Build Creative Command Files with EXEC

April 1984 USA $4.00

80micro

A WAYNE GREEN PUBLICATION

T.M.

the magazine for TRS-80 users*

DEFLATING

Demaresf

The Hassle-Free III-to-4 Converter

How to Streamline String Data Input

Plus:

C•Notes for the Model 100
A Natural-Language DBM
All About Threaded Lists
TRS-80 Tomspoolery

*TRS-80 is a trademark of Radio Shack, a division of Tandy Corp.

0 74470 65947 04

80micro 4/84 #51 A

THE TANDY TRS-80® MODEL

The Ultra-High Performance MS-DOS Personal Computer That Operates at Twice the Speed of the IBM PC

Our remarkable Tandy 2000 delivers much more than other 16-bit MS-DOS based computers. More speed. More disk storage. More expansion. Higher resolution graphics. But that's not all. You also get the quality and support that have kept Tandy Corporation in the forefront of the microcomputer industry from the beginning.

Higher-Speed 16-Bit Microprocessor

The Tandy 2000 is dramatically faster than other 16-bit MS-DOS computers. In actual benchmark comparisons, the Tandy 2000 performed almost three times faster than the IBM Personal Computer. The higher operating speed lets you finish bigger jobs in less time.

Increased Storage Capacity

Each of the two Tandy 2000 disk drives stores over four times as much information as a standard IBM PC drive, and twice as much as a TI Professional drive. If you need even more storage, choose our Tandy 2000 HD with a built-in hard disk.

Get a Better Picture of Things

The Tandy 2000 video monitors and graphics options let you easily create stunning, highly-detailed business charts and graphs. Our color graphics have twice the resolution of the COMPAQ Portable or IBM PC color graphics, and twice the number of colors.

Tandy 2000 With Two Disk Drives

2750.00 26-5103

Commerical Lease Available
For Only $95 Per Month
(Plus Applicable Use/Sales Tax)

Tandy 2000 HD With Built-In 10-Megabyte Hard Disk

4250.00 26-5104

Commercial Lease Available
For Only $150 Per Month
(Plus Applicable Use/Sales Tax)

Non-interlaced graphics, floor stand, pedestal and Digi™-Mouse not included

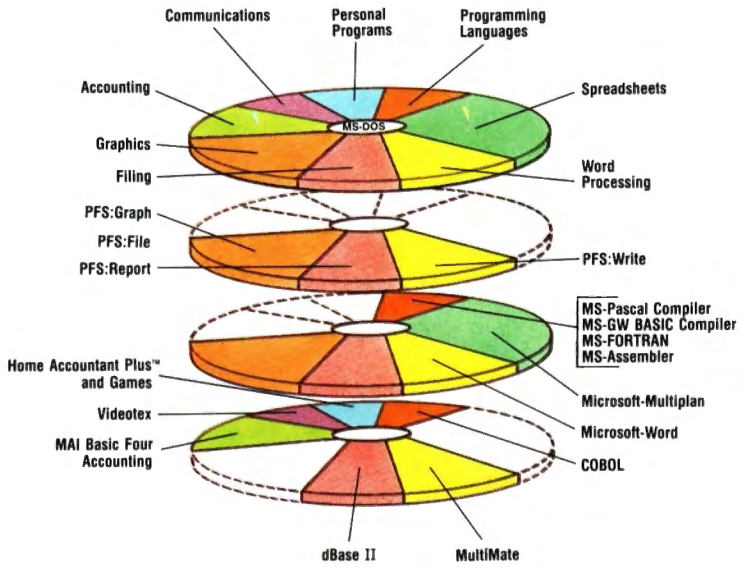
Compare the Model 2000 to the IBM Personal Computer

Price Comparison†	Tandy 2000	IBM Personal Computer
Base Unit	$2750	$2104
2nd Drive	Included (720K)	$529 (320K)
Monochrome Monitor	$249	$345
Display/Printer Adapter	Included	$335
128K RAM	Included	$165
RS-232	Included	$120
MS-DOS 2.0	Included	$60
Total Cost*	$2999	$3658
Feature Description	**Tandy 2000**	**IBM Personal Computer**
Internal Memory	128K Standard	64K Standard
Disk Capacity Per Drive	720K	160K or 320K (optional)
Microprocessor Clock Speed	8 MHz	4.7 MHz
True 16-Bit Microprocessor	Yes (80186) 16 bit/16 bit data path	No (8088) 16 bit/8 bit data path
User-Available Expansion Slots*	4	2
Grapics Options		
Color Resolution	640 × 400	320 × 200
Number of Colors	8	4
Monochrome Resolution	640 × 400	640 × 200

*Comparable IBM configuration with monochrome adapter and display, communications adapter, two 320K disk drives and 128K RAM. †Manufacturer's pricing as of 9/1/83.

2000 PERSONAL COMPUTER

The Tandy 2000 Adds a New Dimension to the Most Advanced MS-DOS Software Around



Choose From the Hottest Names In Software

Rapidly becoming an industry standard, the MS-DOS operating system lets us bring you the most popular programs around. Programs like dBase II. Microsoft-Multiplan. PFS:File. MultiMate. And many more already acclaimed by the entire microcomputer industry. The four software "wheels" above illustrate the outstanding programs available. Each "slice" in the top wheel represents typical applications—electronic filing, word processing, spreadsheets, communications and more. The corresponding slices on the lower wheels portray the programs available for each application family. For example, we have an excellent line of small business accounting software from MAI/Basic Four—general ledger, accounts payable, accounts receivable and more. These flexible programs have already been proven in thousands of applications worldwide. More programs are under development, including Microsoft's state-of-the-art MS-Windows operating environment. You can view several "windows" at once—files, letters, graphs and more—and exchange information between them.

Room to Grow for the Future

The Tandy 2000 has many standard features that cost extra on other computers. Aside from obvious cost advantages, that leaves more expansion slots open for your future needs. Add additional memory, a hard disk drive, our Digi™-Mouse and more. And you can install most options yourself.

A Milestone in Ergonomic Design

The Tandy 2000 is as spectacular outside as it is inside. The attractive modular system adapts to your environment to assure maximum comfort and productivity. With the optional floor stand, Tandy 2000 occupies much less desk space than other personal computers.

Total Service and Support is Close at Hand

Our extensive network of Radio Shack Computer Centers gives you complete hardware and software support directly from the manufacturer, not an independent computer dealer. On-site and carry-in service is available nationwide.

The Future of Personal Computing

See the Tandy 2000 and its popular line of software today at over 1000 Radio Shack Computer Centers and participating stores and dealers nationwide. Ask for a hands-on demonstration and you'll never want to let go.

Radio Shack®

The biggest name in little computers®

A DIVISION OF TANDY CORPORATION

~75

Send me the Tandy 2000 brochure.

Mail To: Radio Shack, Dept. 84-A-939
300 One Tandy Center, Fort Worth, Texas 76102

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE _____

Prices apply at participating Radio Shack stores and dealers. MS and Microsoft are registered trademarks of Microsoft Corp. IBM is a registered trademark of International Business Machines Corp. TI is a registered trademark of Texas Instruments, Inc. COMPAQ ia a trademark of COMPAQ Computer Corp. PFS is a registered trademark of Software Publishing. Multiplan is a trademark of Microsoft Corp. MultiMate is a trademark of Softword Systems Inc. dBase II is a trademark of Ashton-Tate. MAI/Basic Four is a trademark of Management Assistance, Inc. The Home Accountant Plus is a trademark of Continental Software.

For users of Apple, IBM, TRS/80, Atari, Commodore, Texas Instruments, and other brand name computers:

Here's the easiest way to buy quality diskettes at discount prices

Now you can get error-free double density diskettes by IBM, Control Data, Maxell and Verbatim delivered to your door. For some of the lowest prices around.

You save because we ship huge volumes of magnetic media in boxes of 10.

To order, use this form. →
For even faster service, call toll-free.

1-(800)-FLOPPYS or
1-(800)-521-5700
Michigan • 1-800-482-4770
Canada • 1-800-265-4824
Alaska/Hawaii • 1-800-821-9029

CALL FOR FREE CATALOGUE
ALL MAJOR CREDIT CARDS ACCEPTED
Shipping & handling F.O.B. Southfield
Transaction Storage Systems Inc., Southfield, MI

TSS

EXPECT A MIRACLE

Size	IBM	Qty.	Verbatim®	Qty.	Control Data	Qty.	maxell	Qty.
5-¼" SS	23.90		23.90		19.90		28.90	
5-¼" DS	34.90		34.90		29.90		41.90	
8" SS	24.90		—		28.00		—	
8" DS	39.90		—		29.90		—	
Sub Totals	$_____		$_____		$_____		$_____	

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
☐ AMEX ☐ MASTERCARD ☐ VISA
Card # _____ Exp. Date _____
Shipping and handling 1-6 boxes add $4.00 per order
7 or more add $6.00 per order.
TSS
Clip and mail today to: Transaction Storage Systems, Inc., 22255 Greenfield Road, Southfield, MI 48075

Imagine.... a letter quality printer compatible to your TRS 80

Introducing the JUKI MODEL 6100

Letter Quality, Daisy Wheel Printer/Driver Software Specifically Developed For Use With The TRS-80™ And SuperSCRIPSIT™ !!!

All control codes must be preceded by a <CLEAR>

UNDERSCORE	<CLEAR> <->	UNDERLINES EVERYTHING
BOLD PRINT	<CLEAR> <->	GEE IT LOOKS BOLDER
SHADOW PRINT	<CLEAR> </>	THIS SHADOW IS WILD HU?
1/2 LINEFEED F	<CLEAR> <+>	I LOVE SuperSCRIPSIT(TM)
1/2 LINEFEED R	<CLEAR> <,>	$Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4$
PAUSE PRINTER	<CLEAR> <?>	I HATE PAUSING.
TOP OF FORM	<CLEAR> <>	

$699.00

Now you can enhance your TRS-80™ Model III word processing system with the JUKI 6100 letter quality printer and driver software package.

Totally compatible with the TRS™ Model III when used with the SuperSCRIPSIT™ word processor, the Model 6100 is a sophisticated printer with all the advanced features of a higher priced unit. And the JUKI Model 6100 printer driver software package can be added to the TRS 80™ Model 4 system as well.

Utilizing a 100 character daisy wheel drop-in system, the Model 6100 prints bi-directionally at 18 cps, has 10/12/15 pitch, proportional spacing, and a 2k buffer memory expandable to 8k. Operating on a linear induction motor for accurate positioning, the logic seeking Model 6100 performs superscript, subscript, bold/shadow printing, double strike, underlining and has graphic capabilities.

Also, the Juki printer is lightweight and conventional in design, has low noise level, is easy to maintain, and features a self-testing function. And the printer driver software is available on diskette for either parallel or serial interface.

But the dream is not over...with a low price tag of $699.00 and driver software diskette for less than $25.00 you'll have top quality performance for a remarkably affordable price.

JUKI® AMERICA

JUKI INDUSTRIES OF AMERICA, INC. CONTACT YOUR JUKI DISTRIBUTOR FOR THE DEALER LOCATION MOST CONVENIENT FOR YOU.

ACORN DATA PRODUCTS
7304-L South Alton Way
Englewood, CO 80112
303/779-6644
Serving:
MT, WY, CO, UT, NM

BUTLER ASSOCIATES, INC
82A Winchester Street
Newton, MA 02161
617/964-5270
Serving:
ME, NH, VT, CT, RI, MA

COMPUTER SERVICES INTERNATIONAL CORP.
560 Sylvan Avenue
Englewood Cliffs, N.J. 07632
201/569-6300
Serving: METRO NY, E. PA, NJ

GENTRY ASSOCIATES, INC.
7665 Currency Drive
Orlando, FL 32809
305/859-7450
Serving:
TN, NC, SC, MS, LA, AL, GA, FL

INFORMATION SYSTEMS, INC.
2420 E. Oakton Street, Unit K
Arlington Heights, IL 60005
312/228-5480
Serving:
WI, IL, MN, IA, MO, NE, ND, KS, SD

INTERNATIONAL BUSINESS SYSTEMS CENTER
7023 Little River Turnpike
Annandale, VA 22003
703/750-3882
Serving: MD, DE, DC, VA

OSSMANN COMPUTER TECHNOLOGIES, INC.
6666 Old Collamer Road
E. Syracuse, NY 13057
315/437-6666
Serving: UPSTATE NY

SIGMA DISTRIBUTING
2110 116th Ave. N.E.
Bellevue, WA 98005
206/454-6307
Serving:
WA, OR, ID, AK

SOUTHERN MICRO DISTRIBUTORS
8708 Royal Lane
Irving, TX 75063
214/258-6636
Serving: TX, OK, AR, LA

STAR-TRONIC DISTRIBUTOR CO.
23976 Freeway Park Drive
Farmington Hills, MI 48024
313/477-7586
Serving: MI, IN, OH, KY, PA, W. PA, WV

TECHNOLOGY MARKETING CORP.
2300 Valley View Lane
Suite 109
Dallas, TX 75234
214/243-7994
Serving: TX, OK, AR, LA

VITEK
930-G Boardwalk Avenue
San Marcos, CA 92069
619/744-8305
Serving:
S. CA

WESTERN MICRO TECHNOLOGY
10040 Bubb Road
Cupertino, CA 95014
408/725-1660
Serving: N. CA, NV, AZ

NATIONAL HEADQUARTERS:
JUKI INDUSTRIES OF AMERICA, INC.
DA DIVISION
299 Market Street
Saddle Brook, NJ 07662
201/368-3666

WEST COAST:
JUKI INDUSTRIES OF AMERICA, INC.
CALIFORNIA DIVISION
3555 Lomita Boulevard
Torrance, CA 90505
213/325-3093

To master the computer, master the software

Challenge your ability. Take charge of your computer. Take pride in the results.

You've invested in the computer. Now invest in yourself. Writing your own software lets you define your own boundaries, broaden your problem-solving resources and puts you in complete command at the keyboard. It's challenging. It's exciting. And now it's easier than ever before with Self-Study Computer Courses from Heathkit/Zenith.

Master today's most powerful contemporary languages including Microsoft BASIC, PASCAL and FORTRAN. And learn the popular CP/M and MS-DOS operating systems, too. When you need to know, we'll take you as far as you want to go.

For more information, send for our FREE colorful catalog below or circle the reader service number.

Our colorful catalog is FREE! If coupon is missing write: Heath Company, Dept. 335-162, Benton Harbor, MI 49022.

Send for yours today!

FREE CATALOG

Mail to: Heath Company
Dept. 335-162
Benton Harbor, MI 49022

Name _____

Address _____

City _____

State _____ Zip _____

CP-225

168

Heathkit®

Heathkit/Zenith

PUBLISHER/PRESIDENT
Wayne Green
VICE PRESIDENT/GENERAL MANAGER
Debra Wetherbee
VICE PRESIDENT/FINANCE
Roger Murphy
ASSISTANT TO PRESIDENT/VP
Matt Smith
ASSISTANT TO VP/FINANCE
Dominique Smith
DIRECTOR OF MARKETING & SALES
David Schissler
DIRECTOR OF CIRCULATION
William P. Howard
603-924-9471
RETAIL & NEWSSTAND SALES MANAGER
Ginnie Boudrieau
1-800-343-0728
DIRECTOR OF ADVERTISING
Stephen Twombly
603-924-7138
Sales: Betty Butler, John R. Larmon, William J. Smith
Ad Coordinator: Mary Hartwell
PUBLIC RELATIONS
James Leonard

80 Micro is certified by the Audit Bureau of Circulations.

80 Micro (ISSN -0744-7868) is published 12 times a year by The Wayne Green Publications Group, 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 $36 for one year, $55 for two years, and $75 for three years. In Canada and Mexico $45—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), $55—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 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.

80 Micro is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 42 computer publications in 18 major countries. Nine million people read one or more of the group's publications each month. Members of the publication group include: Australia: *Australasian Computerworld, Micro Magazine*; Argentina: *Computerworld/Argentina*; Brazil: *DataNews, MicroMundo*; Denmark: *Computerworld/Danmark, MikroData*; France: *Le Monde Informatique*; Germany: *ComputerWoche, MicroComputerWelt, PC Welt*; Italy: *Computerworld Italia*; Japan: *Computerworld Japan*; Mexico: *Computerworld/Mexico*; Norway: *Computerworld Norge, MikroData*; People's Republic of China: *China Computerworld*; Saudi Arabia: *Saudi Computerworld*; Spain: *Computerworld/Espana, MicroSistemas*; Sweden: *ComputerSweden, MikroDatorn, Min Hemdator*; United Kingdom: *Computer Management, Computer Business Europe*; United States: *Computerworld, HOT CoCo, inCider, InfoWorld, Micro Market World, Microcomputing, PC World, 80 Micro, RUN*.

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.
Problems with Load 80 Circulation: Address correspondence to Lori Eaton, 80 Pine St., Peterborough, NH 03458.
Problems with Advertisers: Send a description of the problem and your current address to: *80 Micro*, Rt. 101 & Elm Street, Peterborough, NH 03458, ATTN.: Rita B. Rivard, Customer Service Manager. If urgent, call 1-800-441-4403.
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, Retail Sales Manager, *80 Micro*, Pine St., Peterborough, NH 03458. (800) 343-0728.

80 Micro is published monthly by The Wayne Green Publications Group. Entire contents ©copyright 1984 The Wayne Green Publications Group. 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.

April 1984 80micro

page 58

On the Cover

42. What's So Good About CP/M? *by George Antunes*
Before you spend money on Digital Research's DOS, get rid of your TRSDOS inferiority complex.

53. Everything from A to Z *by Ed Levy*
Threaded lists: the secret to keeping things in order without time-consuming shuffling. (I, II, III; Load 80)

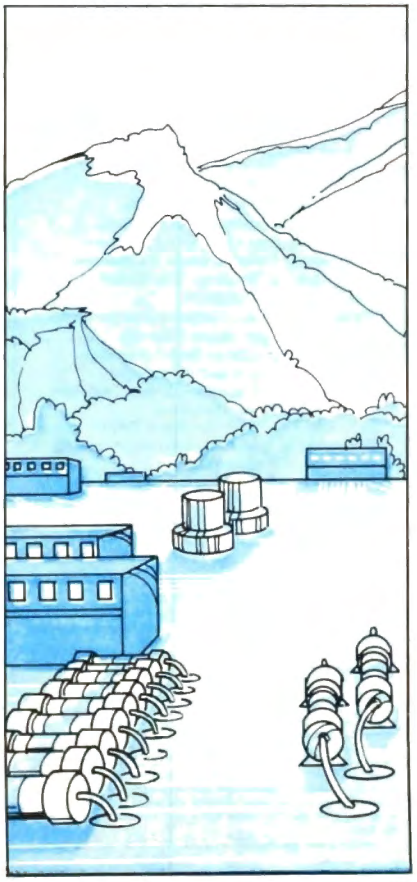
58. Brick by Brick *by Douglas Payne*
Beyond TRSDOS' Build command—an Exec Interpreter that performs a series of steps automatically. (III; Load 80)

77. April Spool *by John Cominio*
Be more efficient: Do other work while this software spooler handles printing chores. (I, III; Load 80)

96. Redevelopment Program *by Mark D. Goodwin*
Convert Model III Basic programs to Model 4, and check trouble spots along the way. (4)

106. Enter Here *by John Stedeford*
A machine-language program that eliminates delays in string data entry. (I, III)

120. Relaxed Syntax *by Dennis Husch*
Artificial intelligence comes to data base management: a DBMS that responds to queries in English. (I, III; Load 80)



page 106

Features

82. Bugs from Outer Space—Part II *by Roger A. Smith Jr.*
Add anti-insect firepower to *80*'s modular machine-language arcade game. (I, III; Load 80)

116. New Math—Old Order *by David Lewis*
Can't read reverse Polish notation? Change RPN equations to conventional format. (I, III)

118. Character Cache *by P. Gregory Springer*
Braces? Brackets? Find Scripsit characters you didn't know you had. (I, III)

138. The Sound of Musikon *by Merton Davis*
Your 48K disk system and these programs let you compose, edit, and play back music. (I, III; Load 80)

157. Restored Art *by Mark D. Goodwin*
Add the III's graphics commands to Model 4 Basic. (4)

160. Oops—Wrong Disk *by C. David Wilson*
Write data to the right files with this disk identifying utility. (II)

164. Dump Site *by Gregg Weissman*
A short, simple routine that sends up to three screens of video memory to the printer. (I, III; Load 80)

168. Routine Access *by Wayne King*
Who needs Disk Basic? Get up to 10 USR routines in trusty Level II. (I, III)

more

Reviews

33. LeScript
The state of the art in Model 4 word processing.

37. Disk Drive Analysis System
Diagnostic help for III/4 disk jockeys.

38. Target PlannerCalc
An excellent, inexpensive Model 4 spreadsheet.

40. dataCure 2.6
First aid for injured CP/M disks.

223. Tele-Stock
A Model 100 program that calls Dow Jones for you.

229. Dostamer
Execute DOS commands with a single keystroke.

230. FPS-3 Hardware Copy System
A hardware interface that backs up protected software.

234. Stock Tracker
When the TRS-80 talks, investors listen.

238. Career Directions
A software job counselor for teens and older students.

238. Review Digest

C•Notes / *for the Model 100*

178. Calling Wall Street *by Thomas L. Robb*
Putting Dow Jones' big board on the Model 100's small screen.

186. North by Northwest *by Smith Harris*
Find the distance and compass bearing between any two points on earth.

188. Graphic Results *by Emmett Carmody*
A portable pie and bar chart producer.

191. RAM Files

Departments

8. Side Tracks
by Eric Maloney

10. Input

11. 80 Alert

13. Feedback Loop
by Terry Kepner

20. Pulse Train
edited by Eric Grevstad

30. Reader Exchange

31. Debug

196. Project 80
by Roger C. Alford

202. The Gamer's Cafe
by Mad Max

206. The Next Step
by Hardin Brothers

214. Fun House
by Richard Ramella

220. Reload 80
by Amee Eisenberg

240. New Products
edited by Amy Campbell

EDITORIAL DIRECTOR
WAYNE GREEN PUBLICATIONS
Jeffrey D. DeTray

EDITOR-IN-CHIEF
Eric Maloney
MANAGING EDITOR (EDITORIAL)
Peter E. McKie
MANAGING EDITOR (PRODUCTION)
Deborah M. Sargent
NEWS EDITOR
Eric Grevstad
REVIEW EDITOR
Lynne M. Nadeau
NEW PRODUCTS EDITOR
Amy Campbell
ASSISTANT EDITORS
Steven Casey
Susan Gubernat
Robert L. Mitchell
TECHNICAL EDITORS
Bradford N. Dixon
Amee Eisenberg (Load 80)
Mare-Anne Jarvela
Beverly Woodbury
EDITORIAL DESIGN MANAGER
Susan Gross
EDITORIAL DESIGNER
Philip Geraci
LAYOUT EDITORS
Joan Ahern, Maurelle Godoy,
Susan Hays, Judy Oliver,
Phyllis Pittet, Glenn Suokko
PROOFREADERS
Peter Bjornsen
Harold Bjornsen
Robin Florence
EDITORIAL ADMINISTRATION
Carole Macioci

PRODUCTION
Director: Nancy Salmon
Lahri Bond, Cindy Boucher, Sandra Dukette,
Marjorie Gillies,
Marlene Mowbray, Anne Rocchio,
Lynne Simonson,
Kenneth Sutcliffe, Leslie Walden;
Film Production: Donna Hartwell,
Laurie Jennison, Theresa Verville,
Robert M. Villeneuve;
Ad Coordinators: Patricia Bradley, Paula Ramsey;
Assistant: Jean Southworth
Advertising Production: Jane Preston,
Fiona Davies, Michael Ford, Bruce Hedin
PHOTOGRAPHY
Supervisor: Nathaniel Haynes;
Laurie Gardos, Jeanne Quickmire,
Sturdy Thomas
TYPESETTING
Supervisor: Sara Bedell;
Darlene Bailey, Prem Gongaju,
Lynn Haines, Cynthia Letourneau,
Kimberly Nadeau, Lindy Palmisano,
Heidi N. Thomas, Sue Weller
DESIGN
Creative Director: Christine Destrempes
Manager: Joyce Pillarella
Design Consultant: Beth Krommes;
Assistant: Sarah Werninger
Administrative Assistants: Susan Donohoe,
Patrice Scribner
Chief Copywriter: Steve Tripp
Copywriters: Louis Marini, Gail Morrison,
Dale Tietjen

Cover by Chris L. Demarest

This symbol LOAD 80 indicates that the program is available on cassette or disk. For details, see our Load 80 ad, p. 35.

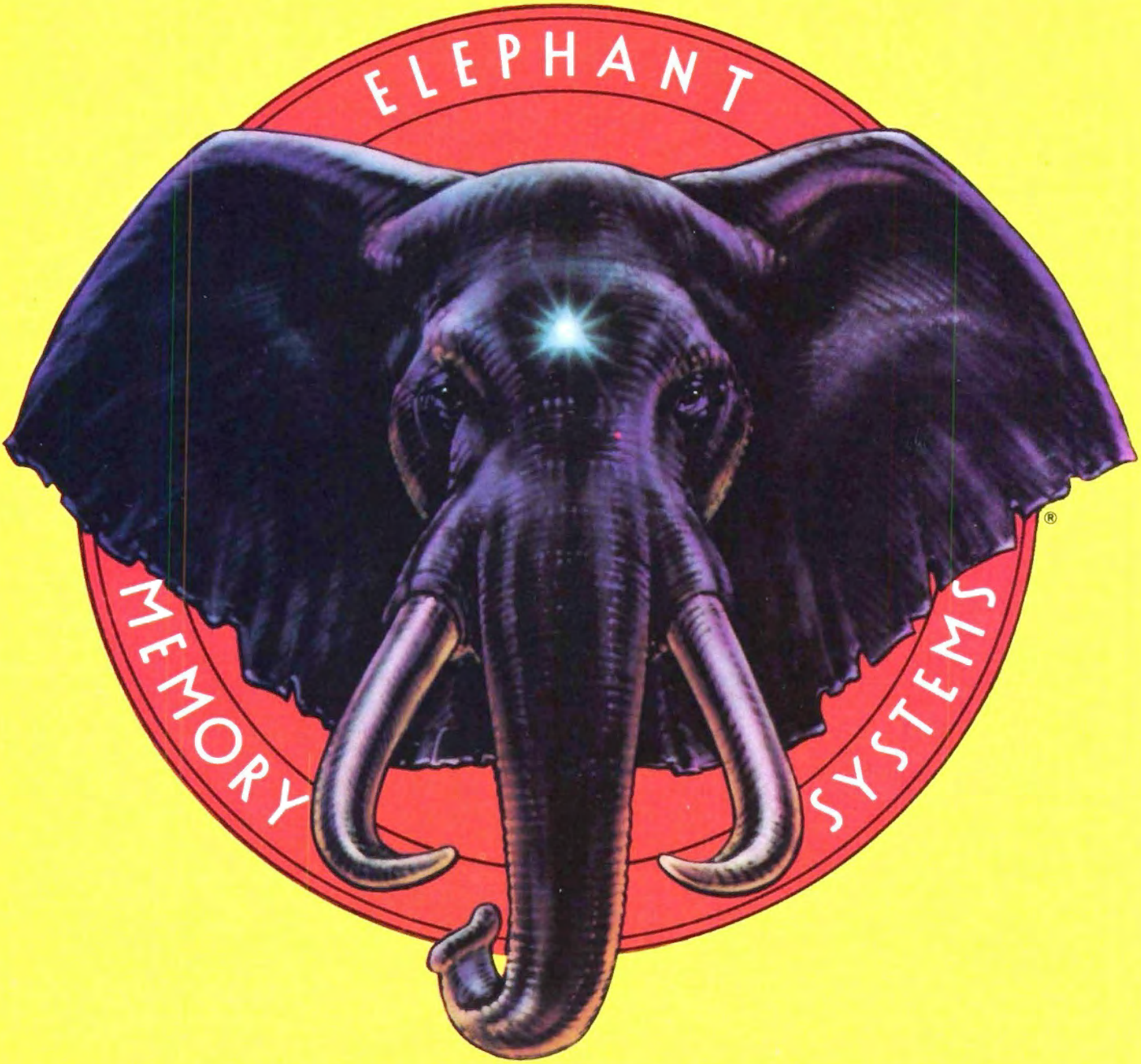
The left bracket, [, replaces the up arrow used by Radio Shack to indicate exponentiation on our printouts. When entering programs published in *80 Micro*, you should make this change.

80 Micro 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 "How to Write for *80 Micro*." 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.

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

REMEMBER.



ELEPHANT™ NEVER FORGETS.

A full line of top-quality floppies, in virtually every 5¼" and 8" model, for compatibility with virtually every computer on the market. Guaranteed to meet or exceed every industry standard, certified 100% error-free and problem-free, and to maintain its quality for at least 12 million passes (or over a lifetime of heavy-duty use).

Contact Dennison Computer Supplies, Inc., 55 Providence Highway, Norwood, MA 02062 or call toll-free 1-800-343-8413. In Massachusetts, call collect (617) 769-8150. Telex 951-624.

✓472

Dennison

Nothing pleases me like machinery that holds up over time. That's why I keep my VW. And buy Sony stereo equipment. And use a Hermes typewriter. They are the stuff of which domestic tranquility is made.

The office is another matter entirely. I have little choice over what equipment we get. For starters, we're here to cover the TRS-80, and are therefore obliged to keep a certain number of Radio Shack products around. We get other equipment through trade agreements with advertisers. Still more is bestowed on us by the purchasing department.

The result is a real hodge-podge of electronic paraphernalia. Sometimes I marvel that any of it works. Yet with a few notable exceptions we've done pretty well.

Curious about how much broken equipment we actually have, I recently rummaged through our Closet of the Dead. I exhumed two Model I's, three PMCs (and eight PMC drives), a gutted Centronics 704, a MicroCompatible buffer, and three cassette recorders. In addition, a burned-out Centronics 739 is in the shop for repairs.

I then checked out our functional equipment. It includes one Model I, one Model II, eight Model IIIs, two Model 4's, one Model 4P, one Model 16B, three Model 100s, two Model 2000s, and one PMC-81. Our working printers include an Epson MX-80 with Graftrax, an Olivetti Praxis 30, a Gemini 15, a Radio Shack Line Printer V, and an NEC Spinwriter. Also in use are two Novation modems, two cassette recorders, a Houston Instrument plotter, nine electric typewriters, a Mayday power supply, an IDE printer switcher, and a coffee maker.

(I make no claims for how *well* the above equipment works. The liquid that comes out of the coffee maker, for instance, could strip the paint off your car.)

Our worst debacle was undoubtedly with our PMCs. We bought four in early 1982 because they were cheap. By the end of 1982, we were down to two. Today, we have one.

My most memorable PMC experience came one Monday morning when I stumbled into work and turned the machine on to do some word processing. The screen went blank. Then smoke started curling from the keyboard.

That, I knew, was a bad omen.

A second PMC blew its power supply the next week. That reduced us to two. Then a couple of the video controllers went, along with one of the interfaces. Five of the eight disk drives dropped dead. We were swapping so many parts back and forth that we didn't even bother to screw down the cases.

Finally, we managed to piece together one working PMC. I use "working" here in the most liberal of senses. It usually powers up. Disks will boot most of the time. And all of the keys still work. We've got it hooked up to our slow, noisy Praxis (a marriage that somehow seems appropriate), and it serves adequately as a dedicated word processing station.

On the other end of the spectrum sits my favorite piece of equipment, the NEC Spinwriter. It's going into its fifth year, cranking out listings day in and day out, and it's been down only three times.

The MX-80, too, is a workhorse. It's funny how the success of a company is reflected in the reliability of its products. Take Epson and Centronics. We've had the MX-80 for a year and a half without so much as a checkup. The 739 has required major repairs twice in the same time.

The LP V is another machine that has earned my respect. It's as big as a bathtub and sounds like a lawnmower, but it rarely fails to do what we ask.

What about all of our TRS-80s? Well, the Model I has seen better days. It has made "spontaneous reboot" a part of our everyday vocabulary. Programs hang up if somebody sneezes in the next building. Sometimes the tech editors have to load a program half a dozen times before they can get it to run. This has not led them to look fondly on cassette software.

The Model IIIs chug along, except for the ones we obtained through a mail-order house. Their drives run like three-legged horses. A good, hard slap will occasionally get them going. Otherwise, we have to wait until a full moon, and perform druidic rituals.

The other computers are too new (or, in the case of the 16B, too unused) for us to tell how durable they'll be. I'm worried about the Model 2000s, though. They seem fragile. They don't look like they can be kicked around like the Model IIIs can. Maybe it's the color. Gray reminds me of metal utility shelves; white reminds me of cheap plastic furniture.

All things considered, I can't complain too much. Most of our equipment does what it's supposed to do—sometimes a little more, sometimes a little less. It doesn't give me as much security as my Volkswagen, but I suppose it gives me as much as I can ask for.

Although I wouldn't mind a better cup of coffee in the morning. ■

The Answer is...

NEWSCRIPT!™

THE WORD PROCESSOR FOR BUSINESSMEN AND PROFESSIONALS

With ongoing support directly from us

A FEW OF NEWSCRIPT's 200 STANDARD FEATURES:

- FORM LETTERS WITH MERGING OF NAMES AND ADDRESSES
- GIVES SUPERB APPEARANCE TO YOUR FINAL DOCUMENTS
- COMPREHENSIVE MANUAL WITH TUTORIAL AND EXAMPLES
- CENTERING, TOP/BOTTOM TITLES, INDENTS, PAGINATION
- UNDERLINING, BOLDFACE, DOUBLE-WIDTH, ITALICS†
- SUB/SUPER SCRIPTS, RIGHT-JUSTIFIED PROPORTIONAL†
- CREATES TABLE OF CONTENTS, SORTED INDEX
- "LEGAL" LINE NUMBERING
- SCREEN GRAPHICS, SPECIAL PRINTER SYMBOLS†
- SEARCH/REPLACE GLOBALLY OR WITHIN LINES, COLUMNS
- BLOCK MOVE, COPY, DELETE, INSERT. FILE MERGES
- AUTOSAVE, WHOOPS, DIRECTORY, KILL
- SUPPORT FOR **ALL** LISTED PRINTERS IS INCLUDED ** **(NO PATCHES INVOLVED)** **
- SUPPLIED READY-TO-RUN ON "TINY" DOSPLUS
- ALSO RUNS UNDER NEWDOS/80, LDOS, MULTIDOS, TRSDOS

NEWSCRIPT 7.1:	**$124.95**
Mailing Labels Option:	**29.95**
Special: NEWSCRIPT + LABELS:	**139.95**
Daisywheel Proportional Option:	**49.95**
"Pencil"/"Scripsit" File Convertor:	**24.95**
NEWSCRIPT Manual & Reference card only:	**29.95**
Electric Webster + Correction Feature:	**149.50**
Hyphenation Feature for Electric Webster:	**49.95**
Grammatical Feature for Electric Webster:	**49.95**
Dotwriter 3.0:	**79.95**
Dotwriter + Letter Utilities:	**99.95**
6.0 PLUS-Micro Systems Model 4 utility pak	**49.95**

REQUIRED CONFIGURATION:

48K TRS-80, MAX-80, LNW, or compatible, with one or more disk drives. Specify Model I or Model III.

† some features work only if your printer has the mechanical capability.

** Daisy Wheel Proportional is an extra-cost option.

BUILT-IN SUPPORT FOR MOST POPULAR PRINTERS†, INCLUDING:

Anadex, Brother, Centronics. C.Itoh, Diablo, Epson, Gemini, Microline, NEC, Prowriter, Qume, Radio Shack (LP 1-8, DW2, DMP-410, DWP 200-2100), Smith Corona, Teletype, Typewriter, anything compatible with any of these, and many others, parallel and RS-232.

SPECIAL AVAILABLE OPTION: Right-justified proportional for Diablo, F-10, Qume, Spinwriter, etc. Requires "Daisywheel Proportional" Option plus NEWSCRIPT.

REVIEWERS AND USERS AGREE:

"NEWSCRIPT" is the best word procesor I have seen . . . unsurpassed in printer control . . . no other TRS-80 word processor can match its ability to format text . . . its editor is fast, easy, and powerful." *(80 MICRO, Oct. 1982)*

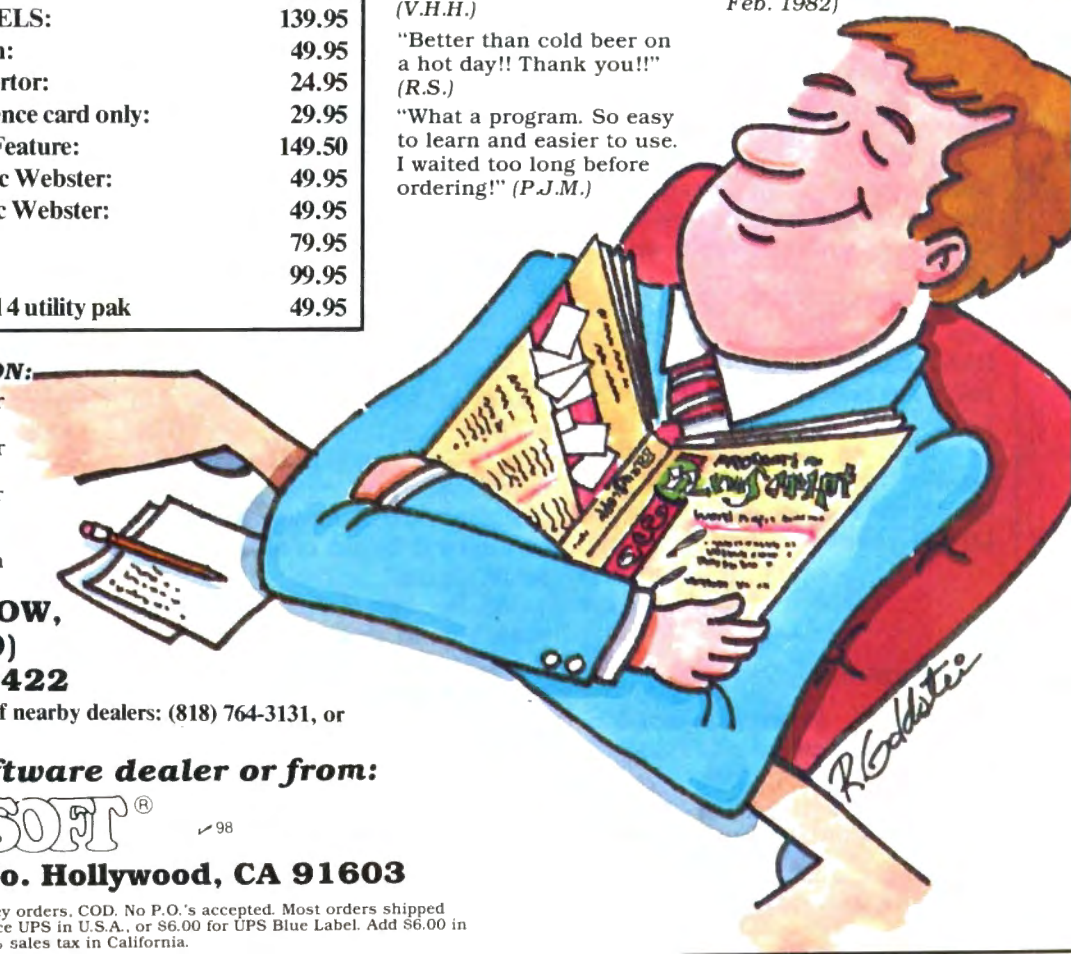
"Your phone information system and the prompt and courteous staff that you provide to help your clients . . . are worth the cost of the system." *(V.H.H.)*

"Better than cold beer on a hot day!! Thank you!!" *(R.S.)*

"What a program. So easy to learn and easier to use. I waited too long before ordering!" *(P.J.M.)*

". . . takes the TRS-80 to a new level of text handling . . . very user-friendly . . . superb documentation, adaptability to many printers and operating systems . . . a standard against which other TRS-80 word processing programs will be judged." *(SOFTSIDE, Dec. 1982)*

". . . ongoing support second to none, with superb documentation." *(80 U.S. Journal, Feb. 1982)*



TO ORDER, CALL NOW, TOLL-FREE: (800) 824-7888, Operator 422

For orders, information, or names of nearby dealers: (818) 764-3131, or write to us.

Order from your Software dealer or from:

PROSOFT® ✓98

Dep't. C, Box 560 No. Hollywood, CA 91603

TERMS: VISA, Mastercard, checks, money orders, COD. No P.O.'s accepted. Most orders shipped within 24 hours. Please add $3.00 for surface UPS in U.S.A., or $6.00 for UPS Blue Label. Add $6.00 in Canada, $15.00 overseas air shipment, 6½% sales tax in California.

National Modem Blues

Regarding the Pulse Train article, "Oklahoma Modem Blues" (November 1983, p. 285), Southern Bell is on shaky ground by attempting to enforce a virtually forgotten 1965 tariff at a time when modem users all over the country are using information networks and bulletin board services (BBS).

Southern Bell could have revised the tariff before enforcing it, thereby reducing the number of irate customers and lawsuits they inevitably face.

At $36.95 per month, who can justify using a BBS, or paying information service time, especially with long-distance rates?

If this is not stopped, it will spread to other states, and you'll be printing another news article, titled "National Modem Blues," in the near future.

Darryl Conrad
College Place, WA

Extend Coverage

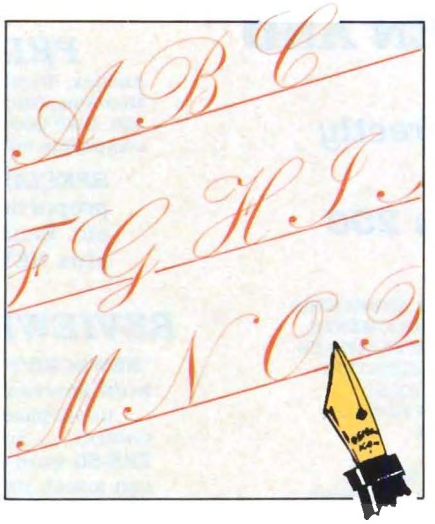
In the November 1983 Side Tracks column (p. 6), Eric Maloney stated that nearly half of *80 Micro*'s subscribers still own Tandy's original Model I.

Is it not, therefore, ironic that in the very same issue, the utility "Extend Radio Shack's Editor/Assember" (p. 248) is the only article for 16K Model I, Level II, cassette-driven machine owners like myself? And wouldn't you know it, the lengthy source listing is one of the few not included on the Load 80 cassette!

Baron de Beer
Monrovia, CA

WordStar Review

Charles R. Perelman's unreasonably favorable review of MicroPro's WordStar (January 1984, p. 108) might mislead a novice into an unwise purchase. WordStar is a powerful



word processor, but other word processors cost much less and are easier to learn and use.

Contrary to what WordStar's promotional material says, what you see is not what you get. Switching from 10-pitch to 16-pitch type between paragraphs looks O.K. on the screen, but WordStar doesn't print the margins properly.

Also, if you expand the typeface in the middle of a line, it looks fine on the screen, but WordStar loses track of the right margin when printing. WordStar's support of special printer features and typefaces is poor.

Communications with the printer for printer typefaces is also complicated. In contrast, a novice can fully install all the features of a new printer in NewScript in about two minutes.

WordStar's commands are difficult to remember, since they are rarely mnemonic. To re-form a paragraph, why use a B instead of an R, as logic would suggest?

The fact that people can and do learn how to make efficient use of WordStar is a testimony to the flexibility, persistence, and adaptability of its users in spite of poor design.

If WordStar were introduced in the current software market, it wouldn't make it at half the price. If WordStar is a premier accomplishment, as Perelman says, it is an accomplishment in marketing, not in usability or cost-effectiveness.

Alex Censor
Del Mar, CA

Bad Advice

The patch published in the December Input column (High Speed POKE, p. 16) puts a program running in the Model 4's Model III mode into 4 MHz. Unfortunately, Mr. Stuart included no patch for disk I/O, which also runs at 4 MHz.

Saving a file of more than 25 records makes the disk operating system lose track of where it is writing and results in a blown directory. The disk is useless because the patch writes a block of data over the directory file.

Printing such patches may be well-intentioned, but the average hacker is not an Assembly-language programmer, nor does he understand the disk operating system that he is affecting.

I feel strongly that this type of thing should be well tested by *80 Micro* before publication.

Francis A. Desimone
Futuraware
Nashua, NH

CP/M Review Reviewed

I must take issue with the two glowing reviews of Omikron CP/M for the Model III by Terry Kepner and John Harrell in the December 1983 issue (p. 61).

I ordered this product shortly after its announcement and waited several months for delivery. When it arrived, I found that the documentation was for a Model I, not a Model III.

Also, you can't use lowercase without a hardware modification, and a dozen useful utilities described in the manual were missing on the distribution disk. The CBIOS provided with the Model III system doesn't support double density and is full of bugs, and

a promised utility to convert TRSDOS files to CP/M format has also not materialized.

Omikron assured me that they would fix everything and would mail me a new distribution disk. I have attempted to contact Omikron twice since then, but have received no response.

Harrell and Kepner describe features and user support lacking in my experiences with Omikron. Because the Omikron CP/M modification has no documentation and no software support, it is useless to me. I hope that Terry Kepner and John Harrell will share with us the secret of getting all that information and support out of Omikron, or perhaps offer copies of those wonderful utilities to those of us who have paid for them and so far have received nothing.

Gary Lee Phillips
Chicago, IL

The Authors Respond

I am sorry that you had problems with Omikron; however, my review reflects the software as I received it.

Terry Kepner
Peterborough, NH

I must stand fast and defend Omikron for their fine products and their reputation for supporting their users.

I reviewed a system for the Model I that I received from Omikron last summer. It worked perfectly and all the utilities mentioned in the Digital Research documentation were present. The heart of the system is the documented features in the DRI manuals.

Five of the 17 programs described in the Software Comments section of the user's manual aren't included on the distribution disk. However, Omikron states in the same section of the manual that some of the programs in that section don't come with the distribution disk—these programs are available on an accessory disk.

Omikron replaced the programs and utilities deleted from the disk with more useful specialized utilities.

I have experienced no problems with the CBIOS routine. Furthermore, I have not found the deficiency in the Model I keyboard driver described by Mr. Phillips.

Obviously Mr. Phillips has had a bad experience with Omikron. However, my dealings with them have been smooth. I hold Omikron in high regard.

John B. Harrell III
Washington, DC

Send correspondence to Input, c/o 80 Micro, *80 Pine St., Peterborough, NH 03458.*

80 ALERT

Occasionally, 80 Micro *receives letters from advertisers who have changed their status, or from readers who have had difficulties with our advertisers. Most of these problems are resolved to the satisfaction of all parties, but some problems appear to be insoluble.*

As a service to our readers and advertisers, 80 Alert posts the names of advertisers we are unable to reach, or who have changed their address or status. Anyone who has current information about a manufacturer or distributor, or who has an advertiser complaint, should write to 80 Alert, c/o 80 Micro, *80 Pine St., Peterborough, NH 03458.*

Since publishing the February 1983 Alert on Omikron Systems (1127 Hearst St., Berkeley, CA 94702), *80 Micro* has been deluged by reader complaints against the company.

Although Omikron issued refunds to customers who complained to *80 Micro* a few months ago, they have not guaranteed refunds to all their customers or delivery of advertised products.

Readers who continue to have problems with Omikron should contact us through this column.

80 Micro has received numerous complaints regarding Micro Price (1100 East Hector St., Conshohocken, PA 19428). Micro Price advertised computers and accessories in *80 Micro* but is not delivering products or issuing refunds.

Readers ordering products from Micro Price received charges to their credit card accounts from Freedom Technology (119 N. 18th St., Philadelphia, PA 19103). *80 Micro* contacted Freedom Technology, and they stated that they are no longer associated with Micro Price. We are unable to obtain further information from either company and have cancelled Micro Price's advertisements.

As of Jan. 1, 1984, Prosoft assumed manufacturing and distribution of Dotwriter, a graphics word processor. Prosoft (P.O. Box 560, N. Hollywood, CA 91603) now provides support and enhancements to registered owners of Dotwriter.

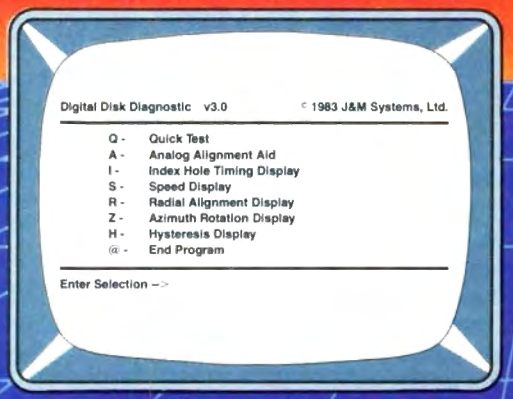
Autel Electronics (146 Wisconsin N.E., Albuquerque, NM 87108) no longer handles sales of Graphics Enhanced Basic. Larry Wiles, of Wilesoft (12100 Rosemont N.E., Albuquerque, NM 87112, 505-299-1275) is now accepting orders by mail or phone.

Briefcase Portable magazine (560 S. Hartz Ave., Suite 447, Danville, CA 94526), a publication for Model 100 owners, solicited subscriptions in several national magazines, including *80 Micro*. However, the company notified us that they will be unable to produce the magazine.

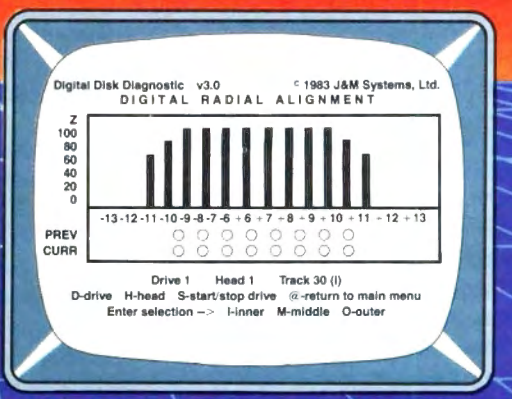
David Gourley, representing *Briefcase Portable*, told *80 Micro* that he hopes to offer subscribers either refunds or subscriptions to another Model 100 magazine, *Portable 100*. Readers with questions should call David Gourley at 415-820-8149 or contact *Portable 100* at P.O. Box 250, Camden, ME 04843.

DISK DRIVE ANALYSIS PROGRAM

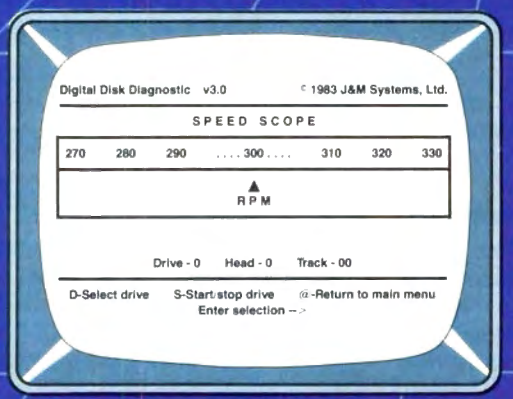
. . . A UNIQUE APPROACH TO DISK RELIABILITY!



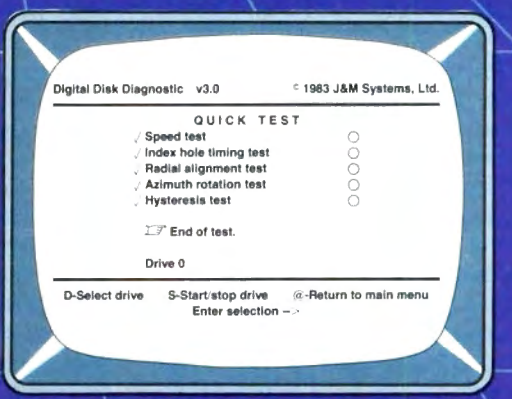
Select any one of seven tests to perform preventive maintenance or to isolate problems. Simple, single-letter commands make DDA easy to use! Use DDA to align the head, adjust the index hole detector, or adjust the speed.



Use the DDA Radial Alignment Test to check the head alignment of your drives. No need for an oscilloscope or other expensive test equipment!



Check the motor speed of your drives. Or, you can even use the Speed Test to adjust the drive speed. No need for any test equipment!



Use the Quick Test to quickly and automatically test five of the most important performance parameters of your drive. Monitor your drives for long term drift. Isolate problems quickly and automatically!

PROTECT YOUR DATA.

Now you can make sure your data is being recorded properly by the use of the revolutionary *Disk Drive Analysis Program (DDA)!*

The *Disk Drive Analysis Program* from J & M Systems, tests your disk's performance and calibration without any additional equipment! It measures your disk's performance and displays it on your screen.

This is the most comprehensive disk diagnostic program available for your TRS-80 microcomputer. You can even adjust drive alignment while watching the display!

Spot problems BEFORE they endanger your data! If you own a disk drive, you NEED the *Disk Drive Analysis Program!*

Now Available For The TRS-80 Microcomputer.

J & M SYSTEMS IS THE DRIVING FORCE!

J & M SYSTEMS, LTD. 101

137 UTAH NE · ALBUQUERQUE, N.M. 87108 505/265-1501

Send any questions or problems dealing with any area of TRS-80 microcomputing to Feedback Loop, 80 Micro, *80 Pine St, Peterborough, NH 03458.*

Q: I've been sorely disappointed to find that my SuperScript and Dictionary programs require a third disk drive for the Dictionary on a data disk document. As a professional writer, I want to put long documents on data disks to keep them separate from my other work and in one piece.

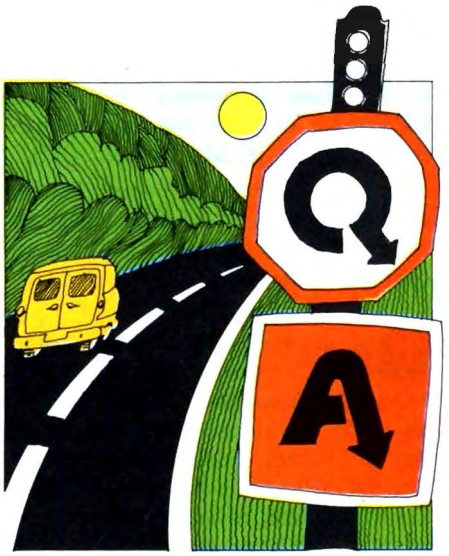
Is there any way to combine SuperScript commands, the Proofread option, and Dictionary on one disk (there's room, I've done it) and make the programs work? It seems that the problem is that the INSTALL/BLD file automatically kills SPEDIT:1, CHECK/CMD:1 and copies PROOF/CTL:0 to PROOF/CTL:1. But by this time they're all on drive zero.

I tried changing the drive number in the INSTALL/BLD file, but I get a File Not Found error when I attempted to use it. Can you help? (N.S., Green Bay, WI).

A: You won't like this, but Radio Shack says it can't be done. In fact, they say you can't fit all the necessary files for both SuperScript and the Dictionary program on drive zero at the same time. WORD/USR is required since it grows as you tell the Dictionary program to learn words.

They suggest that you ignore the SuperScript instructions about using the Dictionary program and use the Dictionary program instructions to use the program as a stand-alone. Put your document files on drive zero with TRSDOS, and the Dictionary program and files on drive 1.

Has anyone else tried combining SuperScript and Dictionary on drive zero and succeeded?



Q: Referring to W.K.'s letter (July 1983, p. 368) we make an 80-track version of TRSDOS 1.3. This DOS will format, back up, etc., to 80 tracks. The stepping rate is 6 milliseconds (ms), but if this is too fast, a patch program (STP6T030/BLD) changes the stepping rate to 30 ms. Furthermore, a TRSDOS version of Superzap is enclosed so that you can transfer password-protected programs to the 80-track disk from a 40-track disk, if a 40-track drive is connected to the computer (e.g., as drive 2).

E-C Data Inc. (Tornevangsvej 88, P.O.B. 116, DK-3460, Birkered, Denmark, phone: +45/(0)2/818191) is a Tandy importer and distributor. In the Scandinavian countries, where TRS-80s are used almost exclusively professionally, the standard disk configuration is single-sided 80-track. (E-C Data, Birkered, Denmark).

A: Thanks for the disk and the information. I'm sure you're going to hear from many people wanting to buy an 80-track version of TRSDOS.

Q: I have been trying for several months to locate a source for the disk version of Microsoft's Level III Basic. The advertisements I've seen for it list a very useful set of functions not available on Radio Shack's Disk Basic: Menu, Chain, Common, Dump, and several other editor enhancements. I'm particularly interested in the Chain and Common commands.

I would appreciate any leads to a Microsoft dealer from whom I could purchase this program. (J.B., Glenview, IL).

A: Have you tried writing to Microsoft Consumer Products (10700 Northup Way, Suite 200, Bellevue, WA 98004, 213-828-8080)? If anyone has Level III Basic, they should. Before you buy it, though, have you considered just buying a new DOS? LDOS and DOSPLUS both have the two commands you're interested in, plus many more.

Q: I have a Model I with two 35-track drives, an expansion interface, an Epson MX-80, and Radio Shack's Modem II. My drives have been acting up; they've even erased the directory on the disk. I was wondering if a program to restore disk directories exists. The computer also has a tendency to reboot suddenly. I've cleaned all the contacts, but with no luck. Please help. (A.W., Montreal, Canada).

A: First, if the directory track has really been totally erased and not just damaged, there's no hope of rebuilding it. You would have to know the locations and lengths of all the files on the disk. Scanning the disk, track by track, wouldn't help since you'd also see the remains of previous, deleted files still on the disk. Also, you would have to know if any given file was in one or more segments. All in all, a very tough and almost impossible task.

On the other hand, if the directory

has just been damaged by the DOS (HIT sector, GAT, or one of the directory entries), then you can use Kim Watt's Super Utility Plus to go directly to track 17, examine the directory, modify it, and then write the corrected information back to the disk. Super Utility Plus even has utilities to repair the HIT and GAT tables with the press of a button. If the actual entries are damaged, you should see enough information left intact to allow you to rebuild the entry correctly. Information on how to do that sort of thing is available in the IJG book *TRS-80 Disk & Other Mysteries* (see address at the end of the column). Super Utility Plus is sold by Powersoft (11500 Stemmons Fwy., Suite 125, Dallas, TX 75229, 214-484-2976, $74.95).

Q: I have a 48K, two-disk drive Model III. I use my computer for data management, and think I've found one I like: Profile III Plus from Radio Shack. My problem is that I previously purchased Scripsit, which doesn't work with Profile III Plus. Only SuperScripsit works with it. Other than buying SuperScripsit (an additional $200 expenditure), do you or your readers have a solution? (W.D., Somerdale, NJ).

A: I haven't run across any better or cheaper solutions. Does anyone know of a possible patch for either Profile III Plus or Scripsit that would make them integrate and work together?

Q: I'm writing in response to J.J.W. of Columbus, IN, who asked about a listing of the Model I Level I ROM (May 1983, p. 384). I have disassembled the contents of the ROM and would be happy to send him a copy. The listing is about 45 pages long. (D.D.W., Cedar Falls, IA).

Here's a copy of my old Level I listing which Racet Computes used to sell. It has some comments by them, and I've made a few pencil scratchings in it myself.

It's interesting to note that a large portion of the code appears to have been lifted from Li Chen Wang's Palo-Alto Tiny Basic, published in *Dr. Dobb's Journal* in its first year of publication. The *Dr. Dobb's* article, and comments in the accompanying listing, can help you understand Level I Basic if you keep track of where the code is the same and where it differs.

An examination of the code seems to reveal no hooks into RAM, such as the jump vectors of Level II. In fact, the programs TBUG and EDTASM cheat to get control! They CLOAD right over the stack area of RAM, putting their entry point where the CLOAD routine expects to POP its return address. So instead of returning to the Basic interpreter, it goes to EDTASM, or your own special-purpose program. (C.M., Dayton, OH).

A: I've forwarded your letters, comments, and disassembly to J.J.W. Thanks for taking the time to drop me a line.

Q: I'm having a problem using 8-inch drives with my 48K Model I. I have two 5¼-inch drives, an LNW 5/8 double-density controller, a Holmes Engineering speedup kit, DOSPLUS 3.4D, two Tandon DS/DD 8-inch drives, an LNW cable adapter, and a two-drive cable with all pins connected. The system is configured with a 35-track 5¼-inch unit as drive zero and the 8-inch DS/DD units as drives 1 and 2.

The problem crops up when using Copy or Transfer: I get Lost Data During Read errors. This occurs most frequently with Verify On, and occasionally with Verify Off. The errors occur only when copying from 5¼- to 8-inch disks or 8- to 8-inch disks; never when going from 5¼- to 5¼-inch disks or 8- to 5¼-inch disks. I also get an occasional Directory Write error when copying from 8- to 8-inch disks.

The 8-inch units arrived with a below-par power supply; however, the problem still exists after bringing the power supply up to specifications. My technician is stumped. (H.W., Albany, GA).

A: Sounds like the difficulty could be the timing in the 8-inch drives. Most copy routines read the data just written for verification. Any discrepancies are reported. The original Model I used a poor timing technique to transfer data from the computer to the disk drive, resulting in Data Lost errors.

This timing problem was associated with the data transfer rate from disk to computer and the rotational speed of the disk drive; they were closely matched. For soft sectored disks, the drives would send out pulses whenever the sense hole passed the detector. If you were unlucky, the pulse would occur before the computer could clear data from the FDC chip register RAM. Result: destroyed data, and the error. The doubler board should have corrected that problem, and did, or you'd be having difficulties with the 5¼-inch drives as well.

I don't know what to suggest, except to contact the LNW and Tandon people and ask for their help. I would guess that the problem is a conflict between the timing of the disk drives and the doubler board. (Are you sure the 8-inch drives are set to the proper rotational and timing specifications?)

Does anyone else have any suggestions?

Q: I have a dual-drive 48K Model III that I use as a remote terminal to the University of South Florida's IBM. Their operating system (WYLBUR) allows for full screen editing if you use a commercial terminal such as a Televideo 912 or IBM 3101.

Is there a terminal program that makes the Model III emulate one of these two terminals, with all their respective features? (G.A., Zephyrhills, FL).

A: I don't know of any emulation programs for the Model III for those terminals. Does anyone else?

Q: Is there an electronic spreadsheet program for my Model I that is equal in performance to the enhanced VisiCalc for the Model III? It appears that Model I owners are stuck with version I of Radio Shack's VisiCalc, unless they upgrade to CP/M. (Christopher Jensen, West Point, NY).

A: I'm afraid I can't help you, I don't know of any spreadsheet programs for the Model I with the enhanced features of the Model III version of VisiCalc. From my research, the closest contender is Microsoft's MULTIPLAN, but I don't know if it's available for the Model I, although it is available for CP/M.

Q: I have a great checkbook program that I've used for several years on my Model I Level II computer. The program came from Exatron.

GIVE YOUR COMPUTER A

VOICE

As Well as a Mind

VS-100
VOICE SYNTHESIZER

FOR RADIO SHACK MODELS
I, III, 4P and Color Computer

Introducing
the "No Compromise"
Voice Synthesizer at a
price that speaks for itself!
Price includes synthesizer, module,
power supply, 40 page manual,
editing and demo software.

Call our "NEW" Demo Hot-Line
☎ 212 296-0399
And hear it for yourself!

VS 100

$69.95

Speaker not included,
add $5.95
Text to Speech software:
- Talker 1.4.....$19.95
- Talker 2.0.....$29.95

An Impressive List of Features:

- Unlimited vocabulary.
- Automatic inflection.
- Proven VOTRAX technology.
- We use the famous VOTRAX SC01 phoneme synthesizer. 4 programable pitch level.
- Built in audio amplifier with volume control.
- You can add voice to any basic program in minutes.
- Super efficient: one single line in Basic will produce a full sentence!
- Works with any speaker (or add $5.95 for handsome speaker module).
- Price breakthrough: same performance as units costing hundreds of dollars.
- Voice editor will help you create unlimited number of words, sound effects, etc.
- Hundreds of applications—now cost effective in education, robotics, speech therapy, monitoring, games, aid to handicapped, security, prompting...
- Fully assembled and tested.
- Ready to plug in and talk.
- Plugs into 50 pin I/O bus on Model 3
- As usual our 15-day money back guarantee protects you

Text to Speech Software for the VS-100

TALKER 1.4

- ✓ Unlimited vocabulary translation of English text to speech
- ✓ Very easy to use: In BASIC simply type PRINT"I talk"
- ✓ Reads numbers up to 999 trillion
- ✓ Reads many abbreviations correctly (such as Mrs., Mr., lb., Co., etc.)
- ✓ Very fast machine language program is only 4.5K long
- ✓ Loads in high memory

Only $19.95. Specify disk or tape

TALKER 2.0

NEW!

- ✓ Same features as TALKER 1.4 plus:
- ✓ Automatic keyboard echo option
- ✓ Automatic video display echo option
- ✓ Punctuation pronunciation if desired
- ✓ And many control codes for increased versatility
- ✓ Self relocatable program is only 6¼K long
- ✓ New BASIC command: PRINT! prints and talks.

$29.95. On disk only

ALPHA Products

79-04 Jamaica Ave., Woodhaven, NY 11421 (212) 296-5916

Toll Free Order Line
800-221-0916
Orders Only. NY & info call (212) 296-5916.
Hours: 9-5 Eastern Standard Time

Add $3.00 Per Order For Shipping And Handling. We Accept Visa, Mastercard, Checks, M.O. C.O.D. Add Sales Tax. Overseas, FPO APO; Add 10% Dealer Discounts Available C.O.D. add $3.00 extra.

My problem is that it won't work on my upgraded 48K dual-disk Model III. I can load and save the program easily, but trying to run it just locks up the computer.

I'm anxious to get this program up and running. Enclosed is a printout of the first few lines of program logic flow. Can you help? (Harvey Hunter, Bainsbridge Island, WA).

A: The problem is that your program contains POKE and PEEK commands. On the Model I these were probably required to get the program to interface properly with Exatron's Stringy Floppy system. On the Model III these commands mess up the computer, since the linkage points in the Model I and Model III are in different locations.

I would first remove the POKE and PEEK commands and see what happens. You will have to be selective about what you remove, however, since it's obvious that some of the POKEs are used to put machine-language subroutines in string variables, notably R$, G, H, S$, and Y$. These are indicated by the use of the VARPTR command. Start by removing the POKE and PEEK commands one at a time until you can get the program to run at least partially. Then just experiment.

Q: Have you ever published a disassembled listing of the Model I ROM? Have you ever published a disassembler? I'm interested in scrolling information on my screen while keeping a stationary header. (Glen Myers, Meridian, MS).

A: No, we've never printed a disassembly of the Model I ROM, but a disassembler was published in the July 1981 issue ("A Basic Disassembler," p. 244), with an update in the February 1982 issue (p. 28).

As for scroll protection, refer to the February 1982 issue for an article on that subject. ("As the Screen Scrolls," p. 264).

Q: I have a 48K Model I with two Pertex FD200 40-track drives, the Percom Doubler, and the Omikron Mapper I. TRSDOS works fine, NEWDOS80 1.0 and 2.0 work fine, and so does the double-density.

CP/M works fine on drive A, but whenever I access drive B by any command, it takes 21 seconds before getting anything to show up on the screen. Once the read starts, it works fine as long as the light stays on (copying from drive to drive is fine once it starts). If the light goes out, another 21 seconds pass before the drive completes the access.

I've cleaned all the contacts, removed and installed the Omikron and Percom boards, swapped drives, and tried the Terminal Resistor Pak on drives A and B. I get the usual reply from Omikron and Radio Shack: "It must be something wrong with their equipment because we've never had that problem before."

I took the case off drive B and watched the read/write head during the 21 seconds; it doesn't move. Once it does, I start getting information on the screen. (J. Haynes, Palmer, TX).

A: The only question I have is: Do you mean that no matter which drive is in the B position, you get the same result, or do you mean that only the one drive has problems, regardless of its position?

If the first is the problem, have you checked your drive cable for problems? What about the disk controller edge card connection? Is it clean? Are you using a keyed cable (Radio Shack cables have pins removed from the connectors so that the position of the drive on the cable determines the drive number)? Or are you using a full cable (no teeth pulled)?

Since you say everything works fine in a normal TRSDOS environment, I'd suspect the Omikron board, if the disk cable checks out okay. But I can't really offer any more than that because I don't know much about the setup of the Omikron board.

If the problem is just one drive always fouling up, the problem is probably the drive itself.

Q: In the June 1983 column you printed a letter from a reader in Port Richey, FL (p. 349) complaining about video swaying. I had a similar problem with video jiggling, which I suspect may be common and your readers should know about.

Shortly after buying my Model I, I noticed that the video display sometimes shook. I also noticed that the problem would go away if I tapped the video plug socket. I took the unit to Radio Shack several times, but several days after getting the computer back, it would act up again.

After the warranty expired I opened the computer case and traced the problem to a noisy trimmer potentiometer (R20), used to locate the display horizontally. Cleaning the potentiometer with contact cleaner solved the problem. (Bill Premerlani, Scotia, NY).

A: Thanks for the information.

Q: This concerns a short program you had in the June 1983 Feedback column (p. 346). The program was designed to assist in converting from hexadecimal to decimal and back. I had no trouble with the first part (decimal to hex), but the second has a symbol in line 330 that I can't find. The symbol is the left bracket [. Is this a typo? What is the correct symbol?

I began purchasing *80 Micro* because I can convert so many of the programs to Applesoft with the *Radio Shack Conversion Book*. (Frank Grimes, Hot Springs, VA).

A: The symbol is supposed to be an up arrow, for exponentiation. Due to a flaw common to all printers, the up arrow is printed as a left bracket. For your conversion, substitute the proper Applesoft character for raising a number to a power.

Q: I have a Model II and an Epson MX-80 printer. I get a random six-line skip in printing both program output and in listing programs. Any ideas? (Robert Goodman, Houston, TX).

A: Are you sure it's random? In a program listing, your MX-80 automatically makes a line feed and carriage return when any line exceeds 80 characters. So, even though your Model II thinks it's sending 60 lines per page, it's actually sending more than 60 lines if any of those lines exceed 80 characters. (Are you using the Forms command?)

The other possibility is that the MX-80 is performing a form feed after receiving a control character sent by the Model II, which you may not notice being sent.

I can't really say more with the sketchy information you gave me.

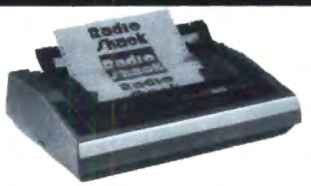
From Computer Plus to YOU . . .

PLUS after PLUS after PLUS

Model 100 8K $679
Model 100 24K $835

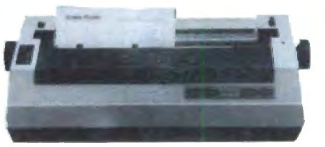
Color Computer II 16K $135
w/16K Ext. Basic $165
w/64K Ext. Basic $210

Model 4 16K $849
Model 4 64K
2 Disk & RS232 $1699



DMP120 $395
DMP200 $520

Color Computer Disk Drive
Drive 0 $329 Drive 1 $235



DWP210 $629

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS	
Model 4 Portable 64K 2 Drives	1525
Pocket Computer 2	165
Pocket Computer 3	89
Pocket Computer 4	59
Model 2000 2 Drive	2299
Model 2000 W/Hard Disk	3599
Model 12 64K 1 Drive	2699
Model 12 64K 2 Drive	3375
Model 16B 1Dr 256K	4249
Model 16B 2DR 256K	4915
MODEMS	
Hayes Smartmodem II	225
Hayes Smartmodem 1200	539
Novation Smartcat 1200	410
Novation J-Cat	115
AC-3	129
DC Modem I	89
DC Modem II	160

PRINTERS	
Silver Reed EXP500 D.W.	425
Silver Reed EXP550 D.W.	575
Daisy Wheel II	1745
DWP410	1159
DWP210	629
CGP115	159
CGP220 Ink Jet	545
DMP110	305
DMP420	735
DMP500	1219
DMP2100	1689
Gemini 10X	300
Delta-10	470
Gemini 15X	405
Prowriter	379
Prowriter II	649
Okidata	CALL
Epson	CALL
DISK DRIVES	
Model III/4 Drive 0	515
Model III/4 Drive 1	195
Model III/4 Drive 2	289
Model III/4 Drive 3	259
Primary Hard Disk M12	2689
Primary Hard Disk MIII	1799
ETC.	
CCR-81 Recorder	52
Cassette Tapes (10 Pk)	9.95
16K Ram Chips	25
64K Ram Chips	75
Model 4 64K Upgrade Kit	140
M100 Bar Code Reader	89
64K Printer Buffer	199
Printer Stand	25
Printer Cables	
Printer Ribbons	
Printer Paper	
Dust Covers	
Computer Books	
Radio Shack software 10% off.	
Send for complete listing of brand name software and hardware.	

CALL TOLL FREE
1-800-343-8124

- *LOWEST POSSIBLE PRICES*
- *BEST POSSIBLE WARRANTY*
- *KNOWLEDGEABLE SALES STAFF*
- *TIMELY DELIVERY*
- *SHOPPING CONVENIENCE*

VISA AMERICAN EXPRESS MasterCard

computer plus

P.O. Box 1094
480 King Street
Littleton, MA 01460

SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

18

TRS-80 is a registered trademark of Tandy Corp.

Q: I've found that in this business of computer repair, there are as many methods of repairing as there are technicians.

Mr. R.G. of North Hollywood, CA (July 1983, p. 364), has an interesting problem concerning a Model I with a 35-track drive. He didn't mention whether or not he has the expansion interface with the buffered cable. I have found that the buffered cable can also cause the problem he described.

Sometimes the crimp connections at the box can work loose, making intermittent connections which translate to noise. One crude way to test for this is to grab the cable and shake the black buffer box up and down. If loose connections are the problem, the computer locks up. It's also possible for the ICs in the black box to go bad. There isn't much to the buffered cable, so you might as well try to fix the problem yourself. If you can't, just buy a new cable. If you do fix it, you've saved yourself about $70.

RAM problems can also cause the same problems. With RAM selling for as little as $15, every computer owner should have a spare 16K set. And don't forget that there are many different ways for RAM to fail, so no one test will prove RAM to be good, it can only prove when RAM is definitely bad. (Ron Kiyomura, Huntington Beach, CA).

A: Thanks for your suggestions.

Q: Other than Radio Shack, are there any other suppliers who make an RS-232 board that plugs into the Model I expansion interface? (Dave Anderson, Los Angeles, CA).

A: To the best of my knowledge, no one else makes an RS-232 plug-in board for the Model I. There are several manufacturers who make outboard RS-232 boards, but most require some type of additional expansion box for the board.

Q: I've just encountered a problem with my Model III computer. I purchased two programs, Home Accountant and The Nodvill Diet Program, and both refuse to work right. Each time I try to open a file through the main menu, I get a Bad File Mode error. I took these programs to a friend and tried them on his machine, and they ran perfectly. Any ideas? (Jentzen Bull, New Bern, NC).

A: The error message you get means that you either don't have any disk file buffers available, or that the files the program is trying to open are of the wrong type (the program is trying to use a sequential file as a random file, or vice versa).

In the first case, how do you answer the Files? prompt? If you're using TRSDOS, just pressing the enter key should open three files for you, but if you're using another DOS, it might not open any buffers for disk I/O unless you specify a number.

The other case might just be an accident. The programs are trying to use a file name for input or output of a file that already exists, but of the wrong type. Did you put these programs on a disk with other programs, ones that might conflict with your programs?

Check out these possibilities before concluding that your computer is broken.

Q: I have an old-style Model I (three satellite ROMs) with a late-model expansion interface: The Patch and The Font from Hacks in Texas. It has worked fine until recently when I added a half-size 1 5/8-inch disk drive. It lasted about three hours and then refused to read or write. I returned the drive to the place of purchase and got a replacement. The new one worked while it was cool, but when I tried to back up my DOS it gave me "Cannot Backup Due To Error." From then on it has refused to work right.

I took the drive to a friend's house and tried it out on his keyboard (my drive and interface) and everything was OK. But when I tried to use my keyboard with his interface and disk drives, I got the same errors as with my system.

We took apart my keyboard, checked the voltage on R10 and R5, and set them to the voltages specified in the technical manual. Unfortunately, that didn't help. I've cleaned all the contacts and don't know what else to do. (E.A. Tampasis, Decatur, IL).

A: The first thing to do is to get an IC puller and remove Hacks' The Patch and The Font. With these removed, try your computer disk system. If it works, the problem is a conflict between Hacks' chips and the disk system. If the problem still exists, you'll have to take the system to Radio Shack and ask for their assistance. Assuming that you've made no other alterations to your computer system, these are your only solutions to the problem.

Q: J.H.H. in the July Feedback Loop (p. 366) complains about the automatic form feed on Scripsit. This is caused by the default command for the page length and can be controlled by specifying a page length before printing (this isn't a solution, just a suggestion).

I have often limited the bottom margin and page length when specifying the instructions at the start of a document. If it still goes beyond, I use the command sequence BREAK, P, comma, P. This helps, but it doesn't solve the problem. (Ralph Anderson, Holton, KS).

A: Thanks for the advice.

Terry Kepner is a freelance writer and programmer, and the vice-president of Interpro. He's been writing about microcomputers since 1979.

Frequently Needed Numbers

Radio Shack, National Parts Division, 900 East Northside Drive, Fort Worth, TX 76102, 817-870-5662. M/C and Visa accepted, each order has $1.50 handling charge.

IJG Inc., 1953 W. 11th St., Upland, CA 91786, 714-946-5805. Publisher of *TRS-80 Disk and Other Mysteries* ($22.50), *Microsoft Basic Decoded and Other Mysteries* ($29.95), *The Custom TRS-80 and Other Mysteries* ($29.95), *Basic Faster and Better* ($29.95), *Machine-language Disk I/O and Other Mysteries* ($29.95), *TRSDOS 2.3 Decoded and Other Mysteries (Model I)* ($29.95), *How to do it on the TRS-80* ($29.95), and the Electric Pencil Word Processor ($89.95).

THE WAIT IS OVER

CP/M®

EXCLUSIVELY FOR THE

TRS-80® Model 4

Now, for the first time, unleash the powerful features resident in your Model 4 computer. Open up the vast store of CP/M software such as WordStar®, dBASE II and Multiplan™, along with thousands of others.

- Includes INTERCHANGE ™, a utility that allows reading, writing and copying 20 different manufacturers' disk formats such as IBM, KAYPRO, OSBORNE, XEROX, etc.
- Includes MEMLINK™, a unique feature that uses the optional 64K RAM memory as a fast disk drive.
- Complete with all these CP/M utilities; ASM, DDT, DUMP, ED, LOAD, PIP, STAT and SYSGEN.
- Operates at the 4Mhz clock in the standard Model 4 mode.
- NO HARDWARE MODIFICATIONS. Just insert the disk and boot.
- NO COPY PROTECTION. Backups may be made for your own use and protection.
- The CONFIGURATION program supports a full range of 5-1/4'' disk drives: 35, 40, 77 and 80 tracks, single and dual sided in any combination as well as the standard Model 4 drives.
- Includes MODEM 7, a powerful public domain communications program for file transfer and remote data base access such as CompuServ and the Source.
- Supports 80 x 24 video, reverse video, direct cursor addressing and more.
- Utilizes the Model 4 function keys and allows user defined keys.
- Auto Execute command for turnkey applications.
- FORMAT utility permits up to 52 disk formats to be constructed, all menu driven.
- Fast backup routine with verify for mirror image copies.
- All support programs are menu driven for ease of use.
- Ready to run in the standard 64K Model 4. The additional, extra cost, 64K RAM upgrade not required.
- Complete with over 250 pages of comprehensive user documentation.

AVAILABLE NOW FOR IMMEDIATE SHIPMENT.....$ 199.95

The full line of MicroPro software is now available formatted for the Model 4 using our CP/M. Each disk is already configured and ready to run. Just install the printer of your choice and go.

WordStar® Fast memory mapped version	$250	InfoStar™ Advanced DBMS	$250
MailMerge® Multi-purpose file merging program	125	ReportStar™ Report generator & file manipulator	175
SpellStar® 20,000 word proofreader on a disk	125	DataStar™ Data entry and retrieval package	150
StarIndex™ Creates index and table of contents	95	SuperSort® Fast and flexible sorting is yours	125
WordStar Professional. All the above for only	450	CalcStar™ Advanced electronic spreadsheet	95

ORDER INFORMATION

Call now and your order will be shipped at once from our Dallas warehouse. We accept American Express, MasterCard, Visa, and most any other form of payment known to man. Credit cards are not charged until your order is shipped. Add $4 UPS surface shipping and handling on orders within the 48 States. No State Sales Tax on software or shipments delivered outside of Texas. No refunds. Defective items are replaced upon return, postpaid.

ORDER NOW . . . TOLL FREE

800-527-0347

800-442-1310

The Toll Free lines are for orders only.
Specifications subject to change without notice.

128K MEMORY UPGRADE

Our upgrade includes 64K of 150nsec RAM, genuine PAL® chip and instructions for installation. This kit will upgrade your 64K Model 4 to 128K and allow the use of our MEMLINK and TRSDOS 6.x MEMDISK. Comes with a full 1 year guarantee.

A BARGAIN AT ONLY $99.95

© Copyright Montezuma Micro 1983

CP/M is a Trademark of Digital Research, Inc.; Interchange and Memlink are Trademarks of Montezuma Micro; TRS-80 is a Trademark of the Tandy Corporation; WordStar, MailMerge, SpellStar, StarIndex, InfoStar, ReportStar, DataStar, SuperSort and CalcStar are Trademarks of MicroPro International Corporation. Multiplan is a Trademark of Microsoft.

AD #883

MONTEZUMA MICRO

214-339-5104
Redbird Airport, Hangar #18
P.O. Box 32027
Dallas, Texas 75232

411

VISA MasterCard AMERICAN EXPRESS

"WE KEEP YOU RUNNING"

There's Nothing New At Home

The low-end market looks to a quiet '84.

edited by Eric Grevstad

When Coleco's Morton Handel told *USA Today*, "1984 is a return to reason and rationality," English majors frowned at his redundancy but industry analysts nodded in agreement. The home computer market, after a rollercoaster of sales and shakeouts in 1983, is settling down for a conservative new year.

The first trend in home computing, to which Handel was referring, is stable prices. Even amid mass marketers like K Mart or Toys R Us, sobering memories of TI and Mattel misfortunes and IBM's discount-defying PC*jr* prices have effectively ended 1983's price wars.

Low-end micros are inexpensive, but they're no longer so cheap as to cut profits or make buyers think in terms of toys. Commodore has more or less established standards of 64K and $200; no successful entrant offers less memory, and none has a lower price. Customers want more than 16K computers, and they're suspicious of $100 ones.

Second, today's home computers aren't technical marvels. High-end systems like Tandy's Model 2000 are racing to blaze new design trails, but low-end manufacturers seem agreed that 8 bits plus a few bells and whistles will do fine.

There's a possible exception—this summer could bring limited U.S. availability of Britain's Sinclair QL, which promises 128K RAM, two tape storage drives, built-in word processing, spreadsheet, graphics, and data base programs, and Motorola's 32-bit 68008 CPU, all for $499. Other than that, though, the most innovative machine in the field is IBM's PC*jr*, dull as a blue business suit except for its 8088 CPU and four-figure price.

Commodore's 264: Something old, something new.

The industry's new conservatism was highlighted at Las Vegas' Consumer Electronics Show (CES) in January, where a much less staid company than IBM—Commodore—showed a long-awaited machine that turned out to be equally conventional.

Of the three leading low-end contenders, two—Commodore and Tandy—are sticking to their guns. The third, Coleco, is trying to recover from shooting itself in the foot.

The New Commodores

Besides rumors of money problems, unhappy dealers, and revolving-door management, Commodore gossip had centered for months on the successor to the best-selling C64 home computer. Some industry insiders predicted a bundled hardware system similar to Coleco's Adam; others expected a 16-bit, 256K micro for $500. More cautious onlookers mentioned the "Commodore 128."

And there was a lot of talk, even as the $200 C64 was stomping low-end rivals into oblivion, that Commodore would drop it overnight, that the new machine would be incompatible, and that the growing C64 support and software industry would be stranded.

As it turned out, the gossipers batted about .500. The new Commodore 264, introduced at CES, comes with software but no hardware. It doesn't replace the C64, which will continue as Commodore's low-end machine (no one gives a nickel for the VIC-20's chances of continued production). And it's not C64 compatible, even though in many ways it's a repackaged version of the older model.

There's the same 64K RAM, though more of it's available for use (60K for Basic programming), and the keyboard's a bit different (seven function keys, a help key, and cursor movement keys arranged in a diamond pattern). Also, the C64's sprite graphics and advanced sound capabilities are missing, as the 264 is intended for serious applications instead of games.

The biggest difference between the new and old Commodores is firmware: The 264 was code-named TED, after its Text Editing Device chip. While an "empty" one will sell for around $300, models in the $500 range will feature built-in word processing or spreadsheet programs.

The top of the line, the V364, has a novel feature: speech synthesis, with a 250-word vocabulary for such remarks as "Good shot" or "Your printer is not ready." A more powerful vocabulary can be loaded from cartridges or disks.

In addition, Commodore promises a wide range of cartridge, disk, and tape software, including a 1-2-3 imitation called 3-Plus-1 (which offers a word processor, spreadsheet, DBMS,

When you need uncommonly good software, Smallware™ delivers.

Whatever your Radio Shack® computer, we have the utilities and enhancements just for you.

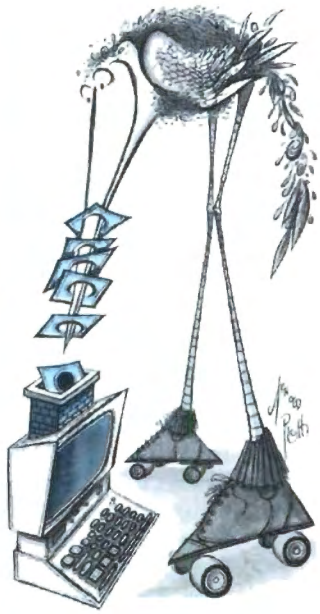
Smallware Reference Guide for Radio Shack Models

Key	
✔	Call Small Computer Company to order.
☎	Call Small Computer Company for availability.
P	Built into Profile.®
RS	Available through Radio Shack.

Smallware	Description	Model 2000	Model 16	Model 4	Model III Hard Disk	Model III	Model II/12
Profile	The definitive, easy-to-use data base manager.	☎	RS	RS	RS	RS	✔
Advanced File Definition w/Shuffle	Revises your fields without losing your data.	P	P	P	☎	☎	✔
Archive	Cleans up files, splits data bases, frees storage space, and more.	P	P	☎	✔	✔	RS
Display	For reviewing reports prior to or instead of printing.	P	P	☎	☎	☎	✔
8 Line Reports with Math	Allows up to 8 lines of data for each record, plus many math features.	P	P				✔
Forms	Prints forms up to 13″ × 11″ with super- or subscripts, trademarks, etc.	P	P	☎	✔	✔	RS
Lookup	Cross-references up to five files into a sixth.	P	P	☎	✔	✔	RS
Math 64	For calculation of up to 64 math formulas per file.	P	P	☎			✔
Math Upgrade for Forms	Does math within forms while you print.	P	P				✔
Prosort	Selects by up to 16 criteria and sorts by up to five.	P	P	P	P	✔	RS
Propack™	For easier-to-write and faster-running BASIC programs.			☎	☎	✔	✔
Quikback™	Formats, backs up and checks for errors in minutes.					☎	✔
Transfer	Transfers data between Radio Shack computers.			☎	✔	✔	✔
Customer Service	Three months included free with each purchase.	✔					✔
Extended Customer Service	Extended service plus *Smalltalk* newsletter. Call for details.	✔	✔	✔	✔	✔	✔

If you're a Radio Shack computer owner who wants speed, versatility and ease-of-use (and who doesn't?), take a moment to review our list of enhancements, extensions and utilities.

Developed by The Small Computer Company, creators of Profile,® these important tools will dramatically improve your operation by broadly expanding capabilities—simply and efficiently.



To order, call (800) 847-4740. For customer service or when dialing in New York state, call (212) 398-9290. Ask for Smallware sales. *Visa and MasterCard accepted.*

MONEY BACK GUARANTEE
These highly sophisticated, simple-to-use products have been developed to meet and exceed the most rigid standards. If not completely satisfied, return all unopened disks for a full refund.

The Small Computer Company, Inc.

230 West 41st Street, Suite 1200, New York, New York 10036 ↙245

Smallware, Propack and Quikback are trademarks of The Small Computer Company, Inc. Profile and Radio Shack are registered trademarks of Tandy Corporation.

Tandy's CoCo 2 was a Christmas bestseller.

and graphics) and a mini-Lisa environment called Magic Desk.

The 264 and V364 were almost upstaged by Commodore's founder, president, and chief executive officer, Jack Tramiel, who announced his resignation from the firm on Jan. 13. Tramiel, who's made Commodore's reputation as a price-slashing, president-shuffling company, said that its booming success ($1 billion in 1983 sales) called for a "professional executive" rather than an entrepreneur at the helm.

At press time, his successor was said to be Marshall Smith, U.S. chief executive officer of the Netherlands' Thyssen-Bornemisza, a shipbuilding and transportation firm.

The New CoCo

Radio Shack doesn't release sales figures, but the Color Computer apparently had a sensational Christmas. Gossipers' estimates of seasonal CoCo sales range up to 800,000 or more units, thanks to price cuts for the regular and Extended Basic versions of the 16K Color Computer 2 (down to $159.95 and $199.95 respectively).

To stay competitive with Commodore in the new year, Tandy replaced the original CoCo, selling for $399 in its white-cased, 64K incarnation, with a 64K version of the compact CoCo 2.

The CoCo 2 doesn't come with software, but it could do a lot to end Tandy's reputation for premium pricing: For $259.95, $60 more than a C64 picked up at a discount house, buyers can get Radio Shack's 6,500 U.S. stores and service outlets behind them.

Coleco is struggling against a brushfire of reports describing Adam as an Edsel.

Coleco Versus Coleco

Finally, service was very much on Coleco's mind, as Adam's manufacturer added a network of repair centers, operated by Honeywell, to its toll-free buyers' phone line. Coleco is struggling against a brushfire of reports describing Adam as an Edsel; stories of Adams dead in their boxes are everywhere, and *Consumer Reports* tried four units and couldn't get the word processor to work in any of them.

J.C. Penney Co. said it canceled its order for Adams after machines "repeatedly failed to meet quality standards." Penney then dropped out of home computer sales altogether, saying that it couldn't compete with discount chains and toy stores.

Financially, then, home computer makers are playing it cool (see "Great, Good, Fair, Poor," later in this section, for figures); technically, they're polishing existing designs. As for buyers, the new conservatism adds up to one thing: People have stopped wondering or worrying about home computers, and have started simply using them. ■

Clash of the Titans

Big Blue, meet Big Bell.

Tandy and Apple are mighty rivals, but a duel should begin soon that'll make theirs look like a petty squabble: The one company big enough to worry Big Blue, AT&T, is heading full-tilt into the computer business, and IBM has launched a crash program to meet the challenge.

Belatedly turning to computers after its Jan. 1 divestiture broke its iron grip on telephone service, AT&T plans to introduce 30 computer business products in 1984. The powerful 3B minicomputers the Bell System companies use will be available to outsiders for the first time, and a desktop version of the 3B, expected in April or May, might be the IBM PC's nemesis.

(The *Wall Street Journal*, overlooking such entries as Apple's Lisa and Tandy's 2000, reports, "Some analysts say [the 3B] represents the first serious challenge to IBM in the desktop market.")

In addition, AT&T is moving quickly to market by putting its stamp on established products. Their logo will appear on equipment supplied by Convergent Technologies, a Santa Clara, CA, manufacturer of micros and superminis sold under Burroughs, NCR, and other brand names.

