called the vasomotor center. It slows the heart (bradycardia) by inhibiting the sino-atria node from initiating a heartbeat.

These two nervous pathways control the heart rate for relatively short time periods. For example, the alarm clock rings and you jump out of bed. What keeps the blood pumping to your heart and brain and not to your feet?

A number of reflexes send nervous information to the brain. One such re-



Computerized aerobic mathematics

flex is the baroreceptor—certain receptors in the circulatory system, such as those located in the carotid and aortic bodies, are sensitive to pressure. When the blood pressure gets too low, their rate of firing slows, indicating to the brain that the pressure needs to be increased. If their rate of firing is too fast, the pressure is too high, so the brain is told to slack off.

The cardiac accelerator nerves secrete norepinephrine and the adrenal medulla secretes epinephrine (adrenaline), increasing the heart rate and raising the blood pressure. The vagus secretes acetylcholine, which slows the heart rate.

Starling's Law of the Heart is a mechanical approach—it says all the blood pumped to the heart must leave the heart. If you increase the venous return (the amount of blood returning to the heart via the veins), then the heart must pump all that blood. Otherwise, your

veins would quickly become distended. This reflex is important in long-term control of the heart.

The lungs' job is to exchange used gases from the blood with fresh gases from the outside air. The functional unit of the lung, an alveoli, is shaped like a very small grape. A thin membrane surrounds this alveoli; through this membrane, carbon dioxide diffuses from high (in the capillary blood) to low (in the alveoli) concentration; oxygen diffuses from high (alveoli) to low (capillary blood) concentration. Once in the blood, oxygen is carried by hemoglobin to the tissues, and carbon dioxide is carried back from the tissues.

The distribution of blood changes with demand. When you eat, more blood goes to your stomach and liver; when you run, the amount of blood to these organs is greatly reduced and the amount of blood going to the working muscles increases tremendously. Normally, the veins, liver, and spleen serve as a reservoir of blood for when it is needed. The brain receives a constant 25 percent of the blood flow regardless of activity.

The Effects of Exercise

The anticipation of a workout usually raises the heart rate and blood pressure a little. When you begin exercising, though, the amount of blood returning to your heart is greatly increased—the blood reservoir is mobilized. This increases the heart rate. Even the breathing rate has an effect on heart rate. As work output increases, the nervous system also has a role in controlling the flow of blood to the muscles and away from organs such as the liver and stomach, a process called blood shunting. The adrenal medulla is called upon to release epinephrine, which further increases heart rate and causes vasoconstriction of the peripheral vessels, also improving shunting. As you can see, a variety of mechanisms increase blood flow through working muscles to supply oxygen and nutrients and remove wastes.

The body is a lazy critter—it will work, and improve the mechanics and abilities of its parts, but only under duress. If little stress is placed on the body, it adapts to this life of leisure. If strenuous activity is placed on the body, and the body is allowed to adapt, it does so

```
10 REM ***** AEROBICS *****
20 CLS:PRINT"AEROBICS PROGRAM BY"
30 PRINT"BRUCE POWEL DOUGLASS"
40 INPUT"ENTER TIME OF RUN IN MINUTES, SECONDS";M,S
50 INPUT"ENTER DISTANCE IN MILES";D
60 TIME=M+S/60:' TIME IN MINUTES (DECIMAL FORM)
70 PTS=10.6181*D-.554151*TIME-1.21753
80 PRINT"AEROBIC POINTS EARNED =";PTS
90 PRINT"AVERAGE MILE TIME (MIN/MILE) ";TIME/D
100 PRINT"AVERAGE VELOCITY (MPH) ";D/TIME*60
110 INPUT"ENTER YOUR 5-MINUTE RECOVERY HEART RATE";HR
120 IF HR>120 THEN PRINT"YOUR RECOVERY IS NOT ADEQUATE - SLOW DOWN OR REDUCE SPEED!" ELSE PRINT"GOOD RECOVERY! DISTANCE AND SPEED NOT EXCESSIVE"
130 END
```

Program Listing 1

Program Listing 2

```

10 REM ***** AUTOHART *****
20 REM * WRITTEN BY *
30 REM * BRUCE POWEL DOUGLASS *
40 REM * DEPT. PHYSIOLOGY *
50 REM * USD MEDICAL SCHOOL *
60 REM *****
70 CLEAR 300:DEFUSR=&HPF00:DEFINT P,I,Z:DIM B(60),Z(200),Y(200),
X(200):'Z IS WHERE THE BEAT TIMES ARE STORED
80 UL$="#####" #.#####" ###.#####"
90 CLS:PRINT TAB(15);"AUTOHART BY BRUCE POWEL DOUGLASS"
100 PRINT TAB(20)"INSTRUCTIONS:"
110 PRINT"THE MACHINE LANGUAGE PROGRAM HEART/CMD MUST"
120 PRINT"ALREADY BE IN MEMORY. LINE 70 IS REQUIRED"
130 PRINT"YOU SHOULD TAKE YOUR CAROTID PULSE AT THE SIDE"
140 PRINT"OF YOUR NECK, JUST LATERAL TO THE TRACHEA AT THE"
150 PRINT"CAROTID ARTERY. EVERYTIME YOU FEEL A BEAT, PRESS"
160 PRINT"THE <ENTER> KEY. TO TERMINATE DATA ENTRY, PRESS THE"
170 PRINT"<BREAK> KEY. THE PROGRAM WILL THEN DISPLAY AND"
180 PRINT"PERFORM AUTOCORRELATION ON THE TIME SERIES. TAKE"
190 PRINT"YOUR PULSE FOR 1 TO 2 MINUTES. IF YOU WANT TO DO IT"
200 PRINT"LONGER, THE ARRAY IN LINE 70 MUST BE DIMENSIONED BIGGE
R."
210 PRINT"IT WILL PROBABLY TAKE A FEW ATTEMPTS TO BE PROFICIENT"

220 PRINT"AT TAKING YOUR PULSE AND PRESSING A KEY.
PRESS ANY KEY TO START"
230 AS=INKEY$:"CLEAR INKEY$ BUFFER
240 AS=INKEY$:IF AS="" THEN 240
250 CLS:PRINT@515,"<ENTER> TO ENTER HEART BEAT, <DOWN ARROW> TO
ANALYSE"
260 A=USR(0)-1:'COLLECT THOSE POINTS INTO Z(I); A=NUMBER OF ENTR
IES
270 DIM M(A):' TO HOLD MOVING AVERAGES LATER
280 ' THE ASSEMBLY ROUTINE TAKES 33.258 MICROSEC PER LOOP
290 ' PLUS THE TIME DELAY (TO REMOVE YOUR FINGERS) OF 0.15 SEC
300 ' LEAVES THE EQUATION (DIVIDE BY 1.0 E+6 TO GET SECONDS)
310 CO=33.258/1E6:' CONSTANT FOR TURNING IT INTO SECONDS
320 TIME=0:FOR I=1 TO A
325 IF Z(I)<0 THEN Y(I)=CO*(65535+Z(I))+0.15
330 Y(I)=CO*Z(I)+0.15:' Y(I)=INTERVAL IN SECONDS
340 IF Y(I)>0 THEN HR=HR+Y(I):' FOR AVERAGE HEART RATE
350 IF MY<Y(I) THEN MY=Y(I)
360 TIME=TIME+Y(I):'TOTAL TIME
370 X(I)=TIME:'CUMULATIVE TIME
380 PRINT USING UL$;Z(I);Y(I);TIME
390 NEXT I:HR=A/HR*60
400 ZZ=3*(TIME+1):DIM Z2(ZZ)
410 CLS:PRINT"YOU HAVE COLLECTED ";A;" POINTS OVER ";TIME;" SECO
NDS"
420 PRINT"AVERAGE HEART RATE IS ";HR;" BEATS/MINUTE"
430 REM TRANSFORM THE DATA FROM BEAT INTERVALS
440 REM TO A TRUE TIME SERIES OF '1' IF BEAT, '0' IF NOT
450 REM THE PLOT IS A CHR$(188) IF ON, CHR$(176) IF OFF
460 A2$=CHR$(188):A1$=CHR$(176)
470 PRINT TAB(20);"PLOT OF 1/3 SECOND INTERVALS"
480 J=1:STP=1/3
490 FOR K=0 TO TIME STEP STP
495 IF K<X(J) THEN PRINT A1$;Z2(K*3)=0:GOTO 510
500 IF X(J)<=K THEN Z2(K*3)=1:PRINT A2$;J=J+1:GOTO 500
510 NEXT K:PRINT:A$=INKEY$
520 PRINT TAB(20);"PRESS ANY KEY TO CONTINUE";
530 AS=INKEY$:IF AS="" THEN 530
540 REM AUTO-CORRELATION
550 REM COMPUTES AUTOCORRELATION WITH PHASE SHIFT FROM 0 TO 20 S
ECONDS AT 1/3 SECOND INTERVALS
560 REM B(I) HOLDS THE 'BINS' FOR THE SUMS
570 REM NOTE THE SIMPLIFICATION SINCE WE ARE DEALING WITH
580 REM A 0=NO BEAT, 1=BEAT
590 CLS:FOR PH=1 TO 60:' 60 INTERVALS OF 1/3 SEC EACH
600 PRINT@0,"WORKING ON PHASE ";PH
610 FOR I=1 TO A
620 IF I+PH>ZZ THEN 650
630 B(PH)=B(PH)+Z2(I)*Z2(I+PH)
640 NEXT I
650 IF MX<B(PH) THEN MX=B(PH):' MAX HEIGHT
660 NEXT PH
670 REM NOW PLOT IT, BUT FIRST SCALE IT FOR SCREEN
680 NM=40/MX:'MAX HEIGHT=40 UNITS
690 CLS:PRINT"AUTO-CORRELOGRAM OF DATA <> PRESS ANY KEY TO CONTI
NUE"
700 FOR I=1 TO 60
710 B(I)=B(I)*NM
720 FOR J=47 TO 47-B(I) STEP -1
730 SET(I+16,J)
740 NEXT J
750 NEXT I
760 AS=INKEY$:IF AS="" THEN 760
770 REM MOVING AVERAGES OF THE INSTANTANEOUS FREQUENCY
780 REM 1/Y(I)
790 CLS:INPUT"ENTER THE ORDER OF THE MOVING AVERAGES";MA
800 PRINT"THINKING ";
810 FOR I=1 TO A-MA:SUM=0
820 FOR J=1 TO MA
830 PRINT".";
840 Y=Y(I+J-1)
850 IF Y=0 THEN 870
860 SUM=SUM+Y
870 NEXT J
880 M(I)=SUM/MA
890 IF MM<M(I) THEN MM=M(I)
900 NEXT I

```

Listing 2 continues

YORK 10™ BASF-DPS WORLD STANDARD TAPE



**MONEY BACK
GUARANTEE**

**COMPUTER GRADE
BLANK CASSETTES**

PREMIUM 5-SCREW
SHELL FITS ALL
STANDARD RECORDERS

DATA TRAC / C-05, C-10, C-20

CASSETTE STORAGE CADDY

NEW!
ORGANIZE
YOUR TAPES!
\$2.95 EACH



FINEST QUALITY
PHILIPS (NORELCO)
TYPE HARD BOXES



TRACTOR FEED
DIE-CUT BLANK
CASSETTE LABELS

INTRODUCTORY OFFER!

ORDER 2 DOZ. CASSETTES AND 1 CADDY
GET 1 CADDY FREE!

ORDER 4 DOZ. CASSETTES AND
2 CADDIES — GET 2 FREE

HERE'S WHAT
USERS SAY ABOUT YORK 10 CASSETTES:

"We monitored the output to the computer with a specially built meter and found absolutely no dropouts throughout the tape..."
Stace Papadopoulos
Beaverton, OR

"It's nice to have a tape you can rely on 100% of the time to perform with such quality. And the fast, courteous service was a pleasant surprise."
Tom Parkinson
Madison, OH

"YOU'VE TRIED THE REST,
NOW BUY THE BEST!"



Call: 213/710-1430

for IMMEDIATE SHIPMENT
on Credit Card Orders.



ORDER NOW... YORK 10™ Computerware

MAIL TO: 24573 Kittridge St., #80, Canoga Park, CA 91307

ORDER FORM

ITEM	1 DOZEN	2 DOZEN	TOTAL
C-05	<input type="checkbox"/> 7.50	<input type="checkbox"/> 13.50	
C-10	<input type="checkbox"/> 8.00	<input type="checkbox"/> 14.40	
C-20	<input type="checkbox"/> 10.00	<input type="checkbox"/> 18.00	
Hard Box	<input type="checkbox"/> 2.50	<input type="checkbox"/> 4.00	
Storage Caddy @ \$2.95 ea.:	Quantity: _____		
	FREE: Quantity: _____		
Blank labels	<input type="checkbox"/> 4.00/100	<input type="checkbox"/> 30.00/1000	
SUB TOTAL			
Calif. residents add 6% sales tax			
Shipping/handling 1 doz. \$2; 2 doz. \$3.50; 3 doz. \$4.50; each additional doz. \$5.00			
For Parcel Post instead of UPS ADD \$1			
Outside Continental USA, ADD \$2			
TOTAL			

Each cassette includes two YORK 10 labels only. Boxes are sold separately. Shipments are by U.P.S. unless Parcel Post requested. Boxes, caddies, and blank labels are free of shipping charges when ordered with cassettes. When ordered without cassettes, shipping charges: Boxes—\$1.00/doz.; Caddies \$1.00 each. MINIMUM SHIPPING/HANDLING ON ANY ORDER—\$2.00.

Check or M.O. enclosed Charge to Credit Card: VISA MASTERCARD
 PLEASE SEND QUANTITY DISCOUNTS

Card No. _____ Exp. _____
Name _____
Address _____
City _____ State/Zip _____
Signature _____
Computer make & model _____ Disk?(y/n) _____

Listing 2 continued

```

910 REM NOW A LONGITUDINAL PLOT OF BOTH INTERVAL AND SMOOTHED IN
TERVALS Y(I) AND M(I)
930 IF MM>MY THEN SC=MM ELSE SC=MY
940 SC=50/SC:'SCALING FACTOR FOR LINE PRINTER OUTPUT
950 LPRINT CHR$(27);CHR$(78);:' THIS SETS THE ITOH 8510 PRINTER
TO 10 CPI MONOSPACE FONT - MAY NOT BE NEEDED ON YOUR PRINTER
960 ' IF YOU WANT TO SEND THIS TO THE SCREEN AND NOT THE PRINTER

970 ' THEN JUST CHANGE ALL THE LPRINTS TO PRINTS.
980 TP$="TIME :"+STRING$(51,"-")+":":LPRINT TP$
990 FOR I=1 TO A-MA
1000 Y=Y(I):IF Y=0 THEN 1040
1005 M=M(I)
1010 LPRINT USING "#### :";I;
1020 ' #=SMOOTHED DATA, 0=UNSMOOTHED DATA
1030 IF Y<M THEN LPRINT TAB(Y*SC+1);"0";TAB(M*SC+1);"##";
1040 IF M<Y THEN LPRINT TAB(M*SC+1);"##";TAB(Y*SC+1);"0";
1050 LPRINT TAB(57);": "
1060 NEXT I
1070 LPRINT TP$
1080 CLS:PRINT TAB(20);"OPTIONS:"
1090 PRINT"1. REDISPLAY OUTPUT RESULTS"
1100 PRINT"2. REDO MOVING AVERAGES"
1110 PRINT"3. END PROGRAM"
1120 AS=INKEY$:IF AS="" THEN 1120 ELSE ON VAL(AS) GOTO 410,700,11
40
1130 GOTO 1120
1140 END
    
```

Program Listing 3

```

5 GOTO 9000:REM LEVEL ii VERSION
10 REM ***** LVII-HART *****
20 REM * WRITTEN BY *
30 REM * BRUCE POWEL DOUGLASS *
40 REM * DEPT. PHYSIOLOGY *
    
```

Listing 3 continues

Listing 3 continued

```

50 REM * USD MEDICAL SCHOOL *
60 REM *****
70 CLEAR 300:POKE 16527,127:POKE16526,0:DEFINT P,I,Z:DIM B(60),Z
(200),Y(200),X(200):'Z IS WHERE THE BEAT TIMES ARE STORED
80 U1$="#####" #.#####" #.#####"
90 CLS:PRINT TAB(15);"AUTOHART BY BRUCE POWEL DOUGLASS"
100 PRINT TAB(20)"INSTRUCTIONS:"
110 PRINT"THE MACHINE LANGUAGE PROGRAM HEART/CMD MUST"
120 PRINT"ALREADY BE IN MEMORY. LINE 70 IS REQUIRED"
130 PRINT"YOU SHOULD TAKE YOUR CAROTID PULSE AT THE SIDE"
140 PRINT"OF YOUR NECK, JUST LATERAL TO THE TRACHEA AT THE"
150 PRINT"CAROTID ARTERY. EVERYTIME YOU FEEL A BEAT, PRESS"
160 PRINT"THE <ENTER> KEY. TO TERMINATE DATA ENTRY, PRESS THE"
170 PRINT"<BREAK> KEY. THE PROGRAM WILL THEN DISPLAY AND"
180 PRINT"PERFORM AUTOCORRELATION ON THE TIME SERIES. TAKE"
190 PRINT"YOUR PULSE FOR 1 TO 2 MINUTES. IF YOU WANT TO DO IT"
200 PRINT"LONGER, THE ARRAY IN LINE 70 MUST BE DIMENSIONED BIGGE
R."
210 PRINT"IT WILL PROBABLY TAKE A FEW ATTEMPTS TO BE PROFICIENT"

220 PRINT"AT TAKING YOUR PULSE AND PRESSING A KEY.
PRESS ANY KEY TO START"
230 AS=INKEY$: 'CLEAR INKEY$ BUFFER
240 AS=INKEY$:IF AS="" THEN 240
250 CLS:PRINT@515,"<ENTER> TO ENTER HEART BEAT, <DOWN ARROW> TO
ANALYSE"
260 A=USR(0)-1:'COLLECT THOSE POINTS INTO Z(I); A=NUMBER OF ENTR
IES
270 DIM M(A):' TO HOLD MOVING AVERAGES LATER
280 ' THE ASSEMBLY ROUTINE TAKES 33.258 MICROSEC PER LOOP
290 ' PLUS THE TIME DELAY (TO REMOVE YOUR FINGERS) OF 0.15 SEC
300 ' LEAVES THE EQUATION (DIVIDE BY 1.0 E+6 TO GET SECONDS)
310 CO=33.258/1E6:' CONSTANT FOR TURNING IT INTO SECONDS
320 TIME=0:FOR I=1 TO A
325 IF Z(I)<0 THEN Y(I)=CO*(65535+Z(I))+0.15
330 Y(I)=CO*Z(I)+0.15;' Y(I)=INTERVAL IN SECONDS
340 IF Y(I)>0 THEN HR=HR+Y(I):' FOR AVERAGE HEART RATE
350 IF MY<Y(I) THEN MY=Y(I)
360 TIME=TIME+Y(I):'TOTAL TIME
370 X(I)=TIME:'CUMULATIVE TIME
380 PRINT USING U1$;Z(I);Y(I);TIME
390 NEXT I:HR=A/HR*60
400 ZZ=3*(TIME+1):DIM Z2(ZZ)
410 CLS:PRINT"YOU HAVE COLLECTED ";A;" POINTS OVER ";TIME;" SECO
NDS"
420 PRINT"AVERAGE HEART RATE IS ";HR;" BEATS/MINUTE"
430 REM TRANSFORM THE DATA FROM BEAT INTERVALS
440 REM TO A TRUE TIME SERIES OF '1' IF BEAT, '0' IF NOT
450 REM THE PLOT IS A CHR$(188) IF ON, CHR$(176) IF OFF
460 A2$=CHR$(188):A1$=CHR$(176)
470 PRINT TAB(20);"PLOT OF 1/3 SECOND INTERVALS"
480 J=1:STP=1/3
490 FOR K=0 TO TIME STEP STP
495 IF K<X(J) THEN PRINT A1$;Z2(K*3)=0:GOTO 510
500 IF X(J)<=K THEN Z2(K*3)=1:PRINT A2$;J=J+1:GOTO 500
510 NEXT K:PRINT:A$=INKEY$
520 PRINT TAB(20);"PRESS ANY KEY TO CONTINUE";
530 AS=INKEY$:IF AS="" THEN 530
540 REM AUTO-CORRELATION
550 REM COMPUTES AUTOCORRELATION WITH PHASE SHIFT FROM 0 TO 20 S
ECONDS AT 1/3 SECOND INTERVALS
560 REM B(I) HOLDS THE 'BINS' FOR THE SUMS
570 REM NOTE THE SIMPLIFICATION SINCE WE ARE DEALING WITH
580 REM A 0=NO BEAT, 1=BEAT
590 CLS:FOR PH=1 TO 60;' 60 INTERVALS OF 1/3 SEC EACH
600 PRINT@0,"WORKING ON PHASE ";PH
610 FOR I=1 TO A
620 IF I+PH>ZZ THEN 650
630 B(PH)=B(PH)+Z2(I)*Z2(I+PH)
640 NEXT I
650 IF MX<B(PH) THEN MX=B(PH):' MAX HEIGHT
660 NEXT PH
670 REM NOW PLOT IT, BUT FIRST SCALE IT FOR SCREEN
680 NM=40/MX:'MAX HEIGHT=40 UNITS
690 CLS:PRINT"AUTO-CORRELOGRAM OF DATA <> PRESS ANY KEY TO CONTI
NUE"
700 FOR I=1 TO 60
710 B(I)=B(I)*NM
720 FOR J=47 TO 47-B(I) STEP -1
730 SET(I+16,J)
740 NEXT J
750 NEXT I
760 AS=INKEY$:IF AS="" THEN 760
770 REM MOVING AVERAGES OF THE INSTANTANEOUS FREQUENCY
780 REM 1/Y(I)
790 CLS:INPUT"ENTER THE ORDER OF THE MOVING AVERAGES";MA
800 PRINT"THINKING ";
810 FOR I=1 TO A-MA:SUM=0
820 FOR J=1 TO MA
830 PRINT". ";
840 Y=Y(I+J-1)
850 IF Y=0 THEN 870
860 SUM=SUM+Y
870 NEXT J
880 M(I)=SUM/MA
890 IF MM<M(I) THEN MM=M(I)
900 NEXT I
910 REM NOW A LONGITUDINAL PLOT OF BOTH INTERVAL AND SMOOTHED IN
TERVALS Y(I) AND M(I)
930 IF MM>MY THEN SC=MM ELSE SC=MY
940 SC=50/SC:'SCALING FACTOR FOR LINE PRINTER OUTPUT
950 LPRINT CHR$(27);CHR$(78);:' THIS SETS THE ITOH 8510 PRINTER
TO 10 CPI MONOSPACE FONT - MAY NOT BE NEEDED ON YOUR PRINTER
960 ' IF YOU WANT TO SEND THIS TO THE SCREEN AND NOT THE PRINTER
    
```

Listing 3 continues

FREE business software directory

- Radio Shack's Model I, II, III.
- Heath's MBASIC and HDOS
- CPM: Xerox, Alto...
- IBM Personal Computer

"IDM2 is GREAT !" - publisher of 80-US

"(GL) superior to either the Osborne (SBSG & Taranto) or Radio Shack... MAIL-X has a greater capacity... more flexible than (R.S.)" - columnist of 80-microcomputing

"imperceptively fast...(DBMS) is a good and reliable workhorse" - publisher of Interface Age

Data base manager, integrated accounting package (AR, AP, GL & Payroll), inventory, word processing, and mailing list. Compare and be selective !



Micro Architect, Inc.
96 Dothan St., Arlington, MA 02174

Announcing the best Error Free Personal Computer Diskette Money can Buy. For Less.



- Error Free
- 1 year warranty
- Hub ring installed
- Write/Protect notch
- Next day delivery

\$19.90/box of 10

- No minimum order quantity
- 8" or 5¹/₄"
- Plus 2 Free BONUS DISKS/Box*

If you are a member of a user group or a school district please call for special terms on future offers. **TSS** is the largest specialty supplier of magnetic media in the Midwest. We have the products that you want when you need them. Please take advantage of this introductory offer and call us **now**.



Transaction
Storage Systems, Inc.
MAGNETIC MEDIA SPECIALISTS

22255 Greenfield Rd.
Southfield, Michigan 48075

44

CALL TOLL FREE

1-800-521-5700

1-800-482-4770 (Michigan)

313-557-3036 (Detroit)

312-922-0076 (Chicago)

614-221-1788 (Columbus)

513-621-1518 (Cincinnati)

Telex 810-224-4646

EXPECT A MIRACLE

YES, **TSS** is the magnetic media supplier that I have always wanted.

Please send me _____, 8" 5¹/₄" , @ _____ ea.
Box Quantity Price

I am interested. Please send me more information
or call me at () _____

For faster order entry call any of our toll-free or local numbers

Company _____

Name _____ Title _____

Address _____

City _____ State _____ Zip _____

Amex/Master Card/Visa orders are accepted Expiration Date

month _____ year _____

Listing 3 continued

```

970 THEN JUST CHANGE ALL THE LPRINTS TO PRINTS.
980 TP$="TIME :"+STRING$(51,"-")+":":LPRINT TP$
990 FOR I=1 TO A-MA
1000 Y=Y(I):IF Y=0 THEN 1040
1005 M=M(I)
1010 LPRINT USING "### :":I;
1020 #=SMOOTHED DATA, 0=UNSMOOTHED DATA
1030 IF Y<M THEN LPRINT TAB(Y*SC+1);"0";TAB(M*SC+1);"#";
1040 IF M<Y THEN LPRINT TAB(M*SC+1);"#";TAB(Y*SC+1);"0";
1050 LPRINT TAB(57);": "
1060 NEXT I
1070 LPRINT TP$
1080 CLS:PRINT TAB(20);"OPTIONS:"
1090 PRINT"1. REDISPLAY OUTPUT RESULTS"
1100 PRINT"2. REDO MOVING AVERAGES"
1110 PRINT"3. END PROGRAM"
1120 A$=INKEY$:IF A$=""THEN 1120 ELSE ON VAL(A$) GOTO 410,790,1140
1130 GOTO 1120
1140 END
9000 REM ROUTINE TO POKE THE MACHINE LANGUAGE PROGRAM HEART/ASM
9010 REM INTO MEMORY FOR LEVEL 11 FOLKS
9020 AD=32512:'&H7F00 IN MEMORY
9030 FOR I=AD TO 32602
9040 READ A:POKE I,A
9050 NEXT I
9060 REM MAKE SURE MEMORY SIZE IS SET TO BELOW 7F00H
9070 M=32500:MS=PEEK(16561)+PEEK(16562)*256+1:IF MS>M THEN POKE
16562,M/256:POKE16561,M-INT(M/256)*256
9080 GOTO 70
10000 DATA 243, 62, 42, 50, 0, 60, 33, 86, 255, 205, 13, 38, 21
3, 221, 225, 17, 0, 0, 33, 0
10010 DATA 0, 58, 64, 56, 254, 16, 40, 53, 254, 1, 40, 3, 35, 2
4, 242, 221, 117, 0, 221, 35
10020 DATA 221, 116, 0, 221, 35, 33, 0, 0, 19, 213, 229, 221, 2
29, 1, 255, 39, 205, 96, 0, 221
10030 DATA 225, 225, 209, 58, 0, 60, 254, 191, 40, 4, 62, 191,
24, 2, 62, 32, 50, 0, 60, 24
10040 DATA 196, 213, 225, 195, 154, 10, 90, 40, 48, 41, 0
    
```

by improving its functions.

The heart responds to exercise during exercise by increasing the strength of each contraction (so that the chambers of the heart are emptied more completely each beat) and by increasing the rate of the contractions. The increase in heart rate may be as dramatic as 40 to 200, or an increase of 500 percent. The stroke volume (the amount of blood pumped each contraction) increases as well, although less dramatically—usually 10 to 35 percent. After a heart rate of about 180, stroke volume will actually decrease because the heart doesn't have time to adequately fill before the next beat is due. In well-trained athletes, the cardiac output (stroke volume times heart rate) can increase six- to sevenfold during severe exercise.

In the long term, the heart becomes stronger. The chamber walls thicken, providing more muscle power for the expulsion of blood into the waiting aorta. Therefore, it does not have to beat as often to supply enough blood to the body. Most, but not all, people find their resting heart rates decrease after a few months of regular endurance exercise. (My resting pulse rate stabilizes at 40 to 45 beats per minute when I'm in shape, and after a few weeks of inactivity returns to 65 to 70 beats per minute.) Jim Ryun had a resting heart rate of 72 beats per minute when he held the world record in the mile, though.

To take your heart rate, use either the autocorrelation program (presented later in this column) or a watch. Place a finger or two on the radial or brachial arteries on the wrist, or better, on the carotid artery on the neck, just beside the trachea. Count the number of beats in 10 seconds, and multiply by 6. You should take your resting heart rate before getting out of bed in the morning.

Muscles get better with use, too. Running and other such endurance exercises will not increase muscle mass, as heavy strength exercises will. In fact, they may decrease the size of a limb by using up fat stores in and around the muscle. Research by Dr. William Winder, here at the University of South Dakota, has shown that with a minimum of about one hour per day the enzymes involved in electron transport (oxidative phosphorylation) will increase. The muscles also increase in myoglobin, a cousin of hemoglobin. The capillaries (tiny blood vessels where the exchange of gases, nutrients, and waste products with the working tissues

Program Listing 4

```

00020 ;*****
00030 ;* ASSEMBLED ON MZAL EDITOR/ASSEMBLER *
00040 ;* THE PROGRAM STORES THE TIME INTERVAL BETWEEN *
00050 ;* HEART BEATS EACH TIME THE <ENTER> KEY IS PRESSED. *
00060 ;* THE PROGRAM RETURNS TO BASIC WHEN YOU PRESS THE *
00070 ;* <BREAK> KEY. NO PARAMETERS NEED BE PASSED FROM BASIC *
00080 ;* BUT THE Z(I) ARRAY MUST BE DECLARED TO BE AT LEAST 200 *
00090 ;* ELEMENTS => AND <= BE INTEGERS *
00100 ;* ON EXIT, HL HAS THE NUMBER OF BEATS STORED *
00110 ;*****
FF00 00120 ;
3840 00130 ORG 0FF00H ;UP IN THE MEMORY STRATOSPHERE
00140 KEYBRD EQU 3840H ;KEYBOARD LOCATION FOR <ENTER>
00150 ;<DOWN ARROW>, ETC
260D 00150 VARPTR EQU 260DH ;ROM CALL TO LOCATE VARIABLE
0A9A 00160 BASIC EQU 0A9AH ;BASIC REENTRY POINT
0060 00170 DELAY EQU 0060H ;DELAY TO AVOID REPEAT CHARACTERS
3C00 00180 SCREEN EQU 3C00H ;VIDEO MEMORY
0001 00000 ENTER EQU 1 ;<ENTER> KEY
0010 00000 DOWN EQU 16 ;<DOWN ARROW> KEY
FF00 F3 00190 DI ;DISABLE INTERRUPTS
FF01 3E2A 00200 LD A,'*'
FF03 32003C 00210 LD (SCREEN),A
FF06 2156FF 00220 HL,ARRAY ;VARIABLE NAME TO REFERENCE
FF09 CD0D26 00230 CALL VARPTR ;GET ADDRESS OF Z(0)
FF0C D5 00240 PUSH DE ;DE HAS ADDRESS
FF0D DDE1 00250 POP IX ;NOW IN IX REGISTER PAIR
FF0F 110000 00260 LD DE,00H ;INITIALIZE # OF BEATS
FF12 210000 00270 LD HL,00H ;INITIAL COUNT FOR HEART BEAT
FF15 3A4038 00280 LOOP LD A,(KEYBRD)
FF18 FE10 00290 CP DOWN ;<DOWN ARROW> KEY TO QUIT
FF1A 2835 00300 JR Z,BACK ;RETURN IF <DOWN ARROW> KEY
FF1C FE01 00310 CONT CP ENTER ;<ENTER> KEY?
FF1E 2803 00320 JR Z,STASH ;STORE HEART BEAT COUNT
FF20 23 00330 INC HL ;UPDATE COUNTER
FF21 18F2 00340 JR LOOP ;IF NOT EITHER, THEN LOOP
FF23 DD7500 00350 STASH LD (IX),L ;STORE LSB
FF26 DD23 00360 INC IX ;UPDATE POINTER
FF28 DD7400 00370 LD (IX),H ;STORE MSB
FF2B DD23 00380 INC IX ;UPDATE POINTER
FF2D 210000 00390 LD HL,00H ;ZERO COUNTER
FF30 13 00400 INC DE ;UPDATE BEAT COUNTER
00410 ; THIS NEXT ROUTINE DELAYS FOR ABOUT 1/10 SECOND
    
```

Listing 4 continues

TRS-80* APTITUDE TEST STUDY GUIDE

Reading and Comprehension Sample Question

READ the short piece below and **ANSWER** the question that follows.

WHY I SUBSCRIBE TO 80 MICRO

Before I read my first issue of 80 MICRO I thought, "What's all the fuss about? It's just another microcomputing magazine; isn't it?" Sure I knew that 80 MICRO had published an awful lot of pages of TRS-80 information (10,000 in its first three years), but I had assumed most of it was filler, just like those other computer magazines.

Boy, was I wrong! One day, while at a friend's house, I happened to see a copy of 80 MICRO lying on his coffee table, I picked it up and began to read. I immediately realized that 80 MICRO was no ordinary micro magazine. That one issue provided me with more useful information on my TRS-80 than any other single source I had ever read. It was just packed with features like honest reviews of hardware and software, dozens of programs for business or pleasure, and page after page of money-saving ads. (I saved hundreds of dollars on computer-related purchases in the first year of my subscription ALONE.) I went out and bought my own copy of the magazine that very day. And I've been a regular subscriber ever since.

QUESTION 1: Why does this TRS-80 user subscribe to 80 MICRO? (More than one answer may be correct. Circle the answer which is most correct.)

- a) 80 MICRO provides him with more useful information than any other single source—over 10,000 pages in the first three years.
- b) He finds dozens of practical and enjoyable programs in each and every issue of 80 MICRO.
- c) 80 MICRO's hardware and software reviews give him the truth, the whole truth, and nothing but the truth.
- d) The ads in 80 MICRO save him literally hundreds of dollars on computer-related purchases every year.
- e) All of the above.

The correct answer is: e) All of the above.

You may now **PROCEED** to the questions on the order form. Remember to darken the squares completely. When you have answered all the questions... **STOP!** Do not turn the page. Do not go back to any previous section. Lay your pencil on the table, cut out the coupon, and send it in. If you are not sure of the answers, you may call toll free

1-800-258-5473

It will not count against you.
Does every one have a pencil? . . .
Are there any questions about this section? . . .
Ready? . . .
Begin.

*TRS-80 is a registered trademark of the Radio Shack Division of Tandy Corp.

80micro

the magazine for TRS-80* users

YES! The correct answer is:

a) 80 MICRO.

Please send me 12 monthly issues
for only \$24.97.

I choose to pay by the following method:

CHECK VISA MC AMEX BILL ME

Card# _____ interbank# _____

Signature _____ Exp. Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Canadian \$27.97/1 yr. only, U.S. funds.
Foreign surface \$44.97/1 yr. only, U.S.
funds drawn on U.S. bank.
Please allow 6-8 weeks for delivery.

80 MICRO • 80 Pine Street • Peterborough NH 03458

332R8

Listing 4 continued

```

00420 ; TO GIVE YOU A CHANCE TO GET YOUR GRUBBY FINGERS OFF
00430 ; THE <ENTER> KEY
FF31 D5 00440 PUSH DE ;SAVE REGISTERS
FF32 E5 00450 PUSH HL
FF33 DDE5 00460 PUSH IX
FF35 01FF27 00470 LD BC,27FFH
FF38 CD6000 00480 CALL DELAY ;DELAY FOR 0.150 SECONDS
FF3B DDE1 00490 POP IX
FF3D E1 00500 POP HL
FF3E D1 00510 POP DE
FF3F 3A003C 00520 LD A,(SCREEN)
FF42 FEBF 00530 CP ;GRAPHICS BLOCK
FF44 2804 00540 JR Z,SPACE ;IF SO PUT A SPACE
FF46 3EBF 00550 LD A,191
FF48 1802 00560 JR CONT2
FF4A 3E20 00570 SPACE LD A,32
FF4C 32003C 00580 CONT2 LD (SCREEN),A
FF4F 18C4 00590 JR LOOP ;BACK TO BUSINESS
FF51 D5 00600 BACK PUSH DE ;NUMBER OF BEATS STORED
FF52 E1 00610 POP HL ;
FF53 C39A0A 00620 JP BASIC ;BACK TO BASIC
FF56 5A283029 00630 ARRAY DEFM 'Z(0)';ARRAY TO STICK THE POINTS IN
FF5A 00 00640 DEFNB 00H ;END WITH A ZERO
00650 ;THE ARRAY MUST BE DEFINED BY BASIC BEFORE THIS ROUTINE
00660 ;IS CALLED. IT SHOULD BE DIMENSIONED TO AT LEAST 200
00670 ;ELEMENTS WITH THE STATEMENT SO YOU WON'T RUN OUT OF ROOM
00680 ; DEFINT Z:DIM Z(200)
402D 00690 END 402DH ;
    
```

occurs) also increase in number. The number of capillaries in the gastrocnemius (calf) muscle has been found to increase by up to 600 percent!

Many other interesting changes take place as a result of endurance exercise. The amount of high-density lipoproteins (HDLs) in the blood increase, which is related to a decrease in the rate of cardiac failure. The level of HDLs seems to be a better indicator of myocardial infarction risk than cholesterol levels. Further, the blood gets "thicker," increasing the number of red blood cells and the amount of hemoglobin in the cells (thus improving the blood's ability to carry oxygen and carbon dioxide). Your ability to tolerate metabolic waste products also improves with training. Consult Guyton's *Textbook of Medical Physiology* or Per Olf Astrand's *Textbook of Exercise Physiology* if you're interested in the specifics.

Measuring Your Fitness

You may be familiar with Dr. Cooper's book, *The New Aerobics*. The book uses an aerobic-point scale to measure work done. Distance and time are both important for determining the stress effect on the cardiovascular system. His book presents tables of interpolated data of points versus time and distance. I contacted Dr. Cooper's lab for the equation they use in determining the number of points per time and distance, and was informed that they would be happy to send it to me, for a mere \$1,500. Since I figured the editors at *80 Micro* wouldn't be too keen on that expense, I simply took a representative number of points from the table and with a regression program, I made my own:

$$\text{POINTS} = 10.6181 * \text{distance} - .554151 * \text{time} - 1.21753$$

where the distance is in miles and the time is in minutes.

Cooper recommends 30 points per week as a minimum for reaching an adequate state of fitness. Think of the points as a measure of the stress placed on the body that demands adaptation of the cardiovascular and muscular systems. They are related to energy output, but since it takes as much energy to walk 10 miles as it does to run it, you can see that the amount of energy per unit time is a more important criterion for fitness. Thus, running a mile gives more points than walking the same mile, and running 10 miles at eight minutes per mile gives more points than running five miles at the same pace.

(Of course, I know all true computer programmers are in excellent physical shape, but if you're over 30 and haven't worked out for a while, don't start running right away without a doctor's approval. It takes time to be macho.)

Program Listing 1 (Aerobics) asks for the beginning and ending time for your run, the distance you covered, your resting heart rate, rate at the finish of the run, and heart rate five minutes after the finish. It will calculate the aerobic points (according to the equation derived above) and average velocity, and will caution you if your five-minute pulse is not adequate.

You should take some precautions. Running has an incredible injury rate for a noncontact sport—it is stressful on the heart and circulatory systems,

and also on the muscles, tendons, ligaments, and joints. For this reason, you should always warm up and warm down thoroughly and stretch constantly to avoid shortening the muscles by using them in a shortened range of motion (running). If you follow a good plan of stretching and warming up and down, you should be able to avoid much of the trouble plaguing many runners—particularly if you are a low-mileage runner (under 40 miles per week).

Your pulse should normally go above 150 during the course of the run, but it will not improve your fitness to go beyond 180. Determine this pulse rate by pressing your fingers either to the carotid artery beside the trachea or the radial or ulnar artery of the wrist, counting the number of pulses in 10 seconds and multiplying by 6. During your warm-down, walk around and stretch, and five minutes after the finish of the run, take your pulse again. It should be below 120 (20 beats in 10 seconds). If it is not, then your run was too hard, and you should slow down.

Statistical Analysis

Now let's consider time-series analysis with moving averages and autocorrelation. Autocorrelation is simply the correlation of a time series with itself. But shouldn't a time series have a high correlation with itself?

A time series is a collection of data points collected at various points in time. An ECG (electrocardiogram) monitors the heart rate (and electrical vectors), for example, and produces a series of data points—a time series. A plot of stock market prices over a period of time is also a time series. Two questions are often asked about time series:

- Is there a periodic (seasonal) aspect to the series?
- Is there an overall trend in the series?

Autocorrelation will determine periodic fluctuations in the time series; moving averages will remove the periodic fluctuations and reveal the overall trend. In this sense, the two functions are opposites. I'll discuss autocorrelation first.

If you imagine a time series consisting of two states (0 and 1) and display the values (0's are shown as spaces), you get something looking like Fig. 1.

If you wanted to perform a correlation, you could align the series with itself, and compare states. If for a given time, both are on or both are off, then

add in a 1 into the correlation sum; if not, then add in a 0. That looks something like Fig. 2.

Of course, this correlation is perfect, as you would expect. Remember that the equations for correlations are:

$$r = \frac{\sum(xy)}{\sqrt{(\sum x^2 \sum y^2)}}$$

where:

$$\sum xy = \sum XY - \frac{\sum X \sum Y}{N}$$

$$E_x^2 = \sum X^2 - \frac{(\sum X)^2}{N}$$

$$\sum y^2 = \sum Y^2 - \frac{(\sum Y)^2}{N}$$

X and Y = raw scores

Autocorrelation is just a special case of the garden-variety product/moment correlation. You can see that from these equations the autocorrelation function (since X and Y are the same) reduced down to unity. Not very interesting, is it?

But something interesting happens if you move the series over a bit—see Fig. 3.

changing the phase shift, you can determine the periodic fluctuations in the data.

Autohart (Program Listing 2) monitors your heart rate and then performs an autocorrelation on it. The output is a histogram (called an autocorrelogram) on the screen. Since the heart rate is fairly regular, you should get a nice big

peak at the fundamental heart rate, but you will notice a second peak at about 20 times per minute. That is from the breathing rhythm, which affects heart rate. Since it is also periodic, you will get another peak farther away from the center.