AT&T has also bought 25 percent of Olivetti, gaining access to the office equipment firm's sizable sales and distribution network in Europe, and is rumored to be planning a cooperative

Last month's Pulse Train promised a look at MS-DOS software publishers and their plans for Tandy's Model 2000. That story will appear next month, in the first of *80 Micro*'s special Model 2000 sections.

agreement with Wang Laboratories Inc.

"We'll be making product announcements all through 1984," AT&T Information Systems' Tom Holub told *InfoWorld*. "We know where we think the money will be in the future. We know where we have a unique capability."

Of AT&T's forthcoming lineup, Holub said, "It's mostly business-oriented stuff. It's not really home-computer kinds of things. But the expertise we have can lead us into other markets as well."

Besides expertise, AT&T has history behind it. The company's hardware resources, with their ties to Bell Laboratories, are awesome; its 32-bit Bellmac microprocessor, for instance, is said to beat any Zilog or Intel chip on the market.

As for software, AT&T has the clout to make its operating system an industry standard. To frighten an IBM executive these days, don't say "Boo," say "Unix."

According to the *Journal*, "About 150,000 skilled computer programmers and professionals have learned Unix in school and are devoted to it." The Bell Labs-designed DOS has been gaining steadily in the multi-user office market; over 50 manufacturers license Microsoft Corp.'s version, Xenix, alone.

According to Kenneth Bosomworth, president of International Resource Development Inc. (a Norwalk, CT, market research firm), Unix's success is bad news for IBM. "It has now become important to IBM that Unix, or at least the AT&T version of Unix, not become an industry standard that will dictate IBM's future hardware and software," Bosomworth told *Micro MarketWorld*.

To that end, he said, IBM shifted in late December from an uncoordinated software development strategy, with different groups of engineers working on Unix versions for different IBM machines, to a concerted effort to develop a proprietary operating system—or, more accurately, three proprietary operating systems for each of IBM's three main hardware configurations, codenamed Nina, Pinta, and Santa Maria.

The trio, Bosomworth says, will consist of "software superstructures, capable of running other operating systems beneath them, including MS-DOS and a new Unix-like design." Nina, said Bosomworth, is scheduled for launch in the third quarter of this year, aboard IBM's new multi-user micro called Popcorn.

On the hardware front, there's talk that Big Blue will counter Tandy's and others' 80186 micros with a second-generation PC, built around Intel's even hotter 80286. The 80286 has multi-user capabilities; whether the new PC is the same machine as Popcorn is unclear.

Until Nina, at any rate, IBM is climbing aboard, or at least trying not to be run over by, the Unix bandwagon: Personal Computer Interactive Executive, a $900 system scheduled for April debut, is a Unix look-alike developed for IBM by Interactive Systems Corp. of California.

Whether due to AT&T paranoia or not, IBM's move to its own operating systems comes as no surprise. Industry gossipers and jealous competitors have said for a year that IBM would eventually drop Microsoft and go it alone.

Microsoft, for its part, is preparing for whatever the two titans do. Future versions of MS-DOS are expected to become more and more like Xenix. ■

Swimming, Boating, and Beeping

TRS-80s go to camp.

by Mike Benton

In the old days, parents went to plush vacation resorts and kids went to woodsy summer camps; today, both Club Med and Camp Weehauken give lessons in Basic. This summer, almost 100,000 children and adults will attend computer camps featuring hands-on practice in everything from Logo and Assembly to word processing and robotics. At over 30 camps, the machines they'll put their hands on will be TRS-80s.

If you or your children are considering a computer camp this summer, one that features Radio Shack micros might be a good choice. You'll learn more about TRS-80 programming and problem-solving tricks and techniques, and you'll be able to apply your new skills as soon as you get home. Also, many camps try to provide the latest equipment, letting you try out new programs and peripherals before you buy them.

And, since you already know the basics of booting up and running TRS-80-compatible software, you'll have a head start on other campers during the first few days, and can get right to work on programming and special projects.

To help you choose a TRS-80 camp, here's an alphabetical (by state) listing of 33. Some of these offer Apples, IBMs, or Commodores in addition to Model IIIs, 4's, or CoCos; some use Tandy machines exclusively.

Prices quoted are per session. Contact the camps for details and their latest dates and prices before making your summer plans.

California

Concord (Lake Tahoe area): Odyssey Academic Camp, 5007 Concord Blvd., Concord, CA 94512, 415-687-6851. Ten one-week sessions ($345), mid-June to mid-August. Sessions may be combined for extended stay.

Modesto: Foothill Horizons, 801 County Center Three Court, Modesto, CA 95355, 209-571-6596. Three five-day sessions ($200), mid-June to mid-July. Weekend stay between combined sessions, $40. Some financial aid available; discount for additional students from the same family.

Connecticut

Lakeside (Bantam Lake): Awosting Camp for Boys, Ebner Camps Inc., Bantam, CT 06750, 203-567-9678. Full session ($1,795) June 1–Aug. 25; two half sessions ($950) June 1–July 28, July 29–Aug. 25.

Simsbury (Westminster Prep School): National Computer Camps, P.O. Box 585, Orange, CT 06447, 203-795-9667. Five one-week sessions ($360), early July to early August. Each additional week, $390 including weekend stay.

Washington (Mt. Tom Lake): Chinqueka Camp for Girls, Ebner Camps Inc., Bantam, CT 06750, 203-567-9678. Full session ($1,795) July 1–Aug. 25; two half sessions ($950) June 1–July 28, July 29–Aug. 25.

Computer campers: Nature hikes through RAM.

Georgia

Atlanta (Oglethorpe University): National Computer Camps, P.O. Box 585, Orange, CT 06447, 203-795-9667. Four one-week sessions ($360), early July to early August. Each additional week, $390 including weekend stay.

Illinois

DeKalb: NIU Computer Camp at DeKalb, College of Continuing Education, Northern Illinois University, DeKalb, IL 60115, 815-753-1454. Seven one-week sessions starting in mid-June. Residential sessions $270; day sessions $230.

Oregon: NIU Computer Camp at Loredo Taft. Same address and prices as above.

Louisiana

Monroe: Northeast Louisiana University Computer Camp, Mathematics Dept., NLU, Monroe, LA 71209, 318-342-2186. Two one-week sessions ($175) in June.

New Orleans: Loyola University Microcomputer Summer Camp, Box 14, Loyola University, New Orleans, LA 70118, 504-865-3530. Four two-week sessions ($325) beginning in June. Some scholarships available; discounts for two or more students from the same family and for additional sessions taken by the same student.

Ruston: Louisiana Tech Computer Camp, Continuing Education, Box 3182, Ruston, LA 71272, 318-257-3848. Three two-week sessions, June 3–15 and July 8–20 (for overnight campers; $450) and June 18–29 (for commuter campers; $250).

Maine

Oakland (Belgrade Lakes region): Camp Manitou for Boys, 10 School Masters Lane, Dedham, MA 02026, 617-329-8048. Four-week ($1,345) and eight-week ($2,300) sessions throughout the summer.

Minnesota

St. Paul (Bethel College campus): CompuCamp, 5810 W. 78th St., Minneapolis, MN 55435, 612-835-0064. One-week ($425) and two-week ($850) sessions, June through August. Each additional week for combined sessions, $390. Family, group, and early sign-up discounts available.

Mississippi

Hattiesburg: University of Southern Mississippi Computer Day Camp, Division of Continuing Education, Southern Station, Box 5056, Hattiesburg, MS 39406, 601-266-4189. One three-day session ($100) in June. Camp meets from 9 a.m. to 3:30 p.m. daily; campus housing is available at extra cost for students who cannot commute (parent, counselor, or teacher must accompany overnight camper).

Hattiesburg: University of Southern Mississippi Computer Week Camp, same address as above. One one-week session in June; $125 for day students, $175 with campus housing.

Missouri

St. Louis: National Computer Camps, P.O. Box 585, Orange, CT 06447, 203-795-9667. Four one-week sessions ($360), late July to early August. Two-week session including weekend stay, $750; each additional week, $390.

New York

Adirondack (Schroon Lake): Camp Saskatchewan, 162-41 Powells Cove Blvd., Beechhurst, NY 11357, 212-767-8557. Four-week ($1,100) and eight-week ($1,950) sessions, July and August.

Dix Hills (New Hills School): Compu-Day Camp, 645 Half Hollow Road, Dix Hills, NY 11746, 516-586-4020. Two-week day sessions (9 a.m.–4 p.m.), June 25–Aug. 31. Each session $300 without transportation, $355 with transportation from Long Island.

Poughkeepsie: Marist Computer Camps, Marist College, Poughkeepsie, NY 12601, 914-471-3240. Three two-week sessions ($795), early June to mid-August. Sessions may be combined. Limited financial aid available.

Saratoga Springs (Skidmore College campus): Computer Discoveries, Office of Special Programs, Skidmore College, Saratoga Springs, NY 12866, 518-584-5000 ext. 264. Two-week day sessions throughout July; costs from $80 to $140, depending on course work selected.

Westchester County: Mercy College Summer Computer Workshops, 555 Broadway, Dobbs Ferry, NY 10522, 914-693-4500 ext. 350. Two one-week sessions in July ($170 each, $325 for both). Camp is held from 9 a.m.–4 p.m. daily. No overnight campers.

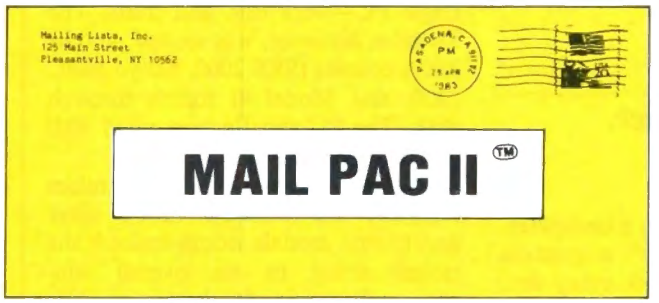
Ohio

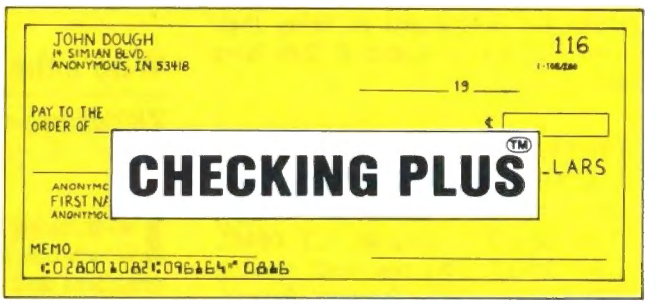
Cleveland (Ursuline College campus): National Computer Camps, P.O. Box 585, Orange, CT 06447, 203-795-9667. Four one-week sessions ($360), early July to early August. Each additional week, $390 including weekend stay.

Wooster (College of Wooster cam-

ANYONE CAN USE OUR SOFTWARE!

MAIL PAC II and CHECKING PLUS represent a new generation of computer software. Our software doesn't even need a manual! Anyone can quickly learn to use either package by following simple, explicit on-screen instructions. But, for those of you who insist -- we've included a complete user's manual as well.





MAIL PAC II FEATURES:

High Capacity --

Stores from one to one million names in Zip Code, Numerical or Alphabetical order. The only limitation is your disk storage space.

Flexibility --

Prints your mailing list on 1, 2, 3, or 4-across labels (with up to 5 user-defined lines on each label) or as a compact, user-designed directory. The record length is completely user-defined, and each field within each of your records is completely variable (allowing storage of any number of characters for any particular address entry). Devote fields to telephone numbers, codes, or even special messages related to each particular name on file.

Powerful --

A built-in word processor allows you to create personalized form letters for each address on your list (or just a particular group of addresses).

Ease of Use --

Create new mailing lists, review existing lists, handle changes of address, delete cancelled names, sort lists, and purge duplicate names from your files. Complete on-screen instructions tell you in plain english exactly how to accomplish all of these tasks.

MAIL PAC II $99.95

CHECKING PLUS FEATURES:

Complete Check Register --

Checking Plus stores your entire check register in a disk file, and then uses the data to balance your account, track your expenses, and help you make budget projections. Review the entire checkbook, enter checks, deposits, fees and adjustments, mark outstanding checks when paid, and get an instant cash balance at any time. All data can be viewed onscreen or printed out in report form.

Tax Preparation --

Storage of monthly and yearly totals and other important information aids in income tax preparation, for your personal use or for your accountant.

Handles the Details --

Store names and addresses for frequently written checks, then print checks to fit standard window envelopes, eliminating the need for extra typing. You can even store any comment, explanation or other message (up to 255 characters) related to a particular check.

Automatic Monthly Bill Payments --

Enter amounts and names of payees for all of your fixed-cost monthly payments, and then sit back while the system automatically prints checks.

CHECKING PLUS $99.95

Both Programs Require 48K And At Least One Disk Drive (2 Drives For Higher Storage Capacities). And All Hard Disk Systems Are Supported.

FREE--TRS-80 Mod I,III & 4 programs supplied on DosPlus (minimum system). Complete DosPlus also available.

FOR YOUR TRS-80™ • APPLE™ • IBM PC™ • NEC™ • OSBORNE™ • XEROX™ • KAYPRO™ • TELEVIDEO™ • ZENITH™ • SANYO™
DEC™ • TI PROFESSIONAL COMPUTER™ • SUPERBRAIN JR.™ • EPSON™ • Any CP/M™ Computer

CP/M-based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC-80)

TRS-80 trademark Tandy Corp. - APPLE trademark Apple Corp - IBM PC trademark IBM Corp. - ATARI trademark Atari, Inc. - OSBORNE trademark Osborne Corp. - XEROX trademark Xerox Corp
KAYPRO trademark Non-Linear Systems, Inc. - TELEVIDEO trademark Televideo Systems, Inc. - SANYO trademark Sanyo Corp. - NEC trademark NEC Corp. - DEC trademark Digital Equipment Corp
ZENITH trademark Zenith Corp - TI PROFESSIONAL COMPUTER trademark Texas Instruments, Inc - SUPERBRAIN trademark Intertec Corp. - CP/M trademark Digital Reseaech - EPSON trademark Epson Corp

OUR SOFTWARE CATALOG

H & E Computronics, Inc., has mailed more than 1 million software catalogs since 1978. Send $2 for our new 64-page catalog today! (We also send you our catalog FREE with every order). DEALER INQUIRIES WELCOME

30-DAY MONEY BACK GUARANTEE

*** ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE ***
DELIVERY SUBJECT TO AVAILABILITY

COMPUTRONICS

50 N. PASCACK RD., SPRING VALLEY, N.Y. 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 & MEXICO
ADD PROPER POSTAGE OUTSIDE OF U.S., CANADA & MEXICO

VISA MasterCard

pus): Computer-Math Camp, College of Wooster, Wooster, OH 44961, 216-263-2239. One 12-day session ($525) from mid-June to early July.

Oklahoma

Okarche: Country Computer Camp, Route 4 Box 84, Okarche, OK 73762, 405-263-7701. One-week sessions ($265) beginning in mid-June.

Norman: University of Oklahoma Computer Camp, Dept. of Mathematics, University of Oklahoma, Norman, OK 73019, 405-325-3410. One two-week session, late June to early July. Tuition is free; $15 charge for text materials. Students who cannot commute may stay in campus housing for $12 per night (meals extra). Students are encouraged to bring their own TRS-80s to camp if they have one.

Oregon

McMinnville (Linfield College campus): National Computer Camps, P.O. Box 585, Orange, CT 06447, 203-795-9667. Five one-week sessions ($360), early July through August. Each additional week, $390 including weekend stay.

Otis: Westwind YWCA Camp, 1111 S.W. 10th Ave., Portland, OR 97205, 503-223-6281. Three one-week sessions ($220), July through August. Financial aid available.

Portland: YWCA Computer Day Camp, 1111 S.W. 10th Ave., Portland, OR 97205, 503-223-6281. One-week sessions ($75), held for 2–3 hours, Monday through Friday. Financial aid available.

Pennsylvania

Beaver Falls (Geneva College campus): CompuCamp, 5810 W. 78th St., Minneapolis, MN 55435, 612-835-0064. One-week ($425) and two-week ($850) sessions, June through August. Each additional week for combined sessions, $390. Family, group, and early sign-up discounts available.

North Springfield: YMCA Camp Fitch, 17 N. Champion St., Youngstown, OH 44501, 216-744-8411. Two two-week sessions ($490), late June to early July.

Reeders: Camp Akiba, Box 400, Bala Cynwyd, PA 19004, 215-649-7877. One eight-week session ($2,700), June 26–Aug. 17.

Vermont

Hancock: Killooleet, Sarah Sanford Road, Bridgewater, CT 06752, 802-767-3152. One eight-week session ($2,400), late June to late August. Scholarships available.

Switzerland

Gstaad: Village Computer Camp, CH-1296 Coppet, Switzerland, phone 022-762059. Three two-week sessions ($700), July through early August. ■

Mike Benton is author of The Complete Guide to Computer Camps and Workshops *(Bobbs-Merrill Publishing Co., 1984, $10.95), from which these listings are adapted.*

Who's the Best?

Z80 micros strike back.

"I'm thinking of buying a computer. Which one's best?" It's a question neighbors and novices ask every day, and one that doesn't have a definitive answer. The honest response is to ask, "Best for what?" Different micros suit different budgets and applications.

Nevertheless, Auerbach Inc., a Pennsauken, NJ, publisher, has attempted to answer the eternal question—and, incidentally, declared that the TRS-80 Model 4 is the world's sixth best computer for spreadsheet analysis, and seventh best for word processing. No other Tandy model made the top 10, but neither did any IBM or Apple computer.

Auerbach passed judgment in two reports, rating micros' value for spreadsheet use and word processing. (A third report, tallying systems for graphics applications, is coming soon.)

To minimize the apples-and-oranges factor, Auerbach specified "optimum systems" for each category that included at least 64K of memory, dual disk drives (one for spreadsheet work), an 80-column upper- and lowercase display, and a daisy-wheel printer. Besides seeing which machine met those specs for the lowest price, the judges gave bonus points for such extras as more RAM or hard disks, juggling those options' prices as well.

While Tandy's super-powered Model 2000 was too new for inclusion, Auerbach's totals favored 8- over 16-bit systems. Inexpensive desktops built around Z80 or Z80A processors took seven of the 10 top-five places in the two contests.

For word processing, the publishers deemed the Kaypro 10, offering CP/M and a 10-megabyte hard disk, the best value. Columbia's MPC, an 8088-based IBM clone, finished second, and three more CP/M systems—the Toshiba T100, Sanyo MBC 1250, and Kaypro II—rounded out the top five. The IBM PC placed 22nd, and the Apple IIe 36th.

In the spreadsheet race, IBM PC clones—Sanyo's MBC 5500 and the Eagle PC—were first and third. The Toshiba, however, was second, and its Z80A cousins (SKS 2000, Sanyo MBC 1200, and Model 4) fourth through sixth. The PC and IIe were rated 30th and 47th respectively.

Though Auerbach kept its tallies separate, the Toshiba T100's silver and bronze medals would make it the closest thing to an overall winner—and, except for better graphics and double-sided drives, the T100's specs match the Model 4's. Even in today's MS-DOS world, it seems, you can go a long way with a Z80A and 64K RAM. ■

Great, Good, Fair, Poor

Fourth-quarter finance.

Four of the leading players in the home computer field released their sales and profit figures for the last quarter of 1983, and the results were what you might expect. Radio Shack and Commodore are doing terrific business, Coleco faces an uphill struggle with Adam, and Atari is struggling to stay alive.

Commodore was proud to break the billion-dollar mark in 1983 sales, but Tandy Corp. nearly matched that in the fourth quarter alone. Fort Worth's sales for the last three months of the year were $898.3 million, up 15 percent from the previous year's $778.2 million.

Net income for the quarter was

Learn to Program Like a Professional!

THE COMPLETE BOOK OF RANDOM ACCESS & DATA FILE PROGRAMMING

Written for TRS-80™ I, II, & III - IBM™/PC - APPLE™ M/S - OSBORNE™ - HEATH™ - DEC™ - SUPERBRAIN™ - and all Computers using CP/M with Microsoft BASIC™

The last word on disk random access and file handling techniques, this series is intended for everyone — beginning programmers, businessmen and professionals will learn how to create custom programs to handle inventories, mailing lists, work scheduling, record keeping, and many other tasks, while more experienced programmers will learn advanced, professional programming techniques for faster, more efficient data storage and retrieval.

Although random access file handling is a matter of some complexity, the subject has been treated in a simple and down-to-earth fashion, so that anyone with some small familiarity with programming in Microsoft BASIC will be able to cope with the material. Each stage of learning uses a sample program as a starting point. The programs grow in capability and complexity as the books progress into all of the various aspects of file handling and record manipulation. An extensive effort has been made to keep the material coherent and every program line is explained in detail.

Volume I
BASIC FILE HANDLING

- The writing of a Menu to summarize program functions
- Screen format for data entry
- The creation of a basic record
- The FIELD and LSET routines for buffer preparation
- Disk storage of random access records
- Changing or editing stored records
- The LPRINT capability from disk using three different formats
- Sorting the random file
- Searching by name or key field
- Search in "next" or "prior" fashion
- Purging deleted records
- Using disk file data for calculations
- Future expansion of data fields
- Using flags to prevent program crashes
- Date setting, printer on-line and many other routines to make a program run like a commercially written program

VOLUME I **$29.95**
Option Vol. I Program Disk
TRS-80 Model I/III **$28.50**
TRS-80 Model II **$32.50**

Volume II
ADVANCED FILE HANDLING TECHNIQUES

- Relational database programming
- Comprehensive self-balancing accounting system with printouts
- Hashcoded data file manipulation -- (probably the fastest method of data retrieval). Hashing the input key and recovery method explained
- Span-blocking techniques allow creation of records longer than 256 bytes without wasted space
- Blocking & Deblocking
- Shell-Metzner sort
- In-place screen editing
- Recovery of deleted record space
- Alpha-index record retrieval
- Fast machine language/BASIC sort
- Linked list record structure and sort-merge, deleted record removal and file reorganization
- Multi-key file reorganization and record searching

VOLUME II **$29.95**
Optional Vol. II Program Disk
TRS-80 Model I/II/III **$49.95**

COMPUTRONICS INC
50 N. PASCACK ROAD
SPRING VALLEY, NEW YORK 10977 ✓9

NEW TOLL-FREE ORDER LINE
(OUTSIDE OF N.Y. STATE)

DEALER INQUIRIES WELCOME
(800) 431-2818

American Express · VISA · A MasterCard

24 HOUR ORDER LINE
(914) 425-1535

30-DAY MONEY BACK GUARANTEE
*** ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE ***
DELIVERY SUBJECT TO AVAILABILITY

★ ADD ★
ADD $3.00 FOR SHIPPING IN UPS AREAS
ADD $4.00 FOR C.O.D. OR NON-UPS AREAS
ADD $5.00 TO CANADA & MEXICO
ADD PROPER POSTAGE OUTSIDE OF U.S., CANADA & MEXICO

$101.2 million, compared to $93 million a year ago. For the last half of the year, the first half of fiscal 1984, Tandy reported profits of $160.9 million on sales of $1.48 billion.

Commodore has a long way to catch up, but is growing faster. The C64 maker reported over $425 million in fourth-quarter sales, more than double the previous year's $176 million. Similarly, estimated profits were nearly $50 million, more than twice the late 1982 figure of $23 million.

Commodore said it filled only 50 to 60 percent of their holiday orders. The unfilled orders, plus continued "tremendous" demand, should segue nicely into sales of the new 264 due this spring.

Coleco, on the other hand, produced only a fifth as many Adams in 1983 as it originally predicted. The West Hartford, CT, company shipped 95,000 copies of its $750 system, blaming the trickle on delays due to redesign, debugging, and parts shortages.

While Coleco expected to show an overall profit for 1983, it admitted an unspecified loss in the fourth quarter. Also, beyond reassurances of "a quick return to profitability" in 1984, the firm wouldn't tell analysts at Las Vegas' Consumer Electronics Show what the projected profit would be or how many Adams it planned to ship.

Adam's future may have brightened, though. At CES, Coleco unveiled a $400 disk drive and $200 modem, scheduled for release in the second quarter, and announced a version of Digital Research Inc.'s Personal CP/M and a plug-in attachment letting Adam run some IBM PC software, both planned for late 1984.

Atari's position was the opposite of Coleco's: a fourth-quarter profit ($1.2 million), but a hefty $536 million loss in the last nine months overall. Representatives of Atari and its parent firm, Warner Communications Inc., spent a lot of time at CES denying rumors that Atari would bail out of the home computer business.

James Morgan, Atari's new chief executive officer, told the *Wall Street Journal* that "the company is definitely turning around," helped by "strong demand" for the 600XL and 800XL and some new business policies.

For instance, retailers can no longer brand Atari products "defective" and return them to reduce inventories, a trick that Morgan said cost Atari over $75 million last year. Now, all returns must be matched by an equal purchase of new items.

As for the non-appearance of Atari's high-end 1450XLD, Morgan spoke candidly: "The history of Atari and this business has been filled with announcements of products that weren't ready, and things were never done right on schedule. If we're going to be a reliable company, we aren't saying anything until we know we can deliver it."

And, if you overlook the fact that 1983's prices were half 1982's, Atari's video game consoles sold well—1.3 million in December, compared to 1.4 million a year earlier. Or, as Warner's Geoffrey Holmes put it, "pretty good for a product that everyone says is dead."■

END BYTES

● As if reports of Adam bombs weren't enough, **COLECO** faces attack on a different front from *VideoPrint*. The Norwalk, CT, newsletter, in a deadpan joke designed to get into End Bytes, deplores forecasts that 5 million personal computers and 4 million Cabbage Patch dolls will be sold in 1984, surpassing the birth of 3.8 million actual children.

"The present trend toward home computers and away from children," *VP*'s Debra Hurd points out, is a self-defeating business strategy, since "after about the year 2040, there won't be anyone to buy the computers." Hurd suggests that Coleco, a "major offender" due to its promotion of "Cabbage Patch Kids and home computers, instead of real children," donate equal time for TV ads aimed at stimulating increased procreation.

● Can you imagine the *New York Times* buying the rights to Galaxy Invasion? One of Britain's leading **NEWSPAPER** publishers, The Mirror Group, is marketing three firms' Commodore, BBC, and Spectrum programs as "MirrorSoft," selling in retail stores and through *Daily* and *Sunday Mirror* mail-order.

● Speaking of the *Times*, computer columnist Erik Sandberg-Diment gave another rave **REVIEW** to the IBM PC*jr*'s chiclet keyboard. "When it comes to letting your fingers do the walking," he wrote, "on the PC*jr* they have all the grace of a rubber-kneed centipede. Two pages into a manuscript, and I was looking for a pad and pen with which to finish my story."

● **FRANKLIN** and **APPLE** have settled their differences (see *80 Micro*, December 1983, p. 258). The clone manufacturer agreed out of court to pay $2.5 million and begin using its own ROM instructions instead of Apple's copyrighted ones. The deal ends both Franklin's Supreme Court appeal and Apple's campaign for an injunction halting Franklin sales.

● Apple's Australian subsidiary, however, has lost to **WOMBAT**. A federal judge there, ruling on Apple's attempt to ban the Taiwanese-made clone, said just the opposite of last fall's Philadelphia decision in the Franklin case: that programs in ROM are not protected by Australian copyright law. The ruling might make U.S. manufacturers hesitate before selling products Down Under.

● Zilog's trusty **Z80** chip, mainstay of the TRS-80 lineup, continues to wave the 8-bit banner. Zilog and Toshiba have teamed up to produce low-power CMOS versions of the microprocessor, and the chip maker, American Microsystems Inc., and Digital Research Inc. have agreed to produce a Z80-based single-chip operating system processor that includes DRI's Personal CP/M. The easy-to-use ROM version of the DOS, Digital claims, will eliminate the need for a second disk drive in many personal or portable micro designs.

● If you were Datasoft, a leading Apple game publisher, how would you compete with Electronic Arts' **CELEBRITY** software (such as "Julius Erving and Larry Bird Go One-on-One")? You'd introduce "The Dallas Quest," an adventure featuring J.R. Ewing and family, and "Bruce Lee," a game inspired by the late kung fu superstar.■

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.

BUSINESS PAC 100

100 Ready-To-Run Business Programs

★ *All orders processed within 24-Hours*
★ *30-Day money back guarantee*

(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	ANNUI	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	REGWITH	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 queueing (waiting line) model
49	CVP	Cost-volume-profit analysis
50	CONDPROF	Conditional profit tables
51	OPTLOSS	Opportunity loss tables
52	FQUOQ	Fixed quantity economic order quantity model
53	FQEOWSH	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	CAP1	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	FUPRINF	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	BUSBUD	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 convertable 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

NEW TOLL-FREE ORDER LINE
(OUTSIDE OF N.Y. STATE)
(800) 431-2818

AMERICAN EXPRESS · VISA · master charge

H & E COMPUTRONICS INC. ✓9
MATHEMATICAL APPLICATIONS SERVICE™

50 N. PASCACK ROAD
SPRING VALLEY, NEW YORK 10977

24 HOUR ORDER LINE
(914) 425-1535

ASK FOR OUR 64-PAGE CATALOG
DEALER INQUIRIES INVITED

ALL PRICES & SPECIFICATIONS SUBJECT TO CHANGE
DELIVERY SUBJECT TO AVAILABILITY

✓ See List of Advertisers on Page 227

Star Gazing

I've converted Adron Lilly's astronomy program ("What's Up and When," October 1983, p. 114) to run on a Model I. The changes work on all the Model I operating systems I've tried: MULTIDOS, NEWDOS80, and DOSPLUS 3.4.

Change lines 1130, 1170, 1300, 1330, and 1340 to:

```
1130 CLS:S=PEEK(16449):MT=PEEK
(16450):H=PEEK(16451):YR=PEEK
(16452):D=PEEK(16454):M=PEEK(16453)
' READS TIME/DATE INFORMATION
1170 YR=PEEK(16452):IFYR=84 ANDM
>=3 THEN E=E+1 'LEAP YEAR
1300 CMD "CLOCK ON"
1330 PRINT@270,STRING$(32,32):PRINT
@270, "ENTER HOUR TO LIST=";:LINE
INPUTP$:P=VAL(P$):IFP$=""GOTO
1330
1340 PRINT@718, "WHAT TYPE.....=";:
LINEINPUTP2$:P2=VAL(P2$):IFP2$=""
GOTO1450 'PRINTS RIGHT POINTING
HAND IN MENU
```

I set line 1300 to turn the clock on in DOSPLUS 3.4; check your operating system's manual to change the command.

Carl Pawl
721 16th St.
Santa Monica, CA 90402

Gemini Driver

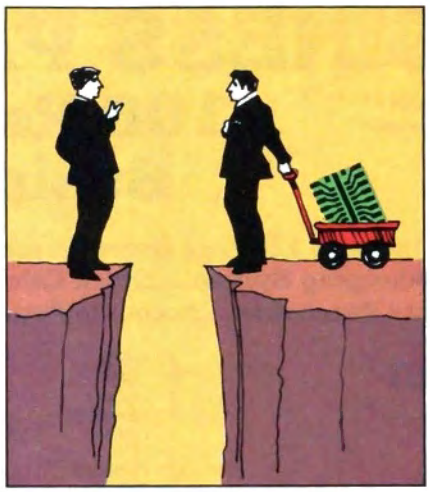
Dan Robinson's SuperScripsit MX-80 driver ("MX-80 Driver," May 1983, p. 125) needs only minor changes to work with the increasingly popular Gemini 10X and 15X printers. Change lines 1300, 1940, and 2460 to read as follows:

```
1300  LD  A,01H
1940  LD  A,54H
2460  LD  A,1BH
```

And add the following two lines:

```
2462  CALL  PRTCHR
2464  LD    A,40H
```

Kenneth D. Grimm
Sweet Briar College
Sweet Briar, VA 24595



Simple Screen Dump

I've discovered an alternative to long subroutines for saving a screen to disk. Since the Model III memory maps the screen (in locations 15360–16383, or 3C00–3EFF hexadecimal [hex]), you can use a conventional memory dump to save it.

With NEWDOS, use CMD "DUMP NAME,15360,16383" to save the screen in the file NAME, and CMD "LOAD NAME" to display the saved screen.

TRSDOS, however, does not allow dumps involving memory addresses below 24576 (6000 hex). And executing a Basic Dump command returns you to TRSDOS—not the calling Basic program.

Use the following one-line subroutine to avoid these problems:

```
49000 OPEN "R",1,S$:FIELD1,4ASS1$,
252ASS2$:S3$=MKI$(S1):S1=VARPTR(S3$):
S2=15360:FORS3=1TO5:S4=252+244*(S3
=5):POKES1,S4:POKES1+1,(S2AND255)
:POKES1+2,S2/256:LSETS1$=CHR$(1)+
CHR$(S4+2)+MKI$(S2):LSETS2$=S3$+
MKI$(514):PUT1:S2=S2+S4:NEXT:
CLOSE1:RETURN
```

Store the dump file name in S$ and execute a GOSUB 49000 command. The routine requires about 300 bytes of memory; the program shouldn't open any file in buffer 1 while it calls the subroutine. To redisplay the screen, simply type in CMD "L",S$.

The subroutine accepts any character; you can save and redisplay what's on the screen without modifications.

T.P. Eggarter, R. Mitchell
358-5700 San Luis
Argentina

Better Blackjack

I've made some improvements to Paul Serotta's blackjack program ("Blackjack," December 1983, p. 247). First, if you and the computer have blackjack, the computer displays an RG error. To correct this, change line 250 to:

```
250 IFCT=21ANDPT=21THENPRINT@
CP,HC$;:GOSUB2210:GOTO145
```

To prevent you from doubling down unless you have 11 points (rules are rules), change line 4000 to:

```
4000 IFCR>2ORPT<>11THENPRINT@280,
"YOU CAN'T DOUBLE NOW!!";:SOUND
7500,20:SOUND13000,20:FORDL=1TO1000:
NEXTDL:PRINT@280,SPACE$(38);:
RETURN
```

To play a few games in a row without running the game every time, take the ":END" off line 3010 and add the following lines:

```
3020 PRINT"PLAY AGAIN?"
3030 A$=INKEY$:IFA$=""THEN3030
3040 IFA$="Y"ORA$="y"THENPM=
1000:GOTO145
3050 IFA$="N"ORA$="n"THENEND
3060 GOTO3030
```

Mike Harper
1124 Shari Lane
Libertyville, IL 60048

Help Wanted

I just finished building the Mikrokolor interface for my Model I ("The 80 Goes Color," May 1983, p. 90). I even bought several TMS 9918A video display processors to make extra boards for my friends.

There's only one problem. The 9918 uses the NTSC video standard

of 525 lines, but my Australian television uses the PAL 625-line standard.

The boards make great conversation pieces, but I'd rather use them in my TRS-80. Does anyone know of an interface that converts NTSC to PAL? If so, I'd like a circuit diagram too.

John Scarborough
31 Stewart St.
Parramatta 2150
N.S.W. Australia

I need a subroutine for my Model III that produces all the combinations possible with two arrays of up to five elements each. Can anyone help?

Bill Huffman
P.O. Box 5065
Alexandria, LA 71301

Help! I need a schematic diagram to fix my 80 Graphix high-resolution board, made by Programma International Inc. I think the repair shop smoked mine. When I turn it on, the screen flashes a scrolling set of 30–40 characters and then goes blank.

Also, does anyone have a routine to prevent Automated Simulation's Tuesday Morning Quarterback from locking up on my Model I? The sound routine in line 40 hangs up on coin toss.

Gary D. Huston
3751A Mt. Vernon Place
Lima, OH 45804

Can someone tell me how to convert Waldo Boyd's and John Etherton's Dvorak keyboard program ("The Dvorak Keyboard," December 1980, p. 66) so it will run on my Model III?

Andrew F. Zarchy
11034 Wrightwood Place
Studio City, CA 91604

Error Trap

In our January 1983 New Products column we misquoted the price of the Rest and Roll footrest. It retails for $99, not $198, and is available from R and R Concepts, 241 Conejo Road, Santa Barbara, CA 93103, 805-966-0101.

The box for frequently needed numbers on p. 29 of the January 1983 issue contains the wrong address for IJG Inc. The correct address is: IJG Inc., 1953 W. 11th St., Upland, CA 91786, 714-946-5805.

New User's Groups

LNW User's Group Newsletter
345 Manchester Road
Grand Island, NE 68801

AUT TRS-80 User's Group
132 Rue Lafayette 75010
Paris, France
Contact: Patrick Potin

Capitol Area TRS-80 User's Group
340 Lewisberry Road
New Cumberland, PA 17070
717-469-0567

New Bulletin Boards

Westchester BBS
10 Davenport Ave.
New Rochelle, NY 10805
914-632-1840
Contact: Bill Graspo

DEBUG

EPROM Bugs

I've discovered a bug in the program that accompanied my article, "Build an EPROM Programmer" (June 1983, p. 200). The problem is in line 292; the instruction STA RST (a Reset command) should be eliminated or replaced with NOP instructions.

When the EPROM fails the Verify routine, this statement resets the programmer. If you answer the CONTINUE VERIFY? question positively, all subsequent reads will take place at EPROM location 0000.

Removing the Reset command at line 292 allows subsequent reads to occur at the proper EPROM location, and reset when the program returns to the menu.

If you have the source code on tape or disk, simply delete line 292, assemble the program, program it into an EPROM defined in the first part of the article, and use this new EPROM with your programmer.

If you don't have the source code, place a blank EPROM in your programmer and select the Input Data option. Use 01E3 for a start address and 01E5 for a stop address.

Type in 12 (an NOP code) for data at all three locations, then select the Program ROM function. Use the same start and stop addresses as above, and where the menu returns, select the Move Buffer function.

Use C000 for a start address and C001 for the stop address. Select Program ROM again, using 0000 for start and 01E2 for stop.

When the menu returns, select the Program ROM option once again, using 01E6 for start and 05B7 for stop. When the menu returns for the last time, use the newly programmed EPROM for your programmer.

William R. Mahoney
145 Laureba Ave.
Stratford, NJ 08084

Tax Manna

My program, "The Taxman Cometh" (January 1984, p. 100), has a bug. To make the printout option (<P>) work, change lines 4000 and 4010 to:

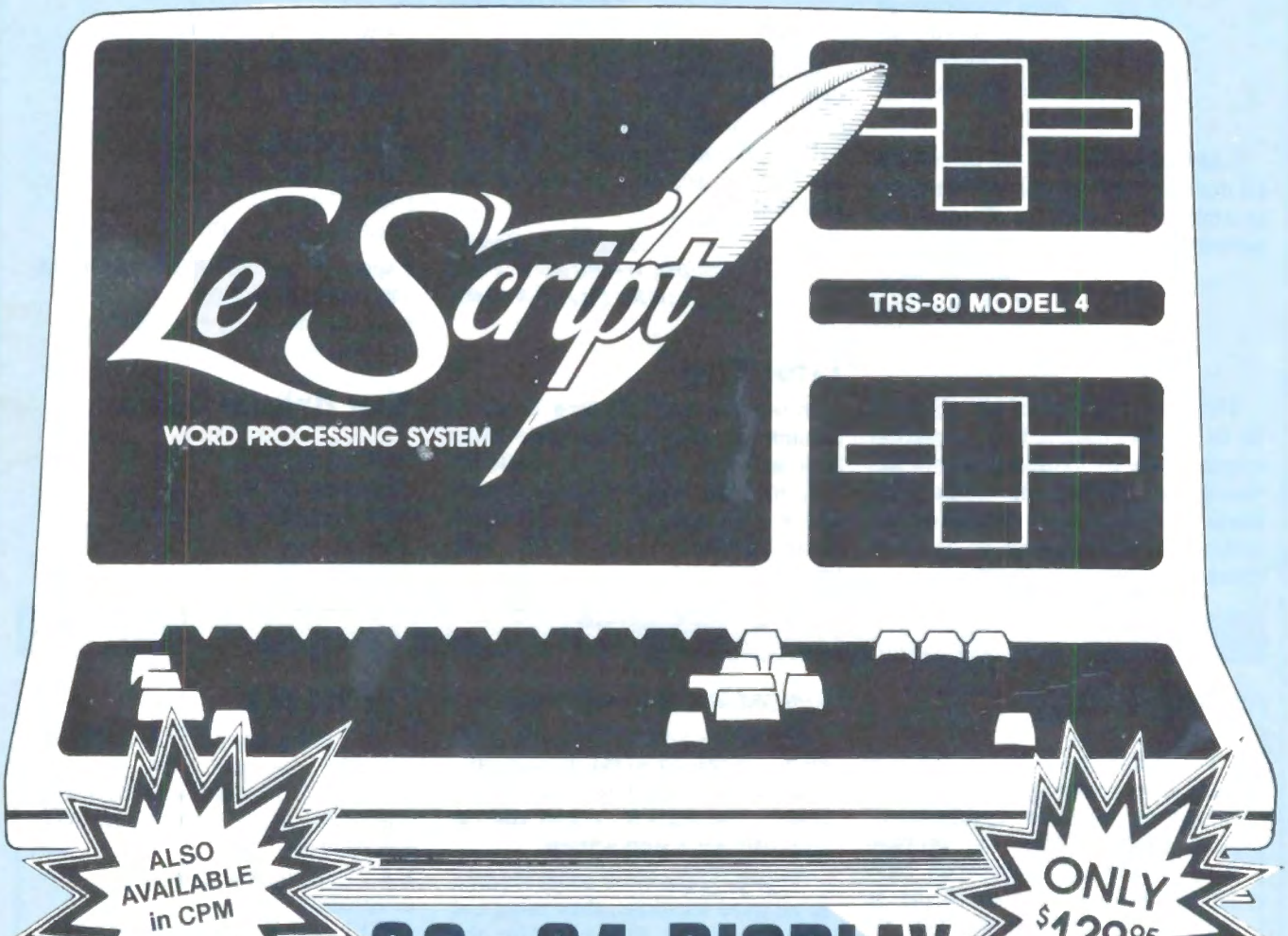
```
4000 LZ=0:PRINT@LI,CHR$(30);
STRING$(LV-1,13);
4010 LT=1:GOSUB7010:GOSUB8380:
A1=63:GOSUB5000:LPRINTAN$:IFLZ=
LNTHEN8040ELSELZ=LZ+1:GOTO4010
```

Also, several people have called me with problems in line 2010. The line is correct as listed in *80 Micro*; I think the problem lies elsewhere. Be sure you have nothing loaded in high memory and that you use a 48K machine. Always start the program from a cold boot.

Last, check line 8010 and make sure you haven't entered a line 8195. The printout in *80 Micro* makes −18195 look like a new line.

Robert Athanasiou
13 Lawnridge Ave.
Albany, NY 12208

TRS-80 MODEL 4
Word Processing Program



ALSO AVAILABLE in CPM

ONLY $129.95

80 x 24 DISPLAY

- Works with **TRSDOS 6** on any Model III DOS.
- **90K TEXT BUFFER** when expanded memory is installed.
- Built-in **FORM LETTER** and **MAIL-MERGE** capabilities.
- Performs **PROPORTIONAL-SPACE** right-margin justification on over 60 different printers (All drivers included **FREE**).
- Same powerful editing features as **ZORLOF II**, with dozens more features added.
- **LeScript** also available to run on **MODEL I, MODEL III, LNW-80, PMC-80**, and **MAX-80** (80 x 24 display).

LeScript costs $200 less than competing products matching its capabilities.

FREE

- 30-Day Support to Registered Owners
- Subscription to LeScript Newsletter

VISA MasterCard

CALL 1-305-259-9397

ANITEK

ANITEK SOFTWARE PRODUCTS
P.O. BOX 361136
MELBOURNE, FL 32936

141

FREE SHIPPING WITHIN THE U.S.; OUTSIDE THE U.S. ADD $10.00 FOR SHIPPING. FLORIDA RESIDENTS ADD 5% SALES TAX. ALL ORDERS PREPAID BY CHECK, MONEY ORDER, CREDIT CARD OR C.O.D.

Anitek's LeScript: Writing with Style

by Eric Grevstad
80 Micro staff

edited by Lynne M. Nadeau

Photo. LeScript in action. (Photo by Suzanne Torsheya.)

Model 4 owners who've been limping along in Model III mode might pounce on LeScript as one of the first 80-column TRS-80 word processors. That's fine, but saying LeScript has an 80-column by 24-line display is like saying a Porsche has four wheels and a spare. It doesn't begin to do justice to the program's power and versatility. I don't think there's a better Model 4 word processor around.

It's also unfair to speak of LeScript as only a Model 4 word processor. Basically, LeScript is an updated, supercharged version of Zorlof, Anitek's $70 sleeper that's attracted a small but loyal following in the Model I/III world.

The nonsystem LeScript disk, put in drive 1, transfers its files to any Model 4, III, or Max-80 DOS disk in drive zero. Versions of LeScript are also available for LNWs, PMCs, and Model I's; there's even a LeScript/UC for those with uppercase only.

I tested LeScript briefly on a 48K Model III. The maximum file length was shorter than that of a Model 4 (17,661 bytes, compared to 24,573 and 90,109 on 64K and 128K Model 4's). The display was only 64 columns wide and lacked the word "LeScript" at the top right. Also, LeScript's screen flicker, a minor problem on the 4, was more obvious on the III.

Other than that, LeScript works admirably on the older machine, though it comes into its own on the 4. Not only can Model 4 owners exploit the wider display, but they can use either of two command keys, control and clear, located at opposite ends of the keyboard.

This excellent feature lets you enter nearly any LeScript command with one hand. (When describing commands in this review, I'll say clear.) Also, the 4's function keys give one-finger access to three of the most frequently used functions.

The manual doesn't mention that LeScript won't fit on a standard TRSDOS 6.0 or 6.1 disk. The two main files, LeScript/CMD and LeScript/DVR, take about 27K, with the sample text and form letter files adding another 22K if you want them. Purge a few TRSDOS 6.x files such as TAPE100 and the useless mailing list, and CONV :1 :0 puts LeScript on your system disk with no trouble.

Digital Fuel Gauge And Trip Odometer

LeScript's screen display tells you all about what you're writing. Text scrolls through the lower 21 lines; the top three lines are devoted to information about the current file.

The first line displays the file name and line width, in addition to a continuously updated count of words, lines, and free memory. While editing a very long file, I found I had to take my hands off the keyboard for perhaps 10 seconds to let LeScript's count catch up to my insertions and deletions, but it's still an invaluable feature.

Presumably, you'll set the line width to 80 columns for writing and editing, and change it to 60 or so for printing. Pushing the clear and equals-sign keys moves the cursor to the status area for such alterations.

However, you can set widths of from five to 252 columns, press clear-J (rejustify), and LeScript adjusts its display accordingly—using only part of the screen, or using the screen as a window that moves horizontally along wide lines.

This is a little bizarre and horizontal scrolling causes screen flicker, but if you write long lines of Basic, you'll appreciate it. (LeScript can read and write Basic, ASCII, and Apparat and Radio Shack EDTASM as well as its own files, and also read Scripsit and Zorlof.)

The second status line displays your search and replace values. Clear-S and clear-R move through the text, finding one string of up to 28 characters and replacing it with another. Clear-A does the process for the entire file automatically, deletes all occurrences of a string, or inserts a string at the cursor (if the replace and

search fields, respectively, are blank).

The third status line occasionally flashes messages for problems or commands that require confirmation (Disk Not Ready, Once More to Exit to DOS). The rest of the time, it displays a WordStar-like line of dots and numbers that indicates the file's line width and tab settings.

Writing Right Along

LeScript has a bit of flicker on the line you're typing, and the cursor blinks rapidly. You can go into insert mode (clear-I) to slow it down bearably. However, for the most part, writing and editing with LeScript is a pleasure.

Cursor movement and scrolling are fast and precise, whether with the arrow keys alone or in moving one page (20 lines) up or down or to the top or bottom of a file. The Model 4's F1 key duplicates clear-T, the top-of-file command, and F3 equals clear-K, the tab.

LeScript marks, moves, copies, and deletes blocks of text easily. You can also save blocks, like whole files, to disk and insert them in other files. Clear-G, the Get or Load command, doesn't overwrite text already in memory; space permitting, it inserts the new file at the cursor.

The program also keeps pace with high-speed typing, although I found a quirk while holding down the shift key. Pressing P and T rapidly or at once produces a clear-T, taking you to the top of the file.

LeScript is in some ways a line-oriented rather than screen-oriented word processor. If you notice a mistake in the last word on the line above the current one, you cannot back up and correct it. Backspace (the left-arrow key) stops at the left margin; you must use the up-arrow key, then the shift key and right-arrow key to reach the end of the previous line.

Anitek president Peter Ray told me this is intentional; apparently many people lean on the left-arrow key rather than using it with the shift key to reach the left margin. Conventional backspacing lets them overshoot their mark.

Similarly, clear-L (delete line) removes everything from the cursor to the right margin, but doesn't bring up the following line to close the gap on screen. Scrolling a page or hitting clear-J does that.

LeScript

★ ★ ★ ★

Anitek Software Products
P.O. Box 361136
Melbourne, FL 32936
Models III and 4, Max-80
$129.95

Easy to use?	★★★★☆
Good docs?	★★½☆☆
Bug free?	★★★★☆
Does the job?	★★★★½

While it leaves apparent gaps in text, LeScript won't tolerate actual ones. If you like to leave two spaces between sentences, or use several spaces to indent text, you're out of luck. LeScript, vigilantly justifying everything, automatically erases any more than one space between other characters.

You do have slightly awkward ways around this: Pressing the clear key and the space bar and enter key, respectively, produces blank and end-of-sentence characters that LeScript leaves intact. To print a file with two spaces after periods, I wrote it with one, then used the search and replace function to change periods to periods plus sentence enders.

You can also indent text and set tabs with printer command lines (beginning with clear-;), like the one at the top of a file in which you set margins, line spacing, and so on. Setting a tab involves finding its location on the line and entering TAB47 or whatever. It's not as easy as moving the cursor and pressing TS in Scripsit, but LeScript does have a dozen default tabs suitable for most applications.

To make up for these inconveniences, LeScript offers other dazzling features. Not only does the program print form letters, it prints letters for all entries in your data file or only those with identifying markers.

And, for small form-letter jobs or words or phrases you use frequently, its keystroke-multiply function programs up to 55 keys (shift/clear-A, shift/clear-B, and so on) to insert items of any length from a LeScript/KSM file.

The latest version, Ray says, supports KSM macros, letting a keystroke replace a series of commands (such as loading a file and moving the cursor to a desired point within it) as well as phrases.

If you don't have a KSM file, shift-clear commands produce an impressive set of European and special characters, from brackets to umlauts. More impressive still, LeScript displays subscripts, superscripts, boldface, underlining, and italics on screen—italicized words, for instance, flash on and off, alternating with slashes. Clear-8 renumbers Basic and EDTASM programs, and clear-9 toggles a Model 4 keyclick.

File-Handling Magic

If LeScript is good (once you learn its minor idiosyncrasies) at writing or creating files, what it does with existing files is amazing. It's more powerful than some DOSes.

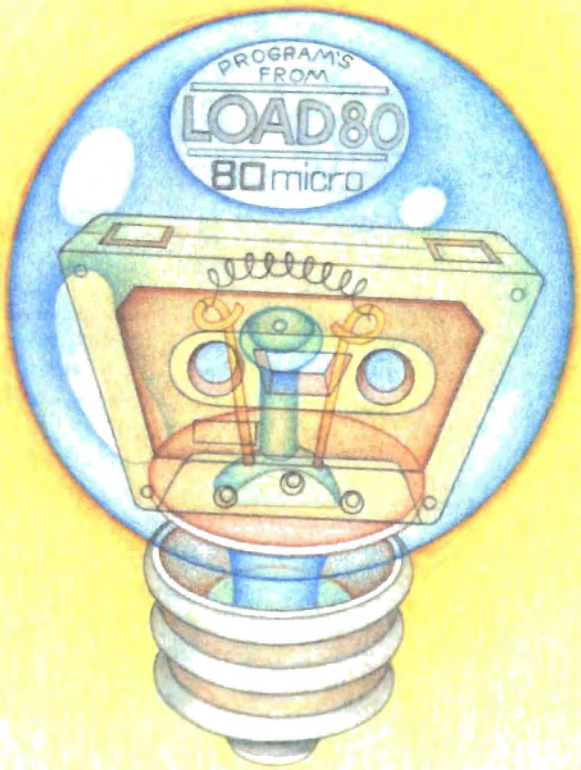
At any time during writing and editing, clear-D (F2 on the Model 4) calls a directory that's better than TRSDOS's. It contains every file on any desired disk, with each file's name, date, length in bytes and granules, and free disk space. From the directory, you can load a file or kill one or more to clear space, and then return to your text without losing a letter.

You won't even lose text in an accidental reboot; type LESCRIPT * from DOS Ready, and your unsaved file reappears.

If that doesn't impress your friends, show them the view (clear-V) function, which displays text on the screen the way it'll look on paper, including width and line spacing; left, right, or full justification or centering; page breaks; headers; and footers. If you don't like the format, change the specs and look at your document again; LeScript lets you rejustify and review all day long.

SuperScripsit owners who've struggled to mate their program with non-Radio Shack printers will be awed by LeScript's printing power. A printer command line at the top of

GREAT IDEAS IN A DISK



GREAT IDEAS IN A CASSETTE

NOW, you can load the major programs from 80 MICRO—automatically.

LOAD 80 is a collection of the major programs from each issue of 80 MICRO including: tutorials...utilities...games ...home-hobby applications...word processing programs... and more. Each program is on a formatted disk or cassette and ready to run...saving you hours of key-in time. And Model III users can now run **LOAD 80** automatically—our new disk transfer system eliminates conversions.

For less than $2.00 per program **LOAD 80** gives you a library of over 100 quality programs in just 12 months—delivered to your home each month with your copy of 80 MICRO.

Plus, a year's subscription to **LOAD 80** saves you nearly 30% off the single disk or cassette price—that's enough for a year's subscription to 80 MICRO.

Your **LOAD 80** comes complete with user support. Just call **1-603-924-9471** any business day and you'll receive prompt assistance from our **LOAD 80** staff and the 80 MICRO Technical Editors.

To get your time-saving subscription or monthly issue of **LOAD 80** call toll free **1-800-258-5473** (in New Hampshire dial **1-924-9471**). Or fill out this coupon and send it in today.

YES! Save me time. Save me money with LOAD 80.

- ☐ YES! I like saving time and money. Send me a year of LOAD 80 on disk for $199.97.
- ☐ YES! I need this time saver and want to save 30% off the single cassette price. Send me a year of LOAD 80 on cassette for $99.97.
- ☐ YES! I want LOAD 80 to save me money. Send me this month's LOAD 80 disk for $21.97 which includes postage and handling.
- ☐ Of course! I'd be a fool not to order. Send me this month's LOAD 80 on cassette for only $11.47. That includes postage and handling.

Foreign Airmail please add $25.00 per subscription.
U.S. funds drawn on U.S. banks only.

☐ Check/MO ☐ MC ☐ Visa ☐ AE

Card#_____ Exp. Date_____

Signature_____

Name_____

Address_____

City_____ State_____ Zip_____

L8404

LOAD 80

80 Pine Street • Peterborough, NH 03458

Some Like It HOT

HOT CoCo®

Guaranteed to make your TRS-80 Color Computer* sizzle with color, **HOT CoCo** magazine is informative, interesting, and *best of all* just for the Color Computer. You'll look forward to **HOT CoCo** month after month because it has something for everyone, from the novice right on up to the expert. **HOT CoCo** gives you:

- •PROGRAMMING TECHNIQUES & TUTORIALS—that promise to make you a superior programmer.
- •UTILITIES—to save you time and effort on all your routine tasks.
- •EXPERTLY WRITTEN COLUMNS—including *BASIC, GRAPHICS, FLEX and GAMES.*
- •HARDWARE & CONSTRUCTION—ideas on interfacing and enhancing to make building projects a breeze.
- •EDUCATIONAL APPLICATIONS—will stimulate and encourage imaginative thinking in your child.

PLUS

- •BUSINESS PROGRAMS—sure to make you a star at the office.
- •FEATURES ON COLOR APPLICATIONS—make your computer reach its full potential and get your money's worth from your machine.
- •BUYER'S GUIDES & PRODUCT REVIEWS—now you can stop running around comparing prices and products and start running your computer.
- •HOME & HOBBY APPLICATIONS—exciting ways to help your computer add enjoyment to your leisure time.
- •ANSWERS TO SPECIFIC QUESTIONS—it's like having your own private consultant—free!

Join in the color explosion with **HOT CoCo** today! Take advantage of our money saving offer, 12 issues for $24.97. A 13th issue is yours FREE with pre-payment (check or credit card). Use the attached order form, the coupon below, or call toll free 1-800-258-5473.
(In NH. call 1-924-9471)

YES! I want my Color Computer to sizzle with color. I understand that with payment enclosed or credit card order I will receive a free issue making a total of 13 issues for $24.97.

☐ CHECK/MO ☐ MC ☐ VISA ☐ AE ☐ BILL ME

card #_____ exp. date_____
signature _____
name_____
address _____
city _____ state _____ zip _____

Canada & Mexico $27.97/1 yr. only, U.S. funds drawn on U.S. bank.
Foreign Surface $44.97/1 yr. only, U.S. funds drawn on U.S. bank.
Please allow 6–8 weeks for delivery.

*This price voids all previous offers.

HOT CoCo • PO Box 975 • Farmingdale NY 11737

* TRS-80 Color Computer is a trademark of Radio Shack, a division of Tandy Corp. **344F8**

your text, containing a code such as K4 or K53, loads the correct driver for one of 60-odd printers (listed in the manual) from the LeScript/DVR file.

With its replacement of complicated escape or control codes with on-screen aids such as blinking italics, LeScript rivals new MS-DOS programs such as Microsoft Word, which is powerful enough to drive a phototypesetter. With its ability to handle proportional spacing and different margins, headers, and footers for odd and even pages, it could almost produce a ready-to-bind book on a desktop printer.

Bells and whistles, by the way, slow you down; LeScript does more than other word processors, and needs more time to do it. In Model III benchmark tests, LeScript loaded a 1,000-word file in 10.3 seconds to Scripsit's 5.3, and printed it in 3:31 as opposed to 2:51.

LeScript's manual is tough to get through and of average quality at best. The information's there, but its organization is poor: Commands are listed in alphabetical order, clear-A followed by clear-B, rather than in order of function. The five commands that delete text are scattered through the alphabet. Some vital information is buried in the appendix.

And, though the manual contains occasional touches of wit, the sample form letter material—in which Mrs. Hellen Housewife buys a dishwasher while Miss Sally Somethingelse of 38-24-36 Waahoo Court buys a bikini—is sexist and stupid.

You'll find better writing in Anitek's newsletter, a year's subscription to which provides LeScript owners with 30 days' handholding and inexpensive upgrades. The newsletter promises CP/M and possibly MS-DOS versions of LeScript.

When it comes to TRSDOS, though, LeScript offers power that many CP/M and MS-DOS programs can't match, and it offers it at a terrific $129.95.

Ordinarily, I'd conclude an enthusiastic review like this by saying I rushed out and bought the product for my personal use. To be honest, since my review copy of LeScript was free, I didn't do that.

I bought a Model 4P to use with it. ■

Doctoring Your Disk Drives

by Wynne Keller

Disk Drive Analysis System

★★★★½

J & M Systems Ltd.
137 Utah NE
Albuquerque, NM 87108
Models III and 4
$79

Easy to use?	★★★★★
Good docs?	★★★★☆
Bug free?	★★★★★
Does the job?	★★★★★

The Disk Drive Analysis System provides a set of excellent diagnostic tests that give Model III or 4 owners the power to thoroughly examine their own drives and pinpoint any problems. Knowledgeable owners can also attempt repairs. The only tools you need are a screwdriver and hexkey.

You must have a Model III or 4 to load the programs, but you can test any other drive by attaching it to the computer as drive 2. The program tests single- or double-sided drives with 40 or 80 tracks in single or double density format.

Two disks come with the system. You load the diagnostics program into memory, then remove that disk so that all drives are available for testing.

The second disk is the test disk, which you insert into the drive you want to analyze. This disk contains various test tracks that check for clamping, speed, index hole timing, read sensitivity, head alignment, directional seek, head rotation, and analog alignment. It also provides a quick test for a 30-second overall diagnostic to find problem areas so you can perform more specific tests.

Using the Program

On boot-up, a main menu displays all the tests available. You can change drives at any time, start and stop tests, and, for double-sided drives, select which head to test.

The program graphically displays test results on the screen. Comparing the graph with pictures in the manual makes it simple to tell when you have a problem. While adjusting the drive, you can keep the test disk spinning and watch the changing condition of the drive on screen.

Test Types

The clamping test checks the quality of the disk hub. If the hub is worn, the disk will rotate unevenly. If the test disk isn't properly clamped, all other test results are misleading, so this is the first test the program runs. A worn disk, bent spindle, or gross head misalignment can make the drive fail the clamping test.

The spindle speed test measures rotational speed. A pointer on screen indicates the drive's speed in RPMs along with the acceptable limits. You adjust drive speed with "a variable resistor on the servo board." The manual explains how to distinguish the servo board, but, unfortunately, it doesn't describe how to make the adjustment. You cannot adjust some newer drives and must return them to the manufacturer if the speed is off.

The index hole timing test produces a similar graphics display. Adjusting the timing in this test requires moving the photodetector assembly until you achieve proper timing. This is explained clearly in the manual.

Read sensitivity and head alignment tests determine proper head alignment. A dirty head, among other things, causes problems here. The manual suggests you clean the drive heads if your drives don't pass muster, then rerun the tests. Unless you're very knowledgeable, you'll need to refer to the drive manufacturer's manual to adjust alignment.

The hysteresis and head rotation tests measure other head alignment factors, but the manual contains no advice regarding repairs if your drives fail these tests. Presumably, these problems require qualified technicians.

For users who have an oscilloscope, an analog alignment aid is also available on the program disk.

Documentation and Backing up the Disks

The manual is cleanly printed and

bound into a booklet with glossy heavy-paper covers. The pages are prepunched to accommodate a three-ring binder.

The manual contains a chapter on each test, with a clear explanation of how each works, diagrams of good and bad test results, and a description of their significance. Some chapters also include instructions for adjusting the drives.

The Dysan test disk provided with the program might become worn with use. You cannot copy it, but the disk contains spare tracks for some of the tests. You can quit using the primary set of tracks and go to the alternate set when the primary set fails.

Wrap-up

This program takes a lot of the guesswork out of computer malfunctions. Even if you have no desire to open your drive case, running the tests helps you become a more informed consumer when you face the technician.

The Disk Drive Analysis System is the tool that can make at-home disk drive maintenance a reality. You take risks, of course. The program documentation gives only general guidelines; it is neither a step-by-step repair manual nor a course in electronics. However, some cautious experimentation can achieve excellent results and renew your disk drives. ■

Target PlannerCalc: Finances for the 4

by Mark D. Goodwin

Target PlannerCalc is Tandy's first Model 4 spreadsheet program and it's an excellent one, especially considering its moderate price. PlannerCalc is packed with advanced features and it's easy to use.

Using PlannerCalc

In its full-blown configuration, PlannerCalc provides a 128-column by 512-line spreadsheet. This gives you a maximum of 65,536 individual cells that hold either numeric data or formulas.

Column sizes range from two to 30 characters and you can vary the width of each column in the spreadsheet. In addition, you can specify up to 10 column headings of up to 80 characters in length.

Target PlannerCalc

★ ★ ★ ★

Tandy/Radio Shack
One Tandy Center
Fort Worth, TX 76102
Model 4, 64K
One disk drive
$99.95

Easy to use?	★★★★★
Good docs?	★★★★★
Bug free?	★★★★★
Does the job?	★★★☆☆

Unfortunately, the labels for columns and lines are limited to 12 characters each. While I found 12-character column labels adequate for most purposes, many reports, such as check registers or sales journals, require descriptive line labels where this maximum becomes limiting. This limitation, coupled with PlannerCalc's lack of labels within cells, is, in my opinion, a serious weakness.

As with VisiCalc, you initially enter data, formulas, headings, and labels at a command-mode level. PlannerCalc provides a versatile editor, but it performs some disk operations that create long delays in the editing process, and this reduces the editor's utility.

PlannerCalc supports most of the arithmetic operators and functions found in other spreadsheets. It also supports conditional operators and functions that let you make "what-if" calculations. With all of PlannerCalc's operators and functions at your disposal, it's easy to build simple or complex formulas to meet your needs.

PlannerCalc provides two different calculation modes, immediate and deferred. The immediate mode recalculates the spreadsheet each time you alter an entry. The deferred calculation mode recalculates the spreadsheet only when you tell it to. Although PlannerCalc performs calculations very fast, the deferred calculation mode saves a considerable amount of time when you're working on a large spreadsheet.

PlannerCalc's display is well organized and attractive. You can scroll through the spreadsheet rapidly, and you can split the display either horizontally or vertically, a useful feature for comparing figures physically far apart in the spreadsheet.

Printing a PlannerCalc spreadsheet is easy. First, PlannerCalc presents a menu of printer defaults for parameters such as which lines and columns you want printed, the maximum number of columns per page, and your printer's line length. You can quickly change any default with the PlannerCalc editor and once you start the printing process you can abort it at any point.

By their very nature, most spreadsheet programs are difficult to use. PlannerCalc is an exception. It accepts plain English syntax commands and formulas. A sample PlannerCalc formula looks like:

```
LINE 6 COSTS= SUM OF UTILITIES
THRU TAX
```

This is far less complicated than the cryptic syntax other programs use.

PlannerCalc also provides Help screens for virtually any subject. These serve as a useful and complete quick-reference tool.

Documentation

The PlannerCalc manual is laudable. While it was written with the novice in mind, it doesn't insult the intelligence of the more experienced computer user.

The first chapter provides instructions for making a working copy of the PlannerCalc disk, getting the program up and running, accessing the Help screens, and exiting the system. Then the manual guides you through using the PlannerCalc system.

Once you have a thorough knowledge of the basics, the manual leads you through more advanced topics: creating your own spreadsheets, constructing simple and complex formulas, editing, formatting, and printing the final product. The manual ends with a dictionary of PlannerCalc commands, a complete list of error and warning messages, and an extensive index.

OMNITERM COMMUNICATIONS

Award Winning Software!

Reader's Choice Awards
1st place for data communications
80 Micro Jan, 1984

Top Rated
Microcomputer Software Letter
March, 1983

"OMNITERM is a beautifully designed program..."

Software Review March, 1983

"It has become the standard for TRS-80 terminal software."

80 Micro June/July, 1982

"The documentation is excellent."

80 Microcomputing April, 1982

"OMNITERM [is] a contender for the title of best in its class."

Byte Feb, 1982

"I have to applaud the craftsmanship evident in the OMNITERM package."

Infoworld Oct, 1981

"OMNITERM has my vote as the top TRS-80 program available today."

Microcomputing June, 1981

OMNITERM, the professional communications package, has been winning top ratings from reviewers and users since 1981. We think we know why.

SMART TERMINAL EMULATION AND FILE TRANSFER
OMNITERM turns your personal computer into a terminal which can communicate with any other computer system, mainframe, minicomputer, or microcomputer. OMNITERM can put you in touch with your company's mainframe, for example, or your branch offices, clients, customers, and suppliers. You can send and receive files using the popular XMODEM protocol, run programs, use electronic mail systems, access remote data bases and information services. The applications are limitless.

COMPATIBILITY AND COMPLETENESS
OMNITERM is a full featured program which offers complete control of the RS-232 settings, user definable carriage return, line feed and echoing, translation tables for all 256 characters, character and line pauses as well as XON/XOFF. These and many other possible settings guarantee that OMNITERM will communicate with any remote system using any modem including smart modems for autodial and logon.

DESIGNED WITH USERS IN MIND
OMNITERM is run from a single main menu which keeps the user in control. You can run your printer, review the text which has scrolled off the screen, automatically dial and logon with a smart modem, and store all settings in a file for easy access. Whether you are a first time user of communications software or an expert, OMNITERM makes it easy to get the job done.

BUY WITH CONFIDENCE
OMNITERM comes with complete, professional documentation and free telephone support. There are sample settings files for several of the most popular information services and default settings to make it simple to get started. You can buy OMNITERM with confidence since it is proven software that has been winning praise from reviewers and users since 1981.

Omniterm

✓ 135

PROFESSIONAL COMMUNICATIONS SOFTWARE

Minimum Requirements:

TRS-80 Models I, III 32K memory $95.00	TRS-80 Model 4 32K memory $95.00	TRS-80 Models II, 12, 16 64K memory $175.00	IBM PC/XT 128K memory $245.00

With at least one disk drive and an asynchronous communications board.

See your dealer or call Lindbergh Systems, 49 Beechmont Street, Worcester, MA 01609, Telephone: (617) 852-0233, Source: TCA818, Delphi: LINDBERGH, CompuServe: 70310,267. IBM PC and IBM XT are registered trademarks of IBM, TRS-80 is a trademark of Tandy Corporation.

MasterCard, VISA, and C.O.D.

✓ See List of Advertisers on Page 227

Conclusions

PlannerCalc works exactly as documented and appears to be bug-free. The program's label limitations are its only serious weaknesses. Otherwise, it's a model spreadsheet program. ■

dataCure Salvages CP/M Disks

by Charles R. Perelman

The dataCure system is a unique software tool that regenerates portions of physically or electrically damaged CP/M disks. Overall, the program works fine, but dataCure only repairs disks you've initialized with the program itself.

dataCure uses a sophisticated software error-correction algorithm to store information necessary for duplicating the disk and directory data in two special files that require about 5 percent of the original file space. If you damage a few sectors on a working master, you can usually replace them quickly with dataCure. This saves you from creating a new master from the distribution disk.

dataCure

★ ★ ★

Colorado Online
40 Balfour Lane
Ramsey, NJ 07446
CP/M
$99 (8-inch)
$109 (5¼-inch)

Easy to use?	★★★☆☆
Good docs?	★★★★☆
Bug free?	★★★★☆
Does the job?	★★★★☆

Program Abuse

To use dataCure, you must initialize a disk with the program after you format it but before you write files to it. After you copy or change a file, dataCure's Protection routine creates the special files needed to duplicate the original data. If problems arise later on a protected disk, the Rewrite routine attempts to re-create the correct data by writing over the damaged disk sectors.

If Rewrite doesn't work, use Cure to block out bad sectors by transferring them to a special file placed in User 15. Then write a good copy of the defective data into previously unused sectors.

The Verify routine checks a disk for files changed since you protected the files, leaving the disk unaltered.

Using dataCure

dataCure is easy to use and doesn't require installation. It has both menu and single-line command modes. By calling a CP/M Submit file at the end of one of your programs, you can automatically update disk protection for critical data files.

While you should always back up important files, dataCure provides added security. Unfortunately, the more data you have, the longer the protection process takes. In general, protection takes from a minimum of several seconds to a maximum of between three and four minutes for a full, double-density, 8-inch disk.

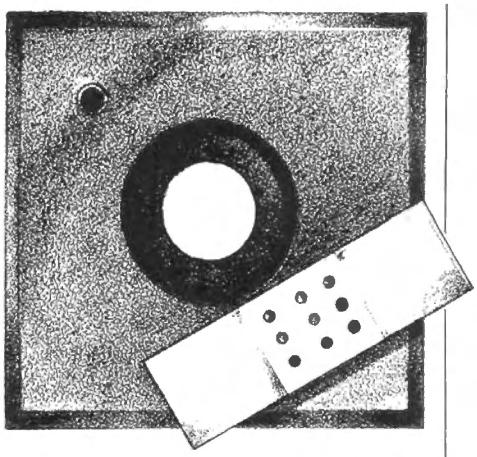
dataCure is intended primarily for CPUs with a 4MHz or faster clock rate. Colorado Online furnishes a patch for Kaypro and other computers using a slower clock speed.

The Help screen, accessible from the main menu, provides a good, single-screen program summary. Prompts and error messages are reasonably clear and informative. The manual and the distribution disk include program tutorials and demonstrations.

Evaluation

dataCure works as represented, but it's not a panacea. The program does not affect any existing disks that have Basic disk operating system (BDOS) or other errors since you did not initialize them prior to file creation.

dataCure corrects a maximum of approximately eight sectors of 1,024 bytes or 16 sectors of 512 bytes. More extensive damage is beyond its present capabilities and causes failure or uncertain results.



I deliberately altered sectors on a disk with a magnet. dataCure rewrote read errors as long as the system was not overloaded.

Generally, if the sectors are on a single track or in the same physical position on sequential tracks and do not exceed the critical number of bytes, dataCure does the job. This is the typical situation for small scratches and damage caused by pointed objects or small magnets.

If Colorado Online expands dataCure's capability to handle more extensive file changes, it will have many applications of greater interest to end users.

You still need the protection of offsite storage for distribution disks. You can't protect them with dataCure unless you're willing to destroy your master, initialize it with dataCure, and re-create the master from the copy. Initializing a disk with dataCure completely obliterates any prior contents.

Documentation and Support

The manual comes in an 8½- by 11-inch three-ring binder. It's well spaced and clearly printed on heavy paper. Explanations are clear. The manual contains sufficient redundancy with few enough topics so that the table of contents and sectional divisions are sufficient without an index.

Colorado Online markets dataCure by mail only, and they provide free updates. The company supports dataCure by phone and through user newsletters.

The program apparently still has some bugs in it, but within the limitations I've described, it worked fine on my Model II.

Continued on p. 223

"THE RESULTS ARE IMPRESSIVE..."
—Dennis Kitsz, 80 Microcomputing; 12/82

Langley-St. Clair's* *Soft·View*™

Replacement CRT's

eliminates the strobe, flicker and fatigue from TRS-80's.™

Now you can upgrade your monitor with the new medium persistence green or amber phosphor tube.

State-of-the-art systems such as IBM™ and Apple III™ do not use the less costly "P4" B&W display tube because it is actually intended for TV viewing and its rapid strobes (60 times per second) cause irritating eye fatigue.

No amount of "green plastic" will solve this problem. But the new ***Soft·View*** CRT display tube from Langley-St. Clair will.

- Available in slow decay Green or medium decay "European Amber" (the standard in Europe)
- Made with Lead/Strontium impregnated glass that stops X-ray emission.
- Of high-contrast face glass that also stops most U.V. radiation.
- Available in frosted glass with extra Anti-Glare benefits.
- Easily installed...comes with pre-mounted hardware.
- Warranted for one full year against manufacturing defects or tube failure.
- The finest quality double-dark glass phosphor fields to produce dramatic contrast.
- Ideal for Word Processing and Programming, yet fast enough for Games and Graphics.

LSIS *Soft·View*™ CRT'S

☐ #GN42 Green Phosphor	$79.95
☐ #GN42G Green Phosphor w/Anti-Glare	$89.95
☐ #OR34 Amber Phosphor	$89.95
☐ #OR34G Amber Phosphor w/Anti-Glare	$99.95
also available:	
☐ #R22G Red Phosphor w/Anti-Glare	$139.95
☐ #B22G Blue Phosphor w/Anti-Glare	$139.95

Plus: $7.00 for packing and UPS Shipping
$17.00 for Overseas, Parcel Post or UPS Blue Label
Add Sales Tax where applicable.
(Inquire about the CRT's we have available for many other computer models)

For MasterCard and Visa Orders only, call
800/221-7070 (in N.Y. call 212/989-6876)

Langley-St. Clair Instrumentation Systems, Inc.
132 West 24th St., New York, N.Y. 10011

Actual unretouched photo.
* World's largest supplier of upgraded replacement CRT's.
Soft-View, IBM, Apple and TRS-80 and trademarks of LSIS, IBM, Apple Computer and Tandy Corp.

462

What's so good about

CP/M may be the industry-standard operating system for 8-bit computers, but that doesn't necessarily make it the best. George Antunes examines its shortcomings, and why you should approach CP/M with caution.

Somehow, a substantial portion of the Radio Shack community has the notion that CP/M (control program for microprocessors) is an operating system superior to TRSDOS and other popular Radio Shack-compatible DOSes. It isn't, and I'll tell you why. In addition, I'll discuss why a Model I/III owner might want to upgrade his computer to run under CP/M and I'll describe how you go about it.

CP/M Versus TRSDOS and Company

The impression that CP/M gives your Model I, III, or 4 applications beyond your wildest dreams or supersedes those available with TRS-80 DOSes is a false one. Granted, a lot of excellent applications software exists for CP/M systems, but CP/M 2.2 is far from a state-of-the-art operating system. Rather, it's a plain, reliable, low-memory-overhead operating system with some distinctly irritating attributes.

People buy CP/M either because it comes with their computer or because it has a huge amount of quality software that runs only under this system—not because it is an exceptional operating system in itself.

If you're familiar with Micro-Systems Software's DOS-PLUS 3.4, Apparat's NEWDOS80 2.0, Logical Systems' LDOS, or even Radio Shack's TRSDOS 1.3, CP/M's poor documentation, its backward command syntax, and its general lack of sophistication will surprise you. I'm not one to tout Radio Shack products, but as an operating system, CP/M 2.2 makes TRSDOS look great. In my book, TRSDOS wins in both documentation and performance.

Most users consider the CP/M documentation as the most obtuse and confusing in the industry. This fact, combined with the commercial popularity of the system, has spawned

by George Antunes

many introductory books explaining CP/M. (I recommend *The Osborne CP/M User Guide*, by Thom Hogan [Osborne/McGraw-Hill].)

Recently, Digital Research, which manufactures CP/M, published the rewritten CP/M documentation set (originally six pamphlets photo-offset from a daisy-wheel typewriter) integrated into one document, typeset, and issued as a paperbound book. It's a vast improvement, but in terms of style and content it's still less than what you'd get from Radio Shack.

If you cut your teeth on TRSDOS, many CP/M features will strike you as bizarre. Some CP/M command syntax is backward. For instance, you'd normally copy a file from the original disk to the second disk. With CP/M, you do the reverse.

Other than some backward command syntax, you'll find CP/M uncomplicated and easy to learn (assuming you have an introduction-to-CP/M book). The DOS has only six commands, listed in Table 1.

To perform other functions, you must go to utilities outside the DOS. The major CP/M utilities are STAT, which displays information about disk files and free space, and PIP, which copies files. Also included with CP/M is DDT (a Debug monitor), a primitive text editor, an 8080 assembler, and a few odds and ends. That's it.

You can see how unimpressive that is compared to DOS-PLUS 3.4's 30 powerful commands, 15 utilities, two Basic interpreters (one of which has many enhancements and extended features), programming utilities that renumber and cross-reference code, an enhanced program editor, and an extremely powerful sort routine that you can call from Basic.

Duplicating these features in CP/M 2.2 (including disk-zap editors, file editors, cross-reference utilities, fast sorts, and the

Microsoft Basic interpreter) would be very expensive.

Bones About It

CP/M 2.2 is a bare-bones operating system. It performs the necessary functions reliably, and that's all. Few features and a general lack of sophistication epitomize CP/M.

For instance, the DIR command tells you the names of files on a disk, but doesn't tell you anything about the size of the various files, when you created or last updated them, or how much free space remains. To access disk file information, you have to use the STAT utility with a cryptic STAT d:*.* command.

Take the case of running MicroPro's WordStar. If you try to save too large a piece of text for the free space on the disk, a no-space message appears and the system hangs up. To get out, you have to execute a cold boot, forfeiting any text you had in RAM. A more sophisticated operating system would catch this and let you insert another disk to save the file.

CP/M also has cryptic system messages. For example, "Bdos Err on c: Select" means that you've tried to access a drive that doesn't exist on your system. An equally terse message could be more informative: "Drive c not available." CP/M 2.2 error messages are a major improvement over those of version 1.4, but many are still unclear.

My favorite strange fact about CP/M is that it's marketed with neither the ability to format disks nor the ability to invoke a back-up utility. You must format all disks before writing data on them, but Digital Research markets CP/M with no formatting capability.

Fortunately, most people don't purchase CP/M directly from Digital Research, but from a licensed vendor who modifies it to run on popular 5¼-inch-drive machines. Most of these vendors include a formatting program with CP/M. Many manufacturers also include a back-up utility for copying the contents of entire disks. Radio Shack's CP/M 3.0 has both formatting and back-up utilities.

Still other CP/M vendors throw in additional utility programs, and a few modify the CP/M user interface to be more communicative and tolerant (called custom BIOS).

But if you don't own a popular 5¼-inch system and you want to use CP/M, you still have some options. You can add an 8-inch drive to your computer and transfer the program, or send the software (on an 8-inch disk) to your system company and pay them to transfer it to the proper disk. You can also buy a modem program and transfer the software over an RS-232 port from a system with an 8-inch drive and communications program. Finally, you can buy some utilities that let your computer read and write in popular 5¼-inch formats.

Nonetheless, CP/M is the most widely used operating system for 8-bit microcomputers. It's not fancy; it's terse, but it works.

ERA	Erases (kills) a file
DIR	Calls up a file directory
REN	Renames a file
SAVE	Saves a file to disk
TYPE	Displays an ASCII file on the CRT
USER	Lets you access separate space in a disk directory (mostly for 8-inch drives)

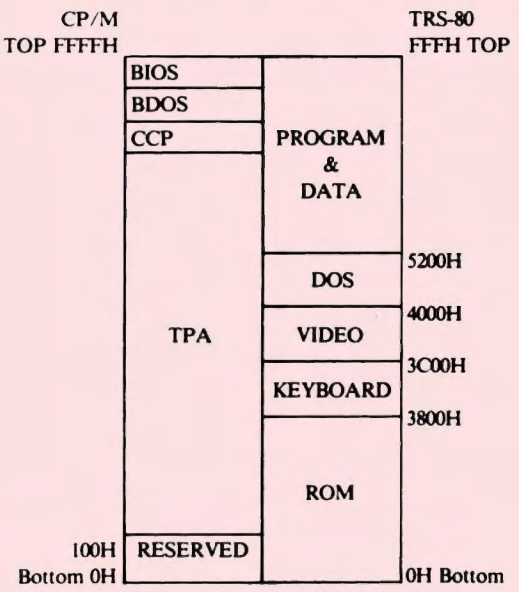
Table 1. CP/M's six commands

Is CP/M for You?

You've seen many ads, and heard much talk proclaiming the benefits of modifying your computer to accept the CP/M operating system. But how do you identify a real need for CP/M, and if you do decide to add CP/M capability, how do you go about it?

Most Radio Shack users have no need for CP/M. Radio Shack supports several of its own operating systems with a wide variety of applications software. If, however, you're frustrated with the existing software available to

Comparative Memory Map of CP/M and Model III



*Reserved: this 256-byte area holds CP/M system vectors—a set of important address locations used by various components of CP/M.

*TPA: the transient program area is where programs and data are located when a program executes. In most CP/M implementations on 64K this is approximately 58K in size.

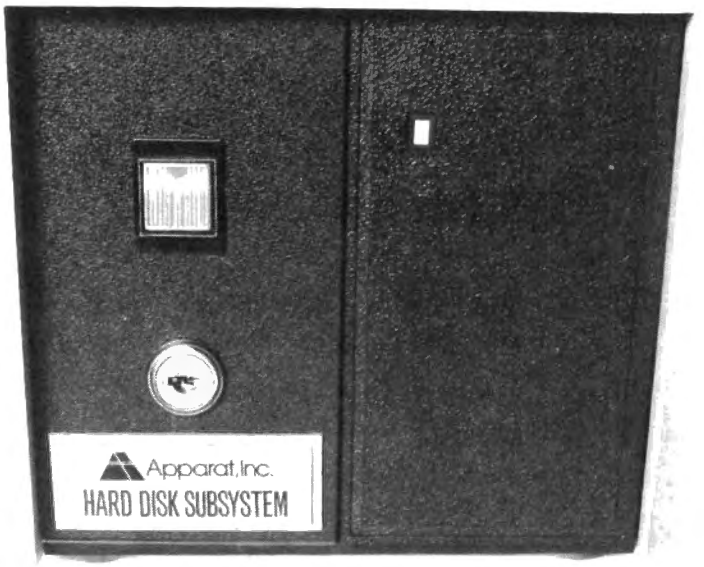
*CCP: the console command processor is the part of CP/M which receives direct commands from the user and sends system status and activity reports to the user.

*BDOS: the Basic disk operating system handles all tasks and transactions involving disks.

*BIOS: the Basic input/output system handles all I/O devices such as drive controller, terminal, and printer. This section of CP/M is machine specific; it is revised for each new type of computer implementing CP/M. For this reason the exact amount of memory which CP/M occupies varies by type of computer. Together the CCP, BDOS, and BIOS take up about 6K of memory.

Figure. Comparative memory map of CP/M and Model III.

OURS DOES ONE THING RADIO SHACK'S DOESN'T;



SAVES YOU $500.

The Apparat hard disk subsystems for the TRS-80 Model I & III computers give you the high performance, complete compatibility and top value you demand.

These systems use the most advanced 5¼" Winchester technology with transfer rates up to 5 Mbits/sec. and an average access time of 85 msec. And you can add a second drive in the future if your needs grow.

The Apparat hard disks offer complete compatibility with the model III, just plug it in and you're ready to work. They are fully supported by NEWDOS/80 2.5 and RS LDOS 5.1.3.

Top performance and compatibility doesn't have to mean a high price. The disks are available in four configurations; 5 Mb at $1,489, 10 Mb at $1,735, 15 Mb at $1,945 and the 26 Mb at $2,499. These prices offer you top value in a hard disk sub-system. Prices include all required components and software.

For more information write Apparat, Inc., 4401 S. Tamarac Parkway, Denver, CO 80237, 303/741-1778. Dealer inquiries invited. ↙40

Radio Shack and TRS-80 are registered trademarks of Tandy Corp.

Apparat, Inc.

↙ See List of Advertisers on Page 211

you or, more important, if you have specialized needs, then you should consider CP/M.

You're a candidate for CP/M expansion if you can identify a superior application that runs only under CP/M. An abundance of CP/M software exists for specialized business and professional applications. For instance, if you're looking for a manufacturing inventory and cost accounting system for a small factory, or an integrated medical records, accounting, and medical supplies inventory package for a veterinary office, CP/M is the way to go.

But adding CP/M to access yet another spreadsheet program or general accounting package isn't worth the bother, unless the program offers important features not found in standard Model I/III software. Any experienced Radio Shack user who adds CP/M simply for its qualities as an operating system is likely to be disappointed.

If you do decide to add CP/M to your system, you should look for the features outlined below:

- 64K RAM (minimum)
- 80-column by 24-line display
- Double-sided, high-capacity drive support.
- Microsoft Basic (MBasic)
- Extra CP/M utilities, including reading/writing in multiple formats

Memory, Disk Storage, and Screen Display Concerns

In some ways the need for 64K of RAM and an 80-character by 24-line video display are related. Both are a result of differences in the Radio Shack memory configuration and standard CP/M memory configuration.

A CP/M enhancement has to re-address the random-access memory in the Model I/III to get rid of the addressing space that the ROM occupies. It must also move the screen display (which is memory-mapped from 3C00 to 3FFF hexadecimal [hex]) to a neutral location.

CP/M requires memory from 0000 to 00FF hex for system vectors (analogous to ROM addresses under TRS-DOS) and from 0100 hex to the top of memory (FFFF hex in a 64K machine) for data, program code, and about 6K of CP/M routines. In a Model I/III this means serious memory relocation. (See the Figure for Model III and CP/M memory use.)

Two other points to consider are the Model I/III's ROM memory map and video display. The Model III has only 48K of programmable memory (RAM); an additional 14K of its addressing space works in conjunction with the software in read only memory (ROM). If CP/M takes up 6K of RAM, that leaves only about 42K for programs and data, space known as the temporary program area (TPA).

A TPA of 42K is too small for serious applications programs. To make CP/M installation in a Model I/III effective, you must add at least 16K more RAM to get enough TPA to run many CP/M programs.

The Model I/III maps a video display space of 400 hex in memory starting at 3C00 hex; any data written to those addresses automatically appears on the screen. This puts the screen in the middle of the space CP/M uses for the TPA.

Any Radio Shack user who adds CP/M simply for its qualities as an operating system will be disappointed.

To run standard CP/M software, you must move the screen display out of memory reserved for data and programs. In addition, if an 80-character by 24-line display is included, you must double the video memory size.

The standard Model I/III screen display takes up 400 hex of memory, or 1,024 decimal—exactly enough memory for a 64-character by 16-line screen display. The problem is that CP/M evolved in a world where terminal video displays were at least 80 characters wide by 24 lines long. As a result, most CP/M applications programs assume an 80-column by 24-line display that requires 1,920 decimal memory in a memory-mapped system. Some programs, such as MicroPro's WordStar, let you select a 64-column by 16-line screen, but most CP/M software requires an 80 by 24 display.

CP/M handles communications with a CRT through an input/output (I/O) port—a special access mode independent of the main memory space. The CP/M CRT screen display doesn't require address space overhead like that of a Model I/III. Implementing an equivalent CP/M 80 by 24 screen display on a Model I/III requires 1,920 bytes of memory that is transparent to the main memory map.

You can reformat your Model I/III display in two ways. One option is to re-address the video memory so it occupies 2K of protected RAM at the top of main memory, like the Lobo Max-80 does. However, this method reduces the TPA by about 2K.

Alternatively, you can physically add an extra 2K of dedicated video memory accessed through an I/O port, leaving the TPA intact. This is difficult and expensive to do, but it produces the largest possible TPA.

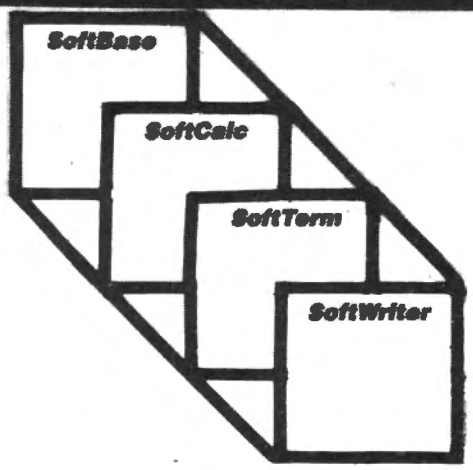
Any way you accomplish it, setting up an 80-column by 24-line screen display on a Model I/III is no simple task. Model I owners have an even tougher time—they have to add a high resolution monochrome monitor (the standard monitor won't work with an 80 by 24 display).

Once you solve the screen display problem, you have to determine which CRT terminal your CP/M package emulates. Make a point of asking vendors. This is important because most CP/M applications programs require that you specify the terminal brand and model so that your program sends the proper control codes for cursor movement and the like.

If possible, examine the documentation of the programs you want to use before you choose a CP/M card. Check to see with which terminals the software interfaces, and be sure the CP/M package you select lets your computer emulate at least one terminal listed in the docs.

Some terminals offer many features; others are unadorned. If intelligent cursor positioning, reverse video, high/low intensity highlighting, and so on are important to your application, find a CP/M terminal emulation card that supports these features.

In addition to memory and screen display, you should think about the data storage requirements of the anticipated application. Many business



SoftPac

Integrated Software for your TRS-80

Meet SoftPac — the remarkable new software package that puts more raw power at your fingertips than anything yet created for the Radio Shack computer. Integration is the key. SoftPac actually combines word processing, information management, spread sheet calculations, and communications into one fully integrated system. Data is transmitted from one program to another at the touch of a key. Don't worry, SoftPac doesn't cheat by using disk files, it transfers data through memory. This means that SoftPac is fast and easy to use! Perhaps the single reason why you should own SoftPac is that all updates to the package are free! The SoftPac program package includes the Master and Backup diskettes, and over 200 pages of documentation. This includes hundreds of models and examples! Just look at all those features in each SoftPac program!

SoftWriter

Insert characters, words, lines, paragraphs, screens & more. Delete characters, words, lines, paragraphs, screens & more. Variable Margin widths from 1 to 255 and Right Justification. Simple Arrow key movements with automatic text scrolling. Automatic Line Centering and Word Wraparound supported. Block Copy of text from 1 to 1000 characters instantly. Block Copy and Deletion of text from 1 to 1000 characters. Global Find and Replace commands with Wild Cards supported. Automatic Key Repeat and two control keys for command access. Whoops feature to prevent deletion of valuable text. Transmit and Receive text from any other SoftPac program. Save part or all of a document in the SoftWriter memory. Merge two or more files together to form one document. Complete spelling checker to correct any misspelled words. Underline, Emphasize, Subscripts, Superscripts, Correspondence, variable character sizes, form feed, page numbers, left margin, right margin, page length, line length, all printers supported. Complete printer control codes allow you to cut & paste text. Automatically counts the number of letters, words, & sentences. Split screen viewing of any file on your data diskette. Type ahead of any keyboard character or command supported.

SoftCalc

Text and Character entry into any position for labeling. Easy cursor movement using the Arrow keys and Control keys. Block cursor movement to each corner of the spread sheet. Automatic key repeat and type ahead of any character typed. Replication and Forecasting command for value prediction. Deletion of Labels or Numbers in any Column, Row, or Position. Sorts any Column or Row in Ascending or Descending order. Print any portion of the spread sheet to any standard printer. Move a Label, Number, Position, Column, or Row instantly. Calculate the Total of any Column or Row on your spread sheet. Set up financial models with cross referencing of values. All standard math functions supported including Trig functions. Many Engineering and Scientific functions fully supported. Integrate & merge SoftCalc data into any other SoftPac program. Instant scrolling of the screen during Row or Column movement. High resolution screen supports 8 column width & 14 Row depth. Instant on-screen graphs of your data in Bar or Pie plots. Complete error trapping routines prevent loss of any data. Simple operation with complete prompting on the command line.

SoftTerm

Variable Screen Width from 1 to 255 with Word Wraparound. Printer Output supported with High Speed Printer Spooler. Carriage Return and Line Feed Suppression command supported. Upper/Lower command converts all uppercase text to lowercase. Echo Keyboard command for incoming and outgoing characters. Input Buffer and Output Buffer command to a 10,000 byte buffer. Place text from other SoftPac programs in the SoftTerm buffer. Transmit text to other SoftPac programs from SoftTerm. Send all ASCII characters and re-program the keyboard. Complete translation tables for incoming, outgoing, & printer. Review data that has scrolled off the top of the screen. Communicate with any system including a EBCDIC-coded system. Change the Baud Rate, Parity, Stop Bits, and Word Length. Automatic count and display of all transmit and receive errors. Automatic dialing, Hang Up, Directory, and Pause features. Complete Modem & RS-232 test command for hardware analysis. Transmit and Receive Basic and Binary files from any system. Save all current SoftTerm settings to your data diskette. Nulls supported for incoming, outgoing, and printer characters. Several supplied setting files for your printer and keyboard. Special commands allow buffer transfer and Cold Startups.

SoftBase

Set up files using customized forms generated by the data base. Use Multiple forms in any portion of the SoftBase program. Use all or part of a form in a file with control commands. Select the Full Screen Text Editor mode for data entry. SoftBase does not limit you to a specific field or entry size. Read any file using the file name or the Wild Card feature. Correct any file instantly using the Full Screen Editor mode. Delete any file from the data base with the touch of a key. Read Multiple files on screen and print each file to a printer. Search for a file by the letter, word, sentence, and more. Locate any file in the data base in under 1 second at any time. Review selected portions of each group of 10 files on screen. Print one, all, or selected files to any standard printer. Insert text from any SoftPac program into a SoftBase file. Transfer text from any SoftBase file to other SoftPac programs. Print mailing labels and merge SoftBase files with SoftWriter text to generate form letters using any portion of the file. Memory command displays available memory and unused files. Complete Error Trapping routines and High Speed operation.

SoftPac V3.0 Disk & Manual $299.00
SoftPac V3.0 Manual & Demo 25.00
Available for any Model I, III, & 4.
Dealer Inquiries are Welcome.

Visa and C.O.D. orders welcome.

918-749-6211

Softronics Computer Systems
2300 E. 14th Suite 201
Tulsa, Oklahoma 74104

116

TRS-80 is tm of Radio Shack, a Tandy Corp

and professional programs use disk overlays that automatically swap in and out of RAM while you use the program. These programs require a substantial amount of disk storage. For example, MicroPro's WordStar and Cornucopia Software's Electric Webster spelling package take up most of a double-density, double-sided, 40-track drive.

In addition, many applications, such as inventory or accounting programs, involve large data files that a single-sided, 40-track drive can't handle.

Every application has its own requirements, but the double-sided, 40-track drive is the minimum acceptable configuration in most business settings.

After thinking this through, you might find that your application requires the higher storage capacity of 8-inch drives or a hard disk. Whatever your needs, make sure that the vendor you choose has an implementation of CP/M that can control the drives you need in your specific application.

Basic Needs

Don't overlook the need for Basic in your CP/M package. The CP/M package that comes from Digital Research includes an old 8080 assembler, but no Basic. As a Radio Shack regular, you're used to an enhanced Basic on your operating system, so you might not inquire about this option.

If the CP/M package you want doesn't include Basic, you'll have to buy it separately. The CP/M version of the Microsoft Basic interpreter lists for about $350. The other commonly used CP/M Basic, C-Basic 2, lists for approximately $150. Radio Shack sells this for the Model 4 at $99.

Either way, the extra cost is substantial. Fortunately, most CP/M boards on the market for the Model I/III include MBasic as part of the package. But check before you buy.

Utilities, Disk Formats, and File Compatibility

Because CP/M is a low-frills operating system, ancillary utilities take on a more important role than in most Radio Shack-compatible DOSes. A good set of utilities helps keep you sane and even happy when using CP/M. Digital Research doesn't supply utilities, but they're available from many other sources. In addition, you'll find many utilities in the public domain.

Investigate the utilities included with each CP/M product. Utilities aid in file management, let you copy disks (remember an unenhanced CP/M has no back-up command), and do myriad housekeeping activities.

Since no standard 5¼-inch disk format exists, you want a version of CP/M that reads, writes, and formats in a variety of popular disk formats. Finding one is the challenge.

A partial solution is to have a system format compatible with one of the major vendors, like Kaypro or Morrow, that can also read and write in a variety of CP/M formats. Remember, the key word here is format. Simply because you can read and write in different formats doesn't mean you can format a new disk.

Most CP/M boards for the Model III include MBasic as part of the package. But check before you buy.

If my friend with a Kaypro sends me a disk, I can read from it and write to it with my CP/M. However, I can't send something to him unless he supplies me with a disk formatted for his Kaypro system. Still I'm lucky to be able to read and write in his format; most CP/M 5¼-inch systems are single format and can't communicate with other system formats.

Some versions of CP/M offer selection of more than one format, but advertisers don't provide enough information for consumers. You should request product information from vendors, and carefully examine statements in ads and product announcements concerning alternative disk formats. Follow up by phone to resolve any ambiguities.

If possible, choose a version of CP/M that allows choices in reading from, writing to, and formatting disks. If your application involves transporting data files from current Model I/III disks, make sure that the CP/M you buy supports that format or has utilities to convert files between CP/M and Radio Shack disks. The only software I know of that's not bundled with a CP/M package and that supports such file conversion is from XXXX and it sells for $149.

Once you resolve the issue of disk format compatibility, you face the problem of file compatibility. Many Model I/III programs such as word processors, data-base managers, and spreadsheets store information in non-ASCII files that are incompatible with the file structures used by comparable CP/M programs. Simply because you can read a disk under CP/M doesn't mean you can transfer its data files in a useful form.

If you use The Small Computer Company's Profile III+ on a Model III and want to implement Ashton-Tate's dBase II, you must rekey existing data files. This can be tedious and expensive. Similarly, many other spreadsheet programs can't read VisiCorp's VisiCalc files.

You can save VisiCalc data in the special DIF format that some CP/M spreadsheets can read (e.g., SuperCalc), but not all CP/M packages support the DIF format. Without support for DIF files, your existing data files are unreadable. Don't assume file compatibility unless you see it demonstrated.

An analogous set of problems pertains to programs written in Basic. You can solve the problem of reading a TRS-DOS disk under CP/M, but you still can't read a Basic program under MBasic. CP/M's MBasic compresses files to save disk space. In the process, MBasic replaces Basic commands such as GOTO, Print, and Clear with special codes or tokens.

MBasic and Microsoft Disk Basic use different values for Basic keywords, so using MBasic to read a program saved in Disk Basic results in hopelessly scrambled code. However, you can use MBasic to read Basic programs saved as ASCII files. Because of syntax differences between MBasic and Disk Basic, the program probably needs revision before you can execute it, but some utilities available convert Disk Basic commands into MBasic syntax.

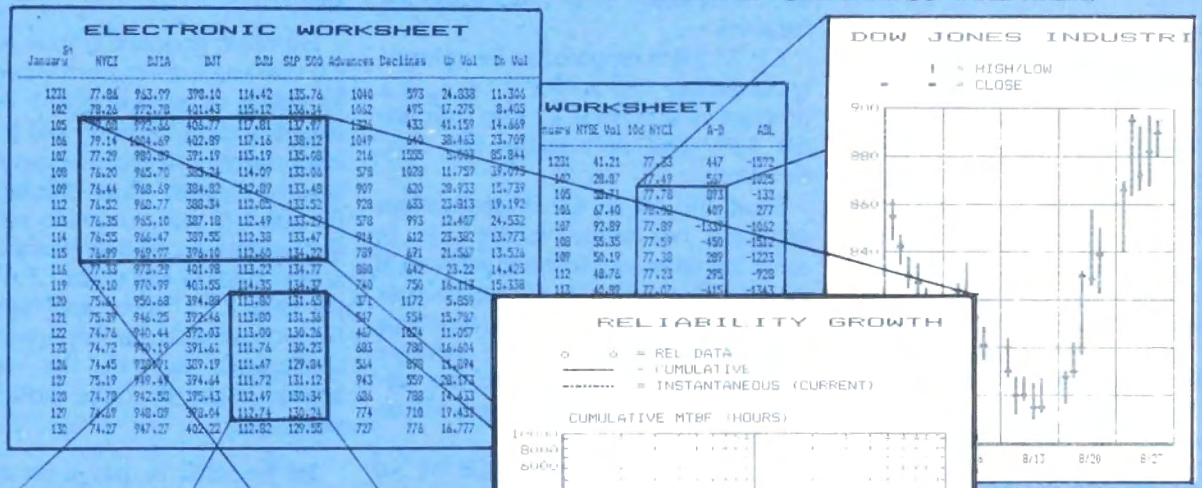
The Model 4 Upgrade And CP/M 3.0

As you assemble information and evaluate features, bundled software,

DATAGRAPH™

PRINTER GRAPHICS PROGRAM

TRANSFORM YOUR VISICALC™ FILES INTO HIGH-RESOLUTION CUSTOM GRAPHS ON YOUR TRS-80™ COMPUTER AND GRAPHICS PRINTER.



NEW!

- **LOG SCALES**
- **MULTIPLE SYMBOL LIBRARIES**

MODEL I, III
$79.95

PIE CHART OPTION: $34.95

MODEL II/12/16
$129.95*

***INCLUDES PIE CHARTS**

* 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-formated 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 LIBRARIES - Plots data with 324 different Line/Symbol Shapes chosen from 27 line/symbol libraries. * 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. * SCALE SELECTION - Has Linear, or LOG Scales with selectable pattern of grid lines. * CALENDAR SCALE - Optionally prints names of month on horizontal scale. * CURVE SELECTION - Can Mix Scatter, Line, Curve-Fit, Stairstep, Bargraphs, Pie Charts. * 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 ENTRYS - 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, III 48K
- TRS-80 MODEL II, 12, 16
- LNW80, LNWII, MAX-80

DOS
- TRSDOS 1.3, 2.3, 2.0, 4.2
- NEWDOS, NEWDOS/80
- DOSPLUS 3.4/5, LDOS 5.1

DISK DRIVES
- SINGLE DRIVE
- DUAL DRIVE (PREFERRED)

GRAPHICS PRINTER:
- MX-80 GRAFTRAX, OR GT+
- MX-100, FX 80/100
- LP VIII, DMP 200-2100, 120
- NEC 8023 A-C, C.ITOH 8510
- IDS 460/560, 480, 80/132
- OKIDATA 82/83, 92/93, 84
- GEMINI 10/15

TO ORDER: Send check, purchase order, or request for COD shipment. Specify Computer and Printer Type. Include $2.50 for postage and handling. Calif. residents add 6% tax.

526 MICRO SOFTWARE SYSTEMS • MICROPLOT, INC.

DEALER INQUIRIES WELCOME

1815 SMOKEWOOD AVE. • FULLERTON, CA 92631 • (714) 526-8435

TRADEMARKS: DATAGRAPH (MICRO SOFTWARE SYSTEMS); VISICALC (VISICORP); TRS-80 (TANDY CORP); DIF (SOFTWARE ARTS INC.)

VISA/MASTERCARD ACCEPTED

and price, keep in mind that, if you own a Model III, either Radio Shack or an independent dealer can upgrade it to a CP/M-compatible Model 4 for about $1,000.

Radio Shack makes the upgrade for $800 plus an installation fee. Adding CP/M 3.0 to a Model III costs about $150. (Upgrading a Model III using the CP/M boards currently on the market is cheaper, but all lack one or more of the Model 4's features.) Remember that this gives you a new keyboard, 80-column by 24-line display, full Model III compatibility, TRSDOS 6.0 from Logical Systems, MBasic from Microsoft (which I assume will be patched to run in CP/M as well as Model 4 mode), and 4 MHz speed in any mode.

A number of independent dealers also offer upgrades, and for less money. But most of these involve some non-Radio Shack components that Radio Shack Repair Centers will not service. These upgrades include an 80-column by 24-line screen, 128K RAM, Microsoft Basic, CP/M 3.0 hardware, and a 4 MHz processor. The new CPU runs Model III applications involving limited I/O, sorts, spelling checks, and statistical analyses at twice the III's normal speed.

Only one CP/M manufacturer, Holmes Engineering, claims its CP/M software runs with the Model I/III in the high speed mode. All other manufacturers report that their boards are incompatible with high speed operation, or aren't sufficiently reliable in high speed mode to recommend such use. If 4 MHz operation is important to your application, you should consider buying a Model 4.

Radio Shack offers CP/M 3.0 for the Model 4, the latest implementation of this operating system. The currently advertised, non-Radio Shack CP/M add-on boards offer version 2.2 (see Table 2 for a comparison of CP/M 3.0 and 2.2 features).

CP/M 3.0 is supposed to be upwardly compatible with version 2.2 (i.e., if a program runs under 2.2 it also runs under 3.0). This isn't always the case, however.

Most, but not all, CP/M applications programs run under version 3.0. In some instances, applications software is incompatible with CP/M 3.0 because of shortcuts taken by the applications programmer. Make sure the software you want is compatible with the version of the operating system you will be installing.

Digital Research markets CP/M 3.0 in two versions. One uses bank-switched memory and requires a minimum of three 32K banks (a total of 96K). The other, expurgated, version runs on a 64K system without bank switching, but lacks many of version 3.0's nicer features and has a smaller TPA than CP/M 2.2. You should consider CP/M 3.0 only if you'll use it in a bank-switching environment. Radio Shack's CP/M 3.0 uses 128K for bank switching.

CP/M 3.0 (which Digital Research also calls CP/M Plus) adds a few features important for business applications, like stamping the time and date on files. It also includes additional utilities that are popular in the public domain. CP/M 3.0 even has a Help file with on-screen prompts and explanations.

Digital Research now includes its macro assembler as a standard CP/M 3.0 feature, and you don't need to log new disks. In addition, it features an improved user interface, more extensive error trapping, and clearer error messages.

However, the main feature of CP/M 3.0 that sets it apart from version 2.2 is its ability to expand RAM by bank-switching extra memory, and the use of extra memory to speed up program execution through more efficient, direct file disk I/O calls. Programs with extensive random-access data files should run at least twice as fast under CP/M 3.0. If the faster CPU speed and faster direct file processing are not important in your application, one of the expansion boards might be quite sufficient for your needs.

Be prepared to pay a bit more for CP/M software than you usually do for TRS-80-compatible software. Historically, prices for CP/M applications programs run two to three times the price of comparable programs for the Model I/III. If you need the software, make the sacrifice and buy from a dealer who supplies good support. After all, software capability should be your reason for aquiring CP/M in the first place. ■

George Antunes is an associate professor of political science and director of the College of Social Science Computer Applications Laboratory at the University of Houston. He is also a computer consultant. Write to him at the Department of Political Science, University of Houston, University Park, Houston, TX 77004.

Somewhat larger TPA
A few CP/M 2.2 programs will not run under CP/M 3.0
Faster file I/O for random access files
Help support on screen
Time and date stamping of files
Password protection of files
Improved error trapping and error messages
No need to log after changing disks
Enhanced standard utilities
Includes Digital Research's Macro Assembler and additional utilities

Table 2. CP/M 3.0 features compared with CP/M 2.2 assuming a 128K banked system.

For further reading in *80 Micro*

Brewer, Bill. "CP/M Cheap." A hardware/Assembly-language project to upgrade your Model III to CP/M for $5. March 1983, p. 112.

Harrell, John B. III. Review of CP/M 2.2, MBasic 80 on the Mapper I (48K)/III (64K) by Omikron Systems. December 1983, p. 61.

Kepner, Terry. "CP/M III Ways." Review of: CP/M Mapper III board by Omikron Systems ($199); VID-80 board by Holmes Engineering Inc. ($279); and Shuffleboard III board by Memory Merchant ($299); plus a short history "The CP/M Story." December 1983, p. 122.

THE RISE OF CP/M

by George Antunes

In spite of its limitations, CP/M has risen as the undisputed leader among operating systems for 8-bit CPUs. To help you understand why, I'll review the context in which CP/M entered the industry.

Gary Kildall, president of Digital Research, CP/M's parent company, wrote much of what is now CP/M 1.4 in 1973 to demonstrate Shugart floppy-disk drives. By 1976 the microcomputer industry was coming into existence, but using available systems to do real work was a problem; each manufacturer had his own disk formatting and operating systems that were, of course, incompatible with one another.

A more serious problem, however, was that the existing software and hardware didn't work dependably. Furthermore, there were severe software incompatibilities that required extensive program rewrites for each new computer.

By comparison, the CP/M operating system worked reliably. It featured dynamic allocation of disk space for data files, and published system input/output routines that let Assembly-language programmers customize particular applications.

In addition, CP/M was relocatable; you could implement the same version on systems with memory capacity of from 16K to 64K. CP/M provided a more or less machine-independent environment for applications software. All CP/M systems with 8-inch drives could read and write IBM single-sided, single-density disks, which greatly simplified marketing and distributing software.

As the only operating system to offer these features, CP/M 1.4, released in 1977, became a terrific success. To put it another way, even a minimal standard was better than no standard.

CP/M went out in front early as one of the only operating systems with enough disk space for small business applications. An active user's group of hobbyists and hackers developed a large amount of software in the public domain that contributed to this success.

The fact that the disk format was compatible across computers from different manufacturers also helped, as did the fact that CP/M ran on the 8080, 8085, and Z80 CPU chips (the 8085 and Z80 accept 8080 code, the language in which CP/M is written). Commercial software manufacturers soon generated more CP/M compatible software than that for any other operating system.

The power of the CP/M software base was so strong that even owners of Apple and Commodore machines, which use the CP/M incompatible Mostek 6502 chip, converted to CP/M by adding a compatible CPU chip.

Manufacturers like North Star and Heath, which had compatible CPUs but originally promoted their own DOS, merely reconfigured CP/M to run on their existing systems.

Either way, manufacturers who had operating systems competing with CP/M did not fare well. By the time 5¼-inch drives became an important factor, manufacturers had to offer CP/M if they wanted to sell to the small-business market.

Gradually, even manufacturers of 8-bit operating systems targeted for commercial applications either offered CP/M or went under. Radio Shack was the only major manufacturer to go it alone by supporting only its own DOS. This year, however, they lost that distinction by announcing CP/M for the Models II, 4, 12, and 16.

Digital Research has a history of licensing vendors to offer CP/M for various systems. The vendor is then responsible for modifying the software, and for documenting any utilities or enhancements that he provides.

The only disk format that Digital Research officially supported is the original 8-inch, single-sided, single-density IBM format. Since 8-inch drives were standard for business systems, this caused no problems. You could exchange software and data in the single-sided, single-density format and write it back out to a more exotic format.

Digital did not support any other formats—8-inch double-density, 8-inch double-sided, and all 5¼-inch disks. Individual companies defined these formats according to their needs and whims. Consequently, in 1982, declining sales of 8-inch drives, and the market surge of high-capacity 5¼-inch floppy- and hard-disk systems, caused problems for CP/M users.

Without a 5¼-inch floppy standard, software manufacturers and distributors make available scores of different, incompatible formats. For instance, Lifeboat Associates, a prominent distributor of CP/M software, supplies their products in virtually any known format. If you want a product they don't handle, or if you want to buy from a discount distributor, you're in trouble.

Despite the chaos, sales of 5¼-inch disk systems continue to grow and CP/M continues to increase its market share in the small business and professional applications on 8-bit CPUs. The arrival of the Model 4 and Radio Shack's promise to support CP/M now generates new interest in CP/M among the TRS-80 community. ■

TCS Heart of TEXAS COMPUTER SYSTEMS

Toll Free 1-800-433-5184 Texas 1-817-274-5625

CORVUS

25% OFF LIST PRICE!

OMNINET--A high speed multiuser network that can connect several computers for instant communication up to 4,000 feet away. **Save over $1,000 on a 20mg. Corvus Hard Disk system for TRS-80, IBM, and other computers.**

5mg. $1649 10mg. $2279 20mg. $3049

Tandon

TCS DRIVE CABINET is industrial grade heavy guage metal, safety fused, and comes with gold plated external connector with extender cable.

1 DRIVE in Cabinet

40 track single sided $199
80 track (dual sided 40 track) .. $299
160 track (dual sided 80 track .. $399

2 DRIVE Double Cabinet

40 track single sided $399
80 track (dual sided 40 tracks) . $599
160 track (dual sided 80 tracks) $799

1 DRIVE Double Cabinet

40 track single sided $269
80 track (dual sided 40 track) .. $369
160 track (dual sided 80 track) . $449

Drives in cabinets come assembled and tested with power supply. Order cable separately.

BARE DRIVES:
TM100-1 (40-trk SS):**$159** **TM100-2** (80-trk dual 40s):**CALL**

PRINTERS

PRINTER CABLES AND INTERFACES AVAILABLE
Call for current pricing

star PRINTERS

- 100 - 120 - 160 CPS
- Bidirectional Logic Seeking
- Friction and Tractor
- 9X9 Dot Matrix
- True Decenders
- High Res-Bit Image Block Graphics
- Super Script-Subscript
- Underlining
- Backspacing Doublestrike
- 5, 6, 8 1/2, 10, 12 and 17 Pitch
- Programmable Line Spacing
- SIX (6) MONTH WARRANTY

Gemini 10X (9 inch, 120 cps, Friction & Tractor standard)
Gemini 15X (15 inch, 120 cps, Friction & Tractor standard)
STAR Printers interface with most computers on the market. Call!

RITEMAN PRINTERS Briefcase size, dot matrix, 120 CPS. We will beat any advertised price. Give us a call.
$259 Including tractor. Limited quantities.

CompuDisk

MINI DISKETTES $1.70
100% Certified Error Free
Meets or exceeds standards for ANSI, DIN, JIS, ECMA.
Money back guarantee.

All disks include:
- Hub Rings
- Protective Envelopes
- Write Protect Tabs
- Adhesive Labels

Boxed: 10 per box

Type	5-9 boxes	10 plus
SSDD	$18.95	$17.95
DSDD	$23.95	$22.95

Bulk: 10 per pack

Type	5-9 packs	10 plus
SSDD	$17.95	$16.95
DSDD	$22.95	$21.95

In Hard Storage Case

Type	5-9 cases	10 plus
SSDD	$20.95	$19.95
DSDD	$25.95	$24.95

The PRODUCER Professional Program Writer
Sensational software breakthrough. You may never again need to buy a packaged program to store and retrieve data and perform calculations. Design your own custom programs with The PRODUCER. It writes the entire program for you, including all the BASIC code. Available for the TRS-80 Model I & III. See the PRODUCER SOFTWARE extended ad in this issue. **$199.95**

TRS-80

TRS-2000 Tandy's new PC is quite a machine. Faster and cheaper than the IBM. Dual disk drive. Impressive throughout. Call for our low price.

TRS-80 equipment comes with original 90 day Manufacturer's Limited Warranty.

MODEL 12 and MODEL 16

MODEL 12, 1 drive ..... $CALL
MODEL 12, 2 drives ..... $CALL
TCS MODEL 12 version, 2 Tandon drives (like the original) $2995

MODEL 16B...Support up to 6 users. Run your whole office with hard disk capabilities for about $1000 per user!

MODEL 16B, 1 drive ..... $CALL
MODEL 16B, 2 drives ..... $CALL

Model 12 and Model 16 Accessories

128K memory board (256K Max.) $629
128K extra memory chips (RS) $269
128K extra memory chips (TCS) $189
Xenix Microsoft Multi-user Basic $269
Xenix Accounting Software ..... $CALL
Xenix Multiplan Spread Sheet Software $263
MII/12 to M16 multi-user upgrade kit $1339
DT/1 Video Terminal $629

MODEL IV

MODEL IV, 16K Cassette $825
MODEL IV, 64K, 2 drives, RS-232 ..... $CALL

MODEL 100 PORTABLE COMPUTER

Full size typewriter keyboard, 8 line 40 character display.

8K / 24K / 32K Models **CALL**

TCS Model IV, 64K, 2 Disks

Systems come with 180 Day Warranty

$1499 RS-232 included free! **$1699**

With standard 40 track double density drives. Over 340,000 bytes. Enhanced Model IV Operating System

With 2 dual headed 40 track double density drives Over 730,000 bytes Enhanced Model IV Operating System

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.

TCS DISK EXPANSION KITS FOR TRS-80s

		M-III	M-IV
1	Controller, Power Supply, Hardware, Instructions	$249	$329
2	Kit 1 plus one 40-track Tandon Disk Drive	$429	$479
3	Kit 1 plus two 40-track Tandon Disk Drives	$598	$649
3a	Kit 3 w/2 80-track Tandon Drives (dual sided 40s)	$698	$729

Model IV needs 64K to operate. For 64K Kit, call.

TCS Heart of TEXAS COMPUTER SYSTEMS

P.O. Box 1327 Arlington, Texas 76004-1327

Toll Free 1-800-433-5184 Texas 1-817-274-5625

Everything from A to Z

Threaded lists quickly organize your array entries in alphabetical order, regardless of the sequence in which you input them.

If you've ever inserted an item into a Basic program's ordered array, you've probably wasted time waiting for the program to rearrange data and make room for the new entry. You can eliminate that wait by using threaded lists to alphabetize your arrays.

Threaded lists let you quickly insert items into, or delete them from, ordered lists while maintaining alphabetical sequence. Threaded lists use no time-consuming data movements, sorts, reorganizations, or garbage collection routines. And they work with any TRS-80.

The Threaded List Concept

Threaded lists consist of two parts, a full list and a free-element list. The full list is alphabetized by what you can think of as an imaginary thread running through the list, connecting all the items in order. The free-element list accepts any insertions in the list you want to make; a second imaginary thread connects the blanks in the free-element list.

To get a better idea of how threaded lists operate, look at the list in Fig. 1. It's divided into its two components. The first segment is filled with names (the full list), the second contains blank spaces (the free-element list). Each name in the full list has a physical successor (not necessarily in alphabetical order) and a logical successor (ordered alphabetically).

You can run a thread through the list (the dotted line in Fig. 1) to connect the names alphabetically. Another thread connects the blanks in the free-element list.

Suppose you want to add the name Krane to this list. A threaded list program places Krane in the first empty space in the free-element list. Then, starting at the first name alphabetically (Able), it traces a thread until it finds the name that logically belongs just be-

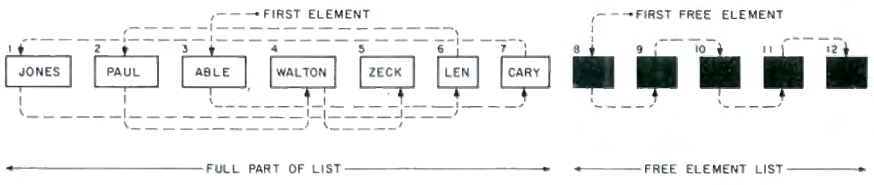


Figure 1. Threading a list of names alphabetically.

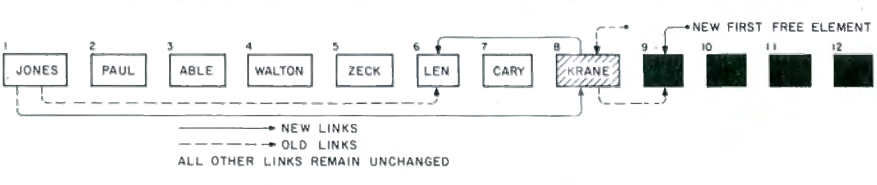


Figure 2. Threading Krane into the list.

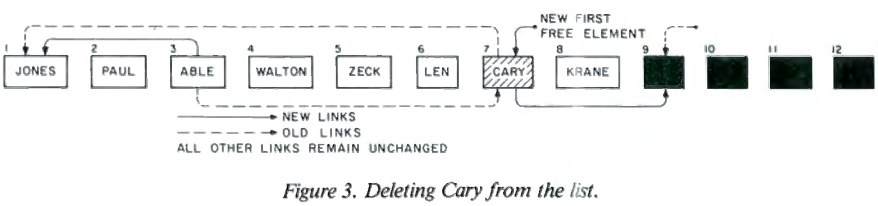


Figure 3. Deleting Cary from the list.

The Key Box

LOAD 80

Any TRS-80
16K RAM Cassette Basic
32K RAM Disk Basic

Variable	Function
A$( )	List holding data elements (names, in this example) that you want to reference and use in an ordered fashion.
S1	Pointer to current data element in list A$ or subscript of A$( ).
S0	Pointer to (subscript of) logical element prior to A$(S1).
S2	Pointer to (subscript of) logical element following A$(S1).
FE	Pointer to (subscript of) first free element in list A$.
F	Pointer to (subscript of) the first logical element in list A$.
NL(i)	Thread or list of pointers that link the physical elements of A$ together in logical order. Consequently, NL(i) represents the pointer to (subscript of) the element that logically follows A$(i). Since the last logical elements in the full and empty parts of A$ have no successors, a value of 99999 is assigned to the pointers from these elements.

Table 1. Variables that are functional to the threaded list technique.

Physical Position i	List Element A$(i)	Next Logical Position NL(i)	
1	Jones	6	F = 3 (First logical element in A$)
2	Paul	4	
3	Able	7	
4	Walton	5	FE = 8 (Pointer to free first element of A$)
5	Zeck	99999	
6	Len	2	
7	Cary	1	if S1 = 2 then S0 = 6, S2 = 4
8		9	
9		10	
10		11	
11		12	
12		99999	

Table 2. Here's how the variables in Table 1 are assigned for the data in Fig. 1. In this case, List A$ is 12 elements long.

Subroutine	Purpose
Initialize	Initializes the empty space list and nominal values for all other pointers and variables (lines 10110–10130).
Get	Retrieves the next logical element in list and resets pointers (lines 10300–10315).
Insert	Inserts a data element into the list, reassigns free space, and resets pointers (lines 10400–10455).
Delete	Removes a data element from the list, reassigns free space, and resets pointers (lines 10500–10590).
Top	Positions current element at the top of the list and resets appropriate pointer (lines 10200–10215).

Table 3. Description of list maintenance subroutines.

Procedure	Program Code	Program Lines
Add a name alphabetically to the list	A	140–170
Delete (kill) a name from the list	K	200–230
Go down and print next lower element	D	350–365
Go up and print next higher element	U	400–430
Search for a name and set pointer to it	S	450–490
List entire list on video screen	L	300–330
End program	E	125

Table 4. List-handling procedures.

Program Listing. An example of how to use threaded lists in a program.

```
2 '            A PROGRAM THAT USES THREADED LISTS
3 '                    BY ED LEVY
4 '
5 'THIS PROGRAM IS AN EXAMPLE OF THE USE OF THREADED LISTS.
6 'THE PROGRAM ALLOWS BUILDING AN ALPHABETICAL LIST OF NAMES
7 'IN LIST A$( ).  THE OPERATOR CAN PERFORM VARIOUS FUNCTIONS
8 'BY RESPONDING WITH THE APPROPRIATE CODES:
9 '    A - ADD A NAME ALPHABETICALLY     U - GO UP LIST
10 '   K - KILL (DELETE) A NAME          D - GO DOWN LIST
11 '   S - SEARCH FOR A NAME             E - END PROGRAM
12 '   L - PRINT THE ALPHABETIC LIST ON TERMINAL
100 CLEAR 10000
103 DIM A$(1000),NL(1000)
110 CLS:PRINTTAB(10)"PROGRAM TO BUILD AN ALPHABETICAL THREADED L
IST":PRINT
112 PRINTTAB(20)"VALID COMMANDS ARE:":PRINT
113 PRINT"  A - TO ADD A NAME   U - TO GO UP LIST   E - TO END P
ROGRAM"
114 PRINT"  K - TO DELETE NAME  D - TO GO DOWN LIST L - TO PRINT
 LIST"
115 PRINT"                      S - TO SEARCH LIST"
116 PRINT:PRINT:INPUT"PRESS ENTER TO CONTINUE";E$
117 GOSUB 10100                : 'INITIALIZE THREADED LIST VARIA
BLES
120 '
121 '                  MAIN ROUTINES
122 '
123 INPUT "ENTER COMMAND";C$
125 IF C$="E"THEN STOP         : ' END
127 IF C$="A"THEN 140          : ' ADD A NAME
129 IF C$="K"THEN 200          : ' DELETE A NAME
131 IF C$="D"THEN 350          : ' GO DOWN ONE ELEMENT
133 IF C$="U"THEN 400          : ' GO UP ONE ELEMENT
135 IF C$="S"THEN 450          : ' SEARCH FOR A NAME
137 IF C$="L"THEN 300          : ' PRINT LIST
139 PRINT"** INVALID COMMAND **":GOTO 123
140 '
142 INPUT"ENTER NAME TO ADD";N$  : '------ADDITION ROUTINE
```

Listing continued

fore Krane (in this case, Jones).

Now, it runs a thread from Jones to Krane, and from Krane to the name that was previously the logical successor to Jones (Len). The solid line in Fig. 2 shows these new connections. Notice that the free-element list now has a new first free element, a new blank.

When you want to delete a name, you must also redirect some threads. For example, to delete the name Cary, the program bypasses it by running a thread directly from Able to Jones. The space Cary occupied is now the first free element in the free-element list, whose thread has been accordingly rearranged. The free-element list begins at this new blank, and a thread runs from this space to the one that was previously the first free element.

By redirecting threads through empty spaces, you link successive holes left by deletions. These holes are the first spaces used for insertions; you don't lose spaces through deletions. The solid lines in Fig. 3 show the new threads after deletion.

A Sample Threaded List Program

I've included a sample program that uses a threaded list to create and manipulate an alphabetical list of the names in

JMG SOFTWARE ANNOUNCES THE MODEL I/III/4
SPRING SUPER SOFTWARE SALE!

ASSEMBLY LANGUAGE PACKAGE

EDAS & Disassembler III together with smal-LDOS.

A complete assembly language package, EDAS is the most advanced Editor/-Assembler available, and DSMBLR III is the most advanced Disassembler on the market. They are a must for anyone doing serious assembly language work, and they are also ideal if you are just starting; as you become more proficient, you will find more use for the advanced features available. You'll never outgrow them, and you won't find a more powerful combination on the market today.

RETAIL PRICE: $197.00

SALES PRICE: $166.50

Smal-LDOS is a version of the LDOS operating system, with many powerful features as well. It is required when using EDAS on Models I/III. If you already have smal-LDOS or LDOS, then you may deduct $47.00 from the sale price. Also deduct $47.00 if using Model 4 TRSDOS-6 (please specify when ordering).

THREE REASONS WHY JMG SHOULD BE YOUR SOURCE FOR TRS-80 SOFTWARE:

1) QUALITY We guarantee the quality of the programs that we sell, and we have a 99% satisfaction rate.

2) SUPPORT Programs we sell are fully supported by both the Publisher AND JMG Software.

3) PRICE All products we sell are at a 10 to 30 percent discount.

WORD PROCESSING DISCOUNTS

We've not only gathered together the best word processors available for TRS-80s, but we are slashing their prices in our Super Sale: our prices below already reflect a discount off the retail price, but we will give you an ADDITIONAL 10 percent off!

TAKE AN ADDITIONAL 10% OFF ANY OF THESE:

Program	List	JMG
LAZY WRITER	$175.00	$149.50
w/Options Pkg.	$214.95	$173.50
NEWSCRIPT	$124.95	$114.50
w/Labels Optn.	$139.95	$124.50
LE SCRIPT	$129.95	$118.50
ZORLOF II	$69.95	$61.50
ELECTRIC WEBSTER	$149.95	$129.50

All programs are available in Model I and III versions. LAZY WRITER and LE SCRIPT are available in Model 4 versions also. They are all great programs, and each has received excellent reviews. ZORLOF II is the "economy" model, with less features but a great price. ELECTRIC WEBSTER is a spelling checker that integrates with all the above programs.
Can't decide which one to buy? Call or write for our free "Word Processor Information booklet" for more details on each.
(10% discount offer expires April 15, 1984.)

THE PROGRAMS ARE ALSO SOLD SEPARATELY:

EDAS	(List $99.00)	$89.50
DSMBLR III	(List $39.00)	$34.50
smal-LDOS	(List $59.00)	$53.50

A limited version of the powerful LDOS operating system.

ALSO AVAILABLE:

LDOS 5.1.4 (List $129.00) $114.50
A powerful and versatile operating system for Models I and III.

SUPER UTILITY+ (List $79.00) $64.50
A highly praised and very useful disk utility package.

FM for LDOS (List $39.00) $29.50
A "File Manager" for file handling and moving in LDOS.

PLUS... BASIC Utilities, LDOS Support, and more!

All Work and No Play?

SUPREME RULER PLUS $26.50

Our best selling program, a simultation/strategy game for one to nine players. By far the best game of its type available today. Requires 48K; supplied on Disk or Cassette.

WRITE FOR OUR FREE CATALOG!

TO ORDER: Please specify Model of computer, amount of memory you have, program(s) wanted, and method of payment. For Word Processors, please specify printer brand also. We accept Check, Money Order, VISA, MasterCard, COD, and gold.

Please enclose $2.50 for shipping costs. We accept orders by phone or mail.

OUR "TOLL FREE" NUMBER:

As they say, nothing is free. Every time you call "Toll Free", it costs the other end $2.00. Since almost all long distance phone orders end up costing LESS than $2.00, we'll GIVE you the $2.00, and you can keep the change! And if you order by mail, ask for our "Toll Free discount", and deduct $2.00 from your order!

OUR GUARANTEE:

We sell only top-quality software. If, however, you are unsatisfied with a product you have purchased from JMG, you may return it (in good condition) within 10 days for a refund, less a $2.50 handling charge for programs under $50 ($5.00 for programs over $50). We also ask that you send us a letter stating the reason for your return.

JMG SOFTWARE INTERNATIONAL

THE FINE PRINT:

Shipping Charges are $2.50 in North America, $5.00 overseas.
All prices in U.S. Funds.
Please allow 1 to 2 weeks for Personal Checks to clear.
Add $1.50 for COD Charges.
Model III programs will also run on Mod 4 in III mode.

P.O. BOX 598
FALLS STATION,
NIAGARA FALLS, N.Y.
U.S.A. 14303

OR

710 UPPER JAMES ST.
HAMILTON, ONTARIO
CANADA L9C 2Z8
(416) 389-6086

126

See List of Advertisers on Page 227

NEW for Mods I, III, 4*

Integrated Word Processing and Spelling Correction with

PEL-TEK'S

word machine 3.0 +

only **$65.00**

INCLUDES . . . . . .

■ All Word Machine 2.0 features ■ Easiest to use Word Processor anywhere ■ Supports unmodified Model I for lower-case ■ On screen formatting — what you type is what prints on printer ■ Graphics mode — for TRS-80 block graphics ■ Print multiple copies of your text ■ Embedded forms control — to skip lines, eject paper, etc. ■ Insert/delete characters, lines, files — anywhere in text ■ And more . . .

PLUS . . . . . .

■ New Word Processing features . . . ■ New Pause features — allows entry of data into text line fields during printout (great for form letters!) ■ Headers and Footers ■ Page numbering ■ ASCII codes embedded for printer support ■ Embedded file retrieval during printout (called from text) allows printing a document of any virtual length ■ Integrates with the SPELL CHECK/CORRECT System ■ And more . . .

PLUS . . . . . .

■ Integrated SPELL/CHECK CORRECT System . . . ■ Type "CHECK" in Word Machine Command Mode ■ 30,000+ word literal dictionary (on disk) is compared word for word to your text . . . ■ Misspelled words are shown in context with optional correction or . . . ■ Expand your "Personal" Auxiliary Dictionary with selected words from your text ■ Returns to the Word Machine with your text loaded automatically after spelling corrections ■ No duplication of files like other Spelling Checkers.

PLUS . . . . . .

■ 100% Machine language speed ■ The included SPELL CHECK/CORRECT programs may be used with files created by ANY Word Processor (except Super Scriptsit) ■ Manuals and Command Summaries . . . PLUS . . . ■ FREE . . . FREE . . . Pel-Tek's INDOOR SOCCER Arcade Game FREE with purchase of the Word Machine 3.0 Plus package!!!

TO ORDER

(Please specify Model I, III, or 4* Disk)

Word Machine 3.0 Plus — Word Processor and integrated Spell Check/Correct System Disk 48K **$65.00**

Word Machine 2.0 — Word Processor Disk 32/48K **$20.00**

Spell Check/Correct System — For use with any Word Processor (except Super Scriptsit) Disk 48K **$50.00**

Postage & Handling per order . . . . **$ 2.00**

*Mod 4 operates in Mod III mode

PEL-TEK

P.O. Box 1026 ■ Southampton, PA 18966

Toll Free order line 1-800-523-2445 Ext 19

In Penna. 1-800-346-7511 Ext 19

Visa, MasterCharge, Check or Money Order accepted. or add $3.00 for Domestic C.O.D.

324

Fig. 1 (see the Program Listing).

This program demonstrates how the variables and subroutines accomplish many list-handling tasks. I include detailed comments in the listing to clarify the thread-linking procedures.

To use a threaded list program, you must first define all the variables and subroutines relevant to the threaded list technique. Table 1 identifies the variables and subroutines in the sample program. Table 2 shows how these variables would be assigned to the names in Fig. 1.

Lines 120–490, which make up the main program, handle the list-processing procedures cited in Table 4. Lines 10000–10590 contain the subroutines and related pointers that alphabetize the list (see Table 3). These subroutines maintain the system of pointers (variables S0, S1, and S2) that reference your location in the list. S1 points to the current element, S0 points to the prior element, and S2 points to the next element. Proper rotation of these pointers is necessary for moving up or down the list. Coordinating these pointers with NL( ) is essential to deleting, inserting, and maintaining control of the free-element list.

You'll notice that this program demonstrates a trivial application. With ingenuity, you can modify it to work as a Basic word processor, a mailing list program, or some other type of data management system. ■

Write to Ed Levy c/o Pel-Tek, P.O. Box 1026, Southampton, PA 18566.

Listing continued

```
145 GOSUB 10200:GOTO 155        : 'GO TO TOP OF LIST
150 GOSUB 10300                 : 'GET NEXT LOGICAL ELEMENT
155 IF N$> A$(S2) THEN 150      : 'COMPARE ENTRY TO CURRENT ELEME
NT
160 GOSUB 10400                 : 'IF GREATER THEN INSERT INTO LI
ST
170 GOTO 123
200 '
205 INPUT"ENTER NAME TO DELETE";N$ : '----DELETIONS ROUTINE
210 GOSUB 10200                 : 'GOTO TOP OF LIST
213 GOSUB 10300                 : 'GET NEXT LOGICAL ELEMENT
215 IF N$<>A$(S1) THEN 240      : 'COMPARE ENTRY TO LIST
220 GOSUB 10500                 : 'IF SAME, DELETE CURRENT ELEMEN
T
225 PRINT "DELETED"             : 'CONFIRM
230 GOTO 123
235 '                           : 'NAME DOESNT MATCH
240 IF S2=99999 THEN PRINT"NOT FOUND":GOTO 123 :'END OF LIST
250 GOTO 213                    : 'IF NOT END, CHECK NEXT ELEMENT

300 '
301 '                           : '---------PRINT ROUTINE
305 GOSUB 10200                 : 'GOTO TOP OF LIST
310 GOSUB 10300                 : 'GET NEXT ELEMENT
315 PRINT A$(S1)                : 'PRINT ELEMENT
320 IF S2=99999 THEN 123        : 'IF END OF LIST RETURN TO QUERY

330 GOTO 310                    : 'OTHERWISE - CONTINUE PRINTING
350 '
351 '                           : '------GO DOWN ROUTINE
355 IF S2=99999 THEN PRINT"** BOTTOM **":GOTO 123
360 GOSUB 10300                 : ' GET NEXT LOGICAL ELEMENT
365 PRINT A$(S1):GOTO 123       : ' PRINT
400 '
401 '                           : '------GO UP ROUTINE
410 X=S0                        : ' SAVE POINTER TO PRIOR ELEMENT

415 GOSUB 10200                 : ' TO TOP
420 GOSUB 10300                 : ' GET NEXT LOGICAL ELEMENT
425 IF X<>S1 THEN 420           : ' DOES CURRENT MATCH SAVED PRIO
R
430 PRINT A$(S1):GOTO 123       : ' PRINT HIGHER NAME
450 '
451 INPUT"SEARCH FOR";N$        : '------SEARCH ROUTINE
455 GOSUB 10200                 : ' GO TOP OF LIST
460 GOSUB 10300                 : ' GET NEXT LOGICAL ELEMENT
465 IF N$<>A$(S1) THEN 480      : ' COMPARE TO CURRENT ENTRY
470 PRINT A$(S1):GOTO 123       : ' PRINT IF SAME
480 IF S2=99999 THEN PRINT"NOT FOUND": GOTO 123
490 GOTO 460                    : ' TEST NEXT ENTRY
10000 '
10001 '          THREADED LIST SUBROUTINES
10002 ' A$=LIST OF NAMES , S1=CURRENT POSITION,S0=PRIOR POSITION

10003 ' S2=NEXT POSITION , FE=POSITION OF FIRST FREE ELEMENT
```

Listing continued

Listing continued

```
10004 ' NL(i)=POINTER TO LOGICAL ELEMENT FOLLOWING A$(i)
10005 '

10100 '
10105 '              INITIALIZATION ROUTINE
10106 '
10110 FOR I=0 TO 1000          :'THREAD POINTERS FOR FREE LIST
10112 NL(I)=I+1:NEXT I
10115 NL(1)=99999              : 'MARK END OF FULL PART OF LIST
AT POSITION 1
10120 FE=2                     : 'FREE ELEMENT LIST STARTS AT PO
SITION 2
10125 A$(0)=" ":A$(1)="ZZZZZZ" : 'PAD LIST WITH HIGH & LOW ELEME
NTS
10130 RETURN

10200 '
10205 '                 TOP OF LIST ROUTINE
10210 '
10215 S0=0 : S1=0 : S2=NL(S1) : RETURN  : 'SET POSITIONS AT TOP
10300 '
10310 '                     GET ROUTINE
10312 '
10315 S0=S1:S1=S2:S2=NL(S1):RETURN     : 'ADVANCE POSITIONS

10400 '
10405 '                    INSERT ROUTINE
10410 '
10415 A$(FE)=N$                : 'PUT NAME IN FIRST FREE SPACE
10420 X=NL(FE)          : 'SAVE SUCESSOR TO FIRST FREE ELMENT AS

DUMMY
10430 NL(S1)=FE         : 'LINK CURRENT ELEMENT TO FREE POSITION
10435 NL(FE)=S2         : 'LINK FREE POSITION TO SUCCESSOR TO CUR
RENT ELEMENT
10440 S0=S1             : 'POSITION POINTER TO PRIOR ELEMENT
10445 S1=FE             : 'POINT CURRENT ELEMENT AT FREE POSITION
10450 FE=X              : 'RE-SET FIRST FREE ELEMENT
10455 RETURN
10500 '
10555 '                    DELETE ROUTINE
10560 '
10565 NL(S0)=S2         : 'LINK FROM PRIOR TO NEXT ELEMENT
10570 NL(S1)=FS         : 'LINK FROM CURRENT TO FREE ELEMENT
10575 FS=S1             : 'SET FIRST FREE ELEMENT TO CURRENT POSI
TION
10580 S1=S2             : 'CURRENT ELEMENT IS PREVIOUS SUCCESSOR
10585 S2=NL(S1)                : 'RE-SET POINTER TO NEXT ELEMENT
10590 RETURN

10600 ' END OF PROGRAM
```

End

SuperSCRIPSIT PRINTER DRIVERS

With an ALPS Printer Driver (software), you can attach your printer to SuperSCRIPSIT Word Processing for automatic interfacing. Over 70 printers now supported. Call or write for latest Product Review Sheet describing features supported.
$49 each w/o Proportional, $59 with Proportional

MEMDISK FOR MODEL 4 IN MODEL III MODE

Easy to use. (LDOS only). Use **MEMDISK** as your System Drive or load other files into memory for Instant Access. Use **80K** of 128K memory. Too many features to descibe here. Call or write for more details. $39

4 MODEL 4 UTILITIES (FOR MODEL III MODE) $19

Run Model 4 at **High CPU Speed** (4 MHz)
Test Memory (To 128K Automatic & Clear Memory
Easily **Sound** (Beep) in JCL file or BASIC

MEMORY DUMP UTILITY (80x24 Screen) $24
LOADMAP UTILITY $19

Mail / Phone Orders Accepted

ALPS
23 Angus Road
Warren, New Jersey 07060
201 - 647-7230

✓ 374

"WHERE TO FIND FREE PROGRAMS FOR YOUR TRS-80, APPLE, OR IBM MICROCOMPUTER"

Vol. 1. Index to 4000 BASIC Programs
Contained in 160 Popular Computer Books
176 pages. **$14.95**

Vol. 2. Index to 4000 BASIC Programs
Contained in 500 Computer Magazines 1979-1983
196 pages. **$14.95**

All 8000 programs described by title and indexed by subject — Astronomy to Bookkeeping to Games to Graphics to Utilities to Zoology, etc.

For programmers, computer users, teachers, students — Learn where to find program listings and algorithms. Saves hours of programming time.

Attn. Dept. EM
PASADENA TECHNOLOGY PRESS
P. O. Box 3836
South El Monte, CA 91733

✓ 20

Include $2.00 Postage and Handling per order.
California residents add 6.5% sales tax.

ARRANGER II

FOR THE TRS80 MODEL 1, 3 OR 4 DOUBLE DENSITY

WORLD'S FINEST DISK CATALOG FILING SYSTEM

ARRANGER II is a VERY fast 100% Z-80 machine language self contained master disk catalog filing program that AUTOMATICALLY records disk name, date, density, DOS, free grans/bytes track count and type of disk (data or system) in SECONDS, or almost ANY disk REGARDLESS of DOS, density or track count or **YOUR MONEY BACK!**

ARRANGER II can:
*Use single, multiple, or double headed drives
*Record 250 diskettes up to 250 files each
*Add or update any disk in seconds
*Add disks manually, semi-automatically or fully automatic
*Rename a disk at any time . . . in seconds . . . or delete it
*Print disk labels
*List your disk names or file names to the screen or printer in almost any manner you choose!
*Find any program in less than 10 seconds!
*Sort 1500 files in 15 seconds!
*Sort by any extension
*Scan disks or files starting at any point
*Search for any file using an 8 character wildcard or extension
*List all files alphabetically to the screen or printer
*Filter mode to look, search, print or sort only selected files

ARRANGER II is completely independent. I can even back myself up.
We believe the **ARRANGER II** to be the Finest, Fastest, Easiest to use disk catalog filing program on the market! Available in one version for both Model 1, 3 and 4 in double density for $49.95.

***The Original* ARRANGER I $29.95** + $3 Shp.
Reviewed Sept. '83 Basic Computing
Limited printing capabilities, reduced file capacity but still reads almost anything, (upgradable) single or double density.

ARRANGER II $49.95 + $3 Shp.
Reviewed Jan. '84 80 Micro
World's finest catalog program, double density

C D C ✓ 167
Serious Software for the 80's
13715 Vanowen Street, Van Nuys, CA 91405
(213) 997-9692

Toll Free Order (800) 692-5235

TRS80 MODEL 4

DOSTAMER 4

Never type another DIR:1, COPY "FILENAME":1 TO "FILENAME":0, PURGE "FILENAME":0, LIST "FILENAME":1, LOAD "FILENAME" (F = 3), . . . and on and on and on!
Imagine over 200 commands that YOU define, executed with ONLY ONE OR TWO KEYSTROKES! Instant sorted directories with 1 key. Load Basic, protect memory, run your program with 2 keystrokes. List a file to the screen or the printer, print a directory, copy a file from one disk to another, copy the entire disk, and much more.
Your DOS has a lot of great features. The trouble is, you have to remember all those commands. With **DOSTAMER 4** those commands are 1 or 2 keystrokes away. Nothing to remember and nothing to forget, just use it!
We use the SPECIAL features in YOUR DOS for the GREATEST utility you'll ever want. Once you use **DOSTAMER** you'll wonder how you got along without it. Also available Model 1 & 3 for DOSPLUS, LDOS, NEWDOS80, MULTIDOS & TRSDOS 1.3 (even works on LNW & MAX 80) for $49.95 complete with the easiest instructions you'll find. By the way, **DOSTAMER** is written in FAST Z-80 machine code.

MODEL 1/3 VERSIONS **$39.95** + $3 Shp.
MODEL 4 VERSION **$49.95** + $3 Shp.

Dealer Inquiries Invited

• See List of Advertisers on Page 227

EXEC Interpreter, a supercharged version of TRSDOS's Build command, lets you edit the command file, stack commands on one line, specify conditional execution, and more. By Douglas Payne.

Radio Shack's TRSDOS Build command is a handy utility that lets you execute a file of DOS commands with a single Do command. But if you want to make a change in the command file, you can't simply edit it; rather, you have to re-create the entire file. TRSDOS is further limiting in that it makes no provision for conditional execution or for substituting parameters into file commands.

EXEC Interpreter (see Program Listing 1) solves these problems and gives you a number of additional features to boot. It lets you execute a group of DOS commands with a single command line, simplifying disk back-up, formatting, and other processing tasks. EXEC Interpreter optionally displays the commands as it executes them.

The command file also accepts sequenced line numbers like those in Basic, and you can annotate the file with comment lines; EXEC Interpreter ignores both of these.

In addition, you can specify up to nine parameters, or arguments, when executing the file, and the program can substitute them into any of the lines in the file.

If a DOS error occurs, EXEC Interpreter lets you terminate execution before it reaches the end of the file. You can display messages during execution, or temporarily suspend execution to allow for user intervention.

Finally, EXEC Interpreter can automatically pass data to a program or conditionally execute commands in a file, depending on the value of one or more of the arguments passed to it. The Example on p. 60 shows an execution file.

File Format

To create an execution file, use any suitable editor that processes ASCII text. You can use the Build command, Disk Basic, EDTASM, or a text editor such as Scripsit or Edit80 from Microsoft (10700 Northup Way, Bellevue, WA 98004). When you use Disk Basic, save the file with the A option (type SAVE "filespec",A). EXEC Interpreter's default file extension is /EXE, but you can use any other extension.

Maximum line length is 80

BRICK by BRICK

characters, not including the line numbers and terminating carriage return. EXEC Interpreter considers lines starting with a semicolon as comment lines.

All other lines in the file consist of an optional label, followed by either a DOS command, a control statement, data for simulated keyboard input, or a null string.

Labels consist of a dash followed by a string of non-blank characters. The first character must be a letter from A–Z, followed by one or more non-blank characters. EXEC Interpreter does not differentiate between upper- and lowercase letters.

Also, EXEC Interpreter uses only the first letter of the label, so you can have a maximum of 26 labels. You can use a label on a line by itself, or on a line containing additional text. I use labels in the If and GOTO statements described below.

Control Statements

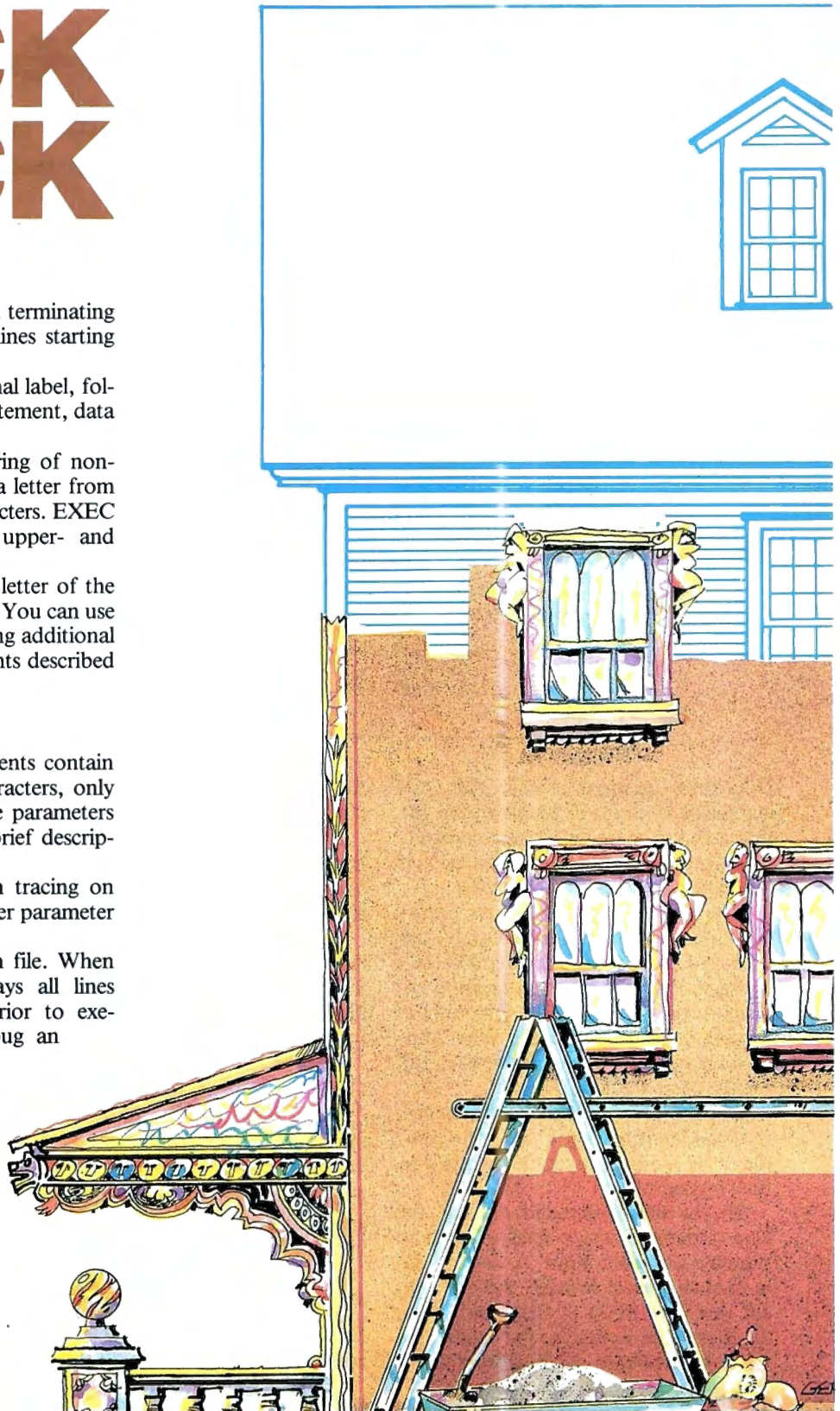
The following execution file control statements contain an ampersand and a string of non-blank characters, only the first of which is significant. Zero or more parameters separated by blanks follow. Table 1 gives a brief description of each command.

The Trace command, &T, turns execution tracing on and off. &T or &T Y turn tracing on. Any other parameter (such as &T N) turns tracing off.

Tracing is off when you start the execution file. When tracing is on, the EXEC Interpreter displays all lines in the file, including inserted arguments, prior to execution. You can use this command to debug an execution file. For example, you can check to make sure the program substitutes arguments as you intend.

&Q (or &Q Y), the Quit command, terminates execution if a DOS error occurs. Using any other parameter continues execution regardless of errors. This is the default setting when you start the execution file.

The program displays all



Example. Test execution file.

```
File = TEST/EXE LRL = 256        REC = ASCII

00100    ; This is an EXEC test file.
00110    ;
00120       CLS
00130       &QUIT YES
00140       &IF .&1 <> . -OK
00150       &IF .&2 <> . -OK
00160       &IF .&3  = . -HELP
00170    -OK
00180       &IF .&1 = .? -QUESTION
00190       &WAIT EXEC testing ...
00200       CLS
00210       &DISPLAY The name of this EXEC file is &0.
00220       &DISPLAY You entered the following arguments:
00230       &DISPLAY '&1', '&2', '&3', '&4', '&5', '&6', '&7', '&8', '&9'.
00240       &IF .&1 <> .CREATE -FREE
00250       &WAIT Insert a SCRATCH diskette in drive 1.
00260       &DISPLAY I will now create a file called TEST/DAT:1.
00270       CREATE TEST/DAT:1 (LRL=0,REC=3)
00280       &WAIT Press Break if you want to check this.
00290    -FREE
00300       &IF .&2 <> .FREE -LIB
00310       &WAIT I will now display the free space on drive 1.
00320       CLS
00330       FREE :1
00340    -LIB
00350       &IF .&3 <> .LIB -EXIT
00360       &DISPLAY The following is a list of TRSDOS commands:
00370       LIB
00380       &GOTO -EXIT
00390    -HELP
00400       &DISPLAY You didn't give any arguments, so here is an explanation:
00410       &DISPLAY
00420    -QUESTION
00430       &DISPLAY The format is:
00440       &DISPLAY
00450       &DISPLAY EXEC TEST <?/CREATE> <FREE> <LIB>
00460       &DISPLAY
00470       &DISPLAY If arg1 is ?, this explanation is displayed.
00480       &DISPLAY If arg1 is CREATE, TEST/DAT:1 is created.
00490       &DISPLAY If arg2 is FREE, free space on drive 1 is displayed.
00500       &DISPLAY If arg3 if LIB, a list of TRSDOS commands is displayed.
00510       &DISPLAY If you want to omit any of these, use # instead.
00520       &DISPLAY
00530    -EXIT
00540       &QUIT NO
00550       KILL TEST/DAT:1
00560       &DISPLAY
00570       &DISPLAY EXEC testing complete.
EOF
```

DOS error messages in full. The Quit command is useful in an execution file that executes more than one command, when some commands depend on the outcome of previous commands.

The Wait command, &W, temporarily suspends execution and displays the strings of characters following &W as a message. Press the break key to stop execution; press any other key to resume execution. You can use the Wait command if you need to change disks in the middle of an execution file.

&D, the Display command, displays the message following it. Use this command to monitor execution when you turn tracing off.

&S, the Stack command, and &E, the End command, stack lines of data to simulate keyboard input. A stack of data lines must start with &S and end with &E (see lines 18–23 of Program Listing 2). When the executing file reads data from the keyboard, all lines from &S to &E pass to the program currently running.

EXEC Interpreter discards stacked lines when the execution file does not request keyboard input. This feature provides optional input to a program.

The Break command, &B, terminates the next line in the execution file with the break character 01 hexadecimal (hex) rather than the normal carriage return. Edit80 requires input in this form.

&I, the If statement, and &G, the GOTO statement, alter the normal sequential flow of execution. The GOTO statement has the form:

&G -label

Execution continues at the line with the specified label, rather than at the next line in the file.

The If statement has the form:

&I operand1 relop operand2 -label

Table 2 shows the different relational operators (relops). The If statement functions similarly to its counterpart in Basic.

When the given relation between the two operands is true, execution resumes at the specified label. Otherwise it continues at the line following the If statement. Each of the two operands is a string of non-blank characters.

If both operands are numeric (consist only of decimal digits), the program conducts an unsigned numeric comparison. When either of the operands contains a non-numeric character, the program performs a string comparison using the standard ASCII collating sequence.

If one string is shorter than the other, the program pads the shorter string on its right with enough blanks to make the lengths equal. Do not put strings inside quotation marks.

Argument Substitution

You can enter up to nine arguments

Command	Description
&T	Trace command.
&Q	Quit command.
&W	Wait command.
&D	Display command.
&S	Stack command.
&E	End command.
&B	Break command.
&I	If statement.
&G	GOTO statement.

Table 1. Description of execution file control statements.

Operator	Definition
=	Equal to
<>	Not equal to
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

Table 2. List of relational operators.

when running the execution file. To do this, type in:

EXEC filespec arg1 arg2...argn

Here, "filespec" is the name of the execution file. Each argument is a string of up to 23 non-blank characters. The program truncates longer arguments.

EXEC Interpreter references the arguments in the execution file with &1–&9. When the program finds a digit following an ampersand in the file, it replaces these two characters with the corresponding argument. &0 holds the name of the execution file as entered on the command line.

If you enter no corresponding argument, the program replaces the &n with a null string. If you want to leave out an argument in the list and have more arguments following, use a pound sign (#) in its place. The interpreter replaces the pound sign with a null string.

If you need an ampersand followed by a digit in your file, use a double ampersand. For example, if you want to use the literal string &3 without substitution, use &&3. The maximum line length after you substitute arguments is 100 characters.

The Key Box

LOAD 80

Model III
32K RAM
Disk Basic
TRSDOS 1.3

Program Listing 1. EXEC Interpreter program.

```
00100 ;*****************************************************;
00110 ;                                                     ;
00120 ;                  EXEC Interpreter                   ;
00130 ;                                                     ;
00140 ;                   by Doug Payne                     ;
00150 ;                                                     ;
00160 ;                     July 1983                       ;
00170 ;                                                     ;
00180 ;*****************************************************;
00190
00200 ;-----------------------------------------------------
00210 ;       The following features are supported:
00220
00230 ;       Handles standard TRSDOS /BLD (DO) files
00240
00250 ;       &1 to &9 argument substitution
00260 ;       Comment lines
00270 ;       &I(f) operand1 relop operand2 -label
00280 ;       &G(oto) -label
00290 ;       &T(race) Yes/No
00300 ;       &B(reak)
00310 ;       &S(tack)
00320 ;       &E(nd)
00330 ;       &W(ait) message string
00340 ;       &D(isplay) message string
00350 ;       &Q(uit) Yes/No
00360 ;-----------------------------------------------------
00370
00380 ;-----------------------------------------------------
00390 ;       ROM LOCATIONS
00400 ;-----------------------------------------------------
00410
00420 GET     EQU     0013H           ; GENERAL GET ROUTINE
00430 KBWAIT  EQU     0049H           ; WAIT FOR KEYBOARD CHAR
00440 VDLINE  EQU     021BH           ; DISPLAY A LINE
00450
00460 ;-----------------------------------------------------
00470 ;       DOS LOCATIONS
00480 ;-----------------------------------------------------
00490
00500 KBDDCB  EQU     4015H           ; KEYBOARD DCB
00510 DOS     EQU     402DH           ; RETURN TO DOS
00520 CMDTXT  EQU     4225H           ; DOS COMMAND TEXT AREA
00530 COMDOS  EQU     4299H           ; ISSUE DOS CMD, NO RETURN
00540 CMDDOS  EQU     429CH           ; ISSUE DOS CMD, RETURN
00550 ERRDSP  EQU     4409H           ; DISPLAY DOS ERROR MSG
00560 INVFNM  EQU     19              ; - INVALID FILENAME
00570 FILEOF  EQU     28              ; - END-OF-FILE
00580 MEMEND  EQU     4411H           ; HIGH MEMORY ADDRESS
00590 SYNTAX  EQU     441CH           ; COPY FILESPEC TO DCB
00600 OPEN    EQU     4424H           ; OPEN DISK FILE
00610 CLOSE   EQU     4428H           ; CLOSE DISK FILE
00620 PUTEXT  EQU     444BH           ; ADD FILENAME EXTENSION
00630 DMULT   EQU     444EH           ; MULTIPLY HL BY A
00640
00650 ;-----------------------------------------------------
00660 ;       ASCII CHARACTERS
00670 ;-----------------------------------------------------
00680
00690 BREAK   EQU     01H             ; <BREAK>
00700 TAB     EQU     09H             ; <TAB>
00710 CR      EQU     0DH             ; <CR>
00720
00730 ;-----------------------------------------------------
00740 ;       MISCELLANEOUS CONSTANTS
00750 ;-----------------------------------------------------
00760
00770 EOFMRK  EQU     7FH             ; END-OF-FILE MARKER
00780 PRMLEN  EQU     23              ; MAX &N PARM LENGTH
00790 PARMSL  EQU     240             ; 10 * (PRMLEN+1)
00800 ;                               ; (TOTAL REQ'D PARM AREA)
00810 TXTLEN  EQU     100             ; MAX COMMAND TEXT LENGTH
00820 RECLEN  EQU     80              ; MAX /EXE RECORD LENGTH
00830 LABNUM  EQU     26              ; MAX # OF LABELS
00840
00850 ;-----------------------------------------------------
00860 ;       LOW MEMORY VARIABLES
00870 ;-----------------------------------------------------
00880
00890         ORG     5200H
00900
00910 EXEDCB  DEFS    50              ; /EXE FILE DCB
00920 EXEBUF  DEFS    256             ; /EXE FILE BUFFER
00930
00940 RECBUF  DEFS    RECLEN+1        ; /EXE RECORD AREA
00950
```

Listing 1 continued

Listing 1 continued

```
00960 FILPTR  DEFS    2               ; FILE POINTER
00970
00980 FILBUF  EQU     $               ; FILE IS READ INTO HERE
00990
01000 ;-------------------------------------------------------
01010 ;       ENTER AND INITIALIZE
01020 ;-------------------------------------------------------
01030
01040         ORG     0F800H
01050
01060 EXEC    EQU     $               ; EXECUTION BEGINS HERE
01070         LD      (SPSAVE),SP     ; SAVE STACK PTR
01080         PUSH    HL              ; SAVE PLIST ADDRESS
01090
01100         LD      HL,(MEMEND)     ; SAVE HIGH MEMORY PTR
01110         LD      (MESAVE),HL
01120
01130         LD      HL,(KBDDCB+1)   ; SAVE KEYBOARD DRIVER
01140         LD      (KBDSAV),HL
01150         LD      HL,KBDINT       ; SET NEW ONE
01160         LD      (KBDDCB+1),HL
01170
01180         LD      HL,(DOS+1)      ; SAVE DOS JUMP ADDRESS
01190         LD      (DOSSAV),HL
01200         LD      HL,EXMAIN       ; SET NEW ONE
01210         LD      (DOS+1),HL
01220
01230         LD      HL,ERRDSP       ; SAVE DOS ERROR HANDLER
01240         LD      DE,ERRSAV
01250         LD      BC,4
01260         LDIR
01270         LD      A,0C3H          ; SET NEW ONE = ...
01280         LD      (ERRDSP),A      ; ... JP ERTRAP
01290         LD      HL,ERTRAP
01300         LD      (ERRDSP+1),HL
01310
01320         LD      HL,COMDOS       ; SAVE DOS CMD HANDLER
01330         LD      DE,COMSAV
01340         LD      BC,3
01350         LDIR
01360         LD      (COMDOS),A      ; SET NEW ONE = ...
01370         LD      HL,CMTRAP       ; ... JP CMTRAP
01380         LD      (COMDOS+1),HL
01390
01400         XOR     A
01410         LD      HL,PARMS        ; CLEAR PARM STRINGS
01420         LD      (HL),A
01430         LD      DE,PARMS+1
01440         LD      BC,PARMSL-1
01450         LDIR
01460
01470         DEC     A               ; INITIALIZE LABEL TABLE
01480         LD      HL,LABTAB
01490         LD      (HL),A
01500         LD      DE,LABTAB+1
01510         LD      BC,LABNUM+LABNUM-1
01520         LDIR
01530
01540 ;-------------------------------------------------------
01550 ;       GET PARMS FROM PLIST
01560 ;-------------------------------------------------------
01570
01580         POP     HL
01590         PUSH    HL
01600         LD      DE,EXEDCB       ; MOVE FILENAME TO DCB
01610         CALL    SYNTAX
01620         LD      A,INVFNM
01630         JP      NZ,EXERR        ; EXIT IF ERROR
01640         POP     HL              ; GET PLIST ADDRESS
01650         LD      DE,PARMS        ; COPY &N PARMS
01660 MVPRMS  EQU     $
01670         CALL    SKIPBL          ; SKIP OVER BLANKS
01680         JR      C,OPNEXE        ; DONE IF <CR> FOUND
01690         CP      '#'             ; NULL PARM ?
01700         JR      NZ,NOTNUL       ; NO - PROCESS IT
01710         INC     HL
01720         CALL    CHKBL
01730         JR      Z,NXTPRM        ; YES - IGNORE IT
01740         DEC     HL
01750 NOTNUL  EQU     $
01760         PUSH    DE
01770         LD      BC,PRMLEN       ; COPY PARM
01780         CALL    CPYSTR
01790         POP     DE
01800         JR      C,OPNEXE        ; DONE IF <CR> FOUND
01810 NXTPRM  EQU     $
01820         EX      DE,HL           ; INDEX TO NEXT PARM
01830         LD      BC,PRMLEN+1
```

Listing 1 continued

Example File

Program Listing 2 is an execution file called CC/EXE that I used to compile a program written in the C language. It optionally creates an executable command file, and runs it. I numbered each line for the purpose of illustration. These numbers aren't part of the actual file.

This execution file can have from one to five arguments. The first one is either the name of the file you want to compile or a question mark. When you enter no arguments or when the first argument is a question mark, the program displays a brief explanation of the execution file.

The second, third, and fourth arguments are the optional names of additional libraries that the linker uses. When the second argument is NOLINK, execution ends after the assemble step. If the fifth argument is NOGO, the command file does not run.

Lines 1 and 2 are comments. Line 3 ends execution if a DOS error occurs. Lines 4 and 5 explain the form of the execution file command. The periods in front of the two operands of the If statements prevent an invalid form of the statement.

If you enter no first argument and you don't use periods, the statement &IF &1=?-HELP becomes &IF = ? -HELP after argument replacement. With the periods, it becomes &IF .= ? -HELP, a valid form of the If statement.

ÈXEC Interpreter substitutes arguments, if any, directly into the line. Typing EXEC CC or EXEC CC ? lets execution continue at the label -HELP, and displays an explanation of the execution file.

Line 7 invokes the C preprocessor, which produces a file with extension /C80. Line 9 invokes the C compiler to compile the file. Line 10 erases this file, since it is no longer necessary. The compiler produces an assemble file with the extension /MAC.

Line 11 suspends execution so you can insert the disk containing the assembler and linker programs. When you press any key, execution resumes at line 12. Line 13 starts the assembler, and line 14 erases the assemble file.

Line 15 determines whether or not the second argument is NOLINK. If it is, control passes to label -EXIT in line 33, the last line in the file. This bypasses the linker step. Again, I put periods before the If statement operands to prevent errors.

Line 17 runs the linker, giving it the library RUNLIB and argument 1 as parameters. Lines 18 and 23 pass lines

MONTEZUMA MICRO

P.O. Box 2169
Camp Verde (Lizard Flats)
Arizona 86322

✔ 416

"WE KEEP YOU RUNNING"

COMPUTERS

	Model 4 with 2 drives & RS-232 64K Complete	1495
26-1067	16K Model 4, Pure Radio Shack	849
26-1068	1dr Model 4, Pure Radio Shack	1444
26-1069	2dr Model 4 64K RS232, Pure Radio Shack	1650
26-1080	**NEW!** Model 4 Portable	1529
26-3003	64K Color Computer	340
26-3011	MC-10 Micro Color Computer	99
26-3026	16K Color Computer 2	199
26-3027	16K Extended BASIC Color Computer 2	275
26-3590	Pocket Computer 3	84
26-3601	Pocket Computer 2	169
26-3650	Pocket Computer 4	59
26-3801	Model 100 8K Portable Computer	679
26-3802	Model 100 24K Portable Computer	849
26-4004	Model 12 2-Drive	2599
26-4005	Model 12 2-Drive	3199
26-6004	Model 16B 1-Drive	4249
26-6005	Model 16B 2-Drive	4928
26-6006	Model 16B with built-in 12Mb Hard Disk	5949
26-6050	DT-1 Terminal	599

LNW Model II Computer, 112K, RS-232, TRSDOS Compatible. Complete with CP/M 2.2 and lots of FREE Software 1488

ZORBA Portable, 2 DSDD drives, 80x25, 4Mhz, graphics, 7 green phosphor screen, RS-232, IEEE-488 & Centronics ports, with WordStar, MailMerge, SuperSort, CalcStar 1695

MODEMS

26-1084	Model 4P Modem Board	128
26-1173	DC Modem II	169
26-1174	Acoustic Coupler Modem	127
26-1175	DC Modem 1B	85
76-1005	DC-1200 High Speed Modem	595
76-1009	Auto Dial Attachment for DC-1200	127
	Anchor Mark I Modem, 300 Baud	89
	Password 300/1200 Baud Modem	399
	Hayes Smartmodem 300 Baud	233
	Hayes Smartmodem 1200 Baud	525

PERIPHERALS

	LNW Model 1 Expansion Interface. 32K & RS-232	329
	12" Green 18MHz NonGlare Video Monitor	87
	12" Amber 20MHz NonGlare Video Monitor	99
	Video cable for Model 1 keyboard-to-monitor	7
16-0230	13" Remote Control Cable Ready Color TV	285
16-0501	Model 10 Video Tape Recorder w/Remote	449
26-1130	Model 1.3.4 5MB Hard Disk Primary	1699
26-1131	Model 1.3.4 5MB Hard Disk Secondary	1529
26-1183	Model 100 Bar Code Reader	85
26-1208	CCR-81 Cassette Tape Recorder	51
26-1410	Model 100 Modem Cable	17
26-3007	Color Computer Carrying Case	17
26-3008	Color Computer Joysticks, Per Pair	21
26-3012	**NEW!** Deluxe Joystick/each	34
26-3022	Color Computer Disk Drive 0 Kit	339
26-3023	Color Computer Disk Drive 1, 2 or 3	237
	Same as above except our brand. Save $$$$	199
26-3024	Color Computer Multi-Pak Interface	153
26-3025	Color Computer Mouse	43
26-3029	Disk Drive 0 for the Color Computer 2	329
26-3503	PC 1 Cassette Interface	25
26-3508	PC 1 Carrying Case	13
26-3608	PC 2 Carrying Case	25
26-3612	PC 2 RS-232C Interface	169
26-3615	PC 2 4K RAM Module	33
26-3616	PC 2 8K RAM Module	118
26-3651	PC 4 Cassette Interface	33
26-3653	PC 4 1K Ram Module	16
26-3654	PC 4 Carrying Case	6
26-3804	Model 100 AC Adapter	5
26-3805	Model 100 Acoustic Coupler	34
26-3809	Model 100 Carrying Case	42
26-3816	Model 100 8K RAM Module	101
	Same as above except our brand. Save $$$$	79
26-4152	Model 2,12,16 12Mb Hard Disk Primary	2545
26-4153	Model 2,12,16 12Mb Hard Disk Secondary	2120
26-4160	Model 2 1-Disk Expansion Bay	674
26-4162	Model 2 3-Disk Expansion Bay	1379
26-4165	Model 12, 16 SlimLine 1-Drive Expansion	1104
26-4166	Model 12, 16 SlimLine 2-Drive Expansion	1783

FURNITURE

26-1305	Model 3 System Desk	152
26-1308	Universal Printer Stand	85
26-1324	Computer Table	60
26-1325	Platform	26
26-4301	Model 2 Desk	299
26-4303	Deluxe System Desk	229
26-4304	System Desk Drawer	111
26-4305	Deluxe Printer Stand	128
26-4308	Terminal Stand	153
74-0550	Docu-Rack Stand	51

PRINTERS & ACCESSORIES

26-1155	Quick Printer II	69
26-1158	Daisywheel II	1525
26-1190	Plotter	424
26-1191	Multi-Pen Plotter	1695
26-1192	GCP-115 Color Graphics Printer	169
26-1193	Flatbed Plotter/Printer	845
26-1195	Digitizer	361
26-1196	Color Computer Graphics Input Tablet	297
26-1250	DWP-410 Daisywheel Printer	1099
26-1251	DMP-400 140cps Printer	715
26-1252	DMP-500 220cps Printer	1099
26-1253	DMP-100 50cps Printer	339
26-1254	DMP-200 120cps Printer	594
26-1255	DMP-120 120cps Dual Mode Printer	424
26-1256	DMP-2100 160cps Dual Mode Printer	1695
26-1257	DWP-210 Daisywheel Printer	679
26-1260	Envelope Feeder for the Daisywheel II	1015
26-1261	TP-10 Thermal Matrix Printer	85
26-1266	CR-510 Computer Card Reader	1440
26-1267	DMP-420 140cps Triple Mode Printer	849
26-1268	CGP-220 Color Ink Jet Printer	594
26-1269	PTC-64 64K Printer Controller(Buffer)	212
	All $29 Printwheels	25
	All $39 Printwheels	33
26-1440	Single Bin Sheet Feeder	845
26-1441	Bi-Directional Tractor	144
26-1443	Bi-Directional Tractor	127
26-1447	Bi-Directional Tractor	208
26-1448	Single Bin Sheet Feeder	999
26-1455	Acoustic Cover	339
26-1459	Bi-Directional Tractor	204
26-1401	Model 1, M3, M4 Printer Cable	29
26-1408	RS-232C Cable	16
26-1409	Model 100 Printer Cable	13
26-4401	Model 2, M12, M16 Printer Cable	29
26-1490	10' RS-232C Cable	25
26-1491	25' RS-232C Cable	33
26-1492	50' RS-232C Cable	46
26-1493	100' RS-232C Cable	76
26-1495	RS-232C Cable Extender	25
26-1496	RS-232C Null Modem Adapter	25
26-1498	Parallel Printer Switch	102
26-1499	RS-232C Selector Switch	128
26-3505	PC 1 Printer	106
26-3591	PC 3 Printer	102
26-3605	PC 2 Printer	187
26-3652	PC 4 Printer	68

C.ITOH

8510	Prowriter, 120cps, Friction/Tractor, Parallel	359
1550	Prowriter 2, 120cps, for Wide Paper, Parallel	699
F10-40	Starwriter, 40cps Daisywheel	1299
F10-55	Printmaster, 55cps Daisywheel, FAST	1499
F10	Bi-Directional Tractor, with Plastic Cover	210
F10	Single Bin Sheet Feeder	888
8600	Near Letter Quality, 180cps, 2-Color	899
GX-100	Gorilla Banana, 50cps	229
CX-4800	Printer Plotter, 4-Color	599

ANADEX

DP-9620	180cps Printer	1199
DP-9625A	200cps Triple Mode Printer	1299
WP-6000	285cps Near Letter Quality Printer	2099
DP-6500	500cps Super Trick Includes Tractor	2299
	Tractor Assembly for WP-6000	129
	Automatic Sheet Feeder for WP-6000/6500	925

We have dust covers for most every printer we sell. Be sure to order one with your new printer to keep it like new for years.

MONTEZUMA'S REVENGE

This month we offer the Holmes VID-80 with CP/M 2.2 and 112K RAM for the Model III. Now you can be the CP/M King and/or Queen on your block and save $125 by installing it yourself. Complete instructions included.

See the Holmes ads in 80 Micro

Retail Price $524.50 **YOUR COST ONLY... $ 399**

SOFTWARE

	NEW CP/M 2.2 by Montezuma Micro For The Model 4	199
	NEW MBASIC for the Model 4	149
26-0310	TRSDOS 2.3 For The Model 1	12
26-0312	TRSDOS 1.3 For The Model 3	12
26-0313	TRSDOS 6.0 For The Model 4	12
26-1507	Stockpack	42
26-1510	Trendex	51
26-1512	**NEW!** Target PlannerCalc	85
26-1515	**NEW!** pfs file	106
26-1516	**NEW!** pfs report	85
26-1518	**NEW!** pfs file for the Model 4	107
26-1520	**NEW!** Model 4 VisiCalc	212
26-1521	VisiCalc Business Forecast	85
26-1530	**NEW!** Model 4 Multiplan	169
26-1540	**NEW!** Model 3 General Ledger	169
26-1541	**NEW!** Model 3 Accounts Receivable	169
26-1543	**NEW!** Model 3 Payroll	169
26-1552	General Ledger	85
26-1553	Inventory Control I	85
26-1554	Accounts Payable	128
26-1555	Accounts Receivable	128
26-1556	Disk Payroll	169
26-1557	Concrete Take-Off	49
26-1558	Business Mailing List	85
26-1559	Manufacturing Inventory Control	169
26-1560	Fixed Assets	68
26-1562	Profile	68
26-1563	Scripsit	85
26-1564	Mailgram	34
26-1565	Microfile	85
26-1566	Model 1 VisiCalc	85
26-1568	Medical Office Systems	254
26-1569	Model 3 VisiCalc, Enhanced Version	169
26-1579	Real Estate	85
26-1580	Project Manager	85
26-1581	Personnel Manager	85
26-1582	Time Manager	85
26-1584	Checkwriter 80	85
26-1585	Business Checkwriter	127
26-1588	Videotex Plus	42
26-1589	MICRO/Courier	127
26-1590	SuperSCRIPSIT	169
26-1591	Scripsit Dictionary	126
26-1592	Profile Plus	169
26-1593	Profile Plus LD/HD Version	254
26-1594	Desktop/Plan-80	169
26-1595	**NEW!** SuperSCRIPSIT For The Model 4	169
26-1596	**NEW!** Scripsit For The Model 4	85
26-1597	Business Graphics Pak	148
26-2010	Mod 3 BASIC Programming Course	25
26-2011	EDAS, Tape Version	25
26-2012	Assembly Language Development Course	126
26-2013	EDAS, Disk Version	29
26-2014	Mod 3 Disk Course	25
26-2017	**NEW!** Assembly Language Course, Tape	34
26-2018	**NEW!** Assembly Language Course, Disk	59
26-2022	**NEW!** Power Tool	43
26-2023	**NEW!** Dot Plot	17
26-2150	Introduction to BASIC	99
26-2200-1	Model 1,Model 3 FORTRAN	85
26-2201	Model 1 FORTRAN	85
26-2203	COBOL	169
26-2204	Compiler BASIC	126
26-2205	PILOT	85
26-2206-7	COBOL Runtime Disk	25
26-2208-9	Compiler BASIC Runtime Disk	17
26-2210	**NEW!** BASCOM	169
26-2211	**PASCAL**	212
26-2212	**NEW!** PASCAL For The Model 4	169
26-2213	Model 1 LDOS	109
26-2214	Model 3 LDOS	109
26-2216	CP/M Plus For The Model 4	126
26-GOOD	The Good CP/M for the Model 4(MM)	199
26-2217	CBASIC For The Model 4 (Requires CP/M)	85
26-2220-23	Videotex	26
26-2224	Videotex Compuserv Kit	16
26-2709	Color Computer PILOT, Tape	51
26-2710	Color Computer PILOT, Disk	68
26-2718	PILOT III	101
26-2721	Color Computor LOGO, Disk	85
26-2722	LOGO ROM Pack	43
26-3019	Diagnostic ROM Pack	17
26-3030	**NEW!** OS-9 For The Color Computer	59
26-3036	**NEW!** BASIC-09 For The Color Computer	85
26-3821	**NEW!** Model 100 Learning Lab	25
	ALL Color Computer GAMES 25% OFF Catalog Price	
	ALL PC SOFTWARE 30% OFF Catalog Price	
26-4501	General Ledger I	135
26-4502	Inventory Management System I	135
26-4503	Payroll	270
26-4504	Accounts Receivable	199
26-4505	Accounts Payable	199
26-4506	Mailing List	44
26-4507	Mailing List II	101
26-4508	Medical Office Systems	637
26-4509	Manufacturing Inventory Control	637
26-4510	Versafile	59
26-4511	VisiCalc	254
26-4512	Profile II	152
26-4513	Job Costing	126
26-4514	Order Entry	169
26-4515	Profile II Plus	254
26-4516	Profile Training Guide	58
26-4517	Profile Plus Upgrade	102
26-4520	Time Accounting	424
26-4521	VisiCalc	254
26-4525	Electronic Broker	850
26-4531	SCRIPSIT 2.0	254
26-4532	SCRIPSIT Utility Disk	109
26-4534	SCRIPSIT Dictionary	169
26-4536	SCRIPSIT Plotter Driver	42
26-4540	Statistical Analysis	85
26-4545	Litigation Support	254
26-4550	**NEW!** Business Graphics Anyisis Pak	212
26-4554	Accounts Receivable	107
26-4555	Menu Generator	33
26-4556	Profile Forms	106
26-4557	Profile Archive	42
26-4558	Profile Prosort	126
26-4559	Prolook	169
26-4560	WESTLAW	211
26-4580	MultiPlan, Model 2 & Model 12 Version	212
26-4601	General Ledger	424
26-4602	Inventory Control System	254
26-4603	Payroll	509
26-4604	Accounts Receivable	424
26-4605	Accounts Payable	424
26-4607	Order Entry/ICS	424
26-4608	Sales Analysis	254
26-4621	Personnel Search	254
26-4701	FORTRAN	254
26-4702	EDAS	169
26-4703	COBOL	254
26-4704	COBOL Run-Time Disk	34
26-4705	Compiler BASIC	169
26-4706	Compiler BASIC Run-time Disk	26
26-4707	COBOL Generator	850
26-4708	Report Generator	254
26-4710	Program Editor	67
26-4711	**NEW!** PASCAL MT ☤	361
26-4712	Assembly Language Development System	211
26-4713	EDAS 1	43
26-4714	ReformaTTer	212
26-4716	BiSYNC 3780	850
26-4718	Term Administration	???
26-4721	Videotex For The Model 2, 12, 16	42
26-4725	**NEW!** BASCOM BASIC Compiler	169
26-4730	BiSYNC 3270, Version 2	1270
26-4740	CP/M Plus	211
26-4742	CBASIC	84
26-4802	Inventory for the Hard Disk	339
26-4831	SCRIPSIT for the Hard Disk	339
26-4834	Dictionary for the Hard Disk	169
26-4835	SCRIPSIT for Thinline Drives	339
26-4910	TRSDOS 2.0	21
26-4912	TRSDOS 4.2	21
26-6100	COBOL Development System	254
26-6101	COBOL Run-time Diskette	34
26-6105	TRSDOS 16	34
26-6201	General Ledger	509
26-6203	Payroll	594
26-6204	Accounts Receivable	509
26-6205	Accounts Payable	509
26-6207	Order Entry/ICS	509
26-6208	Sales Analysis	339
26-6209	Job Costing	169
26-6302	Inventory	339
26-6309	Manufacturing ICS	722
26-6401	XENIX Development System	637
26-6455	COBOL	599
26-6457	MBASIC	254
26-6480	MultiPlan, Model 16 & XENIX	296
	Electric Pencil 2.0, M1, M3	89
	Blue Pencil, M1, M3	89
	Red Pencil, M1, M3	89
	HEXSPELL 2	80
	HEXMAN	60
	Modem 80, A Powerful Communications Program	35

CP/M

	CP/M 2.2 for the Model 4 **The VERY BEST ONE**	199
	MBASIC for the Model 4	149
	P & T CP/M 2.2m Floppy, M2-12-16	180
	P & T CP/M 2.2m Hard, M2-12-16	225
	All MICROPRO Software Available. Call For Details	

BOOKS

26-2102	Model 1 Level II Manual	5
26-2103	Model 1 Technical Manual	13
26-2109	Model 3 Technical Manual	8
26-2110	Model 4 Technical Manual	21
26-2111	Model 3 DOS Manual	6
26-2112	Model 3 BASIC Instruction Manual	5
26-2114	Sourcebook, New Edition	4
26-2115	Newsletter Book 1980	4
26-2117	Model 4 DOS Manual	15
26-2240	Newsletter Book 1981	8
26-3191	Color Computer Manual	5
26-3192	Extended Color Computer Manual	
26-4920	Model 2 Operators Manual	26
26-4921	Model 2 Technical Reference Manual	26
26-4922	Model 12 Operating Manual	59
26-6040	Model 16 Operators Manual	64
26-6041	Model 16B Operating Manual	72
62-2084	TRS-80 Pocket BASIC Handbook	6
	TRS-80 Disk & Other Mysteries	18
	Microsoft BASIC Decoded	24
	BASIC Faster & Better	24
	BASIC Faster & Better Demonstration Disk	15
	BASIC Faster & Better Library Disk	15
	BASIC Disk I/O Faster & Better	24
	The Custom TRS-80	24
	TRSDOS 2.3 Decoded	24
	Machine Language Disk I/O	24
	How Do It On The TRS-80	24
	TRS-80 Beginners Guide	19

UPGRADES

	16K RAM, 200 nsec, 1 Full Year Guarantee	16
	64K RAM, 150 nsec, 1 Full Year Guarantee	64
26-1122	Model 4 64K RAM Kit with PAL	134
	Same except ours. Includes a genuine PAL. Save $$$$	89
26-1123	Model 3 to Model 4 Upgrade Kit	719
26-1125	Model 3 Hi-Resolution Board	314
26-1126	Model 4 Hi-Resolution Board	214
26-1127	Model 4 Drive 0 Kit	551
	Same as above except our brand. Save $$$$	369
26-1143	Model 1 Double Density Controller	127
	Famous AEROCOMP "DDC" Double Density Controller	99
26-1145	Model 1 RS232 Kit	85
26-1148	Model 3 RS232 Kit	95
	Same as above except our brand. Save $$$$	69
26-1162	Model 3 Drive 0 Kit	550
	Same as above except our brand. Save $$$$	389
26-1163	Radio Shack 40 Track Disk Drive	203
	Same as above except 40 track Tandon. Save $$$	169
26-4104	Model 2 Hi-Resolution Board	424
26-4105	64K RAM Board	339
26-4163	8" Disk Drive	510
26-4167	8" Slim Drive	359
	Holmes Mod 1, Mod 3 4Mhz Speedup Mod	89
26-3013	16K RAM For MC-10 Color Computer	42
26-3016	Color Computer Low Profile Keyboard	34
26-3018	Color Computer Extended BASIC ROM	85
26-6010	Model 2/12 to Model 16 68000 Kit	1299
26-6017	Model 12 Card Cage	169

We maintain an extensively equipped service facility with a large stock of parts. Give us a call for that hard-to find item. We'll try and provide what you need.