The autocorrelogram is often displayed with only positive phase shifts, since it will be symmetrical about $p = 0$. There is no reason why you cannot perform an autocorrelation with real, continuous functions, such as commodity prices. The autocorrelation function gives you essentially the same information as the Discrete Fourier Transform, although in a somewhat different format.

Moving averages does the opposite to autocorrelation—it removes periodic fluctuation in a type of data smoothing and reveals an overall trend devoid of

1 1 111 1 1 111 1 1 111 1 1 111

Figure 1

1 1 111 1 1 111 1 1 111 1 1 111
1 1 111 1 1 111 1 1 111 1 1 111

Figure 2

1 1 111 1 1 111 1 1 111 1 1 111
1 1 111 1 1 111 1 1 111 1 1 111

Figure 3

1 1 111 1 1 111 1 1 111 1 1 111
1 1 111 1 1 111 1 1 111 1 1 111

Figure 4

“Autocorrelation will determine periodic fluctuations in the time series.”

Now you no longer have a perfect correlation! You made a copy of the original time series, and then added a constant to the time for each interval. Watch what happens when you move it over more (see Fig. 4). You moved it over and regained the perfect correlation! How did that happen?

The amount you moved the series over is called the *phase shift* of the series. In autocorrelation, you correlate a series with itself, but add various phase shifts to the correlation to discover periodicities in the data. Normally, the equation for autocorrelation takes a slightly different format that the normal correlation equation because you are correlating one time series with itself, but at different time-phase shifts:

$$\Phi(p) = \frac{1}{2N+p} \sum_{i=-N}^{i=N} f(i)(i+p)$$

You can see the autocorrelation function $\Phi(p)$ (where p is the phase shift) is a function of phase shift. By

Learn Successful Computerized Investing To Make Money In Any Stock Market & Gain Financial Freedom

371

If you want to increase your personal wealth while beating any stock market in the world at its own game, then the Wall Street TAP System with its outstanding programs merit your immediate and serious attention.

Stockline and Stock Stalker are finally available to help you build lifelong financial independence for yourself by unlocking the basic secrets of how to succeed in any American, Canadian or international stock market. Now, more and more market professionals who use technical analysis, are switching to this kind of software.

These two superior packages systematically compute stock and market data into graphic charts, displays and printouts that allow you to quickly evaluate

the quality, value and trend of any target stock moving in any market.

Both Stockline and Stock Stalker use the same reliable and proven appraisal techniques perfected by seasoned stock market specialists to pick their stocks. Offering unparalleled value-per-dollar features and simplicity of operation, they are designed exclusively for the home computer owner who seeks new, exciting ways to employ his hardware.

Easy to use, each program is self-documented, menu-driven, help desk supported, user-friendly, self-prompting with error trapping entry and batch updating. The accompanying operations manual is extensive, understandable and

comes complete with hardcopy samples. Configuration: Apple II with Applesoft ROM or Apple II Plus. TRS-80 Model I or III 48K, 1 disk drive.

Valuable Bonus Extra With Stockline! When you order Stockline you'll receive, FREE, a 6-month subscription to **Computer Investing News**. It's the up-to-the-minute newsletter that opens vaults of information on how to maximize your gains through computerized technical analysis investment software.

Think Software Inc., 572-810 West Broadway, Vancouver, B.C. Canada V5Z 4C9 (604) 261-7261

Choose The Stock Appraisal Software That Turns Stock Market Investing Into Computer Play

The Wall Street TAP System From Think Software Inc.

Stockline The Advanced Stock Appraiser US \$149.95. Stockline uses classic performance factors; from moving average, through point and figure, to on balance volume. With its many value-rated features such as the stock split adjustment subsystem and simultaneous chart comparison capabilities, you will have an efficient personal stock consultant at your command.

Stockline With Wall Street TAP Communications Package US \$199.95. Save \$10.

Stockline Operations Manual by Itself US \$29.95.

Stock Stalker The Basic Stock Appraiser US \$49.95. A beginner's package that is

simply revealing in its ability to spot trends, relative strengths and confirmation patterns based on price and volume data. Chart comparison system built-in. Documentation is not sold separately.

Wall Street TAP Communications Package US \$59.95. Tap into the CompuServe database with Stockline and Stock Stalker. Apple requires D.C. Hayes Micromodem.

Name _____

Address _____

City _____ State/Zip _____

\$ _____ enclosed plus \$2.00 postage & handling. Add 6% tax if delivered in B.C.

Check Money Order Visa MasterCard

Card No. _____ Expiry _____

Signature _____

Dealer Inquiries Welcome.

Order By Phone 24 Hours Daily.

Call (604) 261-7261. Please have your charge card handy.

Order By Mail. Complete coupon and mail to Think Software Inc., 572-810 W. Broadway, Vancouver, B.C. Canada V5Z 4C9.

Yes, Send me rush the stock appraisal package(s) that I've checked. I want to start making money in the stock market immediately with my Apple TRS-80.

Think Software Inc. M4

572-810 W. Broadway, Vancouver, B.C. Canada V5Z 4C9

**Add
living
color
plus
high
resolution
graphics
to your
TRS-80
for a
pale
\$219.**



The Micromint E-Z Color board is a high resolution sprite graphics interface which connects to the expansion bus of your Model I or Model III. Design and store text and graphics patterns and add colorful details to existing TRS-80 black and white displays with the Super Editor software. The E-Z Color board plus your own imagination are all you need to create an endless variety of video games and cartoons.

- Resolution—256 by 192 in 15 brilliant colors.
- Can be used with existing Basic and Machine Language programs.
- Connects directly to color monitor or color TV via r-f modulator.
- Brings animated displays alive using sprites and prioritized planes.
- Comes complete with everything you need to create dazzling graphics displays

Put an E-Z Color interface between your TRS-80 and your color monitor and watch the States light up.

including connecting cable, power supply, manuals, Super Editor software on diskette (with animation demo).

- EZ06 E-Z Color for Model I Assembled and Tested \$249
- EZ07 E-Z Color for Model I Complete Kit \$219
- EZ08 E-Z Color for Model III Assembled and Tested . . . \$249
- EZ09 E-Z Color for Model III Complete Kit \$219
- ENC02 Pactec Enclosure . . \$20

To Order:
Call Toll Free
1-800-645-3479
For Information Call:
1-516-374-6793

MICROMINT INC. ✓ 117
561 Willow Avenue
Cedarhurst, NY 11516

Color monitor

e/z color
Makes your TRS-80 light up.



As featured in
Ciarcia's Circuit Cellar,
Byte Magazine, August, 1982

TRS-80 is a Trademark of Tandy Corp.

the periodicities. Moving averages will remove only those periodicities that you tell it to remove—it is like passing your time-series data through a filter to remove some noise, or unwanted information. In fact, this data filter is called a low-pass filter.

If you begin with a set of numbers $X(1), X(2), X(3), \dots$ the moving average of order N is defined to be the sequence of means shown in Fig. 5. If you set $Y = M(X)$ (the series $Y(i)$ is the moving average of the series $X(i)$), the Y series will be smoothed, since each number in the X series is replaced by the arithmetic mean of the i th through the $(i + n - 1)$ th data points in the X series. This will effectively filter out periodic fluctuations with a frequency higher than the filter (N). In this way, the moving averages filter reduces the amount of variation present in a set of data, specifically, the periodic fluctuations with a higher frequency than the order of the moving average. This process will reduce the number of data points in a manner dependent on the order of the moving average (number of raw data points - order of moving average).

The Autohart program (see Listings 2 and 3) gathers time series data about your heart beats and finds the periodic fluctuations in it (via autocorrelation) and the overall trend (via moving averages). There should be two periodic fluctuations, as shown in the autocorrelogram—from the period of the heart beat itself, and another due to the influence of the respiratory feedback inhibition on the heart rate.

Autohart is easy to use—I've included both a disk and a Level II version. For disk users, assemble the machine-language routine HEART/ASM to sit at FF00H. When you enter Basic, make sure the memory size is set to below that. If you have only 32K, then adjust the ORG of HEART/ASM. If you are a Level II user, I have provided an extra routine that takes the data statement equivalent of the program (lines 10000 and up) and POKES them into memory at 7F00H.

Type run and messages will tell you how to operate the program. The machine-language routine keeps a counter going until you press enter. Then it

stores the value of the counter, and starts over. It keeps doing this until you press the down-arrow key. It uses the ROM call VARPTR to find the integer array $Z(i)$, and stores the values there. On return, the HL register pair (and the USR function) have the value of the number of times you pressed the enter key.

Take your heart rate as I described earlier and every time you feel a beat, press the enter key. Take at least 100 beats—it will take a little while to learn how to keep with the pulses. Don't hold the key down very long—the machine-language routine only waits 15/100 seconds before scanning the keyboard again. Press the key and let go. The up-

“The moving averages filter is most effective at frequencies close to its order.”

per left corner of the screen will toggle a space with a graphics block each time you press it. If it did not change, the routine stored two beats, not one, and you need to let go sooner.

When you press the down arrow, Basic takes over and turns the $Z(i)$ integer array into a single-precision array of seconds between beats, and another array of the cumulative time in seconds. Autohart calculates and displays the average heart rate, and then shows a plot of the beats. Each second is divided into thirds. A tall graphics block indicates a heart beat.

Press the enter key, and an autocorrelation will be performed with 60 phase shifts (20 seconds with $\frac{1}{3}$ -second intervals for the phase shift). You should have at least 100 points to do this, although you can do it with fewer. Then the program draws an autocorrelogram on the screen. Remember, this is the correlation of a time series with itself with various phase shifts. If you're lucky and got enough points with accurate enough timing for your data entry,

you should see a second peak in the histogram, showing a periodic fluctuation in heart rate (it should match your respiration rate).

Next, you will be asked for the order of the moving averages. This affects the periodicities that are removed. The moving averages filter is most effective at frequencies close to its order. The program calculates this and performs a longitudinal plot on your printer. The #s are the smoothed series and the Os are the raw data. If you do not have a line printer, then just change every LPRINT to print. You will then be given the options of reviewing all the statistics or redoing the moving averages with a different order. Try this out and see the effect of the period of the smoothing.

The program has a number of routines that you may find very useful. The autocorrelation routine will scale and plot a histogram of data values. The moving averages plot routine allows you to scale the width of a plot for your line printer and print a loooooong plot of lots of data points by scrolling. (It will also work on the screen, although somewhat less effectively.) You cannot use the Tab statements to tab beyond 64 even if your printer has more columns than that (unless you use a Basic that supports this function, such as DOS-PLUS's Disk Basic). Since my printer's default print font is proportional, I output CHR\$(27) and CHR\$(78) to use a monospace font, in which all the characters take up the same amount of space.

Finally, these two routines for autocorrelation and moving averages can be used to analyze other types of time-series data. I suggest you generate a series with the function $Y = X + \text{SIN}(X) + \text{RND}(0)$ since it has both a nice trend ($Y = X$), a nice periodic feature ($+\text{SIN}(X)$) and a little noise, too ($\text{RND}(0)$). You will find an autocorrelogram showing the periodic nature and a longitudinal plot of the moving average showing the trend.

For mathematically inclined readers wishing to learn more about this area of statistical analysis, I recommend the classic *Time-Series Analysis: Forecasting and Control* by George Box and Gwilym Jenkins, popularizers of the ARIMA (Auto Regressive Integrated Moving Averages) model for time-series analysis. Less mathematically sophisticated readers may find *Statistics* by Murray Spiegel of Schaum's Outline Series more understandable. ■

$$\frac{X(1) + X(2) + \dots + X(n)}{N}, \frac{X(2) + X(3) + \dots + X(n+1)}{N}, \frac{X(3) + X(4) + \dots + X(n+2)}{N}, \dots$$

Figure 5

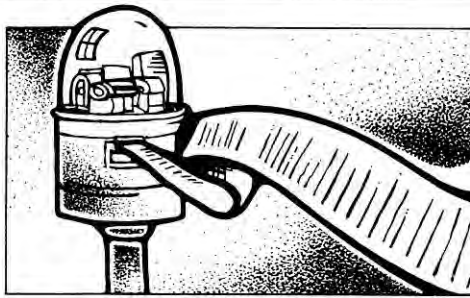
This is the first anniversary of MONEY DOS. During the last year I have dealt with the basic strategy of investing. I've covered bond analysis, convertible securities, rental property evaluation, IRAs, portfolio analysis, commodity trading, and option trading. My programs were designed to help your investment decision making.

A MONEY DOS hotline was set up with a toll-free number where one could get my 30-second comment about the market. The Hotline following has now grown (late October) to over 1,000 calls each weekend...for good reason. My observations about investing have proven to be sound. For example, those who began calling in March 1982 were surprised to hear my very bearish posture on precious metals, the stock market, and my advice to buy precious metals. The famous gold analyst, James Dines, was telling his subscribers to sell.

They were also surprised when I told the callers in July, "We are on the verge of the most awesome rally in market history," and, "We are seeing lows that we will never see again in our lifetime." Joe Granville, the self-proclaimed market mastermind, was telling his subscribers that the Dow was going much lower!

The September column elicited the most response. I shared a commodity trading system that had averaged over 38 percent profit for 10 years—remember the \$50,000 bet! What is important is that the specific recommendations in MONEY DOS have been good. I receive hundreds of letters from callers and writers. An often posed question is why I offer free advice. A recent letter from a man who has closely followed the column and called every weekend states, "For almost a year I have been profiting from your advice and, so far, you haven't tried to sell me a damn thing. There's gotta be a catch somewhere J.M. Why are you writing MONEY DOS?" Well, the catch is that I'm writing a book (my second), which should be released one year hence. The MONEY DOS columns are, generally speaking, excerpts therefrom. Your comments give me valuable insights as to the clarity of my writing. Besides, when it is published, maybe I'll have a few of you interested enough to buy it.

In future columns I shall deal with general investment strategies: buying



Expand your opportunities

stocks and paying no commission; arbitrage, the riskless investment; convertible securities; using VisiCalc to obtain a fantastic portfolio analysis; annuities and other ways to defer taxation; short-term option trading; and strategies when interest rates are low. Remember to take into account the two-month lag time from manuscript submission to publication as specific advice may be stale when you read it.

The most exciting new feature to MONEY DOS is the bulletin board system. The idea came from one of my clients, who has had a TRS-80 for three years. With a BBS and the appropriate password my clients can access day or night my latest advice, place an order, check their account status, or ask a question. During market hours they can get a rapid confirmation.

My hardware for the system is a Model III, 48K, currently using an old 80-track Aerocomp drive. When you read this it will be running on a hard drive. I chose the Lynx auto-answer/auto-dial modem for this dedicated service as it has a built-in RS-232. I use MicroSystems' Micro-80 BBS system, which I modified extensively for this service. The parameters are: 300 baud, 7-bit words, 1 stop bit, and even parity.

The BBS operates 24 hours a day, seven days a week. One can see the BBS as 16 file cabinets one on top of the other. The general public has access to cabinets A and B. The balance are reserved for my colleagues and clients. At any

time you can access my current recommendations, ask a question, or make suggestions. Should you want to act on the advice, do so at your own risk and place the order through your broker. The public has no access to the Order Entering section. Currently, I am ill-equipped to accept new accounts, even at my minimum.

One section is updated hourly during the market day where one can retrieve *Hotnews* (headlines from wire services), current market averages, commodity prices, signals from The System (see the September 1982 issue), current news on 20 widely held stocks, and my intraday market observations. At 4:30 p.m. (EST) the closing market and commodity prices appear, as well as the options that traded the most volume that day.

At 8 a.m. you can find opening stock trends in Europe, the London gold fixing, and a list of suggested covered-option writes as well as the 10 puts and calls that, based solely on price versus historic volatility, are potentially very profitable, albeit risky. If you see a recommendation on which you want more in-depth information, you can request it. No one will ever call and try to sell you anything—that's a promise. This service is free, save the direct-dial charge you pay Ma Bell.

The maiden voyage began on the 16th of October. Hundreds called the first week, and while I am flattered that they find it so interesting, some stay on for 30–40 minutes retrieving the same information several times. You will save time and money having a printer ready so you can get a printout and read it at your leisure. To print, you must have one of the smart terminal programs. Please limit your access time to 10 minutes. The access number currently is (305) 655-2340. It might be changed when you read this, but a call to the MONEY DOS weekend hotline (800-327-3389, or in Florida 305-655-3389) will update if needed. The hotline operates from 9 p.m. Friday–7 a.m. Monday.

Somebody might get rich from this idea. There are several hundred companies whose top officers travel frequently. How can they resist a private central BBS where they can access messages 24 hours a day, leave a private message for a colleague, or access vital statistics even though they are in

MODEL I

TRS-80

MODEL III

HIGH CLASS PROGRAMS (on tape or disk) AT POOR MAN PRICES

Get 12 tapes or disks a year containing over 75 quality programs — and pull ahead of the Joneses without joining the prodigal sons.

A subscription to **CLOAD Magazine** (tape or disk) consists of 6 to 8 ready-to-load programs delivered by First Class Mail every month. Programs like CIA Adventure, Disk Mail, PILOT, Trend Calc, Pac Mania, Keyplus, and Stellar Empire.

No need to beg for a good software meal — Get a subscription to **CLOAD Magazine**. Or just go for hors d'oeuvres and try a back issue . . .

The Bottom Line:

	Tape	Disk
1 year (12 issues)	\$50.00	\$95.00
6 months (6 issues)	\$30.00	\$55.00
Single Copies		
Back Issues	\$ 6.00	\$11.00
Good Games #1	\$12.00	\$23.00
Adventures #1	\$13.00	\$24.00

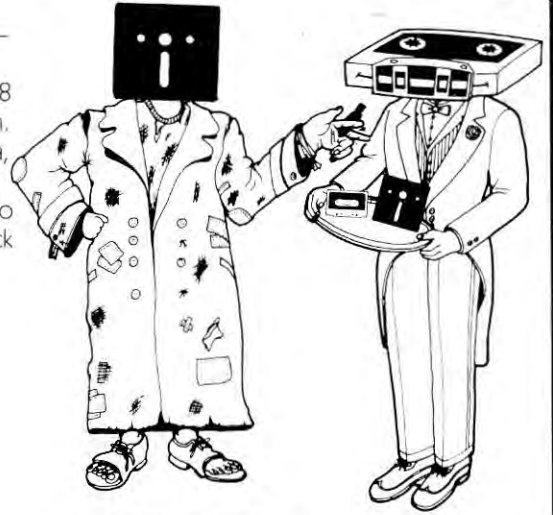
102

California residents add 6% to single copies.
North America — First Class postage included.
Overseas — add \$10 to subscriptions and \$1 to single copies. Sent AO rate.

The Fine Print:

All issues from Oct 78 available on tape, issues from Oct 82 available on disk, also.
Ask for list (24 Level I issues also available).

MasterCard/Visa



P.O. Box 1448
Santa Barbara,
CA 93102
(805) 962-6271

ONLY THE BEST SOFTWARE ON TAPE AT THE BEST PRICE (under 75 cents a program . . .)

Get 12 tapes a year containing over 75 colorful programs — and give your typing fingers a vacation.

A subscription to **CHROMASETTE Magazine** consists of 6 to 8 ready-to-load programs on tape delivered by First Class Mail every month. Programs like Blockade, Drawer, Mansion Adventure, CK Monitor, Append, Germ, and Cataloger.

Give yourself an extended holiday — Get a subscription to **CHROMASETTE Magazine**. Or just take a break and try a back issue (your fingers may never work again) . . .

103



Radio Shack Color Computer TDP System 100

The Bottom Line:

1 year (12 issues)	\$45.00
6 months (6 issues)	\$25.00
Single Copies	\$ 5.00

Calif. residents add 6% to single copies.
North America — First Class postage included.
Overseas — add \$10 to subscriptions and \$1 to single copies. Sent AO rate.

MasterCard/Visa

The Fine Print:

All issues from July 1981 available — ask for list. Programs are for the **Extended BASIC** models and occasionally for disks.

Chromasette MAGAZINE

P.O. Box 1087 Santa Barbara, CA 93102 (805) 963-1066

Why pay more for

TRS-80

Model 16
Model 11
Model 111
Printers
Color Computer

We'll meet or beat any price from an authorized TRS-80 dealer!

We have cables to interface our printers with Commodore, IBM, and Osborne computers.

EPSON
C. ITOH
APPLE
FRANKLIN
OKIDATA
ATARI

We have the lowest prices, massive inventory, and can deliver

Our prices are so low we aren't allowed to print them!



Now Available TRS-80 Color Computer 64K!

Send for FREE 40-page catalog including equipment reviews, prices, specs, and illustrations on over 600 computers and accessories.

CALL TOLL FREE: 800-526-5313
COMPUTER DISCOUNT OF AMERICA, INC.
15 Marshall Hill Road, West Milford Mall
West Milford, New Jersey 07480-219
In New Jersey Call 201-728-8080

Computer Discount of America

Zurich? This is a huge market waiting to be tapped. The briefcase terminal is here complete with tiny printer. Total BBS cost with hard drive is about \$4,000-\$6,000—peanuts to the behemoths of the business world. When you make your first million on this, give a few dollars to a good charity and tell 'em J.M. sent you. ■

(The MONEY DOS bulletin board system's access number is currently (305) 655-2340. The MONEY DOS weekend hotline number is 800-327-3389, or in Florida (305) 655-3389.)

J. M. Keynes is a Senior Vice President-Investments of a member firm of the New York Stock Exchange.



EBERT PERSONAL COMPUTERS INC.

The Bread Board System[®]

(until february 28, 1983)

INTRODUCTORY PRICE

\$99.95

REGULARLY \$149.95

THEY SAID IT COULDN'T BE DONE ON A TRS-80*. BUT WE DID IT!

Finally--A fast, friendly, flexible, responsive approach to remote computer communications. Jam packed with features never before seen on other Bulletin Board Systems costing 2-3 times our special introductory price of only \$99.95. Some of the more exciting features include:

1. Word wrapping so that various screen sizes get a smooth and properly formatted display no matter what screen size was used during text entry. Your callers will love you for it!
2. Complex or Simple Structures. Up to 20 levels of Menu Nesting and UNLIMITED numbers of menus may be utilized for those of you sinister enough to force your users to traverse the "Twisty Passageways."
3. Electronic Mail Service plus up to 25 separate message boards. These boards can be configured for either Private or Combined access or both. You can even authorize individual SYSOPS for each of the message boards! Each user may be given read only, read/write or no access to each board!
4. Storage capacity and efficiency. TBBS utilizes 1/3 the disk space of competing systems! Maximum message capacity is 2500 messages! The userlog stores system configuration, access and privilege levels, password and other important system information for up to 65,535 separate users.
5. All system maintenance is easily accomplished with the provided utility programs. Such tasks as removal of deleted messages, restoration of deleted messages, Userlog maintenance, menu creation/editing, Configuration of system options, and system backup are easier than ever before!
6. System security is enhanced by the optional use of a logon password check, 255 privilege levels, and 16 feature/command authorization flags. These features provide an unprecedented flexibility in presenting TBBS to various users.

7. Fully protected remote use of DOS and Basic for games or remote SYSOP functions is available if desired. This may be restricted or public as desired.
8. Menus are composed using a Menu Editor allowing total flexibility in system appearance. TBBS may be made to look like a system you've seen before or like something totally new and unique.
9. Question and answer capability allows product ordering, vote taking, user surveys etc.
10. Fast, Responsive, and fully protected!! 1200 baud on TBBS averages 40% -120% faster throughput than competitive boards. TBBS responds instantly when a caller commands! Most other systems respond at the end of a line or series of lines or at certain times not at all. TBBS is ready for a new caller in an average of 5 seconds!! Worst case with 2500 messages on file is less than 45 seconds on a floppy based system. TBBS also cleans up correctly after accidental loss of carrier. No hung systems! No lost messages! No forgotten deletes! Even when using remote DOS!
11. To see what we are talking about call TBBS headquarters at (303)690-4566. TBBS has to be used to believe!!
12. System requires Model I or III (or equivalent), Auto-Answer Modem, RS-232, and NEWDOS/80 V 2.0. Program will work on either model automatically. (NOTE: 1200 baud requires a specially modified cable.)

TRS-80* is a registered trademark of TANDY CORPORATION.

FULL AFTER-SALE SUPPORT



"Personal" is our middle name.

4122 SOUTH PARKER ROAD
AURORA, COLORADO 80014 (303)693-8400

Monday-Friday
9:30 AM-6:30 PM
Saturday 10 AM-5 PM

133

545



Adventure's

FROM THE COMPANY THAT STARTED IT ALL!



CURSE OF CROWLEY MANOR

A mysterious adventure into the depths of the occult. This program uses many unique plot-twists and strange devices to guide you either through to victory, or on a certain trip to the gates of hell. Will you be able to solve the CURSE OF CROWLEY MANOR?

TRS-80 16K TAPE \$19.95
 TRS-80 32K DISK \$20.95
 Skill Level: Moderate.



STONE OF SISYPHUS

Hideous monsters or lavish treasures beyond all price? You may not have a choice in this rather unfriendly subterranean world where survival will depend largely upon hard intellect and a little luck. Sure to provide hours of frustrating enjoyment, STONE OF SISYPHUS features the kind of action you've come to expect from the incredible MACES & MAGIC Series!

TRS-80 32K DISK (Mod 1) \$29.95
 TRS-80 48K DISK (Mod 3) \$29.95
 Skill Level: Moderate.



KID VENTURES

These make-believe adventures are designed for little folk between the ages of 3 and 7, and will allow the child to actually interact with the story. All three KID VENTURES are based upon popular children's stories, poems or songs. All feature graphics and sounds, too!

Kid Venture #1 - Red Riding Hood
 TRS-80 16K TAPE (Specify Mod 1 or 3) . \$14.95
 Kid Venture #2 - Night Before Christmas
 TRS-80 16K TAPE (Specify Mod 1 or 3) . \$14.95
 Kid Venture #3 - Old McDonald's Farm
 TRS-80 16K TAPE (Both Mod 1 & 3) ... \$14.95
 Skill Level: Beginner.



ESCAPE FROM TRAAM

You survived the initial crash on a bizarre, distant world, but you may soon wish that you hadn't! You must escape this dangerous placé — but be forewarned that if your decisions are not tempered with intelligence and caution, you may not see home again!

TRS-80 16K TAPE \$19.95
 TRS-80 32K DISK \$20.95
 Skill Level: Advanced.



BALROG

This is the first chapter in our popular MACES & MAGIC Series. You equip a character of your own creation and journey into a weird world of dank dungeons and fiery dragons. This fantasy adventure features one of the largest data bases ever created for a microcomputer role-playing game. A real challenge!

Requires two disk drives
 TRS-80 32K DISK (Mod 1) \$29.95
 TRS-80 48K DISK (Mod 3) \$29.95
 Skill Level: Moderate.



EARTHQUAKE - San Francisco 1906

The title says it all! You're in the middle of one of the most violent earthquakes of modern times — and your survival hinges on wits alone! EARTHQUAKE — SAN FRANCISCO 1906 features one of the most powerful data bases available for a game of this type. Hours of exciting fun guaranteed!

TRS-80 16K TAPE \$19.95
 TRS-80 32K DISK \$20.95
 Skill Level: Moderate.



DEATH PLANET: The Dog Star Adventure

The evil General Doom and his Roche soldiers are gearing up for a galactic onslaught — will you be able to rescue the kidnapped princess and save the royal treasury in time? An adventure from Lance Micklus, author of STAR FLITE.

TRS-80 16K TAPE \$19.95
 TRS-80 COLOR COMPUTER 16K TAPE \$19.95
 Skill Level: Beginner.



MORTON'S FORK

The MACES & MAGIC Series continues! Magical beings and strange creatures populate this mystical realm. Equip your warrior with the necessary accouterments, then plunge into the awesome world of MORTON'S FORK!

TRS-80 32K DISK (Mod 1) \$29.95
 TRS-80 48K DISK (Mod 3) \$29.95
 Skill Level: Moderate.



HIDDEN VALLEY

Sure, you're an exalted, courageous, robust warrior — but can even your sturdy constitution save you from the terrors of HIDDEN VALLEY? This dungeon-type program features 99 separate levels of play. This is the second entry in the new DEMON VENTURE Series.

TRS-80 16K TAPE \$19.95
 TRS-80 32K DISK \$24.95
 Skill Level: Moderate



REIGN OF THE RED DRAGON

First in the new DEMON VENTURE Series, REIGN OF THE RED DRAGON features dungeon-esque excitement laced with real time graphics. Brace yourself for the incredible!

TRS-80 48K DISK \$24.95
 Skill Level: Moderate.

SKILL LEVEL KEY

BEGINNER

Excellent introductory adventure for younger players. Minimal problem-solving skills required.

MODERATE

Moderate problem-solving skills required.

ADVANCED

Advanced problem-solving skills required.

TO ORDER

See your local dealer. If he does not have the program you want, then call 1-800-327-7172 (orders only) or write for our free catalog.

Published by



a subsidiary of Scott Adams, Inc.
 BOX 3435 • LONGWOOD, FL 32750
 (305) 830-8194

TRILOGY

DRIVEN TO DRIVES

HANDLES 5" 8" AND WINCHESTER DRIVES IN A SINGLE BOARD!!!

Trilogy replaces our M3DC1 series of drive controllers, yet provides more, and better features. The name TRILOGY stems from the fact that the controller will handle (a) 5 inch single, double and the NEW QUAD Density drives, (b) 8 inch single and double density drives, and (c) internal Winchester drives.

The neat thing about Trilogy is that it will handle all three types of drives simultaneously, and the drives can be specified as to which logical device they are. For example, the Model III will handle four disk drives and up to four Winchester drives. We have designed the Trilogy so that the user can set up drives 0 and 1 as double density 5 inch drives, drive 2 as a 5 inch quad density drive, drive 3 as 8 inch single density drive, and drives 4,5,6 and 7 as Winchester drives. Of course the above combination is totally user selectable. The user can decide which drives from 0 to 3 he wants to be 5 inch, 8 inch single, double or quad density.

The Trilogy controller uses the newest floppy disk controller chip on the market- the WD2793 from Western Digital. The disk controller chip features ON CHIP PHASE LOCK LOOP DATA SEPARATOR (which means highest reliability), ON CHIP WRITE PRECOMPENSATION (reliability again), and a host of other features too numerous to mention.

NOTE: For supporting 8 inch single and double density drives the user will have to install a clock speed up board in his system. The 8 inch drives running double density require a CPU clock of 4.0 MHz. The virgin Model III has a 2.02 MHz clock. The Winchester support on the Trilogy is identical to our old series of M3DC1 board and as such would still need the Winchester accessories kit, Winchester host adapter, Winchester controller, and a Winchester drive.

FEATURES

- GOLD PLATED EDGE CARD CONNECTIONS
- SILKSCREENED AND SOLDERMASKED PRINTED CIRCUIT BOARD
- POLARIZED POWER CONNECTIONS
- IC SOCKETS USED THROUGHOUT
- HIGHEST GRADE PRINTED CIRCUIT BOARD MATERIAL
- THOROUGH TESTING OF CONTROLLER

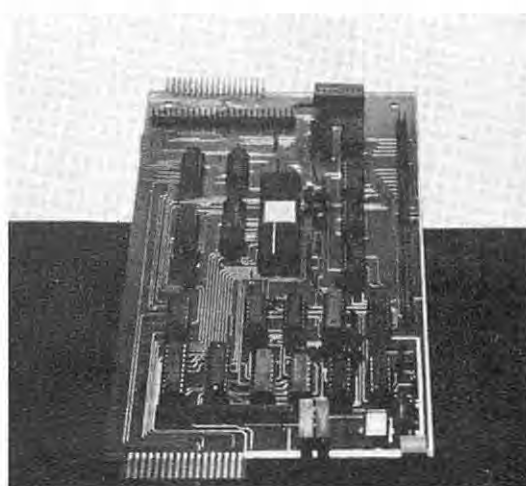
TRILOGY CONTROLLER 149.95

INSTALLATION KIT 129.95

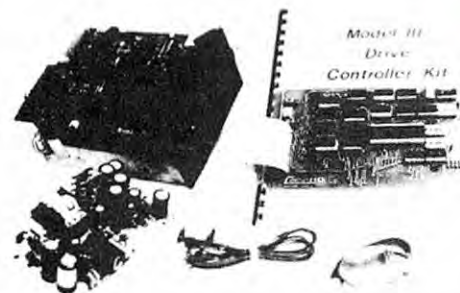
which includes the switching power supply, drive mounting brackets and all necessary cables to complete the installation of disk drives into your Model III.

* DEALERS WELCOMED *

One year limited warranty (replacement/repair-labor and parts.)



COMPLETE MODEL III DRIVE KITS



Complete Model III Disk Drive Kits include the Computex drive controller with capabilities of Winchester drive expansion. Virtually everything you will need to install disk drives in your Model III is included- We even include one of the most popular DOS systems available, DOS PLUS 3.4

M3DK0 Drive Kit with 1 Single Sided 40 Track Drives	\$495.00
M3DK1 Drive Kit with 2 Single Sided 40 Track Drives	\$699.00
M3DK2 Drive Kit with 2 Double Sided 40 Track Drives	\$995.00
M3DK4 Drive Kit with 2 Double Sided 80 Track Drives	\$1150.00

COMPUTEX₂₇
a subsidiary of Worldwide Data Systems Inc.

VISA, MASTERCARD and AMERICAN EXPRESS
NET 30 TERMS AVAILABLE
D & B Rated Firms, Universities and Government
Net 30 Terms Require a 10% Handling Fee

•Prices are subject to change without notice•

17321 El Camino Real Houston, Texas 77058

(713) 488-8022



a subsidiary of Worldwide Data Systems Inc. ✓ 27

17321 El Camino Real
Houston, Texas 77058
(713) 488-8022

Dual Drive Model III With 8" Drive Support

FEATURES

- DOS PLUS 3.4 Operating System
- Winchester Expansion Option
- Gold Plated Edge Cards
- Fully Socketed Drive Controller
- Switching Power Supply
- System Dust Cover
- Expansion Capabilities
- Uses Trilogy Controller Board
- 90 Day warranty
- or
- 1 Year Warranty Available



SPECIAL
CUSTOM BUILT
*M321
\$1795.00

P-31 Green Phosphor CRT \$89.00

Model 320 \$1695.00
One S/S 40 Track Drive

* Model 321 \$1895.00
Two S/S 40 Track Drive

Model 322 \$2295.00
Two D/S 40 Track Drives

Model 324 \$2595.00
Two D/S 80 Track Drives

Model 325 \$3995.00
One TM602 Winchester &
One S/S 40 Track Drive

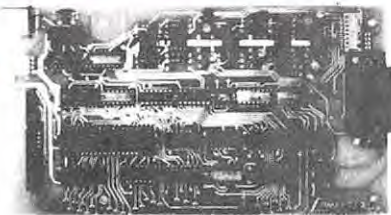
Model 326 \$4495.00
One TM603 Winchester &
One D/S 80 Track Drive

All customized Model III systems from Computex now include at *no extra charge* DOSPLUS 3.4. A Computex customized system starts out as a basic Model III, 32K RAM is added to increase the storage to 48K. Ad to this our Model III drive controller with Winchester expansion option and the appropriate Tandon or MPI disk drives per your requirements. The system is then tested vigorously for 48 hours to assure you of peak performance when the system arrives at your doorstep.

Call or Write for our Free Catalog

MODEL III INTERNAL COMMUNICATIONS BOARD

NEW!



The newest addition to the Computex line of Model III add on kits is our M3CB1 Communications board complete with RS232 and DIRECT CONNECT MODEM. The kit can be supplied in either total kit form or as a partially assembled unit. The partially assembled unit only requires installation of the integrated circuits, all other components have been installed and tested. The M3CB1 mounts in the same location as the Radio Shack RS232 board and installs easily in less than one hour.

FEATURES

- 300 to 9600 Baud RS232•
- 300 Baud Full Duplex Operation•
- Uses FSK Modulation Techniques•
- Supports Originate or Answer Modes•
- Will Operate DTE or DCE Equipment•

M3CB1-1	P.C.B. & Manual	\$34.95
M3CB1-2	Assembled & Tested RS232	\$69.95
M3CB1-3	Complete Kit	\$129.95
M3CB1-4	Partially Assembled Kit	\$169.95

MDX-2 Interface Expansion Boards for your Model III from Micro-Design

COMPLETE KIT \$269.95

- MDX-2 printed circuit board \$74.95
- Onboard direct connect modem kit \$39.95
- 2K/4K Eprom kit \$11.95
- RS232 mA serial interface \$24.95
- Real-time clock kit \$17.95
- 32K RAM expansion kit (less RAM) \$17.95
- Floppy disk controller kit \$31.95
- Cassette port \$4.95
- Analog power supply \$29.95
- Hardware and socket kit \$29.95
- Centronic line printer port \$11.95

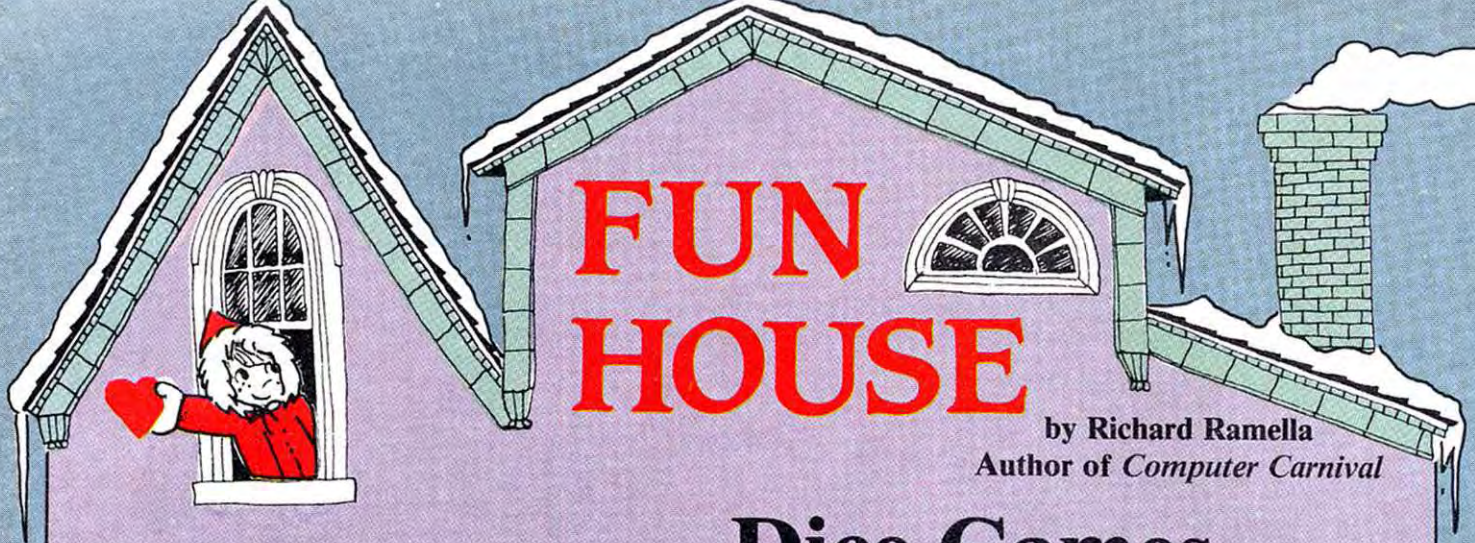
MDX-3 Interface Expansion Boards for your Model III from Micro-Design

• Floppy Disk Controller • Phone Modem •
• RS232 Port • Silkscreened & Soldermasked PCB •
COMPLETE KIT \$274.95

- Printed Circuit Board \$74.95
- Disk Controller Kit \$89.95
- Serial Interface Kit \$79.95
- Phone Modem Kit \$39.95

Our qualified technicians are available for technical questions at (713) 488-8022 every day from 4:00 to 5:00 PM CST

DEALERS WELCOMED



FUN HOUSE

by Richard Ramella
Author of *Computer Carnival*

Dice Games

Stand back as I open this closet door in the game room of the Fun House. Don't be alarmed by what happens next.

Wheee! Out clatter half a million dice. There should be enough for everyone to take five each. We're going to play some dice games, and I'm happy to say that craps is not one of them.

The games are called Fifty, Show Up, Drop Dead, and Martinetti. Separate Color Basic and Level II listings are given for Martinetti, but the program listings for the other three games will work equally well in Level II and on the color machine.

These are games that require only one person and the computer. The computer not only plays against you, but is the scorekeeper and umpire.

Fifty

When I was a kid, like every other kid I had a Monopoly set. As time passed I kept losing parts of the set until I had nothing except the two dice.

That's when I was forced to learn some interesting dice games. The first one I learned was Fifty.

I remember Fifty as a tricky game. It turns out it's quite a simple game when the computer keeps score and takes its turns without bragging or complaining.

You and the computer race to see who can score 50 points first. You throw two dice in turn. Only doubles (two ones, two twos, and the like) have any effect on the score. If you throw two sixes, you get 25 points. If you throw two threes, you lose all the points you have. If you

throw two ones, two twos, two fours, or two fives, you get five points.

When a player gets a total of 50 or more, the computer says who wins.

Show Up

Again, you and the computer take turns and play against each other. Whereas Fifty was a button-tapping race, Show Up combines strategy and luck.

Both players start with 100 points. Whenever the pot is emptied, the players each give an amount equal to one-tenth of the lowest stake. Example: If

Fifty

```

100 REM * FIFTY / TRS-80 COLOR BASIC AND LEVEL II *
110 CLS
120 FOR Q=1 TO 2
130 IF Q=1 THEN PRINT "YOUR TURN" ELSE PRINT "MY TURN"
140 INPUT "TAP ENTER TO ROLL";X
150 A=RND(6)
160 B=RND(6)
170 PRINT A;B
180 IF A=3 AND B=3 THEN PRINT "LOSE ALL POINTS": T(Q)=0: GOTO 21
190 IF A=6 AND B=6 THEN PRINT "25 POINTS": T(Q)=T(Q)+25: GOTO 21
200 IF A=B THEN PRINT "5 POINTS": T(Q)=T(Q)+5
210 IF A<>B THEN PRINT "NO SCORE"
220 IF Q=2 THEN PRINT: PRINT: PRINT "SCORE: YOU";T(1);" ME";T(2)
230 PRINT
240 IF T(1)>49 THEN PRINT "YOU WIN": GOTO 290
250 IF T(2)>49 THEN PRINT "I WIN": GOTO 290
260 NEXT Q
270 INPUT "TAP ENTER TO CONTINUE";X
280 GOTO 110
290 GOTO 290
300 END
  
```

The Key Box

Model I, III or Color Computer
4K RAM

PERIPHERAL VISION

Floppy Disk Services, Inc. is a contracted SIEMENS drive dealer. Do not let the prices fool you, we buy in very large quantities to get the best price and pass that savings on to you! All systems are of the highest grade components and our cabinets are custom designed with you in mind! If not 100% satisfied, call us and we will promptly refund your money. †

We carry Add-on drives for IBM, Radio Shack, Heath, Apple and most other microcomputers.