CABLES

We manufacture a great number of different cable assemblies to connect most anything to anything else. Call us with your specific needs. We might have it on the shelf. All at discount prices, of course.

RIBBONS

We have more ribbons than you do, so please call us when you need some. Way too many types to list here. They're cheeeep too.

SUPPLIES

	5.25" SSDD Diskettes, Pack of 10	19
	5.25" DSDD Diskettes, Pack of 10	25
	8" SSDD Diskettes, Pack of 10	32
	8" DSDD Diskettes, Pack of 10	49
	5.25" Flipsort, Holds 75 Disks	19
	8" Flipsort, Holds 50 Disks	24
	8.5" x 11" Tractor Paper, Good 20 lb. Stock, 2900 Sheets	22
	14" x 11" Tractor Paper, Good 20 lb. Stock, 2900 Sheets	33
	5.25" Head Cleaning Kit	9
	8" Head Cleaning Kit	9

BUY FROM US RIGHT NOW!

Our large inventory can not be listed completely. Please call if you do not see what you want. Chances are we have it. Because of the time lag in magazine advertising, prices are subject to change without notice. Price reductions will be passed along automatically. Your company and/or personal checks are welcome and will not delay your order. We use TeleCheck. Please observe these requirements and your order will be shipped without delay. The check must be drawn on a USA or Canadian bank and payable in US Dollars. It must be a bank printed check and contain your street address and telephone number. The signature must EXACTLY match the name printed on the check. Thats all there is to it. In addition, we accept American Express, Mastercard, Visa, Cashiers Checks, Wire Transfer, and we also ship COD. COD's and motor freight shipments may require a deposit. Some special items require deposits. ALL COD's require cash or cashiers check on delivery. Company and/or personal checks can NOT be accepted in payment of COD shipments. Credit cards are not charged until we ship your order. Shipping charges are not included in our prices unless otherwise indicated. No State Sales Tax collected on out-of-state shipments or software. If you order by 5PM your order will be shipped the NEXT DAY if stock is on hand. Due to the nature of this business there are NO REFUNDS ON SOFTWARE. REPLACEMENTS WILL BE PROVIDED FOR DEFECTIVE SOFTWARE ITEMS, provided we are notified within ten days of delivery of the merchandise. If you have a particular problem please call us for help and instructions.

WARRANTY

All items carry the original manufacturers warranty. We will be happy to mail you a copy upon request.

Ad. 1063

TeleCheck **Makes checks as welcome as cash.**
COMPANY AND PERSONAL CHECKS WELCOME.
Your order will be shipped immediately upon receipt of your check.

CALL TOLL FREE FROM ANYWHERE IN THE USA

800-527-0347

800-442-1310

VISA MasterCard AMERICAN EXPRESS

✔ See List of Advertisers on Page 227

Listing 1 continued

```
01840           ADD     HL,BC
01850           EX      DE,HL
01860           JR      MVPRMS          ; GET NEXT PARM
01870
01880 ;---------------------------------------------------------
01890 ;         READ /EXE FILE INTO MEMORY
01900 ;---------------------------------------------------------
01910
01920 OPNEXE    EQU     $
01930           LD      HL,EXEEXT       ; ADD /EXE EXTENSION
01940           LD      DE,EXEDCB
01950           CALL    PUTEXT
01960           LD      HL,EXEBUF       ; OPEN /EXE FILE
01970           LD      B,0
01980           CALL    OPEN
01990           JP      NZ,EXERR        ; EXIT IF ERROR
02000
02010           LD      HL,FILBUF       ; SET FILE PTR
02020           LD      (FILPTR),HL
02030           LD      IX.FLAGS        ; POINT TO FLAGS BYTE
02040 RDEXEL    EQU     $
02050           LD      HL,RECBUF       ; READ NEXT RECORD
02060           LD      DE,RECBUF+RECLEN
02070           CALL    GETREC
02080           JP      C,EXERR         ; EXIT IF I/O ERROR
02090           EX      DE,HL           ; SAVE EOR PTR
02100           LD      HL,RECBUF       ; SKIP OVER LINE NO'S
02110           CALL    SKIPLN
02120           CALL    NC,SKIPBL       ; SKIP OVER BLANKS
02130           CP      ';'             ; IGNORE COMMENTS
02140           JR      Z,RDEXEL
02150           CP      '-'             ; PROCESS LABELS
02160           CALL    Z,LBTBLD
02170           EX      DE,HL           ; COMPUTE LENGTH
02180           OR      A
02190           SBC     HL,DE
02200           LD      B,H             ; BC = LENGTH
02210           LD      C,L
02220           LD      HL,(FILPTR)     ; COPY REC TO FILE AREA
02230           EX      DE,HL
02240           LDIR
02250           LD      (FILPTR),DE     ; SAVE NEW PTR
02260           BIT     EOF,(IX+0)      ; READ MORE IF NOT EOF
02270           JR      Z,RDEXEL
02280
02290           RES     EOF,(IX+0)      ; RESET EOF FLAG
02300           LD      HL,(FILPTR)     ; ADD EOF MARK TO FILE
02310           LD      (HL),EOFMRK
02320           PUSH    HL
02330           INC     HL              ; COMPUTE FILE LENGTH
02340           LD      DE,FILBUF
02350           OR      A
02360           SBC     HL,DE
02370           LD      B,H             ; BC = LENGTH
02380           LD      C,L
02390           POP     HL              ; MOVE FILE UP IN MEMORY
02400           LD      DE,EXMAIN-65    ; ALLOWING 64-BYTE STACK
02410           LDDR
02420           EX      DE,HL
02430           LD      (MEMEND),HL     ; PROTECT IT
02440           INC     HL              ; SET CURRENT LINE PTR
02450           LD      (CURLIN),HL
02460
02470 ;---------------------------------------------------------
02480 ;         ADJUST LABEL TABLE TO CONTAIN ADDRESSES
02490 ;---------------------------------------------------------
02500
02510           LD      HL,LABTAB       ; POINT TO LABEL TABLE
02520           LD      B,LABNUM        ; # OF LABELS
02530 LBTADJ    EQU     $
02540           PUSH    HL              ; SAVE TABLE PTR
02550           LD      E,(HL)          ; GET LABEL OFFSET
02560           INC     HL
02570           LD      D,(HL)
02580           INC     HL
02590           EX      (SP),HL         ; SAVE NEW PTR
02600           PUSH    HL
02610           LD      A,0FFH          ; THIS LABEL USED ?
02620           CP      D
02630           JR      NZ,HAVLAB
02640           CP      E
02650           JR      NZ,HAVLAB
02660           INC     DE              ; NO - MAKE IT 0
02670           JR      SETLAB
02680 HAVLAB    EQU     $
02690           LD      HL,(CURLIN)     ; YES - CONVERT TO ADDR
02700           ADD     HL,DE
02710           EX      DE,HL
```

Listing 1 continued

19–22 to the linker as keyboard input. This lets you use extra libraries to complete the link. Line 22 tells the linker to create a command file and exit. Line 24 erases the assembler's /REL file.

Line 25 checks whether you entered NOGO as the fifth argument. If you did, control passes to label -EXIT without running the command file in line 27.

The GOTO statement in line 28 bypasses the comments in lines 29–32. Lines 6, 8, 12, 16, and 26 give messages at the beginning of each major step in the execution file, providing a progress report during execution.

If you run the execution file by entering EXEC CC MYPROG CLIB PRINTF # NOGO, the major steps of the process are as follows.

Line 7 becomes PRE MYPROG to invoke the preprocessor. Line 9 becomes C80 MYPROG to run the compiler, and line 10 becomes KILL MYPROG/C80.

Line 13 runs the assembler with M80 MYPROG=MYPROG, and line 14 erases the assemble file with KILL MYPROG/MAC. Line 17 becomes L80 RUNLIB,MYPROG to run the linker. Lines 19–20 pass CLIB and PRINTF to the linker as though you entered them from the keyboard.

Since the fourth argument is a pound sign, line 21 becomes a blank line. EXEC Interpreter passes line 22 as keyboard input MYPROG-N-E:CMAIN to the linker. Line 24 becomes KILL MYPROG/REL.

The fifth argument is NOGO, so line 25 passes control to label -EXIT. Because this is the last line in the file, the execution file process ends.

This example uses expanded forms of labels and control statement keywords for clarity. You can use the single-letter short forms if you have limited memory. Only the first letter of a label or control statement is necessary; the interpreter ignores the rest of the word.

Compiling a C program involves a lot of keyboard input and consumes a lot of time. By using this execution file, I can perform the entire process with one command. Assuming that no errors occur, I then have the original source file and the command file on disk.

Since the program erases the intermediate files produced by the preprocessor, compiler, and assembler, you don't have to worry about running out of disk space. In fact, if you have all the necessary programs in your drives when starting the execution file, you can omit the Wait command in line 11 and run the whole process unattended.

The Example on p. 60 is a test file

that illustrates the use of arguments; the DOS commands CLS, Create, Free, and Kill; and the interpreter commands If, Wait, Display, and Quit.

Program Logic

EXEC Interpreter occupies 2K bytes in high memory. The beginning address is F800 hex in a 48K system. On a 32K machine, it's B800 hex.

The interpreter reads the file into memory, does some preprocessing, and relocates the file adjacent to itself in high memory. This method ensures the availability of low memory for other programs.

EXEC Interpreter is not recursive, so you can't invoke it from within an execution file.

Starting at label EXEC (line 01060), the initialization code places hooks at various locations in the system so the interpreter can trap the system calls that the programs running in the execution file use.

The EXEC routine saves the arguments from the command line in the high-memory PARMS table. EXEC Interpreter then reads the execution file into low memory, one line at a time. When EXEC finds a labeled line, it saves the line's relative position in the file in the label table LABTAB. The program doesn't retain the actual label; it uses the first letter of the label as an index into the table.

When the program reaches the end of the file, it relocates the lines upward in memory and overlays the part of the EXEC routine's initialization code that it no longer needs. This frees up more memory.

The program sets the system variable MEMEND to protect the relocated file and the interpreter. Although most programs use this variable to indicate the highest available memory, some might not. If they don't, the interpreter won't work.

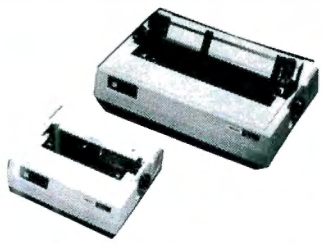
Then the program adjusts the label table entries to contain the real memory addresses of the labeled lines rather than relative offsets.

The main loop of the interpreter starts at label EXMAIN (line 02840) and has 64 bytes of stack space available. It reassigns the stack pointer each time it goes through the loop. The loop processes each line of the execution file through a call to PRCLIN. This routine performs argument substitution.

The CHKCTL routine handles the execution file's control statements. If a line passes to DOS as a command, the routine first copies that line to the DOS command text area. Some programs

OKIDATA

Microline Family



The Okidata ***Microline*** family offers TRS-80 users a wide range of features for almost any application. All ***Microline*** printers are made with the same rugged materials and care. No matter which printer you select, you've chosen one of the best printers made.

The **Microline 92** (160 cps) is ideal for word processing. It features 10, 12 & 17 cpi, a correspondence font, double-width, emphasis/boldface, sub/super scripts, underlining, pin/friction feed (tractor is optional on the **92**) & dot-addressable graphics (120 x 144 dpi). The **93** is the 136 column version. Parallel interfaces are standard; the RS-232C interface is optional.

The **Microline 84** (132 col) is the Step 2 version, featuring 200 cps at 10, 12, & 17 cpi (w/ double-width), all with a correspondence mode & dot addressable graphics. Parallel or RS-232C interfaces available.

The **Microline 82A** (120 cps) is a data cruncher. Features 10 & 16 cpi (5/8 double-width). Dot-addressable graphics are optional. The **83A** is the 136 column version.

Microline Series ..... **$CALL**

Dot Matrix

ANADEX

9500B	$1119.88
9501B	$1119.88
9620B	$1209.88
9625B	$1309.88
WP-6000	$2359.88
WP-6000 Tractor	$139.88

C. ITOH

Prowriter	$379.88
Prowriter 2	$609.88
Prowriter SP	$519.88

EPSON

RX/FX Series	$CALL

IDS/DATAPRODUCTS

P-480	$439.88
Prism 132	$1489.88
w/4-color	$1699.88

INFORUNNER

Riteman	$339.88

MEMOTECH

DMX-80	$339.88

MANNESMANN TALLY

MT-160 L	$629.88
MT-180 L	$879.88
MT-Spirit	$329.88

STAR MICRONICS

Gemini 10X	$299.88
Gemini 15X	$429.88
Delta 10	$499.88
Delta 15	$589.88
Radix 10	$629.88
Radix 15	$739.88

Letter Quality

C. ITOH

A10 Starwriter
F10 Starwriter
F10 Printmaster

The **F10 Starwriter** (40 cps) features 10 & 12 cpi, sub/super scripts, underlining, 6 & 8 lpi, Qume code & Diablo supplies. The **Printmaster** has the same specs, but it prints faster (55 cps). The **A10 Starwriter** has the same specs, but at 20 cps. Both the **Tractor Feed** & the **Sheet Feeder** fit all three models.

A-10 Starwriter	$599.88
F-10 Starwriter	$1119.88
F-10 Printmaster	$1469.88
Tractor Feed	$219.88
Single Bin Sheet Feeder (A10/F10)	$619.88

NEC

2010/2030	$899.88
3530	$1699.88
2000/3500 Tractor	$239.88
2000/3500 Sheet Feed	$479.88

SILVER REED

EXP-550/500

The **EXP-550** (17 cps, 132 columns) features 10, 12, 15 cpi & proportional, sub/superscript, underlining & ***true*** Diablo 1600 code. Friction feed, with page injector; an optional tractor is also available. The **EXP-500** (12 cps, 100 columns) has the same specs as the **EXP-550**, but without page inject or proportional spacing.

EXP-550 (Parallel)	$609.88
EXP-550 Tractor	$129.88
EXP-500 (Parallel)	$449.88
EXP-500 Tractor	$119.88

SMITH-CORONA

Messenger

The **Memory Correct III Messenger** combines an electric typewriter ***and*** a letter-quality printer. It features 12 cps, 3 pitches (10, 12 & 15), variable line spacing, 10.5" writing line, backspacing & auto-correction. Comes complete with parallel/RS-232C interface.

Messenger **$589.88**

Accessories

Printer Stands

Heavy-guage steel with a baked enamel finish (beige), with a paper slot in the center for bottom feeding. Fits 80 or 132 column printers (specify).

80 Column Stand	$39.88
132 Column Stand	$49.88

Microfazer

Printer buffers from 8K to 512K, in parallel in/parallel out configurations.

Microfazers ..... **$CALL**

Modems

US ROBOTICS

Password 1200Bd	$369.88

DC HAYES

Smartmodem 300Bd	$239.88
Smartmodem 1200Bd	$559.88

NOVATION

300Bd SmartCat	$189.88
1200Bd SmartCat	$439.88

Information/Orders:
(603) 881-9855
Prices/Orders Only:
(800) 343-0726

No Hidden Charges:

- You get FREE shipping on all orders within the 48 states.
- Easy payment terms: We accept all major credit cards, certified checks, money orders, company checks or personal checks (allow 21 days for personal checks).
- We never charge extra for credit cards, & your credit card is not charged until your order is shipped.
- We accept CODs up to $1000 (add $10 handling fee per order) payable with certified check or money order.
- We have a $50 minimum order.
- Company Purchase Orders are accepted on a limited basis & upon approval only. Sorry, no APO or foreign orders accepted.
- All our equipment is shipped with full manufacturer's warranty. We are an ***authorized dealer*** for all the products we sell. We prepared this ad in February, & prices do change, so call to verify them.
- Our ***Computer Showroom*** is now open in Amherst, New Hampshire, five miles west of Nashua (one hour from Boston).

Send $1.00 & computer type for our new computer catalog.

MasterCard VISA AMERICAN EXPRESS

HIGH TECHNOLOGY AT AFFORDABLE PRICES

THE BOTTOM LINE

MILFORD, NH 03055-0423 □ TELEPHONE (603) 881-9855

Listing 1 continued

```
02720 SETLAB   EQU     $
02730          POP     HL              ; PUT ADDRESS BACK
02740          LD      (HL),E
02750          INC     HL
02760          LD      (HL),D
02770          POP     HL              ; RESTORE PTR
02780          DJNZ    LBTADJ          ; LOOP UNTIL DONE
02790
02800 ;-----------------------------------------------------
02810 ;        MAIN EXEC PROCESSING
02820 ;-----------------------------------------------------
02830
02840 EXMAIN   EQU     $
02850          LD      SP,EXMAIN       ; SET STACK PTR
02860          LD      IX,FLAGS        ; POINT TO FLAGS BYTE
02870          BIT     EOF,(IX+0)      ; END-OF-FILE ?
02880          JR      NZ,EXEND        ; YES - DONE
02890          LD      HL,(TXTPTR)
02900          BIT     HAVTXT,(IX+0)   ; HAVE TEXT LINE YET ?
02910          JR      NZ,NOPROC
02920          CALL    PRCLIN          ; NO - PROCESS NEXT LINE
02930 NOPROC   EQU     $
02940          RES     HAVTXT,(IX+0)   ; RESET FLAG
02950          LD      A,(HL)          ; NULL LINE ?
02960          CP      CR
02970          JR      Z,EXMAIN        ; YES - IGNORE
02980          CALL    CHKCTL          ; CHECK FOR CTL STMT
02990          JR      C,EXMAIN        ; GET NEXT LINE IF SO
03000          BIT     STACK,(IX+0)    ; STACKED LINE ?
03010          JR      Z,EXCMD
03020          LD      HL,STKMSG       ; YES - ISSUE WARNING
03030          CALL    VDLINE
03040          JR      EXMAIN          ; PROCESS NEXT LINE
03050 EXCMD    EQU     $
03060          PUSH    HL              ; SAVE COMMAND PTR
03070          LD      DE,CMDTXT       ; COPY CMD TO DOS AREA
03080          LD      BC,63           ; (JUST IN CASE)
03090          LDIR
03100          LD      A,CR            ; ADD <CR> TO END
03110          LD      (DE),A
```

Listing 1 continued

address this area directly to get parameters, rather than going through the HL register pair. The CMDDOS system routine executes the command and returns control to EXMAIN to process the next line of the execution file.

When the program reaches the end of the file, EXEND in line 03230 restores all the patches made during initialization into the system and returns to DOS.

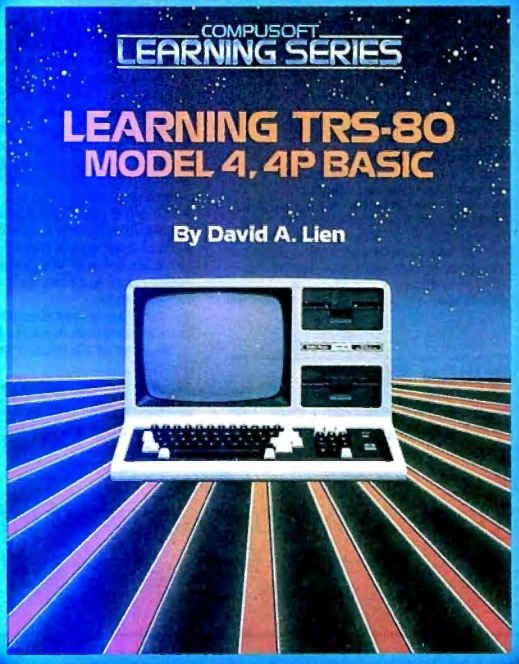
The LBTBLD subroutine in line 03460 adds a label to the label table. It stores the relative offset of the line in the table's file.

The PRCLIN routine in line 03800 processes the next line of the execution file. The routine calls CHKARG to perform an argument substitution. PRCLIN builds up a text line for the main part of the interpreter, and when you've turned tracing on, it displays the line after argument substitution.

The CHKCTL routine in line 04290 and the PRCCTL routine in line 04460 check for and process the special control statements. Since processing If statements requires a lot of time, the program handles it separately in the IFPROC routine (line 05440).

During If statement processing, the

CompuSoft
LEARNING SERIES
Learning TRS-80 Model 4, 4P BASIC



Your TRS-80 Model 4 or 4P is functional and enjoyable with its value limited only by your knowledge and the availability of learning information. *Learning TRS-80 Model 4, 4P BASIC* provides a complete course in BASIC. This book will reinforce your understanding of TRS-80 BASIC including the following special features: New Microsoft BASIC • 80 Column Screen • Advanced Editing Features • Sound Capabilities

Send this coupon or call TOLL FREE 800-854-6505 (in Calif. 619-588-0996) to place your order today.

Please send me _____ copy(s) of *Learning Model 4, 4P BASIC* at $19.95 each (Calif. residents add 6% sales tax). All orders must include $2.00 for P & H (Foreign orders include $3.00 for P & H).

☐ Check ☐ Visa ☐ MasterCard

Account # _____ Exp. Date _____

Signature _____

Name _____

Address _____

Mail to: 535 Broadway, Dept. 200484, El Cajon, CA 92021

COMPUSOFT
• PUBLISHING •

476 pages approx. TRS-80 is a registered trademark of Radio Shack, A Division of Tandy Corporation. Microsoft is a registered trademark of Microsoft Corporation. 365

ANNOUNCING
the premiere of

jr®

Learning to use your *IBM PCjr* becomes easy and fun with **jr** magazine. Because **jr** keeps things simple, the whole family will *learn and understand while they enjoy themselves.*

jr will explain how the *PCjr* works and guide you step-by-step in setting up your system. Most of all **jr** will answer your most important questions month after month . . . like

- **What can I use my *PCjr* for?** **jr** magazine will teach you how to prepare household budgets, balance your checkbooks, do your taxes and organize schedules and lists.
- **What about the kids?** From kindergarten to college, **jr** helps the kids with educational programs in every subject area.
- **Are there more serious uses for *PCjr*?** Yes! You'll improve your own business skills by learning about word processing, spreadsheets and graphics.
- **What about having fun with *PCjr*?** Relax and enjoy all the latest games with your whole family.

Plus:

- **What programs should I choose for the *PCjr*?** **jr** magazine will tell you what programs on the market will run on the *PCjr*, and which ones won't. Plus what new programs are on the way. **jr** will evaluate them *before* you buy.

Order your subscription to **jr** today and you'll get the special charter subscription rate of $14.97. That's 25% off the basic subscription rate! Plus, with your pre-payment of check, American Express, Visa or Mastercard we'll send you a FREE issue making a total of 13 issues for $14.97.

Take advantage of this incredible charter subscription offer. Mail the attached card, the coupon or call TOLL FREE 1-800-258-5473. In New Hampshire call 1-924-9471 . . . TODAY!

Sign me up as a charter subscriber to **jr.** I understand that with prepayment of check or credit card I'll receive a FREE issue making a total of 13 issues for $14.97. Save $5.00 off the basic rate!

☐ CHECK/MO ☐ MC ☐ AE ☐ VISA ☐ BILL ME

Card # _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Canada & Mexico $17.97, 1 year only, US funds drawn on US bank.
Foreign Surface $34.97, 1 year only, US funds drawn on US bank.
Foreign airmail, please inquire. Please allow 6-8 weeks for delivery.

344F8

jr. **For IBM's Home Computer**
Box 903 Farmingdale, NY 11737

☑ INCREDIBLE!

That's what people say to our offer of a powerful data management system on diskette, with manual.

Winner of 80 Micro's Reader's Choice Awards, AIDS-III allows you to enter, organize and isolate data, and print formal reports and labels. It can sort, merge and compute, with performance that matches software many times it's price.

☑ $20.00

How can SofTrends offer all this for $20? Frankly AIDS-III, constantly refined since 1980, no longer represents our most advanced technology. But it's still being employed by more than 10,000 users. Once YOU begin using AIDS-III, you'll be convinced of SofTrends' superior performance, regardless of price.

↙492

To order, phone (216) 289-2002 and use your VISA or MasterCard. Or send your check for $20 (shipping included!) to SofTrends Inc., 26111 Brush Ave., Euclid, OH 44132. Sorry, no COD's or PO's accepted for this special offer.

SOFTRENDS

Listing 1 continued

```
03120           POP     HL              ; EXECUTE COMMAND
03130           CALL    CMDDOS
03140           JR      EXMAIN          ; READ NEXT LINE
03150
03160 ;---------------------------------------------------------
03170 ;       EXEC PROCESSING DONE
03180 ;---------------------------------------------------------
03190
03200 EXERR     EQU     $
03210           OR      0C0H            ; DISPLAY DOS ERROR MSG
03220           CALL    ERRDSP
03230 EXEND     EQU     $
03240           LD      HL,(KBDSAV)     ; RESTORE KBD DRIVER
03250           LD      (KBDDCB+1),HL
03260           LD      HL,(MESAVE)     ; RESTORE HIGH MEM PTR
03270           LD      (MEMEND),HL
03280           LD      HL,ERRSAV       ; AND DOS ERR HANDLER
03290           LD      DE,ERRDSP
03300           LD      BC,4
03310           LDIR
03320           LD      HL,COMSAV       ; AND DOS CMD HANDLER
03330           LD      DE,COMDOS
03340           LD      BC,3
03350           LDIR
03360           LD      HL,(DOSSAV)     ; AND DOS JUMP ADDRESS
03370           LD      (DOS+1),HL
03380           LD      SP,(SPSAVE)     ; RESTORE STACK PTR
03390           RET                     ; EXIT TO DOS
03400
03410 ;---------------------------------------------------------
03420 ;       ADD LABEL TO TABLE
03430 ;       (HL) = /EXE FILE RECORD
03440 ;---------------------------------------------------------
03450
03460 LBTBLD    EQU     $
03470           CALL    CNVLAB          ; MAKE LABEL BINARY
03480           JR      C,LABERR        ; EXIT IF ERROR
03490           LD      C,A             ; TABLE OFFSET -> BC
03500           LD      B,0
03510           CALL    NEXTWD          ; IGNORE REST OF LABEL
03520           PUSH    HL              ; SAVE REGISTERS
03530           PUSH    DE
03540           LD      HL,(FILPTR)     ; COMPUTE FILE OFFSET
03550           LD      DE,FILBUF
03560           OR      A
03570           SBC     HL,DE
03580           EX      DE,HL
03590           LD      HL,LABTAB       ; STORE OFFSET IN TABLE
03600           ADD     HL,BC
03610           LD      (HL),E
03620           INC     HL
03630           LD      (HL),D
03640           POP     DE              ; RESTORE REGISTERS
03650           POP     HL
03660           RET                     ; RETURN TO CALLER
03670
03680 LABERR    EQU     $
03690           ADD     A,'A'           ; SAVE BAD LABEL
03700           LD      (LABLAB),A
03710           LD      HL,LABMSG       ; DISPLAY ERROR MSG
03720           CALL    VDLINE
03730           JR      EXEND           ; EXIT
03740
03750 ;---------------------------------------------------------
03760 ;       PROCESS EXEC LINE, (IX) = FLAGS BYTE
03770 ;       RETURNS (HL) = TEXT LINE
03780 ;---------------------------------------------------------
03790
03800 PRCLIN    EQU     $
03810           LD      BC,(CURLIN)     ; CURRENT LINE PTR
03820           LD      HL,CMDSAV       ; TEXT PTR
03830           LD      DE,CMDSAV+TXTLEN
03840 PROCLP    EQU     $
03850           LD      A,(BC)          ; GET NEXT CHARACTER
03860           INC     BC              ; ADJUST PTR
03870           CP      EOFMRK          ; END-OF-FILE MARK ?
03880           JR      NZ,NOTEOF       ; NO - CONTINUE
03890           SET     EOF,(IX+0)      ; YES - INDICATE EOF
03900           JR      PRCEND          ; DONE
03910 NOTEOF    EQU     $
03920           CP      '&'             ; IS IT '&' ?
03930           JR      NZ,NOAMPR
03940           CALL    CHKARG          ; YES - HANDLE &N PARM
03950           JR      NC,PROCLP       ; GET NEXT CHARACTER
03960           JR      PRCEND          ; DONE IF <CR> FOUND
03970 NOAMPR    EQU     $
03980           CP      CR              ; IS IT <CR> ?
```

Listing 1 continued

program scans and evaluates the two operands, the relational operator, and the label. When both operands are numeric, the program makes an unsigned numeric comparison.

When the operands aren't numeric, the program compares the strings. When the result of the comparison is true, the program alters the current EXEC routine line pointer, CURLIN, to change the flow of control.

The GETLAD routine in line 06400 searches the label table for a label and returns the address of the labeled line. CNVLAB converts a character label to a binary label table index in line 06660.

The EVALOP routine in line 06840 determines whether an If statement's operand is numeric or a string. RELOP (line 07060) returns a numeric value for a relational operator.

NMEQ, NMNE, and so on up to NMLE determine the result of a numeric comparison. The program precompares the two numbers by subtracting one from the other. These routines return a zero or non-zero value in the A register to indicate a false or true condition for the relationship.

STEQ, STNE, and so on up to STGE compare strings and return a value in the A register like the numeric comparison routines.

The CHKARG routine substitutes arguments in line 08830. It uses the number of the argument to obtain the argument string from the PARMS table, then inserts the string into the text line in place of the &n token.

The KBDINT routine in line 09330 runs whenever a program running from within the execution file requests keyboard input. If the &S statement has stacked a line, the next character from that line returns. Otherwise, the program calls the regular system keyboard driver to get the next character from the keyboard.

The program invokes the ERTRAP routine in line 09740 when it calls the DOS error handler. The A register contains the error codes. Under TRSDOS,

Listing 1 continued

```
03990           JR      Z,PRCEND        ; YES - DONE
04000           LD      (HL),A          ; NO - ADD TO TEXT
04010           CALL    INCPTR          ; ADJUST PTR
04020           JR      NC,PROCLP       ; LOOP IF TEXT NOT FULL
04030
04040 PRCEND    EQU     $
04050           LD      (CURLIN),BC     ; SAVE NEW LINE PTR
04060           LD      (HL),CR         ; ADD <CR> TO TEXT
04070           BIT     TRACE,(IX+0)    ; TRACE ON ?
04080           JR      Z,NOTRAC
04090           PUSH    HL
04100           LD      HL,CMDSAV       ; YES - DISPLAY TEXT
04110           CALL    VDLINE
04120           POP     HL
04130
04140 NOTRAC    EQU     $
04150           BIT     BRKEND,(IX+0)   ; END WITH <BRK> ?
04160           JR      Z,NOBRK
04170           LD      (HL),BREAK      ; YES - CHANGE TO <BRK>
04180           RES     BRKEND,(IX+0)   ; RESET FLAG
04190 NOBRK     EQU     $
04200           LD      HL,CMDSAV       ; RETURN TEXT PTR
04210           RET                     ; RETURN TO CALLER
04220
04230 ;---------------------------------------------------------
04240 ;         CHECK FOR CONTROL STATEMENTS
04250 ;         (HL) = LINE, (IX) = FLAGS BYTE
04260 ;         RETURNS CS IF WAS CONTROL STATEMENT
04270 ;---------------------------------------------------------
04280
04290 CHKCTL    EQU     $
04300           LD      A,(HL)          ; IS 1ST CHARACTER '&' ?
04310           CP      '&'
04320           JR      NZ,NOTCTL
04330           CALL    PRCCTL          ; YES - PROCESS IT
04340           SCF                     ; INDICATE CONTROL
04350           RET                     ; RETURN
04360
04370 NOTCTL    EQU     $
04380           OR      A               ; INDICATE NOT CONTROL
04390           RET                     ; RETURN TO CALLER
04400
04410 ;---------------------------------------------------------
04420 ;         PROCESS CONTROL STATEMENT
04430 ;         (HL) = LINE, (IX) = FLAGS BYTE, A = 1ST CHAR
04440 ;---------------------------------------------------------
04450
04460 PRCCTL    EQU     $
04470           INC     HL              ; GET COMMAND CHAR
```

Listing 1 continued

TIED UP BY STRING COMPRESSION?

CUT YOURSELF LOOSE WITH TRASHMAN™

THIS PROGRAM IS A MUST FOR EVERYONE WHO USES "BASIC" ON A TRS-80. It reduces string compression delays by 95% or more. You suffer from these delays whenever you run a BASIC program. Your computer locks up 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. If you're using your computer for business, that wastes your money. If you're using it personally, it wastes your time.

TRASHMAN FIXES THE PROBLEM! As soon as you start to use it, **those delays will almost disappear.** The program is **very easy to use,** so you don't have to be a computer programmer to take advantage of it. It's written in "machine language" and uses only 578 bytes of memory for itself, plus 2 bytes for each "string" in your program. It works with other machine language programs and all the major operating systems.

IT SHOULD HAVE BEEN BUILT INTO THE COMPUTER IN THE FIRST PLACE, but since it wasn't, look at this chart, and then order your copy today.

# STRINGS	SECONDS DELAY NORMAL	SECONDS DELAY TRASHMAN	PERCENT IMPROVEMENT
10	.1	.1	0
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

"FANTASTIC!!! My huge database used to lock up during searching, scrolling, etc. (1,000 strings). Now the true power is unleashed!!!" (L.L.)

". . . If delays are annoyingly frequent, then TRASHMAN is the answer, and at the price, it does not take many operating delays to justify it's purchase." (COMPUTRONICS, March, 1983)

TRASHMAN is available on Disk for the TRS-80 Models I & III for just **$39.95.**

Attention Software Publishers: TRASHMAN may be licensed for use with your packages. Call for details.

ORDER NOW, TOLL-FREE

(800) 824-7888, oper. 422

PROSOFT®

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

(818) 764-3131 Information and Same-Day Order Processing

TERMS: VISA, MC, checks, COD. Please add $2.00 shipping in U.S. or Canada, $5.00 overseas, sales tax in Ca. Most orders filled within one day.

FASTER speeds up most TRS-80 BASIC programs by 20-50%. It analyses programs **while they run**, then displays a simple change, usually one line, to sequence variables so the ROM will find them faster.

You can use FASTER to speed up programs you've bought as well as programs you've written. Since it isn't a compiler, your BASIC programs can be read and changed afterwards. It works on business programs, models, and games. The more complex your program, the better the results. For the past 3 years, FASTER has earned high marks from reviewers and thousands of users:

FASTER is a must for any programmer . . . It is in my opinion one of the best inexpensive utilities available." *80 US JOURNAL (April, 1982)*

"If you . . . would like a significant increase in the run-time speed, then buy FASTER." *80 MICRO (April, 1982)*

EQUIPMENT: TRS-80 Models I & III, 16-48K Tape or Disk, all DOS's. **$29.95**

QUICK COMPRESS

This ultra-fast machine language program reduces the size and increases the speed of most BASIC programs. It needs only 276 bytes of memory, and removes the blanks and remarks from even the largest BASIC program in less than 3 seconds. Works with all DOS's, and is especially useful with LDOS, NEWDOS, and Model I TRSDOS.

Models I & III, 16-48K, Tape or Disk **$19.95**

SPECIAL: FASTER & QUICK **$39.95**

ORDER NOW, TOLL-FREE
(800) 824-7888, oper. 422

PROSOFT. -2

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

(818) 764-3131 Information and Same-Day Processing

TERMS: VISA, MC, checks, COD. Please add $2.00 shipping in U.S. or Canada, $5.00 overseas. sales tax in Ca. Most orders filled within one day.

if the program has set bit 6 of the error code, it displays a detailed error message. Otherwise only the error number appears. I set bit 6 to force a detailed error message.

If &Q forces exit on error, set bit 7 and alter the return address so the interpreter's exit code regains control after the program displays the message. If you don't set bit 7, control returns to the system after the program displays the message.

The CMTRAP routine in line 09970 traps calls to the system routine, COMDOS. COMDOS runs a DOS command, but doesn't return to the caller. The interpreter pushes a return address and uses CMDDOS so it regains control when the command is complete.

GETREC (line 10120) and GETBYT (line 10440) read in the execution file from disk, one line at a time.

The rest of the subroutines in the program are string-handling utilities. NEXTWD scans to the start of the next word in a line. NEXTBL finds the next blank character in a line. The interpreter treats tabs as blanks.

SKIPBL finds the next non-blank character, and CHKBL determines whether or not the next character is a blank or a tab. SKIPLN bypasses line numbers at the beginning of a line. All the above routines check to make sure that the pointer doesn't advance past the end of the line.

INCPTR (line 11300) increments a pointer in the HL register pair and compares it to the value in the DE register pair. CPYSTR (line 11460) copies a string that the HL register pair addresses to a location that the DE register pair addresses. A blank or carriage return character terminates the string. CVBIN in line 11600 checks whether a character string is all numeric. If it is, the program converts it into binary numbers. ■

You can reach Douglas Payne at 58 Brendawood Crescent, Waterloo, Ontario N2J 4J5, Canada.

Listing 1 continued

```
04480           LD      A,(HL)
04490           LD      (CTLCMD),A      ; SAVE IN CASE OF ERROR
04500           AND     0DFH            ; FORCE UPPERCASE
04510
04520           CP      'I'             ; IF ?
04530           JP      Z,IFPROC        ; YES - PROCESS IT
04540
04550           CP      'G'             ; GOTO ?
04560           JR      NZ,CHKTRC
04570           DEC     HL              ; YES - SAVE ADDRESS
04580           LD      (GOSTAD),HL
04590           CALL    NEXTWD          ; SCAN TO LABEL
04600           JR      C,GOERR         ; ERROR IF NONE
04610           CALL    GETLAD          ; GET LABEL ADDRESS
04620           JR      C,GOERR         ; ERROR IF NONE
04630           LD      (CURLIN),HL     ; SAVE NEW LINE PTR
04640           RET                     ; RETURN
04650 GOERR     EQU     $
04660           LD      HL,GOERRM       ; DISPLAY ERROR MSG
04670           CALL    VDLINE
04680           LD      HL,(GOSTAD)
04690           CALL    VDLINE
04700           JP      EXEND           ; EXIT
04710
04720 CHKTRC    EQU     $
04730           CP      'T'             ; TRACE ?
04740           JR      NZ,CHKBRK
04750           SET     TRACE,(IX+0)    ; YES - SET TRACE FLAG
04760           CALL    NEXTWD          ; SCAN TO OPERAND
04770           RET     C               ; DEFAULT IS YES
04780           CP      'Y'
04790           RET     Z
04800           RES     TRACE,(IX+0)    ; RESET TRACE FLAG
04810           RET
04820
04830 CHKBRK    EQU     $
04840           CP      'B'             ; END NEXT WITH BRK ?
04850           JR      NZ,CHKSTK
04860           SET     BRKEND,(IX+0)   ; YES - SET BREAK FLAG
04870           RET
04880
04890 CHKSTK    EQU     $
04900           CP      'S'             ; STACK NEXT LINES ?
04910           JR      NZ,CHKEND
04920           SET     STACK,(IX+0)    ; YES - SET STACK FLAG
04930           RET
04940
04950 CHKEND    EQU     $
04960           CP      'E'             ; END STACKING ?
04970           JR      NZ,CHKWT
```

Listing 1 continued

Listing 1 continued

```
04980           RES     STACK,(IX+0)    ; YES - CLEAR STACK FLAG
04990           RET
05000
05010 CHKWT     EQU     $
05020           CP      'W'             ; WAIT ?
05030           JR      NZ,CHKDSP
05040           CALL    CTLDSP          ; YES - DISP MSG IF ANY
05050           LD      HL,WTMSG        ; DISPLAY WAIT MESSAGE
05060           CALL    VDLINE
05070           SET     NKBDPR,(IX+0)
05080           CALL    KBWAIT          ; WAIT FOR KEY-PRESS
05090           RES     NKBDPR,(IX+0)
05100           CP      BREAK           ; IS IT <BREAK> ?
05110           JP      Z,EXEND         ; YES - TERMINATE
05120           RET
05130
05140 CHKDSP    EQU     $
05150           CP      'D'             ; DISPLAY ?
05160           JR      NZ,CHQUIT
05170 CTLDSP    EQU     $
05180           CALL    NEXTBL          ; YES - SCAN TO STRING
05190           JR      C,DSPLAY
05200           INC     HL
05210 DSPLAY    EQU     $
05220           JP      VDLINE          ; DISPLAY IT, RETURN
05230
05240 CHQUIT    EQU     $
05250           CP      'Q'             ; QUIT ?
05260           JR      NZ,CTLERR
05270           SET     ERQUIT,(IX+0)   ; YES - SET QUIT FLAG
05280           CALL    NEXTWD          ; SCAN TO OPERAND
05290           RET     C               ; DEFAULT IS YES
05300           CP      'Y'
05310           RET     Z
05320           RES     ERQUIT,(IX+0)   ; RESET QUIT FLAG
05330           RET
05340
05350 CTLERR    EQU     $
05360           LD      HL,CTLMSG       ; NONE OF THE ABOVE
05370           JP      VDLINE          ; DISPLAY ERROR MSG, RET
05380
05390 ;---------------------------------------------------------
05400 ;       PROCESS &IF STATEMENT
05410 ;       (HL) = STATEMENT, (IX) = FLAGS BYTE
05420 ;---------------------------------------------------------
05430
05440 IFPROC    EQU     $
05450           DEC     HL              ; SAVE LINE PTR
05460           LD      (IFSTAD),HL
05470           RES     CMPTYP,(IX+0)   ; RESET COMPARE FLAG
05480
05490           CALL    NEXTWD          ; SCAN TO 1ST OPERAND
05500           JP      C,IFERR
05510           LD      (IFOP1A),HL     ; SAVE ADDRESS
05520           CALL    EVALOP          ; EVALUATE
05530           LD      (IFOP1V),DE     ; SAVE VALUE
05540           LD      A,C             ; SAVE LENGTH
05550           LD      (IFOP1L),A
05560           LD      A,B             ; STRING ?
05570           OR      A
05580           JR      NZ,CHKROP
05590           SET     CMPTYP,(IX+0)   ; YES - SET FLAG
05600
05610 CHKROP    EQU     $
05620           CALL    NEXTWD          ; SCAN TO OPERATOR
05630           JP      C,IFERR
05640           CALL    RELOP           ; GET OPERATOR TYPE
05650           JP      C,IFERR         ; EXIT IF ERROR
05660           LD      (IFROPT),A      ; SAVE IT
05670
05680           CALL    NEXTWD          ; SCAN TO 2ND OPERAND
05690           JP      C,IFERR
05700           LD      (IFOP2A),HL     ; SAVE ADDRESS
05710           CALL    EVALOP          ; EVALUATE
05720           LD      (IFOP2V),DE     ; SAVE VALUE
05730           LD      A,C             ; SAVE LENGTH
05740           LD      (IFOP2L),A
05750           LD      A,B             ; STRING ?
05760           OR      A
05770           JR      NZ,CHKLAB
05780           SET     CMPTYP,(IX+0)   ; YES - SET FLAG
05790
05800 CHKLAB    EQU     $
05810           CALL    NEXTWD          ; SCAN TO LABEL
05820           JR      C,IFERR
05830           CALL    GETLAD          ; GET LABEL ADDRESS
```

Listing 1 continued

SAVE TIME SAVE MONEY!

GET MORE WORK OUT OF YOUR COMPUTER WITH PROSOFT's FABULOUS UTILITIES.

ERRATIC DISK DRIVES?

RPM TO THE RESCUE

Find out if your drives need adjustment before you **begin** to lose files. **SAVE** on repair bills. 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) said: "If your drives have problems I recommend RPM before paying to get it repaired."

Customers agree:
"EXCELLENT — Has paid for itself already! Saved the cost of Radio Shack's doing the speed adjust!" (D.M.)

RPM is supplied on disk for the TRS-80 Models 1, 3 and 4 (in 3 mode). We suggest you order a copy **before** you need it.

RPM $24.95

THE BASIC UNSCRAMBLER™

NEW from the author of DOTWRITER! THE ESSENTIAL DOCUMENTATION PROGRAM FOR BASIC

- Lists programs in readable form
- Makes it easier to follow BASIC
- Self-document your own programs
- Self-document others' programs
- Very easy to use, excellent prompts
- Assign names to subroutines
- Use long names for variables
- Saves names to separate disk file
- Doesn't change original program
- Flags GOTO's and GOSUB's
- Indents loops, IF/THEN
- Indents multiple loops, IF/THEN
- long lines broken BETWEEN cmnds
- Remarks made neater, easier to read
- Cross-references with each line
- Written as FAST MACHINE LANGUAGE program

Requires TRS-80 Model I or III, 48K, disk

UNSCRAMBLER $29.95

ORDER NOW, TOLL-FREE
(800) 824-7888, oper. 422

PROSOFT® ↙13

Dept. C Box 560, No. Hollywood, CA 91603
(818) 764-3131 Information and same-day processing

TERMS VISA MC checks COD Please add $2.00 shipping in U.S. or Canada $5.00 overseas sales tax in Ca Most orders filled within one day

↙ See List of Advertisers on Page 227

WHEN YOU TYPE "TALLY"

you get what you thought those "CALC" programs would give you:

- *easy to use*
- *simple and logical*
- *totals by item and category*
- *every category named*
- *built-in sorts*
- *clear documentation*

Customers told us:

"Looks like just what I need to keep track of Income & Expenses in my Real Estate appraisal business." (L.E.)

"Just what we need for In-house Budgets." (N. Ariz. Univ.)

"TALLYMASTER" is everything you advertised and more. I'm having a lot of fun learning the features." (L.C.)

"Well-packaged, clear instructions, easy to use." (G.L.G.)

And, **'80 MICRO gave it a Five Star review:** *"I recommend Tallymaster to every user who wants a good, easy, accurate bookkeeping system, and to anyone interested in home or small business budgeting and bookkeeping." (July, 1983)*

All this for only **$79.95**
(TRS-80 Models I, III, 48K, disk)

Also available for IBM PC:
128K, disk. Has Function Key support and an even faster sort.
Special price: $99.95

ORDER NOW, TOLL-FREE
(800) 824-7888, oper. 422

PROSOFT® -8

Dept. G, Box 560, No. Hollywood, CA 91603
(818) 764-3131 Information and Same-Day Processing

TERMS: VISA, MC, checks, COD. Please add $2.00 shipping in U.S. or Canada, $5.00 overseas, sales tax in Ca. Most orders filled within one day.

Listing 1 continued

```
05840           JR      C,IFERR         ; EXIT IF ERROR
05850           LD      (IFLAB),HL      ; SAVE FOR LATER
05860
05870           LD      HL,IFRET        ; PUSH RETURN ADDRESS
05880           PUSH    HL
05890           LD      A,(IFROPT)      ; GET OPERATOR TYPE
05900           LD      C,A
05910           BIT     CMPTYP,(IX+0)   ; STRING OR NUMBER ?
05920           JR      NZ,STRCMP
05930
05940           LD      HL,NMCTAB       ; NUMBER
05950           ADD     HL,BC           ; COMPARE ROUTINE ADDRESS
05960           LD      A,(HL)
05970           INC     HL
05980           LD      H,(HL)
05990           LD      L,A
06000           PUSH    HL
06010           LD      HL,(IFOP1V)     ; OPERAND VALUES
06020           LD      DE,(IFOP2V)
06030           XOR     A               ; PRE-COMPARE
06040           SBC     HL,DE
06050           RET                     ; COMPUTE RELATION
06060
06070 STRCMP    EQU     $
06080           LD      HL,STCTAB       ; STRING
06090           ADD     HL,BC
06100           LD      A,(HL)
06110           INC     HL
06120           LD      H,(HL)
06130           LD      L,A
06140           PUSH    HL
06150           LD      HL,(IFOP1A)     ; OPERAND ADDRESSES
06160           LD      DE,(IFOP2A)
06170           LD      BC,(IFOPLN)     ; OPERAND LENGTHS
06180           RET                     ; DO COMPARE
06190
06200 IFRET     EQU     $
06210           OR      A               ; CONDITION TRUE ?
06220           RET     Z               ; NO - RETURN
06230           LD      HL,(IFLAB)      ; YES - SET NEW LINE
06240           LD      (CURLIN),HL
06250           RET                     ; RETURN
06260
06270 IFERR     EQU     $
06280           LD      HL,IFERRM       ; DISPLAY ERROR MSG
06290           CALL    VDLINE
06300           LD      HL,(IFSTAD)
06310           CALL    VDLINE
06320           JP      EXEND           ; EXIT
06330
06340 ;---------------------------------------------------------
06350 ;       GET LABEL ADDRESS
06360 ;       (HL) = -LABEL, A = 1ST CHARACTER (-)
06370 ;       RETURNS HL = LABEL ADDRESS OR CS IF NO LABEL
06380 ;---------------------------------------------------------
06390
06400 GETLAD    EQU     $
06410           CP      '-'             ; HAVE '-' ?
06420           SCF
06430           RET     NZ              ; NO - ERROR
06440           CALL    CNVLAB          ; CONVERT TO BINARY
06450           RET     C               ; EXIT IF ERROR
06460           LD      C,A             ; TABLE OFFSET -> BC
06470           LD      B,0
06480           LD      HL,LABTAB       ; TABLE ADDRESS
06490           ADD     HL,BC           ; LABEL ADDRESS
06500           LD      A,(HL)          ; GET IT
06510           INC     HL
06520           LD      H,(HL)
06530           LD      L,A
06540           OR      H               ; ERROR IF ZERO
06550           SCF
06560           RET     Z
06570           CCF
06580           RET                     ; RETURN
06590
06600 ;---------------------------------------------------------
06610 ;       CONVERT LABEL TO BINARY
06620 ;       (HL) = -LABEL
06630 ;       RETURNS BINARY LABEL*2, CS IF NONE
06640 ;---------------------------------------------------------
06650
06660 CNVLAB    EQU     $
06670           INC     HL              ; POINT TO LABEL LETTER
06680           LD      A,(HL)          ; GET IT
06690           AND     0DFH            ; FORCE UPPERCASE
06700           SUB     'A'             ; MAKE BINARY
```

Listing 1 continued on p. 172

22295 EUCLID AVE. ARCO EUCLID, OHIO 44117

DATA SUPPLIES

WE'RE GETTING BIGGER TO SAVE YOU MORE!

IF ANYTHING BEATS OUR SELECTION, IT'S OUR PRICES!

WE'RE GIVING MAIL ORDER A GOOD NAME . . .

NEC VS. RADIO SHACK

The PC-8200 portable from NEC. We think you should be impressed. More software — 14 FREE programs to start, including linear forecasting and word processing.

NOW ONLY $659

	NEC	Radio Shack	Hewlett-Packard
Price	$799*	$799	$995
RAM/ROM	16K/32K	8K/32K	16K/48K
RAM Expandability (Internal/External)	To 96K (64K/32K)	To 32K (32K/none)	To 24K (24K/none)
Free bundled software	Yes	No	No
Function keys	10	8	0
RAM cartridges	Yes	No	No
Bar Code Reader, RS232, Parallel Port, Cassette Port	Yes	Yes	Not Standard
Floppy Disk and SIO Port, Cursor Cluster	Yes	No	Not Standard

New From SANYO

The MBC 550 Personal Computer

IBM COMPATIBLE

$995

Included As Complete System Package

	SUGG. RET. PRICE
SANYO MBC 550	$995
SECOND DRIVE	$400
MONITOR	$180
GEMINI PRINTER	$200
WORDSTAR	$450
SPELLSTAR	$250
MAILMERGE	$250
CALCSTAR	$250
INFOSTAR	$495
MSDOS	$80
PRINTER CABLE	$60
BOX OF DISKETTES	$45
SUGGESTED RETAIL	$3635

SAVE $2040

COMPLETE SYSTEM PACKAGE

$1595

The Sanyo MBC 550 is a new 16 bit computer that runs much of the same software as the IBM PC. Features include 8088 Microprocessor, 128K RAM expandable to 256K RAM, parallel printer port, graphics capability, game paddle port, 8087 match co-processor port.

OKIDATA 92A

THE MOST ADVANCED DOT MATRIX PRINTER IN ITS PRICE RANGE $439

RITEMAN PERSONAL PRINTER

The first 10" printer $329

Star GEMINI 10X

THE PRICE PERFORMANCE LEADER $289

EPSON FX 80	$599
STAR GEMINI 15	$449
STAR DELTA 10	$549
OKIDATA 82	$349
OKIDATA 93	$899
NEC 8023	$399
NEC 2030	$995
NEC 3530	$1795
BROTHER HR15	$549
BROTHER HR25	$899
COMREX CR1	$599
SILVER REED 500	$549
SILVER REED 550	$799
TOSHIBA 1350	$1699

IBM

SAVE $1000

$3995

IBM PCX with 10 Megabyte C.W.I. Winchester Drive and 128K RAM

THE LEADING EDGE PC

$1995

Complete and ready to work for you — 16 bit system includes 128K standard memory, (upgradable to 640K) dual 5-¼" disk drives, high resolution monochrome monitor, built-in RS-232C serial interface, MSDOS 1.25 operating system, and more. Includes Leading Edge GW basic software.

TOLL FREE 1-800-321-3552

IN OHIO & OTHER INQUIRIES 216 481-4993

To Our Friends,

Thank you for making MICRO DATA SUPPLIES one of the fastest growing computer dealers in the U.S. We pledge to continue offering the most complete selection of computers, peripherals, software and supplies at discount prices — to help you save more . . . and to serve you better.

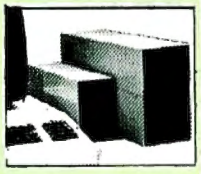
TOLL-FREE NUMBER **1-800-321-3552**

Russ Knotts • President

DISK DRIVES

Complete with Chassis & Power Supply:

Fully assembled silver chassis with external card edge connector for easy cable installation. With MDS 120 days warranty.



BARE DRIVES

*Tandon TM100-1 40 TRK	$169.00
*Tandon TM100-2 40/40 TRK	$239.00
*Tandon TM100-4 80/80	$319.00
TEAC 5 ¼" 55A 40 TRK	$189.00
TEAC 5 ¼" 55B 40/40 TRK	$239.00
OEM Shugart 5 ¼" SA455 40/40 TRK	$219.00
MPI MDL 51 40 TRK	$179.00
MPI MDL 52 40/40 TRK	$239.00
MPI MDL 41 8" 77 TRK Slimline	$399.00
MPI MDL 42 8" 77/77 TRK Slimline	$499.00

FOR COMPLETE DRIVES

Single Full Size 5 ¼" Case & Power Supply	ADD $ 54.00
Dual Thin Line 5 ¼" Case & Power Supply	ADD $ 69.00
Dual Full Size 5 ¼" Case & Power Supply	ADD $ 89.00
Case & Power Supply for 1 Full Size or 2 Thin Line 8" Drives	ADD $189.00

PRINTER BUFFERS

FOR MOST COMPUTERS

QUADRAM MICROFAZER

Parallel to Parallel w/8K	$149.00
Parallel to Serial w/8K	$179.00
Serial to Serial w/8K	$179.00
Serial to Parallel w/8K	$179.00
Each Add'l 8K Upgrade	$ 10.00

All come with pause control and copy feature, and can be upgraded to 512K.

PRACTICAL PERIPHERALS

MBP/EPSON w/16K	$149.00
MBP/EPSON w/32K	$189.00
In-Line Parallel or Serial w/32K	$289.00
In-Line Parallel or Serial w/64K	$339.00

RETURNS: Must have authorization number, obtained at (216) 481-1600. Unauthorized returns will be refused & damaged goods will be refused. All returns subject to 15% restocking fee. No returns after 30 days.

Let Your TRS-80™ Teach You

ASSEMBLY LANGUAGE DISK I/O TECHNIQUES

REMDISK-1	$29.95
REMASSEM-1	$69.95
FOR DISK SYSTEMS	$74.95

LNW
TRS-80 Mod. I Expansion
$349.00

- RS232c serial I/O
- Parallel printer port
- Gold-plated connectors
- Floppy disk controller
- Full 32k 200ns RAM
- Real time clock
- 6 month warranty
- Heavy steel case
- Thousands of users
- Works with any DOS 100%

MODEL I DOUBLE DENSITY PACKAGE

Everything you need to convert your TRS-80 Model I to run double density. Complete with software, hardware and instructions; installs in minutes with no soldering, wiring or cutting.

Dosplus V 3.4 w/LNDOUBLER 5/8 ... $194.00
LNDOUBLER 5/8 Board w/o dos ... $159.00

MODEL III & IV
RS-232 Communication

DIRECT REPLACEMENT FOR RS-232. FULLY TESTED & BURNED IN. EASY INSTALLATION. 120 DAY WARRANTY.

RS-232 ... $ 78.95

SPRINTER Double Your Speed

Speed-up cuts computer operation time in half, saves time and money. Fast 4 MHz Z80B CPU included, installs in 15 minutes with no soldering or cutting.

SPRINTER III for MOD III ... $ 89.95
SPRINTER I for MOD I ... $ 89.95

DISKIT III™

MODEL III & IV DISK UPGRADE

FREE

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
- 1 Hour or Less for Installation
- 100% Compatible
- No Soldering Needed
- 180 Days Warranty on Controller

DISKIT III w/o Drives	$219.00
DISKIT III w/one Tandon 100-1 40 Track Drive	$385.00
DISKIT III w/two Tandon 100-1 40 Track Drive	$555.00
DISKIT III w/two Tandon 100-2 40/40 Dual Drive	$695.00

MEMORY UPGRADE

SPECIAL OFFER

16 K RAM SPECIAL

4116, 20ns. Guaranteed one full year ... $ 17.95

NOW ONLY 11.95 with the purchase of $25. or more! (while supply lasts)

MODEL IV — 64K
MEMORY EXPANSION

GUARANTEED 1 FULL YEAR - SET OF 8

4164 RAM CHIPS ... $ 69.95
w/PAL CHIP to go from 64 to 128K ... $ 84.95

MICRO DATA SUPPLIES

MICRO DATA SUPPLIES

A SUBSIDIARY OF THE COMPUTER WAREHOUSE, INC. OF OHIO

22295 EUCLID AVE. EUCLID, OHIO 44117

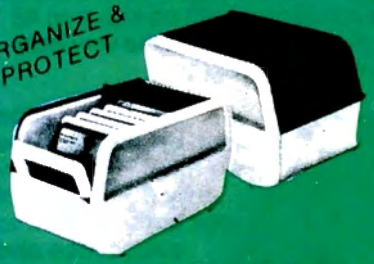
BOOKS

OTHER MYSTERIES

TRS-80 DISK	$19.95
Microsoft Basic Decoded	$24.95
The Custom TRS-80	$24.95
Basic Faster & Better	$25.95
How To Do It On The TRS-80	$24.95
TRSDOS 2.3 Decoded	$24.95
The Custom Apple	$24.95
Machine Language Disk I/O	$25.95
CP/M Primer	$15.95

ELECTRONIC PROTECTION DEVICES

The LEMON - 6-way Surge Suppressor for AC Power Lines (wall outlet)	$44.95
The LIME - same as LEMON w/5 ft. cord and on-off switch	$79.95
The PEACH - 6-way Surge Suppressor, EMI-RFI Line Filter (wall outlet)	$89.95
The ORANGE - same as LIME w/EMI-RFI Filtering PLUM & LIME Combined	$129.95



ROLLTOP 100 Disk File™
Model #RT100

Twice the capacity (100 - 5¼" Disks) of the leading "flip top" file. But it takes no more desk space! An outstanding design that combines contemporary styling with the elegance of a rolltop enclosure and a textured buff plastic body. It includes 10 diskette dividers and anti-skid feet ..... $ 36.00
Locking Model #RT100L ..... $ 46.00

Dotwriter 3.0

Lets you create words and drawings quickly and easily, right on the screen of your TRS-80. "DOTWRITER" uses high-resolution "dot graphics" to create fancy lettersets.

DOTWRITER ..... $ 69.95

DATAGRAPH

Transform your VISI-CALC™ files into high-resolution custom graphs on your TRS-80™ computer and graphics printer. Super 3rd generation printer graphics program.

DATAGRAPH ..... $ 74.95

ULTRA TERM
Version 2

Supports both manual and auto dial modems. Exclusive Ultra Term direct disk file transfer mode, allows unattended operation at the receiving computer. Line printer support with a 1K print buffer. Half & full duplex support. Universal ASCII format file transfer with a 33K buffer and a full featured host program .. $ 49.95

Verbatim DATALIFE™

PREMIUM DISKETTES AT AFFORDABLE PRICES

VERBATIM DATALIFE™ DISKETTES
5¼-inch (box of 10)
MD525-01
1S/DDen

SPECIAL! $23.95

Soft-Sectored Diskettes

5¼" 2S/D Den (MD550-01)	$34.90
5¼" 2S/4 Den (MD557-01)	$49.90
8" 1S/D Den (FD34-8000)	$43.95

*21.95

3M

5¼" 1S/DD/SS — box of 10	$23.95
5¼" 2S/DD/SS — box of 10	$33.95

***With Purchase of 10 Boxes ONLY**

wabash SUPER SALE!

AS LOW AS **$1.39**

5¼" SOFT SECTORS BULK	5¼" SOFT SECTORS BULK
SINGLE SIDE SINGLE DENSITY W/HUB RING	SINGLE SIDE DOUBLE DENSITY W/HUB RING
100% CERTIFIED 1 YR WARRANTY	100% CERTIFIED 1 YR WARRANTY
$1.39*	$1.79*

*Minimum order 20 diskettes
*Quantity discounts - 100 deduct 3%
1000 deduct 5%, 10,000 deduct 10%

MISC.

Avery Tabulabies

5000 - 3½ X 15/16"	$15.95
5¼" File Box for 75 Diskettes	$19.95
LABLMAKER Kit w/ 400 1 up Labels	$29.95
CASSLABEL Kit w/ 200 Casette Labels and 200 1 up Labels	$34.95

NEWDOS/80 Version 2.0

FLOPPY DOCTOR INCLUDED

MOD I or III . . .$119.95

Let your TRS-80™ Test Itself With
THE FLOPPY DOCTOR & MEMORY DIAGNOSTIC
DISK DRIVE & MEMORY DIAGNOSTIC PROGRAM
by David Stambaugh

For MODEL I	$ 24.00
For MODEL III	$ 28.00

LDOS/5.1 ..... $109.95
SMAL-LDOS ..... $ 49.95

ELECTRIC WEBSTER

w/correcting feature	$119.00
Hyphenation feature	$ 39.00
Grammatical feature	$ 39.00
COMPLETE SYSTEM all Four Programs	$189.00

"Cadillac" of Spelling Checkers 80 Micro 9/82

ELECTRIC PENCIL Version II

Disk Version	$79.95
Tape Version	$69.95

NewScript 7.1 . . . $99.95
WITH LABELS $114.95

LeScript

MODEL I, MODEL III, LNW-80 PMC-80, and MAX-80

$104.95

THE HOME ACCOUNTANT

The #1 best selling program for home and small business accounting is now available for TRS-80 Model 3. Handles up to 99 accounts, five checkbooks, multiple income accounts, and can split transactions to any number of accounts. Prints net worth statements, income statements, as well as custom designed reports. Displays a bar chart and trend for any selected category. It is easy to use and yet provides all the power you'll need. (by Continental Software, requires Model 3, 2 drives, 48K.)

..... $ 62.95

PRICES, SPECIFICATIONS & OFFERINGS SUBJECT TO CHANGE WITHOUT NOTICE

MAIL ORDER PRICES ONLY

ADD $3.00 FOR SHIPPING & HANDLING
$6.00 Extra for C.O.D. Orders
Ohio Residents add 6.5% Sales Tax

MOST SCHOOL, GOV'T. AND FORTUNE 1000 CO. P.O.'s ACCEPTED ADD 3% Serv. Chg. Min. order $50

WE ACCEPT
- Visa
- MasterCard
- Checks
- Money Order
- C.O.D.

Call 1-800-321-3552
MONDAY thru SATURDAY
IN OHIO AND OTHER INQUIRIES (216) 481-4993

Quality you expect, at a price you don't.

BECK DOUBLE DENSITY DISKETTES

SINGLE SIDED **$2.19** ea. / **$2.79** ea. DOUBLE SIDED

Our message to you is simple. If you like the quality of Dysan, Verbatim, 3M, et al, you'll like the quality of Beck soft sector, 5¼" flexible diskettes. The only major difference is cost. We're less expensive. In fact, a lot less expensive.

Why does Beck cost less?

Our philosophy is: Excellent quality and reliability, at a cost that beats the jackets off other diskettes. We can do it because we (1) put our money into the product, not mega-marketing schemes and fancy packaging; and (2) sell our money-saving 25-diskette pack to you direct via a toll free order line, so you get fast, door-to-door service efficiently.

When you buy Beck, you've got the best. Beck Quality. Beck Reliability. And, of course, Beck Price.

1D, soft sector 5¼" diskette $2.19 each
2D, soft sector 5¼" diskette $2.79 each

For IBM, Apple, TRS and 97% of popular microcomputers.

What about quality and reliability?

At Beck, our success as a diskette manufacturer depends upon our ability to provide you with a fully reliable, quality diskette – every time. For that reason we take no shortcuts. You get the best because we are committed to excellence. Every diskette is manufactured to very strict quality standards. We test and retest 21 times throughout the manufacturing process to insure compliance with no less than 42 rigid specifications. We make sure you get the very best – a 100% certified, 100% error free diskette.

Our satisfaction money-back guarantee and full 7 year warranty are proof of our commitment to excellence and confidence in our product.

(in New Hampshire call 924-3821)

Door to Door in 48 hrs.

Order Now Toll Free

VISA MasterCard

COD'S CASH ONLY

Corporate Accounts Welcome

1-800-BECK-MFG

Order Toll Free 1-800-232-5634. Available in 25 pack only, plus freight, Complete with hub reinforcing rings, Tyvek envelopes, color coded user labels, and nonmetallic write protect tabs. All Beck Diskettes meet or exceed ANSI specifications.

by John Cominio

APRIL SPOOL

Have your computer do double-duty—this software spooler prints documents while you do other work.

Instead of idly sitting by while your computer directs a printing operation, use my software-based spooler to free up your machine for other tasks. My program temporarily stores all of your text in the disk file and shunts it to the printer as the printer buffer empties. In the meantime, you can copy or run other programs, use your directory, or use your editor/assembler.

My Assembly-language spooler program uses about 1.2K of memory and requires Radio Shack's Editor/Assembler. It runs on a Model I or III with 16K of memory and one disk drive. It automatically boots up on either system.

Spoolers

Spoolers come in two varieties: hardware and software. A hardware spooler contains memory chips that store the data you want to print. While a hardware spooler is efficient, it's also expensive.

A software spooler does the same thing as a hardware spooler, but it uses your computer's internal memory instead of independent memory chips. It reads text, stores it in blocks in disk memory, and sends it in blocks to the printer. The program repeats this process until all your text has been printed.

The Key Box

LOAD 80

Models I and III
16K RAM
Disk Drive
Assembly Language
Editor/Assembler
Printer

Running Spooler

To load Spooler, type in and assemble the code in the Program Listing. If you use NEWDOS, you can execute the program from DOS Ready. If you use TRSDOS, enter either Basic or a program such as the Series 1 Editor/Assembler to activate the program.

To run the program, press the shift/down-arrow and S keys simultaneously (control-S). The program displays the prompt:

FILESPEC ⟶

Enter a file name. The program saves your spooled text under the file name you specify. If an error occurs during disk input/output (I/O), the program displays the appropriate error message.

Once you enter a file name, Spooler sends data destined for the printer to your disk file. This includes data sent using the commands LPRINT, LLIST, NEWDOS's JKL, Print from DOS, or any print routine that uses the ROM LPRINT driver. The program doesn't operate with any program that has its own printer I/O (such as Scripsit).

Spooler lets you break out of an LPRINT command on your Model I. If you try to send data to the printer while it's off line, hitting the break key aborts the program. The Model III aborts automatically under the same circumstances.

Program Operations

The program breaks down into two stages: spooling to memory and despooling to the printer. While the spooling portion of the program stores data you want to print in memory, the despooler sends data from memory to the printer.

To send your file to the printer (despool), press the shift/down-arrow and the D keys simultaneously (control-D). This closes the file and activates the despooler.

When the program finishes despooling the file, it kills the file to free up disk space and prepares to spool another file. If you dump to the printer while the program is running, the despooler pauses while your dump prints out, and then it reactivates.

You can locate Spooler anywhere in memory, as long as you reassemble it at the new location, but you should keep it as high in memory as possible. This leaves more memory for other tasks. The locations I selected leave room for other programs you might need to put in high memory.

Line Description

The program first reserves memory for its own use. Lines 2200–2800 reserve space for variables. Line 2900 reserves 256 bytes for the DOS. Line 2900 provides extra space for the DOS when your computer reads or writes anything to your disk drive.

Line 3000 reserves 256 bytes for the program's text buffer. Rather than constantly reading data off the disk, the program reads and stores it in 256-byte sections. The program prints the section, and then reads in another section until it prints the last section.

Line 3100 reserves 50 bytes for the DOS to open and close files.

To determine whether the program is running on a Model I or III, line 3200 reads memory location 0202 hexadecimal (hex) from ROM. When the location contains the value 28 hex, the program identifies the system as a Model III and saves the value of zero in that memory location. When the location

Program Listing. Listing for the spooling program.

```
                00100 ;****************************************
                00200 ;*** SPOOLER
                00300 ;*** BY: John Cominio
                00400 ;*** May 3, 1982
                00500 ;***
                00600 ;*** CONTROL "S" TO SPOOL
                00700 ;*** CONTROL "D" TO DESPOOL
                00800 ;*** NOTE: CONTROL IS "SHIFT DOWN-ARROW"
                00900 ;***
                01000 ;*** CHANGE LINE 2100 FOR YOUR SYSTEM
                01100 ;***          48 k MEMORY = 0FB00 HEX
                01200 ;***          32 K MEMORY = 0BB00 HEX
                01300 ;***          16 K MEMORY = 07B00 HEX
                01400 ;***
                01500 ;*** MODEL I AND III COMPATIBLE
                01600 ;****************************************
37E8            01700 PROUT   EQU   37E8H          ;L.P. PORT
4016            01800 KBINTR  EQU   4016H          ;K.B. ADDRESS
4026            01900 PRINTR  EQU   4026H          ;L.P. ADDRESS
0040            02000 INPUT   EQU   40H            ;ROM LINEINPUT CALL
FB00            02100         ORG   0FB00H         ;CHANGE FOR YOUR SYSTEM
0002            02200 FLAG    DEFS  2              ;RESERVE TWO BYTES
0002            02300 FLAG1   DEFS  2              ;FOR STATUS FLAGS
0002            02400 FLAG2   DEFS  2
0002            02500 FLAG3   DEFS  2
0002            02600 COUNT   DEFS  2
0002            02700 DATA    DEFS  2
0002            02800 MODEL   DEFS  2              ;MODEL I OR III
0100            02900 DOSBUF  DEFS  256            ;256 BYTE DOS I/O BUFFER
0100            03000 BUFFER  DEFS  256            ;256 BYTE SPOOL BUFFER
0032            03100 NAME    DEFS  50             ;50 BYTES-FILE CTRL BLOCK
FD40 3A0202     03200 START   LD    A,(0202H)      ;TEST FOR MODEL I OR III
FD43 FE28       03300         CP    '('
FD45 2807       03400         JR    Z,MOD3
FD47 3E01       03500         LD    A,1
FD49 320CFB     03600         LD    (MODEL),A      ;MODEL I
FD4C 1804       03700         JR    TSDONE
FD4E AF         03800 MOD3    XOR   A
FD4F 320CFB     03900         LD    (MODEL),A      ;MODEL III
FD52 21FEFA     04000 TSDONE  LD    HL,FLAG-2      ;SET DOS'S HIMEM POINTER
FD55 3A0CFB     04100         LD    A,(MODEL)
FD58 FE01       04200         CP    1
FD5A 2005       04300         JR    NZ,OTHER       ;DETERMINE MOD I OR III
FD5C 224940     04400         LD    (4049H),HL     ;SET FOR MOD I
FD5F 1803       04500         JR    TST1
FD61 221144     04600 OTHER   LD    (4411H),HL     ;MODEL III
FD64 CD74FF     04700 TST1    CALL  CLBUFF         ;CLEAR BUFFER
FD67 210000     04800         LD    HL,0           ;ZERO STATUS FLAGS
FD6A 2200FB     04900         LD    (FLAG),HL
FD6D 2202FB     05000         LD    (FLAG1),HL
FD70 2204FB     05100         LD    (FLAG2),HL
FD73 2206FB     05200         LD    (FLAG3),HL
FD76 220AFB     05300         LD    (DATA),HL
FD79 3EFF       05400         LD    A,255
FD7B 3208FB     05500         LD    (COUNT),A
FD7E 2A1640     05600         LD    HL,(KBINTR)    ;INTERCEPT KEYBOARD
FD81 2294FD     05700         LD    (KBOARD+1),HL  ;PATCH IN ROUTINE
FD84 2193FD     05800         LD    HL,KBOARD
FD87 221640     05900         LD    (KBINTR),HL
FD8A 21D2FD     06000         LD    HL,PRINT       ;INTERCEPT PRINTER
FD8D 222640     06100         LD    (PRINTR),HL    ;AND PATCH
FD90 C32D40     06200         JP    402DH          ;RETURN TO DOS
FD93 CD0000     06300 KBOARD  CALL  $-$            ;KEYBOARD INTERCEPT
FD96 D9         06400         EXX                  ;EXCHANGE REGISTERS
FD97 08         06500         EX    AF,AF'         ;DON'T FORGET AF
FD98 CD8AFE     06600         CALL  DSPOO1         ;CHECK SPOOL STATUS
FD9B CDC9FE     06700         CALL  DSPOO2         ;SEND TO PRINTER
FD9E CD29FF     06800         CALL  DSPOO3         ;SEND LAST 255 BYTES
FDA1 3A02FB     06900         LD    A,(FLAG1)      ;DON'T SCAN IF DESPOOLING
FDA4 FE01       07000         CP    1
FDA6 2827       07100         JR    Z,RETURN
FDA8 3A8038     07200 OVERIT  LD    A,(3880H)      ;TEST "SHIFT" & DOWN
FDAB CB47       07300         BIT   0,A            ;ARROW KEYS
FDAD 2820       07400         JR    Z,RETURN       ;RETURN IF NOT PRESSED
FDAF 3A4038     07500         LD    A,(3840H)
FDB2 CB67       07600         BIT   4,A
FDB4 2819       07700         JR    Z,RETURN       ;RETURN IF NOT DOWN ARR.
FDB6 3A00FB     07800         LD    A,(FLAG)       ;TEST SPOOL OR DESPOOL
FDB9 FE01       07900         CP    1
FDBB 280A       08000         JR    Z,SKIPIT
FDBD 3A0438     08100         LD    A,(3804H)      ;TEST "S" KEY
FDC0 CB5F       08200         BIT   3,A
FDC2 C404FE     08300         CALL  NZ,SPOOL       ;SPOOL IF PRESSED
FDC5 1808       08400         JR    RETURN
FDC7 3A0138     08500 SKIPIT  LD    A,(3801H)      ;TEST "D" KEY
FDCA CB67       08600         BIT   4,A
FDCC C471FE     08700         CALL  NZ,DSPOOL      ;DESPOOL IF PRESSED
FDCF D9         08800 RETURN  EXX                  ;RESTORE REGISTERS
FDD0 08         08900         EX    AF,AF'
FDD1 C9         09000         RET
FDD2 3A00FB     09100 PRINT   LD    A,(FLAG)       ;SEND TO DISK IF SPOOL
FDD5 FE01       09200         CP    1              ;IS ON
FDD7 281A       09300         JR    Z,SAVEIT
FDD9 CD21FF     09400         CALL  PRTEST         ;ELSE TEST PRINTER
FDDC 2803       09500         JR    Z,SKIP         ;STATUS
FDDE CD13FF     09600         CALL  OFFLNE         ;GOTO BASIC IF "BREAK"
FDE1 3A0CFB     09700 SKIP    LD    A,(MODEL)      ;MOD I OR III
FDE4 FE01       09800         CP    1
FDE6 2005       09900         JR    NZ,MODIII      ;GO IF MOD III
FDE8 CD8D05     10000         CALL  058DH          ;MOD I ADDRESS
FDEB 1803       10100         JR    TST2
FDED CDC203     10200 MODIII  CALL  03C2H           ;MOD III ADDRESS
```

Listing continued

does not contain the value 28 hex, the program writes a 1 to that location.

Lines 4000–4600 set the DOS's high-memory pointer so the DOS won't write over the program.

Line 4700 clears the spooler buffer by filling it with zeros. This ensures that the program doesn't print any erroneous data. Lines 4800–5500 initialize the program variables.

Lines 5600–5900 route the ROM's keyboard driver to the program. This lets you check for keyboard input such as control-S and control-D. Lines 6000–6100 route the ROM's printer driver to the program, letting you send data to disk that would normally go to the printer. The program then exits to DOS in line 6200.

The keyboard interrupt routine comprises lines 6300–9000. Line 6300 contains the address of the normal ROM keyboard scan routine after you run the program. Lines 6400–6500 swap the normal and alternate register sets so that the normal registers are unaltered when the spooler returns to the interrupted program.

The program then calls a routine that determines if the program needs to read data from disk, and calls again to send data to the printer if the spooler is on. The program then calls to determine if the spooler should be turned off.

Lines 6900–8700 check for control-S or control-D. If you've pressed either command, the program branches to the appropriate section. Line 8800 restores the registers and returns to whatever the program interrupted.

The next routine (lines 9100–11000) interrupts the LPRINT routine and sends the data either to disk or to the printer. When it sends data to a disk, the program jumps to line 10400 to write that byte to disk. The program jumps to line 9400 when it sends data to the printer.

The PRTEST routine lets you break out of LPRINT. When the printer goes off line, the program loops until you put the computer on line again, and then continues printing. When you hit the break key, the program jumps to 06CC hex and exits to Basic.

Control-S sends the program to the routine at line 11100. This sets a flag indicating that the spooler is on so you won't accidentally spool two files at the same time.

Lines 11300–11400 print the filespec prompt. Lines 11500–11700 let you enter up to 23 characters for the file name. Lines 11800–12100 create the file. After creating the file, the program returns to the caller.

Lines 13000–13900 print whatever error might have occurred. The program sets bits 6 and 7 in the A register so it can display the error name instead of the error number.

Lines 14000–15200 kill the file when the program finishes despooling. Once the despooler runs out of data, it reads an end-of-file error (error 28), kills the file, and despools the last segment of data to the printer.

Control-D sends the program to the routine at line 15300. This routine sets the variables and tells the computer it's ready to despool to the printer. It also closes and reopens the file each time the program reads the data so the despooler reads the file from the beginning.

Lines 16300–18700 transfer data from the disk to the text buffer. When despool is not active, lines 16300–16500 return the program to the caller. Lines 16600–16800 return the program to the caller when the program has read all the data from disk.

Once the program passes these two checks, it clears the text buffer (line 16900) and reads the data from the disk into the buffer (lines 17000–18000). When the program has read all the data, it sets variables that tell the computer not to read more data and returns to the caller.

Printer Routines

Lines 18800–20800 do the despooling. This routine tests to see if the program is ready to despool and, if so, computes the address for the data you want to print and puts it into register A. If the program is not ready to despool, the routine returns to the caller.

Line 20900 saves the character you want printed and makes sure the printer is ready to receive data. It then sends that character to the printer and returns to the program. That's the key to the despooler.

The standard LPRINT routine hangs up if it senses that the printer is not ready to receive data, making your computer unusable. Spooler keeps trying to send the same character to the printer until the printer is ready. When the printer isn't ready, program control returns to you so you can use your computer for other tasks. By constantly trying to send data, the computer appears to do two tasks at the same time.

Lines 22900–23200 check the printer's status. If the printer is on line and ready, the program sets the Z flag.

The last major routine (lines 24900–25200) sends out the last 256-byte chunk of data to the printer. Once the program has reached the end of the data and kills

Listing continued

```
FDF0 C3C8FE   10300 TST2    JP      GOHOME
FDF3 210EFB   10400 SAVEIT  LD      HL,DOSBUF       ;DOS'S I/O BUFFER
FDF6 110EFD   10500         LD      DE,NAME         ;FILESPEC
FDF9 0600     10600         LD      B,00H           ;LOGICAL REC LENGTH = 256
FDFB 79       10700         LD      A,C             ;GET CHAR. TO BE PRINTED
FDFC CD1B00   10800         CALL    1BH             ;SAVE TO DISK FILE
FDFF 2035     10900         JR      NZ,DOSERR       ;GO IF I/O ERROR
FE01 C3C8FE   11000         JP      GOHOME          ;RETURN
FE04 3E01     11100 SPOOL   LD      A,1             ;SPOOL STATUS = "ON"
FE06 3200FB   11200         LD      (FLAG),A
FE09 218CFF   11300         LD      HL,MSG1         ;DISPLAY "Filespec" MSG
FE0C CD82FF   11400         CALL    PMSG
FE0F 0617     11500         LD      B,23            ;MAX FILESPEC LENGTH
FE11 210EFD   11600         LD      HL,NAME         ;SAVE NAME HERE
FE14 CD4000   11700         CALL    INPUT           ;GET FILESPEC
FE17 0600     11800         LD      B,00H           ;LRL = 256 BYTES
FE19 210EFB   11900         LD      HL,DOSBUF       ;256 BYTE DOS BUFFER
FE1C 110EFD   12000         LD      DE,NAME         ;FILESPEC
FE1F CD2044   12100         CALL    4420H           ;OPEN FILE
FE22 2012     12200         JR      NZ,DOSERR       ;DISPLAY ERROR IF ANY
FE24 110EFD   12300         LD      DE,NAME         ;FILESPEC
FE27 3E00     12400         LD      A,00            ;INITIALIZE FILE
FE29 CD1B00   12500         CALL    1BH             ;WRITE TO DISK FILE
FE2C 3E0E     12600         LD      A,0EH           ;TURN CURSOR ON
FE2E CD3300   12700         CALL    33H
FE31 C3C8FE   12800         JP      GOHOME
FE34 DDE1     12900 DSERR   POP     IX              ;RESTORE IX
FE36 FE1C     13000 DOSERR  CP      28              ;TEST FOR END-OF-FILE
FE38 2813     13100         JR      Z,EOF           ;GO IF EOF ERROR EXISTS
FE3A CBFF     13200         SET     7,A             ;SET DISPLAY ERROR MODE
FE3C CBF7     13300         SET     6,A             ;SET MODEL III ERROR MODE
FE3E CD0944   13400         CALL    4409H           ;DISPLAY ERROR MESSAGE
FE41 AF       13500         XOR     A               ;SPOOL STATUS = "OFF"
FE42 3200FB   13600         LD      (FLAG),A
FE45 3E0E     13700         LD      A,0EH           ;TURN CURSOR ON
FE47 CD3300   13800         CALL    33H
FE4A C3C8FE   13900         JP      GOHOME
FE4D 0600     14000 EOF     LD      B,00            ;LRL=256
FE4F 110EFD   14100         LD      DE,NAME         ;FILENAME
FE52 210EFB   14200         LD      HL,DOSBUF       ;DOS BUFFER
FE55 CD2C44   14300         CALL    442CH           ;CLOSE AND KILL FILE
FE58 210000   14400         LD      HL,0            ;RESET FLAGS
FE5B 2202FB   14500         LD      (FLAG1),HL
FE5E 2204FB   14600         LD      (FLAG2),HL
FE61 220AFB   14700         LD      (DATA),HL
FE64 3E01     14800         LD      A,1
FE66 3206FB   14900         LD      (FLAG3),A
FE69 3EFF     15000         LD      A,255
FE6B 3208FB   15100         LD      (COUNT),A
FE6E C3C8FE   15200         JP      GOHOME
FE71 AF       15300 DSPOOL  XOR     A               ;SPOOL STATUS = "OFF"
FE72 3200FB   15400         LD      (FLAG),A
FE75 3E01     15500         LD      A,1             ;DESPOOL STATUS = "ON"
FE77 3202FB   15600         LD      (FLAG1),A
FE7A 110EFD   15700         LD      DE,NAME         ;FILESPEC
FE7D 210EFB   15800         LD      HL,DOSBUF       ;DOS I/O BUFFER
FE80 0600     15900         LD      B,00            ;LRL=256
FE82 CD2844   16000         CALL    4428H           ;CLOSE FILE
FE85 CD2444   16100         CALL    4424H           ;OPEN FILE
FE88 183E     16200         JR      GOHOME
FE8A 3A02FB   16300 DSPOOL  LD      A,(FLAG1)       ;TEST SPOOL FLAG
FE8D FE00     16400         CP      0
FE8F 2837     16500         JR      Z,GOHOME        ;RETURN IF SPOOL IS OFF
FE91 3A04FB   16600         LD      A,(FLAG2)       ;RETURN IF DATA DOESN'T
FE94 FE01     16700         CP      1               ;NEED TO BE READ FROM
FE96 2830     16800         JR      Z,GOHOME        ;DISK
FE98 CD74FF   16900         CALL    CLBUFF          ;CLEAR BUFFER
FE9B 06FF     17000         LD      B,255           ;# BYTES TO READ
FE9D 110EFD   17100         LD      DE,NAME         ;FILESPEC
FEA0 210EFB   17200         LD      HL,DOSBUF       ;DOS BUFFER
FEA3 DDE5     17300         PUSH    IX              ;SAVE IX
FEA5 DD210EFC 17400         LD      IX,BUFFER       ;STORE READ DATA
FEA9 CD1300   17500 RLOOP   CALL    13H             ;READ BYTE INTO "A"
FEAC C234FE   17600         JP      NZ,DSERR        ;GO IF I/O ERROR
FEAF DD7700   17700         LD      (IX),A          ;SAVE BYTE IN BUFFER
FEB2 DD23     17800         INC     IX              ;INC BUFFER POINTER
FEB4 10F3     17900         DJNZ    RLOOP           ;LOOP UNTIL DONE
FEB6 DDE1     18000         POP     IX              ;RESTORE IX
FEB8 3E01     18100         LD      A,1
FEBA 3204FB   18200         LD      (FLAG2),A       ;REMEBER - DATA WAS READ
FEBD 210000   18300         LD      HL,0            ;RESET BUFFER POINTER
FEC0 220AFB   18400         LD      (DATA),HL
FEC3 3EFF     18500         LD      A,255
FEC5 3208FB   18600         LD      (COUNT),A
FEC8 C9       18700 GOHOME  RET
FEC9 3A04FB   18800 DSPOO2  LD      A,(FLAG2)       ;SEND TO PRINTER IF READY
FECC FE00     18900         CP      0
FECE 28F8     19000         JR      Z,GOHOME        ;RETURN IF NOT READY
FED0 2A0AFB   19100         LD      HL,(DATA)       ;OFFSET INTO BUFFER
FED3 110EFC   19200         LD      DE,BUFFER       ;LOC. OF STORED DATA
FED6 19       19300         ADD     HL,DE           ;COMPUTE ACTUAL LOC.
FED7 7E       19400         LD      A,(HL)          ;GET STORED DATA
FED8 181E     19500         JR      OUTPR           ;SEND TO PRINTER
FEDA 210AFB   19600 MORE    LD      HL,DATA         ;INCREMENT OFFSET POINTER
FEDD 34       19700         INC     (HL)
FEDE 3A08FB   19800         LD      A,(COUNT)       ;DECREMENT NUMBER OF
FEE1 3D       19900         DEC     A               ;BYTES TO PRINT
FEE2 3208FB   20000         LD      (COUNT),A
FEE5 FE00     20100         CP      0               ;GET DATA FROM DISK
FEE7 2802     20200         JR      Z,GETDAT        ;IF NEEDED
FEE9 18DD     20300         JR      GOHOME          ;ELSE RETURN
FEEB 210000   20400 GETDAT  LD      HL,0            ;GET DISK DATA = "YES"
FEEE 2204FB   20500         LD      (FLAG2),HL
FEF1 3E01     20600         LD      A,1
FEF3 3202FB   20700         LD      (FLAG1),A
```

Listing continued

SATURN Electronics Company Inc.

SATURN QUALITY PRODUCTS WITH DOWN TO EARTH PRICES

MOD 4 16K	$ 890
MOD 4 64K	$ 990
MOD 4 128K	$ 1090
MOD 4 64K 1 Drive, RS232	$ 1590
MOD 4 64K 2 Drive, RS232	$ 1740
MOD 4 128K 1 Drive, RS232	$ 1690
MOD 4 128K 2 Drive, RS232	$ 1840
20 Meg Hard Drive, complete	$ 3890

UPGRADE YOUR MOD 4 WITH SATURN'S HIGH QUALITY UPGRADE KITS

•KIT #1
Disk controller board
RS232 board, cables, brackets.
Connectors, Sound board and instructions,
includes all hardware ..... $ 400

•KIT #1 + One Drive	$ 500
•KIT #1 + Two Drives	$ 600
•HAYES Smartmodems 300/1200	$ CALL
•Gemini 10X Printer	$ 285
•Delta 10 Printer (160 cps)	$ 520
•MBS (The best business software package ever!!)	$ 250

All types of cables made up to order. Bare Disk drives are also available. Call for our FAST Upgrade services. Everything we sell is guaranteed or your money back.

Dealer Pricing available, call or write. Look in HOT COCO for all our Color computer products. If you don't see what you're looking for call us.

AVAILABLE FROM:

Saturn Electronics Inc.
62 Commerce Drive
Farmingdale, NY 11735
(516) 249-3388

277

Listing continued

```
FEF6 18D0      20800          JR      GOHOME          ;RETURN
FEF8 F5        20900 OUTPR    PUSH    AF              ;SAVE CHR TO BE PRINTED
FEF9 CD21FF    21000          CALL    PRTEST          ;TEST PRINTER STATUS
FEFC 2012      21100          JR      NZ,NOTYET       ;GO IF NOT READY
FEFE 3A0CFB    21200          LD      A,(MODEL)       ; I OR III
FF01 FE01      21300          CP      1
FF03 2006      21400          JR      NZ,MODL3        ;GO IF III
FF05 F1        21500          POP     AF              ;RESTORE CHAR
FF06 32E837    21600          LD      (PROUT),A       ;MOD I LPRINT
FF09 18CF      21700          JR      MORE            ;CONTINUE
FF0B F1        21800 MODL3    POP     AF              ;RESTORE CHAR
FF0C D3F8      21900          OUT     (0F8H),A        ;MOD III LPRINT
FF0E 18CA      22000          JR      MORE            ;CONTNIUE
FF10 F1        22100 NOTYET   POP     AF              ;RESTORE STACK
FF11 18B5      22200          JR      GOHOME          ;RETURN
FF13 CD21FF    22300 OFFLNE   CALL    PRTEST          ;CHECK PRINTER STATUS
FF16 C8        22400          RET     Z               ;RETURN IF ON-LINE
FF17 3A4038    22500          LD      A,(3840H)       ;ELSE TEST "BREAK" KEY
FF1A CB57      22600          BIT     2,A
FF1C 28F5      22700          JR      Z,OFFLNE        ;LOOP IF NOT PRESSED
FF1E C3CC06    22800          JP      06CCH           ;ELSE RETURN TO BASIC
FF21 3AE837    22900 PRTEST   LD      A,(PROUT)       ;READ PRINTER STATUS
FF24 E6F0      23000          AND     0F0H            ;FLAG "Z" SET IF ON-LINE
FF26 FE30      23100          CP      30H             ;FLAG Z NOT SET OFF-LINE
FF28 C9        23200          RET
FF29 3A06FB    23300 DSPOO3   LD      A,(FLAG3)       ;TEST IF ALMOST DONE
FF2C FE00      23400          CP      0
FF2E 2898      23500          JR      Z,GOHOME        ;RETURN IF NOT
FF30 2A0AFB    23600          LD      HL,(DATA)       ;OFFSET POINTER
FF33 110EFC    23700          LD      DE,BUFFER       ;STORED DATA
FF36 19        23800          ADD     HL,DE           ;COMPUTE OFFSET
FF37 7E        23900          LD      A,(HL)          ;GET CHARACTER
FF38 181E      24000          JR      OUTPR1          ;SEND TO PRINTER
FF3A 210AFB    24100 MORE1    LD      HL,DATA         ;BUMP OFFSET POINTER
FF3D 34        24200          INC     (HL)
FF3E 3A08FB    24300          LD      A,(COUNT)       ;DECREMENT NUMBER OF
FF41 3D        24400          DEC     A               ;BYTES LEFT TO PRINT
FF42 3208FB    24500          LD      (COUNT),A
FF45 FE00      24600          CP      0
FF47 2803      24700          JR      Z,FINISH        ;GO IF ALL DONE
FF49 C3C8FE    24800          JP      GOHOME          ;ELSE RETURN
FF4C 210000    24900 FINISH   LD      HL,0            ;RESET POINTERS
FF4F 2202FB    25000          LD      (FLAG1),HL
FF52 2206FB    25100          LD      (FLAG3),HL
FF55 C3C8FE    25200          JP      GOHOME
FF58 F5        25300 OUTPR1   PUSH    AF              ;SAVE CHARACTER
FF59 CD21FF    25400          CALL    PRTEST          ;TEST PRINTER STATUS
FF5C 2012      25500          JR      NZ,NONSND       ;GO IF OFF-LINE
FF5E 3A0CFB    25600          LD      A,(MODEL)       ;MOD I OR III
FF61 FE01      25700          CP      1
FF63 2006      25800          JR      NZ,NOTM1        ;GO IF NOT MOD I
FF65 F1        25900          POP     AF              ;RESTORE CHAR
FF66 32E837    26000          LD      (PROUT),A       ;MOD I LPRINT
FF69 18CF      26100          JR      MORE1           ;CONTINUE
FF6B F1        26200 NOTM1    POP     AF              ;RESTORE CHAR
FF6C D3F8      26300          OUT     (0F8H),A        ;MOD III LPRINT
FF6E 18CA      26400          JR      MORE1           ;CONTINUE
FF70 F1        26500 NONSND   POP     AF              ;RESTORE STACK
FF71 C3C8FE    26600          JP      GOHOME          ;RETURN
FF74 210EFC    26700 CLBUFF   LD      HL,BUFFER       ;SET BUFFERS CONTENTS
FF77 110FFC    26800          LD      DE,BUFFER+1     ;TO ZERO
FF7A 01FF00    26900          LD      BC.255
FF7D 3600      27000          LD      (HL),0
FF7F EDB0      27100          LDIR
FF81 C9        27200          RET                     ;RETURN
FF82 7E        27300 PMSG     LD      A,(HL)          ;HL POINTS TO TEXT
FF83 CD3300    27400          CALL    33H             ;PRINT ON SCREEN
FF86 23        27500          INC     HL              ;INCREMENT TEXT POINTER
FF87 FE00      27600          CP      00H             ;TEST FOR END OF MSG
FF89 20F7      27700          JR      NZ,PMSG ;LOOP UNTIL DONE
FF8B C9        27800          RET                     ;AND RETURN
FF8C 46        27900 MSG1     DEFM    'Filespec --> '
FF99 00        28000          DEFB    00H             ;END OF MESSAGE
FD40           28100          END     START           ;START AT "START"
00000 TOTAL ERRORS
```

the file, this routine prints the last 256 bytes in the text buffer. It also despools the data, resets some variables, and returns control to you.

The routine in lines 26700–27200 clears the text buffer contents to zero. If you try to output a character code zero (null character), nothing prints. Since the last buffer read might not contain the full 256 bytes of text, the zeros fill in the extra space.

The routine in lines 27300–27800 prints a message that HL points to at the current cursor position. The message terminates with character code zero to signal the end of the message.

Since the spooler is linked to the keyboard driver routine, it only prints when Basic scans the keyboard. Under certain conditions, however (such as under heavy computation), the program might appear to slow down. This is because Basic does not scan the keyboard as often when it is computing.

I could have used the internal clock to despool, but certain programs might shut it off. Since Basic scans the keyboard constantly, I find this the best alternative. ■

You can reach John Cominio at 626 Tortoise Way, Satellite Beach, FL 32937.

The Next Generation:

SUPERLOG

ADVANCED ELECTRONIC NOTEBOOK

BY **KSoft**

Over the past two years, LOG Electronic Notebook has quietly been creating a revolution in personal information management. Designed to emulate a familiar pencil and notebook, LOG Electronic Notebook can do for random information what a spreadsheet program does for numbers.

Now, even the best has been improved! KSoft is pleased to announce SUPERLOG, the next generation of the LOG family. SUPERLOG is not a patch! It is a totally rewritten version of the original LOG concept, fully compatible with the LDOS 5.1.3 operating system currently endorsed by Tandy.

SUPERLOG retains all of the versatile features of LOG while adding many new options requested by professional users: Floppy or Hard disk. Any number of LOG files per diskette. 1 to 32767 pages per file. Password protection and error checking. New text editing commands include automatic text Wrap-Around, Expand and Delete for entire lines, a Page Copy command, and an Undo key to reverse editing changes. Cursor motion is more flexible with new key commands plus a Forms simulator. The SEARCH function is greatly enhanced with a Wild-Card character, case-independent search, and multiple word search at 10 pages/second.

Also Note: SUPERLOG is now fully interrupt activated; it may be accessed from practically any foreground task including LDOS Utilities, LBASIC, LSCRIPT, EDAS, etc. with non-destructive return to the foreground program. No other information management program is this versatile!

Write or call Today! We'll be glad to tell you about SUPERLOG and what it can do for you!

SUPERLOG Specify Model I or III. $119.95
LDOS 5.1.3, 48K, and 2 Drives required.

(Model IV version to be offered soon.)

LOG TRSDOS versions, Models I, III still available.

KSoft (601) 992-2239

318 Lakeside Drive
Brandon, MS 39042

Mastercard and Visa accepted.
Add $5.00 for shipping and handling.

(TRSDOS is a trademark of Tandy Corporation)
(LDOS is a trademark of Logical Systems Inc.)

↙331

CONVERT MOD III BASIC TO MOD 4

Good News! The Model 4 is twice as fast as the Model III.

Bad News! Model III disk BASIC programs only run at half speed on the Model 4.

Best News! **"CONV3TO4"** will automate many of the changes required to convert Model III BASIC programs to Model 4 BASIC. Your Model III BASIC programs will run twice as fast as they do now, and your manual conversion efforts will be vastly reduced.

In minutes this powerful utility can insert all required spaces, recalculate PRINT@ addresses, adjust TAB ( ) addresses, insert correct exponentiation symbols, and flag and list unresolved line numbers.

Other options enable your programs to run even faster - remove REM's, comments, down arrows, and unnecessary spaces.

Or, format your programs and make them easier to read and debug - insert down arrows and indent between multiple instructions, IF, THEN, and ELSE statements.

I agree. It's foolish to run my Model III disk BASIC programs at half speed on the Model 4. Send me **"CONV3TO4"** today. Enclosed is my check/money order for $49.95 plus $2.00 for shipping/handling (NJ res. add 6% sales tax)

NAME: _____

_____

STREET: _____

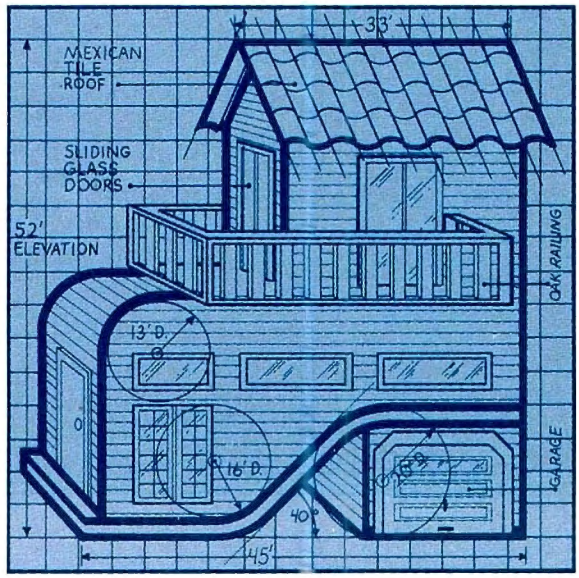
CITY: _____ STATE _____ ZIP _____

EDUCATIONAL MICRO SYSTEMS, INC.
P.O. Box 471, Chester, New Jersey 07930
201-879-5662

Dealer Inquiries Invited

↙85

WE COULD SHOW THE OLD WOMAN WHAT TO DO WITH THE SHOE.



INVESTOR III™ makes rhyme and reason out of real estate investing.

Now you can maximize your real estate profits and avoid questionable ventures with the help of Investor III™.

Investor III™ was conceived and developed by a real estate company. So it's practical and comprehensive. Ready to meet the needs of the average investor or professional user with capabilities like pro-forma, "what-if" analysis, cash flow before and after taxes, depreciation and more.

Yet Investor III™ is as simple as Mother Goose — you can learn to use it in less than one hour.

So whether you're looking at a multi-million-dollar high rise or a cozy rent house with some unique qualities, Investor III™ can help you determine the wisdom — and profitability — of your choice.

Write or call for more details today. Investor III™... for investments that fit. And that's no fairy tale.

Good Software is proud to announce an easy-to-use amortization package — the Amortizer III™.

GOOD SOFTWARE CORP.

A Division of The Goodman Group, Inc.
12900 Preston Rd., Dallas, Texas 75230 (214) 239-6085
Compatible with Radio Shack TRS-80 and IBM PC.
Investor III™: $249.00 plus $5 shipping and handling.
Amortizer III™: $49.95 plus $5 shipping and handling.
American Express, MasterCard and Visa accepted.
Dealer inquiries invited.

Making dollars and sense out of information.

↙496

↙ See List of Advertisers on Page 227

Part II of 80's arcade hunt for alien insects.

Editor's note: "Bugs from Outer Space" is a six-part tutorial on writing machine-language games for the Models I and III. Each installment represents a self-contained component (or components) of the final game. The first installment appeared in March 1984 and the last will appear in August's annual games issue.

Some last-minute improvements in the main program left March's and this month's listings (MAIN1 and MAIN2) without an execution address, causing a system reboot at startup. To fix this bug, change line 02570 from END to END (tab) ENTRY.

(All photos by Suzanne Torsheya.)

The Key Box LOAD 80

Models I and III
16K RAM
Assembly Language
Editor/Assembler

While you've been admiring the introductory and title screens (March 1984, p. 82), the deadly bugs from outer space have been getting closer. You'd better add two more modules to your machine-language arcade game: displaying the score and building your mobile laser base.

Knowing the Score

The first subroutine in Program Listing 1 (TEXT2A) displays the current score and the record high score. The game stores both scores in binary coded decimal (BCD) format, where each byte contains two decimal digits; the score display routine shows the value the HL register points to at the video location to which DE points. The value appears as 3 BCD bytes, allowing six-figure scores.

The subroutine that increments the score (INCSCR) adds the BCD values indicated by DE and HL. The program stores the current score and the high score in 4 bytes, the last of which stores any under- or overflow from the INCSCR subroutine.

Listing 1 also contains a number of important tables, used mostly by routines in later versions of the game. The Base table stores the location of the game's mobile laser base, and the Bombs table stores the locations of the bugs' artillery. BUG1, BUG2, and BUG3 are tables that store the locations and direction codes for the bugs themselves.

Another table, INIT, contains the initial values for PARAMS, itself a table that stores several 1-byte parameters that various parts of the program use. The main program moves the INIT values to PARAMS before each game, and initializes IX to point to the PARAMS table. This lets the program address any byte within the table as an offset from the IX pointer.

Moving and Shooting

MBASE, the first routine in Program Listing 2 (TEXT2B), moves your laser base left and right. Two bytes in the parameter table control how often the program actually executes the routine.

One of the bytes is set by a counter (labeled One in the program) whose value the program decrements each time it calls MBASE. If the counter holds a number other than zero, the game returns to the main program; if it stores a zero, the program resets the counter to a constant value—this is the second byte in the parameter table that controls how often the program executes MBASE.

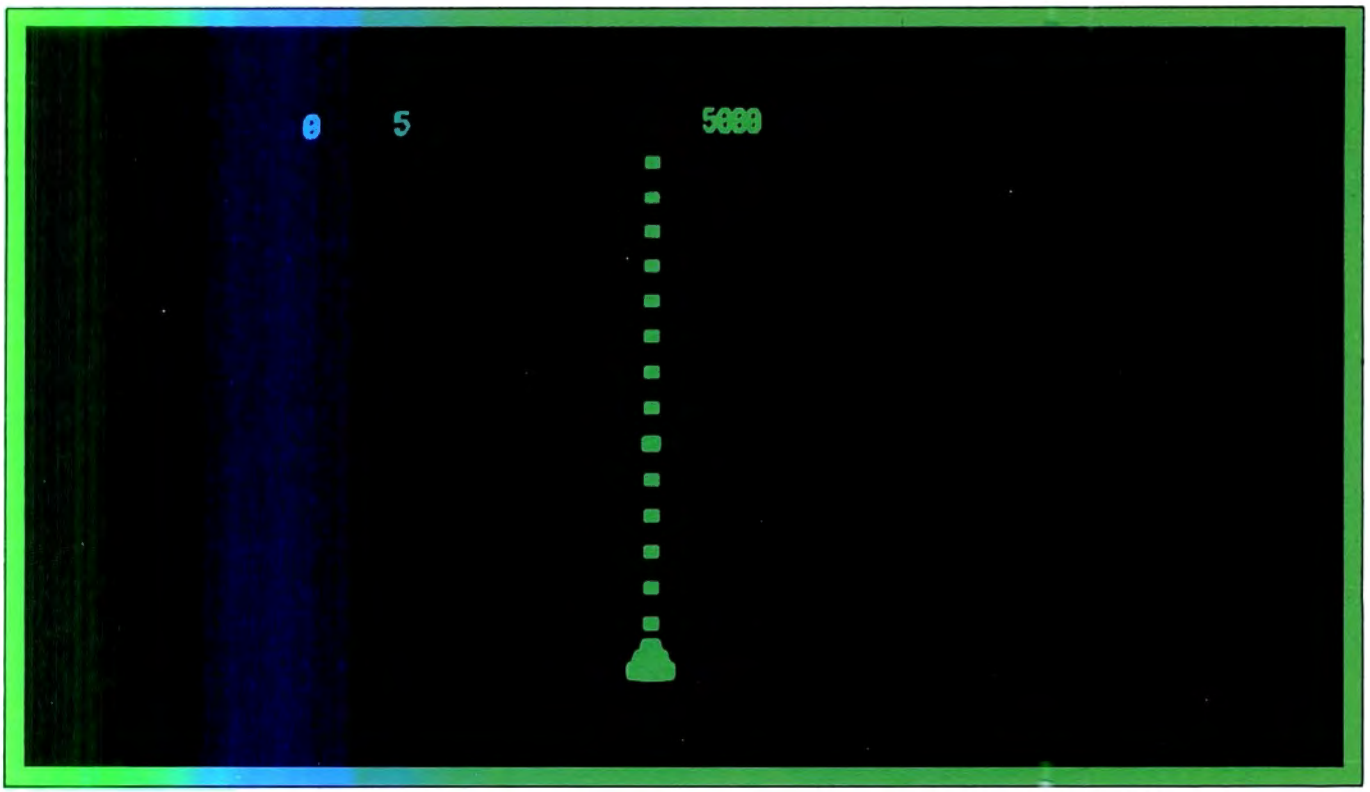


Photo 1 (left). Results of last month's Bugs program: the title screen. Photo 2 (above). Time-lapse exposure of shots fired from the laser cannon; the cannon actually shoots just one bullet at a time.

When the counter reaches zero and it's reset, the MBASE routine continues execution by checking to see whether you've pressed the left- and right-arrow keys. If you press either arrow (but not both), the program tests the left arrow. If you happen to be pressing the left arrow, the program sets DE to 1. Otherwise, it sets DE to −1.

BASEM moves the base in the direction that DE indicates, and erases the base and updates its position. After a check to keep from running off the edge of the screen, the program redraws the base at its new location.

While Bugs gives you unlimited ammunition, it takes some time to reload the laser; BASEX, the routine that fires your laser cannon, allows only one shot on the screen at a time and returns to the main program if a shot is present. A counter forces a slight delay between shots.

If no shot appears on screen and you press the space bar, BASEX sets flags for the shot-fired sound and between-shots delay. Subtracting 63 from the base location yields the shot location, directly above the top of the base. The TEMPW routine stores the location and the Shot routine stores the next shot location.

Program Listing 1. TEXT2A, score display subroutine and tables.

```
                00100 ;***** PART2A
6203            00150         ORG     6203H
618A            00170 SOUNDX  EQU     618AH
                00190 ;**** DISSCR DISPLAYS THE SCORE
                00200 ;     HL==> SCORE
                00210 ;     DE==> VIDEO LOCATION
6203 23         00230 DISSCR  INC     HL              ;POINT TO MSB
6204 23         00240         INC     HL
6205 3E30       00250         LD      A,'0'           ;A= ASCII 0
6207 0603       00260         LD      B,3             ;3 BYTES
6209 C5         00270 DIS2    PUSH    BC              ;STORE BYTE COUNTER
620A 0602       00280         LD      B,2             ;2 DIGITS PER BYTE
620C ED6F       00290 DIS3    RLD                     ;GET DIGIT
620E FE30       00300         CP      '0'             ;0?
6210 2808       00310 DIS1    JR      Z,DIS4          ;SKIP IF SO
6212 F5         00320         PUSH    AF              ;SAVE A
6213 3E07       00330         LD      A,DIS4-DIS1-3   ;CHANGE JUMP
6215 321162     00340         LD      (DIS1+1),A      ;TO DISX
6218 F1         00350         POP     AF              ;RESTORE A
6219 12         00360 DISX    LD      (DE),A          ;DISPLAY A
621A 13         00370 DIS4    INC     DE              ;BUMP POINTER
621B 10EF       00380         DJNZ    DIS3            ;NEXT DIGIT
621D ED6F       00390         RLD                     ;RESET BYTE
621F C1         00400         POP     BC              ;RESTORE BYTE COUNTER
6220 2B         00410         DEC     HL              ;DECREMENT POINTER
6221 10E6       00420         DJNZ    DIS2            ;NEXT BYTE
6223 3A1162     00430         LD      A,(DIS1+1)      ;IF SCORE NOT = 0
6226 FE07       00440         CP      DIS4-DIS1-3
6228 2805       00450         JR      Z,DIS5          ;  THEN SKIP
622A 1B         00460         DEC     DE              ;ELSE DISPLAY 0
622B 3E30       00470         LD      A,30H
622D 12         00480         LD      (DE),A
622E C9         00490         RET                     ;AND RETURN
622F 3E08       00500 DIS5    LD      A,DIS4-DIS1-2   ;IF SCORE IS NOT 0
6231 321162     00510         LD      (DIS1+1),A      ;  THEN RESET JUMP
6234 C9         00520         RET                     ;AND RETURN
                00540 ;**** INCSCR INCREMENTS THE SCORE
                00550 ;     HL==> SCORE
                00560 ;     DE==> INCREMENT
6235 0603       00580 INCSCR  LD      B,3             ;3 BYTES
6237 1A         00590 INC1    LD      A,(DE)          ;GET INCREMENT
6238 4E         00600         LD      C,(HL)          ;GET SCORE
6239 81         00610         ADD     A,C             ;ADD INCREMENT & SCORE
623A 27         00620         DAA                     ;DECIMAL ADJUST
623B 77         00630         LD      (HL),A          ;AND STORE RESULT
623C E5         00640         PUSH    HL              ;SAVE POINTER
623D 3008       00650 INC2    JR      NC,INC3         ;SKIP IF NO CARRY
623F 23         00660         INC     HL              ;ELSE POINT TO NEXT BYTE
6240 7E         00670         LD      A,(HL)          ;GET SCORE
6241 C601       00680         ADD     A,1             ;ADD CARRY
6243 27         00690         DAA                     ;ADJUST RESULT
6244 77         00700         LD      (HL),A          ;STORE IT
6245 18F6       00710         JR      INC2            ;CONTINUE UNTIL NO CARRY
6247 E1         00720 INC3    POP     HL              ;RESTORE POINTER
6248 23         00730         INC     HL              ;BUMP POINTERS
```

Listing 1 continued

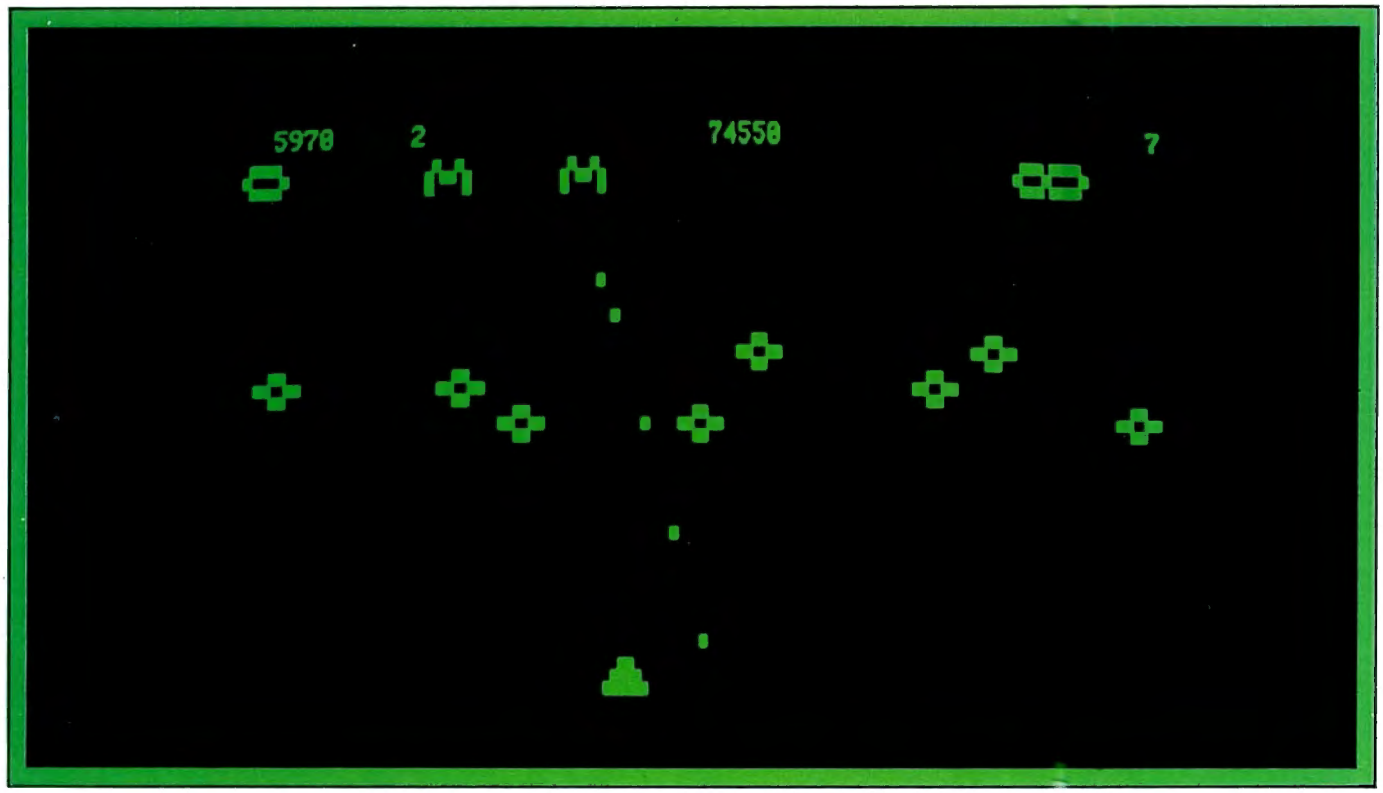


Photo 3. Screen shot of the final game. A spider bug rains deadly bombs while star and saucer bugs hover threateningly. Note the current and high scores at the top left and top center of the screen, respectively.

Listing 1 continued

```
6249 13       00740          INC     DE
624A 10EB     00750          DJNZ    INC1            ;LOOP UNTIL DONE
624C AF       00760          XOR     A               ;RESET OVERFLOW BYTE
624D 77       00770          LD      (HL),A
624E C9       00780          RET                     ;RETURN
624F 0050     00800 HIGH     DEFW    5000H           ;HIGH SCORE STORAGE
6251 0000     00810          DEFW    0
6253 0000     00830 SCORE    DEFW    0               ;SCORE STORAGE
6255 0000     00840          DEFW    0
6257 D73F     00860 BASE     DEFW    3FD7H           ;BASE LOCATION
0080          00880 PARAMS   DEFS    128             ;PARAMETER TABLE
              00890 ;**** INITIAL PARAMETERS
62D9 08       00900 INIT     DEFB    8       ;NUM OF BUG1
62DA 05       00910          DEFB    5       ;       BUG2
62DB 01       00920          DEFB    1       ;       BUG3
62DC 1D1D     00930          DEFW    1D1DH   ;TIME TO MOVE BASE
62DE 6060     00940          DEFW    6060H   ;TIME TO MOVE BUG1
62E0 4545     00950          DEFW    4545H   ;TIME TO MOVE BUG2
62E2 A4A4     00960          DEFW    0A4A4H  ;TIME TO MOVE BUG3
62E4 4040     00970          DEFW    4040H   ;TIME TO ADD BUG1
62E6 4040     00980          DEFW    4040H   ;TIME TO ADD BUG2
62E8 2626     00990          DEFW    2626H   ;TIME TO ADD BUG3
62EA 2020     01000          DEFW    2020H   ;TIME TO MOVE SHOT
62EC 203A     01010          DEFW    3A20H   ;TIME TO MOVE BOMBS
62EE 00       01020          DEFB    0       ;SHOT FIRED FLAG
62EF 00       01030          DEFB    0       ;CHARACTER UNDER SHOT
62F0 00       01040          DEFB    0       ;REDRAW BUGS FLAG
62F1 0A       01050          DEFB    0AH     ;ATTACK PARAMETER
62F2 0A0A     01060          DEFW    0A0AH   ;TIME TO EXPLOSION
62F4 08       01070          DEFB    8       ;DELAY BETWEEN SHOTS
62F5 00       01080          DEFB    0       ;HIGH SCORE REACHED FLAG
62F6 08       01090          DEFB    0CH     ;BOMB DROP PARAMETER
62F7 00       01100          DEFB    0       ;BASE HIT FLAG
62F8 20       01110          DEFB    20H     ;ADD BUG 1 FLAG
62F9 00       01120          DEFB    0       ;ADD BUG 2 FLAG
62FA 00       01130          DEFB    0       ;BUG 1 SPEED TEMP
62FB 00       01140          DEFB    0       ;BUG 2 SPEED TEMP
62FC 00       01150          DEFB    0       ;LEVEL COUNTER
62FD 00       01160          DEFB    0       ;NZ IF ADD BUG 2 FIRST
62FE 00       01170          DEFB    0       ;NZ IF RND ENTRY POINTS
62FF 00       01180          DEFB    0       ;TIME TO ADD NEXT SET OF BUGS
6300 00       01190          DEFB    0       ;LEVEL DONE FLAG
6301 00       01200          DEFB    0       ;COMPARE FOR BONUS TEST
6302 00       01210          DEFB    0       ;BASE DESTROYED FLAG
6303 00       01220          DEFB    0       ;NEXT LEVEL FLAG
6304 00       01230          DEFB    0       ;BONUS REACHED FLAG 1
6305 00       01240          DEFB    0       ;STORAGE FOR ATTACK PARAM
6306 00       01250          DEFB    0       ;STORAGE FOR BOMB PARAM
6307 00       01260          DEFB    0       ;BONUS REACHED FLAG 2
6308 00       01270          DEFB    0       ;BUG HIT FLAG
6309 00       01280          DEFB    0       ;NEW LEVEL FLAG
630A 00       01290          DEFB    0       ;BOMB DROPPED FLAG
004E          01300          DEFS    78
0030          01320 BUG1     DEFS    48              ;BUG1 TABLE
0030          01330 BUG2     DEFS    48              ;BUG2 TABLE
0030          01340 BUG3     DEFS    48              ;BUG3 TABLE
63E9 0000     01350 SHOT     DEFW    0               ;SHOT LOCATION
0020          01360 BOMBS    DEFS    32              ;BOMB LOCATIONS
```

Listing 1 continued

SOUND1 generates the sound of your shot, testing the shot-fired flag and returning if the flag is zero. Otherwise, it decrements the flag and calls SOUNDX.

SOUNDX, introduced last month, generates the sound of a shot through the cassette port. It requires that the Introduction subroutine initialize A' to 1 or 3. SOUNDX swaps A' and A, sending the former to the cassette port. Then the program toggles the lower 2 bits of A' (which control the cassette output line voltage) and restores A.

Once your shot leaves the cannon, the MSHOT routine takes over, erasing and relocating the shot until it leaves the screen. If you hit something (to be precise, if the screen location under the shot contains something other than a blank), the TEST7 subroutine searches the bug tables to see whether you've hit any bugs. If so, it adds the bug's location to the explosion table, determines its value, and updates and displays the score.

Elsewhere in Listing 2, the SCRTAB routine stores the score values (in BCD) for each of the three bug types. ATKSCR stores the values for attacking bugs, and Ships records the number of bases left.

★ FREE SHIPPING ★
WITHIN CONTINENTAL 48 STATES
ON PREPAID CASH & COD ORDERS ONLY.

MICRO IMAGES INDUSTRIES INC.

TRY US!

MICRO IMAGES INDUSTRIES INC.

We've Made Retail Prices A Thing of the ...PAST...

Order Toll Free

1-800-223-1182

THIS IS AN ORDER LINE ONLY!
DIRECT ALL INQUIRIES AND
N.Y. ORDERS TO:
(212) 445-7124

$124.95 DATAWRITER
NEW VERSION
SPECIFY MDL I or III

$84.95 COPYART II
MODEL I or III
SPECIFY PRINTER

$84.95 MULTIDOS
SPECIFY MDL I or III
SINGLE OR DOUBLE DENSITY

$139.95 LAZYWRITER
MDL I, III or IV
SEE LAZY OPTIONS BELOW

ELECTRIC WEBSTER W/Corr **$118.95**

DOTWRITER 3.0 W/Letterset **$84.95**

NEWSCRIPT Ver. 7.1 **$99.95** W/Label — $109.95

MAXI
CRAS 74.95
MGR II . . . 159.95
STAT . . . 159.95

LE SCRIPT Mdl I/III or IV **$108.95**

ZORLOF Mdl I or III **$59.95**

SUPERUTILITY + Mdl I/III Ver. 3.2 **$59.95** *SEE NEW BOOK BELOW*

TALLY MASTER Mdl I or III **$59.95**

OMNI-TERM Mdl I/III/IV **$69.95**

MZAL REL III **$74.95**

LDOS 5.1 **$109.95**

DOSPLUS
Mdl I or III 3.5 . . . 118.95
Mdl IVA 139.95
Mdl II 199.95

PROSOFT UTILITIES
TRASHMAN - Model I or III $34.95
FASTER - Model I or III 26.95
RPM - Model I or III 21.95

LAZY OPTIONS
LAZY FONT (Epson) 44.95
LAZY MERGE 39.95
LAZY DOC 49.95
LAZY Draw, Do, Tab, Calc 34.95

MAIL LIST PROGRAMS
POWER MAIL PLUS-Mdl 2/12/16 . . . . . 129.95
POWER MAIL PLUS-Mdl I/III 129.95
POSTMAN MASS MAIL-Mdl I/III 74.95
MAXI MAIL-Model III 64.95

Z BASIC - MDL I/III 79.95

MICROTERM - Model I or III 69.95

TZAL — Model III Tape 39.95
BASIC EDITOR - Model I/III Tape 24.95

BOOKS
How To Do It on the TRS 80 IJG 26.95
Machine Lang. Disk I/O IJG 26.95
TRSDOS 2.3 Decoded IJG 26.95
Disk + Other Mysteries IJG 20.95
Basic Decoded IJG 26.95
Custom TRS-80 IJG 26.95
Basic Faster & Better IJG 26.95
Basic Disk I/O Faster & Better 26.95
Captain 80 IJG 17.95
BFBLIB or BFBDEM Disk 17.95
Inside Superutility Plus 2.2 or 3.0 . . . . . 17.95
Electric Pencil Manual 26.95
CPM Users Guide 15.95
Game + Graphics for TRS80 . . . . . 15.95
TRS 80 Data Comm. Systems 12.95
Hardware Intrac TRS80 . . . . . 14.95
Start with Basic TRS80 Color 12.95

MAS 80 Acctg System
Integrated G/L, A/R, A/P & Ck Reg.
Retail $599.00 ***SPECIAL $399.00***
Overview — $5.00 Credited on Purchase

SPECIAL

LNW 80 Model II
Includes: 12" Monitor and Two S/S D/D/ Disk Drives
$1895.00*
*This is a cash price-c/c + 3½%

PRINTER STANDS

SPACE AGE		NO FRILLS	
MX 80 No Frills	Clear 13.50	Bronze 15.95	
MX80 Spage Age	Clear 27.50	Bronze 29.95	
Microline 82A Spage Age	Clear 27.50	Bronze 29.95	
Microline 83A Spage Age	Clear 34.95	Bronze 39.95	
NEC 8023A Spage Age	Clear 27.50	Bronze 29.95	
MX100 Spage Age	Clear 34.95	Bronze 39.95	
Multiuse - 18x12x6x¼	Clear 24.95	Bronze N/A	
No Frills 132 Col. w/slot	Clear N/A	Bronze 24.95	
Gorilla Banana	Clear N/A	Bronze 19.95	
FX80 Space Age	Clear N/A	Bronze 34.95	
FX100 Space Age	Clear N/A	Bronze 39.95	

WE HAVE A STAND FOR MOST PRINTERS

MICRO SPOOLER By Consolink 16K 199.95
64K 269.95

HAYES SMARTMODEM 300 . . . . . 229.95
HAYES SMARTMODEM 1200/300 . . . . . 549.95

RIBBONS
ZIP BOX RELOADS

	½ Doz.	Doz.
Epson MX 70/80-20 Yds	24.00	42.00
Epson MX 100-30 Yds.	30.00	51.00
NEC/Prowriter-14 Yds.	21.00	36.00
Centronics 730/737/739/779 or LP-I/II/IV-16 Yds.	18.00	33.00

All ZIP BOXES are individually sealed black nylon and require no rewinding. Epson Reloads also available in red, blue, brown, green & purple. Any mix allowed.

CARTRIDGES

	Each	Doz.
Epson MX70/80	7.00	60.00
Epson MX100	10.00	108.00
Prowriter 8510 & Nec 8023A	7.50	75.00
RS LP III/V	6.50	66.00
RS LP VI/VIII	6.50	66.00
RS DSY WH II or DWP 410	6.00	66.00
RS DSY WH II - Nylon	6.50	69.00
RS DMP 2100 - Toshiba 1350	9.00	96.00
MICROLINE 80/82A/83A/92	N/A	30.00
MICROLINE 84 ½ x 40 Yds	5.50	60.00
ANADEX - 9000 Series	10.00	108.00
Diablo Hytype II-Multi Strike	5.50	54.00
Diablo Hytype II - Nylon	5.50	60.00
Diablo Hytpe I-Multi Strike	5.50	60.00
Qume-Multi Strike	5.00	50.00
NEC—5500/7700-Multi Strike	6.00	60.00
Mannesman Tally 1000	11.00	120.00
TTX 1014	8.00	90.00
Brother HR I	5.50	60.00
Silver Reed Multi Strike Ex55/77	14.00	132.00
Silver Reed Nylon Ex55/77	9.00	96.00
Wangwriter DW-20 #279-5204-6	4.00	42.00

Note: All cartridges black only.
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 manufacturers in the country.
—QUALITY GUARANTEED—

Micro Images Industries Inc.
164-06 Crocheron Ave. Dept. L
Flushing, N.Y. 11358
(212) 445-7124 ✓ 157
HOURS: Mon.-Thurs. 10AM-6PM; Fri. & Sat. 10AM-5PM

VISA* MasterCard

ORDERING INFORMATION
COD Orders add $2.00. Minimum credit card order $25.00. FREE shipping on all COD and prepaid cash orders within the continental 48 states via UPS Ground. Actual shipping and insurance charges apply on all credit card orders, approved P/O's and shipments outside the continental 48 states. Certified Ck, M/O, COD and credit cards shipped immediately. Please allow 2 weeks for personal checks. Credit card orders shipped to card address only. Prices subject to change without notice. New York State residents please add appropriate sales tax.

Listing 1 continued

```
640B            01380 NEXT1   EQU     $               ;START OF NEXT PART
0000            01400         END
00000 TOTAL ERRORS
31208  TEXT AREA BYTES LEFT


BASE   6257 00860
BOMBS  63EB 01360
BUG1   6359 01320
BUG2   6389 01330
BUG3   63B9 01340
DIS1   6210 00310   00330 00340 00430 00440 00500 00510
DIS2   6209 00270   00420
DIS3   620C 00290   00380
DIS4   621A 00370   00310 00330 00440 00500
DIS5   622F 00500   00450
DISSCR 6203 00230
DISX   6219 00360
HIGH   624F 00800
INC1   6237 00590   00750
INC2   623D 00650   00710
INC3   6247 00720   00650
INCSCR 6235 00580
INIT   62D9 00900
NEXT1  640B 01380
PARAMS 6259 00880
SCORE  6253 00830
SHOT   63E9 01350
SOUNDX 618A 00170
```

MINUS1 is a constant, also in BCD, representing a value of −1. EXPLOD is a subroutine that adds the address in DE to the explosion table, and EXPTAB stores the addresses and durations of explosions.

So Far, So Good

Program Listing 3 (MAIN2) is the second version of the main program. You don't need to type it in; just change last month's MAIN1 source code to match it. If you entered all the comment lines of that listing, all you do is remove some of the semicolons.

Assemble all the listings, then load all the object code files, including last month's TEXT1 module (but not MAIN1; each month's main program replaces all earlier versions). Then execute the assembled main program to begin Bugs.

After the introduction and title screens, press the clear key and the screen will "melt" as before. Then your base appears at the bottom of the screen, with the current score and high score at either end of the top of the screen.

You can use the left- and right-arrow keys to move the base, and the space bar to fire a shot. Everything will move quickly because you haven't yet added the other routines.

You've finished just in time. The bugs from outer space have entered the galaxy, and should be here by this time next month. ■

Contact Roger Smith at 267 Seminole Trail, Crestview, FL 32536.

Program Listing 2. TEXT2B, base and firing subroutines.

```
                00100 ;***** PART2B
                00101
                00102 ;   BUGS FROM OUTER SPACE
                00103 ;   BY ROGER SMITH
                00104
640B            00120         ORG     640BH
                00130
6257            00140 BASE    EQU     6257H           ;BASE LOCATION
63EB            00150 BOMBS   EQU     63EBH           ;BOMB TABLE
6359            00160 BUG1    EQU     6359H           ;BUG TABLES
6389            00170 BUG2    EQU     6389H
63B9            00180 BUG3    EQU     63B9H
6203            00190 DISSCR  EQU     6203H           ;DISPLAY SCORE SUB
624F            00200 HIGH    EQU     624FH           ;HIGH SCORE
6235            00210 INCSCR  EQU     6235H           ;INCREMENT SCORE SUB
6253            00220 SCORE   EQU     6253H           ;SCORE
63E9            00230 SHOT    EQU     63E9H           ;SHOT LOCATION
618A            00240 SOUNDX  EQU     618AH           ;SOUND SUB
                00250
640B 0000       00260 TEMPW   DEFW    0               ;LAST SHOT LOCATION
                00270
                00271 ;**** MBASE IS THE MOVE BASE ROUTINE
                00272
640D DD3503     00280 MBASE   DEC     (IX+3)          ;TIME TO MOVE?
6410 C0         00290         RET     NZ              ;RETURN IF NOT
6411 DD7E04     00300         LD      A,(IX+4)        ;ELSE RESTORE COUNTER
6414 DD7703     00310         LD      (IX+3),A
6417 3A4038     00320         LD      A,(3840H)       ;CHECK KEYBOARD
641A E660       00330         AND     60H             ;MASK LEFT & RIGHT ARROWS
641C 280E       00340         JR      Z,BASEX         ;IF NEITHER THEN SKIP
641E FE60       00350         CP      60H             ;IF BOTH
6420 280A       00360         JR      Z,BASEX         ;  THEN SKIP
6422 E620       00370         AND     20H             ;  MASK LEFT ARROW
6424 2035       00380         JR      NZ,BASEL        ;IF LEFT THEN JUMP
6426 110100     00390 BASER   LD      DE,1            ;DE=OFFSET
6429 CD6364     00400         CALL    BASEM           ;MOVE BASE
642C 3A0C64     00410 BASEX   LD      A,(TEMPW+1)     ;SHOT ALREADY FIRED?
642F B7         00420         OR      A
6430 C0         00430         RET     NZ              ;RETURN IF SO
6431 DD7E1B     00440         LD      A,(IX+27)       ;DELAY BETWEEN SHOTS?
6434 B7         00450         OR      A
6435 2804       00460         JR      Z,NOWAIT        ;SKIP IF NOT
6437 DD351B     00470         DEC     (IX+27)         ;DECREMENT COUNTER
643A C9         00480         RET
643B 3A4038     00490 NOWAIT  LD      A,(3840H)       ;ELSE CHECK KEYBOARD
643E E680       00500         AND     128             ;MASK SPACE BAR
6440 C8         00510         RET     Z               ;RETURN IF NOT SPACE
6441 DD361520   00520         LD      (IX+21),20H     ;STORE FIRE FLAG
6445 DD361B04   00530         LD      (IX+27),4       ;STORE DELAY
6449 2A5762     00540         LD      HL,(BASE)       ;GET BASE LOC
644C 01C1FF     00550         LD      BC,-63
644F 09         00560         ADD     HL,BC           ;HL=HL-63
6450 220B64     00570         LD      (TEMPW),HL      ;STORE HL
6453 22E963     00580         LD      (SHOT),HL       ;STORE SHOT LOC
6456 DD361101   00590         LD      (IX+17),1       ;SET TIME TO MOVE SHOT
645A C9         00600         RET
645B 11FFFF     00610 BASEL   LD      DE,-1           ;DE=OFFSET
```

Listing 2 continued

WHAT THE HECK! IS THIS MANUAL TRYING TO SAY?

SuperSCRIPSIT© insert pgs for Mod III disk explains/expands training manual; ALSO combines reference manual info. Includes chart $14.00
Profile III Plus© 108 insert pgs for Mod III manual, plain English explanations/examples, 2 16x22 charts show where you're going $14.00
General Ledger insert pgs for Mod III Disk Manual. Tells HOW accounts interact and produce statements. 19x25 2-color wall chart shows Cycle, P&L, Balance Sheet, Terms $14.00
THEORY Section of GL above Whys, How Comes of GL, 20 pages of pure Gen Ledger Theory $5.00
2-COLOR 19x25 COMMAND WALL CHARTS
Super SCRIPSIT© commands with explanations and tips in highly visible form $4.00
VisiCalc© ALL commands at a glance $4.00
GL Mod III Disk helps grasp cycle, terms, P&L & Bal Sheet (index for manual) $4.00
BASIC© most often used Mod III Disk commands with details, samples, examples $4.00
Plus Commands used to set up files, screens, reports, labels of Profile III Plus© $4.00
© - Copyrights of Tandy or VisiCorp or Microsoft

Send cash, check, money order to:
CREST SOFTWARE ✓223
2132 Crestview, Suite #6 • Durango, CO 81301
(303) 247-9518
Visa, MC accepted. include card # and expiration date.
(Add $2.00 Shipping — We use UPS)

SOFTWARE PRICE WAR

$19.95

These are complete software systems supplied to you on a **TRSDOS 1.3** system diskette
All systems fully menu driven — user friendly just insert diskettes, reset and go. Systems are supplied with full documentation (although most users report that they don't read it).
Easy backup from main menu.

This is a sample of my mail

"Your PAYROLL program is great — I use it for all my accounts — it's quite a time saver." Hampton, NJ

"I received your PAYROLL program yesterday and was impressed by it. Hence I am enclosing a Cashier's check for..." Jacksonville Beach, FL

"A friend showed off his possession of your check register system to me and I want a copy for my personal use." Bloomington, IL

"We have received the first two programs and have found them to be quite sophisticated and are anxious to try another. Please accept my order for..." Durango, CO

All systems are written for Model III or Model IV in Model III Mode.

LYNN'S PAYROLL SYSTEM

Complete record keeping & payroll calculation. To include your state's unemployment tax & forms, detailed 941 form, prints paychecks & W-2's. Accounting write-up version available.

LYNN'S ACCOUNTS RECEIVABLE SYSTEM

Single entry — open invoice system. Prints invoice and statements. Built in aging report.

LYNN'S CHECK REGISTER SYSTEM

Prints checks. Register for any month, reconciliation statement.
1,000 checks per month— 220 expense accounts.

LYNN'S TRSDOS UTILITY PROGRAMS

For TRSDOS 1.3 includes short directory (file names only), cursor directory (allows cursor access to CMD, BASIC, and "DO" Files), and a 2K Print Spooler. Menu installs utilities on existing TRSDOS Diskettes.

LYNN'S E-Z MAIL SYSTEM

Sort by name, zip code, state. 2,500 names. E-Z edit.

AND NOW THE BEST PART

ANY SYSTEM ONLY $19.95 EACH.

Plus $3.00 shipping per order. (add $1.65 for C.O.D.) Ill. residents add 6¼% sales tax.
(The **TRSDOS** alone is worth **$14.95**)

master charge THE INTERBANK CARD

Joe Lynn ✓ 115
Computer Services
23501 W. Gagne Lane
Plainfield, Illinois 60544
815/436-4477

BANKAMERICARD VISA

✓ See List of Advertisers on Page 227

Listing 2 continued

```
645E CD6364   00620          CALL    BASEM
6461 18C9     00630          JR      BASEX
6463 2A5762   00640 BASEM    LD      HL,(BASE)       ;GET BASE LOCATION
6466 0603     00650          LD      B,3             ;FOR B=1 TO 3
6468 3680     00660 BASEM1   LD      (HL),80H        ;STORE BLANK AT (HL)
646A 23       00670          INC     HL              ;HL=HL+1
646B 10FB     00680          DJNZ    BASEM1          ;NEXT
646D 2A5762   00690          LD      HL,(BASE)       ;GET LOCATION
6470 19       00700          ADD     HL,DE           ;UPDATE
6471 7D       00710          LD      A,L             ;TEST IF HL IS IN RANGE
6472 E63F     00720          AND     3FH
6474 FE3D     00730          CP      03DH
6476 3803     00740          JR      C,BASEM2        ;JUMP IF IN RANGE
6478 2A5762   00750          LD      HL,(BASE)       ;GET OLD LOCATION
647B 225762   00760 BASEM2   LD      (BASE),HL       ;STORE LOCATION
647E 36B8     00770          LD      (HL),184        ;STORE GRAPHICS
6480 23       00780          INC     HL              ;HL=HL+1
6481 36BF     00790          LD      (HL),191        ;STORE NEXT GRAPHIC
6483 23       00800          INC     HL
6484 36B4     00810          LD      (HL),180        ;STORE LAST CHARACTER
6486 C9       00820          RET
              00830
              00831 ;**** SOUND1 IS THE SHOT FIRED SOUND ROUTINE
              00832
6487 DD7E15   00840 SOUND1   LD      A,(IX+21)       ;CHECK SHOT FIRED FLAG
648A B7       00850          OR      A
648B C8       00860          RET     Z               ;RETURN IF ZERO
648C 3D       00870          DEC     A               ;ELSE DECREMENT
648D DD7715   00880          LD      (IX+21),A       ;AND STORE
6490 CD8A61   00890          CALL    SOUNDX          ;MAKE SOUND
6493 C9       00900          RET
              00910
              00911 ;**** MSHOT IS THE MOVE SHOT ROUTINE
              00912
6494 DD3511   00920 MSHOT    DEC     (IX+17)         ;TIME TO MOVE SHOT?
6497 C0       00930          RET     NZ              ;RETURN IF NOT
6498 DD7E12   00940          LD      A,(IX+16)       ;ELSE RESET
649B DD7711   00950          LD      (IX+17),A       ;       COUNTER
649E 3A0C64   00960          LD      A,(TEMPW+1)     ;GET MSB OF SHOT LOC
64A1 B7       00970          OR      A               ;IS A=0?
64A2 C8       00980          RET     Z               ;RETURN IF SO
64A3 CDDF64   00990          CALL    TEST7           ;TEST FOR HIT
64A6 ED5B0B64 01000          LD      DE,(TEMPW)      ;DE=OLD SHOT LOC
64AA 7A       01010          LD      A,D
64AB B7       01020          OR      A
64AC C8       01030          RET     Z               ;RETURN IF D=0
64AD 2AE963   01040          LD      HL,(SHOT)       ;HL=NEW SHOT LOC
64B0 3E80     01050          LD      A,128           ;BLANK
64B2 12       01060          LD      (DE),A          ;STORE IT
64B3 7E       01070          LD      A,(HL)          ;GET CHR UNDER SHOT
64B4 DD7716   01080          LD      (IX+22),A       ;STORE IT
64B7 368C     01090          LD      (HL),8CH        ;DISPLAY SHOT
64B9 220B64   01100          LD      (TEMPW),HL      ;STORE SHOT LOC
64BC 01C0FF   01110          LD      BC,-64          ;SUBTRACT 64
64BF 09       01120          ADD     HL,BC
64C0 7C       01130          LD      A,H             ;TEST IF OFF SCREEN
64C1 FE3B     01140          CP      3BH
64C3 200D     01150          JR      NZ,OK10         ;SKIP IF NOT
64C5 DD7E16   01160          LD      A,(IX+22)       ;RESTORE LOCATION
64C8 2A0B64   01170          LD      HL,(TEMPW)
64CB 77       01180          LD      (HL),A
64CC 210000   01190          LD      HL,0            ;SHOTLOC = 0
64CF 220B64   01200          LD      (TEMPW),HL
64D2 22E963   01210 OK10     LD      (SHOT),HL       ;STORE NEW LOCATION
64D5 DD7E16   01220          LD      A,(IX+22)       ;ANYTHING HIT?
64D8 DD361680 01230          LD      (IX+22),128     ;(CLEAR CHR)
64DC FE81     01240          CP      81H
64DE D8       01250          RET     C               ;RETURN IF NOT
64DF 2A0B64   01260 TEST7    LD      HL,(TEMPW)
64E2 FD215963 01270          LD      IY,BUG1         ;IY==>BUG TABLE
64E6 0630     01280          LD      B,48            ;B=NUMBER OF BUGS
64E8 FD5E00   01290 LOOP10   LD      E,(IY)          ;DE=(IY)
64EB FD5601   01300          LD      D,(IY+1)
64EE 7A       01310          LD      A,D             ;MSB=0?
64EF B7       01320          OR      A
64F0 2855     01330          JR      Z,NOPE          ;SKIP IF 0
64F2 7C       01340          LD      A,H             ;CP HL & DE
64F3 BA       01350          CP      D
64F4 2051     01360          JR      NZ,NOPE         ;IF D<>H THEN NO MATCH
64F6 7D       01370          LD      A,L
64F7 93       01380          SUB     E               ;A=L-E
64F8 FE03     01390          CP      3
64FA 304B     01400          JR      NC,NOPE         ;IF A>2 THEN NO MATCH
64FC C5       01410          PUSH    BC
64FD FDE5     01420          PUSH    IY
64FF CD7065   01430          CALL    EXPLOD          ;ADD DE TO EXPLOSION LIST
6502 FDE1     01440          POP     IY
6504 FD360100 01450          LD      (IY+1),0
6508 210000   01460          LD      HL,0            ;END SHOTS
650B 220B64   01470          LD      (TEMPW),HL
650E 22E963   01480          LD      (SHOT),HL
6511 C1       01490          POP     BC
6512 C5       01500          PUSH    BC
6513 78       01510          LD      A,B             ;A=B
6514 FE21     01520          CP      33              ;>32?
6516 3804     01530          JR      C,SKIP32        ;SKIP IF NOT
6518 0E08     01540          LD      C,8             ;OFFSET=8
651A 1808     01550          JR      SKIP00          ;SKIP
651C FE11     01560 SKIP32   CP      17              ;>16?
651E 0E00     01570          LD      C,0             ;OFFSET=0
              01580                                  ;LD DOESN'T AFFECT FLAGS
6520 3802     01590          JR      C,SKIP00        ;SKIP IF <16
6522 0E04     01600          LD      C,4             ;OFFSET=4
6524 E5       01610 SKIP00   PUSH    HL              ;STORE HL
6525 215065   01620          LD      HL,SCRTAB       ;HL==>SCORE TABLE
6528 FD7E02   01630          LD      A,(IY+2)        ;IS DIRECTION CODE
652B FE0A     01640          CP      10              ;>9?
652D 3803     01650          JR      C,SKIP66        ;SKIP IF NOT
652F 215C65   01660          LD      HL,ATKSCR       ;HL==>ATTACKING SCORES
6532 0600     01670 SKIP66   LD      B,0             ;BC=OFFSET
6534 09       01680          ADD     HL,BC           ;HL==>SCORE FOR BUG
6535 115362   01690          LD      DE,SCORE        ;DE==>PLAYERS SCORE
6538 EB       01700          EX      DE,HL           ;SWAP HL AND DE
6539 CD3562   01710          CALL    INCSCR          ;INCREMENT SCORE
653C 215362   01720          LD      HL,SCORE        ;HL==>SCORE
653F 11003C   01730          LD      DE,3C00H        ;DE==>SCREEN LOC
6542 CD0362   01740          CALL    DISSCR          ;DISPLAY SCORE
6545 E1       01750          POP     HL
6546 C1       01760          POP     BC
6547 FD23     01770 NOPE     INC     IY              ;IY=IY+3
6549 FD23     01780          INC     IY
654B FD23     01790          INC     IY
654D 1099     01800          DJNZ    LOOP10          ;LOOP UNTIL B=0
654F C9       01810          RET
              01820
6550 5000     01830 SCRTAB   DEFW    50H             ;SCORE TABLE (BUG3)
6552 0000     01840          DEFW    0
6554 2500     01850          DEFW    25H             ;BUG2
6556 0000     01860          DEFW    0
6558 1000     01870          DEFW    10H             ;BUG1
655A 0000     01880          DEFW    0
              01890
655C 0001     01900 ATKSCR   DEFW    100H            ;ATTACKING SCORES
655E 0000     01910          DEFW    0
6560 5000     01920          DEFW    50H
6562 0000     01930          DEFW    0
6564 2000     01940          DEFW    20H
6566 0000     01950          DEFW    0
              01960
6568 0500     01970 SHIPS    DEFW    5               ;NUMBER OF SHIPS LEFT
656A 0000     01980          DEFW    0
              01990
656C 9999     02000 MINUS1   DEFW    9999H           ;MINUS 1 CONSTANT
656E 9999     02010          DEFW    9999H
              02020
              02021 ;**** EXPLOD ADDS DE TO THE EXPLOSION TABLE
              02022
6570 FD219065 02030 EXPLOD   LD      IY,EXPTAB       ;IY==>EXPLOSION TABLE
6574 0610     02040          LD      B,16            ;MAX OF 16 EXPLOSIONS
6576 FD7E02   02050 LOOP20   LD      A,(IY+2)        ;IS TIME = 0?
```

Listing 2 continued on p. 93

The PRODUCER

The Professional Program Writer.

Sensational Software Breakthrough

What has your computer done for you lately? You bought it to be a powerful and time saving tool. But if lack of good software keeps you frustrated and makes your computer an expensive and idle gadget, The PRODUCER is here to solve your problem.

Now you can design and produce professional quality programs that meet your exact specifications and you don't even need to understand programming at all.

What exactly is The PRODUCER?

The PRODUCER is a program development system that writes software. If you have a need to store and retrieve information, perform calculations on your data, and get displayed and printed reports, you can design the exact format you need and The PRODUCER will write that program for you. In short, it is the most simple, practical,and versatile program generator ever put on the market.

What can The PRODUCER do for you?

- **The PRODUCER makes programming easy.** If you can answer simple English questions and push buttons, it will do all the hard work for you. It helps you conceptualize your program, gives you complete freedom in drawing your screen, lets you edit until you are satisfied, and then writes all the BASIC code for you to produce a stand alone finished program.
- **The PRODUCER can save you hundreds of hours of time.** Why labor over hammering out BASIC code when you don't have to? It provides a short cut for you to go directly from your custom idea to a finished program. Many professional programmers are now using the PRODUCER to quickly write programs for sale. You can do that too. Why spend weeks looking for programs to do what you need? Why struggle with the complex task of writing them yourself? Let The PRODUCER go to work for you and give you exactly the programs you want.
- **The PRODUCER can save you big bucks.** How many data storage programs do you own? How much did you pay for them? It's likely The PRODUCER could have written all of them. With The PRODUCER, you may never again need to buy such programs. Add to that the advantage of having customized programs, the ability to edit them at will to suit your changing needs, and your ability to sell the programs The PRODUCER writes for you. That is really a big dollar savings that continues to grow and grow.
- **The PRODUCER makes you more productive.** Of course you will save time that can better be spent doing other things. But your creativity also will be unleashed. With The PRODUCER as your partner, your computer will at last become the valuable tool you bought it to be. And you will get much more accomplished.
- **The PRODUCER can turn you into a professional.** It writes complete, stand alone programs that you, as a licensed PRODUCER owner, can sell without paying royalties. And if you already are a pro, it can make you more of one. The PRODUCER writes fully commented BASIC code so you can use it as a building block to customize your own specialized software. The PRODUCER has the best screen and input module available anywhere at any price.

"The PRODUCER is a very impressive software package. It is well worth the money. While other micro owners are printing mailing labels, I am now selling them programs to use. I now have more time to spend enjoying my computer."
V. E. Ryberg, Bloomington, Illinois

How Do You Learn to Use The PRODUCER?

We recognize that most people learn best by hearing and doing, rather than through reading alone. That's why we have included a complete audio cassette tutorial as part of The PRODUCER TRS-80 Model I & Model III versions. One of your fellow PRODUCER users talks you through the step by step lessons. The tapes not only teach you the process, they enable you to create a complete program of your own design while you learn.

Of course the program documentation of over 200 pages is a very thorough and readable reference manual to answer any questions you may have. But we encourage you to treat it as a reference manual only. We have provided the tutorial as a quick and easy way to get started. That's an advantage seldom provided by any software package.

"The tutorial was an excellent starter. It enabled me to get on with it without days and days of reading. Very helpful.
S. R. Foster, Pensacola, Florida

Continued

WHAT DO YOU GET WITH THE PRODUCER?

This impressive package includes:

DISKETTE(s) containing PRODUCER Program Development System.

REFERENCE MANUAL of over 200 pages of extensive, easy to read, well organized material. Attractive hardback 3-ring binder. Color-keyed index tabs separate the chapters. Comprehensive alphabetical index refers to specific chapter subsections.

QUICK REFERENCE CARD

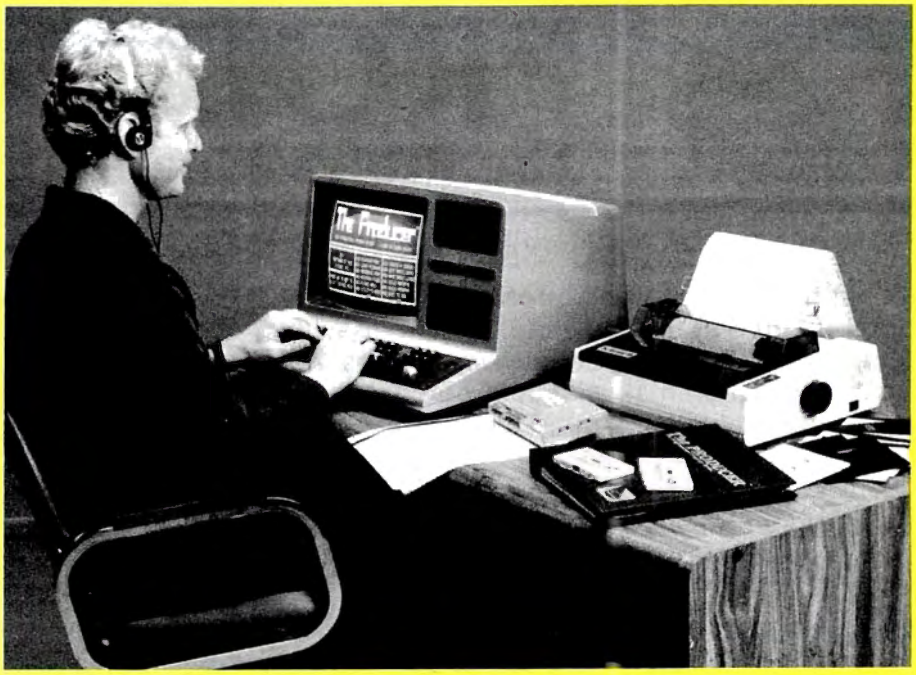
OWNER REGISTRATION CARD

TUTORIAL SESSION including audio cassettes and detailed follow-along outline, written and produced by a fellow user.

HOME INVENTORY MANAGEMENT program ($60 value) included free as a sample, allowing you to use a finished program immediately.

ONE YEAR SUBSCRIPTION to The PRODUCER newsletter.

TECHNICAL ASSISTANCE, available by phone only to registered PRODUCER owners.



The PRODUCER

HOW THE PRODUCER WORKS

You will be impressed with the ease of operation and the amazing versatility of features you get with The PRODUCER. The documentation is thorough, the screens are clear and readable (see at right) and with the help of the audio cassette tutorial, you will move quickly through the steps outlined below and be turning out finished programs in no time.

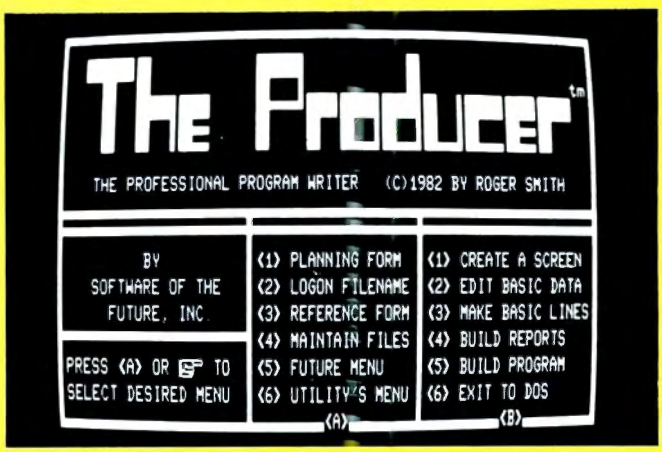
Steps in Developing a Program

■ **Planning:**
The PRODUCER provides a helpful planning form that you can print on your own printer. It helps organize your thoughts in creating a tailor made program to meet your needs.

■ **Screen Creation:**
The PRODUCER gives you complete freedom to create a screen for your monitor on which you will enter data for your program. To create the screen you follow these six simple steps:

1. **Draw the Screen** using arrow keys to form the configuration you desire. Enter large graphic letters and borders with a single key stroke. Store up to nine trial screens as you experiment. Edit at will until you are satisfied.
2. **Define Message Areas** on your screen by selecting where The PRODUCER's messages to you will appear.
3. **Define Input Fields** by answering The PRODUCER's questions about where you want to enter data. You specify the length of each area or field as well as the acceptable characters in each field.
4. **Define Display Fields** by selecting any area of the screen where you want to show the results of calculations done on your data.
5. **Define Custom Prompts** by selecting an area where help messages to yourself may be displayed.
6. **Save Your Results** by assigning a working name for your program and saving it to disk.

■ **Editing Data:**
The PRODUCER allows you to edit any part of the program you have created - screen field names, lengths, prompt areas, etc. You may type in any help message as a custom prompt to help you operate the program. Calculations can be created easily, using actual field names. And you can use the contents of of any numeric field and all math operations including logical operators.



■ **Making BASIC Code:**
Press a key and sit back to watch The PRODUCER do all the work of creating BASIC code for your program. The program lines will appear on your screen and complete error checking is done for you.

■ **Building Reports:**
With the amazing new Freeform Report Generator, virtually any report is available to you. It works with any size paper. You are allowed up to 100 calculations within the report. And you can specify the exact position of any text information to any position on your paper (even preprinted forms, checks, etc.). It's an amazingly versatile tool.

■ **Building the Program:**
Put the finishing touches on your program by selecting cursor type, size, flashing speed, auto messages, custom logos, etc. After you make your selections, press a key and your entire finished program is created in less than five minutes. That's all there is to this remarkably simple program generation process.

What Kinds of Programs Can Be Written?

Just let your imagination run wild. Here are just a few we've heard about: Home Inventory, Checkbook Balancer, Teacher's Gradebook, Loan Calculator, Small Business Payroll, Book/Record/Video Library Catalog, Membership/Mailing List, Photo File System, Writer's Notebook, Amway Distributor's Inventory, Sales Call Log, Commodities Market Tracker, Small Business Inventory, Student Notebook, Auto Maintenance Record, etc.

The PRODUCER

TECHNICAL INFORMATION

The PRODUCER provides many advanced features which allow you to do "magic" with the programs you create. We invite you to compare its features with any product on the market.

The SCREEN GENERATOR

- Use the full screen (all lines and column positions)
- Create a professional well organized screen with graphics
- Save up to 9 separate screens in memory at one time and get instant access to each
- Move the cursor to any location on the screen
- Replicate bars/lines/graphics to define certain screen areas
- Access an instantly available Help Menu of all Screen Editor commands
- Insert and delete any character with a single keystroke
- Clear or erase selected areas of any screen
- Insert and delete whole lines on the screen
- Center any text on the screen
- Move any rectangular block of text anywhere on the screen (block move)
- Create titles with a single keystroke large graphic letter alphabet
- Move portions of screens between different screens (cut and paste)
- Save any number of screens to disk at any time
- Recall any screen from disk any time
- Create BASIC lines to re-create any screen

FILE and RECORD HANDLING

- Rapidly access records with BTREE File structure
- Search for a record with only the first few letters of the name or key (partial key) (Example: locate PRODUCER by typing PR)
- Recall and edit duplicate and multiple keys (Example: Several last names may be the same on a file and you can find and edit them individually
- Fully edit any part of a previously entered record
- Recover unused space automatically upon deletion of a record
- Enter data very fast with the special batch mode
- Report immediately any record after it's been entered, eliminating time consuming sorting and indexing
- Rapidly access any record anytime (2-4 seconds average)
- Globally search and replace data in certain fields in selected record range
- Automatically rebuild any file to meet new specifications. No need to re-enter data when a file needs to be restructured.
- Balance any BTREE file automatically to reorganize and speed up file access time
- Recover from power failure and easily rebuild files that have been damaged. Avoid laborious re-entry of long data files

SCREEN ORIENTED INPUT and EDITING of DATA

- Insert and delete characters at any position in any field. No "back to start" retyping of data
- Move forward or back to previously entered fields to edit using the arrow keys. Totally non-destructive cursor. Does not require re-entering of each data field
- Move within any field using the arrow keys
- Move instantly to any field with Control G command
- Exit from input/edit mode at any point allowing immediate escape from data entry mode. Allows partial information to be entered for each record without the annoying, time consuming need to press ENTER for each blank field not used at the time of entry
- Duplicate field information from a previous record with one keystroke. No need to re-enter duplicate information, addresses, etc. on consecutive records
- View custom prompt, your own custom reminder or help message for each field with 1 keystroke
- Verify each character typed automatically
- Enter data as fast as you want, even if you are a speed typist
- View visible display of automatic field length restrictions
- View prompts for each field showing number of characters allowed

PRINTED REPORTS

- Create up to 9 separate reports at a time in a finished program
- Generate any number of reports you want (no limit)
- Select reports by name from a report menu in the program
- Select from six different automatic report formats including custom mailing labels
- Instantly print reports by key with no time consuming sort necessary
- Sort and print any other (non key) field with the fast machine language sort
- Sort only records that meet your search criteria
- Sort on more than one field if desired
- Use any restrictions or search criteria to determine which records will be included in a report
- Use any number of multiple search criteriea (including logical) (Example: You can search for all the males who are single, and drive a car that are over 24 years old but less than 35 years old
- Send any special command to your printer before or after any report
- Specify any line length needed and any page length desired
- Select single line or multiple lines per record, even one page per record
- Total any fields during the report (running totals)

ADVANCED CALCULATIONS

- Globally recalculate any field in any or all records. (Example: If file is a list of gold assets and the spot price changes, each separate asset may be recalculated with a new value for the spot price)
- Use all math operations including exponentiation and trigonometry
- Use logical calculations such as And, Or, Not, etc.
- Use any level of parenthesis in calculation formulas
- Save results in any field and display results in any field
- Store temporary results in several extra memory slots
- Pass calculation results between records
- Determine the exact order of calculations
- Display or save results at your option in the finished record

OTHER ADVANCED FEATURES

- Edit any part of any program without starting over or redefining the entire program
- Create screen and input modules only (for professional programmers)
- Create Calculate-only programs with the easy desk-top super calculator program
- Design custom logos for your program
- Control cursor type, size, flash speed, etc.
- Design custom prompts or help info for any field

FREEFORM REPORT GENERATOR

Formerly a PRODUCER option, now part of the standard package. An amazingly versatile data processing tool, far surpassing other products on the market.

- Specify column and row of every heading and field
- Allow up to 100 of interfield calculations, even string calculations
- Include any text anywhere on the screen
- Keep sub-totals on any field and print at any time in any format
- Format any numeric fields anyway you wish
- Print reports on pre-printed forms, checks, etc.
- Create form letters with merged field data, with no word processing necessary
- Put any field anywhere on the page. No limitations

Continued

The PRODUCER

WHAT ARE PRODUCER USERS SAYING?

We get comments by phone every day from satisfied users who are excited about what The PRODUCER has done for them. Here is a sampling of what we are hearing.

"How did I ever live without it." This often heard quote comes from experienced programmers who are now using The PRODUCER to generate programs in a fraction of the time it previously took to code a program.

"This program has paid for itself over and over." People tell us this repeatedly. First time users of computers have been able to successfully generate professional quality programs with The PRODUCER that rival the capabilities of commercial applications.

"There are only two things you need to say about The PRODUCER: it's easy to use and it's powerful!" The woman who told us this had used several computers before but had no programming experience. Now she is saving time, money and effort by creating the programs she needs for her office.

"Owning The PRODUCER is like having a professional programmer on call--24 hours a day. I particularly like the fact that if I design a program to do a specific job today, and later discover it is inadequate to my changing needs, I can regenerate the program with corrections in a matter of minutes." That's right. The PRODUCER gives you the ability to edit or expand your programs in any way you choose.

"The screen generator alone is worth the price! I created a professional data entry screen in minutes just after opening the package." With our screen generator, you are the artist and you are never locked into what someone else has designed for you.

"The Freeform Report Generator is an amazing feature. I never thought a product like this could give me the ability to get reports on my preprinted forms, but The Producer does it all." Yes, you can put the text anywhere on the page you want, do up to 100 interfield calculations, etc. etc. And the Freeform is now a part of The PRODUCER package.

OTHER QUOTES FROM PRODUCER USERS

"The PRODUCER package I received was excellent. The finest software package I have ever purchased. Far beyond my expectations."
S.R. Foster, Pensacola, Florida

"I'm in love with The PRODUCER. It's one of my favorite programs.
R. Selsback, Burlingame, California

"The value of the deal, everything included, was the best I've seen to date.
G. Slusher, Martin, Kentucky

"Excellent! Above and beyond other software.
R. Hapgood, Henrietta, Texas

VERSATILITY

"The PRODUCER is the best all purpose program generator I have used. (We have tried almost all of them.) The generated code is bug free, well commented and efficient."
R.A. Copella, Northbrook, Illinois

"This is by far my number one software and I will use it anywhere and everywhere I possibly can, both personal and in business."
R.A. Neuman, Okemos, Michigan

DOCUMENTATION

"Very well laid out and organized. One of the best I've seen.
J.D. Konkler, Columbus, Ohio

"One of the best I've seen. We write about 20 volumes of material per year. Take it from a pro, it's good.
J. Crespi, Sherman Oaks, California

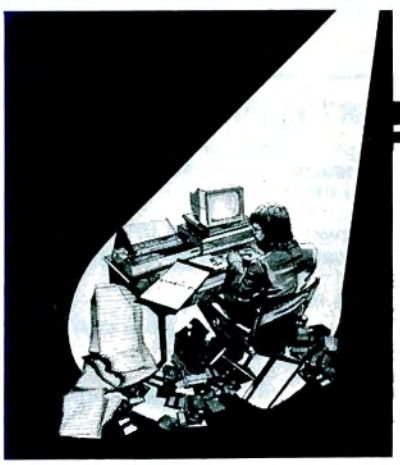
QUALITY

"Thank you for an excellent program. I agree that The PRODUCER will change the entire concept of program creation in the future. But for now, you stand as the best data base management system I can buy.
E. Sung, Vancouver, B.C.

"I think The PRODUCER will make the software hackers upgrade their products to this high level quality of the PRODUCER. I'm sure you realize that there is a lot of garbage on the market."
D.J. Smith, Lombard, Illinois

PRODUCER PROGRAMS RUN BY THEMSELVES

PRODUCER created programs are stand alone, Microsoft BASIC programs which do not require The PRODUCER to run, once completed. They can be LISTed and modified. You might even learn to program by careful examination of the LISTings--but you really don't need to know anything about programming to create and run your own custom generated software with The PRODUCER.



The PRODUCER

~59

Call your order in today.

PRODUCER
Box 1245
Arlington, Texas
76004-1245

800-433-5355

Texas 817-274-6998

Sensational Software Breakthrough

Model I Version	**$199.95**
Model III Version	**$199.95**
IBM-PC Version	**$299.95**

Including Freeform Report Generator

Listing 2 continued from p. 88

```
6579 B7        02060          OR      A
657A 200B      02070          JR      NZ,SKIP20       ;SKIP IF NOT
657C FD7300    02080          LD      (IY),E          ;STORE DE IN TABLE
657F FD7201    02090          LD      (IY+1),D
6582 FD360220 02100           LD      (IY+2),20H      ;STORE DURATION
6586 C9        02110          RET                     ;RETURN
6587 FD23      02120 SKIP20   INC     IY              ;IY=IY+3
6589 FD23      02130          INC     IY
658B FD23      02140          INC     IY
658D 10E7      02150          DJNZ    LOOP20          ;LOOP UNTIL B=0
658F C9        02160          RET
               02170
0030           02180 EXPTAB   DEFS    48              ;EXPLOSION TABLE
               02190
65C0           02200 NEXT1    EQU     $               ;START OF NEXT PART
               02210
0000           02220          END
00000 TOTAL ERRORS
29088  TEXT AREA BYTES LEFT


ATKSCR 655C 01900   01660
BASE   6257 00140   00540 00640 00690 00750 00760
BASEL  645B 00610   00380
BASEM  6463 00640   00400 00620
BASEM1 6468 00660   00680
BASEM2 647B 00760   00740
BASER  6426 00390
BASEX  642C 00410   00340 00360 00630
BOMBS  63EB 00150
BUG1   6359 00160   01270
BUG2   6389 00170
BUG3   63B9 00180
DISSCR 6203 00190   01740
EXPLOD 6570 02030   01430
EXPTAB 6590 02180   02030
HIGH   624F 00200
INCSCR 6235 00210   01710
LOOP10 64E8 01290   01800
LOOP20 6576 02050   02150
MBASE  640D 00280
MINUS1 656C 02000
MSHOT  6494 00920
NEXT1  65C0 02200
NOPE   6547 01770   01330 01360 01400
NOWAIT 643B 00490   00460
OK10   64D2 01210   01150
SCORE  6253 00220   01690 01720
SCRTAB 6550 01830   01620
SHIPS  6568 01970
SHOT   63E9 00230   00580 01040 01210 01480
SKIP00 6524 01610   01550 01590
SKIP20 6587 02120   02070
SKIP32 651C 01560   01530
SKIP66 6532 01670   01650
SOUND1 6487 00840
SOUNDX 618A 00240   00890
TEMPW  640B 00260   00410 00570 00960 01000 01100 01170 01200
                    01260 01470
TEST7  64DF 01260   00990
```

Program Listing 3. MAIN2, updated Bugs from Outer Space main program.

```
               00100 ;***** MAIN PROGRAM
               00110 ;      VERSION 2
6DDD           00120          ORG     6DDDH
65C0           00130 ADD1     EQU     65C0H
663A           00140 ADD2     EQU     663AH
66B4           00150 ADD3     EQU     66B4H
6BFB           00160 ADDBMB   EQU     6BFBH
6AB8           00170 ATTACK   EQU     6AB8H
6463           00180 BASEM    EQU     6463H
63EB           00190 BOMBS    EQU     63EBH
63E9           00200 BOMB     EQU     63E9H
6359           00210 BUG1     EQU     6359H
6389           00220 BUG2     EQU     6389H
63B9           00230 BUG3     EQU     63B9H
6203           00240 DISSCR   EQU     6203H
690D           00250 DRAW     EQU     690DH
6590           00260 EXPTAB   EQU     6590H
624F           00270 HIGH     EQU     624FH
6235           00280 INCSCR   EQU     6235H
62D9           00290 INIT     EQU     62D9H
61BC           00300 INTRO    EQU     61BCH
6A50           00310 LEVEL    EQU     6A50H
6AA4           00320 LEVTAB   EQU     6AA4H
640D           00330 MBASE    EQU     640DH
6C57           00340 MBOMB    EQU     6C57H
656C           00350 MINUS1   EQU     656CH
695D           00360 MOVEB1   EQU     695DH
6970           00370 MOVEB2   EQU     6970H
6983           00380 MOVEB3   EQU     6983H
6494           00390 MSHOT    EQU     6494H
6AB4           00400 ONE      EQU     6AB4H
6259           00410 PARAMS   EQU     6259H
6253           00420 SCORE    EQU     6253H
6568           00430 SHIPS    EQU     6568H
63E9           00440 SHOT     EQU     63E9H
6487           00450 SOUND1   EQU     6487H
6B56           00460 SOUND2   EQU     6B56H
6BE4           00470 SOUND3   EQU     6BE4H
6CAB           00480 SOUND4   EQU     6CABH
618A           00490 SOUNDX   EQU     618AH
640B           00500 TEMPW    EQU     640BH
6B20           00510 TEST     EQU     6B20H
6B74           00520 TEST2    EQU     6B74H
6B9B           00530 TEST3    EQU     6B9BH
6BC1           00540 TEST5    EQU     6BC1H
6CB6           00550 TEST6    EQU     6CB6H
64DF           00560 TEST7    EQU     64DFH
6CCD           00570 FLASH    EQU     6CCDH
6CF4           00580 SOUND1   EQU     6CF4H
6D1B           00590 START    EQU     6D1BH
               00600 ;***** ENTRY POINT
6DDD CDBC61    00610 ENTRY    CALL    INTRO           ;INTRODUCTION
6DE0 21D962    00620 GAME     LD      HL,INIT         ;INITIALIZE PARAMETERS
6DE3 115962    00630          LD      DE,PARAMS
6DE6 017F00    00640          LD      BC,127
6DE9 EDB0      00650          LDIR
6DEB 210000    00660          LD      HL,0
6DEE 22506A    00670          LD      (LEVEL),HL      ;LEVEL = 0
6DF1 22526A    00680          LD      (LEVEL+2),HL
6DF4 225362    00690          LD      (SCORE),HL      ;SCORE = 0
6DF7 225562    00700          LD      (SCORE+2),HL
6DFA 226A65    00710          LD      (SHIPS+2),HL
6DFD 210500    00720          LD      HL,5
6E00 226865    00730          LD      (SHIPS),HL      ;BASES = 5
6E03 DD215962  00740          LD      IX,PARAMS       ;IX==>PARAMETER TABLE
6E07 110000    00750          LD      DE,0
6E0A CD6364    00760          CALL    BASEM           ;DISPLAY BASE
6E0D 11003C    00770          LD      DE,3C00H
6E10 215362    00780          LD      HL,SCORE
6E13 CD0362    00790          CALL    DISSCR          ;DISPLAY SCORE
6E16 11063C    00800          LD      DE,3C06H
6E19 216865    00810          LD      HL,SHIPS
6E1C CD0362    00820          CALL    DISSCR          ;DISPLAY BASES LEFT
6E1F 111E3C    00830          LD      DE,3C1EH
6E22 214F62    00840          LD      HL,HIGH
6E25 CD0362    00850          CALL    DISSCR          ;DISPLAY HIGH SCORE
6E28 DD7E06    00860          LD      A,(IX+6)        ;STORE SPEEDS
6E2B DD7721    00870          LD      (IX+33),A
6E2E DD7E08    00880          LD      A,(IX+8)
6E31 DD7722    00890          LD      (IX+34),A
6E34 DD363000 00900           LD      (IX+48),0       ;NEW LEVEL FLAG
6E38 215963    00910 NEXT     LD      HL,BUG1         ;CLEAR BUG TABLE
6E3B 115A63    00920          LD      DE,BUG1+1
6E3E 018F00    00930          LD      BC,48+48+48-1
6E41 3600      00940          LD      (HL),0
```

Listing 3 continued

```
6E43 EDB0      00950          LDIR
6E45 219065    00960          LD      HL,EXPTAB       ;CLEAR EXPLOSION TABLE
6E48 119165    00970          LD      DE,EXPTAB+1
6E4B 012F00    00980          LD      BC,47
6E4E 3600      00990          LD      (HL),0
6E50 EDB0      01000          LDIR
6E52 21EB63    01010          LD      HL,BOMBS        ;CLEAR BOMBS TABLE
6E55 11EC63    01020          LD      DE,BOMBS+1
6E58 011F00    01030          LD      BC,31
6E5B 3600      01040          LD      (HL),0
6E5D EDB0      01050          LDIR
6E5F 210000    01060          LD      HL,0
6E62 22E963    01070          LD      (SHOT),HL       ;CLEAR SHOT LOCATION
6E65 220B64    01080          LD      (TEMPW),HL
6E68 DD362900 01090           LD      (IX+41),0       ;RESET FLAGS
6E6C DD362A00 01100           LD      (IX+42),0
               01110 ;        LD      (IX+31),0
               01120 ;        LD      (IX+32),0
6E70 DD362F00 01130           LD      (IX+47),0
6E74 DD7E21    01140          LD      A,(IX+33)       ;RESTORE SPEEDS
6E77 DD7706    01150          LD      (IX+6),A
6E7A DD7E22    01160          LD      A,(IX+34)
6E7D DD7708    01170          LD      (IX+8),A
               01180 ;        CALL    FLASH           ;FLASH AND CLS
               01190 ;        CALL    SOUNDI          ;SOUND AND INC LEVEL
               01200 ;        CALL    START           ;INITIALIZE
6E80 0604      01210 LOOPMN   LD      B,4
6E82 C5        01220 LOOPX0   PUSH    BC
               01230 ;        CALL    MOVEB1
               01240 ;        CALL    MOVEB2
               01250 ;        CALL    MOVEB3
               01260 ;        CALL    DRAW
               01270 ;        CALL    TEST8
               01280 ;        CALL    MBOMB
6E83 DD7E1E    01290          LD      A,(IX+30)       ;BASE HIT?
6E86 B7        01300          OR      A
6E87 CC0D64    01310          CALL    Z,MBASE         ;MOVE IT IF NOT
               01320 ;        CALL    ADDBMB
               01330 ;        CALL    SOUND4
6E8A CD9464    01340          CALL    MSHOT
6E8D CD8764    01350          CALL    SOUND1
               01360 ;        CALL    TEST
               01370 ;        CALL    SOUND2
               01380 ;        CALL    BOOM
               01390 ;        CALL    TEST2
               01400 ;        CALL    TEST3
               01410 ;        CALL    SOUND3
               01420 ;        CALL    TEST5
               01430 ;        CALL    TEST6
6E90 C1        01440          POP     BC
6E91 DD7E2A    01450          LD      A,(IX+42)       ;NEXT LEVEL?
6E94 B7        01460          OR      A
6E95 C2386E    01470          JP      NZ,NEXT
6E98 DD7E29    01480          LD      A,(IX+41)
6E9B B7        01490          OR      A
6E9C C2AE6E    01500          JP      NZ,CONT         ;JP IF BASE HIT
6E9F 10E1      01510          DJNZ    LOOPX0
               01520 ;        CALL    ATTACK
6EA1 DD342B    01530          INC     (IX+43)
               01540 ;        CALL    ADD1
               01550 ;        CALL    ADD2
               01560 ;        CALL    ADD3
6EA4 3A0438    01570          LD      A,(3804H)       ;CHECK FOR 'P'
6EA7 E601      01580          AND     1
6EA9 C41D6F    01590          CALL    NZ,PAUSE        ;PAUSE IF SO
6EAC 18D2      01600          JR      LOOPMN          ;LOOP
6EAE DD3523    01610 CONT     DEC     (IX+35)         ;DECREMENT LEVEL
6EB1 DD363001 01620           LD      (IX+48),1       ;SET FLAG
6EB5 216865    01630          LD      HL,SHIPS        ;TEST IF 0 LEFT
6EB8 0603      01640          LD      B,3
6EBA AF        01650          XOR     A
6EBB B6        01660 CONT10   OR      (HL)            ;OR # SHIPS
6EBC 23        01670          INC     HL
6EBD 10FC      01680          DJNZ    CONT10          ;LOOP UNTIL B=0
6EBF C2386E    01690          JP      NZ,NEXT         ;JP IF NOT GAME OVER
6EC2 21F66F    01700          LD      HL,MESS10       ;DISPLAY MESSAGE
6EC5 119B3C    01710          LD      DE,3CA0H-5
6EC8 010B00    01720          LD      BC,11
6ECB EDB0      01730          LDIR
6ECD 210170    01740          LD      HL,MESS20       ;DISPLAY SECOND LINE
6ED0 11D33C    01750          LD      DE,3CE0H-13
6ED3 011D00    01760          LD      BC,29
6ED6 EDB0      01770          LDIR
6ED8 1E0A      01780          LD      E,0AH           ;SOUND
6EDA 0E10      01790 OVER05   LD      C,10H
6EDC 0640      01800 OVER10   LD      B,40H
6EDE C5        01810 OVER20   PUSH    BC
6EDF 10FE      01820          DJNZ    $
6EE1 C1        01830          POP     BC
6EE2 CD8A61    01840          CALL    SOUNDX
6EE5 10F7      01850          DJNZ    OVER20
6EE7 0D        01860          DEC     C
6EE8 20F2      01870          JR      NZ,OVER10
6EEA 010003    01880          LD      BC,300H
6EED CD6000    01890          CALL    60H
6EF0 1D        01900          DEC     E
6EF1 20E7      01910          JR      NZ,OVER05
6EF3 3A4038    01920 OVER30   LD      A,(3840H)
6EF6 10FE      01930          DJNZ    $
6EF8 E602      01940          AND     2
6EFA 28F7      01950          JR      Z,OVER30        ;LOOP UNTIL <CLEAR>
6EFC 21003C    01960          LD      HL,3C00H        ;CLEAR SCREEN
6EFF 11013C    01970          LD      DE,3C01H
6F02 3680      01980          LD      (HL),128
6F04 01FF03    01990          LD      BC,1023
6F07 EDB0      02000          LDIR
6F09 C3E06D    02010          JP      GAME            ;DO IT
6F0C DD7E2F    02020 TEST8    LD      A,(IX+47)       ;BUG HIT?
6F0F B7        02030          OR      A
6F10 C8        02040          RET     Z               ;RETURN IF NOT
6F11 DD362F00 02050           LD      (IX+47),0       ;RESET FLAG
6F15 3A0C64    02060          LD      A,(TEMPW+1)     ;SHOT FIRED?
6F18 B7        02070          OR      A
6F19 C8        02080          RET     Z               ;RETURN IF NOT
6F1A C3DF64    02090          JP      TEST7           ;BUG HIT SUB
6F1D 1E20      02100 PAUSE    LD      E,20H
6F1F 0E40      02110 PAUSEA   LD      C,40H           ;SOUND
6F21 43        02120 PAUSEB   LD      B,E
6F22 CD8A61    02130          CALL    SOUNDX
6F25 10FE      02140          DJNZ    $
6F27 0D        02150          DEC     C
6F28 20F7      02160          JR      NZ,PAUSEB
6F2A 43        02170          LD      B,E
6F2B 10FE      02180          DJNZ    $
6F2D 1D        02190          DEC     E
6F2E 20EF      02200          JR      NZ,PAUSEA
6F30 21803C    02210          LD      HL,3C80H        ;STORE LINE
6F33 11776F    02220          LD      DE,BUFFER
6F36 014000    02230          LD      BC,64
6F39 EDB0      02240          LDIR
6F3B 21B76F    02250          LD      HL,MESS         ;DISPLAY MESSAGE
6F3E 11803C    02260          LD      DE,3C80H
6F41 014000    02270          LD      BC,64
6F44 EDB0      02280          LDIR
6F46 3A4038    02290 PAUSE1   LD      A,(3840H)
6F49 10FE      02300          DJNZ    $
6F4B E602      02310          AND     2
6F4D 28F7      02320          JR      Z,PAUSE1        ;LOOP UNTIL <CLEAR>
6F4F 21776F    02330          LD      HL,BUFFER       ;RESTORE LINE
6F52 11803C    02340          LD      DE,3C80H
6F55 014000    02350          LD      BC,64
6F58 EDB0      02360          LDIR
6F5A 010020    02370          LD      BC,2000H        ;DELAY
6F5D CD6000    02380          CALL    60H
6F60 1E20      02390          LD      E,20H           ;MORE SOUND
6F62 0E20      02400 PAUSE2   LD      C,20H
6F64 7B        02410 PAUSE3   LD      A,E
6F65 ED44      02420          NEG
```

```
Listing 3 continued

6F67 47          02430          LD          B,A
6F68 CD8A61      02440          CALL        SOUNDX
6F6B 10FE        02450          DJNZ        $
6F6D 0D          02460          DEC         C
6F6E 20F4        02470          JR          NZ,PAUSE3
6F70 43          02480          LD          B,E
6F71 10FE        02490          DJNZ        $
6F73 1D          02500          DEC         E
6F74 20EC        02510          JR          NZ,PAUSE2
6F76 C9          02520          RET
0040             02530 BUFFER   DEFS        64
6FB7 2A          02540 MESS     DEFM        '* * * * * * * * PAUSE --- Press <CLEAR> to pl
ay * * * * * * * *'
6FF6 20          02550 MESS10   DEFM        ' GAME OVER '
7001 20          02560 MESS20   DEFM        ' Press <CLEAR> to play again '
6DDD             02570          END         ENTRY
00000 TOTAL ERRORS
29367 TEXT AREA BYTES LEFT

ADD1    65C0 00130
ADD2    663A 00140
ADD3    66B4 00150
ADDBMB  6BFB 00160
ATTACK  6AB8 00170
BASEM   6463 00180          00760
BOMBS   63EB 00190          01010 01020
BOOM    69E9 00200
BUFFER  6F77 02530          02220 02330
BUG1    6359 00210          00910 00920
BUG2    6389 00220
BUG3    63B9 00230
CONT    6EAE 01610          01500
CONT10  6EBB 01660          01680
DISSCR  6203 00240          00790 00820 00850
DRAW    690D 00250          02570
ENTRY   6DDD 00610          00960 00970
EXPTAB  6590 00260
FLASH   6CCD 00570          02010
GAME    6DE0 00620          00840
HIGH    624F 00270
INCSCR  6235 00280          00620
INIT    62D9 00290          00610 00680
INTRO   61BC 00300          00670
LEVEL   6A50 00310
LEVTAB  6AA4 00320          01600
LOOPMN  6E80 01210          01510
LOOPX0  6E82 01220          01310
MBASE   640D 00330
MBOMB   6C57 00340          02250
MESS    6FB7 02540          01700
MESS10  6FF6 02550          01740
MESS20  7001 02560
MINUS1  656C 00350
MOVEB1  695D 00360          01340
MOVEB2  6970 00370          01470 01690
MOVEB3  6983 00380
MSHOT   6494 00390          01910
NEXT    6E38 00910          01790
ONE     6AB4 00400          01870
OVER05  6EDA 01790          01800
OVER10  6EDC 01800          01850
OVER20  6EDE 01810          01950
OVER30  6EF3 01920          00630 00740
PARAMS  6259 00410          01590
PAUSE   6F1D 02100          02320
PAUSE1  6F46 02290          02510
PAUSE2  6F62 02400          02470
PAUSE3  6F64 02410          02200
PAUSEA  6F1F 02110          02160
PAUSEB  6F21 02120          00690 00700 00780
SCORE   6253 00420          00710 00730 00810 01630
SHIPS   6568 00430

SHOT    63E9 00440  01070
SOUND1  6487 00450  01350
SOUND2  6B56 00460
SOUND3  6BE4 00470
SOUND4  6CAB 00480
SOUNDI  6CF4 00580
SOUNDX  618A 00490  01840 02130 02440
START   6D1B 00590
TEMPW   640B 00500  01680 02060
TEST    6B20 00510
TEST2   6B74 00520
TEST3   6B9B 00530
TEST5   6BC1 00540
TEST6   6CB6 00550
TEST7   64DF 00560  02090
TEST8   6F0C 02020
```


CRAYON DELUXE & SCRIPTR — ⅓ OFF SALE !!!