Apple II Add on drives.....	\$329.00
Apple 8 inch controller	365.00
Apple 80 track dual system.....	1395.00
Apple dual 8 inch system w/ controller	1250.00
FDD-100-5b 'flippy' exact HEATH add on.....	235.00
FDD-200-5 double sided 40 track drive	250.00
FDD-111-5 5ms step IBM or MOD 3 Add on	245.00
FDD-221-5 5ms step 80 track DD/DS.....	350.00
TEC SFD-51B 5ms 5¼ 48TPI	215.00
FDD-100-8d 8 inch single side DD drive	340.00
FDD-200-8p Double sided 8 inch drive.....	445.00
Custom 8 inch and 5¼ inch enclosures	Call

System packages available for all drives ...	
Dual 8 inch system with EVERYTHING	935.00*
Dual double sided 8 inch system	1125.00*
Single 5¼ Heath or MOD I Add on w/ case.....	285.00*
Dual 5¼ Heath or MOD I.....	585.00*
10mb Hard Disk for any computer.....	2700.00*
CDR controller, allows any combo 8 and 5¼ inch drives to be added to your H88 or H89.....	Call

* 8 inch systems require minor assembly. Add \$100.00 A&T.
 All 5¼ inch systems come assembled and tested.
 † Equipment must be in same condition as you received it.

WE HAVE ZENTH Z-100 SYSTEMS IN STOCK.

Have a disk drive in need of repair? We have expert techs ready to optimize your drives!
 Call us for info.

AT FLOPPY Disk Services, we not only sell drives, we also sell custom enclosures. Our cabinets are designed by our experts to be functional and attractive. And our quantity pricing is so attractive, we invite dealers and large group purchasers to call.

CALL TODAY • 609-799-4440



If you don't see what you want, give us a call between 9 am & 5 pm (ET). Chances are we'll have what you need for your system at your price. Due to production deadlines for advertising, prices in this ad are 2 months old, so we encourage you to call us for current prices and new product information.

PAYMENT POLICY - We accept Mastercard, VISA, personal checks & MO. We reserve the right to wait 10 working days for personal checks to clear your bank before we ship. All shipping standard UPS rates plus shipping & handling. NJ residents must add 5% sales tax.

PRICES & SPECIFICATIONS SUBJECT TO CHANGE

FLOPPY DISK SERVICES INC. 292
 741 ALEXANDER ROAD
 PRINCETON, NJ 08540

MOD II-III, CP/M are trademarks of Tandy and Digital Research respectively.

FD2-1

Show Up

```
100 REM * SHOW UP / TRS-80 COLOR BASIC AND LEVEL II *
110 CLS
120 P(1)=100
130 P(2)=100
140 FOR Q=1 TO 2
150 IF P=0 GOSUB 390
160 IF Q=1 THEN PRINT "YOUR TURN" ELSE PRINT "MY TURN"
170 A=RND(6)
180 PRINT
190 PRINT "YOU";P(1);" ME";P(2);" POT";P
200 PRINT
210 PRINT "THE POINT IS";A
220 IF Q=1 THEN INPUT "YOUR BET";X
230 IF Q=2 GOSUB 470
240 IF X<1 OR X>P(Q) OR X>P THEN PRINT "IMPOSSIBLE": GOTO 220
250 B=RND(6)
260 C=RND(6)
270 IF Q=1 THEN PRINT "YOU "; ELSE PRINT "I ";
280 PRINT "ROLL";B;C
290 IF B>A AND C>A THEN PRINT "WINNER": P(Q)=P(Q)+X: P=P-X
300 IF B<A OR C<A THEN PRINT "LOSE ALL": P(Q)=P(Q)-X: P=P+X
310 IF B=A AND C>A OR C=A AND B>A THEN PRINT "WIN 1/4": P(Q)=P(Q)
+INT(X/4): P=P-INT(X/4)
320 IF B=A AND C=A THEN PRINT "DOUBLE POINT. TAKE POT": P(Q)=P(Q)
)+P: P=0
330 IF P(1)<1 THEN PRINT: PRINT "I WIN": END
340 IF P(2)<1 THEN PRINT: PRINT "YOU WIN": END
350 INPUT "TAP ENTER TO CONTINUE";X
360 CLS
370 NEXT Q
380 GOTO 140
390 IF P(1)<P(2) THEN S=INT(P(1)/10)
400 IF P(2)<P(1) THEN S=INT(P(2)/10)
410 PRINT "ANTE: 1/10 OF LOW STAKE:";S
420 PRINT
430 P=P+S*2
440 P(1)=P(1)-S
450 P(2)=P(2)-S
460 RETURN
470 PRINT "I'LL BET";
480 FOR T=1 TO 500
490 NEXT T
500 IF A>3 THEN X=1
510 IF A=1 THEN X=P: IF X>P(2) THEN X=P(2)
520 IF A=2 THEN X=INT(P/3): IF X>P(2) THEN X=INT(P(2)/3)
530 IF A=3 THEN X=INT(P/10): IF X>P(2) THEN X=INT(P(2)/10)
540 IF X<1 THEN X=1
550 PRINT X
560 FOR T=1 TO 500
570 NEXT T
580 RETURN
590 END
```

the pot empties when you have 100 points and the computer 80, you each have to ante eight points to the pot because that's a tenth of the lowest stake—the computer's 80.

Here's what happens during a turn. First, one die is thrown. Its total becomes the point. Next, you can bet up to the total of your stake or the total of the pot that the next throw of two dice will be a winner. You must bet at least one point, even in very bad situations.

Here are the winners and losers of that second roll:

- You win your bet if both dice are higher than the point number.
- You win a fourth of your bet if one die is equal to the point and the other is higher.
- You win the entire pot if both dice equal the point. Example: The point is three and you throw two threes. This is called a "double point" in the game.
- You lose your bet if both dice are lower than the point or if one is equal and the other lower.

Drop Dead

```
100 REM * DROP DEAD / TRS-80 COLOR BASIC AND LEVEL II *
110 CLS
120 P(1)=0
130 P(2)=0
140 C(1)=5
150 C(2)=5
160 CLS
170 FOR Q=1 TO 2
180 IF P(1)>P(2) AND C(2)=0 OR P(2)>P(1) AND C(1)=0 GOTO 520
190 IF C(Q)=0 GOTO 490
200 IF Q=1 THEN PRINT "YOUR TURN" ELSE PRINT "MY TURN"
210 PRINT "THROWING";C(Q);
220 IF C(Q)>1 THEN PRINT "DICE" ELSE PRINT "DIE"
230 PRINT "TAP ENTER TO ROLL."
240 A$=INKEY$
250 IF A$<>" " GOTO 260 ELSE GOTO 240
260 PRINT STRING$(4*C(Q)+2,"*")
270 PRINT"*";
280 FOR A=1 TO C(Q)
290 B(A)=RND(6)
300 PRINT B(A);" ";
310 NEXT A
320 PRINT "*"
330 PRINT STRING$(4*C(Q)+2,"*")
340 C=0
350 FOR A=1 TO C(Q)
360 IF B(A)=2 THEN C=C+1
370 IF B(A)=5 THEN C=C+1
380 NEXT A
390 PRINT
400 IF C=0 GOSUB 610
410 IF C>0 GOSUB 690
420 IF C(1)=0 AND C(2)=0 GOTO 510
430 PRINT
440 PRINT "SCORE: YOU-";P(1);" ME-";P(2)
450 PRINT "DICE: YOU-";C(1);" ME-";C(2)
460 PRINT
470 INPUT "TAP ENTER TO GO ON";J
480 CLS
490 NEXT Q
500 GOTO 170
510 PRINT "ALL OUT OF DICE"
520 PRINT
530 IF P(1)>P(2) THEN T=T+1
```

Listing continues

Turn your color computer on to the power of FLEX

NOW FROM THE WORLDS LARGEST SUPPLIER OF SOFTWARE FOR FLEX COMES FHL COLOR FLEX. JUST LOOK AT THESE FEATURES:

IF YOU'RE TIRED OF NO DISK SOFTWARE, THEN FHL Color FLEX IS THE ANSWER!

FLEX is the world's most popular operating system for the 6809 and with over 100 programs, we are the largest supplier of software for FLEX. These programs are NOT games but serious programs for your Color Computer. They range from word processors thru business applications to software development tools. Many Fortune 500 companies use our software. FHL Color FLEX turns your Color computer into a powerful system more capable than systems costing several times as much.

Get on our mailing list, call or send for our complete catalog of over 100 products for FLEX. We're doing exciting things with your color computer!

FLEX NOW ONLY \$99

- HI-RES screen formats
- 16 x 32 and 24 x 51, upper and lower case characters
- 24 x 64 and 32 x 64 upper case
- Full ASCII keyboards
- Easy start-up—just type RUN "FLEX"
- Online assistance just type HELP
- Optionally use a standard terminal and printer
- Advance disk I/O and terminal capabilities
- NO additional hardware required
- We have supported FLEX with more software than anyone else in the world for more than 2 years!

SPECIAL

1. DBASIC, RS Disk Basic under FLEX with a utility to copy RS to FLEX disk \$30.
2. ED/ASM line and screen editor and macro assembler, both more powerful than TSC's, and at the same cost, only \$100.
3. UTILITIES, a set of 12 utilities especially designed for FHL Color FLEX \$50.
4. STYLOGRAPH full word processor. Special for FHL Color FLEX only. \$195.00



THE REGENCY TOWER
770 JAMES ST. • SYRACUSE, NY 13203
TELEX 646740 • (315) 474-7856

FHL FRANK HOGG LABORATORY

*FLEX is a trademark of Technical Systems Consultants Inc.

Listing continued

```
540 IF P(2)>P(1) THEN W=W+1
550 IF P(1)=P(2) THEN PRINT "TIE GAME. NO SCORE."
560 PRINT
570 PRINT "SERIES: YOU";T;" ME";W
580 PRINT
590 INPUT "TAP ENTER TO CONTINUE";J
600 GOTO 110
610 FOR A=1 TO C(Q)
620 G(Q)=G(Q)+B(A)
630 NEXT A
640 PRINT "TURN:";G(Q)
650 P(Q)=P(Q)+G(Q)
660 IF G(Q)>20 THEN FOR H=1 TO 8: PRINT "WOW ";: NEXT H: PRINT:
PRINT
670 G(Q)=0
680 RETURN
690 PRINT "NO SCORE. LOSE";C;
700 IF C>1 THEN PRINT "DICE" ELSE PRINT "DIE"
710 C(Q)=C(Q)-C
720 RETURN
730 END
```

Martinetti—Level II

```
100 REM * MARTINETTI / LEVEL II *
110 CLS: CLEAR 200: B$=STRING$(62,128)
120 PRINT "MARTINETTI";
130 C(2)=8: P(1)=1: S(1)=1: S(8)=1: Y=6
140 PRINT @ 194, "1 2 3 4 5 6 7 8 9 10";
150 FOR X=2 TO 62: SET(X,Y): SET(X,Y+6): NEXT X
160 FOR X=2 TO 62 STEP 6: FOR Y=6 TO 11: SET(X,Y): NEXT Y: NEXT
X
170 X(8)=0: Y(8)=4: X(1)=0: Y(1)=14: SET(X(1),Y(1))
180 SET(X(8),Y(8))
190 FOR Q=1 TO 8 STEP 7
200 PRINT @ 384,"";
210 IF Q=1 THEN PRINT "YOUR TURN. "; ELSE PRINT "MY TURN. ";
220 INPUT "TAP ENTER TO ROLL";E
230 G=RND(6): H=RND(7): J=RND(6)
240 PRINT G;H;J: IF Q=8 GOTO 360
250 FOR Z=1 TO 7
260 IF G=S(Q) THEN R(Z)=G
270 IF H=S(Q) THEN R(Z)=H
280 IF J=S(Q) THEN R(Z)=J
290 IF G+H=S(Q) THEN R(Z)=G+H
300 IF G+J=S(Q) THEN R(Z)=G+J
310 IF H+J=S(Q) THEN R(Z)=H+J
320 IF G+H+J=S(Q) THEN R(Z)=G+H+J
330 NEXT Z
340 GOTO 710
360 FOR Z=1 TO 10
370 IF G=S(Q) THEN PRINT G;"=";S(Q): GOSUB 470
380 IF H=S(Q) THEN PRINT H;"=";S(Q): GOSUB 470
390 IF J=S(Q) THEN PRINT J;"=";S(Q): GOSUB 470
400 IF G+H=S(Q) THEN PRINT G;"+";H;"=";S(Q): GOSUB 470
410 IF G+J=S(Q) THEN PRINT G;"+";J;"=";S(Q): GOSUB 470
420 IF H+J=S(Q) THEN PRINT H;"+";J;"=";S(Q): GOSUB 470
430 IF G+H+J=S(Q) THEN PRINT G;"+";H;"+";J;"=";S(Q): GOSUB 470
450 NEXT Z: GOSUB 630
460 NEXT Q: GOTO 190
470 FOR T=1 TO 500: NEXT T
480 IF W(Q)<>2 THEN S(Q)=S(Q)+1 ELSE S(Q)=S(Q)-1
490 RESET(X(Q),Y(Q))
500 IF W(Q)<>2 THEN FOR L=X(Q) TO X(Q)+5
510 IF W(Q)=2 THEN FOR L=X(Q) TO X(Q)-5 STEP -1
520 SET(L,Y(Q))
530 FOR T=1 TO 20: NEXT T
540 RESET(L,Y(Q))
550 NEXT L
560 SET(L,Y(Q)): X(Q)=L
590 IF S(Q)=0 AND W(Q)=2 GOSUB 670
600 IF S(Q)=11 GOSUB 650: S(Q)=9
610 IF Q=1 GOTO 250
620 RETURN
630 FOR V=384 TO 960 STEP 64: PRINT @ V,B$;: NEXT V
640 RETURN
650 W(Q)=2
660 RETURN
```

Listing continues

When someone goes broke, the winner is named.

This program deals only in whole numbers, no fractions; so there will be times when the ante doesn't exactly equal the total of the lowest stake. And unless you bet at least four points, the computer won't pay off in those "WIN 1/4" situations.

Confused? Then play the game and see how easy it really is.

Drop Dead

I don't like the name of this game, but it would be dishonest if I called it anything except what it's really called—Drop Dead. However, it's the dice that drop dead, not the player.

This game is all luck and no skill. There is absolutely no strategy, and to play all you have to do is tap enter over and over. Still, it can be a lot of fun to see what happens next.

Both you and the computer start out with five dice and take turns throwing. In each turn your score increases by the total of all the dice. However, if either a two or a five turns up, two things happen. First, you get no score for the turn. Second, the two and five dice are removed so you have fewer dice to throw your next turn.

Play in a round continues until one of the following happens: Both players lose all their dice; or one player loses all the dice and the other player is ahead in points. If a player who is ahead loses all the dice, the trailing player continues to throw until either losing the last die or pulling ahead.

COLOR FOR THE 80's

MOD I & MOD III

NOW! -- Vivid Color Graphics
Exciting Sound Effects
Joystick Game Action
Kit only **\$99.00***



BUY THE BEST! Our CHROMAtrs add-on lets you create spectacular color and sound effects with capabilities never before possible on MODEL I or MODEL III. Now your old TRS-80 can look and sound like the best around!

CHROMAtrs™ Comes Complete With:

- 16 vivid colors
- High resolution graphics (256 x 192)
- 2 Atari joystick and paddle connectors
- 3-D animation using sprite graphics
- 16k display RAM
- Programmability in BASIC
- LOGO language subset on disk
- One complimentary game
- Easy-to understand operating manual

The CHROMAtrs easily attaches to all TRS-80 Mod I and Mod III microcomputers without affecting your Radio Shack warranty. This system is so simple to use that you will be amazing your friends in no time at all!

*\$99 Kit price does not include case or power transformer

Watch for our User Interest Group on Micronet via Photo-80

- CHROMAtrs kit \$99
- CHROMAtrs assembled & tested \$169
- RF modulator with switch box \$25
- Mod 1 ribbon cable \$12
- Mod 3 ribbon cable \$14
- Cassette software (free with CHROMAtrs)
- Diskette software (free with CHROMAtrs)
- Subtotal
- N.Y.S. residents add 7.25% sales tax
- Shipping and handling (USA) \$5.00
- TOTAL

Check one: () Check () M.O. () COD () M.C. () Visa

Account # Exp

Name

Address

City

State Zip

Please send MORE information

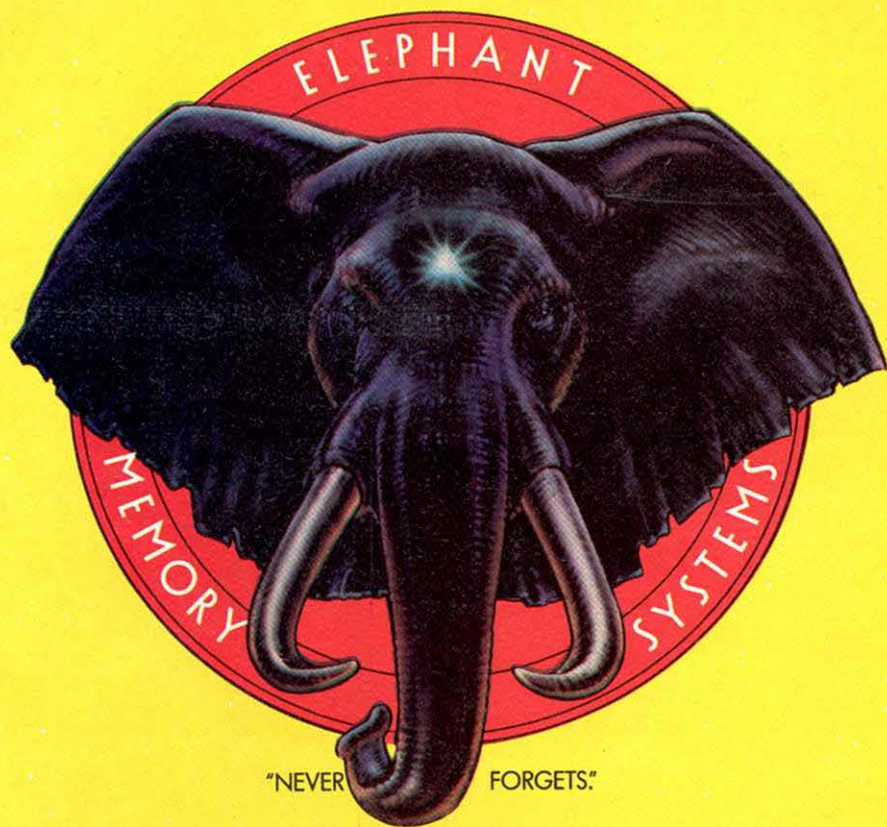
171



South Shore Computer Concepts, Inc.

1590 Broadway, Hewlett, NY, 11557
Phone orders accepted (516) 569-4390

REMEMBER:



MORE THAN JUST ANOTHER PRETTY FACE.

Says who? Says ANSI.

Specifically, subcommittee X3B8 of the American National Standards Institute (ANSI) says so. The fact is all Elephant™ floppies meet or exceed the specs required to meet or exceed all their standards.

But just who is "subcommittee X3B8" to issue such pronouncements?

They're a group of people representing a large, well-balanced cross section of disciplines—from academia, government agencies, and the computer industry. People from places like IBM, Hewlett-Packard, 3M, Lawrence Livermore Labs, The U.S. Department of Defense, Honeywell and The Association of Computer Programmers and Analysts. In short, it's a bunch of high-caliber nitpickers whose mission, it seems, in order to make better disks for consumers, is also to

make life miserable for everyone in the disk-making business.

How? By gathering together periodically (often, one suspects, under the full moon) to concoct more and more rules to increase the quality of flexible disks. Their most recent rule book runs over 20 single-spaced pages—listing, and insisting upon—hundreds upon hundreds of standards a disk must meet in order to be blessed by ANSI. (And thereby be taken seriously by people who take disks seriously.)

In fact, if you'd like a copy of this formidable document, for free, just let us know and we'll send you one. Because once you know what it takes to make an Elephant for ANSI . . .

We think you'll want us to make some Elephants for you.

ELEPHANT.™ HEAVY DUTY DISKS.

For a free poster-size portrait of our powerful pachyderm, please write us.

Distributed Exclusively by Leading Edge Products, Inc., 225 Turnpike Street, Canton, Massachusetts 02021
Call: toll-free 1-800-343-6833; or in Massachusetts call collect (617) 828-8150. Telex 951-624.

READER SERVICE

Please help us to bring you a better magazine—
by answering these questions.

This card valid until March 31, 1982

My vote for the best advertisement in this issue goes to _____ (company)
whose Reader Service number is _____

A. What is your age?

1. 12 or under 4. 26-35 7. 55-60
 2. 13-20 5. 36-45 8. 61-65
 3. 21-25 6. 46-55 9. Over 65

B. How much interest do you have in articles on the following products? (1 = no interest, 5 = much interest)

- ___ 1. Printers ___ 3. Plotters ___ 5. Modems
 ___ 2. Disk drives ___ 4. Hard disk drives ___ 6. PMC/LNW micros

C. If you plan to buy a new printer during the next year, how much do you expect to spend?

1. Under \$250 4. \$751-\$1,000 7. \$2,001-\$2,500
 2. \$251-\$500 5. \$1,001-\$1,500 8. Over \$2,500
 3. \$501-\$750 6. \$1,501-\$2,000

D. If you plan to buy a plotter during the next year, how much do you expect to spend?

1. Under \$250 4. \$751-\$1,000 7. \$2,001-\$2,500
 2. \$251-\$500 5. \$1,001-\$1,500 8. Over \$2,500
 3. \$501-\$750 6. \$1,501-\$2,000

E. If you plan to buy a new modem during the next year, how much do you expect to spend?

1. Under \$250 4. \$751-\$1,000 7. \$2,001-\$2,500
 2. \$251-\$500 5. \$1,001-\$1,500 8. Over \$2,500
 3. \$501-\$750 6. \$1,501-\$2,000

F. If you were planning to purchase an additional microcomputer, would you buy another TRS-80?

1. Yes 2. No

G. What is your major application for your TRS-80?

1. Word processing 5. Games
 2. Business 6. Hobby
 3. Freelance clerical 7. Other home use
 4. Education 8. Other _____

H. If you use a Model II, what types of software would you like to see more of?

1. Word processing 5. Games
 2. Business 6. Hobby
 3. Freelance clerical 7. Other home use
 4. Education 8. Other _____

I. Do you use your micro at home as a source of revenue?

1. Yes 2. No

J. Where do your children use a microcomputer?

1. At home 3. Both of the above 5. Don't use a micro
 2. At school 4. Other _____

L. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following regular columns:

- ___ 1. 80 Remarks ___ 7. 80 Applications
 ___ 2. Money DOS ___ 8. Copernica Mathematica
 ___ 3. Reviews ___ 9. Medical Opinion
 ___ 4. News ___ 10. Exclusive Oracle
 ___ 5. Feedback Loop ___ 11. Fun House*
 ___ 6. Beneath the Keyboard ___ 12. New Products

Reader Service: To receive more information from any of the advertisers in this issue of 80 Micro circle the number on the postage-paid Reader Service Card that corresponds with the Reader Service number on the ad in which you are interested. You will find numbers, preceded by a ✓, near the logo of each advertiser. Complete the entire card, drop into a mailbox and in 4-6 weeks you will hear from the advertiser directly.

1	6	11	16	21	151	156	161	166	171	301	306	311	316	321	451	456	461	466	471
2	7	12	17	22	152	157	162	167	172	302	307	312	317	322	452	457	462	467	472
3	8	13	18	23	153	158	163	168	173	303	308	313	318	323	453	458	463	468	473
4	9	14	19	24	154	159	164	169	174	304	309	314	319	324	454	459	464	469	474
5	10	15	20	25	155	160	165	170	175	305	310	315	320	325	455	460	465	470	475
26	31	36	41	46	176	181	186	191	196	326	331	336	341	346	476	481	486	491	496
27	32	37	42	47	177	182	187	192	197	327	332	337	342	347	477	482	487	492	497
28	33	38	43	48	178	183	188	193	198	328	333	338	343	348	478	483	488	493	498
29	34	39	44	49	179	184	189	194	199	329	334	339	344	349	479	484	489	494	499
30	35	40	45	50	180	185	190	195	200	330	335	340	345	350	480	485	490	495	500
51	56	61	66	71	201	206	211	216	221	351	356	361	366	371	501	506	511	516	521
52	57	62	67	72	202	207	212	217	222	352	357	362	367	372	502	507	512	517	522
53	58	63	68	73	203	208	213	218	223	353	358	363	368	373	503	508	513	518	523
54	59	64	69	74	204	209	214	219	224	354	359	364	369	374	504	509	514	519	524
55	60	65	70	75	205	210	215	220	225	355	360	365	370	375	505	510	515	520	525
76	81	86	91	96	226	231	236	241	246	376	381	386	391	396	526	531	536	541	546
77	82	87	92	97	227	232	237	242	247	377	382	387	392	397	527	532	537	542	547
78	83	88	93	98	228	233	238	243	248	378	383	388	393	398	528	533	538	543	548
79	84	89	94	99	229	234	239	244	249	379	384	389	394	399	529	534	539	544	549
80	85	90	95	100	230	235	240	245	250	380	385	390	395	400	530	535	540	545	550
101	106	111	116	121	251	256	261	266	271	401	406	411	416	421	551	556	561	566	571
102	107	112	117	122	252	257	262	267	272	402	407	412	417	422	552	557	562	567	572
103	108	113	118	123	253	258	263	268	273	403	408	413	418	423	553	558	563	568	573
104	109	114	119	124	254	259	264	269	274	404	409	414	419	424	554	559	564	569	574
105	110	115	120	125	255	260	265	270	275	405	410	415	420	425	555	560	565	570	575
126	131	136	141	146	276	281	286	291	296	426	431	436	441	446	576	581	586	591	596
127	132	137	142	147	277	282	287	292	297	427	432	437	442	447	577	582	587	592	597
128	133	138	143	148	278	283	288	293	298	428	433	438	443	448	578	583	588	593	598
129	134	139	144	149	279	284	289	294	299	429	434	439	444	449	579	584	589	594	599
130	135	140	145	150	280	285	290	295	300	430	435	440	445	450	580	585	590	595	600

Name _____

Address _____

City _____ State _____ Zip _____

80 Micro • February 1983

BOOKS

80 Micro
Peterborough NH 03458

2-83

Please send me the following 80
Micro products:

Qty.	Catalog #	Title	Unit Price	Total

Shipping and handling charges:
\$1.50 1st book, \$1.00 each additional book
(UPS, use street address)
\$10.00 each book overseas airmail

Shipping/handling _____
Total _____

Enclosed \$ _____ Check M.O.

Bill: AE MC VISA

Card# _____ Exp. date _____

Signature _____ Interbank# _____

Name _____

Address _____

City _____ State _____ Zip _____

No C.O.D. orders accepted.

Please allow 4-6 weeks for delivery

SUBSCRIPTION

80micro
the magazine for TRS-80 users

subscribers save \$10
off the
newsstand price.

New subscription Renewal
 1 year—\$24.97

Enclosed \$ _____ Check M.O.

Bill: AE MC VISA

Card# _____

Exp. date _____ Interbank# _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Canada and Mexico \$27.97 1 year only, US Funds.

Foreign Surface—\$44.97, 1 year only, US Funds.

Foreign Air—Please Inquire.

332R89

Place
Stamp
Here

80micro

P. O. BOX 306
DALTON, MA 01226

Place
Stamp
Here

80micro
Subscription Dept.
POB 981
Farmingdale NY 11737

Place
Stamp
Here

80micro
Att. Mail Order
Peterborough NH 03458

RS Number	Page	RS Number	Page	RS Number	Page	RS Number	Page
476 ABC Sales	347	118 Data Services Inc.	349	368 Mar-Tec	337	275 Red Baron Computer Products	249
477 A.M. Electronics	97	565 DataSoft	421	241 Mark Data Products	168	114 RelWare	288
443 A String Systems	409	99 Data Systems	361	146 Master Electronics Inc.	431	145 REMarkable Software	403
107 Aardvark-90	321	237 Data Terminals & Communications	355	83 Med Systems Software	51, 271	129 REMSOFT Inc.	239
311 Abacus Associates	304	291 Dithium Press	231	250 Melbourne House Software Inc.	65	480 Rimes Computer Products	112
26 Access Unlimited	210, 211	* Disk Supply Co.	145	461 Memory Merchant	195	512 Rockware Data Corp.	295
536 Adcock & Johnson	423	204 DISKcount Data	359	188 Mercer Systems Inc.	167	343 Rogo Computer Products	150
590 Addison-Wesley Publishing	426	441 Diskette Connection	409	13 Meta Technologies Corp.	9, 11	213 80 Micro Journal	213
19 Adventure International	377	5 Diskette Junction	91	149 Micro Architect Inc.	366	35 SID	275
82 Aerocomp Inc.	164, 165	37 Diskovery Unlimited	411	247 Microcomputer Technology Inc.	146, 147	266 STSC Inc.	345
183 Alamo Computer Co.	301	62 Displayed Video	182, 183, 185	142 Microcomputing Sales Opportunity	397	142 Sales Data Inc.	363
* AideoCo	302	167 Downeast Digital	308	459 Micro Data Supplies	59	Sandipier Software	202
136 Algorex	191	353 Dresselhaus Computer Products	363	76 Micro-Design Inc.	148	203 Scientific Engineering Lab	133
473 Alpha Byte Computer Products	13	* 80 Micro	35, 131, 213, 322, 323, 361, 369, 397, 417	77 Micro-Design Inc.	324	510 Scott Tasso	390
17 Alpha Products Co.	15, 17, 19	* 80 Micro Bookshelf	339-341	463 Micro-Design Inc.	171	528 Serious Personal Computing	42
374 ALPS	126	* 80 Micro Subscription	213	565 Micro-Design Inc.	428	363 Shawmut Systems	349
69 Alternate Source, The	333	216 EAP Company	16	132 Micro-80 Inc.	428	248 Shirley Software	312
217 American Small Business Computers	303	401 E & G Umlor Enterprises	133	161 Micro-Grip Ltd.	241	12 Simutek	121
218 American Small Business Computers	305	385 E&H Software	102	419 Microhatch	267	163 Simutek	287, 289, 291
219 American Small Business Computers	307	382 E.J.B. Electronic Systems	415	569 Microhatch	422	164 Simutek	162
220 American Small Business Computers	309	28 EPYX/Automated Simulations	274	157 Micro-Images Inc.	129	370 Skyline Software	289
221 American Small Business Computers	311	581 EPYX/Automated Simulations	422	464 Micro-Labs, Inc.	388	182 Small Systems Center	327
284 Ancie Labs	264	49 ESI Lynx	241	60 Micro Mainframe	317	556 Small Systems Center	430
141 Anitek	361, 147	147 EZ Tax	57	551 Micro Mainframe	434	567 Small Systems Center	426
* Ann Arbor Precision	275	402 Early Games	319	96 Micro Management Systems	169	* Snappware	242, 423
40 Apparat Inc.	143, 315	545 Ebert Personal Computers	376	342 Micromatic Programming Co.	292	379 Softcore Software	107
552 Applied Creative Technology Inc.	430	349 Educational Microcomputer Systems	130	162 Micro Mega	419	399 Soft Images/Decision Systems Inc.	257
390 Applied Microsystems Inc.	225	154 Eigen Systems	241	117 Micromint Inc.	372	84 Soft Sector Marketing	153
514 Ashland Computer Systems	112	159 Electronic Specialists	181	548 Micro Projects Engineering	289	85 Soft Sector Marketing	155
65 Aspen Software Company	163	283 Endicott Software	92, 304	575 Microserve	423	86 Soft Sector Marketing	157
383 Astro-Star Enterprises	216	578 Endicott Software	430	312 Microsette	94	69 Soft Sector Marketing	159
152 BCCOMPCO	55	379 Epson America Inc.	82, 83	209 Micro Software	267	57 Softshell	432
300 B.T. Enterprises	265	97 Exaltron	275	528 Micro Software Systems	293	386 Softouch	103
287 Barstrann Corporation	336	* Excellonix	275	* Micro Solutions Inc.	222	537 Software Options	181
558 Barstrann Corporation	432	292 Floppy Disk Services Inc.	381	384 Micro Systems Software Inc.	ClI, 207	327 Software Support	36
146 Baudy House Computer Products	336	214 Fort Worth Computers	318	339 Micro-Tax	68	272 Solutions Inc.	331
243 Bay Technical Associates Inc.	120, 267	262 Frank Hogg Laboratory Inc.	383	380 Micro Tech Exports Inc.	151	271 South Shore Computers	385
* Bible Research Systems	61	391 Funsoft Inc.	217	125 Micro Works, The	278	195 Specialized Software Inc.	127
106 Binary Devices	290	66 Futuresoft	53	* Midwest Computer Wholesale	357	119 Spectral Associates	201, 203
198 Blackjack Clinic	216	492 GSB Electronics Inc.	337	137 Miller Microcomputer Services	136	577 Spectrum Projects	429
* Bottom Line, The	87	379 Gamemaster Software	107	281 Mind Spa, The	130	572 Speech Systems	428
571 Bretford Manufacturing	423	186 Good-Lyndon Data Systems	222, 409	430 Mini Systems Support	28	208 Spiral Enterprises	255
20 Business Division, The	44, 45	236 Gooth Software	413	123 MisoSys	204, 205	432 Star-Kits	125
325 C-Cal	415	299 Gtek Corp.	363	567 Modtec Software Division	429	* Starlogic Inc.	151, 251
138 C&S Electronics Ltd.	179	9 H & E Computronics Inc.	73-79	562 Multi-Tech Systems Inc.	430	506 Star Micronics Inc.	101
548 C Tensi	68	409 H.F. Signalling Inc.	92	67 Mumford Micro Systems	229, 277	583 Star Value Software	420
181 CMD Micro	234	487 HPB Vector Co.	286	538 N.C. Software Inc.	267	71 Sublogic Communication Corp.	297
368 CNGA	100	359 Harley D. Wilbur	302	533 NEBS Computer Forms	294	144 Sugar Software	340
100 CPU Shop, The	313	46 Hexagon Systems	63	* NRI Schools	189	285 Sun Research Inc.	200
249 Cab-Tek	277	355 Holman D.P. Services	80	128 Nelson Software Systems Inc.	177, 285	456 Sunlock Systems	291
422 Calflec	325	153 Holmes Engineering Inc.	29, 261	150 Nevins Associates	173, 175	210 Superior Software	54
53 Capital Software	174	573 Homebase Computer Systems	428	430 Mini Systems Support	28	94 Swallow Software	191
575 Century Software Systems	423	373 Horizons Software	431	232 Nocona Electronics	151, 258, 418	230 Synergetic Solutions	393
466 Check-Mate	215	175 Howe Software	326	54 Novdill Software	306	174 Syracuse R & D Center	16
493 Chiles & Chiles	128	185 Hurricane Laboratories Inc.	407	* OCR Associates	267	568 3G Company	432
103 Chromasette Magazine	375	211 ICR Futuresoft	69	50 Omikron	267	208 T & D Software	91
102 Cloud Magazine Inc.	375	* IJG	141, 223, 327, 422, 427	195 Omnitek Computers International Inc.	206	389 T.C.E. Programs	222
12 Cognitech	87	* InCider Apple Users	299	206 Options-80	128	168 Tab Sales	172
267 Color Software	267	* Instant Software System	395	151 Orion Instruments	126	70 Taranto & Associates Inc.	299
361 Communications Systems Lab	336	351 Institute for Scientific Analysis	313	321 PAB Software Inc.	127	576 Teaching Tools Microcomputer Services	426
415 Comp-U-Gamer	419	101 J&M Systems	325	435 PCD Systems	220	541 Teach Yourself By Computer Software	312
252 CompuAdd Corp.	281	439 JES Graphics	312	25 PC Newsletter	235	404 Tech Data Corp.	92, 115
455 CompuKit	424, 425	273 JF Consulting	49	242 PMC Software	95	504 Telepress Inc.	115
120 Computer Applications Unlimited	247	42 JPC Products Co.	113	207 Pacific Exchanges	151, 213, 390	59 Texas Computer Systems	279
139 Computer Case Company	88	534 Jameco Electronics	389	122 Pan American Electronics	431	371 Think Software	371, 409
133 Computer Discount of America	376	254 Jimscot Inc.	403	366 Parhelson Company	158	81 Total Access	119
574 Computer Friends	430	293 Jordan Computers Ltd.	33	324 Pel-tek	33	280 Trade Service Publications Inc.	331
420 Computer Peripheral Resources	175	331 KSoft	349	* Percom Data Company	3	44 Transaction Storage Systems Inc.	367
18 Computer Plus	21	485 Kaigo Electronics Co. Inc.	180	272 Peripherals Unlimited	273	489 Triple-D Software	413
24 Computer Shack	122	51 Krell Software Corp.	106	124 Perry Oil & Gas Inc.	245	582 Triple-D Software	430
109 Computer Shack	123	561 Krell Software Corp.	430	* Phase I Systems Inc.	111	397 Two/Sixteen Magazine	102, 308
39 Computer Shopper	197	354 Kuzel Computer Software	100	490 Pion Inc.	202	522 Two/Sixteen Magazine	175
404 Computer Solutions	140	358 KWIK Software	415	160 Pioneer Software	434	332 United Software Associates	330
138 Computer Station, The	179	30 LNW Research Corp.	CIV	73 Plus Computer Technology	329	417 Universal Data Research Inc.	102
501 Computer Systems & Services Inc.	308	31 LNW Research Corp.	7	306 Powersoft	181	* University Microfilms Int'l	213
* Computerware	277	32 LNW Research Corp.	353	315 Powersoft	263	215 VLM Computer Electronics	306
27 Computex	378, 379	33 LNW Research Corp.	230	111 Practical Peripherals	CIII	10 VR Data Corp.	233
511 Compuware Corp.	179	340 Langin-Hooper Associates	320	63 Precision Prototypes	47	352 Valley Research Company	426
263 Compuware Corp.	179	462 Langley St. Clair Instrumentation Systems	31	277 Prentice Hall Inc.	253	169 Van Horn Office Supply	206
104 ComSoft	284	472 Leading Edge Products Inc.	386	477 Priority One Electronics	343	523 Verbatim	161
405 ConsoLink Corp.	41	155 LEPS Publishing Company Inc.	327	288 Process Control Technology	419	518 Vespa Computer Outlet	170
412 Continental Software	219	358 Lemons Tech Services	415	521 Professional Aids	393	* Videotronics of Sarasota	306
395 Control Corp.	128	554 Lemons Tech Services	432	80 Program Store, The	288, 289	560 Votrax	420
110 Control Craft Inc.	415	* Level IV Products Inc.	331	143 Progressive Electronics	105	305 Wadsworth Electronic Publications	209
105 Coosol Inc.	393	400 Lewsoft	238	91 Prosoft	25	* Wayne Green Books	405
52 Cornsoft Group, The	43	131 Libra Laboratories Inc.	99	95 Prosoft	421	* Wayne Green Inc.	131, 213, 322, 323, 397, 399, 433
45 Cornucopia Software	109	135 Lindbergh Systems	60	48 Quality Computer Services	236	238 Western Micro Systems	125
38 Cornucopian Electronics Corp.	351	Load-90	227, 361, 401, 417	194 Quant Systems	90	199 Westworld Magnetics	320
187 Cottage Software	234	393 M.C.S. Software	32	116 Quatre Computer Systems Inc.	267	William Fink	93
190 Creative Computer	429	304 MECA	275	41 Racet Computers Ltd.	335	337 Wittsoft	403
55 DA&D Sales Inc.	357	398 M.E.S.C.	61	468 Racet Computers Ltd.	335	248 World Electronics	330
410 D.B. Software Company	240	231 M.M. Computer Club	304	559 Radio Shack Computer Center	429	96 Worldwide Data Systems Inc.	137
517 DCS Software	325	90 MWB Industries Inc.	180	269 Radix Technology	133	158 XYZT Computer Dimensions Inc.	135
413 DLP Company	150	457 Management Systems Software	302	264 Rainbow P & P Corp.	54	156 York 10 Computerware	365
550 Data Impact Products Inc.	420	553 Management, The	434	460 Rainbow Software Services	413	566 Zolman International Inc.	426
452 Data-Mail	409	92 Maple Leaf Systems	150	296 Rainbow, The	357		
478 Data Management	100	579 Maple Leaf Systems	426	130 Rand's	226		

For further information from our advertisers, please use the Reader Service card.

This game goes on forever. At the end of each round, a score is given on the series as a whole; then a new round begins.

Martinetti

Martinetti is the original name of this game, although I don't know why. I've altered it slightly so it fits the Color Computer screen.

To start, the computer draws the playing board, which is made up of 10 squares numbered 1 to 10. Then it places the two players' tokens at the starting position. These are at screen left. Your token is below the board, the computer's on top of the board.