The word processor of the future is here today and at an affordable price! **Crayon Deluxe** is a complete Bit-Image word/graphics processor which creates stunning visual effects using custom text and graphics. No matter which word processing system you now use, **Crayon Deluxe** 2.0 does all the things your word processor can't! ***(Deluxe Version 1.0 while they last - $40.00 with 2 fonts!)***

- *Specialty Fonts & Shapes*
- *Standard Text Processing*
- *Just., Block Moves & Word Wrap*
- *Prints All Foreign Languages*
- *18K Full Screen Editor (Z-80)*
- *Full & ½ Page Scrolling*
- *Superb Manual W/Examples*
- *18K Font Design Utility (Z-80)*
- *Custom Logos (Newscript)*
- *Cartoons & Basic Screens*
- *Programmable Centering*
- *No Wait Printing! (logic seeking)*
- *24,000 Character Library*
- *True Mirror Images*
- *Easy To Learn & Use*
- *Super Fast Text Entry*
- *Multiple Mail Labels*
- *Hang. Indents, Bibl. & Outlines*
- *Prints as Shown On Screen*
- *Line Drawing Graphics*
- *19 User Def Chars 1 Keystroke*
- *Automatic Wide Entry Mode*
- *3 User Selectable Underlines*
- *Business Forms & Graphs*
- *Draws Angles, Patterns & Lines*
- *Inversions Mid-Line*
- *Chars. To 40 × 127 Dots*
- *Custom Borders & Graphics*
- *3 Programmable Tab Lines*
- *Tone Beeps & Signals*
- *3 User Selectable Overlays*
- *Sub & Superscripting*

***AVAILABLE FOR All MX + FX** printers with **Graphtrax** -* All **PROWRITER** and **8510A** and **NEC 8023** and All **GEMINI 10+15.** Comes with 130 page loose leaf manual, Fontmaker Utility, 5 fonts (1500 characters). **PRICE = $150.00 $99.00 Disk Mod 1,3,4. + $4 Ship. & Hand.**

Brush	*Heritage*	*Digital*	*Outline*	*Borders*	*Shapes*
RST	ABCabc	ABCDEF	def		ACME

Scriptr - Turns **Scriptsit** into a full word processing system by providing complete printer support for the following printers **MX 80 + FX 80 - LP-4+8 — DMP 200+400 — DW2 — PROWRITER — CIOTH 8510A — GEMINI — MICROLINE — FEATURES** on most versions include Emphasized, Double Strike, access all available typestyles, change character widths, sub and super script, pausing, dot linespacing changes, Editing, Macro's, DOS Reentry, Send any Code to printer, Supports (ALL ***Graphtrax*** Functions, — most **Mid-Line), DIAL-A-PRINT,** Form Letters, Print to video only for trial pagination and much much more. Available with versions for **Models 1,3,4 on DISK/CASSETTE for $40.00** with teaching programs and a 66 page manual. ***(Print samples available on request)***

Free Brochures **PIONEER SOFTWARE** **(✓) 160**

1746 N.W. 55th AVE. No. 204 Lauderhill, FL 33313 Phone: (305) 739-2071 Checks/Money Orders/COD's accepted

✓ See List of Advertisers on Page 227

by Mark D. Goodwin

REDEVELOPMENT PROGRAM

Here's a simple utility that converts Model III Basic programs to Model 4 format and pinpoints potential trouble spots, too.

Converting Model III Basic programs to run on your Model 4 can be tedious; the most time-consuming process is inserting spaces to delimit Basic keywords. I wrote a handy utility, Convert, that does the work for you. Convert not only delimits Basic keywords with spaces, it also cross-references and lists all errors and potential errors in the converted program (see the Program Listing).

Using Convert

You can easily assemble Convert with an editor/assembler. Because of the program's length, you should carefully check your work for typographical errors. Once you're sure no errors exist, make copies of the source and object codes. Produce a copy of the object code on a TRSDOS 6.0 disk and name it Convert.

In Basic format, save any program you want to convert (SAVE"MYPROG"). Once saved, move it to a TRSDOS 6.0 disk that contains the Convert program. If your Model III program is on a TRSDOS 1.3 disk, you can move it with the TRSDOS 6.0 CONV command. If saved on an LDOS 5.1 disk, you can move it with the TRSDOS 6.0 Copy command. Once you successfully move the program, you're ready to use Convert to generate Model 4 Basic code.

At TRSDOS Ready, type in CONVERT MYPROG. Convert automatically saves the converted program to the same name and sends a cross-referenced list to the video display. If you type in CONVERT MYPROG (P=Y), Convert translates the program MYPROG and sends a cross-referenced listing to the printer. Typing CONVERT MYPROG (X=N) converts the program MYPROG with no cross-referenced list or printout.

Error Cross-Referencing

The Figure illustrates a typical cross-referenced list. The first column indicates a command-word error. The second column indicates whether the error is fatal (*) or potential (?). Line numbers in which there are errors appear adjacent to the appropriate command error. If a line appears more than once in a row, that line has multiple errors.

The Key Box

Model 4
32K RAM
Assembly Language
Editor/Assembler

Command	Model III Basic	Model 4 Basic
Clear	Erases all variables and reserves string space	Erases all variables and reserves high memory
CLOAD	Loads a Basic program from the cassette recorder	Does not support cassette operations
CMD	Provides miscellaneous routines	Does not recognize
CSAVE	Saves a Basic program on the cassette recorder	Does not support cassette operations
ERR	Incompatible error codes	Incompatible error codes
Error	Incompatible error codes	Incompatible error codes
For	Loops once before checking validity of For...To values	Checks validity of For...To values before attempting to loop
If	Then is optional in an If...Then statement	Then is required in an If...Then statement
INP	Incompatible port assignments	Incompatible port assignments
Input	Can read data from the cassette recorder	Does not support cassette operations
Name	Various uses	Does not recognize
Out	Incompatible port assignments	Incompatible port assignments
PEEK	Incompatible memory map	Incompatible memory map
Point	Tests graphics pixel	Does not recognize
POKE	Incompatible memory map	Incompatible memory map
POS	64-by-16 screen format	80-by-24 screen format
Print	Can write data to the cassette recorder 64-by-16 screen format	Does not support cassette operations 80-by-24 screen format
Reset	Resets a graphics pixel	Does not recognize
Set	Sets a graphics pixel	Does not recognize
System	Loads machine-language object code files from the cassette recorder	Executes TRSDOS commands and returns to TRSDOS
USR	Can call a ROM routine	Incompatible memory map

Table. Model III and Model 4 commands compared.

For example, in the Figure you see a potential error cited in line 00010 concerning the clear statement. Lines 00100, 00200, 00300, and 00400 all have fatal errors regarding the set statement, and line 00300 has two such errors.

The Table lists the command errors the Convert program finds and explains their different meanings in Model III and Model 4 Basic. ■

Write to Mark D. Goodwin at Star Route 79, Box 103, Orland, ME 04472.

```
CLEAR   ?   00010
SET     *   00100   00200   00300   00300   00400
```

Figure. A sample cross-referenced list. Column one indicates command-word error, column two indicates a potential (?) or fatal (*) error, and the third column shows line numbers in which these errors appear.

Program Listing. Convert.

```
00100          TITLE   '<Convert 1.0.0>'
00110 ;
00120 ;
00130 ; Model III to Model 4 Basic Program Conversion Utility 01.00.00
00140 ; BY MARK D. Goodwin
00150 ;
00160 ;
00170 ; EQUates for TRSDOS 6.0 Supervisor Calls
00180 ;
00190 @BREAK   EQU     103
00200 @CLOSE   EQU     60
00210 @DSP     EQU     2
00220 @DSPLY   EQU     10
00230 @ERROR   EQU     26
00240 @EXIT    EQU     22
00250 @FLAGS   EQU     101
00260 @FSPEC   EQU     78
00270 @GET     EQU     3
00280 @HEXDEC  EQU     97
00290 @HIGH$   EQU     100
00300 @KEY     EQU     1
00310 @KEYIN   EQU     9
00320 @OPEN    EQU     59
00330 @PARAM   EQU     17
00340 @PAUSE   EQU     16
00350 @PRINT   EQU     14
00360 @PRT     EQU     6
00370 @PUT     EQU     4
00380 ;
00390 ; Supervisor Call Macro
00400 ;
00410 SVC      MACRO   #SVC
00420          LD      A,#SVC
00430          RST     28H
00440          ENDM
00450 ;
00460 ; 16-Bit Comparison Macro
00470 ;
00480 CMP      MACRO   #CMP0,#CMP1,#CMP2,#CMP3
00490          LD      A,#CMP0
00500          SUB     #CMP2
00510          JR      NZ,CMP?
00520          LD      A,#CMP1
00530          SUB     #CMP3
00540 CMP?     DEFL    $
00550          ENDM
00560 ;
00570 ; Get a Byte and Auto Increment Macro
00580 ;
00590 INX      MACRO   #INX0,#INX1
00600          LD      #INX0,(#INX1)
00610          INC     #INX1
00620          ENDM
00630 ;
00640 ; Reserved Words List Entry Macro
00650 ;
00660 WORD     MACRO   #WORD1,#WORD2
00670          IFEQ$   #WORD2,''
00680          DB      #WORD1+80H
00690          ELSE
00700          DB      #WORD1+80H,#WORD2
00710          ENDIF
00720          ENDM
00730 ;
00740 ; Program Initialization Routine
00750 ;
00760          ORG     3000H
00770 START    LD      (STACK),SP      ;Save the stack pointer.
00780          LD      (TEXPNT),HL     ;Save the DOS command line pointer.
00790          PUSH    HL              ;Save it on the stack also.
00800          SVC     @FLAGS          ;IY=System flags pointer.
00810          RES     0,(IY+10)       ;Flag no BREAK.
00820          RES     4,(IY+18)       ;Enable BREAK.
00830          LD      HL,ERROR3       ;HL=BREAK vector.
00840          SVC     @BREAK          ;Set the BREAK vector.
00850          LD      HL,0            ;HL=Get request flag.
```

Listing continued

Creative Computer

"Everything for your computer."

Ribbons

PRINTER Radio Shack Printers	RIBBONS Ribbon EZ Reload
Daisy Wheel II	10 for $24.95
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	
MX-70/80/80/F/T	3 for $16.95
MX-100	3 for $18.95
CENTRONICS	
700/730/737/739/779 (Zip Pak)	4 for $18.95
CITOH	
Prowriter	3 for $13.95

Radio Shack Printers	Cartridges
Daisy Wheel II	3 for $29.95 (Reloadable)
Black	6 for $29.95 (DW II Only) (Non-Reloadable)
EPSON/IBM	**EPSON BRAND**
MX-70/80/80/F/T	$16.95 each
MX-100	$21.95 each
OKIDATA	
80-82-83	4 for $13.95
84	2 for $12.95
CITOH	
Prowriter	3 for $16.95
COMTREX II	3 for $16.95
BROTHER II	3 for $16.95
SILVER REED 550	
Single Strike	3 for $16.95
Multi Strike	3 for $29.95

CALL TOLL FREE:
1-800-327-9294
FLORIDA RESIDENTS CALL:
1-305-894-0789

WRITE FOR OUR FREE CATALOG

Our 1984 catalog is now available and includes over 1000 items, including:

- diskettes
- paper
- labels
- ribbon
- checks
- storage boxes
- furniture
- binders
- and a wide assortment of hardware.

Add $2.00 for shipping on orders less than $30.00. Florida residents add 5% sales tax.

Most orders shipped within 24 hours. Personal checks please allow 10-14 days for delivery. We make mail order shopping easy by accepting Visa, MasterCard, American Express, Cashiers Checks, Bank Wires, and C.O.D. shipments.

CREATIVE COMPUTER
Department 80
1236 E. Colonial Drive
Orlando, FL 32803
(305) 894-0789

190

MasterCard VISA

See List of Advertisers on Page 227

Save 44% off the newsstand price!

RUN

THESE COULD BE THE KEYS TO YOUR FUTURE

Unlock *all* the potential of your Commodore 64 and VIC-20* with **RUN**.

Explore . . . Experiment . . . Enjoy . . . Beginner and expert alike will be taken beyond the manual to the limits of their abilities. Enter your own game programs. Construct a simple hardware add-on. Broaden your scope with unique applications . . . And . . . get a 13th issue FREE!

Enjoy key features like these:

- Games for fun & strategy.
- Programming tips help you learn short cuts.
- Candid reviews help you make money-saving decisions.
- Programs to add to your library.
- Instructions & tutorials to increase your skills.
- Hardware & software modifications help your machine work smart.
- Unique applications broaden your scope.

Here's a system-specific magazine written with you in mind. Written by and for the reader to give time-saving, money-saving hints. You'll get instructions and tutorials to increase your skills, and candid reviews to help you make the right decisions. Most of all though, you'll have fun.

Commodore 64 and VIC-20 owners are one of the largest groups of computerists today. Enjoy the benefits of this with your own magazine. Be in control like never before. Order **RUN** today and get a 13th issue free with your prepaid order (check or credit card) of only $19.97. Send in the coupon or call toll free *1-800-258-5473*. In N.H. call *1-924-9471*.

*Send me a subscription to **RUN** for the regular subscription price of only $19.97 per year. I understand that with payment enclosed or credit card order I will receive a FREE issue making a total of 13 issues for $19.97.*

☐ *CHECK/MO* ☐ *MC* ☐ *AE* ☐ *VISA* ☐ *BILL ME*

card #_____ exp. date _____

signature _____

name _____

address _____

city _____ state _____ zip _____

Canada & Mexico $22.97; Foreign Surface $39.97, 1 year only, US funds drawn on US bank. Foreign airmail, please inquire. Please allow 6 to 8 weeks for delivery.

RUN • Box 954 • Farmingdale, NY 11737

344F3

*Commodore 64 and VIC-20 are registered trademarks of Commodore Business Machines, Inc.

Listing continued

```
00860           LD      B,H             ;B=HIGH$ flag.
00870           SVC     @HIGH$          ;HL=HIGH$.
00880           LD      (HIGH$),HL      ;Save it.
00890           DEC     HL              ;Subtract
00900           DEC     HL              ;  three from
00910           DEC     HL              ;    the HIGH$.
00920           LD      (HIGH$1),HL     ;Save it.
00930           POP     HL              ;HL=DOS command line pointer.
00940 START0    LD      A,(HL)          ;A=Next character.
00950           CP      32              ;Control code or space?
00960           JR      C,START2        ;Jump if it's a control code.
00970           JR      Z,START1        ;Jump if it's a space.
00980           INC     HL              ;Bump the pointer.
00990           JR      START0          ;Loop till control code or space.
01000 START1    INC     HL              ;Bump the pointer.
01010           LD      A,(HL)          ;A=Next character.
01020           CP      32              ;Control code or space?
01030           JR      C,START2        ;Jump if it's a control code.
01040           JR      Z,START1        ;Loop if it's a space.
01050           LD      DE,PARTAB       ;DE=Parameter table pointer.
01060           SVC     @PARAM          ;Parse the parameters.
01070           JP      NZ,ERROR5       ;Jump if bad parameter.
01080           LD      A,(PAR1)        ;A=XREF type code.
01090           AND     0A0H            ;Mask it.
01100           JP      NZ,ERROR5       ;Jump if it wasn't a flag.
01110           LD      A,(PAR2)        ;A=PRINT type code.
01120           AND     0A0H            ;Mask it.
01130           JP      NZ,ERROR5       ;Jump if it wasn't a flag.
01140           LD      A,(PPFLG)       ;A=PRINT response.
01150           LD      (PPFLG0),A      ;Save it.
01160           LD      (PPFLG1),A      ;Save it.
01170 START2    CALL    LOAD            ;Load the program.
01180           CALL    SYMBOL          ;Cross reference the program.
01190           CALL    SAVE            ;Save the new program.
01200           LD      SP,0            ;Restore the stack pointer.
01210 STACK     EQU     $-2
01220           LD      HL,0            ;HL=No JCL abort.
01230           DB      0DDH            ;Dummy LD IX,NNNN opcode.
01240 ABORT     LD      HL,0FFFFH       ;HL=Abort JCL flag.
01250           PUSH    HL              ;Save the flag.
01260           LD      HL,0            ;HL=Reset system BREAK vector flag.
01270           SVC     @BREAK          ;Reset the system BREAK vector.
01280           POP     HL              ;Get the flag.
01290           SVC     @EXIT           ;Abort/Exit to TRSDOS.
01300 ;
01310 ; Load Basic Program Routine
01320 ;
01330 LOAD      LD      HL,M3           ;HL=Message pointer.
01340           SVC     @DSPLY          ;Display it.
01350           LD      HL,0            ;HL=Filespec pointer.
01360 TEXPNT    EQU     $-2
01370           LD      DE,FCB          ;DE=FCB pointer.
01380           SVC     @FSPEC          ;Put the filespec into the FCB.
01390           LD      A,19            ;A=Illegal file name error code.
01400           JP      NZ,ERROR        ;Jump if bad file name.
01410           CALL    OPEN            ;Open the file.
01420           CALL    GET             ;Get the header byte.
01430           JR      NZ,LOAD1        ;Jump if it's the end of file.
01440           INC     A               ;Binary file header?
01450           JP      NZ,ERROR0       ;Jump if it isn't.
01460 LOAD0     CALL    GET             ;Get a byte.
01470           JR      NZ,LOAD1        ;Jump if it's the end of file.
01480           LD      (HL),A          ;Save the byte.
01490           INC     HL              ;Bump the buffer pointer.
01500           LD      BC,0            ;BC=End of buffer pointer.
01510 HIGH$     EQU     $-2
01520           CMP     H,L,B,C         ;Buffer full?
01530           JR      C,LOAD0         ;Loop if not.
01540           JP      ERROR1          ;Jump if it is.
01550 LOAD1     LD      (ENDBUF),HL     ;Save the end of program pointer.
01560           SVC     @CLOSE          ;Close the file.
01570           RET                     ;Return.
01580 ;
01590 ; Save Basic Program Routine
01600 ;
```

```
01610 SAVE      LD      HL,M4           ;HL=Message pointer.
01620           SVC     @DSPLY          ;Display it.
01630           CALL    OPEN            ;Open the file.
01640 SAVE0     INX     A,HL            ;Get LSB of line pointer.
01650           OR      (HL)            ;End of program?
01660           INC     HL              ;Bump pointer.
01670           JR      NZ,SAVE1        ;Jump if it isn't.
01680           LD      DE,FCB          ;DE=FCB pointer.
01690           SVC     @CLOSE          ;Close the file.
01700           RET                     ;Return.
01710 SAVE1     INX     E,HL            ;E=LSB of line number.
01720           INX     D,HL            ;D=MSB of line number.
01730           CALL    HEXDEC          ;Convert it to ASCII.
01740           LD      DE,CONBUF       ;DE=ASCII string pointer.
01750 SAVE2     INX     A,DE            ;A=String character.
01760           CP      32              ;Control code or space?
01770           JR      C,SAVE3         ;Jump if it's a control code.
01780           CALL    NZ,PUT          ;Save it if it isn't a space.
01790           JR      SAVE2           ;Loop till end of string.
01800 SAVE3     LD      A,32            ;A=Space.
01810           CALL    PUT             ;Save it.
01820 SAVE4     INX     A,HL            ;A=Next program character.
01830           OR      A               ;Token or end of line?
01840           JP      M,SAVE15        ;Jump if it's a token.
01850           JR      NZ,SAVE6        ;Jump if it isn't the end of line.
01860 SAVE5     LD      A,13            ;A=Carriage return.
01870           CALL    PUT             ;Save it.
01880           JR      SAVE0           ;Loop till end of program.
01890 SAVE6     CP      ':'             ;Colon?
01900           JR      Z,SAVE9         ;Jump if it is.
01910           CP      '"'             ;Quote?
01920           JR      NZ,SAVE8        ;Jump if it isn't.
01930 SAVE7     CALL    PUT             ;Save the character.
01940           INX     A,HL            ;A=Next character.
01950           OR      A               ;End of line?
01960           JR      Z,SAVE5         ;Jump if it is.
01970           CP      '"'             ;Quote?
01980           JR      NZ,SAVE7        ;Loop if not.
01990 SAVE8     CALL    PUT             ;Save the character.
02000           JR      SAVE4           ;Loop till end of line.
02010 SAVE9     LD      A,(HL)          ;A=Next character.
02020           CP      149             ;ELSE token?
02030           JR      Z,SAVE14        ;Jump if it is.
02040           CP      147             ;REM token?
02050           JR      NZ,SAVE11       ;Jump if it isn't.
02060           PUSH    HL              ;Put program pointer on stack.
02070           POP     IX              ;IX=Program pointer.
02080           LD      A,(IX+1)        ;A=Next character.
02090           CP      0FBH            ;' token?
02100           JR      NZ,SAVE11       ;Jump if it isn't.
02110           INC     HL              ;Bump the program pointer.
02120           INC     HL              ;Bump the program pointer.
02130           LD      A,27H           ;A='.
02140           CALL    PUT             ;Save it.
02150 SAVE10    INX     A,HL            ;A=Next character.
02160           OR      A               ;End of line.
02170           JR      Z,SAVE5         ;Jump if it is.
02180           CALL    PUT             ;Save the character.
02190           JR      SAVE10          ;Loop till end of line.
02200 SAVE11    LD      A,':'           ;A=Colon.
02210           CALL    PUT             ;Save it.
02220           JR      SAVE4           ;Jump.
02230 SAVE12    LD      A,(HL)          ;A=Next character.
02240           CP      32              ;Space?
02250           LD      A,32            ;A=Space.
02260           CALL    NZ,PUT          ;Save space if it wasn't one.
02270 SAVE13    INX     A,HL            ;A=Next character.
02280           OR      A               ;End of line?
02290           JR      Z,SAVE5         ;Jump if it is.
02300           CP      ':'             ;Colon?
02310           JR      Z,SAVE9         ;Jump if it is.
02320           CALL    PUT             ;Save the character.
02330           JR      SAVE13          ;Loop till end of line or colon.
02340 SAVE14    INC     HL              ;Bump the program pointer.
02350 SAVE15    CP      251             ;Is it a real token?
```

Listing continued

MISOSYS

PRO-fessional Software for Model 4

CESS PRO-CESS: A maintenance tool for CMD files. Allows you to append 2 or more files, reorganize, and offset. Extract LIB members. $40

CREATE PRO-CREATE: editor and assembler gives nested MACROs, includes, and conditionals. A powerful tool that is easy to use. $100

CURE PRO-CURE: Transfer files to DOS 6.x from selected CP/M media. Supports Xerox, IBM, Kaypro, Lobo, Osborn, etc. formats. $50

DUCE PRO-DUCE: Disassemble directly from disk files or memory. Source output generates 100% labels and handles data. $40

GENY PRO-GENY: A 4-function utility package loaded with power: DOCONFIG; MEMDIR; PARMDIR; and SWAP. A must for JCL users. $40

HELP PRO-HELP: On-line reference card at your fingertips. Screens for DOS and BASIC. Create your own custom HELP files, too. $25

LC PRO-LC: This is our C-language compiler now compatible with DOS 6.x. Includes the PRO-CREATE macro-assembler package. $150

MACH2 PRO-MACH2: Provides total user control over DOS allocation of file space. Includes MAPPER, ALLOC, CALC, and HANDY. $40

PaDS PRO-PaDS: A utility to build and maintain partitioned data sets. Collect small programs into one and save disk space. $40

ZCAT PRO-ZCAT: A menu-driven diskette catalog program. Handles 255 disks and up to 2226 files per catalog file. Fast! $30

ZGRAPH PRO-ZGRAPH: A pixel-graphics screen editor used to create screen images for BASIC, ASM programs, or printing. $50

THE PROGRAMMER'S GUIDE TO TRSDOS VERSION 6, by Roy Soltoff is the definitive answer to interfacing the DOS. Six chapters and Appendix with three complete filters in ASM source. $20

U.S Shipping: PRO:LC, $5; PRO-CREATE, $4; All others $2. COD add $1.50. VA add 4%. VISA/MC.

MISOSYS, INC

P.O. Box 4848 - Dept M
Alexandria, Virginia 22303-0848
703-960-2998
Dealer Inquiries Invited

TRSDOS is a trademark of Tandy Corp.

✓107

DISnDATa

The Only Disassembler That Even Tracks Down DATA!!!

- Outputs: instead of the meaningless "equivalent",

```
" H37F7  DEFM 'Cass? '          " AB25  LD   B,E
         DEFB 03H       "               LD   H,C
                                        LD   (HL),E
                                        LD   (HL),E
                                        CCF
                                        JR   NZ,$+5    ", etc.
```

- **AUTOMATICALLY** identifies such data areas.
- Outputs fully-labeled Radio Shack* or APPARAT** EDTASM*-format code to display, printer, cassette, or disk. (Printer output fully paginated.)
- Relocates itself to any desired RAM area, up or down by as little as one byte or as many as required.
- Loads programs from cassette or disk and displays entry points.
- Runs on TRS-80 Model I (Level II), Model III, or Model 4 (in Model III mode), 16K or more, cassette or disk.

#1354-12 (Model I/III cassette, Version 2) $34.95
#1354-22 (Model III/4 diskette, TRSDOS* format, Version 2) $39.95

* Registered Trademark, Tandy Corp. ** Registered Trademark, APPARAT, Inc.

REPLiCAS

- Copies virtually **all** formats of cassette files!!!
- **AUTOMATICALLY** senses input cassette density!!! (Model III)
- Allows Mod. III user selection of output density, each file.

#1366-10 (Model I/III cassette) $19.95

Professional Software for both Novice and Expert

Pro/Am Software

To order, phone (513) 435-4480 (M-F, 9 a.m. - 5 p.m. EST), or send check or money order to

Pro/Am Software
220 Cardigan Road
Centerville, Ohio 45459

✓260

Visa and MasterCard accepted. When ordering via card include card number, expiration date, your name, address and phone number.

U.S. Funds only. Add $2.00 shipping (U.S.) $5.00 (overseas) per item.
C.O.D. orders $3.00 additional per item.
Ohio residents please add 6% Sales Tax.

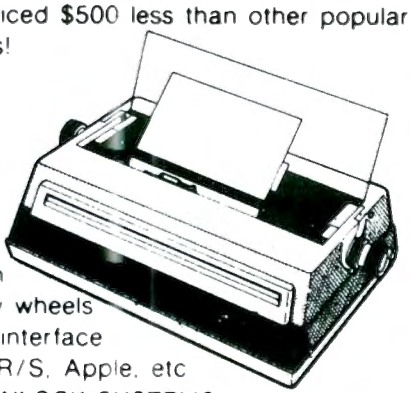
DAISY WHEEL

New Smith Corona TP-1 I

True letter quality printer for less than the cost of an office typewriter! Priced $500 less than other popular daisy wheel printers!

SALE PRICE:

$299



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

✓456

ADDITIONAL PRINTER SPECIALS

Epson		Okidata		Gemini		C.Itoh	
RX80	$299	82A	$359	10	$279	8510AP	$369
80FT	369	83A	569	10S	339	1550P	629
FX80	529	92	429	15	409	F10-40	1099
FX100	649	93	699	15S	469	F10-55	1399

WE WILL MEET ANY ADVERTISED COST IN-STOCK

TO ORDER CALL TOLL FREE 800-368-9191

In Virginia call 804-321-9191

We accept MasterCard, Visa and CODs

Listing continued

```
02360           JR      NC,SAVE8        ;Jump if not.
02370           LD      B,A             ;B=Token.
02380           XOR     A               ;Zero A.
02390           LD      (SPCFLG),A      ;Flag spaces.
02400           LD      (REMFLG),A      ;Flag no REM.
02410           LD      (DATFLG),A      ;Flag no DATA.
02420           LD      A,B             ;A=Token.
02430           CP      147             ;REM token?
02440           JR      NZ,SAVE16       ;Jump if it isn't.
02450           LD      (REMFLG),A      ;Flag REM.
02460 SAVE16    CP      136             ;DATA token.
02470           JR      NZ,SAVE17       ;Jump if it isn't.
02480           LD      (DATFLG),A      ;Flag DATA.
02490 SAVE17    CP      130             ;RESET token?
02500           JR      Z,SAVE18        ;Jump if it is.
02510           CP      131             ;SET token?
02520           JR      Z,SAVE18        ;Jump if it is.
02530           CP      188             ;TAB( token?
02540           JR      Z,SAVE18        ;Jump if it is.
02550           CP      191             ;Token < a USING token?
02560           JR      C,SAVE19        ;Jump if it is.
02570           CP      202             ;Token < a THEN token?
02580           JR      C,SAVE18        ;Jump it it is.
02590           CP      205             ;Token < a + token?
02600           JR      C,SAVE19        ;Jump if it is.
02610           CP      210             ;Token < an AND token?
02620           JR      C,SAVE18        ;Jump if it is.
02630           CP      212             ;Token < a > token?
02640           JR      C,SAVE19        ;Jump if it is.
02650 SAVE18    LD      (SPCFLG),A      ;Flag no spaces.
02660 SAVE19    SUB     80H             ;A=Token counter.
02670           LD      B,A             ;B=Token counter.
02680           LD      A,(SPCFLG)      ;A=Spaces flag.
02690           OR      A               ;Spaces?
02700           JR      NZ,SAVE20       ;Jump if not.
02710           LD      A,(SPACE)       ;A=Space flag.
02720           OR      A               ;Last character a space?
02730           LD      A,32            ;A=Space.
02740           CALL    Z,PUT           ;Save a space if it wasn't one.
02750 SAVE20    LD      DE,TABLE        ;DE=Reserved words list table pointer.
02760           INC     B               ;Bump the token counter.
02770 SAVE21    DEC     B               ;Reserved word found?
02780           JR      Z,SAVE23        ;Jump if it is.
02790 SAVE22    INC     DE              ;Bump the table pointer.
02800           LD      A,(DE)          ;A=Table character.
02810           OR      A               ;1st character of a word?
02820           JP      M,SAVE21        ;Jump if it is.
02830           JP      SAVE22          ;Loop till next word found.
02840 SAVE23    LD      A,(DE)          ;A=1st character of word.
02850           AND     7FH             ;Mask it.
02860           CALL    PUT             ;Save it.
02870 SAVE24    INC     DE              ;Bump the table pointer.
02880           LD      A,(DE)          ;A=Table character.
02890           OR      A               ;1st character of next word?
02900           JP      M,SAVE25        ;Jump if it is.
02910           CALL    PUT             ;Save it.
02920           JR      SAVE24          ;Loop till start of next word.
02930 SAVE25    LD      A,0             ;A=REM flag.
02940 REMFLG    EQU     $-1
02950           OR      A               ;REM token?
02960           JP      NZ,SAVE10       ;Jump if it was.
02970           LD      A,0             ;A=DATA flag.
02980 DATFLG    EQU     $-1
02990           OR      A               ;DATA token?
03000           JP      NZ,SAVE12       ;Jump if it was.
03010           LD      A,(SPCFLG)      ;A=Spaces flag.
03020           OR      A               ;Spaces?
03030           JP      NZ,SAVE4        ;Jump if not.
03040           LD      A,(HL)          ;A=Next character.
03050           CP      32              ;Space?
03060           JP      Z,SAVE4         ;Jump if it is.
03070           CP      ':'             ;Colon?
03080           JP      Z,SAVE4         ;Jump if it is.
03090           OR      A               ;End of line?
03100           JP      Z,SAVE4         ;Jump if it is.
03110           JP      SAVE3           ;Loop.
03120 ;
03130 ; Cross Reference Routine
03140 ;
03150 SYMBOL    LD      HL,0FFFFH       ;HL=XREF flag.
03160 XREF      EQU     $-2
03170           LD      A,H             ;Do
03180           OR      L               ;  XREF?
03190           RET     Z               ;Return if not.
03200           LD      HL,M2           ;HL=Message pointer.
03210           SVC     @DSPLY          ;Display it.
03220           LD      HL,0            ;HL=End of program pointer.
03230 ENDBUF    EQU     $-2
03240           LD      (NEXSYM),HL     ;Save it as next available location.
03250           LD      HL,BUFFER       ;HL=Start of program pointer.
03260 SYM0      INX     A,HL            ;A=LSB of line pointer.
03270           OR      (HL)            ;End of program?
03280           INC     HL              ;Bump the pointer.
03290           JR      Z,SYM10         ;Jump if it's the end of program.
03300 SYM1      INX     E,HL            ;E=LSB of line number.
03310           INX     D,HL            ;D=MSB of line number.
03320           LD      (CURLIN),DE     ;Save the line number.
03330 SYM2      INX     A,HL            ;A=Next character.
03340           OR      A               ;End of line?
03350           JR      Z,SYM0          ;Loop if it is.
03360           CP      '"'             ;Quote?
03370           JR      NZ,SYM4         ;Jump if it isn't.
03380 SYM3      INX     A,HL            ;A=Next character.
03390           OR      A               ;End of line.
03400           JR      Z,SYM0          ;Loop if it is.
03410           CP      '"'             ;Quote?
03420           JR      NZ,SYM3         ;Loop if it isn't.
03430           JR      SYM2            ;Loop.
03440 SYM4      OR      A               ;Token?
03450           JP      P,SYM2          ;Loop if it isn't.
03460           CP      147             ;REM token?
03470           JR      NZ,SYM6         ;Jump if it isn't.
03480 SYM5      INX     A,HL            ;A=Next character.
03490           OR      A               ;End of line?
03500           JR      NZ,SYM5         ;Loop if it isn't.
03510           JR      SYM0            ;Loop.
03520 SYM6      CP      136             ;DATA token?
03530           JR      NZ,SYM8         ;Jump if it isn't.
03540 SYM7      INX     A,HL            ;A=Next character.
03550           OR      A               ;End of line?
03560           JR      Z,SYM0          ;Loop if it is?
03570           CP      ':'             ;Colon?
03580           JR      NZ,SYM7         ;Loop if it isn't.
03590           JR      SYM2            ;Loop.
03600 SYM8      PUSH    HL              ;Save the program pointer.
03610           LD      HL,TOKTAB       ;HL=Token table pointer.
03620           LD      BC,41           ;BC=Table length - 1.
03630           CPIR                    ;Search the table.
03640           JR      Z,SYM9          ;Jump if a match.
03650           POP     HL              ;Get the program pointer.
03660           JR      SYM2            ;Loop.
03670 SYM9      LD      DE,0            ;DE=Next available location pointer.
03680 NEXSYM    EQU     $-2
03690           LD      BC,0            ;BC=Last available location.
03700 HIGH$1    EQU     $-2
03710           CMP     D,E,B,C         ;Symbol table overflow?
03720           JP      NC,ERROR4       ;Jump if it is.
03730           LD      A,(HL)          ;A=Reserved word value.
03740           LD      (DE),A          ;Save it.
03750           INC     DE              ;Bump the pointer.
03760           LD      HL,0            ;HL=Current line number.
03770 CURLIN    EQU     $-2
03780           EX      DE,HL           ;Swap pointer & line number.
03790           LD      (HL),E          ;Save the LSB of line number.
03800           INC     HL              ;Bump the pointer.
03810           LD      (HL),D          ;Save the MSB of line number.
03820           INC     HL              ;Bump the pointer.
03830           LD      (NEXSYM),HL     ;Save the next available location.
03840           POP     HL              ;Get the program pointer.
03850           JR      SYM2            ;Loop.
```

Listing continued

Listing continued

```
03860 SYM10   LD      B,0             ;B=Reserved words counter.
03870 SYM11   XOR     A               ;Zero A.
03880         LD      (PFLG0),A       ;Flag word not done.
03890         LD      (PFLG1),A       ;Zero the number of line numbers.
03900         LD      HL,(ENDBUF)     ;HL=Start of symbols.
03910 SYM12   LD      DE,(NEXSYM)     ;DE=Next available location.
03920         CMP     H,L,D,E         ;End of symbol table?
03930         JP      Z,SYM26         ;Jump if it is.
03940         INX     A,HL            ;A=Reserved words value.
03950         CP      B               ;Do they match?
03960         JR      NZ,SYM25        ;Jump if not.
03970         LD      A,0             ;A=Word done flag.
03980 PFLG0   EQU     $-1
03990         OR      A               ;Has it been done?
04000         JR      NZ,SYM19        ;Jump if it has.
04010         INC     A               ;A=Flag for done.
04020         LD      (PFLG0),A       ;Save the new flag.
04030         LD      C,B             ;C=Reserved words counter.
04040         PUSH    HL              ;Save the pointer.
04050         LD      HL,ERRTAB       ;HL=Words list pointer.
04060         INC     C               ;Bump the counter.
04070 SYM13   DEC     C               ;Word found?
04080         JR      Z,SYM15         ;Jump if it is.
04090 SYM14   INX     A,HL            ;A=Next character.
04100         OR      A               ;End of list entry?
04110         JP      P,SYM14         ;Loop if it isn't.
04120         JR      SYM13           ;Loop.
04130 SYM15   INX     A,HL            ;A=Next character.
04140         OR      A               ;End of word?
04150         JP      M,SYM16         ;Jump if end of word.
04160         CALL    DSP             ;Display the character.
04170         JR      SYM15           ;Loop.
04180 SYM16   CP      80H             ;Possible error?
04190         JR      Z,SYM17         ;Jump if it is.
04200         LD      A,'*'           ;A=Fatal error symbol.
04210         JR      SYM18           ;Jump.
04220 SYM17   LD      A,'?'           ;A=Possible error symbol.
04230 SYM18   CALL    DSP             ;Display the symbol.
04240         LD      HL,M1           ;HL=Message pointer.
04250         CALL    DSPLY           ;Display it.
04260         POP     HL              ;Get the symbol table pointer.
04270 SYM19   INX     E,HL            ;E=LSB of line number.
04280         INX     D,HL            ;D=MSB of line number.
04290         CALL    HEXDEC          ;Convert it to an ASCII string.
04300         LD      DE,CONBUF       ;DE=ASCII string pointer.
04310 SYM20   INX     A,DE            ;A=Next string character.
04320         CP      32              ;Control code or space?
04330         JR      C,SYM22         ;Jump if it's a control code.
04340         JR      NZ,SYM21        ;Jump if it isn't a space.
04350         LD      A,'0'           ;A='0'.
04360 SYM21   CALL    DSP             ;Display the character.
04370         JR      SYM20           ;Loop.
04380 SYM22   LD      A,0             ;A=Number of line numbers counter.
04390 PFLG1   EQU     $-1
04400         INC     A               ;Bump it.
04410         LD      (PFLG1),A       ;Save the new counter.
04420         CP      11              ;End of line?
04430         JR      Z,SYM23         ;Jump if it is.
04440         LD      A,32            ;A=Space.
04450         CALL    DSP             ;Display it.
04460         JR      SYM12           ;Loop.
04470 SYM23   XOR     A               ;A=New line numbers counter.
04480         LD      (PFLG1),A       ;Save it.
04490         LD      A,13            ;A=Carriage return.
04500         CALL    DSP             ;Display it.
04510         LD      C,14            ;C=Number of spaces.
04520         LD      A,32            ;A=Space.
04530 SYM24   CALL    DSP             ;Display a space.
04540         DEC     C               ;All spaces displayed?
04550         JR      NZ,SYM24        ;Loop till they are.
04560         JP      SYM12           ;Loop.
04570 SYM25   INC     HL              ;Bump the pointer.
04580         INC     HL              ;Bump the pointer.
04590         JP      SYM12           ;Loop.
04600 SYM26   LD      A,(PFLG0)       ;A=Word done flag.
04610         OR      A               ;Was it done?
04620         JR      Z,SYM27         ;Jump if it wasn't.
04630         LD      A,13            ;A=Carriage return.
04640         CALL    DSP             ;Display it.
04650 SYM27   INC     B               ;Bump reserved words counter.
04660         LD      A,21            ;A=Check value.
04670         CP      B               ;Done?
04680         JP      NZ,SYM11        ;Loop if not done.
04690         RET                     ;Return.
04700 ;
04710 ; Error Routines
04720 ;
04730 ERROR0  LD      HL,E1           ;HL=Error message pointer.
04740         DB      0DDH            ;Dummy LD IX,nnnn opcode.
04750 ERROR1  LD      HL,E2           ;HL=Error message pointer.
04760         DB      0DDH            ;Dummy LD IX,nnnn opcode.
04770 ERROR3  LD      HL,E3           ;HL=Error message pointer.
04780         DB      0DDH            ;Dummy LD IX,nnnn opcode.
04790 ERROR4  LD      HL,E4           ;HL=Error message pointer.
04800         DB      0DDH            ;Dummy LD IX,nnnn opcode.
04810 ERROR5  LD      HL,E5           ;HL=Error message pointer.
04820         SVC     @DSPLY          ;Display the message.
04830         JR      ERROR2          ;Jump.
04840 ERROR   OR      0C0H            ;Nask the TRSDOS error code.
04850         LD      C,A             ;C=Error code.
04860         SVC     @ERROR          ;Display the message.
04870 ERROR2  LD      A,0             ;A=OPEN/CLOSE flag.
04880 OPNCLS  EQU     $-1
04890         OR      A               ;OPEN?
04900         JP      Z,ABORT         ;Abort if not.
04910         LD      DE,FCB          ;DE=FCB pointer.
04920         SVC     @CLOSE          ;Close the file.
04930         JP      ABORT           ;Abort.
04940 ;
04950 ; Open File Routine
04960 ;
04970 OPEN    XOR     A               ;A=Close flag.
04980         LD      (OPNCLS),A      ;Save it.
04990         LD      HL,INPBUF       ;HL=Buffer pointer.
05000         LD      DE,FCB          ;DE=FCB pointer.
05010         LD      B,0             ;B=LRL.
05020         SVC     @OPEN           ;Open the file.
05030         JR      NZ,ERROR        ;Jump if error.
05040         INC     A               ;A=Open flag.
05050         LD      (OPNCLS),A      ;Save it.
05060         LD      HL,BUFFER       ;HL=Buffer pointer.
05070         RET                     ;Return.
05080 ;
05090 ; Get Byte Routine
05100 ;
05110 GET     SVC     @GET            ;Get a byte.
05120         RET     Z               ;Return if no error.
05130         CP      1CH             ;End of file?
05140         JR      NZ,ERROR        ;Jump if it isn't.
05150         OR      A               ;Flag NZ.
05160         RET                     ;Return.
05170 ;
05180 ; Put Byte Routine
05190 ;
05200 PUT     PUSH    BC              ;Save BC.
05210         PUSH    DE              ;Save DE.
05220         LD      DE,FCB          ;DE=FCB pointer.
05230         LD      C,A             ;C=Byte to send.
05240         XOR     A               ;Zero A.
05250         LD      (SPACE),A       ;Flag no space/colon.
05260         LD      A,C             ;A=Byte to send.
05270         CP      ':'             ;Colon?
05280         JR      Z,PUT0          ;Jump if it is.
05290         CP      ' '             ;Space?
05300         JR      NZ,PUT1         ;Jump if it isn't.
05310 PUT0    LD      (SPACE),A       ;Save the flag.
05320 PUT1    SVC     @PUT            ;Send the byte.
05330         POP     DE              ;Get DE.
05340         POP     BC              ;Get BC.
05350         RET     Z               ;Return if no error.
```

Listing continued

PRICES AND SERVICE TOO GOOD TO PASS UP!

PRODUCTS FOR THE TRS-80®

SOFTWARE

NEWDOS80/Vers. 2	$124.95
COMREF for Newdos80	13.95
LDOS 5.1	109.95
DOSPLUS 3.5	119.95
DOSPLUS IV	119.95
6.0 Plus	39.50
DOSPLUS II	195.00
Micro Clinic - Mod 1	24.50
Micro Clinic - Mod 3	28.50
Super Utility + 3	59.95
Trashman	34.50
Faster	24.95
R.P.M. - Disk Timer	22.50
Basic Editor by C.A.U.	24.75
M-ZAL Release Two by C.A.U.	75.00
LDOS Utility Disk #1	42.50
The Toolbox for LDOS	59.95
EDAS IV	84.95
The BASIC Answer	59.95
Dot Writer 3.0	66.50
Dot Writer 3.0 w/letterset	84.50
Dot Writer Font Disks	23.50
GEAP	38.50
Maxi Manager	119.50
Maxi Mail (Mod 3 Only)	64.95
Maxi Stat	164.95
Maxi CRAS	79.95
Powermail Plus	129.00
Tallymaster	62.95
Microterm Mod 1, 3, or 4	64.95
Omniterm Mod 1/3	79.95
Omniterm Mod II	139.95
LNW Doubler 5/8 w Dos +	194.95
LNW Doubler 5/8 w/o Dos	159.95
LNW System Expansion II	329.95
SBSG Accounting Modules	
Model 1 or 3	175.00
Model 2	250.00

SPECIAL — Verbatim disks

5″ SS/DD	**$23.75**
5″ DS/DD	**$35.75**

TALLYMASTER

Designed to help those running a business or household. It is easier to learn than most spreadsheet programs and includes complete documentation and an on-line HELP command. Handles up to 702 expense or income categories. (By Prosoft, requires 48K, 1 disk drive)

$64.95

T80-FS1 FLIGHT SIMULATOR

The realism of "out-the-window" flight is yours with this challenging simulation by SubLOGIC. It is written in machine language and is capable of a 3 to 6 frame per second display. Flight characteristics are similar to the Piper Super Club. Outperforms other simulators costing over $100,000.

Model 1 or 3 Tape Version — **$22.50**
Model 1 or 3 Enhanced Disk — **$29.50**

WORD PROCESSING

Lazy Writer 3.4	139.95
LeScript	109.95
Zorloff II	58.95

Newscript™

Newscript 7.1	99.95
Newscript 7.1 plus Labels	114.95
Newscript DW Proportional	39.95
Newscript File Converter	19.95

Electric Webster + Corrections	119.50
Elec. Webster Grammar	39.95
Elec. Webster Hyphenation	39.95

WRITE FOR OUR FREE CATALOG

MODEMS

U.S. ROBOTICS INC.™

PASSWORD

Password puts your TRS-80 into telephone communications with 300 or 1200 baud speed, programmable auto dial and auto answer capability, auto mode and auto speed select, audio phone line monitor, and other advanced features. Simple one button operation, compact, and dependable. **$349.95**

PHONE LINK	**$165.95**
MICRO LINK 300	**$199.95**
AUTO LINK 300	**$229.95**
MICRO LINK	**$349.95**
AUTO LINK 1200	**$385.95**
AUTO LINK 212A	**$419.95**
AUTO DIAL 212A	**$449.95**
PASSWORD	**$349.95**
COURIER	**$389.95**

—SAVE AN ADDITIONAL $35.00—
When you purchase your US Robotics modem from AMI we will give you an Omniterm Mod 1/3 at $35 off the retail price— **$65.00**

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 CompuServ, 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.

$79.95

LNW80 II COMPUTER

System complete with monitor and 2 disk drives. Includes DOSPLUS 3.5 and CP/M 2.2. It's ready to run!

$1,995.00

- Free Shipping on Orders over $100
- Friendly, Honest, Reliable Service
- Toll Free Order Line
- Free Use of Credit Cards
- 24-Hour Shipping for Items in Stock
- Large Selection-Call for Items Not Listed

We accept Visa, Master Card, check, cash, money orders, and COD. In the 48 continental States add $2.50 for UPS standard shipping, we'll pay shipping if your order is over $100. Alaska and Hawaii orders are charged actual shipping charges. COD orders are charged an extra $2.00 and require cash or certified check on delivery. POs accepted upon approval.

When ordering by mail, include your telephone number, credit card information, computer model, memory size, and number of drives. Colorado residents add appropriate sales tax (6½% in Denver).

Prices are subject to change without notice.

IN COLO CALL 861-9250

ORDER NOW TOLL FREE **1-800-468-4474**

AMI applied microsystems, inc.

612 Washington, Denver, CO 80203

390

LDOS is a TM of Logical Systems, Inc. **M-ZAL** is a TM of CAU, Inc. **TRS-80** is a TM of Tandy Corp. **NEWSCRIPT** is a TM of Prosoft

Listing continued

```
05360           JR      ERROR           ;Jump.
05370 ;
05380 ; Binary to ASCII Routine
05390 ;
05400 HEXDEC    PUSH    BC              ;Save BC.
05410           PUSH    DE              ;Save DE.
05420           PUSH    HL              ;Save HL.
05430           EX      DE,HL           ;HL=Binary value.
05440           LD      DE,CONBUF       ;DE=Buffer pointer.
05450           SVC     @HEXDEC         ;Do conversion.
05460           LD      A,3             ;A=End of string flag.
05470           LD      (DE),A          ;Save it.
05480           POP     HL              ;Get HL.
05490           POP     DE              ;Get DE.
05500           POP     BC              ;Get BC.
05510           RET                     ;Return.
05520 ;
05530 ; Display or Print Character Routine
05540 ;
05550 DSP       PUSH    AF              ;Save AF.
05560           PUSH    BC              ;Save BC.
05570           PUSH    DE              ;Save DE.
05580           LD      C,A             ;C=Byte to send.
05590           LD      A,0             ;A=Printer flag.
05600 PPFLG0    EQU     $-1
05610           OR      A               ;Printer?
05620           JR      NZ,DSP0         ;Jump if it is.
05630           SVC     @DSP            ;Display the character.
05640           CALL    PAUSE           ;Delay and check for pause.
05650           JR      DSP1            ;Jump.
05660 DSP0      SVC     @PRT            ;Print the character.
05670           JR      NZ,DSP0         ;Loop till printer ready.
05680 DSP1      POP     DE              ;Get DE.
05690           POP     BC              ;Get BC.
05700           POP     AF              ;Get AF.
05710           RET                     ;Return.
05720 ;
05730 ; Display or Print Message Routine.
05740 ;
05750 DSPLY     PUSH    AF              ;Save AF.
05760           PUSH    BC              ;Save BC.
05770           PUSH    DE              ;Save DE.
05780           LD      A,0             ;A=Printer flag.
05790 PPFLG1    EQU     $-1
05800           OR      A               ;Printer?
05810           JR      NZ,DSPLY0       ;Jump if it is.
05820           SVC     @DSPLY          ;Display the message.
05830           CALL    PAUSE           ;Delay and check for pause.
05840           JR      DSPLY1          ;Jump.
05850 DSPLY0    SVC     @PRINT          ;Print the message.
05860           JR      NZ,DSPLY0       ;Loop till printer ready.
05870 DSPLY1    POP     DE              ;Get DE.
05880           POP     BC              ;Get BC.
05890           POP     AF              ;Get AF.
05900           RET                     ;Return.
05910 ;
05920 ; Delay and Check for Pause Routine
05930 ;
05940 PAUSE     LD      BC,1100         ;BC=Delay counter.
05950           SVC     @PAUSE          ;Delay.
05960           SVC     @FLAGS          ;IY=System flags pointer.
05970           BIT     1,(IY+10)       ;Pause pressed?
05980           RET     Z               ;Return if not.
05990 PAUSE1    SVC     @KEY            ;Get a key.
06000           CP      60H             ;Pause?
06010           JR      Z,PAUSE1        ;Loop if it is.
06020           SVC     @FLAGS          ;IY=System flags pointer.
06030           RES     1,(IY+10)       ;Flag no pause.
06040           RET                     ;Return.
06050 ;
06060 ; Program Messages
06070 ;
06080 M1        DB      '      ',03
06090 M2        DB      'Building cross reference symbol table',13
06100 M3        DB      'Loading the program',13
06110 M4        DB      'Saving the program',13
06120 E1        DB      'File must be in binary format',13
06130 E2        DB      'Not enough memory to load file',13
06140 E3        DB      1CH,1FH
06150           DB      'Model III to Model 4 Basic Program Conversion Utility 01.
00.00',10
06160           DB      'Copyright (c) 1983 By Mark D. Goodwin, All Rights Reserve
d',10,13
06170 E4        DB      'Symbol table overflow',13
06180 E5        DB      'Bad parameter(s)',13
06190 ;
06200 ; Program Variables
06210 ;
06220 SPACE     DB      0
06230 SPCFLG    DB      0
06240 CONBUF    DC      6,0
06250 INPBUF    DC      256,0
06260 FCB       DC      32,0
06270 ;
06280 ; Program Tables
06290 ;
06300 PARTAB    DB      80H
06310           DB      54H
06320           DB      'XREF'
06330 PAR1      DB      0
06340           DW      XREF
06350           DB      55H
06360           DB      'PRINT'
06370 PAR2      DB      0
06380           DW      PPFLG
06390           DB      0
06400 PPFLG     DW      0
06410 ERRTAB    DB      'CLEAR  ',80H
06420           DB      'CLOAD  ',81H
06430           DB      'CMD    ',81H
06440           DB      'CSAVE  ',81H
06450           DB      'ERR    ',81H
06460           DB      'ERROR  ',80H
06470           DB      'FOR    ',80H
06480           DB      'IF     ',80H
06490           DB      'INP    ',80H
06500           DB      'INPUT  ',80H
06510           DB      'NAME   ',81H
06520           DB      'OUT    ',80H
06530           DB      'PEEK   ',80H
06540           DB      'POINT  ',81H
06550           DB      'POKE   ',80H
06560           DB      'POS    ',81H
06570           DB      'PRINT  ',80H
06580           DB      'RESET  ',81H
06590           DB      'SET    ',81H
06600           DB      'SYSTEM ',81H
06610           DB      'USR    ',80H
06620 TOKTAB    DB      184,0
06630           DB      185,1
06640           DB      133,2
06650           DB      186,3
06660           DB      195,4
06670           DB      158,5
06680           DB      129,6
06690           DB      143,7
06700           DB      219,8
06710           DB      137,9
06720           DB      169,10
06730           DB      160,11
06740           DB      229,12
06750           DB      198,13
06760           DB      177,14
06770           DB      220,15
06780           DB      178,16
06790           DB      130,17
06800           DB      131,18
06810           DB      174,19
06820           DB      193,20
06830 TABLE     WORD    'E','ND'
06840           WORD    'F','OR'
06850           WORD    'R','ESET'
06860           WORD    'S','ET'
06870           WORD    'C','LS'
06880           WORD    'C','MD'
06890           WORD    'R','ANDOM'
06900           WORD    'N','EXT'
06910           WORD    'D','ATA'
06920           WORD    'I','NPUT'
06930           WORD    'D','IM'
06940           WORD    'R','EAD'
06950           WORD    'L','ET'
06960           WORD    'G','OTO'
06970           WORD    'R','UN'
06980           WORD    'I','F'
06990           WORD    'R','ESTORE'
07000           WORD    'G','OSUB'
07010           WORD    'R','ETURN'
07020           WORD    'R','EM'
07030           WORD    'S','TOP'
07040           WORD    'E','LSE'
07050           WORD    'T','RON'
07060           WORD    'T','ROFF'
07070           WORD    'D','EFSTR'
07080           WORD    'D','EFINT'
07090           WORD    'D','EFSNG'
07100           WORD    'D','EFDBL'
07110           WORD    'L','INE'
07120           WORD    'E','DIT'
07130           WORD    'E','RROR'
07140           WORD    'R','ESUME'
07150           WORD    'O','UT'
07160           WORD    'O','N'
07170           WORD    'O','PEN'
07180           WORD    'F','IELD'
07190           WORD    'G','ET'
07200           WORD    'P','UT'
07210           WORD    'C','LOSE'
07220           WORD    'L','OAD'
07230           WORD    'M','ERGE'
07240           WORD    'N','AME'
07250           WORD    'K','ILL'
07260           WORD    'L','SET'
07270           WORD    'R','SET'
07280           WORD    'S','AVE'
07290           WORD    'S','YSTEM'
07300           WORD    'L','PRINT'
07310           WORD    'D','EF'
07320           WORD    'P','OKE'
07330           WORD    'P','RINT'
```

Listing continued

Listing continued

```
07340                   'C','ONT'
07350                   'L','IST'
07360                   'L','LIST'
07370                   'D','ELETE'
07380                   'A','UTO'
07390                   'C','LEAR'
07400                   'C','LOAD'
07410                   'C','SAVE'
07420                   'N','EW'
07430                   'T','AB('
07440                   'T','O'
07450                   'F','N'
07460                   'U','SING'
07470                   'V','ARPTR'
07480                   'U','SR'
07490                   'E','RL'
07500                   'E','RR'
07510                   'S','TRING$'
07520                   'I','NSTR'
07530                   'P','OINT'
07540                   'T','IME$'
07550                   'M','EM'
07560                   'I','NKEY$'
07570                   'T','HEN'
07580                   'N','OT'
07590                   'S','TEP'
07600                   '+','+'
07610                   '-','-'
07620                   '*','*'
07630                   '/','/'
07640                   '^','^'
07650                   'A','ND'
07660                   'O','R'
07670                   '>','>'
07680                   '=','='
07690                   '<','<'
07700                   'S','GN'
07710                   'I','NT'
07720                   'A','BS'
07730                   'F','RE'
07740                   'I','NP'
07750                   'P','OS'
07760                   'S','QR'
07770                   'R','ND'
07780                   'L','OG'
07790                   'E','XP'
07800                   'C','OS'
07810                   'S','IN'
07820                   'T','AN'
07830                   'A','TN'
07840                   'P','EEK'
07850                   'C','VI'
07860                   'C','VS'
07870                   'C','VD'
07880                   'E','OF'
07890                   'L','OC'
07900                   'L','OF'
07910                   'M','KI$'
07920                   'M','KS$'
07930                   'M','KD$'
07940                   'C','INT'
07950                   'C','SNG'
07960                   'C','DBL'
07970                   'F','IX'
07980                   'L','EN'
07990                   'S','TR$'
08000                   'V','AL'
08010                   'A','SC'
08020                   'C','HR$'
08030                   'L','EFT$'
08040                   'R','IGHT$'
08050                   'M','ID$'
08060                   80H
08070 BUFFER            0
08080                   START
```


A&J Micro Drive exclusive distributor for Exatron.

A&J MICRO DRIVE

Authorized distributor for Holmes Engineering and IJG.

EXATRON STRINGY FLOPPY

Model I ESF STARTER KIT **$149.50**
Add $6.50 Shipping, Includes: Drive 0, Manual, Operating System, Power Supply, Cable, Data I/O Tape, 5 Microwafers

Model I ESF DRIVE 0 ..... **$124.50**
Add $6.50 Shipping

Model I ESF DRIVE 1 thru 7 ..... **$99.50**
Add $6.50 Shipping

Model I OWNER'S MANUAL **$4.95**

1200 Baud Transfer Rate
No Volume Controls or Rewind
No Expansion I/F Required
Automatic Verify with Save
Uses only 4 Bytes User Memory
Key Debounce Routine in ESF

BUS-EXTENDERS

2 for 1 ..... $25.00
3 for 1 ..... $30.00
4 for 1 ..... $35.00
5 for 1 ..... $40.00
Custom ..... call for prices

MICRO WAFER

5 ft $3.50
10 ft $3.50
20 ft $4.00
35 ft $4.00
50 ft $4.50

HOLMES PORTABLE MICRO DRIVE
ENGINEERING, INC.

MODEL 100 PMD-100 ..... **$339.50**
Add $6.50 Shipping, Includes: PMD-100 Drive, 3 Wafers, AC Adaptor/Battery Charger, Power Cable, Manual, PMD User Group Membership

MODEL 100 IM-100
8K RAM Modules **$69.50**

PMD-100 Owners Manual **$4.95**

High Speed Data Transfer
Battery Powered with Charger
No Modification to Model 100
Saves Text Files and Programs
Uses Built-in Telecom Mode

WAFERS

Wafers are the same as used in Model I ESF.
Also compatible with OLIVETTI MTU-231, Royal and ADLER Tape Drives, and Structure Design SD-2024
PAL Programmer, Stringy Floppy for TIMEX 1000 and 1500.

MORE FOR MODEL I

Holmes IM-2 48K in Keyboard Memory .. $119.50
Holmes SP-II Computer Speed-Up ..... $ 89.50
Upper/Lower Case Kit ..... $ 14.95
Installation available for above items
The following are registered trademarks:
TRS-80, MicroWafer, Stringy Floppy, Scripsit, PMD-100
Prices subject to change without notice.

MODEL I ESF SOFTWARE

Patch R/S ED/ASSEM Version 1.1 and 1.2 ... $11.95
IJG Electric Pencil 2.0 ..... $59.95
Advanced Programmers Guide ..... $ 9.95
File Management System I $19.95
Patchword (Patch Scripsit 1.0) ..... $ 9.95
ESF Forth $45.00
Electric Spreadsheet 16K $44.95
ESF-80 Monitor ..... $ 9.95
The Basic Toolkit $19.95

More Software Available

IJG PUBLICATIONS

THE OTHER MYSTERIES SERIES
TSR-80 Disk $20.25
Microsoft Basic Decoded $26.95
The Custom TRS-80 ..... $26.95
Basic Faster & Better $26.95
Machine Language Disk I/O $26.95
TRSDOS 2.3 Decoded $26.95
BASIC Disk I/O Faster & Better $26.95

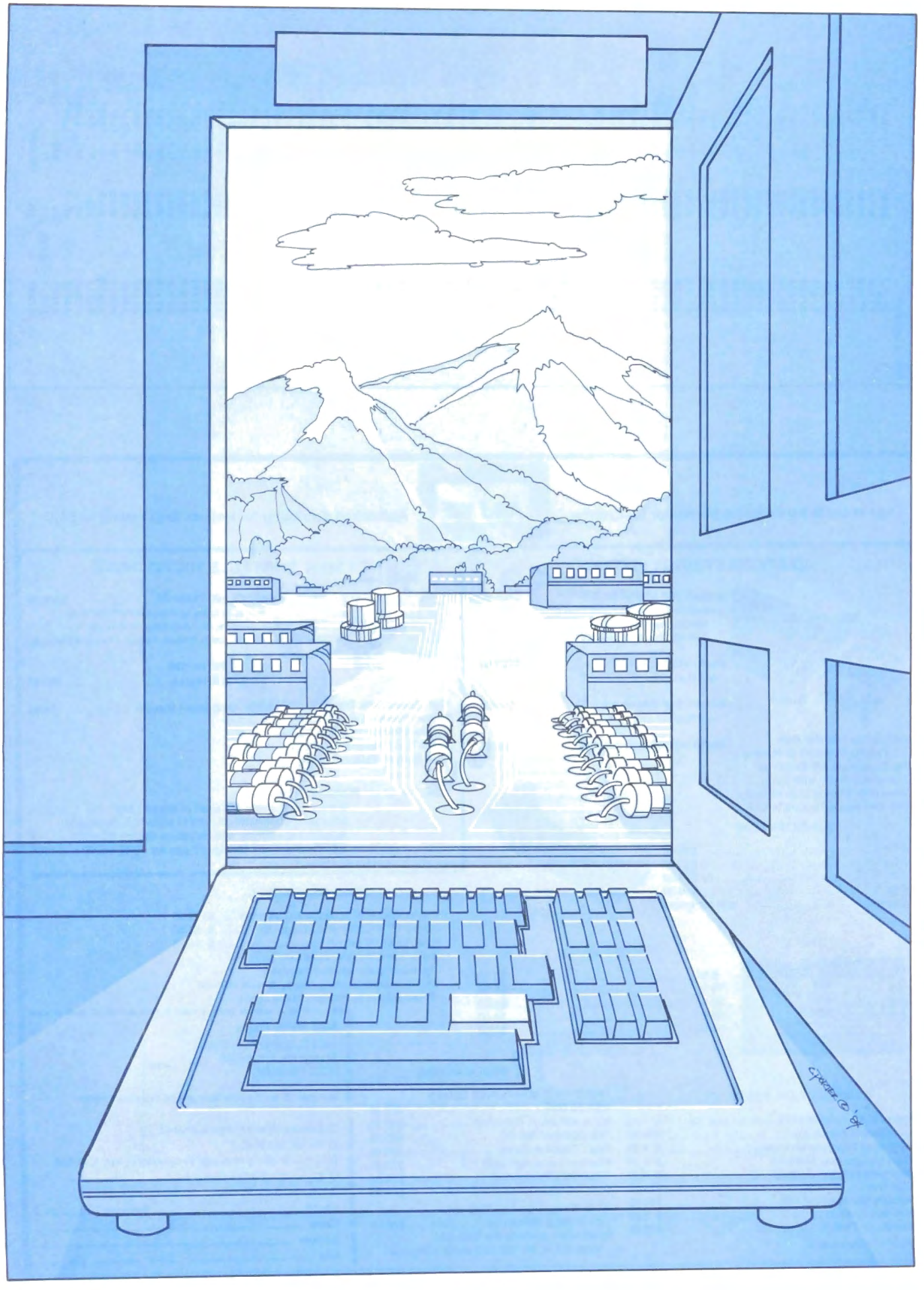
"How To do it On The TRS-80" by William Barden, Jr. $25.00
Application guide to the TRS-80 Models I, II, III, 100, and color computer

A&J Micro Drive
1050 E. Duane Ave., Suite I
Sunnyvale, CA 94086
(408) 732-9292

166

Send $4.95 for Owners Manual and more information

☐ Check or Money Order Enclosed
☐ C.O.D. add $1.65
☐ U.P.S. shipping cost, add $3.00, unless other specified
☐ CA residents add 6.5 % sales tax
☐ Charge to my ☐ VISA ☐ MASTERCARD
Card # _____ Exp. date _____
Name _____
Address _____
City _____ State _____ Zip _____



by John Stedeford

ENTER HERE

This machine-language program eliminates unnecessary string data entry delays.

Perhaps the weakest link in Basic applications programs is the input of string information from the keyboard. This can be especially troubling when the program limits input string length.

For example, suppose a program requires that you input your name, address, and telephone number. A commonly used technique for entering such string data looks like this:

```
200 INPUT "ENTER FULL NAME,
  ADDRESS, AND PHONE";NM$
210 IF LEN(NM$)>25 THEN PRINT "ENTRY
  TOO LONG":GOTO 20
```

This method could more than double the time normally required to enter the information; you either have to count an item's characters before entering them, or enter the item and face the possibility of having to reenter it.

I decided to devise a better input format. I wrote a Model I/III technique called STRINPUT/CMD that offers the following features:

- The screen continuously displays the information already entered, and how much of the allotted entry space remains;
- You can continuously alter or totally retype input information before you press the enter key;
- All keyboard entries are permitted, including the use of commas and semicolons; and
- It is flexible enough to use in a wide variety of situations, anywhere on the screen.

STRINPUT Operation

STRINPUT (see Program Listing 1) is a stand-alone machine-language program that loads into low memory and relocates its working module to the highest available RAM location. STRINPUT honors all user programs loaded into high memory that reset the high-memory indicators stored at 4049 to 404A hexadecimal (hex) in the Model I or 4411 to 4412 hex in the Model III.

After relocating itself, STRINPUT sets the top of memory to 1 byte below the routine's entry point. STRINPUT's beginning location is important; it sets the Basic program's user call location. See the Figure for the definition of Model I/III user calls.

After you load STRINPUT into memory, it waits for a Basic program call. Once called, STRINPUT produces a line of graphics characters equal to the length of allowable input. The program displays these characters at the current screen cursor location stored in Basic.

If you properly set STRINPUT's internal parameters, the program displays other graphics characters before and after the input area. The program then displays a flashing cursor at the beginning of the string area, and waits for you to enter information.

STRINPUT recognizes all text characters, including the up arrow and punctuation characters. The shift/zero (upper-/lowercase) toggle on the Model III and modified Model I performs as usual. In addition, STRINPUT recognizes three control characters: the left arrow, shift/left arrow, and enter keys.

Pressing the left-arrow key erases the last character typed. Pressing the shift/left-arrow keys erases all the currently typed information and resets the cursor to the beginning of the string input area. And pressing the enter key terminates input and returns control to the Basic calling program.

The program doesn't recognize the break or clear keys, the down-arrow key for line feed, or the right-arrow key for tab. It does, however, accept the up-arrow key as an exponentiation character—not as an upward line feed.

STRINPUT uses CHR$(95) for the fill character indicating how much

Continued on p. 110

Program Listing 1. STRINPUT/CMD.

```
100 CLEAR1000:DIMIL(12),IK(12),SV$(12)
110 GOSUB1010
199 '       EXAMPLE OF A LONG INPUT, WITH A CR/LF AT END        '
200 POKEUP(2),61:POKEUP(4),61:POKEUP(5),61:POKEUP(6),61:POKEUP(7
),61
205 PRINT"EXAMPLE 1 INPUT :":LL=240:GOSUB1000:A$=TT$:PRINTA$
209 '           EXAMPLE OF SHORT INPUT WITH NO CR/LF            '
210 POKEUP(2),45:POKEUP(4),45:POKEUP(5),45:POKEUP(6),45:POKEUP(7
),45
215 PRINT"EXAMPLE 2 INPUT :":LL=20:GOSUB1001:B$=TT$:PRINTB$
220 PRINT"PRESS <1> TO RE-EXAMINE PRIOR EXAMPLES":PRINT"       <2
```

Listing 1 continued

The Key Box

Models I and III
32K RAM Disk Basic
16K RAM Cassette Basic
Assembly Language
Editor/Assembler
NEWDOS80

THE BYTE GENERAL

3 Sierks Lane
Roslyn Harbor, NY 11576

24 Hour Order Line

Order: **516-625-0920**

Technical: **516-338-4083**

TRS-80:

Model 4, 64k,
2 Drives, RS-232 .....$1549.00

Model 4, 64k, 2 Disk Drive, RS232
Micro Design. MDX-6,
Upgraded.....$1429.95

1 Year Warranty (Parts and Labor)

Model 100 Computers:

Model 100 Portable 8k.....$659.00

Model 100 Portable 24k.....$820.00

Covered by The R/S 90 Day Warrenty.

Elephant Diskettes:

EMS #1 SS/SD Soft.....$15.95

EMS #2 SS/DD Soft.....$18.95

EMS #5 DS/DD Soft $25.95

Modems:

Signalman Mark I $74.00

Signalman 300/1200.....$259.00

Smartmodem 300 .....$199.00

Smartmodem 1200 .....$479.00

Smartmodem 1200B
IBM Version.....$429.00

Novation J-Cat.....$99.95

Smart Cat 300/1200.....$410.00

Printers:

Prowriter 8510ap $340.00

Gemni 10X.....$279.00

Okidata 92ML $425.00

Prowriter Ribbons $6.00

F10-40cps $1125.00

F10-55cps $1339.00

M.B.S. Business System:

Invoices Mail List
Accts Payable Accts Receivable
General Ledger Check Register

$225

Specify TRS-80 Model I, III or 4

Look Around, Find The Best Prices And The General Will Beat Them.

Dealer Inquiries Invited

TERMS OF SALE: There is a 3% Service Charge for Mastercard or Visa. Orders Under $30 please add $2 shipping and handling. Personal checks require two weeks for clearance. Prices subject to change without notice.

TRS80 is a Tandy trademark

382

Listing 1 continued

```
> TO GO ON TO SCREEN FORM EXAMPLE"
230 CN$=INKEY$:IFCN$=""THEN240ELSE230
240 CN$=INKEY$:IFCN$=""THEN240ELSEIFCN$="2"THEN300ELSEIFCN$="1"T
HEN200ELSE240
300 POKEUP(2),95:POKEUP(4),95:POKEUP(5),95:POKEUP(6),95:POKEUP(7
),95:POKEUP(1),0:POKEUP(3),0
309 '                    DISPLAY SCREEN FORM                    '
310 GOSUB1100
319 '            ENTER INFORMATION INTO SCREEN FORM             '
320 PRINT@IL(0),;:LL=57:GOSUB1001:N$=TT$:IFRT=1THENRETURN
330 PRINT@IL(1),;:LL=47:GOSUB1001:A$=TT$:IFRT=1THENRETURN
340 PRINT@IL(2),;:LL=34:GOSUB1001:C$=TT$:IFRT=1THENRETURN
345 PRINT@IL(3),;:LL=8:GOSUB1001:S$=TT$:IFRT=1THENRETURN
350 PRINT@IL(4),;:LL=3:GOSUB1001:AC$=TT$:IFRT=1THENRETURN
360 PRINT@IL(5),;:LL=8:GOSUB1001:PN$=TT$:IFRT=1THENRETURN
370 PRINT@IL(6),;:LL=53:GOSUB1001:EN$=TT$:IFRT=1THENRETURN
380 PRINT@IL(7),;:LL=43:GOSUB1001:EA$=TT$:IFRT=1THENRETURN
390 PRINT@IL(8),;:LL=30:GOSUB1001:EC$=TT$:IFRT=1THENRETURN
400 PRINT@IL(9),;:LL=8:GOSUB1001:ES$=TT$:IFRT=1THENRETURN
410 PRINT@IL(10),;:LL=3:GOSUB1001:AC$(1)=TT$:IFRT=1THENRETURN
420 PRINT@IL(11),;:LL=8:GOSUB1001:PN$(1)=TT$:IFRT=1THENRETURN
430 PRINT@IL(12),;:LL=169:GOSUB1001:JD$=TT$:IFRT=1THENRETURN
440 PRINT@896,CHR$(30)TAB(6)"<1> = INFORMATION CORRECT    <2> = C
HANGE INFORMATION";
449 CN$=INKEY$:IFCN$=""THEN450ELSE449
450 CN$=INKEY$:IFCN$="1"THEN600ELSEIFCN$<>"2"THEN450
459 '                    CHANGE INPUT INFORMATION               '
460 FOREI=0TO12:IK(EI)=15360+IL(EI)
462 SV$(EI)=CHR$(PEEK(IK(EI)))+CHR$(PEEK(IK(EI)+1))+CHR$(PEEK(IK
(EI)+2))+CHR$(PEEK(IK(EI)+3))+CHR$(PEEK(IK(EI)+4))+CHR$(PEEK(IK(
EI)+5))+CHR$(PEEK(IK(EI)+6))
464 PRINT@IL(EI),"<"EI">";
466 NEXTEI
468 PRINT@896,CHR$(30)TAB(6)"INPUT NUMBER OF ITEM TO CHANGE  ";:
INPUTCI:IFCI<0ORCI>12THEN468
470 UX=PEEK(UP(2)):POKEUP(2),46:POKEUP(4),46:POKEUP(5),46:POKEUP
(6),46:POKEUP(7),46:FOREI=0TO12:PRINT@IL(EI),SV$(EI);:NEXTEI
480 CI=CI+1:RT=1:ONCIGOSUB320,330,340,345,350,360,370,380,390,40
0,410,420,430:RT=0:GOTO440
490 POKEUP(2),UX:POKEUP(4),UX:POKEUP(5),UX:POKEUP(6),UX:POKEUP(7
),UX:GOTO440
599 '                    DISPLAY INFORMATION                    '
600 CLS:PRINTN$:PRINTA$:PRINTC$", "S$;TAB(45)"("AC$") "PN$:PRINT
:PRINT"  EMPLOYER : "EN$:PRINTTAB(13)EA$:PRINTTAB(13)EC$", "ES$;
TAB(45)"("AC$(1)") "PN$(1):PRINT:PRINT"  JOB DUTIES : "JD$
610 PRINT@960,"     <ENTER> = DO SCREEN FORM AGAIN          <"CH
R$(94)"> = END";
620 CN$=INKEY$:IFCN$=""THEN630
630 CN$=INKEY$:IFCN$=""THEN630ELSEIFASC(CN$)=13THEN300ELSEIFPEEK
(14400)=64THEN995ELSE630
989 '       RESTORE ORIGINAL STRINPUT CHARACTERS AND END       '
995 POKEUP(1),149:POKEUP(2),61:POKEUP(3),170:POKEUP(4),61:POKEUP
(5),61:POKEUP(6),61:POKEUP(7),61
998 END
999 '                    INPUT USING STRINPUT                   '
1000 TT$="":LS=USR0(LL):GOTO1003
1001 TT$="":LS=USR0(LL);
1003 IFPEEK(LS)=13THEN1005ELSETT$=TT$+CHR$(PEEK(LS)):LS=LS+1:GOT
O1003
1005 RETURN
1009 '                    GET USR0 LOCATION AND
          CHANGE SCREEN GRAPHICS CHARACTERS IF NECESSARY     '
1010 IFPEEK(293)=73THEN1020
1015 U0=256*PEEK(16458)+PEEK(16457):GOTO1025
1020 U0=256*PEEK(17426)+PEEK(17425)
1025 UP(1)=U0+87:UP(2)=U0+97:UP(3)=U0+102:UP(4)=U0+182:UP(5)=U0+
237:UP(6)=U0+252:UP(7)=U0+275
1030 IFU0>32767THENU0=-1*(65536-U0)
1040 DEFUSR0=U0+1
1041 IFUP(1)>32767THENUP(1)=-1*(65536-UP(1))
1042 IFUP(2)>32767THENUP(2)=-1*(65536-UP(2))
1043 IFUP(3)>32767THENUP(3)=-1*(65536-UP(3))
1044 IFUP(4)>32767THENUP(4)=-1*(65536-UP(4))
1045 IFUP(5)>32767THENUP(5)=-1*(65536-UP(5))
1046 IFUP(6)>32767THENUP(6)=-1*(65536-UP(6))
1047 IFUP(7)>32767THENUP(7)=-1*(65536-UP(7))
1050 PRINT"CHANGE STRING INPUT DISPLAY CHARACTERS (Y/N) ? ";
1054 YN$=INKEY$:IFYN$=""THEN1055ELSE1054
1055 YN$=INKEY$:IFYN$=""THEN1055ELSEIFPEEK(14344)=2THENPRINT"Y"E
LSEIFPEEK(14338)=64THENPRINT"N":GOTO1095ELSE1055
1060 PRINT"BEGINNING CHARACTER":PRINT"   PRESENT ==> CHR$("RIGHT
$(STR$(PEEK(UP(1))),LEN(STR$(PEEK(UP(1))))-1)") ==> ("CHR$(PEEK(
UP(1)))")":PRINT"       NEW ==> CHR$(   ";:INPUTUC
1065 POKEUP(1),UC
1070 PRINT"END CHARACTER":PRINT"   PRESENT ==> CHR$("RIGHT$(STR$
(PEEK(UP(3))),LEN(STR$(PEEK(UP(3))))-1)") ==> ("CHR$(PEEK(UP(3))
)")":PRINT"       NEW ==> CHR$(   ";:INPUTUC
1075 POKEUP(3),UC
1080 PRINT"FILL CHARACTER":PRINT"   PRESENT ==> CHR$("RIGHT$(STR
$(PEEK(UP(2))),LEN(STR$(PEEK(UP(2))))-1)") ==> ("CHR$(PEEK(UP(2)
))")":PRINT"       NEW ==> CHR$(   ";:INPUTUC
1085 POKEUP(2),UC:POKEUP(4),UC:POKEUP(5),UC:POKEUP(6),UC:POKEUP(
7),UC
1095 RETURN
1099 '              DISPLAY SCREEN FORM TO BE FILLED
1100 CLS
1110 PRINT@0,"NAME :":IL(0)=7:PRINT@64,"STREET ADDRESS :":IL(1)=
81:PRINT@128,"CITY :":IL(2)=135:PRINT@171,"STATE, ZIP :":IL(3)=1
84:PRINT@192,"PHONE : (Area Code)":IL(4)=212:PRINT@217,"(Number)
":IL(5)=226
1120 PRINT@320,"EMPLOYED BY :":PRINT@388,"NAME :":IL(6)=395:PRIN
T@452,"STREET ADDRESS :":IL(7)=469:PRINT@516,"CITY :":IL(8)=523:
PRINT@555,"STATE, ZIP :":IL(9)=568
1130 PRINT@580,"PHONE : (Area Code)":IL(10)=600:PRINT@605,"(Numb
er)":IL(11)=614:PRINT@708,"JOB TITLE/DUTIES :":IL(12)=727
1145 RETURN
```

End

GOD CREATED THE WORLD IN SIX DAYS THEN RESTED

. . . WE AT COSMOPOLITAN CONTINUE . . .

We work round the clock to bring you the finest utility programs in the world.

MULITDOS . . . The most compatible, user friendly operating system on the market Easy to learn – easy to use Most efficient Disk BASIC interpreter Execute any DOS commands from BASIC Duel dimension string sort Includes BOSS to give you the ultimate debugging tool for BASIC programs Automatically executes most commonly used LIB commands with one keystroke Contains DDT, ZAP, Mem test utility, Minidos these utilities and others do not require the use of high memory Automatically reads single density, double density, Model I and Model III diskettes, and is compatible with all popular double density boards

Price ***$99.95***

MULTIDOS MAX-80 . . . SUPERBASIC has grown again Has an unpacker as well as a packer for BASIC programs Dynamically changes string space without using variables Unbelievably enhanced BOSS trace function displays instruction before it is executed More shorthand commands Complete LABEL support Intelligent premature exit from FOR-NEXT loops Has eleven additional key word commands "Break" key as well as error trapping and still leaves the user with an incredible 42K bytes of free memory! MOD 4 BASIC PROGRAMMERS, EAT YOUR HEART OUT"

Introductory Price ***$99.95***

FAST

ZEUS – Our mightly Z-80 Editor Assembler

THE ZEUS EDITOR

- Displays a page of text with a single keystroke.
- Built in hex-decimal-label calculator.
- Reference lines by number or label.
- Checks each new line for validity when entered.
- Loads/saves source text in EDTASM, ASCII, and ZEUS formats.
- Single keystroke scrolling, reverse paging and forward paging.

THE ZEUS ASSEMBLER

- Assembly of source text from memory and/or disk source files.
- Multiple expressions on the same line with DB, DEFB, DM, DEFM, DW and DEFW pseudo-ops
- Conditional assembly with IF, ENIF and IF NOT pseudo-ops.
- COMM pseudo-op for comment block on object file
- 16 bit operations for Multiplication, Division, Addition, Subtraction, OR, Exclusive OR, AND, Left and Right shift, and Modulo (remainder of division)
- Pause and single step assembly listing.

ZEUS . . . Works with all popular DOS systems, a special version with added features available for MAX-80 MULTIDOS. Excellent assembly language development system.

Only ***$79.95***

EBASIC . . . Enhances Disk Basic with commands, that draw lines or boxes, or blocks, or cubes, or circles, with a single instruction. Creates wide ranges of sounds. Can fill screen with a specified byte in one instruction. Calculates expressions stored in a string. Formatted input. Labels Basic program lines. Simplifies reading data into an array with one statement Set all array elements equal to any value. Multi keysort of unlimited arrays. Works with all popular DOS systems. Please specify DOS.

Price Only ***$49.95***

Z'DOS . . . and economical disk operating system for the TRS-80 Model I and III computers. Forty library commands, Model I version supports three densities, is read/write compatible with the popular DOS formats and double density boards Has SUPERBASIC II with 41K of free memory, cross reference, renumber, and global editing. The Model III version is totally read/write/copy compatible with the Model I version.

Only ***$39.95***

FAST

BOSS/RENUM 90 . . . Best Of the Single Steppers. BOSS will single step BASIC programs, trace in a controlled area on the display, trace to the line printer, save the screen and display variables, control program execution speed, save BASIC programs to high RAM, and recognizes users inserted breakpoints to execute 1 of 7 functions RENUM/90 will renumber all or part of your BASIC program.

BOSS/RENUM 90 (tape only) for $24.95 or BOSS (disk only) ***$15.95***

Special note to Authors and Publishers . . . Distribution DOS at unbelievable rates, call for details.

COSMOPOLITAN ELECTRONICS CORPORATION

5700 Plymouth Road • Ann Arbor, MI 48105

Orders: (313) 668-6660

Hours: Closed Mondays – Tuesday, Wednesday, Friday 10-5

Thursday 10-3–Saturday 1-6

Add $3.00 shipping & handling. Foreign orders add $15.00 Michigan residents add 4% sales tax. Personal checks take two weeks to clear Visa & Mastercard accepted C.O.D add $1.65

Use this module in machine-language programs without absolute address instructions.

Continued from p. 107

room the Basic program allots to a particular string. CHR$(149) is the beginning delimiter character, CHR$(170) the ending delimiter character, and CHR$(143) the blinking cursor. You can change these by POKEing the desired values into the locations set forth in the Table. The Table also lists the line numbers where you can make permanent character changes.

It should be noted that if you set the beginning delimiter character to zero, no delimiter is displayed and the string input area begins at the current Basic cursor location. Otherwise, the beginning delimiter is at the Basic cursor location, and the string input area begins at the next screen location.

After you've entered information using STRINPUT, the program returns control to the Basic calling program with a value equal to the start of the string's buffer location. The Basic program then translates the string information into a string.

For disk systems:

Model I:
```
DEFUSRn=256*PEEK(16458)+PEEK(15457)+1
```
Model III:
```
DEFUSRn=256*PEEK(17426)+PEEK(17425)+1
```

For tape systems:

Model I:
```
100 U1=PEEK(16457):U2=PEEK(16458):U1=U1+1:IFU1=
256THEN U2=U2+1:U1=0
200 POKE16526,U1:POKE16527,U2
```
Model III:
```
100 U1=PEEK(17425):U2=PEEK(17426):U1=U1+1:IFU1=
256THEN U2=U2+1:U1=0
200 POKE16526,U1:POKE16527,U2
```

Figure. Model I/III user call definitions.

Character Type	Original Value	POKE Location = Entry Location +	Line Number for Permanent Changes
Beginning Delimiter	149=95H	86	1140
Ending Delimiter	170=AAH	101	1230
Fill	95=5FH	96	1200
		181	1660
		236	2010
		251	2120
		274	2260
Cursor	143=8FH	142	1470
		161	1560

Table. POKE locations for modifying STRINPUT graphics characters.

Using STRINPUT

Call STRINPUT with the program statement Variable 1=USRn (Variable 2) if you want a line feed on return to Basic. If you don't want a line feed, use Variable 1=USRn (Variable 2);. The program should start at memory location Variable 1 and read the string into a string variable until it encounters a line feed/carriage return (CHR$(13)). A simple subroutine will do the job.

Program Listing 2 (DEMO/BAS) provides several examples of how you can use STRINPUT. Lines 1000–1005 set the subroutine that does the program's hard work. If you don't need a line feed/carriage return, you should enter the subroutine at line 1001; otherwise, enter it at line 1000. Line 1003 reads the resulting string into TT$ until it encounters CHR$(13).

To use DEMO, initialize STRINPUT from DOS or with the tape System command. As noted above, the program resets the necessary memory pointers; just enter Basic and run the program.

DEMO also shows how you can use STRINPUT in applications involving entry of string information from the keyboard (lines 1100–1130). Included is an example of a simple screen form (lines 309–998).

STRINPUT Features

Several of STRINPUT's features need further discussion. Lines 330–690 represent a relocation routine that determines the top of memory, moves the program there and adjusts the Basic memory pointers accordingly. This module can be used in machine-language programs that don't contain instructions with absolute addresses (such as Jump or Call instructions). Relocate STRINPUT with the instruction LDDR, so the increment of movement may be less than the total length of the program.

The program stores the input string in a buffer area beginning at the location stored in 40A7 hex. Basic sets this buffer aside for temporary storage of keyboard input. We use the buffer for two reasons. First, it obviates the need to reserve another buffer area within the program. And second, if used properly, the buffer is protected from other uses.

Using Basic's keyboard input buffer requires diligence. You should convert the string input stored there to a Basic string variable immediately on return from the USR routine—before keyboard input changes the information.

The STRINPUT subroutine in Listing 2 makes this conversion. As soon as the USR routine relinquishes control to Basic, line 1003 reads the input string information into TT$, protecting the data stored in the input buffer.

Using a semicolon after the USR call to prevent a line feed when leaving STRINPUT requires manipulation of Basic's pointers. Ordinarily, a semicolon after a USR call results in an error when the program returns to Basic, so the program must interpret the semicolon before returning. Lines 2350–2380 determine whether a semicolon is present. If not, the program produces a line feed before returning to Basic.

If a semicolon is present after the USR call, a line feed doesn't occur. So, before the return, lines 2400–2510 adjust the pointers that Basic maintains while the USR call is executing. ■

Listing 2 begins on p. 112

Contact John Stedeford at 138 Second St. East, Twin Falls, ID 83301.