When it's your turn, tapping enter rolls three dice. The values

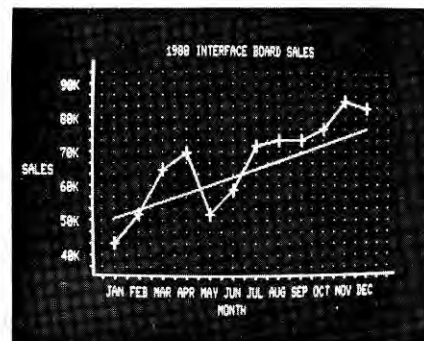
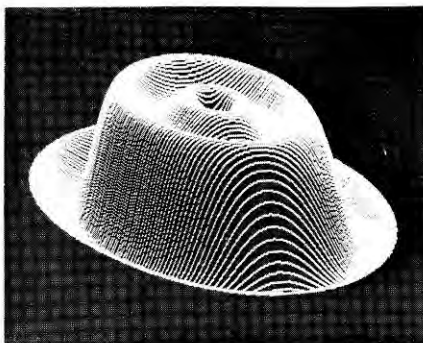
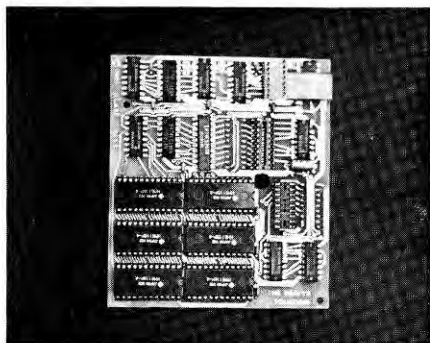
Listing continued

```
670 IF Q=1 THEN PRINT: PRINT "YOU WIN"; ELSE PRINT: PRINT "I WIN";
680 GOTO 680
690 END
710 M=0: INPUT "NUMBER"; M
720 FOR Z=1 TO 7
730 IF M=R(Z) AND M=S(Q) GOTO 480
740 IF M=0 GOSUB 630: GOTO 460
750 IF M<>R(Z) OR M<>S(1) THEN PRINT: PRINT "WRONG. I WIN";: END
760 NEXT Z
770 END
```

Martinetti—Color Basic

```
100 REM * MARTINETTI / TRS-80 COLOR BASIC 4K *
110 CLS(0): B$=STRING$(32,128)
120 PRINT "MARTINETTI ";
130 C(Q)=8: P(Q)=1: S(1)=1: S(8)=1: Y=6
140 PRINT @ 129, " 1 2 3 4 5 6 7 8 9 10";
150 FOR X=2 TO 62: SET(X,Y,3): SET(X,Y+5,3): NEXT X
160 FOR X=2 TO 62 STEP 6: FOR Y=6 TO 11: SET(X,Y,3): NEXT Y: NEX
T X
170 X(8)=0: Y(8)=4: X(1)=0: Y(1)=13: SET(X(1),Y(1),1)
180 SET(X(8),Y(8),8)
190 FOR Q=1 TO 8 STEP 7: PRINT @ 256, " ";
200 PRINT @ 256, " ";
210 IF Q=1 THEN PRINT "YOUR TURN. "; ELSE PRINT "MY TURN. ";
220 INPUT "TAP ENTER TO ROLL"; E
230 G=RND(6): H=RND(6): J=RND(6)
240 PRINT G;H;J: IF Q=8 GOTO 350
250 FOR Z=1 TO 7
```

Listing continues



Mod III

GRAFYX SOLUTION[™]

\$299.95

- 512 × 192 Dot Graphics increases resolution 16× (better than Apple)
- Extensive Business, Personal, Educational, and Scientific applications
- 14 BASIC commands set and reset Points, Lines, Circles, Boxes, etc.
- Allows Display and Printout of detailed Line, Bar, and Pie graphs
- 80 Character/line display compatible with BASIC programs and DOS
- Price includes 98K bits memory, 30 programs, 52 page manual
- Plug-in, clip-on board eliminates soldering for easy installation

Manual only \$15
Products guaranteed
Dealers welcome

MICRO-LABS, INC. 214-235-0915
902 Pinecrest, Richardson, Texas 75080

✓ 464

FREE shipping
Prepaid or COD
Tx. res add 5%

7400

**Number of Pins of each I.C. for easy Socket purchase

Part No.	**Pins	Price	Part No.	**Pins	Price	Part No.	**Pins	Price
SN7400N	14	19	SN7472N	14	29	SN74156N	16	59
SN7401N	14	19	SN7473N	14	35	SN74157N	16	59
SN7402N	14	25	SN7474N	14	35	SN74160N	16	69
SN7404N	14	25	SN7475N	14	35	SN74161N	16	69
SN7405N	14	25	SN7476N	14	35	SN74163N	16	69
SN7406N	14	25	SN7477N	14	35	SN74164N	16	69
SN7407N	14	25	SN7478N	14	35	SN74165N	16	69
SN7408N	14	25	SN7479N	14	35	SN74166N	16	69
SN7409N	14	25	SN7480N	14	35	SN74167N	16	69
SN7410N	14	25	SN7481N	14	35	SN74168N	16	69
SN7411N	14	25	SN7482N	14	35	SN74169N	16	69
SN7412N	14	25	SN7483N	14	35	SN74170N	14	29
SN7413N	14	25	SN7484N	14	35	SN74171N	14	29
SN7414N	14	25	SN7485N	14	35	SN74172N	14	29
SN7415N	14	25	SN7486N	14	35	SN74173N	16	69
SN7416N	14	25	SN7487N	14	35	SN74174N	16	69
SN7417N	14	25	SN7488N	14	35	SN74175N	16	69
SN7418N	14	25	SN7489N	14	35	SN74176N	16	69
SN7419N	14	25	SN7490N	14	35	SN74177N	14	29
SN7420N	14	25	SN7491N	14	35	SN74178N	14	29
SN7421N	14	25	SN7492N	14	35	SN74179N	14	29
SN7422N	14	25	SN7493N	14	35	SN74180N	14	29
SN7423N	14	25	SN7494N	14	35	SN74181N	14	29
SN7424N	14	25	SN7495N	14	35	SN74182N	14	29
SN7425N	14	25	SN7496N	14	35	SN74183N	14	29
SN7426N	14	25	SN7497N	14	35	SN74184N	14	29
SN7427N	14	25	SN7498N	14	35	SN74185N	14	29
SN7428N	14	25	SN7499N	14	35	SN74186N	14	29
SN7429N	14	25	SN7500N	14	35	SN74187N	14	29
SN7430N	14	25						
SN7431N	14	25						
SN7432N	14	25						
SN7433N	14	25						
SN7434N	14	25						
SN7435N	14	25						
SN7436N	14	25						
SN7437N	14	25						
SN7438N	14	25						
SN7439N	14	25						
SN7440N	14	25						
SN7441N	14	25						
SN7442N	14	25						
SN7443N	14	25						
SN7444N	14	25						
SN7445N	14	25						
SN7446N	14	25						
SN7447N	14	25						
SN7448N	14	25						
SN7449N	14	25						
SN7450N	14	25						
SN7451N	14	25						
SN7452N	14	25						
SN7453N	14	25						
SN7454N	14	25						
SN7455N	14	25						
SN7456N	14	25						
SN7457N	14	25						
SN7458N	14	25						
SN7459N	14	25						
SN7460N	14	25						

MICROPROCESSOR COMPONENTS

MICROPROCESSOR CHIPS

Part No.	**Pins	Function	Price
CDP1802	40	CPU	\$9.95
2650	40	CPU	14.95
DM2651ADC	40	40 CPU - 4-bit slice (Com. Temp. Gr.)	19.95
MC6800	40	MPU w/ Clock and RAM	9.95
MC6802	40	CPU with 2K RAM	14.95
MC6805	40	CPU w/ 256 Bytes Micro	14.95
INSTRON-6	40	CPU w/ 256 Bytes Micro	14.95
INSTRON-7	40	CPU w/ 256 Bytes Micro	14.95
INSTRON-3N	40	CPU w/ 256 Bytes Micro	14.95
P805A	40	CPU	9.95

Z80, Z80B, Z80C SERIES

Part No.	**Pins	Function	Price
Z80	40	8080-compatible 8MHz	\$4.99
Z80-CTC	28	Counter Timer Circuit	5.99
Z80-DART	40	Dual Asynchronous Rec./Trans.	11.99
Z80-DMA	40	Direct Memory Access Controller	11.99
Z80-DIO	40	Parallel I/O Interface Controller	5.99
Z80-SIO/0	40	Serial I/O (TxC and RxC Bonded)	15.99
Z80-SIO/1	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/2	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/3	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/4	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/5	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/6	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/7	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/8	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/9	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/10	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/11	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/12	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/13	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/14	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/15	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/16	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/17	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/18	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/19	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/20	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/21	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/22	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/23	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/24	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/25	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/26	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/27	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/28	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/29	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/30	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/31	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/32	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/33	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/34	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/35	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/36	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/37	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/38	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/39	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/40	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/41	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/42	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/43	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/44	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/45	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/46	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/47	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/48	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/49	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/50	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/51	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/52	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/53	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/54	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/55	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/56	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/57	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/58	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/59	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/60	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/61	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/62	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/63	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/64	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/65	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/66	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/67	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/68	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/69	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/70	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/71	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/72	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/73	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/74	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/75	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/76	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/77	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/78	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/79	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/80	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/81	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/82	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/83	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/84	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/85	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/86	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/87	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/88	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/89	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/90	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/91	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/92	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/93	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/94	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/95	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/96	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/97	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/98	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/99	40	Serial I/O (Lacks SYNCR)	15.99
Z80-SIO/100	40	Serial I/O (Lacks SYNCR)	15.99

8080/68000 SERIES

Part No.	**Pins	Function	Price
8080	40	MPU with clock and RAM	4.99
MC6800	40	8-bit Static RAM	7.95
MC6801	40	8-bit Static RAM	7.95
MC6802	40	Peripheral Inter. Adapt. (MC6802)	11.95
MC6803	40	Priority Interrupt Controller	15.95
MC6804	40	Direct Memory Access Controller	15.95
MC6805	40	Asynchronous Comm. Adapter	9.95
MC6806	40	Synchronous Serial Data Adapter	9.95
MC6807	40	24000s Modulator	12.95
MC6808	40	24000s Modulator	12.95
MC6809	40	16-bit Bus Driver	6.95
MC6810	40	General Purpose Int. Adapter	6.95
MC6811	40	Multi-Port Comm. Controller	8.95
MC6812	40	Enhanced Prog. Comm. Int.	8.95

8080A SERIES

Part No.	**Pins	Function	Price
IN8080A	40	CPU	2.95
IN8080A-1	40	8080-compatible 8MHz	14.95
IN8080A-2	40	8080-compatible 8MHz	14.95
IN8080A-3	40	8080-compatible 8MHz	14.95
IN8080A-4	40	8080-compatible 8MHz	14.95
IN8080A-5	40	8080-compatible 8MHz	14.95
IN8080A-6	40	8080-compatible 8MHz	14.95
IN8080A-7	40	8080-compatible 8MHz	14.95
IN8080A-8	40	8080-compatible 8MHz	14.95
IN8080A-9	40	8080-compatible 8MHz	14.95
IN8080A-10	40	8080-compatible 8MHz	14.95
IN8080A-11	40	8080-compatible 8MHz	14.95
IN8080A-12	40	8080-compatible 8MHz	14.95
IN8080A-13	40	8080-compatible 8MHz	14.95
IN8080A-14	40	8080-compatible 8MHz	14.95
IN8080A-15	40	8080-compatible 8MHz	14.95
IN8080A-16	40	8080-compatible 8MHz	14.95
IN8080A-17	40	8080-compatible 8MHz	14.95
IN8080A-18	40	8080-compatible 8MHz	14.95
IN8080A-19	40	8080-compatible 8MHz	14.95
IN8080A-20	40	8080-compatible 8MHz	14.95
IN8080A-21	40	8080-compatible 8MHz	14.95
IN8080A-22	40	8080-compatible 8MHz	14.95
IN8080A-23	40	8080-compatible 8MHz	14.95
IN8080A-24	40	8080-compatible 8MHz	14.95
IN8080A-25	40	8080-compatible 8MHz	14.95
IN8080A-26	40	8080-compatible 8MHz	14.95
IN8080A-27	40	8080-compatible 8MHz	14.95
IN8080A-28	40	8080-compatible 8MHz	14.95
IN8080A-29	40	8080-compatible 8MHz	14.95
IN8080A-30	40	8080-compatible 8MHz	14.95
IN8080A-31	40	8080-compatible 8MHz	14.95
IN8080A-32			

Listing continued

```

260 IF G=S(Q) THEN R(Z)=G
270 IF H=S(Q) THEN R(Z)=H
280 IF J=S(Q) THEN R(Z)=J
290 IF G+H=S(Q) THEN R(Z)=G+H
300 IF G+J=S(Q) THEN R(Z)=G+J
310 IF H+J=S(Q) THEN R(Z)=H+J
320 IF G+H+J=S(Q) THEN R(Z)=G+H+J
330 NEXT Z
340 GOTO 700
350 PRINT @ 352,"";
360 FOR Z=1 TO 10
370 IF G=S(Q) THEN PRINT G;"=";S(Q): GOSUB 470
380 IF H=S(Q) THEN PRINT H;"=";S(Q): GOSUB 470
390 IF J=S(Q) THEN PRINT J;"=";S(Q): GOSUB 470
400 IF G+H=S(Q) THEN PRINT G;"+";H;"=";S(Q): GOSUB 470
410 IF G+J=S(Q) THEN PRINT G;"+";J;"=";S(Q): GOSUB 470
420 IF H+J=S(Q) THEN PRINT H;"+";J;"=";S(Q): GOSUB 470
430 IF G+H+J=S(Q) THEN PRINT G;"+";H;"+";J;"=";S(Q): GOSUB 470
440 PRINT @ 320,B$;: PRINT @ 320,"";
450 NEXT Z: GOSUB 630
460 NEXT Q: GOTO 190
470 FOR T=1 TO 500: NEXT T
480 IF W(Q)<>2 THEN S(Q)=S(Q)+1 ELSE S(Q)=S(Q)-1
490 RESET(X(Q),Y(Q))
500 IF W(Q)<>2 THEN FOR L=X(Q) TO X(Q)+5
510 IF W(Q)=2 THEN FOR L=X(Q) TO X(Q)-5 STEP -1
520 SET(L,Y(Q),Q)
530 FOR T=1 TO 20: NEXT T
540 RESET(L,Y(Q))
550 NEXT L
560 SET(L,Y(Q),Q): X(Q)=L
570 PRINT @ 352,B$;
580 PRINT @ 320,"";
590 IF S(Q)=0 AND W(Q)=2 GOSUB 670
600 IF S(Q)=11 GOSUB 650: S(Q)=9
610 IF Q=1 GOTO 250
620 RETURN
630 FOR V=256 TO 384 STEP 32: PRINT @ V,B$;: NEXT V
640 RETURN
650 W(Q)=2
660 RETURN
670 PRINT @ 384,"";: IF Q=1 THEN PRINT "YOU WIN"; ELSE PRINT "I
WIN.";
680 GOTO 680
690 END
700 PRINT @ 352,"";
710 M=0: INPUT "NUMBER";M
720 FOR Z=1 TO 7
730 IF M=R(Z) AND M=S(Q) GOTO 480
740 IF M=0 GOSUB 630: GOTO 460
750 IF M<>R(Z) OR M<>S(1) THEN PRINT @ 384,"WRONG. I WIN.";: END
760 NEXT Z
770 END

```



FUN HOUSE

of the dice are shown.

Now, here's the tricky part. To advance, you must use one, two, or three dice that equal the number in the next square and then enter that number.

For example, if the dice show totals of one, two, and five, you enter 1 because 1 = 1, 2 because 2 = 2, and 3 because 1 + 2 = 3. You continue your advance in any turn as long as you keep coming up with totals equal to the number in the next square. To end a turn, type 0 (zero) and tap enter.

When you reach square 10, work your way back down to one. The player who returns to the beginning first is the winner.

The computer plays automatically and shows its totals.

Oh, I forgot to mention that mistakes are costly. If you enter a total that isn't equal to the next square or isn't equal to any of your dice added together, then the computer wins the game immediately. However, you aren't punished for not seeing a possible move, except for the fact that the computer plays perfectly and you must do the same to win even half the time.

Coming Attractions: Next month you and I are going to write an adventure column together. Sharpen your imagination. ■

TRS-80 COMPUTER DISCOUNTS

- Factory Direct
- Best Prices Anywhere
- No Out-of-State Taxes
- 100% Radio Shack Warranty
- Free Price List

SCOTT TASSO ASSOCIATES

175 E North Delsea Drive
Vineland, N.J. 08360
800-257-0426
NJ 609-691-7100

✓510

Maxell Floppy Disks

The Mini-Disks
with maximum quality.



Dealer inquiries
invited. C.O.D.'s
accepted. Call

FREE (800) 235-4137.



PACIFIC EXCHANGES
100 Foothill Blvd., San Luis
San Luis Obispo, CA 93401
In Cal. call (800) 592-5935 or
(805)543-1037.

✓ 207

Fame and Fortune may be yours by entering:

80 Micro's Young Programmer's Contest 1983-1984

Grand Prize \$300, Plus Publication

- 3 1st prizes—\$200 each, Plus Publication**
- 3 2nd prizes—\$100 each, Plus Publication**
- 3 3rd prizes—\$50 each, Plus Publication**

**Honorable Mentions—Free subscription to
80 Micro and possible publication**
(These prizes are in addition to our regular purchase price.)

If you are an aspiring Programmer, 18 years or younger, enter **80 Micro's** 2nd Annual Young Programmer's Contest. Your entry may be for any TRS-80. Programs will be judged on originality, documentation (more on this below), and program elegance. The age categories are 11 and under, 12 through 14, and 15 through 18. All entries will be judged by the **80 Micro** staff.

Rules

1. Final entries must be in by November 1, 1983.
2. All entries must be submitted in a 10x13" envelope and must include: typewritten, double-spaced documentation; a printed copy of the program listing; a magnetic disk or cassette containing the program listing, the documentation, and any figures or tables; and a completed entry blank.
3. Documentation should consist of an explanation of the program, its purpose, how to use it, and the necessary software and hardware needed to use it (including memory re-

quirements). Good documentation also points out the interesting algorithms and program techniques used without giving a line-by-line account.

4. Entries must be original and unpublished.
5. All winning programs become the property of **80 Micro**.
6. The category in which you will be judged will be determined by your age as of November 1, 1983. You must not have turned 19 by that date.
7. You may submit as many entries as you like, however, each one must be submitted separately and must have all of the information and materials stated above.

The 80 Micro Young Programmer's Contest

Name _____ Age _____ Date of Birth _____

Street Address _____ City _____

State/Zip _____ Phone _____

Machine (circle one)

Model I Model III Model II/16 Color Computer
Pocket Computer Other _____

Include this form with your entry and return to:

Young Programmer's Contest
80 Micro
80 Pine Street
Peterborough, NH 03458

*A trademark of Radio Shack, a division of Tandy Corporation.

Listing 1 continued from p. 32

```

780  IFPL/2=INT(FL/2) THENG$="*"ELSEG$=" "
800  QQ=QQ+64:PRINT@QQ,G$;:PRINT@QQ+43,G$;:IFQQ>522THENQQ=330
820  IPCK/5=INT(CK/5) THENPRINT@793,"?"CHR$(95);:GOTO720:ELSEPRINT
@793,"?"CHR$(143);:PRINT@832,SS;:PRINT@865,"All Rights Reserved.
";:GOTO720
840  ON M GOTO 860,880,900,920
860  RUN"DREADER/BAS"
880  IFPEEK(&H403E)<81THENRUN"SORT50/BAS"ELSERUN"SORT/BAS"
900  RUN"PRINT/BAS"
920  CLS:PRINT@512,STRINGS(64,140) "          Thank you for purchasin
,g and using MAGIDEX!":PRINTSTRING$(64,140);:CMD"S"

```

Program Listing 2

```

20 REM *****
40 REM ***          SORT/BAS a simple SHELL routine          ***
60 REM ***          COPYRIGHT (c) 1981 by                    ***
80 REM ***          Charles P. Knight                        ***
100 REM***          for use with MAGIDEX program             ***
120 REM***          USE LDOS 5.1 ONLY                         ***
140 REM*****
160 IFPEEK(&H403E)=80THENRUN"SORT50/BAS"LDOS 5.0
180 IFPEEK(&H403E)<81THENPRINT"WRONG OPERATING SYSTEM - LDOS 5.1
ONLY!":STOP
200 ONERRORGOTO1040:CLS:CLEAR29000:DEFINTA-Z:DIME$(800)
220 ONERRORGOTO320:CLS
240 OPEN"I",1,"TRANSFER/DAT"
260 INPUT#1,V1,D2,D2$,DN,IN
280 CLOSE
300 ONERRORGOTO0:GOTO340
320 PRINT"CAN'T SORT WITHOUT FILE TRANSFER/DAT":RUN"MAGIDEX"
340 IFIN<800THEN780ELSEPRINT"There are"IN" records to sort.
360 PRINT"This is an EXTERNAL sort. It moves data around on the
disk
380 PRINT"rather than bringing it into memory. As a result, the
maximum
400 PRINT"file size is limited only by the amount of space remain
ing on
420 PRINT"your disk. The disadvantage is that it takes a good de
al
440 PRINT"longer to perform."
460 PRINT"Be sure you have BACKED UP your disk before running th
is sort.
480 PRINT
500 INPUT"Do you wish to sort this file now";E$:IFLEFT$(E$,1)="n
"ORLEFT$(E$,1)="N"THENRUN"MAGIDEX"
520 CLS:CMD"T"
540 OPEN"R",1,"DIRECTRY/DAT"+D2$,32
560 FIELD1,32 AS A1$:GET1,IN:SET EOF(1)
580 M=IN
600 M=INT(M/2):PRINT@512,"Now making sort pass # ";USING"###";M
;:IFM=0THEN740ELSEJ=1:K=IN-M
620 I=J
640 L=I+M
660 GET1,I:V1$=A1$:GET1,L:V2$=A1$:IFV2$>=V1$THEN720
680 LSETA1$=V1$:PUT1,L:LSETA1$=V2$:PUT1,I
700 I=I-M:IFI>1THEN640
720 J=J+1:IFJ>KTHEN600ELSE620

```

Listing 2 continues

Listing 2 continued

```

740 CLOSE:CMD"R"
760 RUN"MAGIDEX"
780 PRINT@512,"Initializing memory for sort.";
800 CMD"T":OPEN"R",1,"DIRECTRY/DAT"+D2$,32
820 FIELD1,32AS F1$:GET1,IN:SET EOF(1)
840 FORX=1TOIN
860 GET1,X
880 E$(X)=F1$
900 NEXTX
920 CMD"O",IN,E$(1)
940 FORX=1TOIN
960 LSETF1$=E$(X)
980 PUT1,X
1000 NEXTX
1020 GOTO740
1040 IFERR/2+1=7THENPRINT"NOT ENOUGH MEMORY - REDUCE THE SIZE OF
YOUR SYSGEN!":RUN"MAGIDEX"ELSEPRINT"ERROR : "ERR,ERL:STOP

```

Program Listing 3

```

20 REM *****
40 REM ***          SORT/BAS a simple SHELL routine          ***
60 REM ***          COPYRIGHT (c) 1982 by                    ***
80 REM ***          Charles P. Knight                        ***
100 REM***          for use with MAGIDEX program             ***
120 REM***          FOR USE WITH LDOS 5.0 ONLY               ***
140 REM*****
160 CLS:CLEAR29000:DEFINTA-Z:DIME$(800)
180 POKE15360,97:IFPEEK(15360)=97THENLC=-1ELSELC=0
200 CLS
220 ONERRORGOTO320
240 OPEN"i",1,"TRANSFER/DAT"
260 INPUT#1,V1,D2,D2$,DN,IN
280 CLOSE
300 ONERRORGOTO0:GOTO340
320 PRINT"CAN'T SORT WITHOUT FILE TRANSFER/DAT":RUN"MAGIDEX"
340 IFIN<800THEN820ELSEPRINT"There are"IN" records to sort.
360 PRINT"This is an EXTERNAL sort. It moves data around on the
disk
380 PRINT"rather than bringing it into memory. As a result, the
maximum
400 PRINT"file size is limited only by the amount of space remain
ing on
420 PRINT"your disk. The disadvantage is that it takes a good de
al
440 PRINT"longer to perform. A 400 record file, for example, tak
es about
460 PRINT"half an hour to sort. You should make sure that you ha
ve
480 PRINT"BACKED UP your disk before running this sort.
500 PRINT"You should sort the file before running the PRINT modu
le.
520 INPUT"Do you wish to sort this file now";E$:IFLEFT$(E$,1)="n
"ORLEFT$(E$,1)="N"THENRUN"MAGIDEX"
540 CLS
560 OPEN"R",1,"DIRECTRY/DAT"+D2$,32
580 IFLCTHENPOKE27208,&H40:POKE27209,&H3C:REM DIRECT BUFFER TO S

```

Listing 3 continues

Checkbook-Checkwriter II™ is available for:
 TRS-80™ Model I/III
 TRS-80™ Color Computer

Check Us Out!

✓ **Product:** Continuous fan-folded checks with dual-windowed envelopes, checkbook binder and software designed especially for computer use in the home. You can't get continuous checks like these anywhere in the world.

✓ **Savings:** Special package — including software — to get you started. 200 checks, 100 envelopes and binder—\$59.95. 500 checks, 300 envelopes and binder—\$79.95. Both with our versatile "Checkbook-Checkwriter II" program that will have you printing your checks the day you receive them.

SPECIAL BONUS:
 • Each 250th customer—50% off your order;
 • Each 500th customer—your order free;
 • Each 1000th customer—your order free, and free check refills for life.

✓ **Guarantee:** Our checks and accessories are guaranteed to please you and guaranteed compatible with your bank. In fact, if you order a special package and aren't satisfied for any reason, simply return it for a full refund (including postage) and you can keep the "Checkbook-Checkwriter II" program.

Now CHECK WITH US... Order a special package with moneyback guarantee today! Just enclose a voided check for encoding information with your order. Or send today for our free information package. We guarantee you'll be pleased. Visa, M.C., AMEX orders welcome. Shipping: \$2.00 USA, \$5.00 Outside USA.

SYNERGETIC SOLUTIONS

4715 SHEPHERD RD • MULBERRY, FL 33860 • PHONE (813) 646-6557

Keep Magazines, Catalogs, Manuals, Journals

NEAT & ORGANIZED

End Clutter In Home, Office, Workshop With SHELF FILES

Eliminate the mess of loose magazines, catalogs and newspapers. Find what you want when you want it by using these handy shelf or desk top files. Attractive brown front panel. Adhesive ID labels included.

6 POPULAR SIZES AVAILABLE

From digest size to newspaper size! Popular letter and magazine size (9" x 11 1/2", 3 3/4" box width) — 8 for \$13.95. 25 for \$31.95 prepaid. Sturdy, heavy-duty fiberboard will last for years! Charge it! Call or mail coupon today.

Professional Aids Co., Suite 8013 ✓521
 1678 S. Wolf Rd, Wheeling, IL 60090 • 312/459-6828

Please rush postpaid Fiberboard Desk and Shelf Files as checked below:

How Many	Qty.	Size	Price	Total Price
	8	Letter Size	\$13.95	
	25	Letter Size	\$31.95	

Check for Free Catalog. I enclose \$ full payment. Ship postpaid.

Illinois Residents add 6% Sales Tax, please. Other sizes from digest to newspaper available.

Charge it to VISA MasterCard TOTAL: _____

Card No. _____ Exp. Date _____

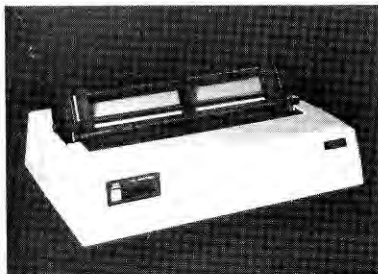
MasterCard Name _____

VISA Address _____

City, State, Zip _____

COOSOL COMPUTER PRODUCTS

OKIDATA PRINTERS

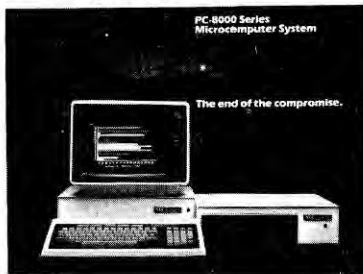


- OKIDATA 82A CALL • 83A CALL
- OKIDATA 84A CALL • 82A TRACTOR \$55
- OKIDATA 80 \$325

OTHER PRINTERS

- NEC PC-8023A-C CALL
- NEC 3550 CALL
- NEC 3510, 3515, 3530 CALL
- NEC 7710, 7715, 7730, 7720, 7725 CALL
- C.I.TOH 8510AP CALL • 8510ACD CALL
- C.I.TOH 1541SP CALL • 1541SRE CALL
- C.I.TOH F10-40PU & F10-40RU CALL
- C.I.TOH F10-55PU & F10-55RU CALL
- EPSON MX80 F/T GRAFTRAX PLUS CALL
- EPSON MX100 GRAFTRAX PLUS CALL
- TALLY MT 1602 MT 1605 \$1495
- TALLY MT 1802 MT 1805 \$1795
- DIABLO 630 and 620 SERIES CALL
- QUME SPRINT 5 45/RO, KSR & 55/RO, KSR CALL
- ANADEx ADX-9500-P, ADX-9501-P \$1295
- COMREX CR-1-S, CR-1-C, CR-1-Q CALL
- SMITH-CORONA TP-1 CALL
- BROTHER HR-1 CALL
- DAISY WRITERS CALL

NEC COMPUTER

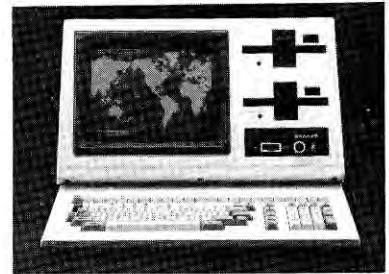


- NEC PC-8001A, PC-8012A, PC-8031A, and JB-1201 (NEC SYSTEM) with CP/M and BASIC \$2149
- NEC Other CPU's and Software CALL

MODEMS

- HAYES SMARTMODEM (300 BAUD) \$229
- HAYES SMART MODEM (300 & 1200 BAUD) \$595
- RS-232C COMPATIBLE
- FULL and HALF-DUPLEX OPERATION WITH BOTH
- TOUCH TONE and PULSE DIALOG
- AUTO-ANSWER/DIAL/REPEAT
- COMPLETELY PROGRAMMABLE
- BUILT-IN AUTO MONITOR
- STATUS AT A GLANCE
- DIRECT-CONNECT DESIGN
- HAYES CHRONOGRAPH \$209
- NOVATION AUTO-CAT AUTO ANS \$219
- SIGNALMAN MARK 1 (300 BAUD) \$89
- U.D.S. 103 OALP (300 BAUD) \$175
- U.D.S. 103 JLP (300 BAUD) \$199
- U.D.S. 202 SLP (1200 BAUD) \$249

SANYO COMPUTER



- SANYO MBC-1000 \$1599
- SANYO MBC-2000 \$2699
- SANYO MBC-3000 \$4999
- above with CP/M and BASIC

OTHER COMPUTERS

- SANYO ACCESSORIES & SOFTWARE CALL
- ALTOS Computer Systems CALL
- ADDS Computer Systems CALL
- NEC PC-8001A, PC-8012A, PC-8031A, and JB-1201 (NEC SYSTEM) with CP/M and BASIC \$2149
- NEC Other CPU's and Software CALL
- DYNABYTE 5605-6-1 \$5999
- DYNABYTE OTHER SYSTEMS CALL
- XEROX 820 SYSTEM w/5 1/4" DRIVES \$2499
- XEROX 820 SYSTEM w/8" DRIVES \$2995
- SOFTWARE FOR THE ABOVE CALL

COOSOL SPECIAL DISCOUNTS

- APPLE SOFTWARE CALL
- IBM SOFTWARE CALL

COOSOL, INC. P.O. BOX 743, ANAHEIM, CALIFORNIA 92805-0743 OR
 COOSOL, INC. 2845 MESA VERDE DR. E. #1, COSTA MESA, CA. 92626

Calif. (714) 545-2216
 PHONE 7 DAYS (800) 854-8498 ✓105

Listing 3 continued

```

CREEN
600 FIELD1,32 AS A1$
620 M=IN
640 M=INT(M/2):PRINT@512,"Now making sort pass # ";USING"####";M
;:IFM=0THEN780ELSEJ=1:K=IN-M
660 I=J
680 L=I+M
700 GET1,I:V1$=A1$:GET1,L:V2$=A1$:IFV2$>=V1$THEN760
720 LSETA1$=V1$:PUT1,L:LSETA1$=V2$:PUT1,I
740 I=I-M:IFI>1THEN680
760 J=J+1:IFJ>KTHEN640ELSE660
780 CLOSE
800 RUN"MAGIDEX"
820 PRINT@512,"Initializing memory for sort.":FORX=1TO800:ES(X)
=STRING$(32,191):NEXTX
840 PRINT@512,"Performing in-memory sort "
860 IFLCTHENPRINT@128,"[[[[ String value being swapped [[[[";
880 OPEN"R",1,"DIRECTRY/DAT"+D2$,32
900 FIELD1,32ASF1$
920 FORX=1TOIN
940 GET1,X
960 LSETES(X)=F1$
980 NEXTX
1000 T$=STRING$(32,32)
1020 IFLCTHENPOKEVARPTR(T$)+2,&H3C:POKEVARPTR(T$)+1,0:REM POINT
T$ TO SCREEN
1040 LSETT$=STRING$(32,143)
1060 M=IN
1080 M=INT(M/2):PRINT@512+128,"Now making sort pass #";M;:IFM=0T
HEN1220ELSEJ=1:K=IN-M
1100 I=J
1120 L=I+M
1140 IFES(I)<ES(L)THEN1200'680
1160 LSETT$=ES(I):LSETES(I)=ES(L):LSETES(L)=T$
1180 I=I-M:IFI>1THEN1120
1200 J=J+1:IFJ>KTHEN1080ELSE1100
1220 FORX=1TOIN
1240 LSETF1$=ES(X)
1260 PUT1,X
1280 NEXTX
1300 GOTO780

```

Program Listing 4

```

20 REM *****
40 REM *** PRINT/BAS Copyright (C) 1981 by C. P. Knight ***
60 REM *** Module for use with the "MAGIDEX" directory ***
80 REM *** management system for LDOS operating system ***
100 REM*** only. ALL RIGHTS RESERVED ***
120 REM*** Version 1.2 ***
140 REM*****
160 CLEAR5000:CLS:DEFINTA-Z
180 DIMAB$(7),MO$(12)
200 AB$(0)="Full":AB$(1)="Kill":AB$(2)="Rename":AB$(3)="*****":A
B$(4)="Write":AB$(5)="Read":AB$(6)="Exec":AB$(7)="None"
220 MO$(1)="Jan ":MO$(2)="Feb ":MO$(3)="Mar ":MO$(4)="Apr ":MO$(
5)="May ":MO$(6)="Jun ":MO$(7)="Jul ":MO$(8)="Aug ":MO$(9)="Sep
":MO$(10)="Oct ":MO$(11)="Nov ":MO$(12)="Dec ":MO$(0)="???"
240 ONERRORGOTO380
260 OPEN"i",1,"TRANSFER/DAT":INPUT#1,VI,D2,D2$,DN,IN,KT$

```

Listing 4 continues

Listing 4 continued

```

280 CLOSE1:ONERRORGOTO5000
300 GOTO420
320 PRINT@196,"Press < > to display next page....."
";
340 PRINT@203,"ENTER";:IK$=INKEY$:FORWL=1TO25:NEXTWL:PRINT@203,"
";:FORWL=1TO25:NEXTWL:IFIK$={"THEN360ELSEIFIK$<>CHR$(13)TH
EN340ELSEPRINT@196,STRING$(50,32);:RETURN
360 CLOSE1:CLOSE2:PRINT@196,STRING$(50,32);:GOTO980
380 IFERR=106THENRESUME400ELSECMD"E":STOP
400 ONERRORGOTO5000:CLS:PRINT@512,"File TRANSFER/DAT not in syst
em. Returning to menu":RUN"MAGIDEX"
420 G1$=STRING$(64,191):G2$=STRING$(2,191)+STRING$(60,32)+STRING
$(2,191):G3$=STRING$(2,191)+STRING$(60,143)+STRING$(2,191):G4$=S
TRING$(2,191)+STRING$(60,188)+STRING$(2,191)
440 CLS:PRINTG3$G2$G2$G2$G4$
460 GOSUB520:R2=LOF(2):CLOSE2:GOTO980
480 OPEN"RO",1,"DIRECTRY/DAT"+D2$,32
500 FIELD1,12 AS F1$,2 AS F2$,2 AS F3$,1 AS F4$,1 AS F5$,1 AS F
6$,2 AS F7$,2 AS F8$,2 AS F9$,4 AS F0$,2 AS FA$,1 AS FB$
520 OPEN"RO",2,"HEADER/DAT"+D2$,25
540 FIELD2,16 AS FC$,2 AS FD$,2 AS FE$,1 AS FF$,1 AS FG$,1 AS FH
$,2 AS FJ$
560 RETURN
580 REM ***** MAIN FILE READ ROUTINE *****
600 GET1,NF
620 NH=CVI(F3$)'GET POINTER TO HEADER FILE
640 NQ$="Disk #"+STR$(CVI(F3$))
660 GET2,NH'GET HEADER FILE RECORD FOR THIS FILE
680 NA$=F1$:AB$=AB$(CVI(F2$)):AB$="Access level = "+AB$
681 X0$=NA$+" Prot= "+AB$(CVI(F2$))
700 UP$=F5$:IFUP$=" "THENUP$="No access password"ELSEIFUP$="#"TH
ENUP$="Access password = Password"ELSEUP$="Access password requi
red"
720 AP$=F4$:IFAP$=" "THENAP$="No update password"ELSEIFAP$="#"TH
ENAP$="Update password = password"ELSEAP$="Update password requi
red"
721 X5$=UP$+" "+AP$
740 MF$=F6$:IFMF$="+"THENMF$="File NOT backed up!"ELSEMF$="File
backed up."
760 EL=ASC(FB$)+1:EL$="Logical record length ="+STR$(EL)
761 X6$=MF$+" "+EL$
780 SZ$="File consumes "+STR$(CVI(FA$))+ " grans or "+STR$(CVS(F0
$))+ "K of disk space"
800 MO=CVI(F7$):DA=CVI(F8$):YR=CVI(F9$):DT$="File's date = "+MO$(
MO)+"-"+STR$(DA)+"-"+STR$(YR):IFMO<=0ORMO>12ORDA<=0ORDA>31THEN
DT$="*** Invalid date ***"
801 X7$=STR$(CVI(FA$))+ " Grans "+STR$(CVS(F0$))+ "K. "+DT$
820 REM ***** CONVERT HEADER FILE DATA *****
840 TV$=FC$:NH$=LEFT$(TV$,8):TV$=RIGHT$(TV$,8):DH$=MO$(VAL(LEFT$
(TV$,2)))+MID$(TV$,3,4)+STR$(VAL(RIGHT$(TV$,2))+1900):REM DISK N
AME & DATE
860 K1$="Diskette has "+STR$(CVI(FD$))+ " Free grans or "+STR$(CV
I(FE$))+ "K of free space"
861 X1$=NQ$+" "+DH$+" free"+STR$(CVI(FD$))+ " Grans"+STR$(CVI(FE$
))+ "K"
880 IFF$="S"THENS$="Diskette is formatted in single density"EL
SESD$="Diskette is formatted in double density"
881 IFF$="S"THENTV$="Single density"ELSETV$="Double density"
882 X2$=TV$
900 IFFG$="8"THEND8$="Diskette is an 8 inch floppy"ELSED8$="Disk
ette is a 5 inch mini-floppy"
901 X2$=X2$+" "+FG$+CHR$(34)+" "

```

Listing 4 continues

YOU COULD BE AN "INSTANT" WINNER!



WITH THESE 5 GAMES FROM INSTANT SOFTWARE.

You absolutely can't lose with any of these mind-twisting, spine-tingling games. These programs will give your family endless hours of fun and enjoyment. All of Instant Software's programs are fully documented and easy to use. Check out these programs and see why you'll be an "Instant" winner with Instant Software.

SPARROW COMMANDER—

Experience the feeling of raw power. Lead your squadron of sparrows safely to the nesting ground while the evil Cloud People try to destroy you and your compatriots in-flight. Watch out for falling brickbats, safes, even the kitchen sink, as your troops fly past the castle. Will you rank as a "Wingless Wonder" or "Exemplar Bird"?

TRS-80* Model I, Mod III 32K 1 Disk Drive
387RD Disk \$19.95

KITCHEN SINK—

Defend the ancient castle of the *Cloud People* from the hoard of winged invaders. Use anything you can lay your hands on: brickbats, safes, even...the kitchen sink? The native savages below will let you use their armed boats...for a price. Only your aim and your judgement can save the *Cloud People* before time runs out.

TRS-80 Model I, Mod III 32K 1 Disk Drive
0386RD Disk \$19.95

MASTER REVERSI—

One of the most exciting games in the world. Experience the thrill of head-to-head competition as you challenge your friends, or the computer, to a game of strategy and skill that will keep you coming back for more. Start training now for the next World Championship.

TRS-80 Model I, 16K
0378RD Disk \$24.95

SANTA PARAVIA—

Castles...Serfs...Feudal Wars...Build a powerful kingdom from your tiny city state. Repel the invading forces from the neighboring castle. Set in Italy in the year 1400 A.D., this challenging program tests all your leadership skills. Will you be a wise and competent ruler or Machiavellian despot?

TRS-80 Model I or III, Level II, 16K
0043R Tape \$14.95

MISSION:MUD—

From the slimy Mud Patch come...THE MUD MONSTERS! Deadly to the human touch, these muck creatures are about to invade the Earthbase city. Your only hope for defense is to find the old caches of hidden weapons before the MUD MONSTERS do. And even if you do, you don't know whether your shots will destroy them or clone them! Can you survive the MUD MONSTERS? You'll never know until you try.

TRS-80 Model I Level II 32K or Model III with convert command (PMC** compatible)
0325RD Disk \$19.95

Be an "Instant" Winner.

Order your Instant Software programs today.

Call toll free

1-800-258-5473

or fill in the coupon below and mail to
INSTANT SOFTWARE, Rte. 101 &
Elm St., Peterborough, NH 03458

*TRS-80 is a trademark of the Radio Shack division of Tandy Corporation.

**PMC is a Trademark of Personal Micro Computers Inc.

YES! I want to be an "Instant" Winner!