THE ALPHA JOYSTICK -30%

NOW ONLY $28.00

SPECIFY MOD I OR III

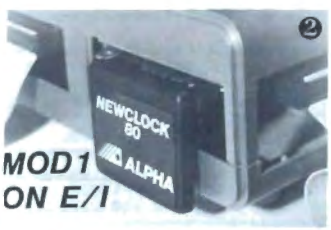
DON'T WAIT!

Limited time special

Works with all joystick games.

Model IV: order model III version

$59.95 NEWCLOCK-80



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 ❸ or side of the Exp. Int. ❷. Model III Newclock fits the 50 pin card edge (underneath) ❶

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 ❹ 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 ↙ 17 (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.

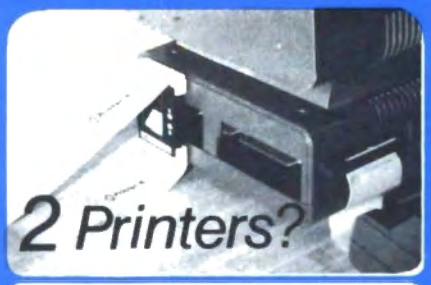
Program Listing 2. DEMO/BAS.

```
                00010 ;     THIS PROGRAM FORMS A 325-BYTE PROTECTED BLOCK OF MACHINE CODE AT THE TOP OF AVAILABLE
                00015 ;MEMORY THAT IS DESIGNED TO BE USED AS A USR ROUTINE CALLED FROM BASIC WITH THE BASIC STATEMENT:
                00020 ;                                 ==============
                00025 ;                                 VAR1=USRX(VAR2)
                00030 ;                                 ==============
                00035 ;     ON EXECUTION, THE ROUTINE WILL DISPLAY ON THE CRT A GRAPHICS LIMITATION FOR ENTRY OF STRING
                00040 ;CHARACTERS, AND WILL ACCEPT 0 TO VAR2 CHARACTERS INTO THE DESIRED STRING.  NO ADDITIONAL
                00045 ;CHARACTERS WILL BE ACCEPTED INTO THE STRING AFTER THE STRING IS VAR2 CHARACTERS LONG, UNLESS
                00050 ;THE BACKSPACE KEY IS USED TO ELIMINATE SOME EXISTING CHARACTERS.  <SHIFT>-BACKSPACE PERFORMS AS
                00055 ;USUAL TO ERASE THE ENTIRE STRING, IN WHICH CASE RE-ENTRY MAY ALSO BE PERFORMED.
                00060 ;     THUS, THE ROUTINE WILL ALLOW ENTRY AND REPEATED CORRECTION OF THE STRING AS DESIRED.
                00065 ;     UPON EXIT (WHEN <ENTER> IS PRESSED), VAR1 WILL CONTAIN THE MEMORY LOCATION OF THE FIRST
                00070 ;CHARACTER OF THE STRING.
                00075 ;     BASIC POKE STATEMENTS MAY BE USED TO CHANGE THE BEGINNING AND/OR ENDING GRAPHIC DELIMITER
                00080 ;CHARACTERS AND/OR THE FILL CHARACTER.  IF A ZERO IS USED FOR THE BEGINNING CHARACTER, NO
                00085 ;DELIMITER CHARACTER WILL BE DISPLAYED, AND THE FIRST INPUT CHARACTER WILL APPEAR AT THE CURRENT
                00090 ;BASIC CURSOR LOCATION.  THE BLINKING CURSOR CHARACTER MAY ALSO BE CHANGED BY A POKE.
                00095 ;     IF THE USR CALL STATEMENT (ABOVE) IS FOLLOWED BY A SEMI-COLON, THE ROUTINE WILL INTERPRET
                00100 ;THE BASIC STATEMENT, AND UPON EXIT THE CURRENT BASIC CURSOR LOCATION WILL BE THE NEXT SCREEN
                00105 ;LOCATION AFTER THE ENDING GRAPHIC DELIMITER CHARACTER (OR AFTER THE LAST AVAILABLE INPUT
                00110 ;LOCATION IF THE ENDING DELIMITER CHARACTER IS SET TO 0).  OTHERWISE, A LINE FEED-CARRIAGE
                00115 ;RETURN WILL BE PERFORMED UPON EXIT FROM THE USR ROUTINE.
                00120 ;     THE PROGRAM MAY BE USED AS PRESENTED ON EITHER MODEL I OR MODEL III MACHINES.
                00125 ;     LINES 700-2550, THE PROGRAM'S WORKING MODULE, CONSIST OF RELOCATABLE MACHINE CODE WHICH
                00130 ;MAY BE LOADED AND ACCESSED BY DIFFERENT METHODS (STRING PACKING, POKING, ETC) FROM BASIC.
                00135 ;     LINES 330-690 RELOCATE THE WORKING MODULE OF THE PROGRAM TO THE TOP OF AVAILABLE MEMORY,
                00140 ;AND STORE THE NEW VALUE FOR TOP OF MEMORY IN THE APPROPRIATE LOCATIONS (MODEL I = 4049-404AH,
                00145 ;MODEL III = 4411-4412H).
                00150 ;
                00155 ;------------------------- CALCULATED LOCATIONS WITHIN THE ROUTINE ---------------------------
                00160 ;
                00165 ;     USR CALL ENTRY (DEFUSRX=)                          = ONE BYTE ABOVE TOP OF MEMORY
                00170 ;     POKE LOCATION FOR BEGINNING DELIMITER CHARACTER = ENTRY LOCATION +  86
                00175 ;     POKE LOCATION FOR ENDING DELIMITER CHARACTER    = ENTRY LOCATION + 101
                00180 ;     FIRST POKE LOCATION FOR FILL CHARACTER          = ENTRY LOCATION +  96
                00185 ;     SECOND POKE LOCATION FOR FILL CHARACTER         = ENTRY LOCATION + 181
                00190 ;     THIRD POKE LOCATION FOR FILL CHARACTER          = ENTRY LOCATION + 236
                00195 ;     FOURTH POKE LOCATION FOR FILL CHARACTER         = ENTRY LOCATION + 251
                00200 ;     FIFTH POKE LOCATION FOR FILL CHARACTER          = ENTRY LOCATION + 274
                00205 ;     FIRST POKE LOCATION FOR CURSOR CHARACTER        = ENTRY LOCATION + 142
                00210 ;     SECOND POKE LOCATION FOR CURSOR CHARACTER       = ENTRY LOCATION + 161
                00215                               ;
                00220                               ;
                00225                               ;
                00230           ORG     07100H      ;LOAD INTO LOW MEMORY AND THEN MOVE UP
                00231 ;=============================================================================================
                00232 ;         DEFINE LABELS
                00233 ;=============================================================================================
                00240 SHOBYT    EQU     033AH       ;BASIC SUBROUTINE TO DISPLAY A BYTE AT CURRENT CURSOR POSITION
                00250 ERRRET    EQU     1A19H       ;RETURN TO BASIC IF LENGTH OF ATTEMPTED INPUT TOO LONG
                00260 STRDON    EQU     0A9AH       ;RETURN TO BASIC WHEN STRING INPUT IS FINISHED
                00270 CURSOR    EQU     4020H       ;BASIC LOCATION WHERE CURSOR LOCATION IS STORED
                00280 BASBUF    EQU     40A7H       ;BASIC STORAGE OF LOCATION OF LEVEL II STRING INPUT BUFFER
                00290 BEGCHR    EQU     95H         ;BEGINNING LIMITER GRAPHICS CHARACTER FOR DISPLAY
                00300 FILCHR    EQU     5FH         ;CHARACTER THAT FILLS IN THE ALLOTTED SPACE ON THE SCREEN
                00310 ENDCHR    EQU     0AAH        ;ENDING LIMITER GRAPHICS CHARACTER FOR DISPLAY
                00320 CURCHR    EQU     08FH        ;CURSOR GRAPHICS CHARACTER FOR DISPLAY
                00321 ;=============================================================================================
                00322 ;         THE FOLLOWING SECTION DETERMINES THE SIZE OF THE WORKING MODULE OF THE PROGRAM, GETS
                00323 ;       THE TOP OF MEMORY POINTER FROM ITS BASIC LOCATION (MODEL I = 4049H-404AH,
                00324 ;       MODEL III = 4411H-4412H), RELOCATES THE WORKING MODULE TO THE TOP OF AVAILABLE MEMORY, AND
                00325 ;       ADJUSTS THE STORED TOP OF MEMORY POINTER TO ONE BYTE BELOW THE ENTRY POINT OF THE MODULE.
                00326 ;=============================================================================================
7100 21B172     00330 RELOC     LD      HL,ENDBYT   ;LAST BYTE TO BE RELOCATED
7103 116B71     00340           LD      DE,ENTRY    ;FIRST BYTE TO BE RELOCATED
7106 ED52       00350           SBC     HL,DE       ;LENGTH OF PROGRAM-1
7108 23         00360           INC     HL          ;NUMBER OF BYTES TO BE RELOCATED
7109 44         00370           LD      B,H         ;
710A 4D         00380           LD      C,L         ;BC NOW HAS NUMBER OF BYTES TO MOVE
710B C5         00390           PUSH    BC          ;SAVE ON STACK
710C 0B         00400           DEC     BC          ;ADJUST TO CHANGE HIMEM VALUE
710D 3A2501     00410           LD      A,(0125H)   ;TEST BYTE
7110 FE49       00420           CP      49H         ;MEM LOC 0125H (293 DEC) = 49H (73 DEC) IF MODEL III
7112 280B       00430           JR      Z,MODIII    ;JUMP IF MODEL III
7114 2A4940     00440           LD      HL,(4049H)  ;TOP OF MODEL I MEMORY
7117 E5         00450           PUSH    HL          ;SAVE TO STACK
7118 ED42       00460           SBC     HL,BC       ;LENGTH OF PROGRAM
711A 224940     00470           LD      (4049H),HL  ;NEW TOP OF MEMORY
711D 180A       00480           JR      SKIP1       ;SKIP OVER MODEL III ROUTINE
711F 2A1144     00490 MODIII    LD      HL,(4411H)  ;TOP OF MODEL III MEMORY
7122 E5         00500           PUSH    HL          ;SAVE TO STACK
7123 ED42       00510           SBC     HL,BC       ;LENGTH OF PROGRAM
7125 2B         00520           DEC     HL          ;ADJUST FOR NO CARRY
7126 221144     00530           LD      (4411H),HL  ;NEW TOP OF MEMORY
7129 21B172     00540 SKIP1     LD      HL,ENDBYT   ;OLD END LOCATION
712C D1         00550           POP     DE          ;NEW END LOCATION
712D C1         00560           POP     BC          ;NUMBER OF BYTES TO MOVE
712E EDB8       00570           LDDR                ;MOVE THEM UP
7130 ED5B2040   00580           LD      DE,(CURSOR) ;GET CURRENT CURSOR LOCATION
7134 1B         00590 BAKCUR    DEC     DE          ;BACKSPACE ONCE
7135 1A         00600           LD      A,(DE)      ;CHECK SCREEN LOCATION
7136 FE20       00610           CP      20H         ;IS ANYTHING THERE?
7138 28FA       00620           JR      Z,BAKCUR    ;BACKSPACE UNTIL YOU FIND SOMETHING ON THE SCREEN
713A 13         00630           INC     DE          ;WHEN YOU DO FIND SOMETHING, INSERT A SPACE AND
713B 13         00640           INC     DE          ;   START THE INSTALLED MESSAGE THERE
713C 012400     00650           LD      BC,24H      ;LENGTH OF MESSAGE
713F 214771     00660           LD      HL,MESSI    ;START OF TEXT
7142 EDB0       00670           LDIR                ;DISPLAY TEXT
7144 C32D40     00680           JP      402DH       ;RETURN TO DOS
7147 49         00690 MESSI     DEFM    'INSTALLED AT TOP OF AVAILABLE MEMORY'
```

Listing 2 continued

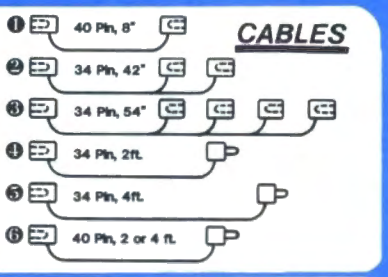
NOW MODEL I AND MODEL III!

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.



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 onto the parellel 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 selectrics, etc. Assembled, tested, ready to use with connector and instructions. For Model I or III (please specify). ONLY . $59.00

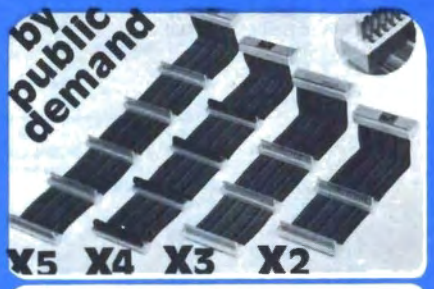


SUPERIOR QUALITY REPLACEMENT & EXTENSION CABLES

Highest quality cable and high force, gold plated contacts ensure the utmost in connection reliability.

1	KEYBOARD TO EXPANSION INTERFACE	$21.
2	DISK DRIVE CABLE FOR 1 OR 2 DRIVES	$32.
3	DISK DRIVE CABLE FOR 3 OR 4 DRIVES	$45.
4	DISK DRIVE CABLE EXTENDER	$22.
5	PRINTER CABLE EXTENDER	$24.
6	40 PIN BUS EXTENDER — 2 ft $22	4 ft. $24

Custom cable configurations are also available. Call us.



YOU ASKED FOR IT: "EXPANDABUS" X1, X2, X3 AND X4.

CONNECT ALL YOUR TRS-80 DEVICES SIMULTANEOUSLY on 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) 'Puts the result in variable 'A'. Volts! 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 shipped 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?

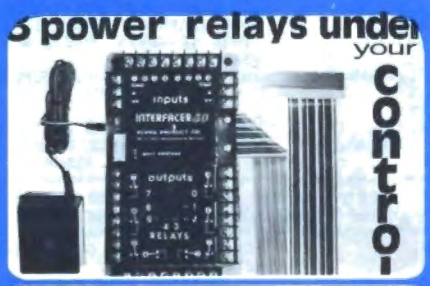
Order your **ALPHA GREEN SCREEN** today. $12.50

DISK DRIVE EXTENDER CABLE, FREE YOUR MINI-DRIVES.

End the daisy-chain mess once and for all. Fits all mini-drives: Percom, Aerocomp, Shugart, Micropolis, MTI, Vista, Pertec, Siemens, BASF. East 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, superb user's manual $159

ALPHA Products

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

See List of Advertisers on Page 227

Listing 2 continued

```
                        00691 ;=========================================================================================
                        00692 ;         THE NEXT SECTION (BEGINNING THE WORKING MODULE) GETS THE INPUT LENGTH CALLED FOR BY THE
                        00693 ;       BASIC PROGRAM, DETERMINES HOW MUCH SPACE ON THE SCREEN WILL BE REQUIRED AND CHECKS TO SEE
                        00694 ;       IF THE LENGTH CALLED FOR IS EXCESSIVE, IN WHICH CASE CONTROL IS RETURNED TO THE 'READY'
                        00695 ;       PROMPT IN BASIC.
                        00696 ;=========================================================================================
716B CD7F0A             00700 ENTRY   CALL    0A7FH           ;LENGTH OF INPUT FROM BASIC PROGRAM TO HL REGISTER
716E E5                 00710         PUSH    HL              ;SAVE ON STACK
716F E5                 00720         PUSH    HL
7170 7C                 00730         LD      A,H             ;MSB OF LENGTH
7171 FE00               00740         CP      00H             ;   MUST BE ZERO
7173 2803               00750         JR      Z,ERRTST        ;IF IT IS, BYPASS ERROR RETURN
7175 C3191A             00760         JP      ERRRET          ;IF NOT, LENGTH IS TOO LONG
7178 7D                 00770 ERRTST  LD      A,L             ;LSB OF LENGTH
7179 FEF2               00780         CP      0F2H            ;   MUST BE LESS THAN 240 (242 WITH END CHARACTERS ADDED)
717B 3803               00790         JR      C,COUNTL        ;IF IT IS, BYPASS ERROR RETURN
717D C3191A             00800         JP      ERRRET          ;IF NOT, LENGTH IS TOO LONG
                        00801 ;=========================================================================================
                        00802 ;         THE NEXT SECTION DETERMINES HOW MANY SCREEN LINES WILL BE REQUIRED FOR INPUT AND
                        00803 ;       SCROLLS THE DISPLAY UP IF NECESSARY.
                        00804 ;=========================================================================================
7180 2A2040             00810 COUNTL  LD      HL,(CURSOR)     ;CURRENT POSITION ON SCREEN
7183 D1                 00820         POP     DE              ;GET LENGTH
7184 19                 00830 CKLEN   ADD     HL,DE           ;WHERE END OF INPUT WILL BE
7185 23                 00840         INC     HL              ;END GRAPHICS MUST BE ADDED TO GET END
7186 01FF3F             00850         LD      BC,3FFFH        ;BOTTOM OF SCREEN
7189 37                 00860         SCF                     ;CLEAR
718A 3F                 00870         CCF                     ;   CARRY
718B ED42               00880         SBC     HL,BC           ;WILL INPUT TAKE US PAST END OF SCREEN?
718D 3826               00890         JR      C,SCRDON        ;IF NOT, DON'T SCROLL
718F 2A2040             00900         LD      HL,(CURSOR)     ;GET CURRENT CURSOR POSITION
7192 014000             00910         LD      BC,40H          ;ONE LINE'S WORTH
7195 ED42               00920         SBC     HL,BC           ;MOVE CURSOR UP ONE LINE
7197 222040             00930         LD      (CURSOR),HL     ;STORE NEW LOCATION
719A E5                 00940         PUSH    HL              ;NEW CURSOR LOCATION TO STACK
719B D5                 00950         PUSH    DE              ;LENGTH OF INPUT TO STACK
719C 11003C             00960         LD      DE,3C00H        ;FIRST LOCATION ON SCREEN
719F 21403C             00970         LD      HL,3C40H        ;FIRST LOCATION OF SECOND LINE
71A2 01C003             00980         LD      BC,03C0H        ;15 LINES OF CHARACTERS
71A5 EDB0               00990         LDIR                    ;MOVE THEM UP
71A7 0640               01000         LD      B,40H           ;ONE LINE OF CHARACTERS
71A9 21C03F             01010         LD      HL,3FC0H        ;FIRST POSITION ON BOTTOM LINE
71AC 3620               01020 CLEARL  LD      (HL),20H        ;BLANK
71AE 23                 01030         INC     HL              ;   BOTTOM
71AF 10FB               01040         DJNZ    CLEARL          ;       LINE
71B1 D1                 01050         POP     DE              ;LENGTH OF INPUT
71B2 E1                 01060         POP     HL              ;CURSOR POSITION
71B3 18CF               01070         JR      CKLEN           ;GO BACK AND CHECK FOR MORE SCROLLING TO BE DONE
                        01071 ;=========================================================================================
                        01072 ;         THE NEXT SECTION DISPLAYS THE INPUT AREA AND FILLS IT WITH THE FILL CHARACTER.  'HL' IS
                        01073 ;       SET TO THE BEGINNING OF THE INPUT BUFFER. 'DE' IS SET TO THE FIRST SCREEN INPUT LOCATION.
                        01074 ;=========================================================================================
71B5 E1                 01080 SCRDON  POP     HL              ;NECESSARY SCROLLING IS FINISHED
71B6 45                 01090         LD      B,L             ;LENGTH OF INPUT
71B7 48                 01100         LD      C,B             ;DUPLICATE IN 'C' REGISTER
71B8 3E0F               01110         LD      A,0FH           ;CODE TO TURN OFF CURSOR
71BA CD3A03             01120         CALL    SHOBYT          ;DO IT
71BD 2A2040             01130         LD      HL,(CURSOR)     ;SCREEN LOCATION
71C0 3E95               01140         LD      A,BEGCHR        ;GET BEGINNING GRAPHICS DELIMITER CHARACTER
71C2 B7                 01150         OR      A               ;IF IT IS A NULL,
71C3 2805               01160         JR      Z,FILL          ;THEN DO NOT DISPLAY AND DO NOT ADVANCE SCREEN LOCATION
71C5 77                 01170         LD      (HL),A          ;PUT GRAPHICS CHARACTER AT BEGINNING OF INPUT AREA
71C6 23                 01180         INC     HL              ;NEXT SCREEN LOCATION
71C7 222040             01190         LD      (CURSOR),HL     ;   IS LOCATION WHERE INPUT WILL EVENTUALLY BEGIN
71CA 365F               01200 FILL    LD      (HL),FILCHR     ;PUT AS MANY OF THIS CHARACTER
71CC 23                 01210         INC     HL              ;   ON SCREEN AS NEEDED
71CD 10FB               01220         DJNZ    FILL            ;       TO FILL UP INPUT AREA
71CF 3EAA               01230         LD      A,ENDCHR        ;GET END GRAPHICS DELIMITER CHARACTER
71D1 B7                 01240         OR      A               ;IF IT IS A NULL,
71D2 2802               01250         JR      Z,SKPEND        ;THEN PUT NOTHING AT THERE AND DO NOT ADVANCE SCREEN LOCATION
71D4 77                 01260         LD      (HL),A          ;PUT GRAPHICS CHARACTER AT END OF INPUT AREA
71D5 23                 01270         INC     HL              ;THIS IS WHERE CURSOR WILL END UP AFTER WE ARE DONE
71D6 E5                 01280 SKPEND  PUSH    HL              ;SAVE ON STACK
71D7 2AA740             01290         LD      HL,(BASBUF)     ;GET START OF INPUT BUFFER
71DA E5                 01300         PUSH    HL              ;   AND DUPLICATE
71DB FDE1               01310         POP     IY              ;       IN 'IY'
71DD 41                 01320         LD      B,C             ;GET LENGTH COUNT IN 'B' AGAIN
71DE ED5B2040           01330         LD      DE,(CURSOR)     ;GET BEGINNING OF SCREEN INPUT AREA
71E2 D5                 01340         PUSH    DE              ;   AND SAVE ON STACK
                        01341 ;=========================================================================================
                        01342 ;         THE NEXT SECTION IS THE ACTUAL INPUT OF CHARACTERS FROM THE KEYBOARD.  THE CHARACTERS
                        01343 ;       ARE STORED IN THE BUFFER AND ECHOED TO THE DISPLAY.
                        01344 ;=========================================================================================
71E3 78                 01350 KEYIN   LD      A,B             ;CHECK HOW MUCH OF ALLOWED INPUT LENGTH REMAINS
71E4 B7                 01360         OR      A               ;IF NONE IS LEFT
71E5 285E               01370         JR      Z,EBONLY        ;   THEN GO WAIT FOR EITHER <ENTER> OR BACKSPACE
71E7 C5                 01380         PUSH    BC              ;SAVE LENGTH COUNTS ON STACK
71E8 CD5B03             01390         CALL    035BH           ;STROBE KEYBOARD FOR INPUT
71EB FE00               01400         CP      00H             ;ANY KEY PRESSED?
71ED 2806               01410         JR      Z,FLASH         ;   NO, GO TO BLINK ROUTINE
71EF E5                 01420         PUSH    HL              ;SAVE HL ON STACK
71F0 CD0B00             01430         CALL    000BH           ;ADDRESS OF NEXT INSTRUCTION TO HL
71F3 1831               01440         JR      VERIFY          ;CHECK INPUT FOR VALIDITY
71F5 06FF               01450 FLASH   LD      B,0FFH          ;SET UP FOR DELAY
71F7 1A                 01460         LD      A,(DE)          ;WHAT IS AT CURSOR POSITION NOW?
71F8 FE8F               01470         CP      CURCHR          ;IS THE CURSOR THERE?
71FA 2814               01480         JR      Z,FLASH1        ;   YES, GO TO THAT SECTION
71FC CD5B03             01490 FLASH0  CALL    035BH           ;STROBE KEYBOARD FOR INPUT
71FF FE00               01500         CP      00H             ;ANY KEY HIT?
7201 2806               01510         JR      Z,NOIN1         ;   NO, WAIT FOR IT
7203 E5                 01520         PUSH    HL              ;SAVE HL ON STACK
7204 CD0B00             01530         CALL    000BH           ;ADDRESS OF NEXT INSTRUCTION TO HL
7207 181D               01540         JR      VERIFY          ;GO VERIFY INPUT
7209 10F1               01550 NOIN1   DJNZ    FLASH0          ;WAIT FOR INPUT
720B 3E8F               01560         LD      A,CURCHR        ;GET CURSOR CHARACTER
720D 12                 01570         LD      (DE),A          ;DISPLAY IT AT CURSOR LOCATION
```

Listing 2 continued

Listing 2 continued

```
720E 06FF      01580          LD      B,0FFH          ;RE-ESTABLISH COUNT
7210 CD5B03    01590 FLASH1   CALL    035BH           ;STROBE KEYBOARD FOR INPUT
7213 FE00      01600          CP      00H             ;ANY KEY HIT?
7215 2806      01610          JR      Z,NOIN2         ;   NO, WAIT FOR IT
7217 E5        01620          PUSH    HL              ;SAVE HL ON STACK
7218 CD0B00    01630          CALL    00BH            ;ADDRESS OF NEXT INSTRUCTION TO HL
721B 1809      01640          JR      VERIFY          ;GO VERIFY INPUT
721D 10F1      01650 NOIN2    DJNZ    FLASH1          ;WAIT FOR INPUT
721F 3E5F      01660          LD      A,FILCHR        ;GET FILL CHARACTER
7221 12        01670          LD      (DE),A          ;DISPLAY IT AT CURSOR LOCATION
7222 06FF      01680          LD      B,0FFH          ;RE-ESTABLISH COUNT
7224 18D6      01690          JR      FLASH0          ;GO WAIT SOME MORE
7226 23        01700 VERIFY   INC     HL              ;PUT
7227 23        01710          INC     HL              ;       RETURN ADDRESS
7228 E3        01720          EX      (SP),HL         ;                 ON STACK
7229 FE20      01730          CP      20H             ;IF INPUT VALUE IS GREATER THAN CONTROL CHARACTERS
722B 300D      01740          JR      NC,PUTCHR       ;   THEN DISPLAY IT AND ADD TO BUFFER
722D FE0D      01750          CP      0DH             ;IF ENTER KEY IS PRESSED
722F 284B      01760          JR      Z,ALLDON        ;   THEN INPUT IS COMPLETED
7231 FE08      01770          CP      08H             ;IF BACKSPACE IS PRESSED
7233 2821      01780          JR      Z,BACKSP        ;   THEN GO TO BACKSPACE ROUTINE
7235 FE18      01790          CP      18H             ;IF SHIFT-LEFT ARROW IS PRESSED
7237 281D      01800          JR      Z,BACKSP        ;   THEN A B-I-G BACKSPACE IS NEEDED
7239 C9        01810          RET                     ;IF NONE OF THE ABOVE, THEN KEY ENTRY IS INVALID.
               01820          ;ENTRIES ARE THUS LIMITED TO CHARACTERS PLUS ENTER, BACKSPACE AND SHIFT-BACKSPACE
723A C1        01830 PUTCHR   POP     BC              ;CLEAN RETURN ADDRESS OFF STACK
723B C1        01840          POP     BC              ;GET LENGTH COUNTS BACK FROM STACK
723C 77        01850          LD      (HL),A          ;LOAD CHARACTER TO BUFFER LOCATION
723D 23        01860          INC     HL              ;POINT TO NEXT BUFFER LOCATION
723E D1        01870          POP     DE              ;GET POINTER TO CURRENT SCREEN LOCATION
723F 12        01880          LD      (DE),A          ;DISPLAY CHARACTER
7240 13        01890          INC     DE              ;POINT TO NEXT SCREEN LOCATION
7241 D5        01900          PUSH    DE              ;SAVE SCREEN LOCATION ON STACK
7242 05        01910          DEC     B               ;REDUCE SIZE OF REMAINING ALLOWABLE INPUT
7243 189E      01920 RELAY    JR      KEYIN           ;GO BACK AND SEE WHAT THE KEYBOARD CALLS FOR NEXT
7245 CD4900    01930 EBONLY   CALL    0049H           ;WAIT FOR KEYBOARD INPUT
7248 FE0D      01940          CP      0DH             ;IF <ENTER> IS PRESSED
724A 2835      01950          JR      Z,ALLDON+5      ;   THEN FINISH UP
724C FE08      01960          CP      08H             ;IF BACKSPACE IS PRESSED
724E 2813      01970          JR      Z,BACKOK        ;   THEN DO A BACKSPACE
7250 FE18      01980          CP      18H             ;IF SHIFT-BACKSPACE IS PRESSED
7252 280F      01990          JR      Z,BACKOK        ;   THEN DO A B-I-G BACKSPACE
7254 18EF      02000          JR      EBONLY          ;IF NONE OF THE ABOVE, KEEP WAITING
7256 3E5F      02010 BACKSP   LD      A,FILCHR        ;GET FILL CHARACTER
7258 12        02020          LD      (DE),A          ;   DISPLAY IT AT CURRENT CURSOR POSITION
7259 C1        02030          POP     BC              ;CLEAN RETURN ADDRESS OFF STACK
725A C1        02040          POP     BC              ;RELOAD LENGTH COUNTS FROM STACK
725B 78        02050          LD      A,B             ;GET REMAINING ALLOWABLE INPUT
725C B9        02060          CP      C               ;COMPARE TO ALLOWABLE INPUT AT START
725D 2004      02070          JR      NZ,BACKOK       ;IF NOT AT START OF INPUT THEN BACKSPACE IS VALID
725F 3E00      02080          LD      A,00H           ;NEGATE INPUT
7261 1880      02090          JR      KEYIN           ;   AND GO WAIT FOR MORE INPUT
7263 D1        02100 BACKOK   POP     DE              ;GET SCREEN LOCATION
7264 1B        02110          DEC     DE              ;BACK UP ONE SPACE
7265 3E5F      02120          LD      A,FILCHR        ;GET FILL CHARACTER
7267 12        02130          LD      (DE),A          ;REPLACE LAST CHARACTER ENTERED WITH FILL CHARACTER
7268 2B        02140          DEC     HL              ;DELETE LAST CHARACTER ENTERED FROM BUFFER
7269 04        02150          INC     B               ;ADD ONE TO ALLOWABLE INPUT REMAINING
726A 3A8038    02160          LD      A,(3880H)       ;CHECK TO SEE IF SHIFT IS PRESSED
726D FE01      02170          CP      01H             ;MODEL I EITHER SHIFT - MODEL III LEFT SHIFT
726F 2804      02180          JR      Z,BIGBAK        ;IF SHIFT IS PRESSED THEN GO ALL THE WAY
7271 FE02      02190          CP      02H             ;MODEL III RIGHT SHIFT
7273 2004      02200          JR      NZ,BAKDON       ;IF SHIFT NOT PRESSED, THEN ONE BACK SPACE WILL DO IT
7275 78        02210 BIGBAK   LD      A,B             ;IF SHIFT IS PRESSED, THEN KEEP BACKING
7276 B9        02220          CP      C               ;   UNTIL ENTIRE ENTRY
7277 20EB      02230          JR      NZ,BACKOK+1     ;       IS ELIMINATED
7279 D5        02240 BAKDON   PUSH    DE              ;SAVE SCREEN LOCATION BACK ON STACK
727A 18C7      02250          JR      RELAY           ;GO BACK AND WAIT FOR MORE KEYBOARD INPUT
               02251 ;=========================================================================================
               02252 ;         WHEN ENTER IS PRESSED TO TERMINATE INPUT, THE ROUTINE JUMPS HERE.  A CARRIAGE RETURN-
               02253 ;       LINE FEED IS ADDED TO THE BUFFER TO BE READ BY THE BASIC PROGRAM, THE CURSOR POSITION IS
               02254 ;       UPDATED, AND THE START OF THE BUFFER IS RETURNED IN HL TO THE BASIC CALLING PROGRAM.
               02255 ;=========================================================================================
727C 3E5F      02260 ALLDON   LD      A,FILCHR        ;REPLACE SCREEN CURSOR
727E 12        02270          LD      (DE),A          ;   WITH FILL CHARACTER
727F C1        02280          POP     BC              ;CLEAN RETURN ADDRESS OFF STACK
7280 C1        02290          POP     BC              ;RELOAD LENGTH COUNTS FROM STACK
7281 360D      02300          LD      (HL),0DH        ;LOAD ENTER-CARRIAGE RETURN TO BUFFER
7283 E1        02310          POP     HL              ;CLEAN ENTRY OFF STACK
7284 E1        02320          POP     HL              ;CURSOR POSITION AT END
7285 FDE5      02330          PUSH    IY              ;SAVE BUFFER BEGINNING ON STACK
7287 222040    02340          LD      (CURSOR),HL     ;ENDING CURSOR LOCATION
728A 2AD840    02350          LD      HL,(40D8H)      ;LOCATION OF LAST BYTE EXECUTED IN CURRENT BASIC STATEMENT
728D 23        02360          INC     HL              ;POINT TO NEXT BYTE
728E 7E        02370          LD      A,(HL)          ;WHAT IS IT?
728F FE3B      02380          CP      3BH             ;IS IT A SEMI-COLON?
7291 2015      02390          JR      NZ,ENDLF        ;   IF NOT, GO DO A LINE-FEED-CARRIAGE RETURN ON SCREEN
7293 23        02400          INC     HL              ;   IF SO, MAKE THE SEMI-COLON THE LAST BYTE EXECUTED
7294 22D840    02410          LD      (40D8H),HL      ;TELL
7297 23        02420          INC     HL              ;   BASIC
7298 22EE40    02430          LD      (40EEH),HL      ;       THE NEWS
729B DDE1      02440          POP     IX              ;THE LOCATION OF THE NEXT BYTE IN THE BASIC STATEMENT TO BE
729D FDE1      02450          POP     IY              ;   EXECUTED IS THIRD UP THE STACK
729F E1        02460          POP     HL              ;       THIS IS IT !
72A0 23        02470          INC     HL              ;POINT PAST THE SEMI-COLON
72A1 E5        02480          PUSH    HL              ;REPLACE
72A2 FDE5      02490          PUSH    IY              ;   STACK
72A4 DDE5      02500          PUSH    IX              ;       CONTENTS
72A6 1805      02510          JR      NENDLF          ;JUMP OVER LINE FEED-CARRIAGE RETURN
72A8 3E0D      02520 ENDLF    LD      A,0DH           ;GET CODE FOR CHARRIAGE RETURN
72AA CD3A03    02530          CALL    SHOBYT          ;GO TO NEXT LINE
72AD E1        02540 NENDLF   POP     HL              ;GET BUFFER START INTO HL FOR TRANSFER TO BASIC PROGRAM
72AE C39A0A    02550          JP      STRDON          ;CARRY THE START OF THE STRING INPUT BUFFER BACK TO BASIC
72B1 00        02560 ENDBYT   DEFB    0
7100           02570          END     RELOC
00000 Total errors
```

by David B. Lewis

NEW MATH— OLD ORDER

Convert those confusing reverse Polish notation equations to more conventional algebraic format.

Jan Lukasiewicz, a noted Polish logician, developed a means of arranging mathematical equations in symbolic logic sequence more than 30 years ago. His new format for math expressions was dubbed reverse Polish notation (RPN). Unlike algebraic equations, where mathematical operators appear in conventional computational sequence, equations using reverse Polish notation have the numbers before the operator. For instance, 3+(4*5) becomes 4 5 * 3 +.

RPN works well with computers because it takes advantage of the way computers store and manipulate numbers to streamline the calculating process. The computer languages Forth and Lisp, as well as some scientific calculators, use this parenthesis-free notation, but I've always found it confusing.

I wrote a short Model I/III Basic program that solves this problem by converting RPN to the more familiar order-of-operations form of algebraic logic (see the Program Listing). It also gives you the decimal value of an RPN expression.

You can use any digits and standard arithmetic operators (* + − /) with my program.

Program Listing. Converting reverse Polish notation.

```
5 'REVERSE POLISH NOTATION TO ORDER OF OPERATIONS NOTATION
7 'BY David B. Lewis, Box 88, Shady, NY  12479
9 CLEAR200
10 CLS:R$="REVERSE POLISH NOTATION":R=LEN(R$)
15 PRINT@128+30,"by David B. Lewis"
20 FORG=1TOR:PRINT@20+G,MID$(R$,G,1):FORM=1TO15:NEXT:NEXT:IFPEEK(1
4591)=0THENFORG=1TOR:PRINT@20+R-G+1,MID$(R$,G,1):FORM=1TO15:NEXT:N
EXTELSE100
25 PRINT@985,"press any key";
30 IFPEEK(14591)=0THEN20ELSE100
90 INPUT"PRESS ENTER TO CONTINUE";R$
100 CLS:PRINT"What is your Reverse Polish Notation expression?":PR
INT"(Don't forget spaces, and use the symbols +, -, *, /.)":PRINT:
INPUTR$:R=LEN(R$):M=1:G=0:PRINT
110 IFM=R+1THENPRINT"Order of Operations Notation: ":PRINTA$(1):PR
INT:PRINT"Value:"A(1):PRINT:PRINT:GOTO 90        ELSEB$=MID$(R$,M,
1):B=ASC(B$)
115 IFB=32THENM=M+1:GOTO110
120 IFB>=48ANDB<=57THENG=G+1:GOSUB300:GOTO110 'READ DIGITS INTO NE
XT LEVEL OF STACK.
130 IFB=42ORB=43ORB=45ORB=47THENGOSUB200:M=M+1:GOTO110
140 PRINT"NON-FATAL ERROR: MEANINGLESS CHARACTER ENCOUNTERED.":PRI
NT:M=M+1:GOTO110
190 '
195 'MAKE EXPRESSION LOOK NICE
200 G=G-1:IFLEN(A$(G))>1THENA$(G)=" ("+A$(G)+") "
210 IFLEN(A$(G+1))>1THENA$(G+1)=" ("+A$(G+1)+") "
220 A$(G)=A$(G)+B$+A$(G+1)
230 IFB=42THENA(G)=A(G)*A(G+1)
240 IFB=43THENA(G)=A(G)+A(G+1)
250 IFB=45THENA(G)=A(G)-A(G+1)
260 IFB=47THENA(G)=A(G)/A(G+1)
270 RETURN
295 'EVALUATE DIGITS
300 A$(G)=""
310 B$=MID$(R$,M,1):IFB$=" "THENA(G)=VAL(A$(G)):RETURN
ELSEA$(G)=A$(G)+B$:M=M+1:GOTO310
```

End

RPN

In reverse Polish notation, each mathematical symbol operates on only two numbers at a time. This makes RPN well-suited for computers because they store numbers in stacks. A stack is an area in memory similar to a stack of dishes; the last item a computer places on a stack is the first item it takes off.

Many compilers convert an arithmetic expression in Basic, such as 3+4*5, to machine code by first converting it to Polish notation. Another pass compiles the expression into machine language.

As an example of RPN, take the expression 4 5 * 3 +. The computer places the digits 4 and 5 on the stack and multiplies them, with a result of 20. Then the computer places the 3 on the empty stack and adds it to the previous number, 20, to produce 23.

In the expression 6 7 8 * +, 7 and 8 are the top two numbers on the stack. The computer multiplies them, and adds 6 to the result.

Here are a few examples to help you appreciate RPN's logic and under-

The Key Box

Models I and III
16K RAM Cassette Basic
32K RAM Disk Basic

stand how the program transforms expressions:

- 1 2 3 * + equals 1+(2*3) equals (2*3)+1 equals 2 3 * 1 +.
- 1 2 3 4 5 / + − * equals 1*(2−(3+(4/5))).
- 5 4 * 3 4 / + equals (5*4)+(3/4).

The Program

In the Program Listing, the PEEK (14591) in line 30 is equivalent to an INKEY$ function. The algorithm that converts the RPN equation simulates the stack, but uses string values.

The program compiles the decimal value in the simulated stack A(X) using pointer G, and forms the standard arithmetic expression in A$(X) by manipulating string values. It then adds any digit or set of digits to the next stack position, ignoring blank spaces.

The program splices arithmetic operators between the top two strings on the stack, and bumps the stack pointer down. When it completes the original string, it places the whole expression in A$(1), and the decimal value in A(1). ■

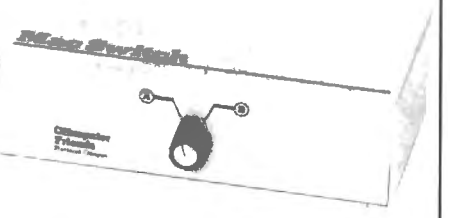
Contact David Lewis at Union College, Box 1927, Schenectady, NY 12308.

Re-ink any fabric ribbon for less than 5¢. Extremely simple operation. We have a MAC INKER for any printer. Lubricant ink safe for dot matrix printheads. Multi-colored inks, uninked cartridges available. Ask for brochure. Thousands of satisfied customers.

$54.95 +

Mac Switch lets you share your computer with any two peripherals (serial or parallel). Ideal for word processors—never type an address twice. Ask us for brochure with tips on how to share two peripherals with MAC SWITCH. Total satisfaction or full refund.

$99.00



Order Toll Free 1-800-547-3303

Computer Friends ↙357
6415 SW Canyon Court
Suite #10
Portland, Oregon 97225
(503) 297-2321

Mac Inker & MacSwitch

COPYCAT

COPYCAT II

THE MOST POWERFUL DISK BACKUP UTILITY HAS BEEN IMPROVED.

Now you can backup virtually all of your protected diskettes. Even the games and utilities that you thought were impossible to copy. COPYCAT II will automatically make a fast, exact duplicate of your original master diskette regardless of protection schemes used, including CRC errors, dual density tracks, mixed sector lengths, false sectors and various other means of protection.

COPYCAT is intended for your personal use only, in making backup copies of your protected software.

COPYCAT runs on a 48K, 2 disk drive, TRS-80 model I, III or 4. Please specify model number when ordering.

COPYCAT II 49.95

Add $2.00 for postage and handling. CA residents please add 6% sales tax.
All orders processed within 24 hours. Personal checks require (2) weeks to clear bank.

OMNISOFT RESEARCH
2170 W. Broadway, #501A
Anaheim, CA 92804
(714) 772-5000
Dealer inquiries welcomed

MasterCard VISA

↙36

↙ See List of Advertisers on Page 227

by P. Gregory Springer

Character Cache

Here's the key to unlocking 10 unusual characters in Scripsit that you can display on the screen or print out.

Serendipity has played a part in some important discoveries. Daguerre accidentally discovered photography when he left an exposed photographic plate in a cupboard with some mercury. And Fleming's discovery of penicillin was nothing more than a botched laboratory experiment. On a more humble scale, chance has looked kindly on me, too: I accidentally discovered a way to display and print some previously inaccessible characters with Scripsit.

I was typing a letter one day and used the word "year." I was hitting the keys at my usual fast and furious pace, and "yea}r" appeared on the screen. After a little experimentation, I found that pressing the y, e, and a keys simultaneously gave me the right brace. When I printed out the file, the brace showed up on paper, too.

I became so intrigued that I did some further experimentation to find that I could use other three-letter upper- and lowercase combinations to produce both the left and right braces ({ }), left and right brackets ([]), the plus-or-minus sign (±), the Spanish tilde (~), a vertical divider (¦), the circumflex (^), a diagonal slash that slopes to the right (\), and the underline character for blank spaces. I've listed the three-letter combinations and their outcome in the Table.

You can generate these characters on either a dot-matrix or a daisy-wheel printer. In either case, you have to do so through Scripsit. I've used this technique successfully on Qume and C. Itoh daisy-wheel printers, but you might have problems with other systems. For example, I've found that if you use a Model I, the brackets, circumflex, and slash all appear on the screen as arrows, but print out properly with a daisy-wheel printer.

Some dot-matrix printers, such as the Radio Shack Line Printer V, won't underline or print the circumflex, and instead substitute arrows. You'll have to experiment to determine your system's capabilities.

Applications

The applications for these characters are limited only by your imagination. You can substitute braces for parentheses to give your prose a distinctive look. Braces also determine working order in mathematics problems.

Use brackets for interpolations within parentheses, in legal documents, for stage directions, in translations, and so on.

The plus/minus sign is a useful mathematical symbol, but it's used so rarely in word processing that it doesn't appear on daisy wheels, and most dot-matrix printers can't print it.

You can, however, use the plus/minus sign as a forced space symbol to prevent compression when you transfer material to non-Scripsit word processing systems. Scripsit, however, ignores the plus/minus sign when printing; it will not force a space.

The underlining created in Scripsit is not true underlining, but you can use it for fill-in-the-blank exam questions.

Since you can't print the tilde or circumflex above a letter in Scripsit, their use is limited to fancy border designs.

Last, I use the vertical line as a left border in justified text; it makes for a very neat page.

Creating Characters

You can create the characters described here with Extended Basic, provided your DOS has a search and replace function. DOSPLUS, for example, replaces a number, letter, or character in any program with ASCII character codes.

CHR$(123) and CHR$(125) are the codes for left and right braces. Once you have a program with the braces (or any other characters) imbedded in it, save the program in ASCII. You can call it into Scripsit as a block with braces intact.

If you'd rather not bother with blocks or pressing three keys at once, you can use a Basic program to convert the greater-than and less-than symbols (<>) into braces (see the Program Listing). You can alter the program to produce any of the other characters.

Since Scripsit uses the greater-than sign to define document formatting lines, you can only use the program for modem transmission.

The characters will also appear in Scripsit's bottom format line (SPECIAL COMMAND?). To do a search and replace with one of them, search and delete the unwanted string of letters. Since y and q rarely appear near

The Key Box

Models I and III
Scripsit

Program Listing. This program changes left- and right-arrow keys to braces.

```
5 CLEAR 5000
10 REM -- PROGRAM TO CHANGE < TO BRACE ON TRS 80, MOD III
20 INPUT "FILE? ";F$
30 OPEN"I",#1,F$
40 OPEN"O",#2,F$+"-FIX"
50 IF EOF(1)THEN130
60 LINE INPUT#1,X$
70 FOR I% = 1 TO LEN(X$)
80 IF MID$(X$,I%,1) = " <" THEN MID$(X$,I%,1) = CHR$(123)
90 IF MID$(X$,I%,1) = " >" THEN MID$(X$,I%,1) = CHR$(125)
100 NEXT I%
110 PRINT #2,X$
120 GOTO 50
130 CLOSE 1,2
140 END
```

each other in the same word, this shouldn't be a problem.

Addendum

I've also discovered that you can use the enter key in the special command line. Pressing control-X lets you search and replace all the enter symbols in your text.

And I've been trying to find the cents sign without success. But it's on my daisy wheel, so there must be a way; I'll keep trying. ■

Contact P. Gregory Springer at 510 W. Stoughton, Urbana, IL 61801.

Keys	Character
yqs	{
yea	}
yqt	¦
yqv	~
yqw	±
YQU	]
YQS	[
YQW	—
YQV	^
YQT	\

Table. Three-letter combinations and the characters they produce.

ENTERTAINING & EDUCATIONAL

BOARD GAMES

For TRS-80 (Mod 1,3,4)

ASSIGNMENT: EUROPE (16K) $24.75
• Plan—Travel—Learn •

BANKING (16K) $29.75
• Business Simulation •

USED CAR DEALER (48K) $29.75
• Wheeling—Dealing Fun •

PRICES INCLUDE POSTAGE & HANDLING

SEND CHECK—or ask for more information

TRIANGLE SOFTWARE
P.O. BOX 58182
RALEIGH, NC 27658 ↙188

AZTEC C80

A powerful, professional, and portable "C" language development system for TRS 80 Models II, III, 4, 12 and 16

Aztec C80 for the TRS 80 Includes:
- "C" Compiler (Full UNIX V7)
- Relocating Assembler
- Linkage Editor & Librarian
- "C" Source Program Editor
- Extensive Run Time Library with UNIX I/O

Aztec C80 is fully compatible with Aztec C compilers for IBM PC DOS, CP/M-86, CP/M-80, Apple, Commodore 64, and with UNIX V7 "C".

Aztec C is currently in use in thousands of corporations, universities, research centers, and small businesses worldwide. It has been used to implement languages, operating systems, word processors, accounting systems, financial packages, graphics systems, utilities, and games.

Micro C80, a newly released student version of Aztec C, supports the full "C" language and comes with a choice of either "The C Programming Language" by Kernighan and Ritchie or "Learning to Program in C" by Thomas Plum. The student version can be upgraded to the full system.

TRS 80

MANX® software systems

Box 55
Shrewsbury, NJ 07701 ↙319

ORDER PHONE (800) 221-0440
TELEX 4995812
INFO. & NJ ORDER PHONE (201) 780-4004

PRICES

Aztec C80, Model 4	$199
Aztec C80 Model III	$199
Aztec C80/Pro (III and 4)	$349
Aztec C II for CP/M all TRS 80 Models	$199
Aztec C II/Pro for Model II CP/M	$349
Aztec C80 or C II Upgrade to /Pro	$150
CP/M-80 to TRS 80 Cross	$750
PC DOS or CP/M-86 to TRS 80 Cross	$750
UNIX (8086,68K) to TRS 80 Cross	$1500
UNIX (PDP 11) to TRS 80 Cross	$2000

STUDENT VERSION

Micro C80 with K&R or PLUM text	$99
Micro C80 without K&R or PLUM text	$75
MICRO C80 Upgrade to Aztec C80 or C II	$149
Micro C80 Upgrade to C80/PRO or C II/PRO	$299

Order by Phone or Mail
Dealer Inquiries Invited
Prices Subject to Change
Call Before Ordering to Check Availability

↙ See List of Advertisers on Page 227

by Dennis Husch

Relaxed Syntax

Artificial Intelligence isn't quite here yet, but this natural-language data base gives you an idea of what's to come in interactive software.

Artificial intelligence (AI) is an area of computer applications that's currently garnering a lot of attention. The goal of AI proponents is to get computers to mimic human thought capabilities—learning, reasoning, and self-correction. To date, no working system of artificial intelligence has been developed, but I've devised a Model I/III natural-language data-base interface called Friend that creates the illusion of intelligence by applying a set of rules to a problem and generating meaningful responses.

My data base contains information for amateur radio operators, but you can tailor the program to fit your needs.

Program Operation

Amateur radio operators (hams) often encounter distant signals they're unfamiliar with and so can't identify. My program stores the international radio stations used in Central America, South America, and the Caribbean. If you encounter an unfamiliar signal, you can query the database in plain English and it will identify the signal's place of origin.

For example, if you detect a signal at 4255 kHz and enter that information, the program displays the station's callsign, city, and country of origin.

Each data-base record contains the following information about a station: radio frequency, callsign, modulation, band width, country-of-origin name, and city-of-origin name. The key fields for data-base query include radio frequency, callsign, modulation, and country name.

The program's natural-language capabilities make special syntax and commands unnecessary. Friend searches through natural-language text strings for key words and parameters. You can enter queries in the same language you use to question another person. For example, if you type in "Who uses callsign CHF?" the program responds with "Canada Halifax."

Natural-language queries usually result in a specific response. But you can also enter parameters alone. If you enter CFH, the program makes a broader, tabular response: "104255 CFH CW 1.5 Canada Halifax."

The program can process queries with one or two parameters. Examples of single-parameter queries include:

- Who uses modulation FSK;
- Show me the signal plan for Peru;
- What callsigns are used on modulation FSK;
- Which frequencies use ISB; and
- Where is callsign CFH used.

Examples of dual-parameter queries include:

- Who uses callsign APO and modulation CW;
- Who uses frequency 6379 and CW;
- What callsign does Peru use on 12307 kHz; and
- What modulations does Peru use on frequency 12307.

Self-Updating

If the program is unable to isolate the parameters in your entry, or if it finds more than one potential substring that matches the characteristics of a parameter, the program asks you for assistance. It stores your responses for later use (W$, WN%).

When you complete the program's queries and the next prompt appears, type END and the program writes the updated word file to disk.

Friend also has a trace feature that identifies the function it's executing. To

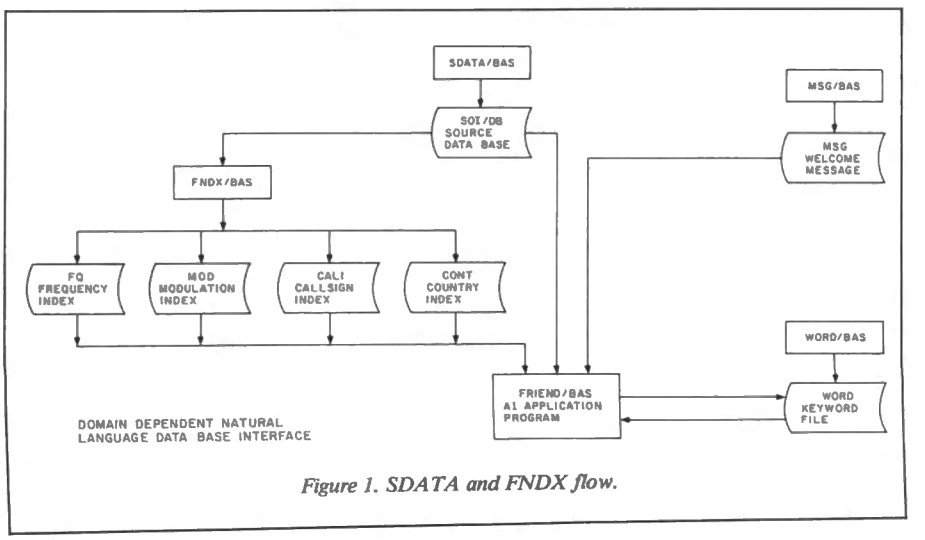


Figure 1. SDATA and FNDX flow.

The Key Box

LOAD 80

Models I and III
48K RAM
Disk Basic
TRSDOS

make this possible, the program POKEs a single letter into display memory (15423) preceding the execution of selected subroutines (see Table 1).

Programming Friend

You must type in two support programs and two interface programs before running Friend.

The first support program, MSG, builds a welcome file (see Program Listing 1). MSG writes the display every time you run the interface programs.

The second support program, Word, provides the seed words used in parsing natural-language strings (see Program Listing 2). But you only have to run Word once; when the interface encounters new natural-language words, it updates the word file for subsequent use.

The two interface programs translate your queries and provide responses. The first interface program, SDATA (see Program Listing 3), creates the random file SOI/DB, reads elements from the data statements, pads data items to standard field lengths, and creates database records and writes them to disk (see Fig. 1).

The second interface program, FNDX (see Program Listing 4), generates the ordered indices for radio frequency, callsign, modulation, and country name (see Fig. 1).

After you've typed in these four programs, you can type in Friend (see Program Listing 5).

Program Development

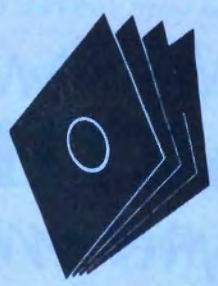
The key to the program is its domain dependence. I had to define the domain, or environment, in which the program works before beginning the natural-language interface.

I entered the data-base elements necessary for a query-response format as data statements in SDATA.

SDATA writes four records to each disk block. This structure provides each data base with a block number (1–N) and a record number (1–4). The inter-

Letter	Subroutine
I	Initialization
R	Ready for query
P	Parses input text
L	Loading search index
S	Executing binary search
F	Searching for frequency parameter
M	Searching for modulation parameter
C	Searching for call sign parameter
N	Searching for country name parameter

Table 1. Traced subroutines.



DISKS ONLY $1.79

We buy thousands of bulk disks each month for our own duplication and sales. We would like to offer these disks to you at tremendous savings. These are Super Quality disks guaranteed for life. If they ever go bad send them back and we will replace them FREE. Try some, if you don't like them return them.

100 DISKS TYVEK SLEEVES $179.95
10 DISKS TYVEK SLEEVES $19.95
10 DISKS WITH COLORED PLASTIC SLEEVES $21.95

FAMILY TREE

Track down your pedigree with the fast and easy methods provided by FAMILY TREE, the exciting genealogy program. You may be surprised and enchanted by the interesting people you find at the roots of your own family.

It will store seperate data for each particular relative, along with that persons mother and father, their sex, date of birth, place of birth, date of marriage, place of marriage, date of death and place of death.

MODEL I/III Tape or Disk (32K). $29.95

SUPER DOS

SUPERDOS alters your present TRS-DOS master, expanding its capabilities. With SUPERDOS you'll be able to bypass any password protection, get rid of manditory clock and date operations and save precious time booting the system, backing up disks and executing files. No more error 13 messages. It will tell you in English what kind of error happened. In addition to all of this, you can make as many backups of VISICALC and SCRIPSIT as you want. . . $19.95

TRANSFER TO MSDOS IBM/TRS 80

Transfer a great new utility that allows the owner of a TRS-80 Model I/III/4 to read and write to a disk made on a MSDOS computer. This includes IBM-PC, PC Jr., and SANYO 550.

NEW

Transfer will even take a compressed basic model III program, insert all the spaces around key words and copy the ASCII program to an MSDOS disk. Transfer will format an MSDOS disk on a Model I/III/4. Transfer will read any MSDOS version 1, (40 Track), Single Sided disk.

All you need is a Model III or 4 with 2 disk drives or a Model I with a doubler and 2 40 track disk drives.

Transfer will format a 40 track disk which can be read by the Tandy 2000. The Tandy 2000 can only write to an 80 track disk so you will not be able to read any disks from the 2000 unless you have an 80 track drive.

Transfer for the Model I/III/4 ..... $59.95

MICHTRON PASCAL-$75.50

A Super version of Pascal, complete in every way. Faster than either Radio Shacks Pascal or the Alcor Pascal.

1/2 price

Michtron Pascal supports full floating points, supports 60 standard keywords, it has 32 non-standard key words most specially designed for the TRS-80. Supports peek, poke, print @, and inkey among others.

Comes with Editor, Compiler, Onterpeter, Translater, and a run time system.

This is normally a $150.95 Pascal for a limited time we are offering it at ½ price for only $75.50. Try it, if you do not agree that it is the best Pascal available for the TRS-80, you may return it.

SANYO

We are dealers for the Fantastic Sanyo 550. A great 16 bit computer, that comes with 1 disk drive, 128 K memory, color Graphics, Word Star and Calc Star and costs only $995.95. Write for more information. We changed to Sanyo, shouldn't you???

SCREEN DUMP

Lets you print any graphics or text on the screen using an EPSON, or Prowriter printers.
Disk only $19.95

MichTron ✓ 22

1691 Eason ● Pontiac, Michigan 48054
Info: **(313) 673-8700**
Orders: **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. Dealers Inquires Invited.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

New! **Diskette "Give-A-Way?"** New!
Judge for yourself!
10 pack in Library Case — **New Low Price**
SS/DD — with hub ring

Introducing the NEW Tabor 3¼" Disk Drive

Storage 737,280 Bytes — 2 in one Case . . . . . **$ Call**

SOFTWARE SUPPORT INC. presents Software
Ldos[C] Improved — New efficient improvements for your Model I/III/IV LDOS[C] System
With Our Program Enhancements You Will Now Be Able To Accomplish:

1. Double the speed of disk operations
2. Reliable fast clock boot (with enhanced hardware — such as the Holmes Sprinter™)
3. Improved dual sided and 80 track disk drive operations.

Model I/III/IV Instapatch™ On Disk $29.95

Esylst™ — Neatly and automatically print out any number of your basic programs. Page numbering, top of page, skip, no limit to the number of programs printed at one setting. Fast — Easy — Efficient. Use with Newdos[A], Dosplus[B], Ldos[C]
For Your Model I/III/IV On Disk $19.95

DRIVE A HARD BARGAIN™

We have rewritten the book on Hard Drives. Our hard drives are the fastest, the most versatile (Newdos[A], Dosplus[B], and Ldos[C] drivers), the most adaptable, (runs on the Model I, Model III and Model IV using the same adapter), but, we must admit, it is the lowest (in cost that is) starting at **$999.95** for a 5 meg. (formatted) primary and **$695.00** for a secondary system. All systems come complete with power supply, case, cables and Instapatch™ software drivers for fast-trouble-free installation and operation. **Nothing else to buy!**

Self Test — Automatic Diagnostics *Error Correction — ECC* *Daisy Chain up to 40 Megabytes*

Warranty — ONE FULL YEAR. Call for details

TOLL FREE ORDERING
1-800-343-8841

GENERAL AND TECHNICAL
1-617-872-9090

SOFTWARE SUPPORT, INC.

✓327

One Edgell Road, Framingham, MA 01701 (617) 872-9090
Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sa . 10 am to 4:30 pm

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.

Canada
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 845-1534**
Canadian Toll Free 800-361-5155

Dealer inquiries invited.

A ™ Apparat Inc.
B ™ Microsystems Software Inc.
C ™ Logical Systems Inc.
© Copyright 1983

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at **$169.00!**

Tandon — Siemens — Remex — MPI — Teac — Shugart — Tabor

40 or 80 Tracks — Single or Dual Head — New 3½" Drivette™

Our Disk Drives Are Capable Of Single **And** Dual Density Operation

The **NEWEST** Technology Capable Of Operating On Most Popular Computers

Drive a Hard Bargain!!™ — 5 M.B.-20 M.B. Complete Systems . . . . . from $999.95

Diskette Breakthrough — 10 Pack in Library Case — ~~$18.95~~ NEW LOW PRICE

Since We Are Always Finding Ways To Save You Money, Please CALL For Our Most Current Pricing.

TOLL FREE ORDERING 1-800-343-8841	GENERAL AND TECHNICAL 1-617-872-9090
Model I/III/IV Drives (0 1 2 3)	starting at $169.00
Color Computer Drive (0 1 2 3)	$ Call Toll Free
Apple/Franklin Compatible Add-On Drives with Case & Cable (Now 40 Tracks)	~~$219.95~~ NEW LOW PRICE $259.95
Apple/Franklin Compatible Drives with Controller (Now 40 Tracks)	~~$219.95~~ NEW LOW PRICE $259.95
Model I/III/IV Memory Upgrade	Call Toll Free
Printers — Daisywheel/Dot Matrix	$ Call Toll Free
Diskettes in Library Cases	~~$18.95~~ New Low Price
Cases and Power Supplies — (Single-Dual-1/2 Height)	starting at $59.95
Printer **Buffers** 8K to 512K	starting at $143.95
Percom Double Density Controller (Model I)	$ Call Toll Free
Holmes Model I/III Speed-up Mod-VID/80	starting at $90.00
Color Computer Printer Interfaces	starting at $29.95
Cables — Printer/Disk Drive	starting at $23.00
DOSPLUS	$ Special Prices
Repair Services Now Offered — FAST Turn-a-Round	$ Call Toll Free

Warranty on Disk Drives — 6 Months — Extended Warranty $ Call Toll Free

SOFTWARE SUPPORT, INC.

↙327

One Edgell Road, Framingham, MA 01701 (617) 872-9090

Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sat. 10 am to 4:30 pm

DEALER INQUIRIES INVITED.

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge. C.O.D., please add $3.00. Shipping: Please call for amount. Not responsible for typographical errors.

Copyright 1983

CANADA
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 845-1534**
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. Schools and D&B corporate P.O.s accepted.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

face program uses these numbers to acquire specific records from the disk file.

Friend's access technique is a binary search of key elements' ordered indices. The program extracts key items and block/record numbers for the index from the data base. The program then sorts the index and writes it to disk.

You can see the natural-language interface's flow in Fig. 2. The program accepts the natural-language text input and parses the string, removing noise words. Friend then identifies key words, isolates parameters, validates them, and pairs them with actual key words or key words implied in the text.

After parsing, the program forms the structured query syntax, determines response content, and executes the query to acquire the necessary physical data records.

The program reads records to determine whether or not they contain the data to satisfy any logical AND conditions implied by the text. Friend generates responses from those records that satisfy query requirements.

Routine Autopsy

Friend initializes in lines 70–200, establishing the tables used for storing the binary search access indices (I$), pointers in the physical data base (P%), the Word file used in parsing (W$, WN%), and program variables.

This section also reads and displays

Program Listing 1. MSG.

```
10 REM WELCOME MESSAGE GENERATOR
20 REM PROGRAM NAME: MSG/BAS
30 REM (C) MARCH 1983
40 REM D.D. HUSCH
50 REM
60 CLS
70 DATA".                    *********************************/"
80 DATA".                    *   DOMAIN DEPENDENT NATURAL    */"
90 DATA".                    * LANGUAGE DATA BASE INTERFACE */"
100 DATA".                    *********************************////"
110 DATA"I AM THE FRIENDLY INTERFACE TO THE INTERNATIONAL COMMER
ICAL/"
120 DATA"SIGNAL PLAN DATA BASE.  I PROVIDE ACCESS TO INFORMATION
 ON/"
130 DATA "THE CALLSIGNS - FREQUENCIES - AND MODULATIONS OF SELEC
TED/"
140 DATA"MEXICAN - CENTRAL AMERICAN - SOUTH AMERICAN - AND CARIB
BEAN/"
150 DATA"COMMERICAL COMMUNICATIONS CIRCUITS.  ONCE I FINISH LOAD
ING/"
```

Listing 1 continued

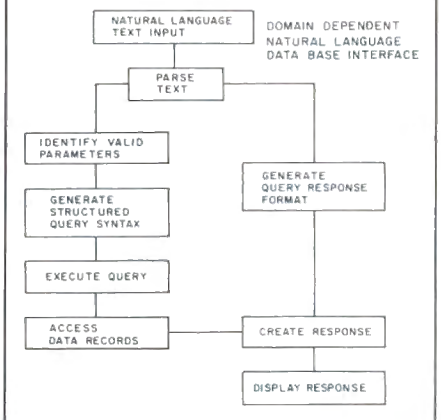
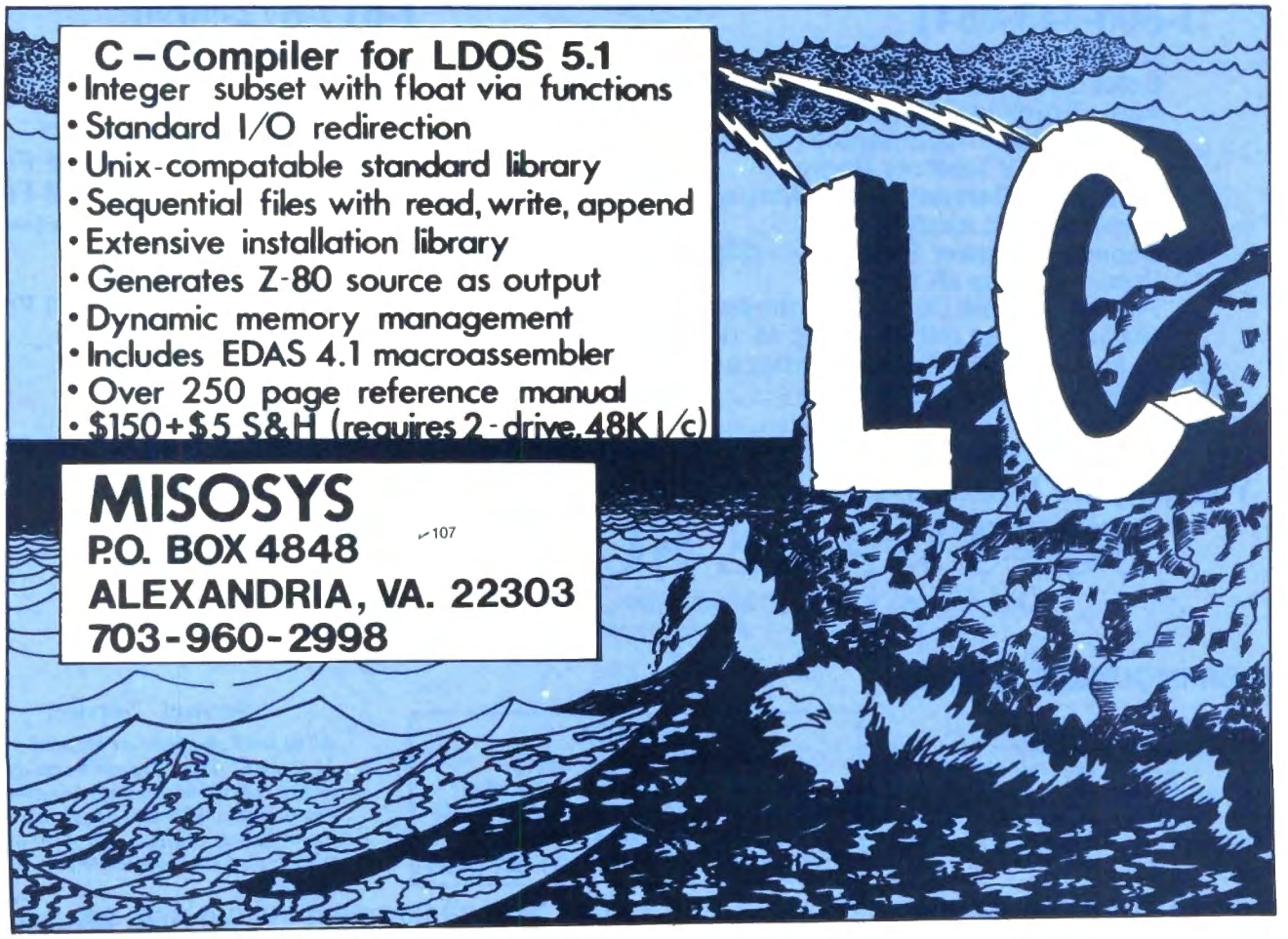


Figure 2. Natural-language interface flow.



the welcome file (MSG), and reads and loads the word file (Word).

The main processing loop in lines 210–340 generates the screen prompt, accepts the natural-language query, and parses the text.

It also accesses the word file and removes noise words from the input string. When Friend finds key words, it updates the output table and removes the key words. It then passes what remains of the input text to the appropriate subroutine for isolation and verification of query parameters.

Once the program parses all noise words, keywords, and parameters, it executes the data-base query and output subroutines. When the program completes the output subroutine, it clears control variables and executes the main processing loop again.

Lines 350–510 contain the binary search subroutine. This routine loads the ordered index specified by the contents of I% (1 equals frequency, 2 equals modulation, 3 equals callsign, and 4 equals country name).

The program uses the query parameter contained in KY$ to search the index, setting variable F% to −1 if it doesn't find a match. Variable P% contains the array pointer value for the match.

The subroutine for accessing data-base physical records is in lines 560–720. It accesses the records in the SOI/DB disk file. In the event of multiple matches in the data base, the subroutine passes the query parameter (KY$) and location pointer (P%) to locate the first entry in the index that matches the parameter.

The program acquires the block/record numbers from table P% for each match, and reads the records from disk.

Prior to accessing the actual records from disk, the response-option subroutine processes table PO%, and sets variables X% and AI% to allow for the implied output format.

Friend then reads data-base records and passes them to the output routine where the required data is displayed.

End Notes

The interface stores only one index because the infamous garbage collection routine provided with normal Basic periodically gathers all free string space. As a result, with all four indices in memory and running under normal Basic, some queries might take as long as 10 minutes. ■

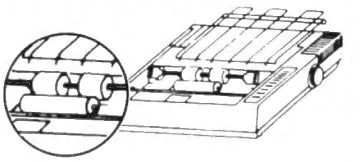
Contact Dennis Husch at 820 Jackson St., Herndon, VA 22070.

GOOD NEWS FOR EPSON MX-80 and RX-80 OWNERS

MICRO-GRIP FRICTION FEED

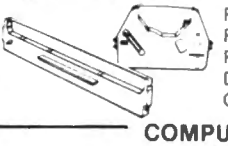
Add inexpensive friction feed to your MX-80 or RX-80. Easily installed with screwdriver, no soldering. Does not disturb tractor feed. Also fits printers based on Epson design such as IBM PC, Commodore and H-P Dot Matrix printers.

Wt. 1 lb. ONLY $39.95/ea.



CARTRIDGE RIBBONS FOR . . .

EPSON MX 70/80	$5.00/ea.	RS LP III, V	$5.85/ea.
EPSON MX 100	9.75/ea.	RS LP VI, VIII	7.00/ea.
RS Daisy Wheel II M/S	5.75/ea.	RS DMP 400	5.50/ea.
RS LP I, IV (Zip Pack)	2.75/ea.	DIABLO Hytype II M/S	4.50/ea.
RS LP I, II, IV (Cart.)	5.85/ea.	OKIDATA 84	5.00/ea.



PRESSURE SENSITIVE LABELS

ONE ACROSS 3-1/2" x 15/16"
ONLY $2.70/M
Order in increments of 5,000

COMPUTER PAPER

MINI PACKS

9-1/2" x 11" Blank, 20 lb. 1 pt., 1000/ctn.
(Extra fine perforations r. & l.) ONLY $16.25/ctn.
14-7/8" x 11" 1/2" Green Bar, 15 lb. 1 pt., 1500/ctn.
ONLY $25.00/ctn.

STANDARD PACKAGING

9-1/2" x 11" Blank, 15 lb. 1 pt. 3300/ctn. ONLY $26.00/ctn.
14-7/8" x 11" 1/2" Green Bar, 15 lb. 1 pt., 3500/ctn.
ONLY $40.00/ctn.

ALL COMPUTER SUPPLIES AT DISCOUNT PRICES

TERMS AND CONDITIONS

We require a minimum order of $10.00, not including shipping charges. Prices effective 7/1/83 and subject to change without notice. To keep prices competitive we operate on cash basis. Credit extended to Federal agencies, but all other institutions and individuals send payment with order; our prices DO NOT include shipping. No C.O.D. orders accepted. We ship via UPS or motor freight. Include street address, we don't ship to P.O. boxes. Freight charges added to credit card purchases. No merchandise returned without prior written authorization from us. Merchandise ordered in error or not wanted is subject to 25% restocking charge and limited to merchandise credit only.

VISA

Send for our Free Brochure of Computer Supplies. Ask for Catalog No. DP-50.

BILL COLE ENTERPRISES, INC. ✓180
P.O. Box 60 • Dept. 80/4 Wollaston, Ma. 02170-0060 617-963-5510
For Credit Card Orders ONLY! Call Toll Free 1-800-225-8249

NEBS

Forms & Supplies for your TRS-80

continuous CHECKS • STATEMENTS INVOICES • Micro-Perf™ STATIONERY Printer Paper, Labels and File Cards

Plus brand name
- Diskettes
- Ribbons
- Storage items
- Work station aids and much more

- Guaranteed compatible with your Radio Shack software programs.
- Quality at low prices...250 checks or 500 statements for as little as $29.95
- Fast service, money-back guarantee.
- Easy ordering by mail or phone Toll Free.

FREE CATALOG
Send today or phone
TOLL FREE
1+800-325-1117
MA 1+800-448-4688

NEBS Computer Forms 12 South St., Townsend, MA 01469
Please Rush a Free NEBS Computer Supplies Catalog.
Name Phone ( )
Company Name
Street Address
City, State, Zip
Use my computer for: Printer ?
□ Word Processing □ Accounting □ □Yes □ No
Your Line of Business
CODE 15603

✓533

✓ See List of Advertisers on Page 227

Listing 1 continued

```
160 DATA"ALL OF THE KEYS I NEED TO ACCESS THIS DATA - YOU WILL B
E/"
170 DATA"ABLE TO ASK QUESTIONS IN PLAIN ENGLISH USING ANY SYNTAX
 THAT/"
180 DATA"MAKES SENSE.  SOME WORDS ABOUT THIS DATA BASE:/"
190 DATA".....CALLSIGNS - THREE LETTER CALLS ONLY - XXX./"
200 DATA".....FREQUENCIES - HF FREQS ONLY - 00000./"
210 DATA".....MODULATIONS - AM  FM  CW  FSK USB LSB ISB./"
220 DATA".....COUNTRY NAME - I ONLY USE THE FIRST FOUR LETTERS./
"
230 DATA"/WHEN I'M READY FOR YOUR QUERIES I WILL PROMPT YOU WITH
 A '*'/"
240 DATA "END"
250 OPEN"O",1,"MSG"
260 READR$
270 PRINT#1,R$
280 IFR$="END"THENCLOSE:END
290 FORI=1TOLEN(R$):X$=MID$(R$,I,1):IFX$="/"THENPRINTELSEPRINTX$
;
300 NEXTI
310 GOTO260
```

End

Program Listing 2. Word.

```
10 REM KEYWORD FILE GENERATOR
20 REM PROGRAM NAME: KWORD/BAS
30 REM (C) MARCH 1983
40 REM D.D. HUSCH
50 REM
60 REM   FILE FORMAT IS  "KEYWORD,FUNCTION NUMBER"
70 REM   DON'T FORGET THE COMMA  [
80 REM
90 REM  FUNCTION NUMBER:
100 REM   -1  =  NOISE WORD
110 REM    1  =  KEYWORD FOR FREQUENCY INDEX
120 REM    2  =  KEYWORD FOR MODULATION INDEX
130 REM    3  =  KEYWORD FOR CALLSIGN INDEX
140 REM    4  =  KEYWORD FOR COUNTRY INDEX
150 REM  LAST ENTRY IN WORD FILE MUST BE "END,0"
160 REM  #'S ARE USED TO REPRESENT SPACES IN KEYWORD FILE
170 CLS:CLEAR5000
180 DATA ?,-1,!,-1,WHO,4,WHAT,-1,WHERE,4,HOW,-1,WHY,-1,#F#,1
190 DATA #FQ#,1,#FREQ,1,#M#,2,#MD#,2,#MOD,2,#C#,3,#CL#,3,#CALL,3
200 DATA COUNTRY,4,NATION,4,GOVERNMENT,4,GOVT,4,#KH#,1,#KHZ#,1
210 DATA #KZ#,1,#CO#,4,#NA#,4,#GO#,4,#A#,-1,#THE#,-1,#I#,-1
220 DATA #IS#,-1,WANT,-1,#TO#,-1,KNOW,-1,#USE,-1,#FOR#,-1
230 DATA #USI,-1,ALL,-1,EVERY,-1,COMPLETE,-1,YOU,-1,FIND,-1
240 DATA SHOW,-1,TELL,-1,ABOUT,-1,DOES,-1,SIGN,-1,SOI,-1
250 DATA PLAN,-1,#IN#,-1.#ME#,-1,#ARE#,-1,#AS#,-1,#AND#,-1
260 DATA END,0
270 OPEN"O",1."WORD"
280 READ W$,N$:IFW$="END"THENPRINT#1,W$;",";N$:CLOSE:END
290 PRINTW$,N$
300 PRINT#1,W$;",";N$
310 GOTO 280
```

End

Program Listing 3. SDATA.

```
10 REM SOURCE INFORMATION FOR DATA BASE
20 REM PROGRAM NAME: SDATA/BAS
30 REM (C) MARCH 1983
40 REM D.D. HUSCH
50 REM
100 DATA 207 : REM NUMBER OF RECORDS IN THE DATA BASE
101 DATA04235.2,CW,CLA3,5.0,CUBA,HAVANA RADIO
102 DATA04244.0,CW,PPR,1.0,BRAZIL,RIO RADIO
103 DATA04251.0,CW,PPJ,1.0,BRAZIL,JUNCAO RADIO
104 DATA04262.0,CW,LPD62,5.0,ARGENTINA,GEN. PACHECO RADIO
105 DATA04263.0,CW,FFP2,1.0,MARTINIQUE,FORT DE FRANCE RADIO
106 DATA04265.0,CW,PPL,1.0,BRAZIL,BELEM RADIO
107 DATA04268.0,CW,LPD68,5.0,ARGENTINA,GEN. PACHECO RADIO
108 DATA04271.0,CW,CCV,0.0,CHILE,VALPARAISO NAVAL RADIO
109 DATA04276.9,CW,HKB,2.5,COLOMBIA,BARRANQUILLA RADIO
110 DATA04289.0,CW,PWZ,5.0,BRAZIL,RIO DE JANEIRO RADIO
111 DATA04297.0,CW,PPO,1.0,BRAZIL,OLINDA RADIO
112 DATA04298.0,CW,CCV,0.0,CHILE,VALPARAISO NAVAL RADIO
113 DATA04224.0,CW,LSA2,2.0,ARGENTINA,BOCA RADIO
114 DATA04366.7,USB,PPL,1.0,BRAZIL,BELEM RADIO
115 DATA04413.2,USB,PPL,1.0,BRAZIL,BELEM RADIO
116 DATA04800.0,CW,XDP,0.0,MEXICO,MEXICO CITY
117 DATA05000.0,AM,LOL,2.0,ARGENTINA.BUENOS AIRES (TIME)
118 DATA05000.0,AM,PPE,0.0,BRAZIL,RIO DE JANEIRO (TIME)
119 DATA05000.0,AM,HD210A,0.0,ECUADOR,GUAYAQUIL
120 DATA05058.0,CW,COZ67,0.0,CUBA,UNKNOWN
121 DATA05122.5,CW,PVB,0.0,BRAZIL,SALVADOR
122 DATA05122.5,CW,PVJ,0.0,BRAZIL,RIO DE JANEIRO
123 DATA05122.5,CW,PVM,1.0,BRAZIL,MANAUS
124 DATA05122.5,CW,PZB,1.0,BRAZIL,BRASILIA
125 DATA05196.0,CW,COZ67,0.0,CUBA.UNKNOWN
126 DATA05258.0,CW,CMU967,0.0,CUBA.UNKNOWN
127 DATA06100.0,AM.YVTO,1.0,VENEZUELA,CARACAS (TIME)
128 DATA06337.0,CW,CLA5,5.0,CUBA,HAVANA RADIO
129 DATA06360.0,CW,CLS,5.0,CUBA,HAVANA RADIO
130 DATA06379.5,CW,APO,1.0,BARBADOS,BARBADOS RADIO
131 DATA06392.0,CW,CLS,5.0,CUBA,HAVANA RADIO
132 DATA06404.0,CW,LPD44,5.0,ARGENTINA,GEN. PACHECO RADIO
133 DATA06435.0,CW,CLQ,5.0,CUBA,HAVANA RADIO
134 DATA06442.5,CW,XFS3,1.0,MEXICO,TAMPICO
135 DATA06442.5,CW,XFU,1.0,MEXICO,VERACRUUZ RADIO
136 DATA06454.0,CW,CLA4,5.0,CUBA,HAVANA RADIO
137 DATA06460.0,CW,LSA3,1.0,ARGENTINA,BOCA RADIO
138 DATA06470.5,CW,TYL,1.0,TRINIDAD,NORTH POST RADIO
139 DATA06481.5,CW,CCS,0.0,CHILE,SANTIAGO NAVAL RADIO
140 DATA06512.6,USB,LPL30,10.0,ARGENTINA,GEN. PACHECO RADIO
141 DATA06745.5,CW,CAK,0.0,CHILE,SANTIAGO
142 DATA07350.0,LSB,XDD212,10.0,MEXICO,MEXICO CITY
143 DATA07430.0,ISB,ZPB74,10.0,PARAGUAY,ASUNCION
144 DATA07600.0,AM,HD210A,0.0,ECUADOR,GUAYAQUIL
145 DATA07661.0,CW,CLN78,20.0,CUBA,HAVANA
146 DATA07665.0,AM,TIO2,3.0,COSTA RICA.LAS PAVAS
147 DATA07815.0,AM,CLN84,20.0,CUBA,HAVANA
148 DATA07935.0,ISB,CML23,3.0,CUBA,HAVANA
149 DATA07935.0,CW,COY895,0.0,CUBA,HAVANA
150 DATA07975.0,CW,CVK79,14.0,URAGUAY,MONTEVIDEO
151 DATA08035.5,USB,CXL21,2.5,URAGUAY,MONTEVIDEO
152 DATA08085.0,AM,ZPB80,10.0,PARAGUAY,ASUNCION
153 DATA08167.5,CW,LQB9,5.0,ARGENTINA.BUENOS AIRES (TIME)
154 DATA08447.0,CW,LSC4,1.0,ARGENTINA.USHUAIA RADIO
155 DATA08447.0,CW,LSG4,1.0,ARGENTINA.RIO GALLEGOS RADIO
156 DATA08447.0,CW,LSM44,1.0,ARGENTINA.COMORDO RIVADAVIA RADIO
157 DATA08447.0,CW,LSN37,1.0,ARGENTINA.MAR DEL PLATA RADIO
158 DATA08447.0,CW,LSO5,1.0,ARGENTINA.BUENOS AIRES RADIO
```

Listing 3 continued

VOICE SYNTHESIZER FOR APPLE AND COMMODORE

NEW!

JE520AP

JE520CM

• Over 250 word vocabulary - affixes allow the formation of more than 500 words • Built-in amplifier, speaker, volume control, and audio jack • Recreates a clear, natural male voice • Plug-in user ready with documentation and sample software • Case size: 7¼"L x 3¼"W x 1-3/8"H

APPLICATIONS: • Security Warning • Teaching • Instrumentation • Telecommunication • Handicap Aid • Games

The JE520 VOICE SYNTHESIZER will plug right into your computer and allow you to enhance almost any application. Utilizing National Semiconductor's DIGITALKER™ Speech Processor IC (with four custom memory chips), the JE520 compresses natural speech into digital memory, including the original inflections and emphases. The result is an extremely clear, natural vocalization.

Part No.	Description	Price
JE520CM	For Commodore 64 & VIC-20	$114.95
JE520AP	For Apple II, II+, and IIe	$149.95

NEW! Software & Documentation for CP/M Computers

JE664 EPROM PROGRAMMER

8K to 64K EPROMS — 24 & 28 Pin Packages

Completely Self-Contained — Requires No Additional Systems for Operation

• Programs and validates EPROMs • Checks for properly erased EPROMs • Emulates PROMs or EPROMs • RS232C Computer Interface for editing and program loading • Loads data into RAM by keyboard • Changes data in RAM by keyboard • Loads RAM from an EPROM • Compares EPROMs for content differences • Copies EPROMs • Power Input: 115VAC, 60Hz, less than 10W power consumption • Enclosure: Color-coordinated, light tan panels with molded end pieces in mocha brown • Size: 15⅝"L x 8¾"D x 3½"H • Weight: 5¾ lbs.

The JE664 EPROM Programmer emulates and programs various 8-Bit Word EPROMs from 8K to 64K-Bit memory capacity. Data can be entered into the JE664's internal 8K x 8-Bit RAM in three ways: (1) from a ROM or EPROM, (2) from an external computer via the optional JE665 RS232C BUS, (3) from its panel keyboard. The JE664's RAMs may be accessed for emulation purposes from the panel's test socket to an external microprocessor in programming and emulation, the JE664 allows for examination, change and validation of program content. The JE664's RAMs can be programmed quickly to all "1"s (or any value), allowing unused addresses in the EPROM to be programmed later without necessity of "UV" erasing. The JE664 displays DATA and ADDRESS in convenient hexadecimal (alphanumeric) format. A "DISPLAY EPROM DATA" button changes the DATA readout from RAM word to EPROM word and is displayed in both hexadecimal and binary code. The front panel features a convenient operating guide. The JE664 Programmer includes one JM16A Jumper Module (as listed below)

JE664-A EPROM Programmer $995.00
Assembled & Tested (Includes JM16A Module)

JE665 — RS232C INTERFACE OPTION — The RS232C Interface Option implements computer access to the JE664's RAM. This allows the computer to manipulate, store and transfer EPROM data to and from the JE664. A sample program listing is supplied in MBASIC for CP/M computers. Documentation is provided to adapt the software to other computers with an RS232 port. 9600 Baud, 8-bit word, odd parity and 2 stop bits.

FOR A LIMITED TIME A SAMPLE OF SOFTWARE WRITTEN IN BASIC FOR THE TRS-80® MODEL I, LEVEL II COMPUTER WILL ALSO BE PROVIDED.

JE664-ARS EPROM Prog. w/JE665 Option. $1195.00
Assembled & Tested (Includes JM16A Module)

EPROM JUMPER MODULES — The JE664's JUMPER MODULE (Personality Module) is a plug-in Module that pre-sets the JE664 for the proper programming pulses to the EPROM and configures the EPROM socket connections for that particular EPROM.

JE664 EPROM Jumper Mod. No.	EPROM	Programming Voltage	EPROM MANUFACTURER	PRICE
JM08A	2708	25V	AMD, Motorola, Nat., Intel, TI	$14.95
JM16A	2716, TMS2516 (TI)	25V	Intel, Motorola, Nat., NEC, TI, AMD, Hitachi, Mostek	$14.95
JM16B	TMS2716 (3-Vlt)	-5V +5V, +12V	Motorola, TI	$14.95
JM32A	TMS2532	25V	Motorola, TI, Hitachi, OKI	$14.95
JM32B	2732	25V	AMD, Fujitsu, NEC, Hitachi, Intel, Mitsubishi, National	$14.95
JM32C	2732A	21V	Fujitsu, Intel	$14.95
JM64A	MCM68764, MCM68,764	21V	Motorola	$14.95
JM64B	2764	21V	Intel, Fairchild, OKI	$14.95
JM64C	TMS2564	25V	TI	$14.95

4-Digit Fluorescent Alarm Clock Kit

NEW!

• Bright 4-digit 0.5" high display • 10 minute snooze alarm • AM/PM indicator • Automatic display dimmer

The JE750 Clock Kit is a versatile 12-hour digital clock with 24-hour alarm. The clock has a bright 0.5" high blue-green fluorescent display. The display will automatically dim with changing light conditions. The 24-hour alarm allows the user to disable the alarm and immediately re-enable the alarm to activate 24 hours later. The kit includes all documentation, components, case and wall transformer. Size: 6⅝"L x 3¼"W x 1¾"D.

JE750 Alarm Clock Kit. $29.95

13⅛"L x 4¼"W x ¾"H

Misumi 54-Key Unencoded Matrix All-Purpose Keyboard

• SPST keyswitches • 20 pin ribbon cable connection • Low profile keys • Features: cursor controls, control, caps (lock), function, enter and shift keys • Color (keycaps): grey • Weight: 1 lb.

KB54. . . . . . $14.95

18"L x 7⅝"W x 1½"H

71-Key ASCII Cherry Keyboard

• 7 bit parallel ASCII with strobe • 11 key numeric keypad • SPST mechanical keyswitches • 15/30 card-edge connector • Features: escape, control, cursor controls, plus additional function keys • Color: white • Weight: 2 lbs. • Spec. included

KB1801. . . . . . $29.95

21⅞"L x 9.8"W x 3⅛"H

106-Key 8-Bit Serial ASCII Keyboard

• Numeric and cursor keypad • 10 user definable keys • 7 LED function displays • Security lock • N-key rollover • Uses Intel 8048/8748 • Color: white w/black panel • Documentation included • Weight: 6½ lbs.

KB139. . . . . . $59.95

Power/Mate Corporation REGULATED POWER SUPPLY +5VDC @ 3 Amp/ +6VDC @ 2.5 Amp

• Input: 105-125/210-250VAC at 47-63 Hz • Output: 5VDC @ 3.0 Amps/6VDC @ 2.5 Amps • Line regulation: 0.05% • Load reg.: 0.1% • Open frame mounts on any 1 of 3 surfaces • Size: 4⅞"L x 4"W x 2⅛"H • Weight: 2 lbs.

EMA5/6B. $29.95

Power/Mate Corporation REGULATED POWER SUPPLY +5VDC @ 6 Amp/ +6VDC @ 5 Amp

• Input: 105-125/210-250VAC at 47-63 Hz • Output: 5V @ 6A/6V @ 5A • Line reg.: 0.05% • Load reg.: 0.1% • Open frame mounts on any one of three surfaces • Size: 5⅜"L x 4⅞"W x 2⅞"H • Wt: 4 lbs.

EMA5/6C. $39.95

POWER SUPPLY +5VDC @ 7.6 AMP, 12VDC @ 1.5 AMP SWITCHING

• Input: 115VAC, 50-60Hz @ 1 amp/230VAC, 50Hz @ 1.6 amp. • Fan volt./power supply select switches (115/230VAC) • Output: 5VDC @ 7.6 amp, 12VDC @ 1.5 amp • 8 foot black power cord • Size: 11½"W x 13¼"D x 3⅜"H • Weight: 6 lbs.

Part No. PS94VOS. $39.95

POWER SUPPLY 4-Channel Switching

Microprocessor, mini-computer, terminal, medical equipment and process control applications. Input: 90-130VAC 47-440Hz. Output: +5VDC @ 5A, -5VDC @ 1A; +12VDC @ 1A, -12VDC @ 1A. Line reg.: ±0.2%. Ripple: 30mV p-p. Load reg.: ±1%. Overcurrent protection. Adj: 5V main output ±10%. 5-3/8"L x 1-7/8"W x 4-15/16"H. Wt. 1½ lbs.