Send me:

_____ copies of 0043R @ \$14.95
_____ copies of 0378RD @ \$24.95
_____ copies of 0386RD @ \$19.95
_____ copies of 0387RD @ \$19.95
_____ copies of 0325RD @ \$19.95
Shipping & handling, add \$2.50

CHECK MONEY ORDER
 VISA MASTERCARD AMEX

Card# _____

Interbank _____

Exp. Date _____

SIGNATURE _____

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Instant Software



Rte. 101 & Elm St., Peterborough NH 03458

IW028

Listing 4 continued

```

920 IFFH$="2"THENS2$="Diskette is double sided"ELSE2$="Diskette
    is single sided"
921 IFFH$="2"THENTV$="double sided"ELSETV$="single sided"
922 X2$=X2$+TV$
940 NT$="Diskette is formatted for "+FJ$+" cylinders"
941 X2$=X2$+" "+FJ$+" cylinders"
960 RETURN
980 PRINT@320,CHR$(31);:PN=0:PRINT@66,STRING$(59,32);
1000 PRINT@132,"Magidex printout program (C) 1981 by Charles P.
    Knight";
1020 PRINT@208,IN;"files in system";R2;"disks";
1040 PRINT@384,"<1> ..... Print file to printer"
1060 PRINT" <2> ..... Search for specific file"
1080 PRINT" <3> ..... Print file to screen"
1100 PRINT" <4> ..... Return to master menu"
1120 PRINT" <5> ..... Printout of Header data"
1140 PRINT" <6> ..... Printout of files by disk"
1160 PRINTSTRING$(64,140);
1180 PA=960
1200 PRINT@832,KT$,"";
1220 IK$=INKEY$:PRINT@896,"Please key your selection. Don't pres
    s enter.";
1240 IFIK$<>"THEN1320
1260 PRINT@PA,"[";:PRINT@PA-1," ";
1280 PA=PA+1:IFPA>1005THENPA=960:PRINT@1005," ";
1300 FORWL=1TO5:NEXTWL
1320 IFIK$<"1"ORIK$>"6"THEN1220
1340 IK=VAL(IK$)
1360 ONIKGOTO1400,2160,3000,3220,3240,3880
1380 REM ***** Print files to printer *****
1400 IP$="":PG=1:PRINT@320,CHR$(31);:PRINT@320,"Press <ENTER> tw
    ice to print whole file":INPUT"Beginning record #";IP$:A1=VAL(IP
    $):IFA1<0ORAL>IN THEN1400
1420 INPUT"Ending record #";IP$:A2=VAL(IP$):IFA2<ALORA2>IN THEN1
    400:IFIP$="":THENA2=IN:A1=1:NF=0
1440 NF=AL-1:IFNF<0THENNF=0
1460 IFIP$="":THENA2=IN:A1=1:NF=0
1480 PRINT"You may use either LONG or SHORT form printout.":PRIN
    T"Enter "CHR$(34)"S"CHR$(34)" for short form output (Default = 1
    ong)";:INPUTIP$
1500 IFIP$="S"ORIP$="s"THENSK=-1ELSESK=0
1501 IP$="":INPUT"Start numbering pages from what page number";I
    P$:IFIP$="":THENPG=1
1502 IFIP$<>"":THENPG=VAL(IP$):IFPG>32000THEN1501
1520 GOSUB480:GOSUB2120:PRINT@320,CHR$(31);
1540 NF=NF+1:REM INCREMENT RECORD NUMBER
1560 GOSUB600:REM READ RECORD INTO BUFFER
1580 LPRINTSTRING$(63,"-")
1600 IFSKTHENLPRINTNA$ "NQ$ "NH$ "DT$:GOTO1820
1620 LPRINTX0$ "X7$
1640 LPRINTTAB(9)X5$
1660 LPRINTTAB(9)X6$
1680 LPRINTTAB(9)X1$;" ";NH$
1700 LPRINTTAB(9)X2$
1820 PRINT@320,CHR$(31);:PRINT@320,NA$;" ";AB$ " ";NQ$ "NF";
1840 PRINT@390,AP$ - "UP$;
1860 PRINT@454,SZ$;
1880 PRINT@518,MF$;" ";EL$;
1900 PRINT@582,DT$;
1920 PRINT@646,SD$;
1940 PRINT@710,NT$;
1960 PRINT@774,D8$;

```

Listing 4 continues

Listing 4 continued

```

1980 PRINT@838,S2$;
2000 PRINT@902,K1$;
2020 PRINT@966,"Disk name & date --> ";NH$;" "DH$;
2040 IFPEEK(16425)>53THENPG=PG+1:LPRINTSTRING$(63,"-"):LPRINTCHR
    $(12):GOSUB2120
2060 IK$=INKEY$:IFIK$="["THENLPRINTSTRING$(63,"="):LPRINTCHR$(12
    ):CLOSE1:CLOSE2:GOTO980
2080 IFNF=>A2 THENCLOSE1:CLOSE2:LPRINTCHR$(12):GOTO980
2100 GOTO1540
2120 LPRINTSTRING$(63,"="):LPRINT"Diskette library of ";KT$;" D
    ATE "LEFT$(TIME$,8);:LPRINTUSING" Page ####";PG:LPRINTSTRING$(63
    ,"=")
2140 RETURN
2160 NF=0:PG=0:REM ***** SEARCH FOR PARTSPEC
2180 GOSUB480:PRINT@320,CHR$(31);:PRINT@384,"Instring search fun
    ction.";
2200 PRINT@448,;:INPUT"Enter the filespec or partspec to be foun
    d";AL$:
2220 IFLEN(AL$)>13ORLEN(AL$)<1THEN2200
2240 INPUT"Do you wish output to your printer";LP$:IFLEFT$(LP$,1
    )="Y"ORLEFT$(LP$,1)="Y"THENLP=-1ELSELP=0
2260 IFLPANDNOTPGTHENPG=1:GOSUB2960
2280 PRINT@69,"Search string ----> ";AL$;
2300 IFLEFT$(AL$,1)="["THENCLOSE1:CLOSE2:GOTO980
2320 NF=NF+1
2340 GET1,NF
2360 CP$=F1$
2380 IFINSTR(CP$,AL$)THEN2460
2400 IFNF=>IN THENCLOSE1:CLOSE2:IFLPTHENLPRINTSTRING$(63,"="):LP
    RINTCHR$(12):GOTO980ELSE980
2420 IFINKEY$="["THENCLOSE1:CLOSE2:IFLPTHENLPRINTCHR$(12):GOTO98
    0ELSEGOTO980
2440 GOTO2320
2460 GOSUB600
2480 PRINT@320,CHR$(31);:PRINT@320,NA$;" ";AB$;" ";NQ$;" ";NF;
2500 PRINT@390,AP$ "UP$;
2520 PRINT@454,SZ$;:PRINT@518,MF$;" ";EL$;
2540 PRINT@582,DT$;:PRINT@646,SD$;:PRINT@710,NT$;:PRINT@774,D8$;
2560 PRINT@838,S2$;:PRINT@902,K1$;
2580 PRINT@966,"Disk name & date --> "NH$ "DH$;
2600 IFNOTLPTHENGOSUB320
2620 IFLPTHENGOSUB2660
2640 GOTO2320
2660 LPRINTSTRING$(63,"=")
2680 LPRINTNA$ "AB$ "NQ$ Record #";NF
2700 LPRINTTAB(9)AP$ - "UP$
2720 LPRINTTAB(9)SZ$
2740 LPRINTTAB(9)MF$ "EL$
2760 LPRINTTAB(9)DT$
2780 LPRINTTAB(9)SD$
2800 LPRINTTAB(9)NT$
2820 LPRINTTAB(9)D8$
2840 LPRINTTAB(9)S2$
2860 LPRINTTAB(9)K1$
2880 LPRINTTAB(9);"Disk name & date -->"NH$ "DH$
2900 IFPEEK(16425)>50THENPG=PG+1:LPRINTSTRING$(63,"="):LPRINTCHR
    $(12):GOSUB2960
2920 IFINKEY$="["THENLPRINTSTRING$(63,"="):CLOSE1:CLOSE2:GOTO980
2940 RETURN
2960 LPRINTSTRING$(63,"="):LPRINT"Disk library of ";KT$;" DATE "
    LEFT$(TIME$,8)" page"PG:LPRINT"Search string ----> "AL$:RETUR
    N

```

Listing 4 continues

Sales Opportunity

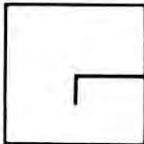
A few select territories available

Join a fast growing company involved in the microcomputer industry as a direct salesman. Sales involve our wide selection of books, five publications and software. We are looking for a non-smoking individual with a good sales background and a basic understanding of microcomputers. An excellent career awaits the person who wants to be "on his own." It will be the responsibility of our direct salesman to become familiar with all makes of computers and their sales outlets, amateur radio and electronic stores, book stores, and other outlets, for our products in your given territory. We will also add other lines as they become available. Arrangements are being made to coordinate efforts with some other firms in the

area, including a major printer manufacturer. We offer an excellent growth potential with a highly motivated, young corporation. If you or someone you know is interested in the opportunities available at Wayne Green Inc., please submit your background in detail, including sales experience, recent work history, knowledge of the microcomputing industry, educational background and references to:

Sales Manager
Wayne Green, Inc.
Peterborough, NH 03458

All replies will be immediately acknowledged and held in the strictest confidence.



WAYNE GREEN, INC.
(E-2) Pine Street
Peterborough, N.H.
03458

MOVING?

Let us know 8 weeks in advance so that you won't miss a single issue of **80 Micro**.

Attach old label where indicated and print new address in space provided. Also include your mailing label whenever you write concerning your subscription. It helps us serve you promptly.

- Extend my subscription one additional year for only \$24.97.
- Payment enclosed
- Bill me

Canadian and Mexican \$27.97 1 year only US funds. Foreign \$44.97 1 year only US funds, drawn on US bank. Please allow 6-8 weeks for delivery

80 MICRO

If you have no label handy, print OLD address here.

AFFIX LABEL

Name _____

Address _____

City _____ State _____ Zip _____

print NEW address here.

Name _____

Address _____

City _____ State _____ Zip _____

332R8M

P.O. Box 981 • Farmingdale NY 11737



SYSTEM REFERENCE CARDS

"This is a quality document and is beautifully conceived and produced. . . . I am in awe of your magnificent document."

H.W.W., Dayton, Ohio

Send Check or Money Order

CARD	ORDER NO.	PRICE
MODEL I: BASIC & Assembler	FC1002	\$4.95
MODEL I: BASIC Only	FC1001	2.95
MODEL II: BASIC & Assembler	FC1005	5.95
MODEL III: BASIC & Assembler	FC1003	5.95
MODEL III: BASIC Only	FC1004	3.95
COLOR: BASIC & Extended	FC1006	4.95
POCKET: BASIC	FC1009	2.95
APPLE II & II PLUS: BASIC & 6502	FC1008	4.95
APPLE II & II PLUS: BASIC Only	FC1007	3.95

NEW!

SCV FC1013 \$2.95
MODEL II
Commands & Utilities
FC1010 \$3.95

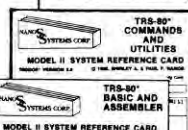
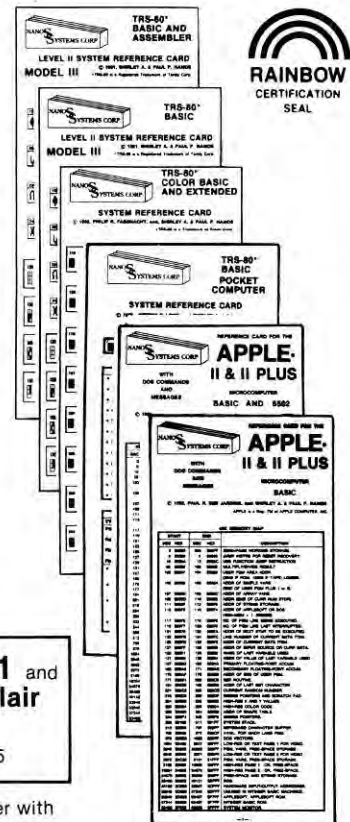
Z80
MICROPROCESSOR
FC1011 \$4.95

**ZX80, ZX81 and
Timex Sinclair
1000**
FC1012 \$5.95

Call TOLL-FREE for Credit Card Orders 1-800-258-5473. Or, send your order with payment or complete credit card information to:

WAYNE GREEN BOOKS • Retail Sales • Peterborough, NH 03458

Enclose \$1.00 per order for shipping and handling



*TRS-80 is a Registered Trademark of Tandy Corp.
APPLE is a Registered Trademark of APPLE COMPUTER, INC.
*Z80 is a Registered Trademark of Zilog, Inc.

Listing 4 continued

```

2980 REM ***** Print entire file to screen *****
3000 NF=0:GOSUB480:PRINT@320,CHR$(31);:REM Open files
3040 NF=NF+1:GOSUB600
3050 PRINT@320,CHR$(31);
3060 PRINT@320,NA$;" "AB$;" "NQ$;" Record #";NF;
3080 PRINT@390,AP$;" -";UP$;
3100 PRINT@454,SZ$;:PRINT@518,MF$;" ";EL$;
3120 PRINT@582,DT$;
3140 PRINT@646,SD$;:PRINT@710,NT$;:PRINT@774,D8$;:PRINT@838,S2$;
:PRINT@902,K1$;:PRINT@966,"Disk name & date --> ";NH$" "DH$;

3160 GOSUB320
3180 IFNF>=IN THENCLOSE1:CLOSE2:GOTO980
3200 GOTO3040
3220 CLOSE:CLEAR50:RUN"MAGIDEX"
3240 GOSUB520:PG=0:DN=0:REM ***** Printout of Header/dat
3260 PRINT@320,CHR$(31);:PRINT@320,"Pressing <ENTER> twice print
s all disks"
3280 INPUT"Enter starting disk number";IP$:S1=VAL(IP$):INPUT"End
ing disk number";IP$:S2=VAL(IP$)
3300 IFS1<0ORS2<0ORS1>R2ORS2>R2THEN3260
3320 IFS1<=1THENS1=1
3340 IFS2>=R2ORS2<=0THENS2=R2
3360 INPUT"Do you wish output to your printer";LP$:IFLEFT$(LP$,1
)="y"ORLEFT$(LP$,1)="Y"THENLP=-1ELSELP=0
3380 IFLPANDNOTPGTHENGOSUB3820
3400 FORDN=S1TOS2
3420 PRINT@320,CHR$(31);
3440 IFINKEY$="{ "THENCLOSE1:CLOSE2:IFLPTHENLPRINTCHR$(12):GOTO98
0ELSE980
3460 GET2,DN
3480 GOSUB840:REM
3500 PRINT@384,"Disk name & date ---> ";NH$;" "DH$;
3520 PRINT@454,SD$;
3540 PRINT@518,NT$;
3560 PRINT@582,D8$;
3580 PRINT@646,S2$;
3600 PRINT@710,K1$;
3620 PRINT@774,"Disk number ---> "DN;
3640 IFLPTHENGOSUB3720ELSEGOSUB320
3660 NEXTDN
3680 CLOSE:CLOSE2:IFLPTHENLPRINTCHR$(12)
3700 GOTO980
3720 IFPEEK(16425)>50THENLPRINTCHR$(12):GOSUB3820
3740 LPRINT"Disk name & date ----> ";NH$" "DH$
3760 LPRINTTAB(9);SD$:LPRINTTAB(9);NT$:LPRINTTAB(9);D8$:LPRINTTA
B(9);S2$:LPRINTTAB(9);K1$:LPRINTTAB(9);"Disk number ----> "DN
3780 LPRINTSTRING$(63,"-")
3800 RETURN
3820 PG=PG+1:LPRINTSTRING$(63,"="):LPRINT"Names of disks in libr
ary of "KT$" page";PG
3840 LPRINTSTRING$(63,"=")
3860 RETURN
3880 IP$="":GOSUB480:S3=LOF(2):PRINT@320,CHR$(31);:PRINT@320,"Pr
essing <ENTER> twice prints entire file":INPUT"Enter starting di
sk number";IP$:S1=VAL(IP$):INPUT"Enter ending disk number";IP$:S2=VAL(IP$)
3900 PN=0:IFS1<0ORS2<0ORS1>S2ORS1>S3ORS2>S3THEN3880
3920 IFS1<=0THENS1=1
3940 IFS2>=S3ORS2<=0THENS2=S3
3960 INPUT"Do you wish output to your printer";L$:IFLEFT$(L$,1)=

```

Listing 4 continues

Listing 4 continued

```

"y"ORLEFT$(L$,1)="Y"THENLP=-1:PF=-1ELSELP=0:PF=0
3980 FORDN=S1TOS2:REM SEARCH DISK NUMBERS
4000 PRINT@320,CHR$(31);
4020 GET2,DN
4040 TV$=FC$:NH$=LEFT$(FC$,8):TV$=RIGHT$(TV$,8):DH$=MO$(VAL(LEFT
$(TV$,2)))+"-"+MID$(TV$,3,4)+STR$(VAL(RIGHT$(TV$,2))+1900):REM N
AME & DATE
4060 K1$="Diskette has "+STR$(CVI(FD$))+ " free grans or "+STR$(C
VI(FE$))+ "K of free space"
4080 IFFF$="S"THENS2$="Diskette is formatted in single density"E
LSESD$="Diskette is formatted in double density"
4100 IFPG$="8"THEND8$="Diskette is an 8 inch floppy"ELSESD$="Dis
kette is a 5 inch mini-floppy"
4120 IFPH$="2"THEN S2$="Diskette is double sided"ELSE S2$="Diske
tte is single sided"
4140 NT$="Diskette is formatted for "+FJ$+" Cylinders."
4160 PRINT@320,NH$" "DH$" DISK #";DN;:PRINT@384,K1$;:PRINT@448,S
D$;:PRINT@512,D8$;:PRINT@576,S2$;:PRINT@640,NT$;
4180 IFFANDLPTHENGOSUB4740:PF=0
4200 FORNF=1TO IN :IFINKEY$="{ "THEN980:REM SEARCH ALL FILES
4220 GET1,NF
4240 NH$=CVI(F3$):IFNH<>DNTHEN 4480
4260 NA$=F1$:AB$=AB$(CVI(F2$)):AB$="Access level "+AB$
4280 UP$=F5$:IFUP$=" "THENUP$="No access password."ELSEIFUP$="#
"THENUP$="Access password = Password."ELSEUP$="Access password re
quired."
4300 AP$=F4$:IFAP$=" "THENAP$="No update password."ELSEIFAP$="#
"THENAP$="Update password = Password."ELSEAP$="Update password re
quired."
4320 MF$=F6$:IFMF$="+"THENMF$="File NOT backed up!"ELSEMF$="File
backed up."
4340 EL=ASC(FB$)+1:EL$="Logical record length =" +STR$(EL)
4360 SZ$=STR$(CVI(FA$))+ " grans "+STR$(CVS(F0$))+ "K."
4380 MO$=CVI(F7$):DA$=CVI(F8$):YR$=CVI(F9$):DT$="File's date = "+MO
$(MO$)+" "+STR$(DA$)+" " +STR$(YR$):IFMO<=0ORDA<=0ORDA>31THENDT$=
"*** Invalid date ***"
4400 PRINT@704,CHR$(31);:PRINT@704,STRING$(64,140);:PRINT@768,NA
$;" "AB$;" "SZ$;:PRINT@832,UP$;" "AP$;" Rec. #";NF;:PRINT@89
6,DT$;" "MF$;:PRINT@960,EL$;
4420 IFNOTLPTHENGOSUB320
4440 IFLPTHENGOSUB4600
4460 IFINKEY$="{ "THENCLOSE1:CLOSE2:LPRINTCHR$(12):GOTO980
4480 IFNF<=IN THEN NEXT NF
4500 IFLPTHENLPRINTCHR$(12):GOSUB4740
4520 NEXTDN
4540 CLOSE:CLOSE2
4560 IFLPTHENLPRINTCHR$(12)
4580 GOTO980
4600 IFPEEK(16425)>53THENLPRINTCHR$(12):GOSUB4740
4620 LPRINTNA$ "AB$" "SZ$"Rec #";NF
4640 LPRINTTAB(9);UP$;" "AP$
4660 LPRINTTAB(9);DT$" "MF$
4680 LPRINTTAB(9);EL$
4700 LPRINTSTRING$(63,"-")
4720 RETURN
4740 PN=PN+1:REM PRINT DISK HEADER INFORMATION AT TOF
4760 LPRINTSTRING$(63,"="):LPRINT"Disk library of "KT$;" "LEFT
$(TIME$,8);TAB(50)"Page ";PN
4780 LPRINTSTRING$(63,"=")
4800 LPRINTNH$;" "DH$;" --> Disk No."DN
4820 LPRINTK1$

```

Listing 4 continues

THE SELECTRIC™ INTERFACE



Daisy wheel quality without daisy wheel expense.

You need the quality print that a daisy wheel printer provides but the thought of buying one makes your wallet wilt. *The Selectric™ Interface*, a step-by-step guide to interfacing an IBM Selectric I/O Writer to your microcomputer, will give you that quality at a fraction of the price. George Young, co-author of *Microcomputing* magazine's popular "Kilobaud Classroom" series, offers a low-cost alternative to buying a daisy wheel printer.

The Selectric™ Interface includes:

- step-by-step instructions
- tips on purchasing a used Selectric™
- information on various Selectric models, including the 2740, 2980, and Dura 1041
- driver software for Z80, 8080, and 6502 chips
- tips on interfacing techniques

With *The Selectric™ Interface* and some background in electronics, you can have a high-quality, low-cost, letter-quality printer. Petals not included.

ISBN 0-88006-051-4 128 pages **\$12.97**

Credit card orders call TOLL-FREE 1-800-258-5473. Or mail your order with payment plus \$1.50 shipping and handling to: Wayne Green Inc. Attn: Retail Book Sales, Peterborough, NH 03458. Dealer inquiries invited.

A Wayne Green Publication

Yes, I want **The Selectric™ Interface**. Enclosed is \$12.97 (BK7388) per copy plus \$1.50 for shipping and handling.

MASTER VISA AMEX

Card # _____ Expires _____

Signature _____

Name _____

Address _____

City _____

State and Zip _____

A Wayne Green Publication

All orders shipped UPS if complete street address is given.

8S02

Listing 4 continued

```

4840 LPRINTSD$
4860 LPRINTD8$
4880 LPRINTS2$
4900 LPRINTNT$
4920 LPRINTSTRING$(63,"=")
4940 RETURN
5000 CLS:PRINT@512,"An error has occurred!":PRINT"Error # "ERR"
in line "ERL:PRINT"DOS ERROR : ";:CMD"E"
5010 INPUT"Press <ENTER> to return to menu";ZC$
5030 CLOSE:RESUME420

```

Program Listing 5

```

20 REM *****
40 REM *** DREADER/BAS - Diskette directory reading ***
60 REM *** program for LDOS operating system. Reads disk ***
80 REM *** and creates data files containing directory ***
100 REM*** information. COPYRIGHT (c) 1982 by ***
120 REM*** Charles P. Knight. ALL RIGHTS RESERVED ***
140 REM*** at least two disk drives required 3 preferred ***
160 REM*** Version 1.2 ***
180 REM*****
200 REM
220 CLEAR2000:DIMAB$(7),MO$(12)
240 AB$(0)="Full":AB$(1)="Kill":AB$(2)="Rename":AB$(3)="*****":A
B$(4)="Write":AB$(5)="Read":AB$(6)="Exec":AB$(7)="None"
260 MO$(1)="Jan ":MO$(2)="Feb ":MO$(3)="Mar ":MO$(4)="Apr ":MO$(
5)="May ":MO$(6)="Jun ":MO$(7)="Jul ":MO$(8)="Aug ":MO$(9)="Sep
":MO$(10)="Oct ":MO$(11)="Nov ":MO$(12)="Dec "
280 DEFFNS$(X$)=LEFT$(X$,INSTR(X$+" ",")-1)
300 DEFFND$(X)=":"+RIGHT$(STR$(X),1)
320 REM Initialize
340 GOSUB2620
360 PRINT@135,"DREADER/BAS. COPYRIGHT (C) 1981 BY C. P. KNIGHT"
;
380 GOSUB2920
400 PRINT@771,"Enter your name, please :":S=798:E=S+20:GOSUB270
0:KT$=A$:IFKT$=""THEN400ELSEPRINT@771,STRING$(59,32);
420 PRINT@771,"Do you wish to include invisible files":S=810:E=
S+3:GOSUB2700:IFAS$="Y"ORAS$="Y"THENVI=-ELSEVI=0
440 IFDN<1THENDN=1
460 PRINT@835,"What drive will the directory file be written on"
;:S=884:E=S+1:GOSUB2700:D2=VAL(A$):IFD2>3ORD2<0THEN460
480 D2$=FND$(D2)
500 PRINT@899,"Do you want to print disk labels as the disks are
read":S=954:E=S+3:GOSUB2700:IFLEFT$(A$,1)="Y"ORLEFT$(A$,1)="Y"
THENLP=-ELSELP=0
520 FORTV=771TO899STEP64:PRINT@TV,CHR$(251);:NEXTTV
540 PRINT@835,"Enter drive containing disk no "DN;:PRINT@899,"En
ter "CHR$(34)"@CHR$(34)" when finished entering";S=873:E=S+1:G
OSUB2700:IFAS$=""THEN3020ELSESD1=VAL(A$):IFD1<0ORD1>3THEN540
560 FORTV=322TO704STEP64:PRINT@TV,CHR$(251);:NEXTTV
580 D1$=FND$(D1)
600 FORTV=66TO256STEP64:PRINT@TV,CHR$(250);:NEXTTV:GOSUB2200
620 REM Loop through directory *****
640 GOSUB1680:GOSUB1860:PRINT"Free granules"EK"K";
660 OPEN"RO",1,"DIR/SYS.RS0LT0FF"+D1$,32

```

Listing 5 continues

Listing 5 continued

```

680 SD=PEEK(18179+(10*D1)):IFSDAND64THENS$="Double Density"ELSE
SD$="Single Density"
700 IFSDAND32THEND8$="8"+CHR$(34)+" Floppy"ELSESD8$="5"+CHR$(34)+
" Floppy"
720 SS=PEEK(18180+(10*D1)):IFSSAND32THENS2$="Double sided"ELSESS2
$="Single Sided"
740 NT$=STR$(PEEK(18182+(10*D1))+1)+" Cyls":NT$=RIGHT$(NT$,LEN(N
T$)-1)
760 PRINT@197,SD$ "S2$ "D8$ "NT$;
780 GOSUB2360
800 IFLPTHENGOSUB2520
820 FIELD1,1ASXF$,1ASZ1$,1ASZ2$,1ASZ3$,1ASZ4$,8ASXN$,3ASXE$,2ASX
1$,2ASX2$,2ASX3$,10ASXX$
840 Q=387
860 FORI=17TOLOF(1)
880 GET 1,I
900 IF(ASC(XF$)AND144)<>16THEN1300:REM EXIT IF KILLED OR IF FXDE
920 IF(ASC(XF$)AND8)ANDNOTVITHEN1300:REM CHECK VISIBILITY
940 IFASC(XF$)AND64THEN1300:REM EXIT IF SYSTEM FILE
960 N$=FNSS$(XN$)+"/"+FNSS$(XE$)
980 GOSUB1380:GOSUB1440
1000 X1=CVI(X1$):X2=CVI(X2$):X3=CVI(X3$)
1020 Z0=ASC(XF$):Z1=ASC(Z1$):Z2=ASC(Z2$):Z3=ASC(Z3$):Z4=ASC(Z4$)
1040 IFZ4=0THENZ4=256
1060 IFX1=17046THENTT$=" ".AP$=" "ELSEIFX1=17120THENTT$="#.":AP
$="# "ELSETT$="P.":AP$="P"
1080 N$=N$+STRING$(14-LEN(N$),32)+TT$:IFMTHENMID$(N$,13,1)="+":M
F$="+":ELSEMF$=" "
1100 IFX2=17046THENTT$=" ".UP$=" "ELSEIFX2=17120THENTT$="#.":UP
$="# "ELSETT$="P.":UP$="P"
1120 N$=N$+TT$+" "+AB$
1140 IFMID$(N$,INSTR(N$,"/") +1,1)=" "THENMID$(N$,INSTR(N$,"/"),1
)=" "
1160 PRINT@Q,CHR$(251);:PRINT@Q+64,CHR$(251);
1180 PRINT@Q,"Reading file : ";N$ "DA$;
1200 IN=IN+1:PRINT@880,"Files.":IN;
1220 GOSUB1560
1240 PRINT@Q+64,"File length ="FS " <"NG"> Granules"NK"K L
RL="Z4;
1260 GOSUB2260
1280 Q=Q+192:IFQ>640THENQ=387
1300 NEXT I
1320 CLOSE1:CLOSE2
1340 DN=DN+1:GOTO540
1360 REM DETERMINE ATTRIBUTES OF FILE
1380 AB$=AB$(ASC(XF$)AND7):AB=ASC(XF$)AND7
1400 RETURN
1420 REM DATE CALCULATIONS
1440 DA$=""IFASC(Z1$)AND16THENDA$="Invalid date":RETURN
1460 YR=ASC(Z2$)AND7:TV=YR=1980+YR
1480 DA=(ASC(Z2$)AND248)/8:MO=ASC(Z1$)AND15:DA$=MO$(MO)+STR$(DA)
+STR$(YR)
1500 IFDA<=0ORMO<=0THENDA$="Invalid date"
1520 IFASC(Z1$)AND64THENM=-1ELSEM=0:REM NOTE MOD STATUS
1540 RETURN
1560 REM CALCULATE FILE SIZE
1580 NS=X3:NK=(NS*1280):NK=INT(NK/100)/10
1600 IFNS<=5THENNS=1:NG=NS:ELSENS=INT(NS/5+.9):NG=NS
1620 NK=NG*1.25:NK=INT(NK*10+.49)/10
1640 FS=((X3-1)*256)+(Z3-1):IFFS<0THENFS=0

```

Listing 5 continues

3 Easy Steps To Better Computing

1. Find the LOAD 80 dealer nearest you.
2. Visit his store.
3. Buy LOAD 80.

Once you discover how much time and money you can save using LOAD 80—and just how easy it is to use—you may never want to keyboard another program as long as you live.

* Leominster News
6 Merriman Ave.
Leominster, MA 01453
617-534-8237

Computer Discount of A
West Millford Mall
West Millford, NJ 07480
201-728-8080

Radio Shack
Morristown Mall
Morristown, NJ 08057
609-779-8877

* The Carpenter Co.
330 McIntyre Rd.
Pittsburgh, PA 15237
412-486-9085

King Electronics
Town & Country Shop. Ctr.
Aberdeen, NC 28315
919-944-2600

American Software Tech
2305 Ponce de Leon Blvd
Coral Gables, FL 33134
305-864-2305

* North Eastern Comp. So.
462 Moody St.
Wallham, MA 02154
617-899-3540

* Software City
147 N. Kinverkamack Rd.
Montvale, NJ 07645
201-391-0931

Computer Encounter
Princeton N. Shop. Ctr.
Princeton, NJ 08540
609-924-8757

Personal Software
146 Paoli Pike
Malvern, PA 19355
215-296-2726

Sound Mill
Stocum Shopping Center
Havelock, NC 28532
919-447-5988

H & H Hobby Sales
4121 S. Tamiami Trail
Sarasota, FL 33581
813-922-7711

Microcom Software Ctr.
25 Elm St.
Watertown, MA 02172

* Software City
161 Cedarland
Teaneck, NJ 07666
201-692-8298

Bargain Brothers
216 Scotch Rd.
W. Trenton, NJ 08628
609-883-2050

Wills Computer Store
4410 Stamp Rd.
Marlow Hgts., MD 20031
301-423-4525

Rayburn Micro-Electron
27 E. Main St.
Sylva, NC 28779
704-586-8133

Paperback Booksmith
8201 S. Tamiami Trail
Sarasota, FL 33583
813-922-5269

Vineyard Electronics
State Rd.
Vineyard Haven, MA 02568
617-693-5900

Computer Madness
Summertown Shopping Ctr.
Englishtown, NJ 07726
201-462-9696

Crowley's
Rt. 22, Rd. 3, Box 570
Whitehouse Station, NJ 08889
201-534-2722

Pentagon Bookstore
The Concourse
Washington, DC 20301
202-695-0870

Anderson Electronics
803-225-6422

Micro Computer Center
14932 N. Florida Hwy.
Tampa, FL 33612
813-961-5269

* Tuff's Radio
61 Lowell Rd.
Hudson, NH 03051

J & J Electronics (S)
Rte. 57, James Way SC
Hackettstown, NJ 07840
201-882-6976

Digibyte
31 E. 31st
New York, NY 10016
212-889-8130

Bowes Books
718 Great Mills Rd.
Lexington, MD 20653
301-863-6200

Megatron-Radio Shack D
Heritage Plaza
Hilton Head Plaza, SC 29928
803-789-9630

* Madison Books
8006-5 Madison Pike
Madison, AL 35758
205-772-9250

Radio Shack
148 Key Rd.
Keene, NH 03431
603-357-0100

Paperback Booksmith
Rockaway Town Square
Rockaway, NJ 07866
201-361-3400

RD International Co.
455 W. 43rd St.
New York, NY 10036
212-307-0266

The Comm Center, Inc.
9624 Fl. Meade Rd.
Laurel, MD 20810
301-953-9353

* Atlanta Computer Mart
5091-B Buford Hwy.
Atlanta, GA 30362
404-455-0647

Hooper Electronic Supp.
495 Rodenburg Ave.
Biloxi, MS 39331

Corner News
Railroad Square
Keene, NH 03431
603-357-4696

MT Electronics (S)
8 Main Street
Sparta, NJ 07871
201-729-5719

Programs Unltd. White
131 Mamaroneck Ave.
White Plains, NY 10601
914-761-9283

B. Dalton Booksellers
Rts. 1-270 & MD 85
Frederick, MD 21701

* Software To-Boot
8514 Cindy St.
Savannah, GA 31406
912-927-2017

Elizabethtown Eletron
Elizabethtown Plaza
Elizabethtown, KY 42701
502-765-5070

* Wm. Holt Association
31 Raynes Ave.
Portsmouth, NH 03801
603-431-7438

Happy Booker
Morris County Mall
Cedar Knolls, NJ 07927
201-539-4240

Programs Unltd., Inc.
204 Jericho Turnpike
Jericho, NY 11753
516-997-8668

Hancock Techninics
33 W. Main St.
Hancock, MD 21750
301-678-6000

* City News Stand
901 E. New Haven Ave.
Melbourne, FL 32901
305-725-0330

Jerry's Computers
Euclid Arcade
Cleveland, OH 44115
216-579-0648

Computer Dynamics
11 Portland Hill
Georgetown, CT 06829
203-235-0643

Morris County Station
Chester Springs Shop. Ctr.
Chester, NJ 07830
201-879-5776

The Computer Shoppe
283 Medford Ave., Rte. 112
Patchogue, NY 11772
516-758-6558

Arcade Electronics, IN
7036-28 Columbia Pike
Annandale, VA 22003

Cape News Co.
700 Clearlake Rd.
Cocoa, FL 32922
813-870-1970

Data Link Ctr.
4520 Airway
Dayton, OH 45431
513-252-1613

Alban, Inc.
11 Portland Hill
Georgetown, CT 06829
203-544-9236

Computer Workshop
1200 Haddensfield Rd.
Cherry Hill, NJ 08002
609-685-4404

Red Ten Radio Shack
129 E. 4th St.
Walkers Glen, NY 14891
606-535-2233

* Community Electronics
258 Broadview Ave.
Warrenton, VA 22186
703-347-1339

* Suppliers of Load 80 Disks

Software Mart
352 Bloomfield Ave.
Caldwell, NJ 07006
201-228-4949

Radio Shack
Cherry Hill Mall
Cherry Hill, NJ 08034

Artec Electronics
Back Mountain Shopping Ctr
Shavertown, PA 18708

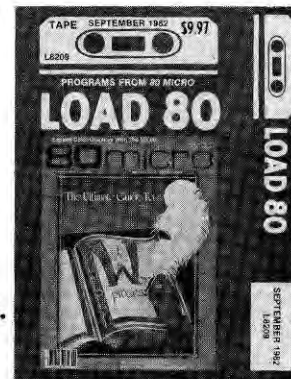
K & S Newstand
1249 Corporation Pkwy.
Winston Salem, NC 27107
919-724-7537

The Computer Nook
Pine Brook Plaza, Rte. 46
Pine Brook, NJ 07058
201-575-1192

Computer Dimensions
116 Elm St.
Westfield, NJ 07090
201-232-8300

Computer Corner of NJ
439 Route 23
Pompton Plains, NJ 07444
201-835-7080

Pamper yourself.
Pamper your computer.
Use LOAD 80 cassettes and disks.
A subsidiary of Wayne Green Inc.
Peterborough, N.H. 03458 USA



Subscribe
to CCN

Color Computer News



Are you tired of searching the latest magazine for articles about your new Color Computer? When was the last time you saw a great sounding program listing only to discover that it's for the Model I and it's too complex to translate? Do you feel that you are all alone in a sea of Z-80's? On finding an ad for a Color Computer program did you mail your hard earned cash only to receive a turkey because the magazine the ad appeared in doesn't review Color Computer Software? If you have any of these symptoms you're suffering from Color Computer Blues!

But take heart there is a cure!

It's COLOR COMPUTER NEWS.

The monthly magazine for Color Computer owners and only Color Computer owners. CCN contains the full range of essential elements for relief of CC Blues. Ingredients include: comments to the ROMS, games, program listings, product reviews, and general interest articles on such goodies as games, personal finances, a Kid's page and other subjects.

The price for 12 monthly treatments is only \$21.00 and is available from:



Mail
Today!

REMarkable Software

P.O. Box 1192
Muskegon, MI 49443 ✓ 145

NAME _____

ADDRESS _____

CITY _____ State _____ Zip _____

Allow 8-10 weeks for 1st issue. 80 M

SUPER DUPER¹

If you own Super Utility Plus² you need Super Duper!

- Enter SU+ with the top 8K of memory unaltered! Pass data back and forth between SU+ and other programs. Load a high memory monitor and jump to it after SU+ loads!
- Keep a SU+ backup on your system disk—always ready when you need it!
- Load or Run machine language programs, exit to DOS READY without re-boot, or save a SU+ backup copy! All from inside SU+!
- NO machine language knowledge required! Super Duper does all the work!

Duplicate SU+² in STANDARD/CMD format. No need for expensive backup disks!

- Super Duper works with the Model I or III, any TRSDOS³ compatible DOS and requires Super Utility Plus V2.2z or V2.2P . . . \$29.95.



1302 - 41st Street • Orlando, Florida 32805
Phone (305) 423-5683

TO ORDER

Send Cash, Check, or Money Order. Credit card orders call or write. Include account number, signature and expiration date.

Florida residents include 5% sales tax.

This product is for personal use only.
It is not meant for distribution or sales.

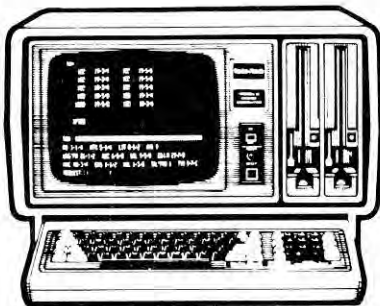
✓337

1. * WittSoft 2. * Breeze/QSD, Inc. 3. * TANDY CORP.

Buy
Direct!

SAVE MONEY ON TRS-80[®] COMPUTERS

Discount
Prices!



TRS-80 Model 16

1-800-835-9056

Kansas Residents — 316-624-1919 (collect)

✓ **CHECK WITH US AND SAVE**

We have the largest Inventory in the Central United States. Immediate shipment directly to you from our warehouse.

- ✓ Visa or Mastercard
- ✓ Bank Cashier's Checks
- ✓ Bank Money Orders
- ✓ Bank Wire Transfers

- ✓ We now Carry Telephones and Telephone Answering Systems!

- * All Inventory 100% TRS-80[®] Equipment
- * Free Price List
- * No Out-Of-State Taxes
- * F-48 Warranty form
- * Immediate Shipment



Jimscot, Inc.

1023 N. Kansas — Box 607
Liberal, Ks. 67901

✓ 254

TRS-80 is the registered trademark of Tandy Corporation

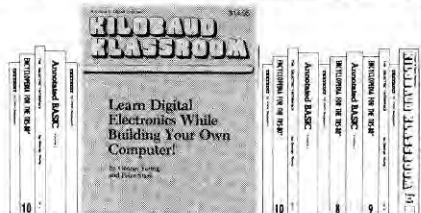
WAYNE GREEN BOOKS

KILOBAUD KLASROOM

by George Young and Peter Stark

Makes learning electronics fun and easy. First published as a series in *Kilobaud Microcomputing*, the book combines the learning of essential theory with practical, hands-on experience. The course begins with basic electronic projects and culminates in the construction of your own programmable microcomputer. The direct instructional methods of authors Young & Stark make KILBAUD KLASROOM a simple way for you to acquire a solid background in digital electronics.

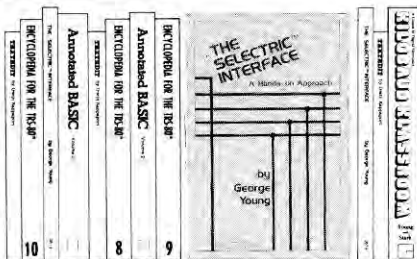
BK7386 (419 pages).....\$14.95



THE SELECTRIC INTERFACE by George Young

You need the quality print that a daisy wheel printer provides but the thought of buying one makes your wallet wilt. The SELECTRIC™ INTERFACE, a step-by-step guide to interfacing an IBM Selectric I/O Writer to your microcomputer, will give you that quality at a fraction of the price. George Young, co-author of *Kilobaud Microcomputing* magazine's popular "Kilobaud Classroom" series, offers a low-cost alternative to buying a daisy wheel printer. The SELECTRIC INTERFACE includes: step-by-step instructions, tips on purchasing a used Selectric, information on various Selectric models, including the 2740, 2980, and Dura 1041, driver software for Z80, 8080, and 6502 chips, tips on interfacing techniques. With The SELECTRIC INTERFACE and some background in electronics, you can have a high-quality, low-cost, letter-quality printer. Petals not included.

BK7388 (125 pages).....\$12.97



TEXTEDIT

A Complete Word Processing System in Kit Form

by Irwin Rappaport

TEXTEDIT is an inexpensive word processor that can be adapted to suit your differing needs—from form letters to lengthy texts. Written in TRS-80 Disk BASIC, the system consists of several modules, permitting the loading and use of only those portions needed. A disk is also available which provides the direct loading of the modules, however, the book is required for documentation. For Model I and III with TRSDOS CONVERT., one disk drive (2 disk drives or copy utility needed to transfer to system disk). Runs under TRSDOS 2.2/2.3. May not function under other systems.

BK7387 (book, 90 pages).....\$9.97

DS7387 (disk).....\$19.97

Disk is manufactured by Instant Software, a division of Wayne Green Inc.

TEXTEDIT

a complete word processing system in kit form.

by Irwin Rappaport

A WAYNE GREEN PUBLICATION



ANNOTATED BASIC

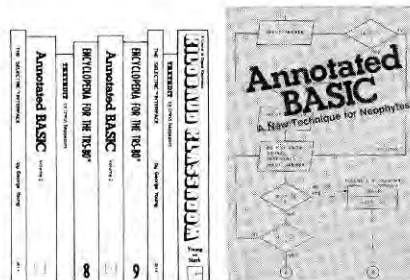
A New Technique for Neophytes

Put your BASIC knowledge to work for you with this 2-volume set of TRS-80 Level II BASIC programs. Gain a better understanding of the elements and techniques involved in programming. ANNOTATED BASIC'S uniquely designed format breaks each program down for you to include: initial documentation and instruction, definitions of New BASIC Concepts, flowchart, annotations of sections, showing how each part fits into the whole, and explaining why certain BASIC commands are chosen over similar ones.

Using the programs as they are or modifying them to sharpen your programming skills, ANNOTATED BASIC is a helpful tool for any BASIC programmer.

BK7384 (Vol. 1, 152 pages).....\$10.95

BK7385 (Vol. 2, 136 pages).....\$10.95

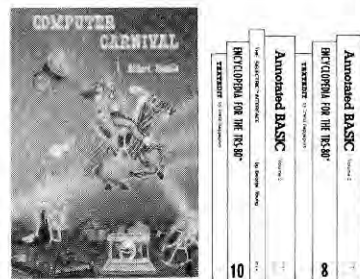


COMPUTER CARNIVAL by Richard Ramella

Your child can become a crackerjack computerist with the sixty TRS-80 Level II programs in COMPUTER CARNIVAL. This large-type, spiral bound book for beginners is a veritable funhouse of games, graphics, quizzes and puzzles. Written by 80 *Micro* columnist Richard Ramella, the programs are challenging enough to ensure continued learning, yet short enough to provide your child with the immediate delight and reward of mastering basic computing skills. And for even greater enjoyment, get the CARNIVAL COMPANION, a 30-minute cassette containing all the programs in the book. Eliminates tiresome typing and lets your child spend more time enjoying the programs.

BK7389 Book (218 pages).....\$16.97

CC7389 Book & Cassette "Carnival Companion".....\$24.97



FOR TOLL-FREE ORDERING CALL 1-800-258-5473 WAYNE GREEN BOOKS • PETERBOROUGH NH 03458

Itemize your order on a separate piece of paper and mail to Wayne Green Books, Att: Sales, Peterborough, NH 03458. Be sure to include check or detailed credit card information. (Visa, MC or AMEX accepted.) No C.O.D. orders accepted. All orders add \$1.50 for the first book, postage and handling; \$1.00 each additional book; \$10.00 per book foreign air mail. Please allow 4-6 weeks after publication for delivery. Questions regarding your order? Please write to Customer Service at the above address.

Send any questions or problems dealing with any area of TRS-80 microcomputing to Feedback Loop, 80 Micro, 80 Pine Street, Peterborough, NH 03458.

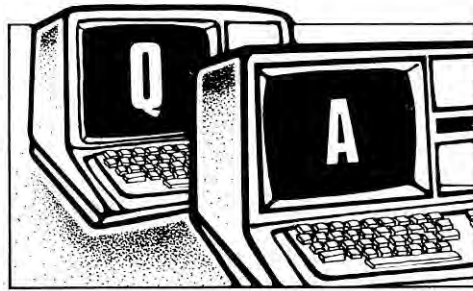
Concerning the problem of expanding RAM in the TRS-80 computer, three vendors in your magazine advertise RAM expansion to 64K RAM, Omikron, Memory Merchant, and Freedom Technology International. Are you saying that these products don't work? Or that they don't provide 64K of usable RAM?

I am now using the Omikron Mapper I and am tempted to update it to the extra 16K RAM, except that you and everyone else states that it can't be done.

C.H.
Wheaton, IL
J.R.
Sherman Oaks, CA

That's not exactly what I meant. The Z80 CPU (or any other processor with a 16-bit address line) can access only 64K bytes of memory, either RAM, ROM, or a mixture of the two. The TRS-80 is designed with a 12K ROM that contains Basic, the TRS-80 operating system, and 48K RAM of user memory (there's an additional 1K of RAM for video memory, and a bank of 2K addresses that aren't used, plus a few miscellaneous bytes used for system overhead). This means that whenever a machine-language program, such as VisiCalc, is used, the memory positions occupied by the Basic ROM aren't used.

The Omikron Mappers I and II and other 64K modifications reconfigure the TRS-80 to turn off the ROMs and use their own operating system software and hardware. When you use the Mapper I, the 48K of memory used is the standard memory in your computer and your ROMs are ignored. Putting in the extra 16K of RAM replaces the ROM, as far as the Mappers are concerned, giving you a total of 64K of RAM. The Z80 isn't addressing more than 64K of memory, it's just accessing the lower 16K bank of RAM in the Mapper I instead of ignoring the 12K of ROM on the TRS-80 main circuit board. This translates into more user space for you since your computer is no longer wast-



Problems and solutions

ing the lower 16K bank of addresses as unusable ROM.

How does one become an independent repair technician for modified Radio Shack computers?

J.C.
Los Angeles, CA

First, learn enough electronics to work on sophisticated equipment without destroying it; second, get the schematics and technical manuals for the TRS-80 computers so you'll know where things are and what they're supposed to be doing; and third, advertise your availability as a service technician.

If you want to get a job with Radio Shack, either at a Computer Center or at an independent dealer store, you have to provide Tandy with a resume stating what electronics school you graduated from, or what your qualifications are as an electronics technician (what companies you've worked for, how long you've been doing it, etc.), as well as a letter declaring that you'll abide by their rules and regulations regarding the proprietary secrets of their products, and that you will not sell repair parts without installing them yourself.

If you succeed in convincing Tandy that you're an honest person and know what you're doing, they'll send you to a training seminar in Fort Worth to certify you for repairing their equipment.

Other than that you're on your own. If you don't know anything about electronics, enroll in a local technical school

course that provides you with hands-on experience.

I have a 48K Model I (with buffered cable and twisted-pair Expansion Interface "fixes," and the new two-chip ROMs with two MPI disk drives. The system refuses to CLOAD in Disk Basic. I have tried to CLOAD Basic programs using four different DOSes without success. System tapes load trouble-free. Basic programs CLOAD perfectly in Level II Basic. I understand the CMD"T" and CMD"R" commands, but they seem to have no effect. After a CMD"T" and CLOAD, the recorder turns on and the system locks up.

D.S.
Austin, TX

That's a toughy! Your problem is probably a bad RAM bit (or series of bits). If there was a problem with the ROM chips, then you wouldn't be able to CLOAD under either Level II or Disk Basic. It can't be the cassette port of the CPU for the same reason. Since the Expansion Interface isn't used for cassette I/O, either for circuitry or for machine-language code, the buffered cable and fixes are likewise removed from the list of suspects. Similarly, when loading a tape program, DOS lets the ROMs do all the work. This leaves only the RAM in the keyboard unit. I suggest that you run a RAM-check program to see if you can trap the problem chip. If the unit fails the test, you've found your problem. If it doesn't fail, take the unit (CPU and Expansion Interface) to your local computer center and have a technician examine it.

The only other choice you have is to use MULTIDOS (Cosmopolitan Electronics Corp., P.O. Box 89, Plymouth, MI 48170, \$99.95), which has a special DOS command that drops into Level II completely. After loading your program in a normal Level II environment, you reset the computer and go back into Disk Basic, where you'll find your program waiting.

I have a Model I, Line Printer VII, and the Printer Interface Cable (26-1411). I recently purchased the bus-decoding version of the Microconnection (Microperipheral Corp.)

If you're tired of playing games with your TRS-80...^{T.M.}



**Turn it into
a high power
computer!**

Now you can give full CP/M[®] capabilities to your TRS-80.

Announcing the new Compactor family from Hurricane Laboratories. We know limitations are a reality but we put on our thinking caps and did something about it. The new Compactor II (112K Memory) gives CP/M 2.2 and 3.0 capabilities to the Model III without altering the TRSDOS and TRS-

BASIC environment. It also allows you to interchange with IBM PC, Xerox, Cromemco, NEC, Zenith, and Osborne-I. It's fast, it's easy to install and needs no extra hardware. The Compactor IV enhances the video display to 80 x 24. And don't forget the 48 K Memory Compactor I, which allows even the novice to run single purpose dedicated CP/M programs. In short, Compactors make your Model III an intelligent and powerful computer. So why not quit playing

games and put that TRS-80 to work! It's as simple as saying, "...Compactors by Hurricane Labs."



30-day money-back guarantee on Compactor II if not totally satisfied.

Write to us or ask your TRS-80 dealer for all the facts about the new Compactor Family from Hurricane Labs.

5149 MOORPARK AVENUE, SUITE 105 **HURRICANE** SAN JOSE, CA. 95129 • (408) 257-8676



✓ 185

My problem is that I can't operate the modem and the printer simultaneously. I could plug the printer to the modem's port on the rear except that the LP VII is set to 600-baud operation. How can I add other peripherals that plug into the expansion (Exatron's Stringy Floppy, joysticks and so forth) and have them all on-line?

D.A.
Smithfield, VA

That's an easy one. Alpha Products (79-04 Jamaica Ave., Woodhaven, NY 11421, (212) 296-5916) makes a series of cables called Expandabus that lets you plug several devices to the expansion port simultaneously. The two-device cable is \$29, the three-device cable is \$44; the four-device cable is \$59; and the five-device cable is \$74.

Since different devices use different ports for their I/O, you should have no problem connecting your peripherals to the expansion bus and eliminating the need to plug and unplug cables each time you want to use a different peripheral.

I have a Model I and I want to connect a large video monitor to use in my high-school class. The TRS-80 uses two wires and a ground to go to the video display, and the monitor I have needs only one wire and a ground. What do I do?

B.H.
New Rochelle, NY

First, a little background: The monitor used on the Model I is a modified TV set. To make the video as inexpensive as possible, Radio Shack used what is known as a hot-chassis TV. The ground on the TV is isolated from the wall-current ground, and can range as much as 30 volts over the normal zero-volt ground. The computer uses a "true" ground. Obviously, to just connect these two together would be disastrous. To get around this problem Radio Shack uses an optical-isolator inside the monitor to separate the computer signals from the video signals. To ensure the separation, the optical-isolator is powered by the computer, not the TV. If you examine the technical manual on the Model I, you'll discover that the three lines to your video are labeled video, 5-Volt, and ground. Since a normal monitor only needs the

video and ground lines, connecting the TRS-80 to it is easy, just ignore the 5-Volt and connect the other two lines to your monitor.

One word of caution, before beginning to operate on your Model I, make sure that the monitor you have is not a hot-chassis. If you don't know, take the unit to a TV technician and have it checked out. For more detailed instructions on how to modify your computer, see pages 96-98 of *The Custom TRS-80* by Dennis Kitz (IJG Inc., 1260 West Foothill Blvd., Upland, CA 91786, (714) 946-5805).

This letter is to acknowledge the receipt of a #GN42G green phosphor CRT for my Model I, as advertised by Langley-St. Clair Instrumentation Systems (132 West 24th St., NY, NY 10001) in the September issue of 80 Micro. Since I ordered the CRT by phone only four days ago, the service is remarkably prompt considering that the majority of suppliers are known for their slow service. Although the instructions contained no diagrams, they are in plain English and I was able to install the new CRT in about 20 minutes.

The difference in the quality of the display is most gratifying; it has a much more "professional" appearance to it. The contrast is much better and it's easier to use for sustained periods of time.

The question I have regards the Model III. I'm thinking of getting one and I want to know if the #GN42G green CRT can be transferred from my Model I to the Model III.

J.K.R.
Columbus, OH

Yes it can. Langley-St. Clair is sending you the instructions on how to do it.

Is there a company that makes a light pen for the standard Color Computer? If not, what would it take to modify the light pen for the Model I or III for use with a Color Computer?

D.C.
Mobile, AL

Spectrum Projects (93-15 86th Drive, Woodhaven, NY 11421, (212) 441-2807) sells a light pen for the Color Computer. It connects to your joystick port and works with both Color Basic and

Extended Basic. It retails for \$14.95.

As for converting a light pen from the Model I or III to the Color Computer, it depends on how the individual light pen is constructed.

I have a Model I, Level II with a 48K RAM, Expansion Interface, three disk drives, and a Line Printer VI, all from Radio Shack.

When I use Radio Shack's Inventory Control System, the forms do not advance properly. When a page is printed, the printer advances to the next page, but instead of stopping at the same place on the new page it goes too far by one line. By the time I have printed several pages, the printer is printing on the page perforations. Can you suggest a fix?

S.G.
Miami, FL

What you want to do is check memory location 4028 (PRINT PEEK (16424)) and see what value is stored there. This should be the number of lines per page. Since you're experiencing problems with one line feed too many, use the POKE command to reduce this number by one (POKE 16424, PEEK(16424) - 1). It should now form-feed one line less than before and stop exactly where you want it to stop.

I have a standard 48K, two-disk-drive Model III, and I want to add two external drives to it. Can I use double-headed drives with my system and DOSPLUS 3.4? I would like to add one 40-track and one 80-track double-headed drive, or would it be better to use two 40-track DH drives for compatibility?

Also, will I be able to run Radio Shack's Profile program after converting it to DOSPLUS on this system? And will it be able to take advantage of the increased available space?

H.C.A.
Seattle, WA

DOSPLUS will let you use any combination of single and double-headed drives on your computer, up to the limit of four drives. Rather than add one 40-track and one 80-track, why don't you just get two 80-track double-headed drives? After all, you already have two 40-track drives in your main computer case. Don't be worried about swapping the disks from drives 1 and 2 to drives 3

Verbatim® Datalife™ disks

Call us free (800) 654-4058
COD & Freight charges prepaid
(Dealer Inquiries Welcomed)

Larger Quantities Quoted On Request..

	10	30	50
1" single-side	2.50	2.45	2.40
5/4" double-den.			
1" double-side	3.85	3.80	3.80
5/4" double-den.			
1" single-side	3.45	3.35	3.30
5/4" quad-den.			
1" double-side	4.45	4.35	4.25
5/4" double-den.			
8" single-side	3.00	2.95	2.90
single-den.			
8" single-side	3.95	3.90	3.80
double-den.			
8" double-side	4.45	4.35	4.30
double-den.			

Head Cleaner Kits 9.40 ea.
Refills 14.50

the
Diskette
connection

P.O. BOX 1674 ✓441
Bethany, Okla.
73008



• (50⁰⁰ min., continental U.S. only)

EXPANDED

DATA-MAN™

Data Manager

NEW FEATURES

- *** Field Manager - Change, Delete, Add, or Modify Fields ANY time.
- *** DATAWORD Text Writer - Merge Data Files with Form Letters, etc.
- *** Label Maker - Any Size. Merge from Data base or stand alone.
- *** Supports LEGAL Size Documents - Any Paper Width to 15 Inches.

OTHER FEATURES

- * Auto Report Generator
- * Auto Totals & Subtotals
- * Multiple Drives Supported
- * Menu Driven, User Friendly
- * Multiple Files on One Disk
- * State Model I or III, 48K Required
- * Auto Screen Format
- * Auto Column Averaging
- * Sorts in Minutes, Not Hours
- * No Programming
- * Unlimited Backups
- * 2 Drives (DDEN) Required

EXISTING OWNERS, WRITE FOR FREE UPDATE.
Price \$69.95 VISA/MC Accepted

ORDERS/INFO: 305-351-0428
FL Residents, Add 5% Tax

Supplied with Micro-Systems' TDOS
For Additional Information, Check
Reader Service or Write Direct to:

String Systems
1446 Hagen Lane
Rockledge, FL 32955 ✓443

PROFESSIONAL SOFTWARE

TRS-80® MODEL II & 16

NOW AVAILABLE!

BASIC COMPILER

- TRSDOS® 2.0 COMPATIBLE
- UP TO 30 TIMES FASTER
- BY MICROSOFT • EASY TO USE
- INCLUDES M-80, CREF-80 & EDIT 80
- AUGMENTED WITH OUR DOCUMENTATION

\$339.00*

DISK SORT

- YOU DON'T HAVE TO BE A PROGRAMMER TO USE IT!
- MENU DRIVEN • RANDOM FILES • EASY TO USE • SPEC'S SAVED ON DISK
- EASILY INSERTED INTO JOB STREAM FOR NON-STOP RUNNING • FULL DISK CAPACITY
- 1,000 REC'S. SORTING 15 BYTES, INCLUDING ALL DISK I/O = 2 MIN, 45 SEC'S.

HARD DISK
DOC. ONLY \$10⁰⁰
DEDUCTIBLE
ON PURCHASES

BASIC CROSS REFERENCE

- SEE USED LINE#S/NAMES AT A GLANCE • PRODUCES NICE PROG. LISTING • INDISPENSABLE
- SAVE HOURS!

\$59.99*

EPSON

- HURRY-LIMITED TIME!
- 9 1/2x11 18lb WHITE STRIPS TO 8 1/2x11 3,000/BOX

\$25.00*

MAILING LIST

- HIGH CAPACITY • SPANS DISK • NO SORTING
- FAST RETRIEVAL-UPDATE • R/S CONVERSION INCLUDED • LONG/SHORT FORMATS
- ESTIMATED AVAILABILITY - DEC. 1982

\$149.95*
DOC. ONLY \$10⁰⁰
DED. ON PURCH.

*PLUS POSTAGE & HANDLING. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

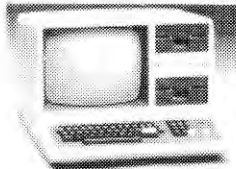
TRS-80 & TRSDOS ARE
REGISTERED
TRADEMARKS OF
TANDY CORP.

GOOD-LYDDON DATA SYSTEMS
5486 RIVERSIDE DR., CHINO, CA 91710
(714) 980-4563

✓186

FREE SHIPPING

TRS -80 MOD III

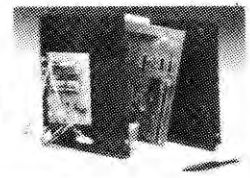


W/48K, 2 TANDON
5 1/4" DISK DRIVES
INCLUDES TRS DOS
W/RS232

\$1695

TRS-80 MOD III Disk Controller

Includes Disk Controller, Linear
Power Supply, Mounting
Hardware, Cables and
Instruction Manuals



\$249.95
COMPLETE

W/RS232
\$299

PRINTERS



MX80 Call
MX80F/T \$525
MX100 \$675
SMITH-CORONA TP-1 \$575
(Letter Quality Daisy Wheel Printer)

Printer Cable \$26.95 (\$20 w/purchase of printer)



TM100-1 Single 40 Track Drive \$199
With Cabinet & Power Supply \$249
TM100-2 Double 40 Track Drive \$289
TM100-3 Single 80 Track Drive \$289
TM100-4 Double 80 Track Drive \$379

8" Dual Slim Line Power Supply & Cabinet \$249
5 1/4" External Power Supply & Cabinet 49
5 1/4" Slim Line Power Supply & Cabinet CALL

VISA, MASTERCARD (\$100 Min., Add 2%)
Or Certified Check

90 Day Warranty (Parts & Labor)
TRS 80 is a Registered Trademark, Tandy Corp.
Prices Subject to Change Without Notice

DATA-MAIL
P.O. Box 818 Reseda, CA 91335
1-800-635-5555 ✓452

FREE SHIPPING IN CONTINENTAL U.S.
(TRS 80 MOD III EXCEPTED)

(213) 993-4804
(IN CALIF.)

FEEDBACK LOOP

and 4, you can use the Skip command to make the 80-track drives read the 40-track drives (but don't try to write on the 40-track disks with the 80-track drives). The October Feedback Loop column and a letter further on in this column provide more information on this subject.

How can I make a disk with track 0, sector 0 in single density and track 0, sector 1 in double density?

R.K.
Fallston, MD

Kim Watt, author of Super Utility and programmer for Powersoft (11500 Stemmons Fwy., Suite 125, Dallas, TX 75229, (214) 484-9428), is the only one I know who has solved this problem, and he's not telling his secret. Instead, he's selling a master disk to software producers that creates distribution disks with track 0 formatted in both single and double density.

My Micromatic printer system, which uses the IBM 1980 terminal with the Micromatic Interface, has started to print F instead of B. Local technicians found one of the two PROMs in the interface to be working improperly, but can't fix it because they don't have the correct PROM program.

Unfortunately, my telegrams to the Micromatic Corporation were returned and their telephone number has been disconnected. Please help!

W.P.
Agana, Guam

I can't find anything about them, can anyone else help?

I own a 16K computer with Color Basic 1.0 that has been upgraded from 4K. When I replaced the keyboard after installing the RAM, the H and O letters didn't work. I checked the keyboard connection and it seemed OK. When I tried the keyboard again, it worked. What happened?

Also, my computer will occasionally turn itself off while I'm using it. What could cause this? And do you know where I can get schematics for my computer?

Finally, the numbers on the bottom of my PC board are 8709137-D and 1018543. What version does that make my computer?

R.R.
Kanona, NY

Your problem after installing the RAM was a loose keyboard connection, as you thought. By reopening the unit and pushing the keyboard around you pushed the keyboard into better alignment, curing the complaint.

Your computer turns itself off because you have a sudden-death power supply! Some power supplies are poorly soldered and as the computer gets warm, the parts sometimes break contact, killing the power to the computer for a millisecond or so. This is just long enough to pull in the protection circuitry, which turns off the computer to prevent damage. The solution is to take a soldering iron and gently reflow the solder of the parts of the power supply, especially around the resistors.

Schematics of the Color Computer are available from Radio Shack in the *Color Computer Technical Manual* (#26-3193, \$14.95).

You have the version D board. The latest version is the E board.

I am 13 and in 8th grade. I am also hooked on Basic programming and can't wait to get my own Model III. I have heard that a Japanese company is making a computer that uses English for programming (i.e., 10 PRINT THE SUM OF 2 & 3). I'm worried that Basic will become obsolete in a few years. Is this true?

R.W.
New York, NY

Yes, computers using English are being developed, and by several companies. The difficulty with programming in English is that English requires so many words to construct commands (compare your example with 10 PRINT 2 + 3) that a good portion of memory and time is used in decoding the command. As processors speed up, can address more memory, and the cost of memory drops, these problems will become trivial. The only problem left is inertia in the marketplace. There are approximately 2 million microcomputers in private hands now, and almost all use a dialect of Basic. Also, the ability to program is based more on experience than on the language used. Someone who has been programming Fortran for 10 years obviously has an advantage in logical thinking and problem-solving techniques than a beginner in Basic.

I don't think you need to worry about the English-programming com-

puters replacing Basic computers; besides, if they do, you'll find it much easier to write your programs since Basic is based on simple English commands.

My problem is with my RS Tandon TM-100 disk drive on my Model I. When trying to back up a disk using NEWDOS80, the screen says "Motor Speed Too Slow." With NEWDOS Plus it says to try the Format command, which in turn responds with "Can't Format." What's up?

T.R.
Weslaco, TX

It sounds like your disk drive needs to be checked out. You have two choices: Take the drive to RS and have them look at it, or buy a disk-drive test program such as the DiscoTech (Micro-computer Products, P.O. Box 11129, Santa Rosa, CA 95406, \$29.95) or the Floppy Doctor (The Micro Clinic, 17375 Brookhurst #114, Fountain Valley, CA 92708, \$29.95).

Either of these programs will tell you if your disk drives are running at the correct speed. Floppy Doctor includes an extensive disk diagnostic that will also check your drive's head alignment, write sense switch activity, track-to-track read/write interference, track-to-track switching accuracy, and several other functions. Once the problem has been located as being either software or hardware, you can take the appropriate corrective action.

The letter from D.T. about blowing a fuse in the Expansion Interface power supply and the subsequent erratic operation are close to what happened to my Model I. Here's what I found:

● *The fuse in the power supply can be replaced by cutting open the case, unsoldering the blown fuse, soldering two clipped-off leads from a resistor onto the endcaps of a new fuse of the same power rating, soldering the new fuse back into the power supply, and taping the case back together. This saves money and time over getting a replacement power supply when the problem is only a blown fuse.*

● *The intermittent and erratic operation of the disk drives was due to the Expansion Interface being turned on and off due to a broken lead of the power rectifier, MDA202. MDA202 is mounted flush on the board with the*



Drive down the high cost of disk drives

DISKovery Unlimited is bringing you the best in microcomputer systems, drives, peripherals, and software for TRS-80 and other popular brands. This month, take advantage of special system and disk drive values like these:

Complete TRS-80 Model III microcomputer system with disk drives

48K RAM, two 40-track, double-density disk drives, A.M. Electronics controller board, DOS and manuals, complete and ready to run. \$1,695.00

Same system as above, including RS-232C interface and MX82F/T dot matrix printer for correspondence-quality output \$2,395.00
(Prepaid shipping when order is prepaid)

A.M. Electronics "Multiplier" for TRS-80 Model I systems

Fed up with unreliable double-density disk drive operation? "Multiplier" lets you upgrade from single-density without doubling your problems. . . . \$ 99.00
"Multiplier" with NEWDOS 80 \$199.00

Mini Winchester hard disk drive

Completely plug-compatible with your TRS-80 system. Includes controller board and DOS Plus 4.0i. Delivers 6.7 megabytes of data capacity (unformatted). Typically uses one amp less than other hard disk drives. Excellent for word-processing, database management, financial planning, and other data-intensive applications \$1595.00

New! Two-inch, high-performance floppy disk drives

Now you can save space *and* money. These drives are only two-thirds the height of conventional drives, and provide extras like door-lock solenoid control, selectable write protect (protect with or without notch—your choice!) and disk change/activity indicators. Shipped complete and ready to run.

Single-sided, 40-track 2" drive
w/case & power supply. \$199.95
Double-sided, 40-track 2" drive
w/case & power supply. \$249.95
Single-sided, 40-track 2" drive, packaged for TRS-80 Model I, including case, power supply, cable, TRSDOS & manual . . . \$249.95

DISKOVERY UNLIMITED

✓ 37

3366 Washtenaw Ave., Ann Arbor, MI 48104 (313) 973-2315



™TRS-80 trademark of Tandy Corp. Shipping costs extra except where otherwise noted. Prices effective through the 15th of cover month.

leads soldered to the foil on the other side of the circuit board. One lead had crystallized and broken right where the lead goes into the plastic case of the rectifier, making it almost impossible to discover by visual inspection.

Subject to temperature changes and vibrations, the lead would either make the connection and allow power to the Expansion Interface, or break the connection and stop power. Every time the Expansion Interface was turned on, it sent a signal to the disk drives to start, as they do whenever the computer is turned on normally. However, in this case the main CPU remained on while the Expansion Interface turned on and off, causing all kinds of havoc with the programs and disks.

● In my case, the resultant shocks and constant on/off cycles killed my disk controller, the FD1771B chip.

Since I replaced the FD1771B chip and the bad rectifier, everything has worked fine, with one exception. I managed to break the ribbon cable connecting the CPU board to the keyboard, but repaired it by using leftover wire from my Archbold Speedup kit.

This problem would have been expensive for a shop to repair, especially with all the modifications my computer has and the near invisible broken lead. I found the culprit by hooking up my voltmeter to the various power-supply components and flexing them by hand while watching the voltmeter readings.

J.E.G.
Newark, DE

Before you go sawing into your power supply to replace a blown fuse, check the catalog number on the bottom of the unit. If the catalog number is 400007, remove the rubber feet and unscrew the four bolts holding the unit together, then replace the fuse and reassemble the power supply. If, on the other hand, the catalog number is 400004, you will have to saw the unit apart to get at the fuse.

About the broken lead, that's the hard way to find a problem. Unfortunately, there isn't an easy way either. I have a similar problem. One of the chips on my CPU board is pulling the 12-volt line down to 8 volts. Everything works fine until I try to plug in my Holmes Engineering 5-MHz speedup kit (the Sprinter II). Whenever I type A = 1 and press enter, I get a syntax error. All other math operations similarly

fail. One of these days I'll tear into the CPU and find that chip, but as long as it works without the speedup kit plugged in, I'm not in a real hurry.

I'm a part-time consultant, and I've leased a Model III and Daisy Wheel printer in my business name for home use. I can't get the insurance company that carries my homeowner's policy (or any other insurance company, for that matter) to cover the equipment. It seems the premiums on \$5,000 aren't worth the insurance company's time and effort.

Are there any insurance companies that specialize in writing these kinds of policies?

J.M.
Los Angeles, CA

Personal computers are usually included with the contents coverage of a homeowner's policy, as long as the monetary coverage you have is sufficient to include the computer in that coverage. For example, if you have contents coverage of \$25,000 and the contents of the house are valued at \$24,000 and you buy a \$5,000 computer, then your coverage will be short by \$4,000. You should always make sure that the insurance contents coverage of your homeowner's policy more than covers the actual cash value of the contents of your home.

This is the category most home computers fall into, myself included. Since I don't have an office and I don't have clients coming to my house (even though I have a room dedicated to my computer stuff) my policy's coverage includes the \$10,000 I have in computers, peripherals, and software.

Unfortunately for you, by putting your computer in your business's name, you've automatically made it ineligible for standard contents coverage (all homeowner's policies exclude equipment owned by a business from their coverage, figuring that the business has a separate policy to cover its equipment).

There are two ways for you to get coverage for your equipment. The first is Inland Marine Coverage, which is used to insure items kept at home that are owned by a business (for example, a carpenter's tools are owned by a business, but the carpenter keeps them at home). This type of coverage is usually available with a minimum premium of

about \$50-\$100.

The other choice you have is called an Office Endorsement policy. If you have an office in your home where you receive customers or appointments, you need the Office Endorsement policy added to your homeowner's policy. This policy requires that you increase your homeowner's contents policy coverage to specifically include the equipment you use.

For more information on these policies, you'll have to contact your insurance agent.

My thanks for your response (January 1983). Since then I have been experimenting and found that the software works well with only a few minor inconveniences if the Epson is initialized to standard-size characters instead of compressed. The following lines accomplish this, and return to TRSDOS:

```
10 LPRINT CHR$(27) CHR$(18) "A"  
CHR$(140);  
20 CMD "S"
```

I have a Model II and use mostly menu programs. Since 80 Micro prints many interesting programs for the Model I and III computers, I'm looking for some translation instructions that will enable me to convert these programs to run on my Model II. I'm certain that something like this must have been done long ago and perhaps has been printed in an earlier issue. I use TRSDOS 2.0A and CP/M 2.25-C.

S.R.
Palatine, IL

Well, there is a partial solution in the offering: 80 Micro will soon be publishing Model II conversions of selected Model I/III articles. Other than that you're on your own. Fortunately, most of the Model I/III Basic commands are duplicated on the Model II. The only commands that cause a problem for conversions are PEEK and POKE, neither of which is available in TRSDOS Model II Basic.

If you buy the *TRS-80 Microcomputer Newsletter Reprints* (catalog #26-2115, \$4.95) you will find a comparison chart of the Basic commands of the Model I, II, and III computers, so you will be able to look up which commands aren't compatible between the three computers. You will also find a conversion chart for translating the

ARRANGER

100% Machine Language Disk Index Program for the TRS-80 Model I&III.

Automatically recognizes ALL major DOS's!

The Arranger is a master index system that automatically records the names of your programs, what disks those programs are on and type of DOS. Features include —

- Automatic single and double density recognition.
 - Accepts LDOS, DOS+, TRSDOS, DBLDOS, NEWDOS/80, MULTIDOS . . .
 - Works interchangeably with Model III, I double density.
 - Capacity of 200 disks, 44 filenames/disk
 - Quickly locates any amount of free granules
 - Finds a program in less than 30 seconds!
 - Alphabetizes 1500 filenames in 40 secs.!
 - Option to sort by any extension (/BAS, /CMD, /???)
 - Easily updates diskettes previously added with only 2 keystrokes.
 - Backup function built in.
 - Uses 1 to 4 drives, 35, 40 or 80 tracks.
 - Radio Shack doubler compatible
- Requires 32k
1 disk minimum

JUST \$29.95
FREE SHIPPING

Specify: TRS-80 Model number
(If you've added double density to your Model I, please indicate)

TRIPLE-D SOFTWARE ✓489
P.O. Box 642
Layton, Utah 84041
(801) 546-2833

VISA OR
MASTERCARD

70 INCOME TAX PROGRAMS

(For Filing by April 15, 1983)

For TRS-80* Models I and III

FEATURES:—

1. Menu Driven.
2. 70 + Tax Programs.
3. Basic; Unlocked; Listable.
4. Name/SS No./FS carried over.
5. Inputs can be checked.
6. Inputs can be changed.
7. I.R.S. approved REVPROC format.
8. Prints entire Form/Schedule.
9. Calculates Taxes, etc.
10. On std. 35-track, Mod. I format disk.
11. CONVERT for Model III.
12. Use GREENBAR in triplicate — don't change paper all season!
13. Our 4th Year in Tax Programs.
14. We back up our Programs!

Helpful programs to calculate and print the many Tax Forms and Schedules. Ideal for the Tax Preparer, C.P.A. and Individual. For just \$24.75 per disk, post-paid (approx. 60 grants per format disk).

Programs are designed for easy-use, with check-points to correct parts as needed. Results on screen for checking before printing.

In all, there are more than 70 individual Tax Programs. These include Form 1040, 1040A, 1040EZ, 1120, 1120S, 1041 and 1065. Also Schedules A, B, C, D, E, F, G, R, RP and SE. And, Forms 1116, 2106, 2119, 2210, 2440, 3468, 3903, 4255, 4562, 4797, 4835, 4972, 5695, 6251 and 6252.

And, we have a disk we call "THE TAX PREPARER'S HELPER" which has programs for INCOME STATEMENTS, RENTAL STATEMENTS, SUPPORTING STATEMENTS, IRA, ACRS, 1040/ES, ADD W-2's and PRINT W-2's.

TRY ONE DISK AND SEE FOR YOURSELF. ONLY \$24.75 POSTPAID.

First disk is TR#1, and includes Form 1040 and Schedules A, B, C, D and G. \$24.75 POSTPAID.

Write:—

GOOTH TAX PROGRAMS

931 So. Bemiston • St. Louis, Mo. 63105

*T.M.Reg. by Tandy Corp. Ft. Worth, Tx.



CANADA

Don't be left out in the COLD!!

You can now order direct! The most popular games, utilities and business programs!

TRS - 80*

ATARI*

PET*

APPLE*

Apparat NEW DOS - 80 2.0 (Model I/III)

NEW Canadian Payroll (Model II) 299.00
User defined General Ledger 299.00
or \$499.00 set

*REGISTERED TRADEMARKS
SEND 3.00 FOR CATALOG - REFUNDABLE WITH PURCHASE
DEALER INQUIRES WELCOME

Rainbow Software Services Ltd.

7070B FARRELL ROAD S.E.,
CALGARY, ALBERTA T2H 0T2 PHONE: 253-6142

Peripherals

- disk drives
- Epson printers
- cables
- books
- magazines
- green screens
- ribbons
- Joy sticks
- Storage boxes
- Skyman
- Mikee angelo

TRS 80 Color

- Spectral Associates
- Meteroids
- Space War
- Space Intruders

Corn Soft Group

- Color Scarfman
- Chromasette

Modem - 80

- auto dial/answer
 - with software
 - no RS 232 required
- \$359.00**

BIG 5 ADVENTURE INTERNATIONAL CLOAD SSM FANTASTIC SOFTWARE SUB-LOGIC

Print@ video positions between the Model I/III and the Model II.

I have a Model III 48K with an 80-track Percom drive and controller. Is there a DOS that will format 35- to 80-tracks in single- or double-density on an 80-track drive so I can copy files to them for compatibility with other systems?

G.R.
Fairport, NY

Yes, but there's a problem you should watch out for: The 35-track drive heads write a magnetic path twice as wide as an 80-track drive head. If you have a 35-track disk formatted by an 80-track drive, it can be read by either an 80- or 35-track drive. It can be written to by either drive type.

The problem comes when you try to read the disk directory in the 35-track drive after it has been written to by *both* the 35- and 80-track drives. When writing to the disk in the 35-track drive, you lay down a double-width magnetic path (any write operation causes the DOS to update the directory, laying down the wider path there also). This is easily read by the 80-track drive. But when the 80-track drive writes to the directory, it writes on only *half* the path put there by the 35-track drive. Now, when you put the disk in the 35-track drive, it sees not only the new information put there by the 80-track drive, but also the leftover information from the previous 35-track write operation. Since the drive head can't tell the two signals apart, you get garbage. But the 80-track drive will still be able to read the track properly.

This is only a problem when you're performing multiple read and write operations to a 35- or 40-track disk in an 80-track drive.

MULTIDOS is easily capable of formatting 35- or 40-track disks on an 80-track drive, in either single or double density. The data disks used for this can easily be read by any DOS on the market, except NEWDOS, TRSDOS, and ULTRADOS. In fact, if the other DOS is LDOS, you can easily swap the data disks between LDOS and MULTIDOS. DOSPLUS can also read and write 35-track disks on 80-track drives, but requires the use of a convert utility to transfer Model I data disks into Model III data disks.

I suggest you get MULTIDOS (Cosmopolitan Electronics Corp., P.O. Box

89, Plymouth, MI 48170). At \$99.95 it's the best DOS available.

You can also use Super Utility Plus (see Feedback Loop in December 1982 issue) to format and copy to 40-track disks in an 80-track drive.

I need the service manual for Model I disk drives. I think the repair charges are out of step since it's so easy to adjust the stepping relay and align the head, yet I hesitate to do anything without a service manual.

F.H.
Flint, MI

You can buy the service manual (catalog #26-1160) for Model I disk drives from National Parts (817) 870-5662 for \$3.03 and \$1.50 shipping and handling. Before digging into your drives, I suggest that you get a disk diagnostic program like Floppy Doctor or DDT.

“The 35-track drive heads write a magnetic path twice as wide as an 80-track drive head.”

I have a Model I with 48K and one disk drive. I use NEWDOS80 2.0, and TRSDOS 2.3. Under DOS the system works fine, but when I try to use Basic nothing works. Under NEWDOS80, Basic loads and the ready prompt appears, but when I try to load a program the trouble starts. When I press the letter O, I get an L followed by a question mark, a graphic symbol, and then the word error. This happens each time I type L until the system locks up. Rebooting repeats the experience or the system goes into the 32-character mode and locks up.

TRSDOS won't even go into Basic. Instead, it goes into a repeating process of going into Basic, rebooting, going into Basic, rebooting, and so on.

The TRSDOS TESTIA/CMD tells me the ROMs are fine, but all the interface RAMs are bad. Using the memory test program published in 80 Micro (March 1980), the interface RAM

checks out OK.

Your help is greatly appreciated.

L.W.
Brookfield, WI

The first thing I would do is disconnect the keyboard/Expansion Interface cable and use Q-Tips and isopropyl alcohol to clean the edge connectors of both the Expansion Interface and CPU boards (both sides, top and bottom). Then remove your disk-drive cable and clean its edge connectors on the interface board and inside the disk drive cabinet. Finally get the Floppy Doctor (see previous letter in this column) and use it to check out your disk drives and your system's RAM. Cleaning the edge connectors cures about 90 percent of the memory problems in the Model I. Since one memory test said all the Expansion Interface RAM was bad and another didn't, I suspect that the cable was fouling things up. Not all memory tests are equal. The MI-Worm Test is one of the better tests, taking hours to thoroughly test the RAM.

If, after cleaning the connectors, you still have the same problem, I suspect that the disk-drive interface circuitry is malfunctioning, especially since two different DOSes have the same problem on your system. This means you'll have to take the system in for repairs at your local Radio Shack Computer Center. ■

Terry Kepner is a free-lance writer and programmer, and the vice president of Interpro. He's been writing about microcomputers since 1979.

Update

In the December issue of Feedback Loop, I said that *80 Micro* had more ads and articles about the Color Computer than either *The Rainbow* or *Color Computer News* magazines. At the time that it was written (approximately August/September) it was a true statement.

However, the microcomputer industry changes so rapidly that by the time this statement appeared, it was outdated. The latest issue of *The Rainbow* (my October 1982 issue) contained about 90 advertisers, and was 130 pages thick. *Color Computer News* has had a similar growth.

If you're looking for products and information on the Color Computer, check out these two magazines.—Terry

EPROM YOUR BASIC PROGRAMS

Basrom (BROM) \$20
Cassette utility that formats TRS-80 color computer Basic programs to be written to Eprom. Cannot list your programs from Eprom, makes them secure.

Multi-Memory Board ... (MMB) .. \$37.50
Board with sockets and support chips will accept 2516, 2716, 2532, 2732, 2564, 6116, 4016, 2016 memory chips. Plugs into color computer and executes its EPROM or extends color computer's memory. Case included.

EPROM Programmer (EPG) ... \$100
Read and Program 2516, 2716-5V, 2532 & 2564 Eprom on the color computer. Write tape programs and using BROM write basic programs to Eprom.

EPACKAGE (EPAK) ... \$143
Includes BROM, EPG, and MMB to program Basic routines on EPROM and execute them from the multi-memory board.

EPROM
2516 ... \$6.95 2564 ... \$24.95
2532 ... \$10.95

To Order: Send name & address, item description & check for item order (plus \$1.50 per item for shipping & handling). Wis. residents add 5% sales tax. Mastercard & VISA accepted, include card # (for Mastercard also include bank # & expiration date). Please sign your charge order.

Prices subject to change without notice.

CONTROL CRAFT INC.

P.O. Box 123 • Muskego, WI 53150
414-784-9027



✓ 110



Now - Add External Monitors To Your Model III



Plugging in VIDEO MOD lets you plug in your TV or extra Monitor for Big Screen Viewing and Remote Display.

Great addition for displaying Home Games, Classroom Instructions, and presenting information at Business Meetings.

Standard features include:
- Monitor and/or TV hookups.
- Switch selection for normal or reverse video.
- Output of sound programs through TV speakers.
- No cutting or soldering required for installation.

EJB ELECTRONIC SYSTEMS
2902 Eggert Road
Tonawanda, N.Y. 14150
(716) 837-9411

VISA or
MasterCard

VIDEO MOD only \$149.95
ship. & handling \$2.00
NY residents add
7% sales tax

✓382

PROGRAM DISCS CLASSROOM TESTED APPROACHES TO A FIRST COMPUTER CLASS

- **INTRO TO BASIC**
Questions & Answers and Sample Programs
- **INTRO TO DATA PROCESSING**
Drill & Practice and Learning Games
- **LOWER DIVISION COLLEGE COURSE**
Vocabulary, Class Exercises, BASIC & Games

DESIGNED TO SUPPLEMENT TRADITIONAL LEARNING

\$29.95 EACH-\$75. THE SET C-CAL, P.O. Box 6413
MODEL III ONLY ✓ 325 King Station, Santa Ana, CA 92706

RELIABLE LOW-COST HIGH-SPEED TAPING

STANDARD RECORDER AND CASSETTES...NO REPROGRAMMING HASSLES...NO EXPENSIVE MODIFICATIONS.

NO-FUSS HIGH SPEED SOFTWARE

KWICOS (Mod 1, 4k to 48k) \$26
KWIK Cassette Operating System for Mod 1. The easy-to-use Level II enhancement for reliable fast taping (select 1000-3000 baud). Features: save, load, verify, search, chain-load, catalog, and test-read of both BASIC and machine-code programs... plus: long pgm names, passwords, debounce, slow 'list', self 'backup', and more.

KOS3 (Mod 3, 16k to 48k) \$26
The KWIK Cassette Operating System for Model 3. All KWICOS features at 2200 baud, plus KWIK set of: clock display, Time, Date, Cassette high/low, I/O routing, etc.

KWIKIT (specify Model) \$12
Mini-system for BASIC programs only. EasyLoad 1000 baud for Mod 1, 2200 baud for Mod 3. Many KWICOS features.

KWINK (Model 1, 4k-48k) \$15
Makes stand-alone fast-loading (2x-6x) copies of any standard 500 baud "SYSTEM" program. (At 6x, 3 minute program loads in 44 sec!)

KLOAD (Model 1) \$15
Similar to KWINK, but for BASIC pgms only. (Specify 16-32-48k)

KLOAN (Mod 3, 16k-48k) \$12
Makes 500 or 1500 baud copy of any other standard 'system' pgm.

KWIK Software
Box 328
Boliivar, MO 65613
Phone (417) 326-7154

✓358

Call either number 'til 10pm most any day for orders or info. US ppd. \$4 COD or overseas (except APO/FPO). MO res. add tax.

NO-FUSS ANY-SPEED HARDWARE

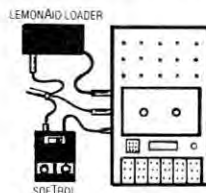
The amazing LemonAid Loader takes the 'finickies' out of Model I loads, but even more amazing... make KWIK copies of your Model I programs and load them flawlessly at 6x speed! Instant installation... simply plug between your cable and recorder. No internal batteries or external power needed.

All Loaders for Model I, switchable to Model III
Model L80 Deluxe loader plus speaker/earphone output jack.....\$19.99
Model L80M Like L80 but with built-in audio monitor.....\$23.50
Model LS80M L80M plus LSS SOFTROL (below) in one.....\$37.50
(Above for Radio Shack CTR80 or 80A. No modifications needed. May or may not work with other recorders.)
Model LS81M Loader/Softrol/Monitor for new RS CCR81.
Built-in auto-powered amplifier for marginal tapes.....\$44.50

Model LSS-2 Solid state SOFTROL (1) eliminates switch-hits (2) pushbutton and slide switch control of CTR Motor makes tape positioning a snap with no plug pulling (3) cushioned motor-off delay pulls end of programs past CTR pinch rollers so you get no pinch-hits, plus (4) automatically gaps between saved programs. May be used to computer-switch other DC loads up to 15 volts and 1.5 A. Works with all standard-plug recorders and computers.....\$18.99



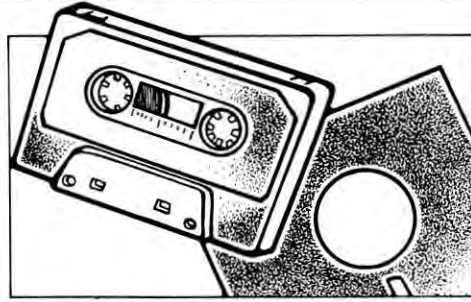
SKEPTICAL? Any doubt that KWIK model I speed-up programs work? Send \$3 for DEMO tape (refund with first order). WE FLAT GUARANTEE...If you are not satisfied with ANY product in this ad, you get your money back. No hassles. No delay.



LEMONS TECH

325 N. Hwy 65
P.O. Drawer 429
Buffalo, MO 65622
(417) 345 7643





Less than 1 percent of the Load 80 tapes we send out come back as unloadable, but that's small consolation if you get one of those tapes. It's one of the most frustrating experiences—the bytes holding your favorite game are there on the tape, but might as well be locked in a bank vault. Here are a few keys to help you unlock those difficult tapes. This information is applicable to Load 80 for the Model I/III and Color Computer.

First let's consider the areas in which difficulty might occur:

- Something is wrong with the computer circuit that reads tapes.
- Something is wrong with the tape recorder.
- Something is wrong with your technique in loading the tapes.
- Something is wrong with the tape.

The problem can be a combination of things. For instance, your tape recorder can be in marginal condition, but still be able to load most tapes. When you attempt to load a flaky tape, however, it will fail. Your aim should be to optimize all four of the above conditions for easy tape loading.

Fine points of tape loading

Table 1 is a partial list of manufacturers who supply products to ease loading difficulties.

Hardware Modifications To the Loading Circuit

Radio Shack improved the cassette port on newer Model Is, the Model III and the Color Computer, but the early Model I cassette port was dismal. In many cases good-quality tapes will not load, or will load only in a narrow volume range.

If your machine prints MEM SIZE? instead of MEMORY SIZE? it is one of the newer machines and has a modified cassette port for easy loading. This is the XRX III modification, and for years the Shack offered it as a free upgrade to older machines. Today there is

a \$15 service charge, but the cost is easily worth it.

One note: The XRX III modification creates a window at 500 baud, so it will not read files created by high-speed tape loaders like KWICOS from Kwik Software or Rapid System Loader (April 1982, *80 Micro*, page 188).

Another way to improve poor loads is to filter the signal coming from the tape recorder. Devices like the Acu-Data from Alphabetic or the Lemon-Aid Loader from Lemons Tech Services improve the quality of the tape signal before it reaches the keyboard. These devices are indispensable for loading Model I/III tapes at 500 baud.

The LM339 chip on the earliest Color Computers has a distressing tendency to blow up when loading a tape at high volume. When the chip blows up the

The program NODOS80 from the Anniversary Issue did not appear in the Load 80 directory but is included on the cassette. Since this is a tape utility, it is not included on the disk. This special Load 80 tape is expanded to 40 minutes instead of the usual 30. ■

Program	Title	Page	Comments
1	COPYRGHT/BAS	—	None
2	NIGHTSHD/BAS	85	None
3	DEEPDIVE/BAS	96	None
4	SUPRDRAW/BAS	108	None
5	TURTLE/BAS	116	None
6	BOXER/SRC	134	Needs EDTASM
7	FLAGS/BAS	149	None
8	CASS80/BAS	152	None
9	MATHCDWN/BAS	160	None
10	PRESKOOL/BAS *	184	None
11	PRESKOOL/SRC *	184	Needs EDTASM
12	PROGGEN/BAS	296	None

* Disk versions for disk, cassette versions for cassette. Remark statements in source code listing are deleted to make room for this program on Load 80, and to enable Assembly in a 16K cassette-based machine. Cassette versions are modified to run in 16K.

February Load 80 Directory

Tape Digitizers

Acu-Data
Alphabetic
Box 597
Forestville, CA 95436
\$49.95

Eazy Loader
Progressive Electronics
643 E. Chestnut St.
Lancaster, OH 43130
External: \$24.95
Internal: \$12.50

LemonAid Loader
Lemons Tech
325 N. Highway 65
P.O. Drawer 429
Buffalo, MO 65622
\$14.99-\$21.99

Head Alignment (Azimuth) Tapes

Recordex Corporation
1935 Delk Industrial Boulevard
Marietta, GA 30067
\$25 (specify Azimuth tape)

Most major tape manufacturers (TDK, Maxell, etc.). Check with your local hi-fi store.

Tape Head Demagnetizer

Radio Shack part #44631
\$5.95

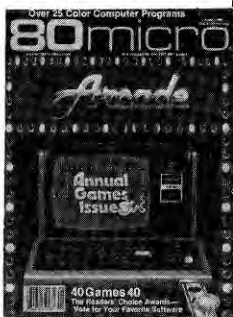
Table 1. Products to Improve Tape Loading

80micro

BONANZA package

20 Back Issues for \$20**

You get thousands of pages of useful information on the TRS-80*. Including over 270 programs you can use—programs that would cost you over \$3000 to buy individually. . . if you could buy them! And you get all 20 issues for only \$20 plus \$7.95 shipping and handling. *TRS-80 is a trademark of the Radio Shack division of Tandy Corporation.



Order your 80 MICRO BONANZA PACKAGE TODAY.

YES, I want 20 back issues of 80 MICRO for \$20 plus \$7.95 shipping and handling.

Check Enclosed MC Visa AE

Card# _____ Exp. Date _____

Signature _____ Interbank# _____

Name _____

Address _____

City _____ State _____ Zip _____

Please allow 3-4 weeks delivery

Single back issues available: January to June 1980, \$3.00; July 1980 on, \$3.50.

**Nonconsecutive issues, magazines of our choice.

Add \$1.00 Per magazine for shipping

80 MICRO Mail Order • 80 Pine St. • Peterborough NH 03458

Dealers BELLY

Selling 80 Micro will make money for you. Consider the facts:

Fact #1: Selling 80 Micro increases store traffic—our dealers tell us that 80 Micro is the hottest-selling computer magazine on the newsstands.

Fact #2: There is a direct correlation between store traffic and sales—increase the number of people coming through your door and you'll increase sales.

Fact #3: Fact #1 + Fact #2 = INCREASED SALES, which means more money for you. And that's a fact.

For information on selling 80 Micro, call 800-343-0728 and speak with Ginnie Boudrieau, our bulk sales manager. Or write to her at 80 Micro, 80 Pine St., Peterborough, NH 03458.

80micro

the magazine for TRS-80 users

80 Pine Street Peterborough, NH 03458

800-343-0728

LOAD 80

LOADS EASY



ELIMINATE HOURS OF TYPING AND AGGRAVATION

LOAD 80 cassettes for BACK ISSUES of 80 Micro now available

In the April, 1981 issue of 80 Micro we introduced LOAD 80 to save you the time and trouble of typing our programs yourself. LOAD 80 cassette tapes contain dumps of the major program listings in 80 Micro.

If you have not yet ordered any LOAD 80 tapes and wish you had, don't worry. We are now offering a "back issue" cassette program. You can order any LOAD 80 cassette from April, 1981 to date for \$9.97. Back issues of 80 Micro are also available with the LOAD 80 cassettes for \$3.50. With the complete documentation found in the companion magazine issue, you should have no difficulty loading any of 80's major programs.

Please send me the following:

Tapes _____ month _____ year Magazines _____ month _____ year

ITEM	COST	QTY.	TOTAL
Load 80 Tapes	\$9.97		
August 1982 Double Issue add \$1.50 per tape for postage & handling	\$17.97		
80 Micro add \$1.00 per magazine for postage and handling.	\$3.50		
TOTAL			

Check Enclosed Bill my: MC AE VISA

NAME _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP _____
 CARD # _____ EXP. DATE _____
 SIGNATURE _____ INTERBANK # _____

Please allow 4-6 weeks for delivery
 LOAD 80 • 80 Pine Street • Peterborough NH 03458
 Marcia Stone

machine will be totally deaf. The LM339N chip (Radio Shack part #AMX4319, \$6) corrects this problem.

Correcting Your Recorder's Head Alignment

The tape recorder has an extremely difficult job—it must store data on an audio tape with sufficient fidelity for the routines in ROM to convert it back to bits and bytes. In the recording and playback process a fair bit of electronic noise is added to the signal. It's clear then that we must keep the recorder in top operating condition to have a fighting chance.

If you press the play button on your tape recorder without a tape in the machine, you will see three components come out. From left to right, they are a tape guide, which guides the tape on its way, the playback head, which does the actual reading and writing of the tape, and the pinch roller, which pinches the tape against a small metal prong called the capstan.

The single most important factor in loading tapes is the alignment of the playback head. If the alignment (also called the azimuth) of the recorder is different from the alignment of the tape, the signal will lose the important higher frequencies and cause extremely poor loading.

Correct head alignment is relative only to the alignment of the recorder that recorded the tape. In other words, if your head alignment is off and you record a tape, you will be able to read it,

but will not be able to load a tape produced on your friend's brand-new CTR-80. In our experience, head alignment varies widely on recorders used both in the home and in the computing profession. The best we can do is align our equipment to factory specifications.

The CTR-80 permits access to the head alignment screw through a tiny hole in the faceplate, but some recorders require that you drill a small hole. You will need a drill with a small bit (about 3/16").

- Press play with no cassette in place. The playback head will come out to meet the cassette.

- If you look closely you will see a small Phillips screw about 1 millimeter behind the playback head, on the side of the head nearest the tape guide. This is the head alignment screw. On most recorders it is directly in line with the play button.

- Drill a small hole directly over this screw. Be careful not to damage the head mechanism.

You will need a small Phillips screwdriver to do the actual alignment. You can use a professional alignment cassette or you can align to individual cassettes. We recommend the latter.

- Insert the cassette and fast-forward to the middle of a program. Press play and turn the volume up about halfway.

- Use the small Phillips screwdriver to adjust the head alignment screw. Turn the screw until the sound is brightest and the pitch seems highest.

- The tape and your recorder should now be in the same alignment.

A Shack Mod and Maintaining Your Recorder

The playback heads on early CTR-80 recorders have a distressing tendency to erase tapes. A field collapse occurs when you press stop during a load, erasing the bytes currently on the tape head. For years Radio Shack installed (for free!) a capacitor to clear up this problem. Today it will cost you the \$15 service charge but is well worth it.

To determine if your recorder needs this modification, remove the cover to the battery compartment. If the inspection sticker is marked earlier than 4A9 (April 1979) you need this modification.

Your recorder also requires periodic cleaning to stay in peak condition. Clean the playback head regularly with a cotton swab and isopropyl alcohol (not acetone) to prevent tarnishing. This alcohol can be purchased at a local drugstore. Simply ask for 97 percent rubbing alcohol with no dye or perfume additives.

The pinch roller and capstan pick up a varnish from the tape which prevents them from gripping the tape effectively. A cotton swab and isopropyl alcohol or acetone is in order here.

The playback head becomes magnetized after repeated use and will erase bits and bytes from the tape oxide. Monthly use of a tape demagnetizer (Radio Shack part #44631) will prevent this.

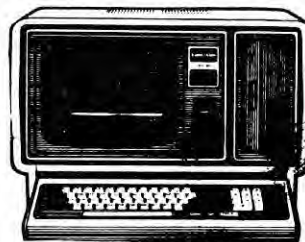
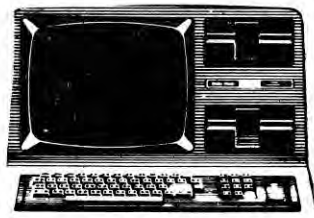
Next month we will go over the two remaining areas of difficulty: user skill and tape problems. ■

PRICE BREAKTHROUGH

100% RS COMPONENTS, NO FOREIGN DRIVES OR MEMORY — FULL WARRANTY

MOD III 48K
2 Drives RS232

\$1795



MOD II 64K
1 Drive

\$2499

CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS.

(817) 825-4027

NOCONA ELECTRONICS • P.O. Box 593 • Nocona, TX 76255

232

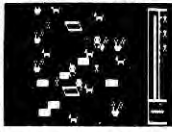
**THE ROOM'S
OF
CYGNES IV**



MODEL I AND III
16K CASSETTE
AND
NEW 32K DISK
COMP U GAMER SOFTWARE
PO BOX 802 NEVADA, MO 64772

YOU'RE SURROUNDED BY LASCARD'S
THAT DON'T SEEM TO HATE YOU AND
LACK NEW ROOM YOU ENTER THEY ARE
HEARD AND FASTER THAN EVER
THERE ARE TWO SMALL LEVELS AND
TEN GAME SPEEDS WILL YOU BRAVE
THE ROOM'S OF CYGNES IV?
COST: \$15.95 SOUND

**GAS
ATTACK**



Model I and III
16k Cassette
and
32k Disk
COMP U GAMER SOFTWARE
PO BOX 802 NEVADA, MO 64772

Now you're the bad guy! Gas all
the aliens, dogs and people in
your sector without falling into
gills or getting caught by the
Dark Reptiles. Watch out for the
deadly Tissue Paper Roll. Uses 8K
resolution controlling playing
fields. COST: \$15.95 SOUND

Spacerays



Model I and III
16k Cassette
and
32k Disk
COMP U GAMER SOFTWARE
PO BOX 802 NEVADA, MO 64772

Can you find the Atoms by
shooting lasers into the box?
GREAT thinking game with
SOUND!!
COST: \$15.95

**THE
SMASHER**



MODEL I AND III
16K CASSETTE
AND
32K DISK VER
COMP U GAMER SOFTWARE
PO BOX 802 NEVADA, MO 64772

Smash the moles in your
yard with your Robot Pest
Eliminator before enough
get out of their holes to
destroy your robot!!
COST: \$15.95
SOUND

**PLASMOID
INVASION**



MODEL I AND III
16K CASSETTE
AND
32K DISK
COMP U GAMER SOFTWARE
PO BOX 802 NEVADA, MO 64772

Destroy those deadly spinning and
tumbling Alien Warships before
they land enough forces to take
over the Earth. You have 6 planets
forward equipped ships to stop
the laser equipped Alien Ships
LASERS. You don't stand a chance.
COST: \$15.95
SOUND

**HARDER
HARDER**



Model I and III
16K CASSETTE
AND
32K DISK
COMP U GAMER SOFTWARE
PO BOX 802 NEVADA, MO 64772

Explore a "DIFFER" dimension
with seven other people (one of
them is a murderer) for a large
prize. How quick will you be
to all the benefits of your unit
size? Cost: \$16.95

For a limited time when you purchase the cassette version of our TRS 80 games you will receive the disk version absolutely free. And our disk versions are upgraded to add more sound and graphics that you won't get with other programs. COMING SOON! ASTEROIDS: REVENGE SODA TANK AND POGUE ATTACK

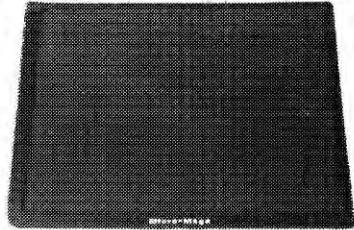
COMP-U-GAMER SOFTWARE ✓415

PO BOX 802 NEVADA MISSOURI 64772 Missouri residents add 4% sales tax. No Shipping Charges. Send for catalog.

TRS 80 is a registered trademark of the Radio Shack Division of Tandy Corporation. For fast delivery send certified checks or money orders (same day shipping). Personal and company checks require one to three weeks to clear.

for the TRS-80 from Micro-Mega

The Original GREEN-SCREEN



The eye-pleasing Green-Screen fits over the front of your TRS-80 Video Display and gives you improved contrast with reduced glare. You get bright luminous green characters and graphics like those featured by more expensive CRT units.

Don't confuse the Original Green-Screen with a piece of thin film stuck to the face of your video tube, such as that advertised by others. The Original Green-Screen is mounted in a full frame perfectly matched to the color and texture of the TRS-80 Video Display. It is attached with adhesive strips which do not mar your unit in any way.

The full frame design of the Original Green-Screen "squares off" the face of your video display and greatly improves the overall appearance of your system.

(Specify whether for Model I or Model III)

THE GREEN-SCREEN.....\$13.95
Add \$1.50 for postage and handling.

Terms: Check or money order, no CODs or credit cards, please. Add amount shown for postage and handling to price of the item. All items shipped within 48 hours by first class or priority mail. Virginia residents, add 4% sales tax. ✓162

Micro-Mega • P.O. Box 6265 • Arlington, Va 22206



We've done it again!
*We said we had the best system, and now...
8" double density is here for Model III's.*

Check out these Features -

✓568K of storage on a single-sided 8 inch drive, when used with our controller & speedup MOD. ✓The maximum storage capacity of your Model 3 will be 4.544 Megabytes - without a hard disk. ✓One 5 1/4 single-sided and one 8 inch single-sided drive will store 676K. ✓One 5 1/4 single-sided and one 8 inch double-sided drive will store 1.244 Megabytes. ✓Mix and match 5 1/4 and 8 inch drives, in any density, single or double-sided. All under software control.

1. Speedup \$99.00.
2. General purpose speedup, which also works with 8 inch drives \$129.00.

Here's 3 good reasons to buy our system -

1. **VERSATILITY**
Our own proven, dependable drive controller will give you the hardware to run almost any drive configuration you can imagine/
 - 5 1/4 and 8 inch drives in any combination.
 - Internal/external drive combinations (Up to all 4 drives external)
 - Single - and dual - headed drive combinations.
2. **QUALITY**
 - We use quality drives - MPI and now new generation Siemens.
 - We construct our own disk drive installation kits of heavy steel - no shielding Problems!
 - We are now using a field proven switching supply
3. **PRICE**
 - Drive controller kit with first drive, 16K MEM, TRSDOS 1.3* \$679
 - Second (internal) drive..... \$279
 - Third drive (5 1/4 floppy with cable) \$359
 - Fourth drive (5 1/4 floppy) \$329

If these sound like good deals, but you don't have the Model III yet, we've got the answer.
TRS-80 Model III, 48K TRSDOS*, 2 drives \$1899

*TRADEMARK OF TANDY, INC.



✓288



Process Control Technology

8030 Lorraine Ave., Suite 328 • Stockton, California 95210 • (209) 952-6576

A More Powerful Vocabulary

The Votrax Personal Speech System is a voice synthesizer that uses a highly articulate text-to-speech translator, achieving a translation accuracy rate of at least 95 percent for conversational vocabulary. It also has a programmable master clock, 350 programmable frequencies for speech and sound effects, and a built-in speaker, and can simultaneously provide speech and sound effects or speech and music.

To compensate for some of the idiosyncracies of English or for specialized or technical vocabularies, users can define an exception-word table. This allows you to store programs for words and proper names whose spelling violates the rules incorporated in the unit.

The PS System is equipped with both serial and parallel interfaces and an input buffer of more than 3,500 characters, subdivisible for a printer buffer. User-programmable speech rate and amplitude give more natural rhythm and greater control over word emphasis.

Other features include an audible alarm, a chime-prompted mode, oral error prompting, X-on/X-off, and RTS/CTS handshaking. Experimenters can use a ROM expansion socket and

Z80 software capabilities.

The synthesizer sells for \$395 from Votrax, 500 Stephenson Highway, Troy, MI 48084, (800) 521-1350.

Reader Service ✓560

Zaxxon Comes Home

Sega Enterprises' Zaxxon, one of the most popular arcade games of 1982, has been adapted by Datasoft for the Color Computer.

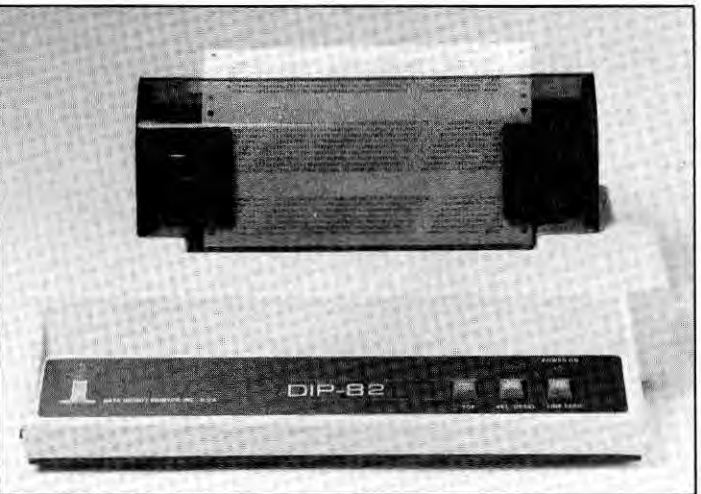
The vivid graphics display simulates aircraft flight, with your ship invading the floating enemy fortress. Navigating between laser barriers and fortress walls, you score by destroying missiles, ships, gunnery, and radar towers, heading toward a final confrontation with the enemy robot.

The game costs \$39.95 on tape or disk from Datasoft, 9421 Winnetka Ave., Chatsworth, CA 91311, (213) 701-5161.

Reader Service ✓555

Versatile Dot-Matrix Printer

The D-82 F/T printer supports the full 96-character ASCII set at 40, 48, 66, 89, 96, or 132 characters on 8.5-inch paper. It features tractor or friction paper feed, 7 by 7 or expanded 14 by 7 matrix, 100-cps bidirectional printing, an 800-character buffer, and high-resolution, dot-addressable



Data Impact Printer

graphics.

The user can specify six different character sizes and one- or two-pass printing under program control. All electronic components are mounted on a single printed circuit board and can be serviced without disassembling the printer. A Centronics-compatible parallel interface is standard; options include an RS-232C serial interface, 2K buffer, high-speed serial up to 9,600 baud, and single-sheet paper tray.

The D-82 F/T measures 17 by 9.75 by 6.5 inches. It sells for \$595 from Data Impact Products Inc., 745 Atlantic Ave., Boston, MA 02111, (617) 482-4214.

Reader Service ✓550

Stock Market Spreadsheet

Stockvue is a spreadsheet program that lets stockbrokers and investors scan information, change variables, and calculate potential profit and risk on investments.

The display includes calculations of dividends, interest (margined trades), trade commissions (either full service or discount broker), and opening cost according to Securities and Exchange Commission rules on margin requirements. Users simply plug in information related

to the opening trade, plus hypothetical figures for a closing date and a likely price on that date. Stockvue posts all the results, including the bottom-line net return on investment.

The \$129.95 program is available on disk or cassette for the Model III from Star Value Software, 12218 Scribe Drive, Austin, TX 78759, (512) 837-5498.

Reader Service ✓583

Monster Maze

Monster Maze is a challenging graphics action game from Epyx/Automated Simulations.

Trapped in a web of blind alleys and seemingly endless halls, you must find gold bars and vitamins while over 40 mutant monsters try to find you. The vitamins give you strength to kill the monsters and escape with the gold. Be careful—you only have nine lives!

Screen graphics show the labyrinth from the wanderer's point of view. A map gives an overhead view, though monsters sneak up on those who look at it too long. Nine levels of play increase the challenge, and a new maze is created for each game.

Monster Maze is available on disk (32K) or cassette



Votrax Synthesizer

DOES STRING COMPRESSION HAVE YOU TIED UP IN KNOTS?

LET TRASHMAN CLEAN UP THE MESS!

TRASHMAN is a machine language utility for the TRS-80 Models I and III. It was written by Glenn Tesler, the author of FASTER, and can reduce BASIC's string compression time by 95% (see table below).



WHAT'S STRING COMPRESSION?

When a BASIC program changes a string (words, names, descriptions), it moves it to a new place in memory, and leaves a hole in the old place. Eventually, all available memory gets used up and BASIC has to push the strings together to free up some space. This takes time. Lots of time. The computer stops running for seconds or minutes, and you may even think it's "crashed". The keyboard won't work, and until all the strings have been collected, you just have to sit and wait. Then things run for a while, until string compression is needed again. And again.

If you're using your computer for business, that wastes your money. If you're using it personally, it wastes your time.

WHAT'S THE SOLUTION?

As soon as you start using TRASHMAN, those delays almost disappear. It uses less than 600 bytes of memory, plus 2 bytes for each active string. It works with other machine language programs and with all major operating systems. It's easy to use, comes with complete instructions, and can be copied to your own disks.

WHAT'S THE CATCH?

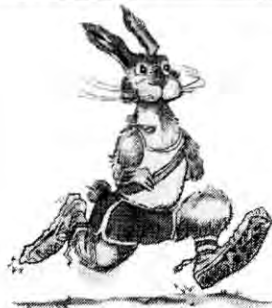
If a BASIC program uses only a few strings, very little time is wasted in string compression, and TRASHMAN won't be helpful. But, if hundreds of strings, including large string arrays, are used, TRASHMAN is just what you need.

TRASHMAN is available on disk for just \$39.95.

# STRINGS	SECONDS DELAY NORMAL	SECONDS DELAY TRASHMAN	PERCENT IMPROVEMENT
250	11.8	0.7	94
500	45.8	1.6	96.5
1000	179.6	3.5	98
2000	713.2	7.8	98.9

(All timings done on TRS-80 Model I. Model III 15% faster, but pct. improvements identical. Listing of timing program available on request.)

SAVE TIME WITH FASTER



"FASTER" speeds up most TRS-80 BASIC programs by 20-50%. It's helped hundreds of satisfied people and it can help you. Detailed instructions make it easy to use. FASTER analyses your BASIC programs while they run, then displays a simple change, usually one line, that sequences program variables so the ROM will find them faster.

You can use FASTER to speed up programs you've bought, as well as programs of your own. Since it isn't a compiler, your BASIC programs can be read and changed afterwards. FASTER works on business programs, models, and games. The more complex your program, the better the results.

Does FASTER really work? Yes! Just check the reviews in *Personal Computing*, May, 1981, p. 116: "FASTER is effective and easy to use"; *80 U.S. Journal*, April, 1982, p. 106: "I recommend FASTER to everyone"; and *80 MICRO* (April, 1982, p. 40): "If you...would like a significant increase in the run-time speed, then buy FASTER."

FASTER runs on the TRS-80 Models I and III, 16-48K tape or disk, and all major operating systems. **\$29.95**

"QUICK COMPRESS" takes only 276 bytes of memory, and removes the blanks and remarks from even the largest BASIC program in less than 3 seconds. It produces smaller, faster programs without altering their logic. **\$19.95**

SPECIAL: FASTER and QUICK COMPRESS: \$39.95

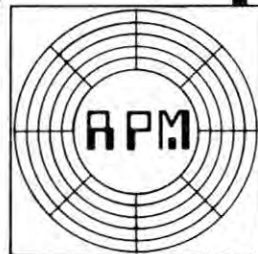
ERRATIC DISK DRIVES?

You can avoid unnecessary disk errors and repair bills by using **RPM**. This easy-to-use program measures the rotational speed and fluctuations of your disk drives, and warns you if they are running too fast, too slow, or unevenly.

Incorrect or erratic speed is a common cause of unexplained disk errors and loss of data. RPM's documentation explains how to detect and correct these problems quickly and easily. As *80 MICRO* (April, 1982, page 41) said: "If your drives have problems I recommend RPM before paying to get it repaired."

RPM is supplied on diskette for the TRS-80 Models I and III. We suggest you order a copy before you need it.

\$24.95



ORDER FROM YOUR LOCAL SOFTWARE DEALER, OR CALL NOW, TOLL-FREE:

(800) 824-7888, Operator 422
CALIF: (800) 852-7777, Oper. 422
ALASKA/HAWAII: (800) 824-7919

FOR TECHNICAL INFORMATION CALL:
(213) 764-3131, or write to us.

PROSOFT®

Dept. G, Box 560, No. Hollywood, CA 91603

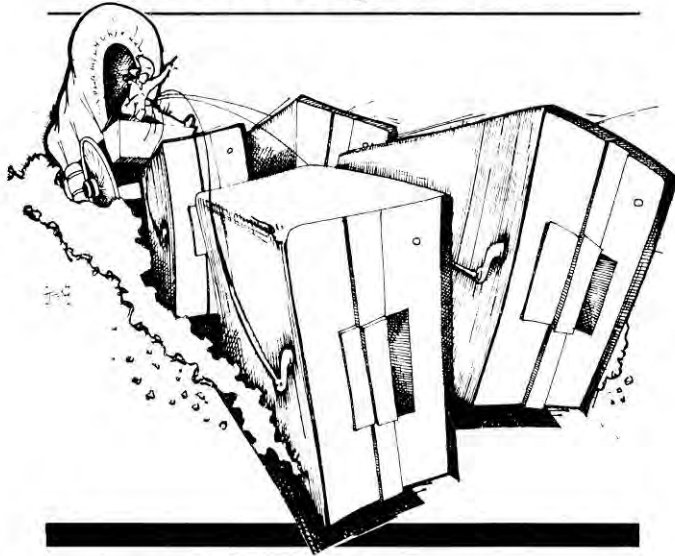
TERMS: We accept VISA, MasterCard, checks, or even cash. Please add \$2.00 shipping/handling within U.S.A. or Canada, and \$5.00 overseas. C.O.D. charge is \$2.00 in U.S. only. We ship within one day of receiving orders.



IT'S JUST GREAT



MACHINE LANGUAGE DISK I/O & Other Mysteries.



**The most complete book on
TRS-80 Model I and III disk I/O available!**

Dateline: California, November 1982.

A hushed stillness held captive the hearts of thousands here as the news continued to spread of the impending arrival of a fantastic new book from the publishers at IJG.

Then, out of the West a cloud of dust could be seen on the horizon, coming fast...

Machine Language Disk I/O & Other Mysteries.

**ON SALE
NOW**

270 pages of powerful information including the source code for a small disk operating system.

This book explains what the floppy disk system is all about, the Western Digital 1771 and 1793 Floppy Disk Controllers, what constitutes a disk file, how records are stored on disk, error processing, and

TRSDOS error codes.

Plus a disk formatter program, a program to calculate the password for a given file, a full screen file editor, a complete smart terminal program and much, much more.

Harness the Power!

MACHINE LANGUAGE DISK I/O & Other Mysteries is available for \$29.95 at computer stores, B. Dalton Booksellers and independent book dealers around the world. If your dealer does not carry IJG products, order direct.

Include \$4.00 for shipping and handling. Foreign residents add \$11.00 plus purchase price. U.S. funds only please.

IJG, Inc. 1953 W. 11th Street
Upland, California 91786
714/946-5805

**Helping You
Help Yourself.** 

NEW PRODUCTS

(16K Level II) for the Models I and III. Either version is \$29.95 from Epyx/Automated Simulations Inc., 1043 Kiel Court, Sunnyvale, CA 94086, (408) 745-0700.

Reader Service ✓581

96K for Model I

Bigmem upgrades the Model I with 64K keyboard RAM, 48K available on power-up, with or without an expansion interface connected. With one, port switching the external memory from Level II Basic yields 80K RAM; by port command, 96K (minus 1.28K for video, keyboard, and input/output) is available for machine-language programs.

A board jumper will enable 2K RAM above ROM and 3/4K RAM in keyboard address space. This protected memory is suitable for special machine-language routines such as printer driver, keyboard debounce, or line renumbering.

New 64K RAMs replace the old 16K chips in the keyboard unit; an internally mounted memory controller board provides the means for bank switching the expansion interface memory.

Switching to the 64K mode either overlays the ROM with RAM or remaps the video, keyboard, and I/O to high memory for CP/M-compatible operation. The choice is determined by a second board jumper.

Installation involves cutting power-supply traces not used by the new single-voltage RAMs and soldering an internal cable that plugs into the controller board. The \$180 kit includes eight 64K RAM chips, controller board, internal cable/connector, wire, solder, and detailed instruction manual.

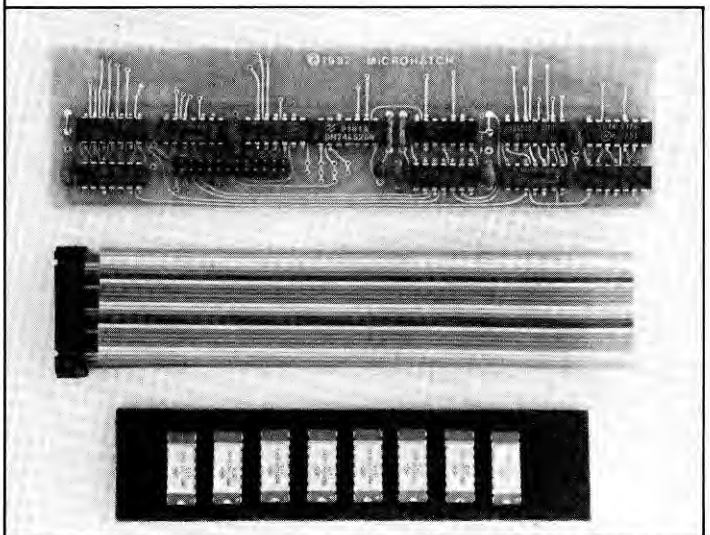
For more information, write Microhatch, P.O. Box 501, DeWitt, NY 13214, or call (315) 446-8031 after 6 p.m.

Reader Service ✓569

Cassette Stock Planner

Stoktrak is a tracking/planning program for the investor who spends money on stocks instead of disk drives.

Handling up to 30 stocks per data file, the program provides reports on current value and yield, unrealized capital gains for each stock, realized gains for any stock sold, and quarterly and annual dividend records. A



Model I Bigmem

32-page user's guide is included.

It operates on a Model I/III with 16K Level II RAM, cassette, and optional printer. Price is \$24 from David H. Barrett c/o Microserve, 1304 Kent St., Durham, NC 27707.

Reader Service ✓575

Business Management Series

Century Software Systems has completed the first phase of its Business Management Series, seven professional decision-making tool packages for the Model II with CP/M or TRSDOS and at least 56K of memory.

Based on financial, statistical, econometric, and accounting theories, the series helps managers set policy for business, professional, or industrial companies. The programs, supplied with extensive documentation and examples, cover financial decisions (\$345), lease-versus-purchase analysis (\$295), statistical analysis (\$320), real estate analysis (\$395), econometrics (\$310), financial-statement analysis (\$345), and linear programming (\$240).

A \$50 demo disk displays sample runs from each package, and the seven manuals and demo disk are available for \$350. The Business Man-

agement Series is produced by Century Software Systems, 1875 Century Park East, Suite 1730, Los Angeles, CA 90067, (213) 879-5911.

Reader Service ✓570

Educational CRT Table

The EC5, a CRT table for school and training use, offers a 2-by-3-foot work surface, 4-inch casters (two with locking brakes), and positive stops that eliminate shelf slippage.

A cord organizer/modesty panel keeps cords and connectors off the floor and out of the way. The table's electrical supply unit features three outlets and a 20-foot cord with grounded plug.

The table weighs 58 pounds, ships via UPS, and is easily assembled with standard tools. For more information, contact Bretford Manufacturing, 9715 Soreng Ave., Schiller Park, IL 60176, (312) 678-2545.

Reader Service ✓571

CP/M Software Index

The third edition of Small Systems Group's CP/M Software Index lists 1,688 programs offered by 507 vendors, more than twice as many as the previous edition.



Model II Business Series

✓ See List of Advertisers on Page 387

Can
 “...you can't take it, with you”

ECCLESIASTES

Adcock & Johnson



**The totally PORTABLE,
 totally COMPATIBLE,
 Model III in a
 Briefcase**

ADCOCK & JOHNSON

P. O. DRAWER 8778 FORT WORTH, TEXAS 76112

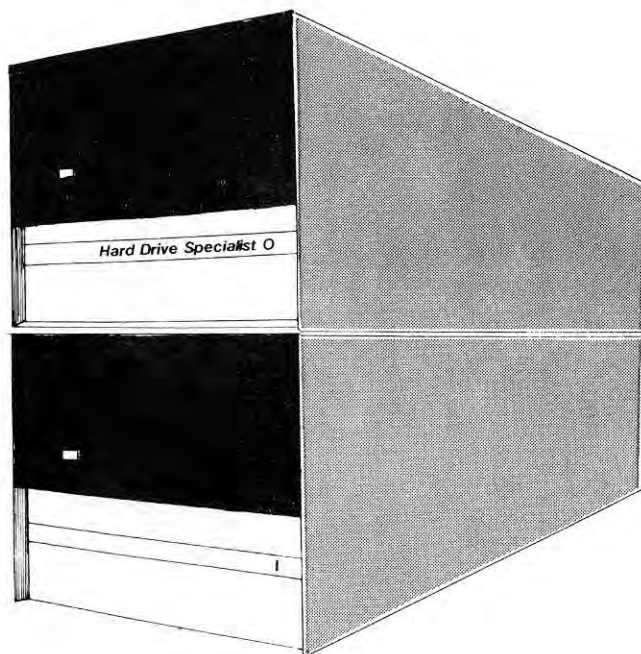
**ORDERS AND INFORMATION
 (817) 429-5131**

✓ 536

MODEL III HARD DRIVE \$1295.

PRIMARY DRIVE

SECONDARY



It's no secret. We have a quantity contract to bring you the highest quality system at the lowest price available. The combination of Tandon Disk Drives and Western Digital's error checking and correcting Hard Drive Controller Board create the backbone of the Hard Drive Specialist System. The balance of the interfacing is by one of the oldest Engineering teams in the Model III/Hard Drive business. These systems have been in testing since September of 1981 and have proven to be reliable and fault free. The first primary systems are available in a 5 meg version for \$1295., a 10 meg for \$1495., and a 15 meg for \$1695.. The secondary or add on systems are available in a 5 meg version for \$895., a 10 meg version for \$1095., and a 15 meg for \$1295. Model I primary version add \$50.. All prices include our 120 day warranty and free shipping UPS ground. Compatible with DOSPLUS 4.0 and LDOS.

HARD DISK SPECIALIST A Division of COMPUKIT

1-800-231-6671

in Texas call 1-713-480-6000

See the COMPUKIT ad in this issue

We accept Visa, Mastercard, Bank checks, Money orders, personal checks are held 1-3 weeks, and COD



Model III Drive Kits

We refuse to sell a low quality kit, because you don't need any problems. All of the Compukit drive kits contain Tandon disk drives, Astec switching power supply, factory brackets, a drive controller board that works with all Model III disk operating systems, 32K of memory, a manual that is easy and simple to use, and all of the hardware required. All that you supply is 2 screw drivers, 2 hours average time, and software.

Drive kit with one 40trk single sided drive \$479.

Drive kit with two 40trk single sided drives \$699.

Drive kit with two 40trk double sided drives \$899.

Drive kit with one 40trk SS/8 5meg hard drive system \$1799.

Complete Model III Systems

48K one drive system \$1495. 48K two drive system \$1695.

48K with two double sided drives \$1895.

48K one double sided floppy disk drive and one 5 meg hard drive \$2895.

112K CP/M and Model III software compatible, with two disk drives and a 80 column green phosphor CRT \$2699.

System options with free installation are a green phosphor CRT \$89, a RS232c \$89., DOSPLUS 3.4 \$100., DOSPLUS 4.0 \$200.

TANDON DISK DRIVES ask for a FREE copy of DR. Roberts Disk Drive Manual with any drive purchase

TM100-1 40trk Single Sided/Double Density \$199.

TM100-2 40trk Double Sided/Double Density \$299.

one drive case and power supply \$49.95 2 drive cable \$24.95

Model II Disk Bays

these bays consist of the TANDON slim line drives as used in the Model 16, case and power supply, and all the cables required.

one single sided drive bay \$699.

two single sided drive bay \$1099.

Model 16 Disk Bays

these bays consist of the TANDON slim line drives as used in the Model 16, case and power supply, and all the cables required.

one double sided drive bay \$799.

two double sided drive bay \$1299.

Model III RS232c Kit \$89.

Green phosphor CRT Kit \$89.

for your Model I, II, or III

COMPUKIT DOCTOR \$29.95 by Jim Penny

System diagnostic for disk based Model III's.
If your not sure if your Model III is working correctly
Compukit Doctor will check ROM, RAM, Keyboard, and Disk
Drives. This fast machine program leads you through it
with documentation built into the program. \$10.00 off on this
program with any purchase on this page.

COMPUKIT

1-800-231-6671

in Texas 1-713-480-6000

P.O. BOX 306 Kemah, Texas 77565

or visit our showroom at 16206 Hickory Knoll Houston, Texas

Compukit Coast to Coast Dealers

Computer Kits Boca Raton Florida
Kit-N-Computers Tacoma Washington
Nautilus Computers Edmonton Alberta Canada
Microtech Software Dudley MA
Select Computer Service Anoka MN
Data Base Scranton PA
Rabbit Computers Melrose WI
Omni Gray TN

DOSPLUS 3.4 \$125. Newsprint 7.0 w/labels \$110.

C.Itoh 8510 \$519. F10 \$1449. 1550 \$749.

Epson MX-80 \$499. MX80f/t \$559. MX100 \$727.

Okidata 82A \$459. 83A \$727.

Verbatim SS/DD Box of 10 \$25.95

FREE SHIPPING UPS GROUND 120 DAY WARRANTY

We accept Visa, Mastercard, bank checks, money orders, personal checks are held 1-3 weeks, and COD

The index is organized into five major areas: systems programs, general applications, accounting, utility applications, and industry-specific software. These areas are broken down into 89 categories, ranging from data management and higher-level language processors to dairy and cattle programs and sports. Each entry gives a program description, price, vendor's address and phone, and operating-system versions.

Single copies are \$10 (California residents add 6 percent tax) from Small Systems Group, Box 5429, Santa Monica, CA 90405, (213) 392-1234.

Reader Service ✓557

Head Cleaner Disk

Cleaning your drive heads can increase their life, prevent read/write errors and head crashes, and provide a clearer screen. The Verfin dry nonchemical head cleaner disk removes oxide, smoke, and oil particles, and is safer than liquids or wet-process disks.

To clean the head, simply insert the Verfin disk as you would any other and engage the drive for 20 seconds. The disk's nonabrasive soft polyester material absorbs contaminants.

Two disks (\$24.95) can be used for 30 cleanings with single-sided or 15 cleanings with double-sided drives. They are available in 5¼- or 8-inch sizes from Zolman International Inc., 600 Montgomery St., 45th Floor, San Francisco, CA 94111, (415) 421-5340.

Reader Service ✓566

Watt-Watching Software

Energy Monitor is a software system that organizes data on energy units, expenditures, and energy use rela-



Verfin Cleaner Disks

tive to climactic variables. It can handle from one to 90 independent buildings.

The program produces a set of six reporting formats. Each report illustrates energy use and documents conservation activity by fuel type at each building and for the system as a whole.

Managers can use reports to identify and set energy conservation goals and objectives, prepare energy budgets, verify invoices for billing and fuel delivery, and review the performance of energy-saving investments. Energy Monitor can also be used to compare the energy efficiency of various buildings within a system.

The program is available on disk for the 48K Model III. Its price is \$245 from Addison-Wesley Publishing Co., Computer Software and Applications, Reading, MA 01867, (617) 944-3700.

Reader Service ✓580

Match Game

The Match Game is a memory-testing program that can be adapted to an unlimited variety of education-

al materials. It is suitable for home or school use by children of all ages.

The computer presents a game board of numbered boxes. Players uncover two boxes on each turn, trying to find those with matching contents. The game can be played with exact word matches, paired word matches (such as synonyms), math problems and answers, or pairs assigned in your own games.

One to four people can play on any of five game board sizes. The computer can take the role of one player, adjusting its level to the other players' skills.

The game is available on Model I and III cassette (\$24.95) or disk (\$29.95) from Teaching Tools Microcomputer Services, P.O. Box 50065, Palo Alto, CA 94303, (415) 493-3477.

Reader Service ✓576

Multiport

The Multiport expansion unit for the Color Computer allows simultaneous connection of up to four peripherals. The computer can switch

between peripherals under software control, allowing one program to access any or all of them at any time. A disk drive, modem, program cartridge, and printer, for example, can now be on-line at once.

The unit allows selection of any of the four sockets with a simple POKE command. It connects directly to the expansion port of all Color Computer models.

Price is \$99.50 with full instructions. For more information, write Maple Leaf Systems, P.O. Box 2190, Station C, Downsview, Ontario, Canada M2N 2S9.

Reader Service ✓579

Data and Text Manager for Color Computer

Homebase for Color Computer disk owners is an integrated system that provides a data-base manager, spreadsheet, and text processor in one menu-driven package. The \$75 program also includes utilities for copying, merging, and synchronizing files and summarizing amount data fields.

The data manager lets you define up to 250 records in 49 data fields; add, change, and delete records and fields or move records within the file; and sort, sum, and reorder data. The text processor allocates up to 250 screens of text, letting you add, change, and delete files and edit with insert, delete, duplicate, move, and search and replace commands and four-direction cursor control.

Radio Shack or Epson printer owners can print all or selected records or data fields, with automatic formatting of dates, time of day, phone numbers, and dollar amounts. Users printing text can define left and right margins, line spacing,

New Book

IT'S JUST GREAT

NO 6 IN THE SERIES

AUTHORIZED EDITION

TRSDOS 2.3 DECODED & Other Mysteries.

**FARVOUR EXPEDITION EXPLORES TRSDOS,
AND YOU ARE THERE!**

**Dateline: California,
December 1982.**

James Farvour . . . Programmer, Author and Adventurer Extraordinaire', who two years ago last spring came to popular public attention with his much heralded and nationally acclaimed publication Microsoft Basic Decoded & Other Mysteries, has done it again.

Leaving no stone unturned in his never ending quest to bring to the common man and programmer the information hidden for so long in the dark uncharted expanse of computer software, which was thought before to be unobtainable to mortal men, James Farvour brings to you . . .

TRSDOS 2.3 Decoded & Other Mysteries.

The diary of our intrepid explorers' journey through the internal operations of the TRSDOS operating system (used on the TRS-80 Model I computer) and what he found while he was there.

With the assistance of his trusted friend and long time companion Tandy, our hero brings to you, in the comfort of your

own home, such wonders as . . .

a fully commented source code listing at the end of each chapter along with (where appropriate) diagrams and descriptions of the data structures for the modules described, a discussion of the Model I system architecture as it pertains to

operating system implementation, a general description of the Z-80 CPU register sets and interrupt modes, a description of the command line interpreter and the subroutines used by the TRSDOS commands module, the modules used by the file management system, the error message processor, the debug module available with TRSDOS, and much, much more.

Can you believe it? . . . Believe it!

Discover yours today!

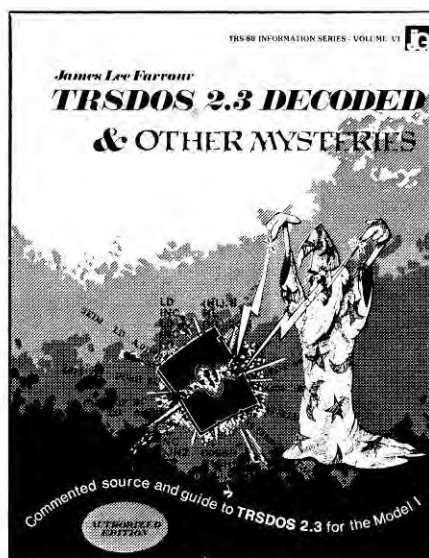
TRSDOS 2.3 DECODED & Other Mysteries is available for \$29.95 at computer stores, B. Dalton Booksellers and independent book dealers around the world. If your dealer is out of stock, order direct from IJG.

Include \$4.00 for shipping and handling. Foreign residents add \$11.00 plus purchase price. U.S. funds only please.

IJG, Inc. 1953 West 11th Street
Upland, California 91786
Phone: 714/946-5805



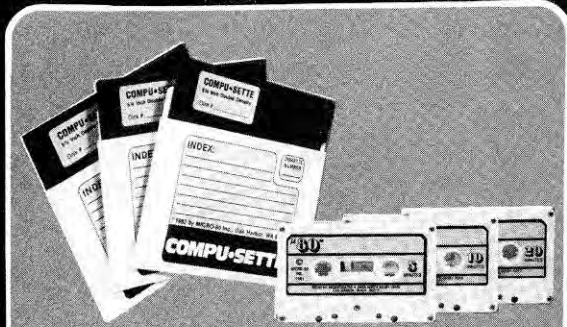
Helping you help yourself.



compu•sette®

TAPES & DISKS

**100% ERROR-FREE
FULLY GUARANTEED**



Compu•sette, a product of MICRO-80 INC

The Micro-Trac™ Generation

Used by Software Firms & Computer Hobbyists
Choice of School Districts Nationwide

CASSETTES	MINI	STANDARD
	12-PAK	24-PAK
C-05.....	\$.79	\$.59
C-10.....	\$.89	\$.69
C-20.....	\$.99	\$.89
C-30.....	\$1.29	\$1.09
Custom Cases.....	\$.26	\$.21

Cases recommended to protect sensitive cassettes.

5¼" DISKETTES	MINI	STANDARD
	5-PAK	10-PAK*
Soft Sector		
Single Sided		
S/D Density.....	\$14.95	\$26.95

*10 PAK w/custom library case, add \$3.00

— UPS SHIPPING —

(No. P.O. Boxes please)

\$3.00 per pack

— Canadian shipping multiply by 2 —

No. 1 Magnetic Media in the USA!

— Write for volume prices —

TOLL-FREE
(orders only)

1-800-528-6050

ext. 3005

In Arizona State

1-800-352-0458

ext. 3005

MICRO-80™ INC.

E. 2665 Busby Road
Oak Harbor, WA 98277
1 (206) 675-6143



NEW PRODUCTS

and six horizontal tabs, with standard, compressed, double-width, or emphasized characters.

Homebase requires 32K Extended Color Basic and one disk drive. For more information, contact Homebase Computer Systems, P.O. Box 3448, Durham, NC 27702, (919) 544-5408.

Reader Service ✓573

Model III Disk Upgrade

The Micro-Design MDX Upgrade for the Model III includes an MDX-6 floppy-disk controller board, an installation kit with all required hardware for mounting two internal disk drives, and one 40-track TEC disk drive.

The MDX-6 controller board features a state-of-the-art LSI device designed specifically for read/clock recovery separation. All data and control lines from the CPU are buffered to assure accurate data levels to the 1793 controller chip. The board will control up to two internal and two external single- or double-density disk drives, and is compatible with all Model III DOSes.

The accompanying hardware includes a linear power

supply, gold alodine aluminum mounting towers, and all required cables for installing both internal drives. The TEC drive has a track-to-track access time of 5 ms and is rated for both single- and double-density operation.

Installation requires a screwdriver and about one hour. The Upgrade is priced at \$399, with additional TEC disk drives available for \$219.95, from Micro-Design, 6301 Manchaca Road, Suite J, Austin, TX 78745, (800) 532-5001.

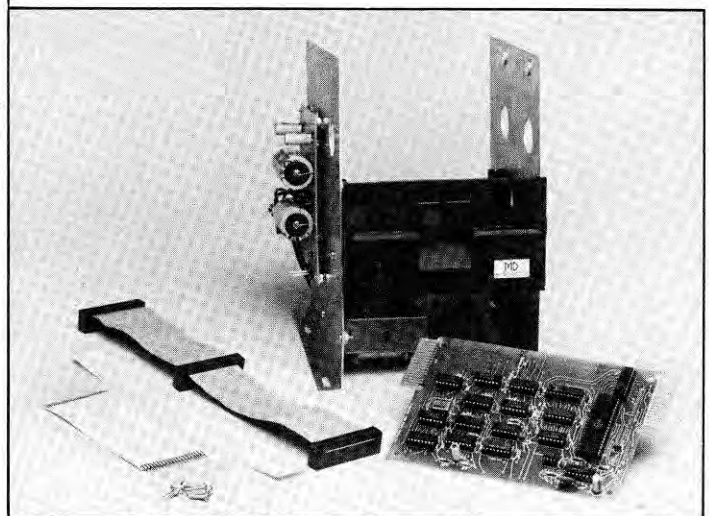
Reader Service ✓565

Hard Disks, Printers From Radio Shack

Radio Shack's winter lineup of peripherals includes two new printers and hard disks for the Model I/III.

The DMP-400 (\$1,195) is a 132-column dot-matrix printer that produces 140 cps at 10 characters per inch and supports proportional space, backspace, boldface, underline, and super- and subscripts. The DWP-410 daisy-wheel printer (\$1,495) allows 10 or 12 cpi and proportional spacing, and prints over 300 words per minute.

For \$2,495, Model III users can add a five-mega-



Model III Disk Kit

NEW PRODUCTS

byte Winchester drive with the LDOS operating system; up to three more drives (\$1,995 each) can bring your TRS-80's total to 20 megabytes. Model I owners must buy a \$39.95 hard-disk adapter package.

Other new Tandy products are a Model III business graphics analysis package for pie, bar, line, and scatter charts (\$174.95), 48K SuperScripsit for the two-disk Model I and one-disk Model III (\$199), and a Color Computer game based on the recent movie *Poltergeist* (\$34.95).

All are available at Radio Shack Computer Centers nationwide.

Reader Service ✓559

Smart Terminal Program

Colorcom/E is a smart terminal program on plug-in ROM cartridge for the Color Computer. It supports on-line and off-line scrolling, off-line printing of data, receiving and sending cassette files, and full and half duplex, and works with any serial printer. An optional word mode eliminates word-wrap. Data can be easily edited before printing or writing to cassette.

The program sells for \$49.95 from Spectrum Projects, 93-15 86 Drive, Woodhaven, NY 11421, (212) 441-2807.

Reader Service ✓577

Color Quartet

The Composer, a menu-driven music compiler for the Color Computer, allows you to write music using four separate voices over a seven-octave range. Key and tempo may be specified and changed as music is played.

The screen displays a colored kaleidoscope pattern and the number of the note being played. The latter

helps in debugging music. Compiled music is saved as an independent machine-language subroutine, so that music and sound effects can be integrated into other Basic programs.

The Composer requires Extended Basic for cassette (\$24.95) or disk (\$29.95). It can be ordered from Speech Systems, 38 W. 255 Deerpath Road, Batavia, IL 60510, (312) 879-6880.

Reader Service ✓572

Duplicate Your Tapes

Copy-Tape is a menu-driven utility that makes back-up copies of Basic or machine-language tapes on the 16K Model I or III. It displays the ASCII code of the program during loading and recording, and also verifies and advances tapes. On the Model III, Copy-Tape also converts 500 baud to 1,500 baud and vice versa.

The guaranteed cassette sells for \$9.95 plus \$2 postage from Modtec, Software Division, 4144 N. Via Villas, Tucson, AZ 85719, (602) 293-5186.

Reader Service ✓567

The Amazing Ben

The Amazing Ben is the first in a series of program sets designed to introduce programmers of all ages to the concepts of artificial intelligence. Using your knowledge of Basic, the set teaches you to write programs in Ben's language, allowing him to make decisions, evaluate different paths, and record data as he explores a sequence of increasingly difficult mazes.

The process involves examining your own thought processes while giving Ben rules for acquiring knowledge, and handling the computer as a symbol processor rather than a calculating device. The focus is not only on

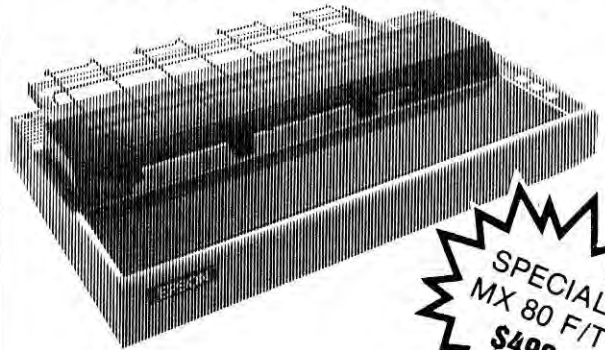


EVERYTHING FOR YOUR COMPUTER™

Creative Computer

Department 80 1236 E. Colonial Drive
(305) 894-0789 (Florida) Orlando, FL 32803 USA

TOLL FREE 800-327-9294



**SPECIAL
MX 80 FT
\$499**

HARDWARE

PRINTERS

Epson MX 100	\$ 699	C. Itoh F10-40 CPS	\$1399
Epson MX 80FT	579	C. Itoh Prowriter Par	495
Okidata 80	349	C. Itoh Prowriter Serial	649
Okidata 82A	469	Brother/ComRex	
Okidata 83A	719	Daisy	995

RIBBONS

EZ RELOAD

PRINTER

CARTRIDGES

PRINTER	RIBBONS EZ RELOAD	CARTRIDGES
RADIO SHACK PRINTERS		
Daisy II, DWP 410, Black	10 For \$24.95	6 for 24.95(DW II only)
Brown / Blue/Red	6 For 24.95	N/A
LP 1-2-4	4 For 18.95	
LP 3 & 5	3 For 13.95	
LP 6 & 8 (DMP 400)	3 For 13.95	
DMP 200	3 For 13.95	
DMP 500	3 For 13.95	
EPSON / IBM		EPSON BRAND
MX-70/80/80/F/T	3 For 16.95	16.95 ea.
MX-100	3 For 18.95	21.95 ea.
OKIDATA		
80-82-83		3 For 11.95
CENTRONICS		
700/730/737/739/779		
ZIP PAK	4 For 18.95	

MISCELLANEOUS

Plastic File Bx 50-5 1/4" . . . \$19.00	Green Screen I, II, III . . . \$11.00
Library Case 5 1/4" . . . 3.00	Mailing Labels 5000 . . . 12.00
Library Case 8" . . . 4.00	+ Shipping
Head Clean Kit . . . 23.00	NEWDOS 80 2.0 . . . 139
	LDOS 5.1 . . . 105

Write For Free Catalog

Over 600 items in Diskettes, Paper, Labels, Ribbons, Checks, Storage Boxes, Furniture, Binders and Hardware. * -Mfg. Trademark. Florida plus 5% tax.

FREE SHIPPING except hardware.

Most orders out in 24 hours with VISA, M/C, Money Order, Cashier Check, Bank Wire and C.O.D. Personal check over \$150 allow 10-14 days. Mail order only. Prices subject to change.

9-8 Monday-Friday, 9-6 Saturday.

✓ 190

what Ben learns, but how he learns it.

Priced at \$79.95, the program set is offered on 32K disk for the Model I/III. A Color Computer version might appear in the future, as will additional sets such as Elementary, My Dear Ben and Ben On the Asteroid.

For more information, contact Krell Software Corp., 1320 Stony Brook Road, Stony Brook, NY 11790, (516) 751-5139.

Reader Service ✓561

The Arranger

The Arranger is a fast machine-code program that automates and catalogs your disk library. The double-density Arranger disk stores the directories of up to 250 disks, 45 programs per disk, and lets you alphabetize all or part of your library file in a few seconds.

If you have changed one of your disks, you can update the library with one keystroke. During this update, the Arranger records DOS type, density, free grants, number of tracks, system or data, date updated, and current visible file names. A back-up function is built in.

The program works with the Models I or III with all popular DOSes and one to four disk drives, whether 35, 40, or 80 tracks. Its price is \$29.95 from Triple-D Software, P.O. Box 642, Layton, UT 84041, (801) 456-2833.

Reader Service ✓582

Printer Optimizer

The Printer Optimizer is an independent Z80-based spooler with its own power supply. It absorbs data from your computer at full speed and then sends it to a printer or modem, freeing the computer for other work.

A keypad and display let you program the unit to convert characters on a one-to-



Printer Optimizer

one, many-to-one, or one-to-many basis, or ignore characters that confuse your printer. Users can record new printers' command sequences for different type fonts and sizes, page formatting, and so on, and then access a different mode by simply pushing a button.

The Printer Optimizer also handles bidirectional RS-232 data transmission, data compression, and temporary halts in printing. It sells for \$495. A plug-in serial RS-232 card or additional 64K memory cards are \$125 each.

For more information, contact Applied Creative Technology Inc., 2723 Avenue E East, Suite 717, Arlington, TX 76011, (800) 433-5373.

Reader Service ✓552

InfoScan

InfoScan is a menu-driven facility that lets the non-technical user format, store, retrieve, and display information.

Data entry is totally free form, and does not require any complex specifying of fields. Up to 450 records are stored on disk, along with a user-specified key that describes the record. The keys can be sorted in any sequence, reviewed in sequence, changed, or deleted easily. Disk space allocation and management are automatic.

The machine-language program runs on the 48K Model I or III with one disk

drive. It sells for \$49.95 from The Smallsystem Center, P.O. Box 268, New Hartford, CT 06057, (203) 482-3689.

Reader Service ✓556

Color Computer Joystick

Endicott Software has introduced an affordable, reliable joystick for the Color Computer. Hand-assembled and checked for durable service, the unit features smooth function for excellent cursor or game character control. A 90-day parts and labor warranty is included.

The joysticks sell for \$18.95 each or two for \$35.95, plus \$2 apiece for shipping. For more information, contact Endicott Software, P.O. Box 12543, Huntsville, AL 35802, (205) 881-0506.

Reader Service ✓578

2,400-Baud Modem

A direct replacement for

Bell 201B data sets, the MT201B modem provides 2,400-baud, full-duplex operation over four-wire leased lines, or half duplex over two-wire lines. The modem uses phase-shift modulation and synchronous data format, and communicates with other 201B- and 201C-compatible modems.

A stand-alone unit sells for \$685 from Multi-Tech Systems Inc., 82 Second Ave. S.E., New Brighton, MN 55112, (612) 631-3550.

Reader Service ✓562

Mac Inker

Mac Inker is a device that automatically reinks ribbons for any printer, nearly eliminating ribbon replacement costs.

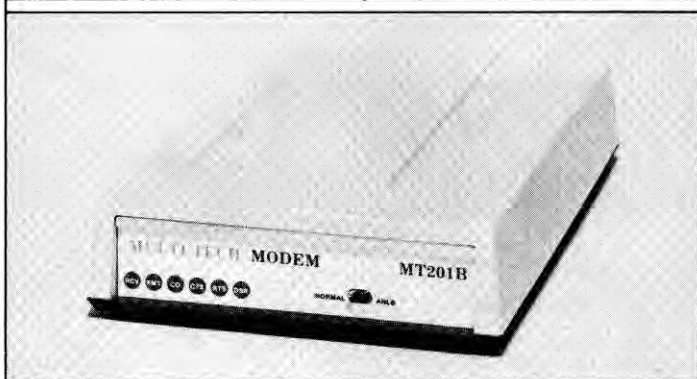
Once you load the cartridge and press the start button, Mac Inker meters and distributes the correct amount of ink across the ribbon. Printing stays crisp and legible, and ribbon life is extended almost indefinitely.

Different ink colors and cartridge loading stations for any current printer are available. Price is \$54.95 from Computer Friends, 100 NW 86th Ave., Portland, OR 97229, (503) 297-2321.

Reader Service ✓574

Softrol for Recorders

The solid-state Softrol cassette-recorder controller



2,400-Baud Modem

RadioShack TRS-80's Full Line



YOU CAN SAVE money when you buy Radio Shack TRS-80 Computers from **Pan American Electronics**. Pan American Electronics went into business in 1976 and led the way in bringing consumers original Radio Shack TRS-80 Computers at reduced prices. **NO** other company has done it longer. **NO** other company has done it better and **NO** other company sells them for less.

Pan American Electronics

TOLL FREE NUMBER 800/531-7466

1117 Conway Avenue • Department E.M.
Mission, Texas 78572
Phone: 512/581-2766
Telex Number 767339

TM — Trademark of Tandy Corporation

✓122

MASTER ELECTRONICS, INC.

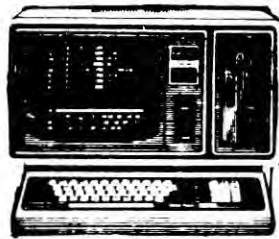
*TRS-80 is a trademark of Tandy

CAN SET YOU UP IN A

TRS-80

STATE-OF-THE-ART-COMPUTER

STARTING AT 15% DISCOUNT!



FULLY STOCKED

IN: Model II's

Model III's

ALL-PRINTERS

AND — MORE!!

* PLUS *

THE ALL NEW:

Model 16 and the 8.5 meg. Hard Drive!

CALL US NOW!!!

Toll FREE: 1-800-531-7323

TEXAS CALL COLLECT 512/689-5536



MASTER ELECTRONICS, INC.
154 NORTH 5th
RAYMONDVILLE, TX 78580



✓146

Transform your Home into a Computerized Arcade with HORIZONS Software



NEW!

Tape \$14.95 / Disk \$19.95

VENTURE

Journey into the derelict stronghold of an ancient wizard in an effort to destroy monsters and collect treasure in this realtime machine language arcade game. With sound effects, this is the first in a series of outstanding quality arcade-style games for your TRS-80 computer.

Please specify Model I or Model 3 when ordering.

TRS-STICK Joystick for all Horizons games: Model I or 3: \$39.95

A Division of Case Technology

P.O. Box 4792
Springfield, MO 65802

HORIZONS Software

Dealer inquiries invited.
TRS-80 is a trademark of Tandy Corp.
Please add \$1.00 for handling. MO res. add 6%.



(417) 831-5673

✓373

plugs between the computer and any standard-plug recorder, regardless of motor polarity.

The "soft" switch allows pushbutton positioning of tape to start of program without plug pulling, reduces switching noise that can cause "switch hits" on programs, and protects CPU relay contacts from possible early failure. A motor-off delay of about one second eliminates "pinch hits" on the ends of programs caused by capstan/pinch-roller pressure; the delay also automatically puts short silent gaps following Saves for easier location of program starts.

Softrol can also be used to computer-switch any other DC load of from five to 15 volts and up to 1.5 amps, with or without the delay-off feature. It is available for



Softrol

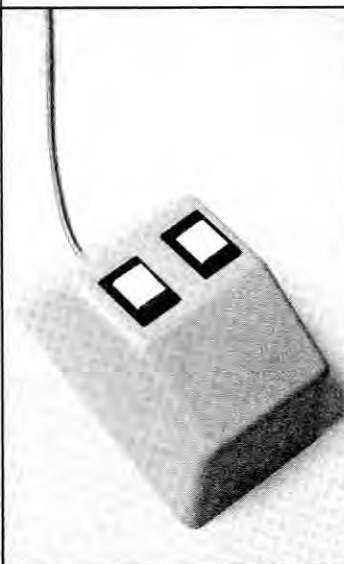
\$18.99 from Lemons Tech Services, P.O. Box 0429, Buffalo, MO 65622, (417) 345-7643.

Reader Service ✓554

Eeeek! A Mouse!

Micro owners with a flair for tinkering can now put a new input device beside their joystick and light pen—a mouse.

The 3G Micromouse is a pointing device that moves the screen cursor as it is moved on the desk or table top, allowing the same eye-hand coordination used in writing to direct cursor location. Buttons on the unit's top give commands, such as marking the beginning and



Micromouse

end of a line in graphics work or deleting a letter in word processing.

The mouse is still primarily an OEM product, but 3G says that the work of rigging a TRS-80 interface is fairly simple—with one integrated circuit and a few transistors, the mouse's tail is hooked up to the cassette port.

The device sells for \$180. More information is available from 3G Company Inc., Route 3 Box 28A, Gaston, OR 97119, (503) 662-4492.

Reader Service ✓568

Food Co-Op Software

FC/M (Food Co-Op Management System) is a software package for church, civic, educational, or other groups that simplifies the organization and management of co-operatives.

The documentation (\$35) gives complete instructions for the setup and operation of a co-op for any size group, and shows you how to write your own program to keep track of the co-op's activities. The complete system includes the FC/M program in Cobol and the Radio Shack Cobol runtime package.

Price is \$150 (Model I/III, 5¼-inch disk) or \$200 (Model II, 8-inch). Purchase of documentation is credited to purchase of the system.

For more information, write Barstrann Corp., P.O. Box 265, Mid City Station, Dayton, OH 45402.

Reader Service ✓558

Disk Controller Boards

Micro Mainframe (2227 McGregor Ave., Rancho Cordova, CA 95670, (916) 635-3997) offers two floppy-disk controller boards with upgrade kits for the Model III.

The FDC-3B (\$79.95) will run 5¼-inch drives in both single- and double-density

Softshell introduces

MAP

Information retrieval programs for professionals use multiple keys, partial information or words to quickly search large TRS-DOS* data and text files no need to code information or establish fixed fields Softshell's Multiple Access Programs (MAP) use advanced hash coding techniques.

SAMPLE APPLICATIONS:

Matching Client to Product or Service

Your client needs a house in the \$90,000 to \$100,000 range and requires 4 bedrooms and a den. In a matter of seconds you can search your listings for all houses that meet the requirements.

Indexing Private Collections of Professional Literature

Your patient with SLE has a pericardial effusion. You remember filing away an article on the cardiac complications of autoimmune disease. But what was the title and where did you file it? Just type in the words 'autoimmune' and 'cardiac' and within seconds find all titles in your collection which have these words.

MAP **\$ 125.00**

Programs to create, index and search data or text files interactive help file documentation

MINIMAP **\$ 25.00**

Introductory MAP program instruction manual explanation of hash coding techniques used by MAP.

Programs require 32K, 1 disk; specify Model I, II or III

Softshell, P.O. Box 18722, Baltimore, MD 21237
Master Card and Visa accepted *TRS-DOS TM Tandy Corp.

In The Beginning Was The Word...

MICROCOMPUTING[®]

October 1982
USA \$2.95 (UK£2.00)
Number 70

A WAYNE GREEN PUBLICATION

Discover Sp
Matchless

MICROCOCCUS • MICROLITER

micrococcus, mi kro kok' us, n. a microscopic organism of a round form.

Microcomputing, mi' kro kom put ing, n. (Gr. mikros, small, and L. computo, to calculate.) The multi-system monthly journal for computer enthusiasts, containing all the information needed to turn your microcomputer into a powerful machine. Includes dozens of new programs, articles on innovative computer applications, buyer's guides, new programming techniques, accurate reviews of hardware and software, complete coverage of new products, tips on your system's hidden capabilities, hardware modifications, tutorials, utilities, book reviews, industry news. Plus features on computers in business, science, education and games. Written in understandable language by experts in the field of computing. Special emphasis is placed on the Apple[®], Atari, Commodore, Heath and IBM systems, but not to the exclusion of other systems.

(Ed. note—A one year subscription to MICROCOMPUTING is only \$24.97. Call

1-800-258-5473

Or send in the coupon below.

microcopy, mi' kro kop i, n. A photographic copy of printed material or photographs...

MICROCOMPUTING[®]

The First Word in Computer Publishing.

*Apple[®] is a registered trademark of Apple Computer, Inc.

YES! I want to get the First Word in Computer Publishing. Send me 12 issues of MICROCOMPUTING for only \$24.97.

Check enclosed MC VISA AE Bill me

Card# _____ Exp. Date _____

Interbank# _____

Name _____

Address _____

City _____ State _____ Zip _____

332R8

MICROCOMPUTING[®]

Box 997
Farmingdale, NY 11737

Canada & Mexico \$27.97, 1 Year Only, U.S. Funds
Foreign Surface \$44.97, 1 Year Only, U.S. Funds Drawn on U.S. Bank
Allow 6-8 weeks for delivery.

INNOVATION QUALITY
SUPPORT

PIONEER SOFTWARE
1746 North West 55th. Ave. No 204
LAUDERHILL, FLORIDA 33313
PHONE 1-(305)-739-2071

PIONEER tm

SCRIPTR

SCRIPTR makes **SCRIP5II** a **FULL SYSTEM**
Special Custom Versions Support *All Popular Printers*

MX-80 version allows for Underlining, Emphasized, Sub + Super Scripting, Double and *ITALICS*, MID-LINE even on Justified text lines without disturbing the formatting. **SCRIPTR** supports **EVERY** programmable feature of the **GRAPHTRAX 80** and **PLUS** roms. Even variable Linespacing.

STANDARD FEATURES INCLUDE

OUTPUT any code or string of codes to your printer.
Write FORM LETTERS by inserting data during printing
Print any page DIRECT with correct Headers / Footers
Reenter SCRIP5II to get use of ALL DOS functions.
See where PAGES start and end without printed copy.
Edit mode for errors, changes or GRAPHICS entry.
(7) TEACHING PROGRAMS Fully explain every function.
66 page manual-bound, indexed and completely revised.

CUSTOM EFS FOR FOLLOWING:
Centronics 737 + 739 / LP-8 + LP-4 - Daisy Wheel II.
Microline 80 + 82A - Prowriter + NEC 8023, Cloth F-10
Sub+SUPER, Emphasized, DIAL A PRINT, Linespacing MORE!!
LDOS COMPATIBLE

SYSTEM REQ. TRS-80 MOD I/III, 32K, lower case.
Disk ver. requires **SCRIP5II** on both Model's I/III.
PRICE - \$40.00 ON disk / cass. 5.5K. program.
FREE BROCHURE Demonstrates all features.
Customer support by phone or letter after the sale makes
Scriptr a pleasure to own and use. 1,500 fully satisfied
customers in over 12 countries. **CALL / WRITE FOR INFO.**

PLEASE INCLUDE THIS INFORMATION WHEN ORDERING

Name Cass/Disk
Address - Phone - Zip Printer Type MEM SIZE

CHECKS - MONEY ORDERS - COD'S

CRAYON

INTRODUCING

CRAYON DELUXE

Due to popular demand we have just included into our popular CRAYON program an exciting new dimension. Crayon Deluxe and your MX-80 with any version of GRAPHTRAX can now produce GRAPHICS. But that's not all! CRAYON allows you to work with CUSTOM CHARACTER sets. This ad was prepared directly with our CRAYON DELUXE using the REGULAR font. It has many exciting features. Written entirely in 2-80 Assembler it is fast, very flexible and easy to use. Character sets can have up to 256 characters thus providing you with a regular, an alternate and a graphics set as well as a reversed capitals set, all in memory together.

STANDARD FEATURES INCLUDE

1. Underlining either by word or create lined paper.
2. Mix **WIDE** and regular sizes **MID-LINE**.
3. Graphic **INVERSION** of any part of the text.
4. Short line **LOGIC SEEKING** for increased throughput.
5. Reversed **Block Capitals Character Set**.
6. **FONTRAKER** - A 12K machine language program which enables you to create your own custom fonts.
7. Repeat printing capability without carriage advance even on graphic lines enables really crisp printing.
8. Create multiple **HI-RES** mail labels with ease.
9. Three and 1/2 character sets possible in every font.
10. Variable Linespacing control for text documents.
11. Bit Masking like you see here.
12. Create any type or style of characters desired.
13. Proportionalize the screen graphics to any size.
14. Create Graphics that have fancy designs in them.
15. Character sets may contain letters up to 40H x 12BW.
16. Continuous **WIDE** printing in any font or style.

ORDERING INFORMATION

CRAYON - Disk/Cass MOD 1/3 \$45 DISK / \$35 CASS
CRAYON DELUXE - DISK ONLY MOD 1/3 \$80.00
UPDATE - \$35.00 To previous owners only.

Consider carefully before you buy any character set generation program. CRAYON DELUXE is the most advanced Graphic/Text editor ever written for the TRS-80. See our previous ads for a description of CRAYON's many outstanding standard features. Add to this CRAYON DELUXE's character font generation capabilities and machine language speed and you will see why it is the BEST editor of its kind. Don't sell yourself short.

FREE BROCHURE

LIBERAL DEALER TERMS AVAILABLE - INQUIRIES INVITED

NEW PRODUCTS

modes. The **FDC-3C** (\$99.95) will also run drives with both single- and double-headed configurations, and allows operation of 8-inch single- and double-density disks using **DOSPLUS 3.4/4.0** software.

An installation kit with all cables, brackets, and screws for either is \$39.95. A complete upgrade package containing the controller board, installation kit, power supply, and a **TEC 40-track** drive is available for \$349 (**FDC-3B**) or \$369 (**FDC-3C**).

Reader Service ✓551

ware modifications or complex encryption.

The extension modifies the standard **TRSDOS 2.0** operating system and **Basic**. It requires no additional **RAM**, disk space, **Assembly-language** coding, or user calls, and is permanent even through back-up. Your **Basic** program is not modified in any way; the only visible result is that **List** and **LLIST** will not work.

Price is \$24.95 from The Management, P.O. Box T, Aledo, TX 76008.

Reader Service ✓553

Model II Security

The **Locker** is a simple, effective, and reversible software extension that protects **Model II** programs against unauthorized modification or plagiarism, without hard-

New Products listings are based on information supplied in manufacturers' press releases. 80 Micro has not tested or reviewed these products and cannot guarantee any claims.

DIFFERENT TRACK

A pair of two-dimensional products to introduce this occasional spotlight on unusual or novel items:

Bumperware 1.0 is an adhesive piece of white vinyl with the message "i'd rather be programming" (supports lowercase only) printed on it in red. "Written in the high-level language English," according to the manufacturer (Opcode Software, 1909½ Vine St., Berkeley, CA 94709), **Bumperware** is hardware compatible with most automobiles, offices, and programming environments. It is priced at \$N+1 for quantity N, including tax and postage.

The **Portable Keyboard** is a laminated, 8½ by 11-inch reproduction of a computer keyboard (the **TRS-80** is one of many models available), designed for the novice typist or the experienced one who wants to learn the position of special keys. Each key function is explained, so that the user can practice fingering without need of a computer or manual.

The keyboard costs \$9.95 or two for \$18 from **Computer Practice Keyboard Co.**, 616 9th St., Union City, NJ 07087.

Reader Service ✓563, 564

January's **New Products** section gave the wrong area code for **Printer Graphist Ltd.**, makers of a dot-addressable graphics software package. The mailing address is P.O. Box 603, Newport, VT 05855, but the phone is Quebec number (819) 564-7704.

HOW TO USE YOUR EPSON WITHOUT WASTING COMPUTER TIME:

Your computer is capable of sending data at thousands of characters per second but the Epson can only print 80 characters per second.

This means your computer is forced to wait for the printer to finish one line before it can send the next. A waste of valuable time.

THE NEW MICROBUFFER™ ACCEPTS DATA AS FAST AS YOUR COMPUTER CAN SEND IT.

Microbuffer stores the data in its own memory buffer and then takes control of the printer. This frees your computer for more productive functions.

PARALLEL OR SERIAL.

Microbuffer model MBP-16K is a Centronics-compatible parallel interface with 16,384 bytes of on-board RAM for data buffering.

The MBS-8K is a full-featured RS-232C serial interface with both hardware and software (X-On/X-Off) handshaking, baud rates from 300 to 19,000 and an 8,192 byte RAM buffer.

SIMPLY PLUG IT IN.

Either model fits the existing auxiliary interface connector inside the Epson MX-80, MX-80 F/T or MX-100 without modification, and is compatible with standard Epson cables and printer control software, including GRAFTRAX-80.

JUST \$159.00*

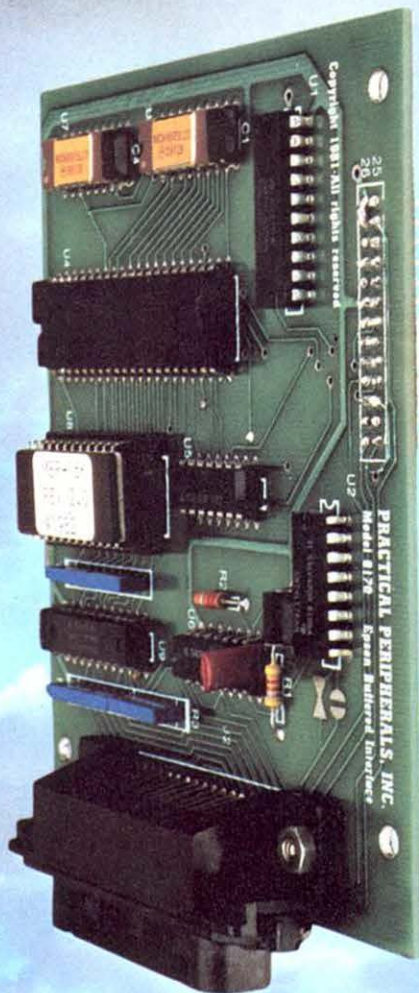
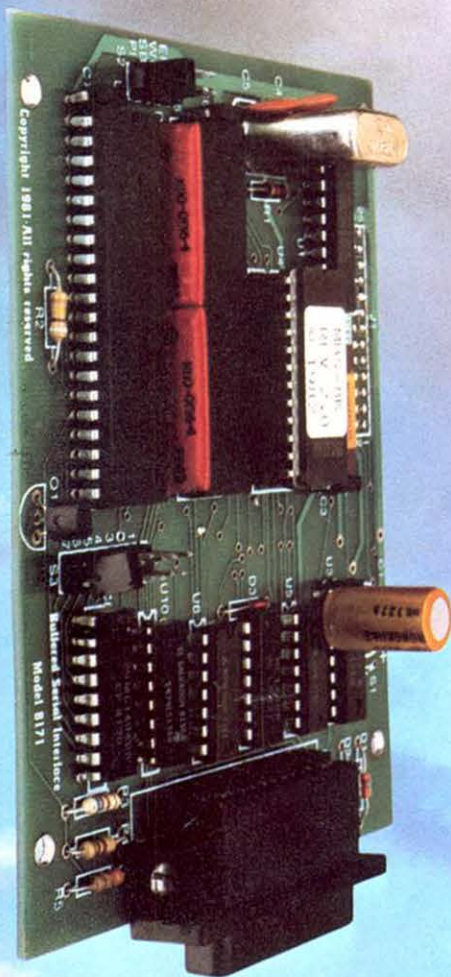
When you think how much time Microbuffer will save, can you afford *not* to have one? Call us for your nearest dealer.

PRACTICAL PERIPHERALS, INC.

31245 LA BAYA DRIVE, WESTLAKE VILLAGE, CA 91362 • (213) 991-8200

11

*Suggested retail price for either model.



DON'T GET LOCKED IN



Pascal
Basic
Cobol
Forth
Pilot
Fortran
Spread Sheet
Inventory
Logo
"C"

Data Base Management
Word Processor
Communication Utility
Accounts Receivable
Accounts Payable
Engineering Utility

General Ledger
Mailing List
Macro Assembler
Education



TRSDOS*

CP/M**

Open your doors to a world of SOFTWARE with LNW computers. You'll get **MORE PERFORMANCE**¹ than with the IBM PC², the Apple II³, TRS80 MODEL II or TRS80 MODEL III⁴ along with software support of TRSDOS or CP/M, the TWO MOST WIDELY USED OPERATING SYSTEMS. This means you, the user, can select from the largest base of business or personal software.

Standard Features: A serial RS232 communication port, parallel printer port, Hi-Resolution (480x192) B/W and COLOR graphics, an 80 character-per-line screen display along with Quad-density interface for 5" or 8" floppy disk storage offering immediate access to 3.5 million characters, or optional Hard disk

interface to 5 or 10 million characters.

Standard Software: LNW BASIC and DOS PLUS operating system packages, commanding all the above features, are included.

The LNW computer will be the key to your success with the starting price at **\$1695.00**, along with a full 6 month warranty.

Dealers: You too can open the door to a successful product. Call for our special dealer programs: (714) 544-5745.



LNW Computers
2620 Walnut Avenue
Tustin, California 92680
(714) 544-5744 ✓ 30

*TRSDOS is a trademark of Tandy Corp.

**CP/M is a trademark of Digital Research Corp.

1. Performance is based on bench mark test in the JAN 1982 issue of BYTE magazine, pg. 54, with LNW80 II as the comparison.

2. IBM PC is a trademark of IBM CORP.

3. APPLE II is a trademark of APPLE COMPUTERS.

4. TRS80 is a trademark of Tandy Corp.