Part No. FCS-604A . . . . . $69.95 each

Switching Power Supply for APPLE II, II+ & IIe™

• Can drive four floppy disk drives and up to eight expansion cards • Short circuit and overload protection • Fits inside Apple computer • Fully regulated +5V @ 5A, +12V @ 3A, -5V @ .5A, -12V @ .5A • Direct plug-in power cord included • Size: 9⅞"L x 3½"W x 2¼"H • Weight: 2 lbs.

KHP4007. . . . . . $79.95

DISKETTES AND ACCESSORIES

5¼" and 8" Diskettes

SSDD = Single Sided Double Density DSDD = Double Sided Double Density
SSQD = Single Sided Quad Density DSQD = Double Sided Quad Density

ULTRA MAGNETICS — 5¼" DISKETTES

Part No.	Description	Boxed	PRICE
UM51401	5¼" SSDD Soft Sector with Hub Ring and Envelope	10	$24.95
UM00096	5¼" SSDD Soft Sector with Hub Ring (Bulk)	100	199.95
UM52401	5¼" DSDD Soft Sector with Hub Ring and Envelope	10	32.95
UM00140	5¼" DSDD Soft Sector with Hub Ring (Bulk)	100	239.95
UM51801	5¼" SSQD Soft Sector with Envelope (96TPI)	10	34.95
UM00214	5¼" SSQD Soft Sector 96TPI (Bulk)	100	269.95
UM52801	5¼" DSQD Soft Sector with Envelope (96TPI)	10	41.95
UM00217	5¼" DSQD Soft Sector 96TPI (Bulk)	100	299.95

SK (ESKEI) — 5¼" DISKETTES

SK1D	5¼" SSDD Soft Sector with Hub Ring and Envelope	10	20.95
SK1DB	5¼" SSDD Soft Sector with Hub Ring (Bulk)	100	149.95
SK2D	5¼" DSDD Soft Sector with Hub Ring and Envelope	10	26.95
SK2DB	5¼" DSDD Soft Sector with Hub Ring (Bulk)	100	199.95

ULTRA MAGNETICS — 8" DISKETTES

UM81728	8" SSSD IBM-Compatible (128 B/S, 26 Sectors) and Envelope	10	34.95
UM00826	8" SSSD IBM-Compatible (128 B/S, 26 Sectors) Bulk	100	239.95
UM82726	8" DSDD Soft Sector (Unformatted) with Envelope	10	49.95
UM00840	8" DSDD Soft Sector (Unformatted) Bulk	100	299.95

All diskettes listed above are soft-sectored. All have Hub Rings with the exception of the Quad Density and the 8" Series.

DISKETTE ACCESSORIES

Disk Minder

• Attractive, functional disk storage system • 50 (8") or 75 (5¼") disk storage capacity • Easy filing and retrieving • Protects disk from dust contamination • Molded from durable smoked plastic with front carrying handle • Size: 7"W x 6½"H x 9¼"D • Weight: 2 lbs.

Part No.	Description	Price
DM75	Stores 75 (5¼") Diskettes	$19.95 each
DM50	Stores 50 (8") Diskettes	$29.95 each

MINI-PAK

• Stores 10 (5¼") diskettes • Protects disk from dust contamination • Durable smoked plastic • Size: 6"L x 5⅛"H x 1⅛"D

Part No.	Description	Price
MP-10	Stores 10 (5¼") Diskettes	$2.95 each

Diskette Envelopes

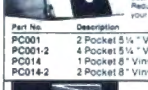
Sleeves for Bulk-Purchased Diskettes

• Tear proof • Lint/contaminant free • Anti-static protect • Wear resist

Part No.	Description	Price
MPS201	10 White 5¼" Envelopes	10 for $ 1.49
MPS201-100	100 White 5¼" Envelopes	100 for $10.95
MP8201	10 White 8" Envelopes	10 for $ 1.95
MP8201-100	100 White 8" Envelopes	100 for $17.95

Vinyl Pages

For 3-Ring Binders



Protects disks from dirt, scratches, dust, spills, and other contaminants. Reduces the risk of getting dirt near your disk drive head. Size: 8½" x 11".

Part No.	Description	Price
PC001	2 Pocket 5¼" Vinyl Page	10 for $7.95
PC001-2	4 Pocket 5¼" Vinyl Page	10 for $8.95
PC014	1 Pocket 8" Vinyl Page	10 for $7.95
PC014-2	2 Pocket 8" Vinyl Page	10 for $8.95

Mail Pak™

• Holds up to 3 diskettes • Ideal for mailing and retail packaging • Dust proof and durable • Transparent sleeve allows easy identification

Part No.	Description	Price
MP-05	Holds 3 ea. 5¼" Diskettes	$2.49 each
MP-08	Holds 3 ea. 8" Diskettes	$3.95 each

$10.00 Minimum Order — U.S. Funds Only
California Residents Add 6½% Sales Tax
Shipping — Add 5% plus $1.50 Insurance
Send S.A.S.E. for Monthly Sales Flyer!

Spec Sheets — 30¢ each
Send $1.00 Postage for your *FREE 1984 JAMECO CATALOG*
Prices Subject to Change

Mail Order Electronics - Worldwide

MasterCard VISA

Jameco ELECTRONICS

1355 SHOREWAY ROAD, BELMONT, CA 94002 ↙534

4/84 *PHONE ORDERS WELCOME — (415) 592-8097 Telex: 176043*

8" FLOPPY DISK DRIVE

- Single-Sided
- 77 Tracks
- 400/800K Bytes Capacity
- Industry Standard

The FDD100-8 8" Floppy Disk Drive (Industry Standard) features single or double density. Recording mode: FM single, MFM double density. Transfer rate: 250K bits/sec. single density; 500K bits/sec. double density. The FDD100-8 is designed to work with the single-sided soft sectored IBM Diskette I, or eq. disk cartridge. Power: 115VAC @ 50-80Hz, +24VDC @ 1.7 amps max., +5VDC @ 1.2 amps max. Unit as pictured above (does not include case, power supply, or cables). Size: 8.55"W x 14"L x 4.5"H. Weighs 12 lbs. Incl. 96-pg. manual.

FDD100-8 . . $169.95 ea.

5¼" APPLE™ Direct Plug-In Compatible Disk Drive

• Uses Shugart SA390 mechanics • 143K formatted storage • 35 tracks — compatible with Apple controller • Complete with connector and cable — just plug into your disk controller card • Size: 6"L x 3¼"W x 8-9/16"D • Weight: 4¼ lbs.

Part No. ADD-514 $195.95

5¼" TEAC DISK DRIVE

Single-Sided Half-Height 5¼" Drive

• Single or double density • 48 TPI • 40 tracks • 6ms track to track • 5W power consumption • Brushless DC direct-drive motor • 160KBytes formatted storage • One year warranty parts and labor •

Double your work space with the TEAC 5¼ FLOPPY DISK DRIVE. Because the TEAC FD55A Drive is half the height of conventional drives, you can fit up to four TEAC drives in the same space where two conventional drives fit. Or, have room for two floppy disk drives and a hard disk drive. Includes operating manual. Requires: +5VDC @ 55A and +12VDC @ 3A. Size: 5¾"W x 1⅝"H x 8"D. Wt: 3 lbs.

FD55A. $249.95

5¼" SHUGART DISK DRIVE

Double-Sided Half-Height 5¼" Drive

• Single or double density • 48 TPI • 40 tracks • 409KBytes formatted storage • 6ms track to track • Brushless DC direct-drive motor • One year warranty parts and labor • Media and interface compatible with the SA450

Backed by the industry's largest and most experienced engineering sales and service organization, the SA455 is the smart solution for a wide range of desktop applications. Includes operating manual. Requires: +5VDC @ 7A and +12VDC @ 75A. Size: 5.88"W x 1.63"H x 8"D. Wt. 3.3 lbs.

SA455. . . . . . $259.95

5¼" PANASONIC DISK DRIVE

Double-Sided Half-Height 5¼" DRIVE
Shugart SA455 Equivalent

• Single or double density • 48 TPI • 40 tracks • 6ms track to track • 327KBytes formatted storage • One year warranty parts and labor

The JA551 is perfect for word processors, personal and portable computers, small business computers and terminal add-ons. Includes operating manual. Requires: +5VDC @ 9A and +12VDC @ 1A. Size: 5.88"W x 1.63"H x 8"D. Wt 3.3 lbs.

JA551-2. . . . . . $239.95

DISK DRIVE CABLE CUSTOM

We stock a wide variety of signal cables and 3 power cable kits to meet your disk drive requirements. We also customize cable assemblies for many other applications. Call for a price quote.

IBM MEMORY EXPANSION KIT COMPAQ COMPATIBILITY

SAVE HUNDREDS OF $$$ BY UPGRADING MEMORY BOARDS YOURSELF!

Most of the popular memory boards allow you to add an additional 64K, 128K, 192K, or 256K. The IBM64K Kit will populate these boards in 64K byte increments. The kit is simple to install — just insert the nine 64K RAM chips in the provided sockets and set the two groups of switches. Directions are included.

IBM64K (Nine 200ns 64K RAMs) $49.95

EXPAND YOUR MEMORY

TRS-80 to 16K, 32K, or 48K

**Model 1 = From 4K to 16K Requires (1) One Kit
Model 3 = From 4K to 48K Requires (3) Three Kits
Color = From 4K to 16K Requires (1) One Kit**

**Model 1 equipped with Expansion Board up to 48K Two Kits Required — One Kit Required for each 16K of Expansion —

TRS-16K3 *200ns for Color & Model III $12.95
TRS-16K4 *250ns for Model I $10.95

TRS-80 Color 32K or 64K Conversion Kit

Easy to install kits comes complete with 8 ea. 4164-2 (200ns) 64K dynamic RAMs and conversion documentation. Converts TRS-80 color computers with D, E, ET, F and NC circuit boards to 32K. Also converts TRS-80 color computer II to 64K. Flex DOS or OS-9 required to utilize full 64K RAM on all computers.

TRS-64K2. . . . . . $44.95

UV-EPROM Eraser

8 Chips — 51 Minutes

1 Chip — 37 Minutes

Erases 2708, 2716, 2732, 2764, 2516, 2532, 2564. Erases up to 8 chips within 51 minutes (1 chip in 37 minutes). Maintains constant exposure distance of one inch. Special conductive foam liner eliminates static build-up. Built-in safety lock to prevent UV exposure. Compact — only 9.00" x 3.70" x 2.60". Complete with holding tray for 8 chips.

DE-4 UV-EPROM Eraser . . . $79.95
UVS-11EL Replacement Bulb . . $16.95

↙ See List of Advertisers on Page 227

Listing 3 continued

```
159 DATA08457.0,CW,LSA4,1.0,ARGENTINA,BOCA RADIO
160 DATA08460.0,CW,PPJ,1.0,BRAZIL,JUNCAO RADIO
161 DATA08460.4,CW,PPL,1.0,BRAZIL,BELEM RADIO
162 DATA08478.0,CW,CBV2,1.0,CHILE,VALPARAISO RADIO
163 DATA08478.0,CW,TIM,3.0,COSTA RICA,LIMON RADIO
164 DATA08480.0,CW,PWI.2.0,BRAZIL,RECIFE RADIO
165 DATA08480.0,CW,PWN,2.0,BRAZIL,RECIFE RADIO
166 DATA08480.0,CW,PWP,2.0,BRAZIL,FLORIANOPOLIS RADIO
167 DATA08480.0,CW,CLQ,5.0,CUBA,HAVANA RADIO
168 DATA08489.0,CW,CLS,5.0,CUBA,HAVANA RADIO
169 DATA08492.0,CW,PPR,1.0,BRAZIL,RIO RADIO
170 DATA08496.0,CW,CLA20,5.0,CUBA,HAVANA RADIO
171 DATA08507.0,CW,CCM,0.0,CHILE,MAGALLENES NAVAL RADIO
172 DATA08516.0,CW,CLS,5.0,CUBA.HAVANA RADIO
173 DATA08520.0,CW,PPO,1.0,BRAZIL,OLINDA RADIO
174 DATA08526.0,CW,LPD52,10.0,ARGENTINA.GEN. PACHECO RADIO
175 DATA08528.0,CW,LSO3,1.0,ARGENTINA.BUENOS AIRES RADIO
176 DATA08530.0,CW,PWZ,10.0,BRAZIL,RIO DE JANEIRO RADIO
177 DATA08541.0,CW,CLA.5.0,CUBA,HAVANA RADIO
178 DATA08548.0,CW,PPO,1.0,BRAZIL,OLINDA RADIO
179 DATA08550.0,CW,PWZ,2.0,BRAZIL,RIO DE JANEIRO RADIO
180 DATA08558.0,CW,CCV6,0.0,CHILE,VALPARAISO NAVAL RADIO
181 DATA08573.0,CW,CLA,5.0,CUBA,HAVANA RADIO
182 DATA08602.2,CW,CWA.10.0,URAGUAY.MOTEVIDEO RADIO
183 DATA08634.0,CW,PPR,1.0,BRAZIL,RIO DE JANEIRO RADIO
184 DATA08648.0,CW,LPD86,3.0,ARGENTINA.GEN. PACHECO RADIO
185 DATA08666.0,CW,HKB,2.5,COLOMBIA,BARRANQUILLA RADIO
186 DATA08683.0,CW,CCS,1.0,CHILE,SANTIAGO NAVAL RADIO
187 DATA08690.0,CW,CLQ,5.0,CUBA,HAVANA RADIO
188 DATA08690.0,CW,XFA2,1.0,MEXICO,ACAPULCO RADIO
189 DATA08690.0,CW,XFS2,1.0,MEXICO,TAMPICO RADIO
190 DATA08690.0,CW,XFU2,1.0,MEXICO,VERACRUZ RADIO
191 DATA08701.9,CW,CLA22,5.0,CUBA,HAVANA RADIO
192 DATA08721.0,CW,PPE,2.0,BRAZIL,RIO DE JANEIRO (TIME)
193 DATA08759.0,USB,LPL3,10.0,ARGENTINA,GEN. PACHECO RADIO
194 DATA08765.4,USB,APO,2.0,BARBADOS,BARBODAS RADIO
195 DATA08784.0,USB,PPL,1.0,BRAZIL,BELEM RADIO
196 DATA08802.6,USB,PPJ,1.0,BRAZIL,JUNCAO RADIO
197 DATA08808.8,USB,PPR,1.0,BRAZIL,RIO RADIO
198 DATA08963.0,CW,CAK6H,0.0,CHILE.SANTIAGO
199 DATA09051.0,CW,CMA25,1.0,CUBA,HAVANA
200 DATA09115.0,AM,LRB91,2.5,ARGENTINA,GEN. PACHECO RADIO
201 DATA09200.0,CW,AYA,0.0,ARGENTINA.BUENOS AIRES
202 DATA10025.0,CW,COL,0.0,CUBA.HAVANA AERADIO
203 DATA10390.0,CW,AYA47.1.0,ARGENTINA.BUENOS AIRES
204 DATA10415.0,ISB,ZPG4,10.0,PARAGUAY,ASUNCION
205 DATA10428.0,CW,CMH,0.0,CUBA,SANTIAGO AERADIO
206 DATA10428.0,CW,CMI,0.0,CUBA.GEN. PERAZA AERADIO
207 DATA10565.0,ISB,XDD229,10.0,MEXICO,MEXICO CITY
208 DATA10640.0,USB,PVX,2.5,BRAZIL,RIO DE JANEIRO
209 DATA10770.0,ISB,CXL24,2.5,URAGUAY,MONTEVIDEO
210 DATA10788.0,ISB,CLN300,10.0,CUBA.HAVANA
211 DATA10876.0,CW,COZ67,0.0,CUBA.HAVANA
212 DATA11065.0,CW,PWI,2.0,BRAZIL,RECIFE
213 DATA11125.0,CW,APX51,3.0,BARBADOS,BRIDGETOWN
214 DATA11125.0,FSK,APX51,3.0,BARBADOS,BRIDGETOWN
215 DATA11312.0,CW,COL,0.0,CUBA,HAVANA
216 DATA11402.0,CW,CCS,0.0,CHILE.SANTIAGO NAVAL RADIO
217 DATA11427.0,ISB,ZPG14,10.0,PARAGUAY,ASUNCION
218 DATA11472.0,ISB,ZPG15,10.0,PARAGUAY,ASUNCION
219 DATA11560.0,CW,CMA29,1.0,CUBA.HAVANA
220 DATA11660.0,ISB,CXL25,2.5,URAGUAY,MONTEVIDEO
221 DATA12307.0,CW,OCB3,0.0,PERU,CALLAO
222 DATA12673.5,CW,CLA33,5.0,CUBA.HAVANA RADIO
223 DATA12687.0,CW,PPR,1.0,BRAZIL,RIO RADIO
224 DATA12689.5,CW,PPJ,1.0,BRAZIL,JUNCAO RADIO
225 DATA12698.0,CW,PPL,1.0,BRAZIL,BELEM RADIO
226 DATA12709.0,CW,LSA5,1.0,ARGENTINA.BOCA RADIO
227 DATA12709.0,CW,APO,2.0,BARBADOS,BARBADOS RADIO
228 DATA12736.5,CW,PWZ,10.0,BRAZIL,RIO DE JANEIRO RADIO
229 DATA12738.0,CW,PPR,1.0,BRAZIL,RIO RADIO
230 DATA12747.5,CW,CBV,1.0,CHILE,VALPARAISO
231 DATA12747.5,CW,CLQ,5.0,CUBA,HAVANA
232 DATA12747.5,CW,CLA30,5.0,CUBA.HAVANA
233 DATA12750.0,CW,CWA.10.0,URAGUAY,CERRITO RADIO
234 DATA12754.5,CW,PWZ,10.0,BRAZIL,RIO DE JANEIRO RADIO
235 DATA12778.5,CW,XFL,1.0,MEXICO,MAZATLAN RADIO
236 DATA12781.5,CW,HKB,2.5,COLOMBIA,BARRANQUILLA RADIO
237 DATA12790.0,CW,XKF2,1.0.MEXICO,LA PAZ BAJA RADIO
238 DATA12792.0,CW,CLA31,5.0,CUBA.HAVANA RADIO
239 DATA12840.0,CW,PPJ,1.0,BRAZIL,JUNCAO RADIO
240 DATA12840.0,CW,PPO,1.0,BRAZIL,OLINDA RADIO
241 DATA12878.0,CW,CLQ,5.0,CUBA.HAVANA RADIO
242 DATA12900.0,CW,PWZ,10.0,BRAZIL,RIO DE JANEIRO RADIO
243 DATA12985.0,CW,PPO,1.0,BRAZIL,OLINDA RADIO
244 DATA12960.0,CW,CCV6,0.0,CHILE,VALPARAISO NAVAL RADIO
245 DATA12966.0,CW,PWZ,10.0,BRAZIL,RIO DE JANEIRO RADIO
246 DATA12979.4,CW,PPL,1.0,BRAZIL,BELEM RADIO
247 DATA12981.0,CW,PPL,1.0,BRAZIL,BELEM RADIO
248 DATA12988.0,CW,LPD88,15.0,ARGENTINA,GEN. PACHECO RADIO
249 DATA13062.0,CW,CLA32,5.0,CUBA,HAVANA RADIO
250 DATA13371.2,CW,CWO4,5.0,URAGUAY.CERRITO
251 DATA13474.0,AM,CLN404,30.0,CUBA.HAVANA
252 DATA13530.0,ISB,XDA358,10.0,MEXICO,MEXICO CITY
253 DATA13615.0,CW,CWK4,5.0,URAGUAY,MONTEVIDEO
254 DATA13615.0,ISB,CWK4,5.0,URAGUAY.MONTEVIDEO
255 DATA14505.0,ISB,CML38,30.0,CUBA.HAVANA
256 DATA14575.0,USB,ZPG45,5.0,PARAGUAY,ASUNCION
257 DATA15710.0,LSB,LQD24,20.0,ARGENTINA,BUENOS AIRES
258 DATA16175.0,ISB,CML49,30.0,CUBA.HAVANA
259 DATA16380.0,ISB,CLN531,10.0,CUBA.HAVANA
260 DATA16921.0,CW,CLS,5.0,CUBA,HAVANA RADIO
261 DATA17046.6-CW,LPD46,15.0,ARGENTINA,GEN. PACHECO RADIO
262 DATA17165.6-CW,CLA41,5.0,CUBA.HAVANA RADIO
263 DATA17175.5,CW,CLS,5.0,CUBA.HAVANA RADIO
264 DATA17189.5,CW,CLQ,5.0,CUBA,HAVANA RADIO
265 DATA17550.0,CW,LQC20,5.0,ARGENTINA,BUENOS AIRES
266 DATA17590.0,CW,PWZ,15.0,BRAZIL,RIO DE JANEIRO NAVAL RADIO
267 DATA17605.0,CW,CLN572,20.0,CUBA.HAVANA
268 DATA18175.0,ISB,CML52,30.0,CUBA.HAVANA
269 DATA18380.0,USB,CPP38,10.0,BOLIVIA,LA PAZ
270 DATA18512.0,ISB,ZPZ26,10.0,PARAGUAY.ASUNCION
271 DATA18585.0,USB,OCB56.20.0,PERU,LIMA
272 DATA20240.0,CW,PWZ,10.0,BRAZIL,RIO DE JANEIRO RADIO
273 DATA20240.0,FSK.PWZ,10.0,BRAZIL,RIO DE JANEIRO RADIO
274 DATA20440.0,CW,CLP1,0.0,CUBA,HAVANA
275 DATA21790.0,ISB,CML61,30.0,CUBA.HAVANA
276 DATA21813.0,CW,CLN653,30.0,CUBA.HAVANA
277 DATA22396.0,CW,CLA50,5.0,CUBA,HAVANA RADIO
278 DATA22419.0,CW,LPD91,15.0,ARGENTINA.GEN. PACHECO RADIO
279 DATA13031.0,CW,FUF,***,MARTINIQUE.FORT DE FRANCE
280 DATA16962.0,CW,FUF,***,MARTINIQUE.FORT DE FRANCE
281 DATA22390.0,CW,FUF,***,MARTINIQUE.FORT DE FRANCE
282 DATA09890.0,FSK,CFH,***,CANADA,HALIFAX
```

Listing 3 continued

CLONE I

CLONE III

Dear Customer!

If you care about TIME, you need Clone. Why did you buy your computer? If you are like us, you need your computer to save you time. You follow proper programming procedures and backup everything twice. THIS TAKES TIME! If you use more than one disk operating system, IT TAKES TIME. At the end of our programming day we have at least 8 disks to backup twice. With the disk backup utilities that came with our disk operating systems, formatting and verifying that many disks could take 64 minutes, not to mention the amount of time that it took to initialize and answer the opening inquiries for the various disk operating systems we use. Now we use the Clone duplication system and the entire process takes less than 23 minutes. Clone is so reliable at verifying that we never worry about having a bad duplication. We are sure you know that a disk which has not been properly verified might cause problems you would not detect for months. Clone is so advanced that passwords, densities or different disk operating systems don't affect its efficient operation. Clone is so flexible that we are also able to duplicate Atari 400, Atari 800, TRS-80 Color Computer as well as TRS-80 Model I, III, or IV disks. Clone is so sophisticated that if it encounters a damaged disk and is unable to read it, you can ask it to keep trying, take it's best guess, or give up. Most backup utilities just give up. Clone's error messages will explain exactly what the trouble is. Finally, Clone IS FAST! It takes just 1 minute 25 seconds to format, duplicate, and verify a disk that used to take us 4 minutes to complete.

We are sure that everyone who owns a TRS-80 Model I, III, or IV would benefit from owning the Clone duplication system. Clone will become an indispensable part of your programing library. Unlike copying utilities, Clone will have a lasting usefulness which is not dependent on any other program's availability. That is why we at Gibberman Enterprises are proud to offer you Clone I for TRS-80 Model I or Clone III for TRS-80 Model III or IV.

Sincerely,

James Schoengarth

James Schoengarth
Marketing Director
Gibberman Enterprises

HARDWARE REQUIREMENTS

CLONE I OR CLONE III
TRS-80 MODEL III, IV OR
TRS-80 MODEL I WITH LN DOUBLER OR PERCOM DOUBLER ONLY
2 DISK DRIVES OR MORE
32K RAM OR MORE

NOTE: A MODEL I WITH SINGLE DENSITY MAY ALSO BE USED, HOWEVER YOU WILL ONLY BE ABLE TO COPY STANDARD MODEL I SINGLE DENSITY DISKS!

ORDER INFORMATION

$79.97

CLONE I for TRS-80 MODEL I
CLONE III for TRS-80 MODEL III or IV
For VISA or MASTER CARD Orders
CALL NOW - TOLL FREE (800) 824-7888
Ask for operator # 797
Hawaii & Alaska (800) 824-7919
For more information call (213) 367-0887

Add $3.03 Postage & Handling
California Residents add sales tax

(TRS-80 Color Computer and TRS-80 are trademarks of Tandy Corp. Atari is a trademark of Atari Inc. Clone I and Clone III are trademarks of Pegasus Research. LN Doubler is a trademark of LNW Inc. Percom is a trademark of Percom Data Corp.)

523

GIBBERMAN ENTERPRISES

Clone I and Clone III are available exclusively through Gibberman Enterprises, authorized dealer for Pegasus Research.

PEGASUS RESEARCH

Gibberman Enterprises - 13000 San Fernando Rd. - No. 5 - Sylmar, CA 91342

See List of Advertisers on Page 227

Survival Kit for the 80's

Don't program without it.

Technology in transition. Changes in hardware, software, disk systems, printers and modems—the list goes on. It's all happening so fast. How do you survive in the fast-paced computer world?

With the help of 80 MICRO, the largest single source of information for your TRS-80*. It's required reading for those who want to discover:

- •TUTORIALS—To help you become a better programmer whether you're a beginner or an old hand.
- •UTILITY PROGRAMS—Designed to let you get the most from your system.
- •NEW APPLICATIONS—In science, business, and the home.
- •NEW PRODUCT REVIEWS—Straightforward evaluations of state-of-the-art hardware and software that give you the facts before you buy.
- •NEW GAMES—Scores of innovative new games offering a real challenge and lots of fun.

With 80 MICRO in hand you won't just survive. You'll prosper in the Age of the Computer.

Subscribe today. Use the coupon below, the attached card, or call toll free **1-800-258-5473. In NH call 1-924-9471.**

Yes, I want to subscribe to 80 MICRO. Send me 12 issues for only $24.97**. I understand that with payment enclosed or credit card order I will receive a free issue making a total of 13 issues for $24.97.

☐CHECK/MO ☐MC
☐VISA ☐AE ☐BILL ME

Card# _____

Signature _____ Exp. Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Canada & Mexico $27.97/1 yr. only US Funds.
Foreign Surface $44.97/1 yr. only US Funds drawn on US Bank.
Please allow 6-8 weeks for delivery.

*TRS-80 is a trademark of Radio Shack, a division of Tandy Corp.
**This price voids all previous offers.

344F8

80 MICRO • PO Box 981 • Farmingdale, NY 11737

80micro's REVIEW GUIDE

The guide that will save you time and money.

You'll spend more time at your computer and less money for the right product.

80 Micro's Review Guide is the most comprehensive collection of TRS-80* reviews ever compiled in book form. You get 500 hardware, software and book reviews packed with information about:

- Modems
- Games
- Business programs & Word Processing
- Joysticks
- Books on programming
- Printers
- Utilities
- Editor/ Assemblers
- Educational software
- Monitors
- Databases
- And more

*TRS-80 is a trademark of Radio Shack, a division of Tandy Corp.

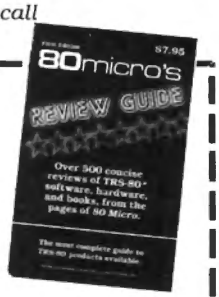
Don't waste valuable time chasing down the right product. We've done it for you with **80 Micro's Review Guide**, compiled and condensed from the pages of **80 Micro**, the magazine you've come to rely on.

A five-star rating system lets you decide what's best. And each review gives you the product manufacturer's information so you can order and receive your product *fast.*

All for $7.95

Order now. Use the attached order form, the coupon, or call toll free 1-800-258-5473.

(Outside U.S.A., and in N.H. call 603-924-9471)



yes, I want to save time and money.

Send me **80 MICRO's REVIEW GUIDE** today.

Please send me _____ Review Guides at $7.95 each and add $1.50 per book shipping and handling.

☐ Check enclosed ☐ MC ☐ VISA ☐ AE

Please allow 6-8 weeks for delivery

Card #_____ Exp. Date_____

Signature _____

Name _____

Address _____

City_____ State_____ Zip Code_____

80RG4

Wayne Green Inc. • 80 Pine St. • Peterborough, NH 03458 Attn: Marcia Stone

Listing 3 continued

```
283 DATA13510.0,FSK,CFH,***,CANADA.HALIFAX
284 DATA15710.0,USB,LPL,***,ARGENTINA,BUENOS ARIES
285 DATA10945.0,CW,CFH,***,CANADA,HALIFAX
286 DATA15920.0,CW,CFH,***,CANADA,HALIFAX
287 DATA08554.0,CW,FUF,***,MARTINIOUE,FORT DE FRANCE
288 DATA17108.0,CW,FUF,***,MARTINIOUE,FORT DE FRANCE
289 DATA16952.0,CW,FUF,***,MARTINIQUE,FORT DE FRANCE
290 DATA08475.5,CW,FUF,***,MARTINIQUE,FORT DE FRANCE
291 DATA13083.5,CW,FUF,***,MARTINIOUE,FORT DE FRANCE
292 DATA08478.4,CW,FUF,***,MARTINIOUE,FORT DE FRANCE
293 DATA12894.0,CW,FUF,***,MARTINIQUE,FORT DE FRANCE
294 DATA12960.0,CW,FUF,***,MARTINIQUE,FORT DE FRANCE
295 DATA13038.0,CW,CLC,***,CUBA,HAVANA
296 DATA13515.5,FSK,CLN405,***,CUBA.HAVANA
297 DATA22315.0,CW,FUF,***,MARTINIOUE,FORT DE FRANCE
298 DATA04255.0,CW,CFH,***,CANADA,HALIFAX
299 DATA05097.0,CW,CFH,***,CANADA,HALIFAX
300 DATA09890.0,CW,CFH,***,CANADA,HALIFAX
301 DATA12726.0,CW,CFH,***,CANADA,HALIFAX
302 DATA13510.0,CW,CFH,***,CANADA,HALIFAX
303 DATA22297.5,CW,CFH,***,CANADA,HALIFAX
304 DATA06386.5,CW,CFH,***,CANADA,HALIFAX
305 DATA08697.0,CW,CFH,***,CANADA,HALIFAX
306 DATA06509.5,USB,CFH,***,CANADA,HALIFAX
307 DATA04363.6,USB,CFH,***,CANADA,HALIFAX
308 CLS:CLEAR1000
309 OPEN "R",1,"SOI/DB:0"
310 FIELD 1, 252 AS F$
311 READ N%
312 FOR I% = 1 TO N%
313 READ FQ$,MO$,CA$,PW$,NA$,CT$
314 IFLEN(MO$)<3THENMO$=MO$+" ":GOTO314
315 IFLEN(CA$)<6THENCA$=CA$+" ":GOTO315
316 IFPW$="***"THENPW$="0.0"
317 IFLEN(PW$)<4THENPW$=PW$+" ":GOTO317
318 IFLEN(NA$)<10THENNA$=NA$+" ":GOTO318
319 IFLEN(CT$)<33THENCT$=CT$+" ":GOTO319
320 R$="":R$=FQ$+MO$+CA$+PW$+NA$+CT$
321 GOSUB324
322 NEXTI%
323 GOSUB327  :CLOSE:END
324 R%=R%+1
325 RO$=RO$+R$
326 IF R%<4 THEN RETURN
327 P%=P%+1
328 LSET F$=RO$
329 PUT 1,P%
330 PRINTF$
331 R%=0:RO$="":RETURN
```

End

Program Listing 4. FNDX.

```
10 REM DATA BASE INDEX BUILDER
20 REM PROGRAM NAME: FNDX/BAS      SET MEMORY SIZE TO 65279
30 REM (C) MARCH 1983
40 REM D.D. HUSCH
50 REM
60 REM R = RECORDS PER DISK BLOCK
70 REM L = LENGTH OF A RECORD
80 REM N$ = OUTPUT FILE NAME
90 REM B = START BYTE OF INDEX FIELD
100 REM FL = LENGTH OF INDEX FIELD
110 REM D = NUMBER OR RECORDS IN DATA BASE
120 CLS:CLEAR30000:GOSUB470  :DEFINTA-Z:DEFUSR=&HFF00
130 R=4
140 L=63
150 D=207
160 OPEN"R",1,"SOI/DB:0"
170 DIMX$(D+1),P(2)
180 N$="FQ":B=1:FL=5:GOSUB230
190 N$="MOD":B=8:FL=3:GOSUB230
200 N$="CALl":B=11:FL=3:GOSUB230
210 N$="CONT":B=21:FL=4:GOSUB230
220 END
230 FIELD1,255ASR$
240 X=0:CLS:PRINT"EXTRACTING INDEX"
250 FORI=1TOLOF(1)
260 GET1,I:CLS:PRINTR$
270 FORJ=1TOR
280 RP$=MID$(R$,((J-1)*63)+1,L)
290 X$(0)=MID$(RP$,B,FL)
300 IFX$(0)=STRING$(LEN(X$(0)),"  )THEN370
310 X=X+1
320 X$(X)=X$(0)
330 P1$=STR$(I):P1$=MID$(P1$,2,LEN(P1$)-1)
340 P2$=STR$(J):P2$=MID$(P2$,2,LEN(P2$)-1)
350 X$(X)=X$(X)+"  "+P1$+"/"+P2$
360 PRINTX,X$(X)
370 NEXTJ:NEXTI
380 PRINT"SORTING"
390 J=0:P(0)=D+1:P(1)=VARPTR(X$(0)):J=USR(VARPTR(P(0)))
400 OPEN"O",2,N$:CLS:PRINT"SAVING INDEX"
410 FORI=1TOX
420 P1$=LEFT$(X$(I),FL):P2$=RIGHT$(X$(I),LEN(X$(I))-(FL+1))
430 PRINT#2,P1$+","+P2$:PRINTI,P1$,P2$
440 NEXTI:CLOSE2
450 RETURN
460 REM LOAD SORT
470 FORI=1TO203:READN:POKEI-257,N
480 T=T+N
490 NEXT:IFT=25337THENRETURNELSESTOP
500 DATA 205,127,010,094,035,086,237,083,019,255
510 DATA 035,094,035,086.237,083,213,255,033,000
520 DATA 000,034,211,255,237.091,211,255,203,059
530 DATA 175,203,058,048,002,203,251,237,083,211
540 DATA 255,122,179,200,042,019,255,237,082,034
550 DATA 207,255,033,000,000,034,205,255,042,205
560 DATA 255,034,203,255,042,203,255,237,091,211
570 DATA 255,025,034,209,255,235,033,000,000,025
580 DATA 025,025,229,237,091,203,255,033,000,000
590 DATA 025,025,025,237.075,213,255,009,235,225
600 DATA 009,229,213.014,000,126.071,026,184,048
610 DATA 003,014,001.071,175,176,040,025,197.019
620 DATA 035,078,035,070,197.225,235,078,035,070
630 DATA 197,225,193,026,150,056,010,032,039,019
640 DATA 035,016.246,203,065,032,031,209,225,006
650 DATA 003,078,235,126,113,235,119,035,019,016
660 DATA 246,042,211,255,235,042,203,255,175,237
670 DATA 082,034,203,255,048,144,024,002,209,225
680 DATA 042,205,255,017,001,000,175,025,034,205
690 DATA 255,237,091,207.255,237,082,218,058,255
700 DATA 195,024,255
```

End

Listing 5 begins on p. 134

DISKETTES $1.70

CompuDisk

A new name in mini floppy disks.
Excellent quality at an affordable price.

100% Certified Error Free
Meets or exceeds standards for ANSI, DIN, JIS, ECMA.
Money back guarantee.

All disks include:
- Hub Rings
- Protective Envelopes
- Write Protect Tabs
- Adhesive Labels

We invite you to compare CompuDisk to other brands in both quality and price. Disks may be ordered bulk in plastic wrapped packets, boxed in standard 10 count paper boxes, or in hard plastic permanent storage cases that form an easel when opened.

Bulk: 10 per pack

Type	5-9 packs	10 plus
SSDD	$17.95	$16.95
DSDD	$22.95	$21.95

Boxed: 10 per box

Type	5-9 boxes	10 plus
SSDD	$18.95	$17.95
DSDD	$23.95	$22.95

In Hard Storage Case

Type	5-9 cases	10 plus
SSDD	$20.95	$19.95
DSDD	$25.95	$24.95

Heart of Texas Computer Systems ✓59

P.O. Box 1327, Arlington, Texas 76004-1327
Toll Free 1-800-433-5184 **Texas 1-817-274-5625**

Introducing
SECURITY VALUE MONITOR
TRS 80 MODEL I, II, III, 4, 12

- COMPLETELY MENU DRIVEN
- FAST AUTO-RETRIEVAL OF MARKET QUOTES FROM **DOW JONES NEWS/RETRIEVAL®**
- ABILITY TO RUN AT 300 OR 1200 BAUD
- INSTANT UPDATING OF EACH PORTFOLIOS' MARKET VALUE
- HANDLE ANY COMBINATION OF STOCKS, OPTIONS, WARRANTS, BONDS, MUTUAL FUNDS OR U.S. TREASURY BILLS
- HANDLE LONG AND SHORT POSITIONS
- EASY ACCESS TO **DOW JONES NEWS/RETRIEVAL'S®** FULL MENU OF INFORMATION SERVICES
- PRINTS ANALYSIS OF EACH PORTFOLIO

APRIL SPECIAL

VISA **$149.95** MasterCard

(Offers expires end of April 1984)

TO ORDER CALL
(803) 787-7256
TELEX 466528

OR MAIL COUPON TO:
EHLEN ENTERPRISES
6319 BRIARWOOD RD.
COLUMBIA, SC 29206

*Account Purchased Separately from Dow Jones & Co Inc
DOW JONES NEWS/RETRIEVAL is a registered trademark of Dow Jones & Co Inc ✓325

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 printer. (Compatible with overlays or NELCO official 1040.)
- Tax deductible.
- Manual: Tax information, lists of deductions, tax glossary.
- **TAX/SAVER®** completes long and short forms, itemized deductions, interest, dividends, business income, capital gains, income averaging, self-employment tax, and the deduction for couples when both work.
- 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

©Copyright 1983 *Registered trademark of Tandy Corp.

TAX/FORECASTER™, a quick tax planner for 1983-1984, lets you see how financial decisions will affect your taxes. Merely change one or more entries to see your tax refigured.

PROFESSIONAL TAX/FORECASTER™ adds disk storage of client files and income averaging. This tax tool is a must!

Orders will be filled in late January to allow inclusion of new tax laws.

TO ORDER:

Call collect **203-968-0933** or mail this coupon to:
Micromatic Programming Co.
Cedar Corners Station, P.O. Box 16735 ✓84
Stamford, CT 06905

Please enroll me in member's service and send:
- ☐ TAX/SAVER® @ $149.95 Manual Included
- ☐ TAX/FORECASTER™ @ $69.95
- ☐ PROFESSIONAL TAX/FORECASTER™ @ $99.95 (requires 48K)

($15. off any TAX/FORECASTER™ with TAX/SAVER®)
- ☐ Tax Form Overlays (set of 6) @ $39.95

Add $3.50 for postage and handling, CT residents add 7½% sales tax.
- ☐ 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

Name _____
Address _____
City _____ State _____ Zip _____
☐ Check ☐ Master Card ☐ Visa
Card No. _____ Exp.date _____

✓ See List of Advertisers on Page 227

Program Listing 5. Friend.

```
10 REM DOMAIN DEPENDENT NATURAL
20 REM LANGUAGE DATA BASE INTERFACE
30 REM PROGRAM NAME: FRIEND/BAS
40 REM (C) MARCH 1983
50 REM D.D. HUSCH
60 REM
70 REM INITIALIZATION
80 CLEAR15000:CLS
90 DIM I$(207),CL$(5),M$(5),R$(4),W$(60),WN%(60),PO%(4),P%(1,207
):AL%=207:WL%=60
100 M$(1)="FREQUENCY ":M$(2)="MODULATION ":M$(3)="CALLSIGN ":M$(
4)="COUNTRY ":M$(5)="CW FSKAM USBLSBISBFM ":OPEN"I",1,"MSG"
110 INPUT#1,R$
120 IFR$="END"THENCLOSE:GOTO150
130 FORX%=1TOLEN(R$):IFMID$(R$,X%,1)="/"THENPRINTELSEPRINTMID$(R
$,X%,1);
140 NEXT:GOTO110
150 POKE15423,73:OPEN"I",1,"WORD":FORX%=1TOWL%:INPUT#1,W$(X%),WN
%(X%)
160 IFW$(X%)="END"THENWS%=X%:CLOSE:GOTO220
170 S$="":FORZ%=1TOLEN(W$(X%))
180 IFMID$(W$(X%),Z%,1)="#"THENS$=S$+" "ELSES$=S$+MID$(W$(X%),Z%
,1)
190 NEXTZ%:W$(X%)=S$
200 NEXTX%:STOP
210 REM MAIN PROCESSING LOOP
220 POKE15423,82:FORI%=1TO4:PO%(I%)=0:NEXT:FA%=0:I%=0:E%=0:F%=0:
PRINT"* ";:LINEINPUTK$:K$="* "+K$+" *"
230 IFINSTR(K$," END ")<>0THENGOTO1740
240 FORL%=1TOWS%:IFW$(L%)="END"THENGOTO280
250 P%=INSTR(K$,W$(L%)):IFP%>0ANDWN%(L%)<0THENGOSUB1370
260 IFP%>0ANDWN%(L%)>=1ANDWN%(L%)<=4THENGOSUB1370 :I%=WN%(L%):PO
%(I%)=1
270 NEXTL%
280 IFPO%(1)+PO%(2)+PO%(3)+PO%(4)>1THENI%=0
290 IFI%=0THENGOSUB1430 :IFF%=-1ANDE%=1THENGOSUB530 :GOTO220 E
LSEIFE%=1THENGOSUB1130 :GOTO220 ELSEIFE%=0THENGOTO220
300 ONI%GOSUB840 ,1000 ,1030 ,1070
310 IFE%=1THENI%=0:GOTO290
320 S%=0:GOSUB360
330 ONF%+2GOSUB530 ,530 ,1580
340 GOTO220
350 REM BINARY SEARCH SUBROUTINE
360 S%=0:LR%=1:HR%=AL%:IFI%=SI%THENGOTO430 ELSESI%=I%
370 POKE15423,76:ONI%GOTO380 ,390 ,400 ,410
380 X$="FQ":GOTO420
390 X$="MOD":GOTO420
400 X$="CALl":GOTO420
410 X$="CONT"
420 OPEN"I",1,X$:FORZ%=1TOAL%:INPUT#1,I$(Z%),R$(0):X%=INSTR(R$(0
),"/"):P%(0,Z%)=VAL(MID$(R$(0),1,X%-1)):P%(1,Z%)=VAL(MID$(R$(0),
X%+1,LEN(R$(0))-X%)):NEXTZ%:CLOSE
430 POKE15423,83:IFKY$=I$(1)THENP%=1:F%=1:RETURN
440 IFKY$=I$(AL%)THENP%=AL%:F%=1:RETURN
450 P%=INT((HR%-LR%)/2)+LR%:S%=S%+1
460 IFKY$=I$(P%)THENF%=1:RETURN
470 IFKY$>I$(P%)THENLR%=P%:GOTO490
480 IFKY$<I$(P%)THENHR%=P%
490 IFP%=1ORP%=AL%ORS%>50THENF%=-1:RETURN
500 IFKY$>I$(P%-1)ANDKY$<I$(P%+1)THENF%=-1:RETURN
510 GOTO450
520 REM NO MATCH SUBROUTINE
530 PRINT"NO MATCH IN THE DATA BASE ON THE ";
540 IFI%>0THENPRINTM$(I%);ELSEPRINT"INPUT PROVIDED.":GOTO1160
550 PRINTKY$:PRINT"SPECIFIED. ";:GOTO1160
560 REM"ACCESS DATA BASE PHYSICAL RECORDS"
570 CL%=0:Z%=0:X$="":FORJ%=P%TO0STEP-1
580 IFKY$=I$(J%)THENNEXTJ%
590 GOSUB740 :PO%(I%)=1:IFAI%>0THENPO%(AI%)=0
600 GOSUB1800 :PRINT:PRINT"HERE IS THE ";:IFX%>0THENPRINTM$(X%);
610 PRINT"INFORMATION FOR THE ";:PRINTM$(I%);KY$
620 IFAI%>0THENPRINT"AND THE ";M$(AI%);AK$ELSECL%=1
630 PRINT:GOSUB1800 :FORP%=J%+1TOAL%
640 IFKY$<>I$(P%)THENGOTO710
650 B%=P%(0,P%):IFB%<>BS%THENGET1,B%
660 R$(0)=R$(P%(1,P%))
670 IFMID$(R$(0),1,1)=" "THENR$(0)=MID$(R$(0),2,LEN(R$(0))-1):GO
TO670
680 IFAI%>0THENE%=0:ONAI%GOSUB1990 ,2000 ,2010 ,2020 :IFE%=1THEN
GOTO700
690 ONX%+1GOSUB760 ,1890 ,1900 ,1910 ,1920 :CL%=1
700 NEXTP%
710 IFCL%=0THENI%=0:GOSUB530
720 BS%=-1:PRINT:PRINT:GET1,LOF(1):CLOSE1:RETURN
730 REM OPEN DATA BASE
740 OPEN"R",1,"SOI/DB":FIELD1,63ASR$(1),63ASR$(2),63ASR$(3),63AS
R$(4):RETURN
750 REM PRINT FULL DB RECORD
760 IFZ%=0THENZ%=1:PRINT" FREQ MOD CALL BW"
770 PRINTMID$(R$(0),1,7);" ";MID$(R$(0),8,3);" ";MID$(R$(0),11
,6);" ";MID$(R$(0),17,4);
780 S%=0:FORL%=LEN(R$(0))TO21STEP-1
790 S%=S%+1:IFMID$(R$(0),L%,1)<>" "THENGOTO810
800 NEXTL%:PRINT:RETURN
810 R$(0)=MID$(R$(0),21,LEN(R$(0))-(19+S%))
820 PRINT" ";MID$(R$(0),1,10);" ";MID$(R$(0),11,LEN(R$(0))-10)
:RETURN
830 REM FIND FREQUENCY
840 POKE15423,70:FORX%=0TO9:Y%=INSTR(K$,MID$(STR$(X%),2,1))
850 IFY%>0THENGOTO870
860 NEXTX%:E%=1:RETURN
870 IFY%=1THENZ%=Y%:GOTO900 ELSEFORZ%=Y%-1TO1STEP-1
880 IFMID$(K$,Z%,1)=" "THENGOTO900
890 NEXTZ%
900 FORL%=Y%+1TOLEN(K$)
910 IFMID$(K$,L%,1)=" "THENGOTO930
920 NEXTL%
930 KY$=MID$(K$,Z%+1,L%-Z%-1)
940 W$(0)=KY$:L%=0:S$=KY$:GOSUB1110 :GOSUB1370
950 IFLEN(KY$)=4THENKY$="0"+KY$
960 IFLEN(KY$)>5ANDLEFT$(KY$,1)="0"THENKY$=RIGHT$(KY$,LEN(KY$)-1
):GOTO960
970 IFLEN(KY$)<4ORLEN(KY$)>5THENE%=1
980 RETURN
990 REM FIND MODULATION
1000 POKE15423,77:FORX%=1TOLEN(M$(5))STEP3:S$=MID$(M$(5),X%,3):I
FINSTR(K$,S$)<>0THENKY$=S$:W$(0)=KY$:L%=0:GOSUB1110 :GOSUB1370 :
RETURN
1010 NEXTX%:E%=1:RETURN
1020 REM FIND CALLSIGN
```

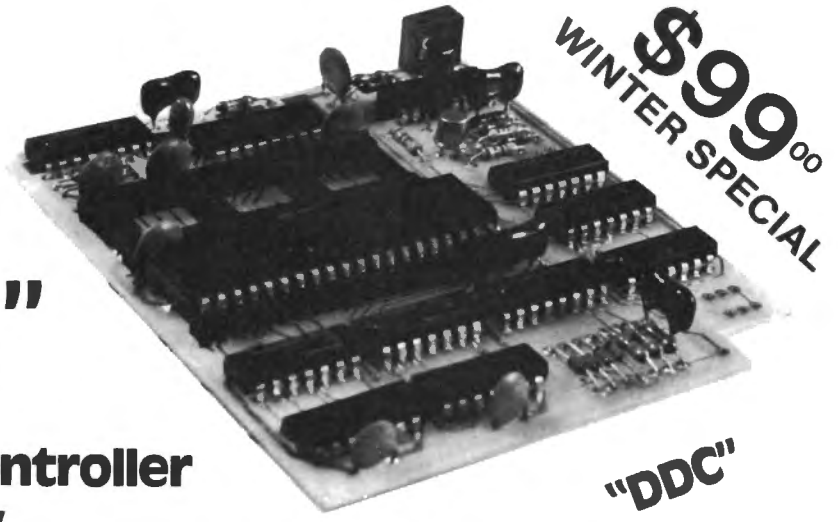
Listing 5 continued

Listing 5 continued

```
1030 POKE15423,67:Y%=3:Z%=3:GOSUB1180
1040 IFE%=0THENGOSUB1270
1050 RETURN
1060 REM FIND COUNTRY
1070 POKE15423,78:Y%=4:Z%=10:GOSUB1180
1080 IFE%=0THENGOSUB1270
1090 RETURN
1100 REM STRING SEARCH
1110 P%=INSTR(K$,S$):RETURN
1120 REM RE-PHRASE QUESTION
1130 PRINT"DID NOT UNDERSTAND YOUR QUESTION.";
1140 IFI%>0THENPRINT" ABOUT A ";M$(I%);
1150 PRINT"."
1160 PRINT"PLEASE RE-PHRASE.":PRINT:RETURN
1170 REM ISOLATE SUB-STRINGS
1180 CL%=0:E%=0:FORP%=1TOLEN(K$):X$=MID$(K$,P%,1):L%=LEN(CL$(CL%
))
1190 IFX$=" "THENIFL%<Y%ORL%>Z%THENCL$(CL%)=""
1200 IFX$=" "THENIFL%>=Y%ANDL%<=Z%THENCL%=CL%+1:IFCL%>5THENCL%=5
:CL$(5)=""
1210 IFX$<"A"ORX$>"Z"THENCL$(CL%)=""ELSECL$(CL%)=CL$(CL%)+X$
1220 NEXTP%
1230 IFLEN(CL$(CL%))<Y%ORLEN(CL$(CL%))>Z%THENCL$(CL%)="":CL%=CL%
-1:IFCL%<0THENE%=1:RETURN
1240 IFCL%=0THENIFLEN(CL$(CL%))<Y%ORLEN(CL$(CL%))>Z%THENCL$(CL%)
="":E%=1
1250 RETURN
1260 REM ISOLATE PARAMETER
1270 IFCL%=0ANDLEN(CL$(0))>=Y%ANDLEN(CL$(0))<=Z%THENKY$=MID$(CL$
(0),1,Y%):CL$(0)="":GOTO1340
1280 PRINT"I FOUND MORE THAN ONE":PRINT"POTENTIAL ";M$(I%);"IN Y
OUR INPUT."
1290 PRINT"I FOUND:":FORX%=0TOCL%:PRINTTAB(10);CL$(X%):NEXTX%
1300 PRINT"WHAT IS THE CORRECT ";M$(I%);"?  ";:INPUTX$
1310 IFLEN(X$)<Y%ORLEN(X$)>Z%THENGOTO1290
1320 FORX%=0TOCL%:IFMID$(X$,1,Y%)<>MID$(CL$(X%),1,Y%)THENGOSUB16
40
1330 CL$(X%)="":NEXTX%:KY$=MID$(X$,1,Y%)
1340 IFINSTR(K$,KY$)>0THENW$(0)=KY$:L%=0:S$=KY$:GOSUB1110 :GOSUB
1370
1350 RETURN
1360 REM REMOVE WORD FROM STRING
1370 Z%=LEN(W$(L%)):IFRIGHT$(W$(L%),1)=" "THENGOTO1390
1380 FORX%=P%+Z%TOLEN(K$):IFMID$(K$,X%,1)=" "THENGOTO1390 ELSEZ%
=Z%+1:NEXTX%
1390 X$=MID$(K$,1,P%-1):Z$=MID$(K$,P%+Z%,LEN(K$)-(P%+Z%)+1)
1400 IFRIGHT$(X$,1)<>" "ANDLEFT$(Z$,1)<>" "THENX$=X$+" "
1410 K$=X$+Z$:RETURN
1420 REM SEARCH FOR PARAMETER WITHOUT KEYWORD
1430 IFLEN(K$)<2ORK$=STRING$(LEN(K$)," ")THENE%=1:RETURN
1440 POKE15423,67:Y%=3:Z%=3:GOSUB1180 :IFE%=1THENGOTO1470
1450 I%=3:FORX%=0TOCL%:KY$=CL$(X%):GOSUB360  :IFF%=1THENGOTO1580

1460 NEXTX%
1470 POKE15423,78:I%=0:F%=0:E%=0
1480 Y%=4:Z%=10:GOSUB1180 :IFE%=1THENGOTO1510
1490 I%=4:FORX%=0TOCL%:KY$=MID$(CL$(X%),1,4):GOSUB360  :IFF%=1TH
ENGOTO1580
1500 NEXTX%
1510 POKE15423,70:I%=0:F%=0:E%=0
1520 GOSUB840  :IFE%=1THENGOTO1550
1530 I%=1:GOSUB360  :IFF%=-1THENE%=1:RETURN
1540 GOTO1580
1550 POKE15423,77:I%=0:F%=0:E%=0
1560 GOSUB1000 :IFE%=1THENI%=0:RETURN
1570 I%=2:GOSUB360  :IFF%=-1THENI%=0:E%=1:RETURN
1580 IFFA%=0THENAP%=P%
1590 W$(0)=KY$:L%=0:S$=KY$:GOSUB1110 :IFP%>0THENGOSUB1370
1600 IFFA%=1ORLEN(K$)<4THENRETURNELSEAF%=F%:FA%=1:AE%=E%:AI%=I%:
AK$=KY$:F%=0:E%=0:I%=0:KY$="":GOSUB1430 :IFE%=0ANDI%>0THENX%=I%:
I%=AI%:AI%=X%:R$=KY$:KY$=AK$:AK$=R$:ELSEI%=AI%:AI%=0:KY$=AK$:AK$
=""
1610 F%=AF%:E%=AE%:P%=AP%:SI%=0:GOSUB360
1620 GOSUB570  :E%=0:RETURN
1630 REM UPDATE WORD LIST
1640 PRINT"IS THE WORD ";CL$(X%);" A SYNONYM FOR ";M$(I%);" ?":I
NPUT"Y OR N ";S$
1650 IFINSTR(S$,"Y")<>0THENGOTO1670
1660 IFINSTR(S$,"N")<>0THENGOTO1690 ELSEGOTO1640
1670 WS%=WS%+1:IFWS%>WL%THENGOTO1740
1680 W$(WS%-1)=" "+CL$(X%)+" ":WN%(WS%-1)=I%:W$(WS%)="END":WN%(W
S%)=0:RETURN
1690 PRINT"IS THE WORD ";CL$(X%);" A NOISE WORD?":INPUT"Y OR N "
;S$
1700 IFINSTR(S$,"Y")<>0THENGOTO1720 ELSEIFINSTR(S$,"N")<>0THENPR
INT"EXPLAIN WHAT ";CL$(X%);" MEANS.":INPUTS$:RETURN
1710 GOTO1690
1720 L%=I%:I%=-1:GOSUB1670 :I%=L%:RETURN
1730 REM SAVE WORD LIST
1740 OPEN"O",1,"WORD":FORX%=1TOWS%
1750 X$="":FORZ%=1TOLEN(W$(X%)):IFMID$(W$(X%),Z%,1)=" "THENX$=X$
+"#"ELSEX$=X$+MID$(W$(X%),Z%,1)
1760 NEXTZ%
1770 PRINT#1,X$;",";WN%(X%)
1780 NEXTX%:END
1790 REM DETERMINE RESPONSE OPTION
1800 ONI%GOTO1810 ,1820 ,1830 ,1840
1810 X%=2:Y%=3:Z%=4:GOTO1850
1820 X%=1:Y%=3:Z%=4:GOTO1850
1830 X%=1:Y%=2:Z%=4:GOTO1850
1840 X%=1:Y%=2:Z%=3
1850 IFPO%(X%)+PO%(Y%)+PO%(Z%)<>1THENX%=0:RETURN
1860 FORX%=1TO4:IFPO%(X%)=1ANDX%<>I%THENRETURN
1870 NEXTX%:X%=0:RETURN
1880 REM OUTPUT RESPONSE
1890 Z%=1:L%=7:GOTO1930
1900 Z%=8:L%=3:GOTO1930
1910 Z%=11:L%=6:GOTO1930
1920 Z%=21:L%=LEN(R$(0))-21
1930 Z$=MID$(R$(0),Z%,L%):IFINSTR(X$,Z$)<>0THENGOTO1960
1940 IFX%=4THENPRINTTAB(10);Z$:GOTO1960
1950 PRINTSTRING$(16-LEN(Z$)," ");Z$;
1960 IFLEN(X$)<150THENX$=Z$+X$ELSEX$=Z$+LEFT$(X$,150)
1970 RETURN
1980 REM SEARCH FOR "AND" PARAMETER
1990 S%=1:L%=5:GOTO2030
2000 S%=8:L%=3:GOTO2030
2010 S%=11:L%=6:GOTO2030
2020 S%=21:L%=4
2030 IFAK$<>MID$(R$(0),S%,L%)THENE%=1
2040 RETURN
```

End

Aerocomp's Proven Best-By Test! The "DDC"



$99.00 WINTER SPECIAL

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 infinately 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 bottom line 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 retrys. 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.

SUMMER SPECIAL $99.00
for the Best DD Controller on the market.

"DDC" and LDOS $169.95
"DDC" and Newdos 80 $179.95

★ 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. U.S. See opposite page for details. Add $4.00 shipping & handling for DDC & DOS.

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" or Superbrain, 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)

Plugs directly into your existing Double Density Controller.

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)

See opposite page ▸▸▸▸▸▸

DISK DRIVES
40 & 80 TRACK
SINGLE & DOUBLE SIDED
as low as $169

NEW!

PACESETTERS

Aerocomp leads the way to the BEST value in disk drives on the market. Quality, performance, reliability, warranty, service plus free trial – that's what you get from the leader. AEROCOMP!

BEST FEATURES

- ★ Fast 5 ms. track-track access
- ★ Single or double density
- ★ Easy entry door
- ★ "Flippy" feature allows read-write to the back of the diskette to cut media cost in half! (MPI)
- ★ Disk ejector (MPI)
- ★ External drive cable connection (no need to remove the cover to hook up the cable)

COMPLETE DRIVES

TRS80 Mod. I & III, IBM PC & TI 99/4A. Power supply & enclosure. Specify silver or almond. 5.25 inch.

- ★ 40 track single side (Tandon)..... $199
- ★ 40 track SS "Flippy" (MPI)..... $239
- ★ 40 track Dual Head (either)..... $279
- ★ 80 track SS (MPI)..... $299
- ★ 80 track SS "Flippy" (MPI)..... $329
- ★ 80 track Dual Head (Tandon)..... $379

Shipping & Handling $5.00 per drive.

BARE DRIVES

Internal drives for TRS80 Mod. III, IBM PC, TI 99/4A, 5.25 in. (controller required)

- ★ 40 track Single Side (Tandon)..... $169
- ★ 40 track Dual Head (either)..... $249
- ★ 80 track SS (MPI)..... $269
- ★ 80 track Dual Head (Tandon)..... $339

Shipping & Handling $4.00 Per Drive.

8 INCH DRIVES

Drive expansion box complete with power supply and fan. Tandon Slimline.

- ★ Two (2) 8" Single Side..... $699
- ★ Two (2) 8" Double Side..... $849
- ★ 8" Bare Slimline, SS..... $260
- ★ 8" Bare Slimline, DS..... $375

Shipping & Handling $5.00 Per Drive.

NEW!

MODEL III & 4 CONTROLLER and DRIVES

Convert cassette Model III or 4 to disk. Complete internal drive kits with 40 track SS drives (Tandon), Aerocomp disk controller board (will take up to 4 drives), power supply, mounting towers, all hardware & cables.

- ★ DRIVE KIT (no drives)..... $199
- ★ ONE DRIVE SYSTEM..... $369
- ★ TWO DRIVE SYSTEM..... $539

Shipping & handling $8.00 per system

- ★ AEROCOMP DISK CONTROLLER ... $119

Shipping & handling $2.00 per controller

- ★ MOUNTING KIT w/o Drives & Controller .. $99

Shipping & handling $4.00 per kit

MODEL I STARTER PACKAGE

One 40 track SS drive, 2-drive cable, TRSDOS 2.3 disk & manual, freight & insurance (Tandon).

$249

MISCELLANEOUS GOODIES

- ★ TRSDOS 2.3 disk & manual..... $20
- ★ LDOS (Mod. I or III)..... $119
- ★ NEWDOS/80, 2.0 (Mod. I or III)..... $129
- ★ Diskettes (10 in library box)..... $23
- ★ 5.25" Drive Power Supply & case..... $59
- ★ 2-Drive Cable..... $24
- ★ 4-Drive Cable..... $34
- ★ Extender Cable..... $13

Shipping & Handling $2.00

PERSONAL CHECKS WELCOME

We'll be happy to accept your personal check with any mail order without any shipping delay.

FREE TRIAL OFFER

Use your AEROCOMP drive for up to 14 days. If you are not satisfied for ANY REASON (except misuse or improper handling), return in the original shipping container for a full purchase price refund. Applies to hardware only. Sorry, we cannot refund on software. We have confidence in our products and we know you will be satisfied.

WARRANTY

We offer a six months warranty on parts and labor against defects in materials and workmanship. In the event service becomes necessary for any reason, our service department is fast, friendly and cooperative. Our goal is 48 hour turnaround on all warranty or repair drives!

100% TESTED

AEROCOMP disk drives are 100% subjected to burn-in and bench test. We even enclose a copy of the test check list, signed by the test technician, with each drive. AEROCOMP means reliability!

ORDER NOW!

Order by mail or call TOLL FREE TO THE NUMBERS BELOW. Please note toll free lines will accept orders only. We accept VISA or MASTERCARD. Be sure to include card number and expiration date. We will not charge your card until the day we ship. Order by mail with credit card or send check or money order. Personal checks welcome. No delay. Order COD. No deposit required but all COD's will arrive cash, certified check or money order only. We'll send a card showing the exact COD amount before your shipment arrives. Shipping is **not** included in the prices shown. Texas residents add 5% sales tax.

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 information only call (214) 339-8324.
For TECHNICAL ASSISTANCE call (214) 337-4346.

Dealer inquiries invited

AEROCOMP
Redbird Airport, Bldg. 8
P.O. Box 24829
Dallas, TX 75224

82

See List of Advertisers on Page 227

by Merton Davis

The Sound of Musikon

Think you have some musical potential? Use Musikon to write and play your own composition, or develop variations on classical pieces.

Beethoven would roll over. Chopin would fall flat. But you can make music on your computer. Musikon lets apsiring musicians compose, edit, and play back compositions—or play the masters—on a 48K disk-based Model I or III.

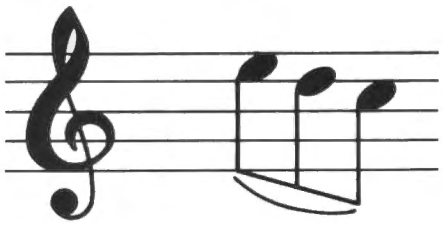
Preparations

Musikon requires extensive set-up. The final, working program is actually a combination of three programs—the main program (see Program Listing 1), a program that reserves a 5,100-byte string for note storage (see Program Listing 2), and a program that creates Musikon's music generator (see Program Listing 3). Program Listing 4 contains the lines owners of 48K cassette-based systems must change in Listing 1 to use Musikon.

Table 1 lists Musikon's variables, and Table 2 lists its subroutines.

Program Listings 2 and 3 are short Basic programs that each produce a single line of source code you insert into Program Listing 1. (The way in which these programs develop the source code isn't pertinent here; simplistically, the Basic program POKEs a machine-language program into upper memory. You can get a better idea of how and why by examining the commented source code in Program Listings 5 and 6.)

To create the 5,100-byte note-storage



string that becomes line 40 in Listing 1, you must first type in and run Program Listing 2. Save memory at 64000 and enter from line 40 on. To run Musikon on a 32K or 16K system, save memory at 48500 or 32000, respectively.

If you retain Listing 2's remark statements, be sure to include lines 30 and 31. Line 40 must be the first line in the program.

After all the preparation, run Listing 2. Respond to the string length prompt with 5100, and the program returns to Basic with a 5,100-byte string in line 40 as its only line. You can list the line and save it to disk or cassette.

After you run Listing 2, type in Listing 3 incorporating line 40 created by Listing 2. Then run the program from Listing 3 to get Musikon's music generator, creating line 20 in Listing 1. Do not try to list Listing 3, as the source code in the Basic program will generate garbage on the screen.

Then delete all but lines 20 and 40 in Listing 3, and type in Program Listing 1 around these lines, omitting my remark statements.

Before you run Musikon, make sure you connect a speaker to your computer. I connect a cable from the computer's cassette port to an Archer (Radio Shack) miniamplifier/speaker, using the gray plug that normally goes into the cassette recorder's auxiliary plug. Alternatively, you can use the cassette recorder's speaker by plugging the gray plug into the recorder's microphone jack.

New Music

Run the final version of Listing 1 to begin Musikon. After a few seconds of initialization, the program displays the main menu (see Fig. 1).

The first time through the program, you should select option 1 to enter new music. Musikon includes traps to prevent you from selecting option 1 or 2 when you have music stored in memory or options 3–7 without music in memory.

Once in option 1, Musikon gives you two suboptions Reply N for the first option, which lets you change the tune of entered music by as much as 4/10 of an octave higher or lower—you haven't entered any music to tune.

The second suboption displays a guide for note duration and note entries above the prompts for your first note entries. The guide includes five example notes, with each note's duration number (DN), value, and meaning—whether it's flat, sharp, or natural.

Musikon first prompts you for the duration (DN) of each note. A DN of 2 sounds a note or rest twice as long as a DN of 1, a DN of 4 produces a note or rest twice as long as a DN of 2, and so on, up to the highest DN of 240. Table 3 contains example durations in terms of musical note division.

If you press the enter key after the duration prompt appears, you'll get a note of the same duration as the previous note. Make sure your last entry was a note or you'll have to recover from a temporarily lost keyboard entry mode.

Musikon lets you substitute lower durations when your music requires accelerated passages and higher durations

The Key Box

LOAD 80

Models I and III
48K RAM Disk Basic
48K RAM Cassette Basic

EXPAND and UPGRADE your TRS-80®

HIGH SPEED - MASS STORAGE FOR THE MODEL 100

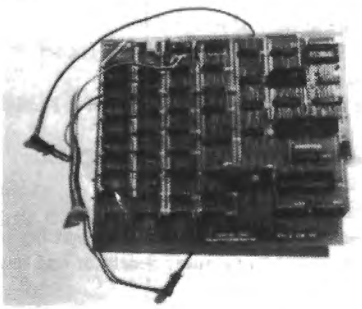
$349.95

The PMD 100 - Fast storage and retrieval of programs and files using miniature high speed wafer tapes.

- Battery Operated (rechargeable)
- Fully portable
- Rom Based operating system

(Includes - wafer tapes, battery charger/ adapter, coiled cable, owners manual.)

8k Memory Modules for the Model 100
HOLMES IM100™ - only $69.50 Up to 32k memory - direct plug in - no mod's req'd



HOLMES VID 80™

MODEL III - Add 64K CP/M 2.2 with 80 x 24 Video Display. . . only **$399.50**

112K extended memory option **$125.00**

Ask about MOD IV software upgrades for MOD III

ORDER TODAY - STOCK DELIVERY

"DOUBLE YOUR SPEED"

CUT COMPUTER OPERATION TIME IN HALF

Sprinter II for Model I	$99.50
Sprinter III for Model III	$99.50

MEMORY EXPANSION

Internal Installation

Model I - IM-2 (W/32K RAM)	$139.50
Model 100 IM100 (8k RAM module)	$ 69.50

MODEL I SPECIAL!!

Add disk drive capability, an RS232C serial communications port, and an additional 32k RAM (48k total) to your Model I with the Holmes Expansion Main Frame Package only **$449.00** (a $508 value)
(Includes a DX-2D, RX232M, and MF-1)

DISK DRIVE CONTROLLERS FOR TRS 80 MODELS I, III and IV Computers

Disk Controller w/clock DX-3DC (Model III & IV)	$157.50
Disk Controller w/o clock DX-3D (Model III & IV)	$137.50
Double Density Adaptor DX-1D (Model I)	$ 99.50
Disk Controller DX-2D (Model 1, requires MF-1)	$159.00

OTHER PERIPHERALS:

Expansion Mainframe-MF-1 (For 4 boards)	$150.00
Color coded diskettes (box 10) 96 TPI SSDD $29.95 DSDD	$ 37.95
Epson Printer Driver for SUPERSCRIPSIT	$ 24.95
Drive O Package w/DX-3DC, drive, power supply	$545.00
RS232 (RX-232) (Requires MF-1)	$119.50
RS232 w/32K RAM (RX-232M-Requires MF-1)	$199.50

About HOLMES ENGINEERING, INC.

- All Holmes Products come complete with easy to follow installation and trouble shooting guides and our technical group is available for support as required. (Monday thru Friday 8 a.m. - 12 noon (MST)
- Installation can be performed with out system modifications, soldering and little or no technical background.
- MORE DETAILED PRODUCT INFORMATION IS AVAILABLE UPON REQUEST.
- 90 DAY WARRANTY.

ORDERING INFORMATION:

- Add shipping and handling charges of: $9.00 for PMD100, and MF-1, pkg. USA, $15.00 Canada & 15% for Overseas.
- Prices subject to change without notice.
- Payment by cashiers check, money order, cash, Visa or Mastercharge. Personal checks subject to 3 week clearance.

HOLMES ENGINEERING, INC.

Bus. Hours: 8-5:30 (MST) Mon. - Fri.
10-2:00 (MST) Sat. (Sales only)
Service Hours: 8-12 noon (MST) Mon. - Fri.

5175 Green Pine Drive Salt Lake City, Utah 84123
(801) 261-5652 or 24 Hr. BBS (801) 263-1103

master charge

VISA

DISTRIBUTORS:
BI Tech, N.Y. (800) 645-1165 / Level IV Products, MI (800) 521-3305
Digital Distributing, TX (214) 330-1332
M & M Micro Mart, Quebec, Canada (514) 731-9486

PLEASE CALL OR WRITE FOR AUTHORIZED DEALER NEAREST YOU.
DEALER INQUIRIES INVITED.

153

See List of Advertisers on Page 211

```
                OPTIONS MENU
================================================
   1)  ENTER NEW MUSIC DATA
   2)  ENTER MUSIC DATA FROM DISK
   3)  APPEND DATA AT END OF ENTERED MUSIC
   4)  CHANGE TUNING OF ENTERED MUSIC
   5)  LIST OF NOTES AND DURATIONS ENTERED
   6)  MAKE CORRECTIONS IN NOTES AND/OR DURATIONS
   7)  SAVE MUSIC DATA ON DISK
   H)  GET HELP FOR DATA ENTRY
   P)  PLAY MUSIC ENTERED WITH OPTIONS 1 OR 2
   E)  EXIT PROGRAM


       SELECT YOUR OPTION?
```

Figure 1. Musikon's main menu.

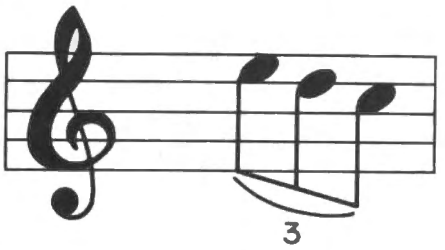


Figure 2. Triplet of eighth notes.

Variable	Definition
A$	5,100-byte string for music data
AØ	Start of A$ in memory
A	Memory location in A$ to pack a byte
A!	Holds A if less than 32767
B%	Tempo value for B register
C	Pitch change to tune at user's option
C%	Tempo value for C register
CP	Fundamental pitch derived from C
CT	Define tempo POKEs in B and C registers
D	Entered duration values
F1	Flags guide option
F8	Flags editing deletion and insertion routines
FB	Flags duration entry errors
FL	Flags return to options menu
I,I9	For...Next indices
J	Counts bytes from A0 to pack next value
JE	Classifies errors in repeat entries
JN	Holds number of consecutive 3-byte spaces left in memory for note entry
K2,K3	Screen position for prompts
K9	Holds total memory left for note entry
KF	Flag for repeat function
L	Line index
L$	Note designation
N	Index for note and duration arrays
N1	Value of N to start editing routines
N2	Value of N to start packing in A$
N3	Value of N to end packing in A$
N8,N9	For...Next loop indices
NE	Entry number at end of repeat
NI	Entry number at end of piece
NL	Number of key-ins per keyboard entry
NM	Highest value of N reached in editing
NN	Number of deletions or insertions
NO	Multiple of 256 for determining P
NS	Entry number at start of repeat
NX	Counts the 3 bytes from J to pack note entries
O$	Holds main option selection
P	Holds note and duration decimal values for POKE into A$
P( )	Fundamental pitch of chromatic scale's 12 notes
Q	VARPTR location of vibrato flag
QV	Holds vibrato flag
R	Octave/numerical value of third character in Z
S$	169-byte string containing music generator and reverse scroller
SØ	Location S$ in memory
S,SS	Indices releasing keyboard entries and flashing cursor
T	Tempo choice
V	Location for screen duration and note display
V!	Temporary calculated value of V
VC	Screen position for editing cursor
W	Holds editing cursor
X,Y	Strings holding keyboard entries
Y( )	String array with legal one-key entries
YD	Duration portion of Z( )
Z( )	Array holding duration and note entries
Z	Note portion of Z( )

Table 1. Variables list for Musikon.

when it requires retarded passages. For example, durations of 13–15 (instead of 16) create accelerated quarter-notes, and durations of 17–19 simulate retarded quarter-notes.

You can also create trills, arpeggioed chords, and cadenzas by using DN values of 1 or 2 for 1/64 or 1/32 notes. (Remember your beats-per-measure requirement.)

For example, if your music requires a triplet of eighth notes (see Fig. 2) for one quarter-note (DN = 16), divide the three consecutive values as 5, 6, and 5.

After you've chosen a duration, Musikon prompts you for note entry. Press the R and the enter keys if you intend a rest; see Table 4 for the three or four characters you can enter for notes.

Musikon automatically gives each note vibrato similar to a horn, but if you don't want vibrato, type N and press the enter key. For example, CN3 is a note in natural C of the third octave. CN3N is the same note without vibrato. Figure 3 shows representative quarter-notes and their designations with vibrato.

Musikon lets you backspace over errors, provided you haven't entered them. Otherwise, you can edit them later.

You can repeat a passage, placing it at the end of your presently entered notes, by pressing P and the enter key in response to the duration prompt. If you know the entry numbers of the first and last notes in the repeated passage, type Y and enter them. If you don't, press F to see a listing of the notes you entered.

You can also press A to abort the repeat mode and return to the duration prompt for the next note.

To end your composition, type in E and press the enter key when Musikon prompts you for your next duration entry. If you type E accidentally, select option 3 when the main menu appears.

Music on Disk

To read music from disk, select option 2 from the main menu and follow the prompts. Once Musikon packs your data into the program, it returns to the main menu.

Option 3 lets you append notes to the end of a piece. I often edit bad entries in a piece before it's done; option 3 lets me continue composing.

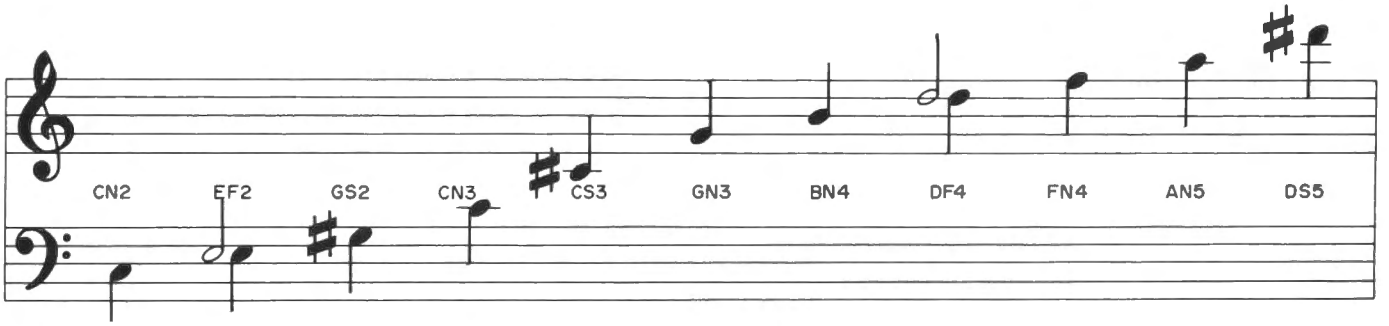


Figure 3. Example staff of quarter-notes.

Line Number	Function
60	Tuning option selection
100	Keyboard entry of music data
160	Find packing values for duration and note
260	Calculate and POKE least significant byte of note pitch into A$
280	POKE into A$
300	Calculate P( ) for 12 notes of chromatic octave
310	Break down Z( ) to D = duration and N = note
320	End keyboard entries
330	Display guide for note entries
360	Trap illegal duration entries
370	Clear space for prompts
375	Locate start of screen display
380	Display a duration and note entry
390	Repeat subroutine
460	Display series of duration and note entries
470	Delay subroutine
480	Find A—the location to pack entries
1500	Determine one-key keyboard entries
1510	Determine four- or five-key keyboard entries
2050	Load data from disk
2150	Save data to disk
2500	Pack music data
3000	List data on screen
3500	List data on printer
4000	Primary editing subroutine
4060	Subroutine for insertion editing
4090	Subroutine for deletion editing
4140	Editing cursor motion
4160	Maintain cursor span for editing
4170	Set screen for editing
4200	Keyboard entry for duration and notes
4210	Keyboard entry for notes
5300	Packing problem codes
6000	Provide help
9000	Determine tempo
10000	Play music
11000	Trap unwanted clearing of memory
12000	Initialization subroutine

Table 2. Subroutine list for Musikon.

DN	Musical Equivalent
1	1/64 note
2	1/32 note
4	sixteenth note
8	eighth note
12	dotted eighth note
16	quarter note
32	half note

Table 3. Example durations in musical note division terms.

Character	Meaning
A–G	Notes A–G
N, F, or S	Natural, flat, or sharp
1–6	Octave 1–6
Enter key	Vibrato
N	No vibrato

Table 4. Characters for note entry.

Option 4 lets you re-tune your music higher or lower in pitch by as much as 4/10 of an octave. Musikon's entire board of six octaves retains the proper equally tempered relationship after tuning.

If you append (option 3) or insert (option 6) additional notes, Musikon packs them at the new tuning.

Option 5 provides a listing of entry numbers, durations, and notes for all entries. Press the S key to display your current selection on the screen. Press B to scroll back, and press any key but R to scroll forward. The R key returns the program to your entry before selecting option 5.

Type P to print your data. Musikon prints in five-column sections, up to 80 columns wide.

Option 6 lets you edit your music by changing, inserting, or deleting notes. Enter the numbers of the notes you want to edit and Musikon displays a list of entries including the numbers you selected plus a pointer.

Use the editing instructions displayed on the screen to place the pointer over the entry you want to edit.

Press the C key to change an entry. Enter the correct duration when prompted, or the same duration if you want to change only the note.

Type I to insert notes. Musikon asks for the number of notes you want to insert and displays the maximum inserts memory space allows. The program provides duration and note prompts until your inserts are complete and then returns to the main menu.

To make deletions, press D. The process for deletions is similar to that for insertions. The program asks how many deletions you want to make and dis-

Figure 4. Example entries for "Glow Worm."

ENTRY	DURATION	NOTE
0	16	BF4
1	16	CN4
2	16	DN4
3	16	FN4
4	8	BF5N
5	8	GN4N
6	8	FN4N
7	8	DN4N
8	8	BF4N
9	8	GN3N
10	8	FN3N
11	8	DN3N
12	8	CN3
13	4	FN4N
14	4	R
15	4	CN4N
16	4	R
17	4	FN4N
18	4	R
19	8	DF3
20	4	FN4N
21	4	R
22	4	BN4N
23	4	R
24	4	FN4N
25	4	R
26	8	CN3
27	4	FN4N
28	4	R
29	4	CN4N
30	4	R
31	4	FN4N
32	4	R
33	2	FN4N
34	8	FN5N
35	22	R
36	8	BF3
37	8	R
38	4	CN3
39	12	R
40	4	DN3
41	12	R
42	4	FN3
43	12	R
44	8	GN3
45	8	BF4
46	24	GN3
47	8	FN3
48	8	DN3
49	8	BF3
50	8	GN3
51	8	BF4
52	24	GN3
53	8	FN3
54	8	DN3
55	8	BF3
56	32	FN3
57	32	EF3
58	8	CN3
59	8	R
60	4	DN3
61	12	R
62	4	EF3
63	12	R
64	4	GN3
65	12	R
66	8	AN4
67	8	CN4
68	24	AN4
69	8	GN3
70	8	EF3
71	8	CN3
72	8	AN4
73	8	CN4
74	24	AN4
75	8	GN3
76	8	EF3
77	8	CN3
78	32	GN3
79	32	FN3
80	8	BF3
81	8	R
82	4	CN3
83	12	R
84	4	DN3
85	12	R
86	4	FN3
87	12	R
88	8	GN3
89	8	BF4
90	24	GN3
91	8	FN3
92	8	DN3
93	8	BF3
94	8	GN3
95	8	BF4
96	24	GN3
97	8	FN3
98	8	DN3
99	8	BF3
100	32	FN3
101	32	EN3
102	8	DN3
103	8	R
104	8	EN3
105	8	R
106	8	FN3
107	8	R
108	8	GN3
109	8	R
110	8	AN4
111	8	CN4
112	24	AN4
113	8	FN3
114	8	DN3
115	8	CN3
116	8	GN3
117	8	BF4
118	24	GN3
119	8	EN3
120	8	DN3
121	8	CN3
122	32	GN3
123	16	FN3
124	16	R
125	2	BF3N
126	2	EF3N
127	12	GN3N
128	4	CN5N
129	12	R
130	4	GN4N
131	12	R
132	2	AN3N
133	2	EF3N
134	12	GF3N
135	2	AF3N
136	2	DN3N
137	12	FN3N
138	4	BF5N
139	12	R
140	4	FN4N
141	12	R
142	2	GN2N
143	2	CS3N
144	12	EN3N
145	2	GF2N
146	2	CN3N
147	12	EF3N
148	4	AN5N
149	12	R
150	4	EF4N
151	12	R
152	2	FN2N
153	2	BF3N
154	12	DN3N
155	2	FN2N
156	2	AN3N
157	12	CN3N
158	4	FN4N
159	12	R
160	4	AN5N
161	12	R
162	4	CN5N
163	12	R
164	2	BF3N
165	2	EF3N
166	12	GN3N
167	4	CN5N
168	12	R
169	4	GN4N
170	12	R
171	2	AN3N
172	2	EF3N
173	12	GF3N
174	2	AF3N
175	2	DN3N
176	12	FN3N
177	4	BF5N
178	12	R
179	4	FN4N
180	12	R
181	2	GN2N
182	2	CS3N
183	12	EN3N
184	2	GF2N
185	2	CN3N
186	12	EF3N
187	4	AN5N
188	12	R
189	4	EF4N
190	12	R
191	2	FN2N
192	2	BF3N
193	12	DN3N
194	2	FN2N
195	2	AN3N
196	12	CN3N
197	4	FN4N
198	12	R
199	4	AN5N
200	12	R
201	4	CN5N
202	12	R
203	4	FN4N
204	4	GN4N
205	4	FN4N
206	2	EN4N
207	2	R
208	4	FN4N
209	4	R
210	4	CN5N
211	4	R
212	4	FN4N
213	4	R
214	4	CN5N
215	4	R
216	4	EN4N
217	4	R
218	4	CN5N
219	4	R
220	4	EF4N
221	4	FN4N
222	4	EF4N
223	2	DN4N
224	2	R
225	4	EF4N
226	4	R
227	4	BF5N
228	4	R
229	4	EF4N
230	4	R
231	4	BF5N
232	4	R
233	4	DN4N
234	4	R
235	4	BF5N
236	4	R
237	4	DF4N
238	4	EF4N
239	4	DF4N
240	2	CN4N
241	2	R
242	4	DF4N
243	4	R
244	4	AF5N
245	4	R
246	4	DF4N
247	4	R
248	4	AF5N
249	4	R
250	4	CN4N
251	4	R
252	4	AF5N
253	4	R
254	4	BN4N

Figure 4 continued

plays the maximum allowed by total entries in memory. To recover from an unintended deletion, press zero when prompted for the number of deletions.

Musikon renumbers entries after deletions and insertions.

To end your editing and return to the main menu, press the E key. You can select option 3 to add musical data to the piece, but be careful not to choose option 1 unless you want to erase all the music in memory.

To save music to disk, simply respond to the prompts in option 7.

To play music you've loaded from disk or created on the keyboard, select P from the main menu options. Once again, check to make sure you hooked up an amplifier to your computer.

After you type in P, Musikon lets you set a metronome tempo (the number of beats to a quarter-note) from 40–400 beats to a minute. Model I owners should change constant 102250 in line 9020 of Listing 1 to use this metronome tempo range.

I often use a slow tempo (40–70) to check new compositions for bad entries. When your music sounds right, save the music to disk using option 7.

Musikon also provides an alternate method for saving music data. Press E to exit from the main menu options, and when READY appears, type in DELETE 50–160 and press the enter key.

Then you must edit line 9040. Delete everything after the first quotation mark, type in the title of your music to end at the second quotation mark, and press the enter key. Type in SAVE and your title between quotation marks. When you next run this program, Musikon will display the title while playing the music.

Small Problems

When entering a long composition, the computer occasionally hangs up for a few seconds while it rearranges string storage space.

The program lessens this inconvenience by giving you a clean slate each time you select option 1 or 2. You can help by doing all your change editing in option 6 before performing any deletions or insertions.

If the notes you want to change are more than 10 entries apart, type E after the first change and select option 6 again to return to the next set of changes.

Glow Worm

I've included the Musikon listing for Paul Lincke's "Glow Worm" as a demonstration program (see Fig. 4).

(Load-80 subscribers will get Chopin's "Fantasy Impromptu" already packed into Musikon's Play option.)

"Glow Worm" has many examples of legato and staccato effects. Notes 203–205 are sixteenth notes (DN = 4) played legato. Note 206 is also a sixteenth note, but played staccato because a DN = 2 is followed by a rest of DN = 2. Note 206 is also followed by six staccato eighth notes, created by dividing the DN = 8 into 4 for a note and 4 for a rest.

Notes 193 and 196 are examples of quarter-length arpeggioed chords. The duration of the chord totals 16; the first two notes are each a DN = 2 and the final note is a DN = 12.

You can save time by using the repeat function (R) to enter notes 125–163 at note entry 164, and 265–304 at entry 325. ■

Contact Merton Davis at 3A Palmetto Arms, Camden, SC 29020.

Figure 4 continued

ENTRY	DURATION	NOTE	ENTRY	DURATION	NOTE	ENTRY	DURATION	NOTE
255	4	R	295	8	BF4	335	8	FS3
256	4	FN4N	296	8	R	336	8	R
257	4	R	297	8	AN4	337	8	GN3
258	4	CN4N	298	8	R	338	8	R
259	4	R	299	8	BF4	339	16	AN4
260	4	FN4N	300	8	R	340	8	GN3
261	2	R	301	8	AN4	341	8	GN3
262	2	FN4N	302	8	R	342	16	FS3
263	8	FN5N	303	8	GN3	343	8	GN3
264	24	R	304	8	R	344	8	GN3
265	16	GN3	305	8	FS3	345	8	AN4
266	8	FN3	306	8	R	346	8	R
267	8	FN3	307	8	GN3	347	8	BF4
268	16	EN3	308	8	R	348	8	R
269	8	FN3	309	8	BF4	349	8	AN4
270	8	FN3	310	8	R	350	8	R
271	8	FS3	311	8	AN4	351	8	BF4
272	8	R	312	8	R	352	8	R
273	8	GN3	313	8	GS3	353	8	CN4
274	8	R	314	8	R	354	8	R
275	8	FS3	315	8	AN4	355	8	BF4
276	8	R	316	8	R	356	8	R
277	8	GN3	317	8	GN3	357	8	AN4
278	8	R	318	8	R	358	8	R
279	16	AN4	319	8	FN3	359	8	BF4
280	8	GN3	320	8	R	360	8	R
281	8	GN3	321	8	EN3	361	8	AN4
282	16	FS3	322	8	R	362	8	R
283	8	GN3	323	8	FN3	363	8	GN3
284	8	GN3	324	8	R	364	8	R
285	8	AN4	325	16	GN3	365	26	CN4
286	8	R	326	8	FN3	366	16	GN3
287	8	BF4	327	8	FN3	367	18	FN3
288	8	R	328	16	EN3	368	20	FN3
289	8	AN4	329	8	FN3	369	32	CN4
290	8	R	330	8	FN3	370	8	BF4
291	8	BF4	331	8	FS3	371	48	BF4
292	8	R	332	8	R	372	16	R
293	8	CN4	333	8	GN3	373	End	
294	8	R	334	8	R			

Program Listing 1. Basic Musikon program.

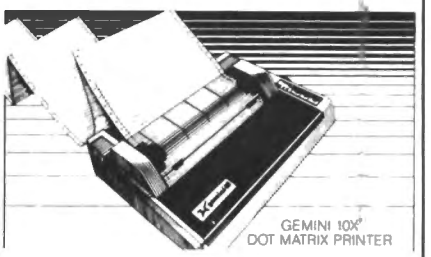
```
1 '********************* "MUSIKON" (c) *********************
2 'A MUSIC PROGRAM WRITTEN FOR THE MODELS I/III TRS-80 DISK SYSTEM
3 'COPYRIGHT 1983
4 'By
5 '                      Merton L. Davis
6 '                      3A Palmetto Arms
7 '                      Camden, SC 29020
10 CLS:PRINT"MUSIKON FOR 48K TRS-80 MODELS I/III":PRINT:PRINT"PLEA
SE WAIT FOR PROGRAM INITIALIZATION":CLEAR15550:GOSUB12000
20 S$="..169 BYTE MACHINE LANGUAGE MUSIC GENERATOR IN HERE.."
30 S1=PEEK(VARPTR(S$)+1):S2=PEEK(VARPTR(S$)+2):S0=S1+S2*256:DEFUSR
=S0:DEFUSR1=S0+141
34 'Lines 35 and 45 make sure that the Basic locations the machine
 language must have do not supply a decimal code 0 or 34.  If this
 is the case, you are advised to position Line 20 upward by adding
 a REM Line.
35 Q2=INT(E/256):Q1=E-Q2*256:IFQ1=0ORQ1=34GOSUB5300:END
```

Listing 1 continued

HUGE SAVINGS ON PRINTERS

FRICTION (Single Sheet) & TRACTOR (Pin Feed)

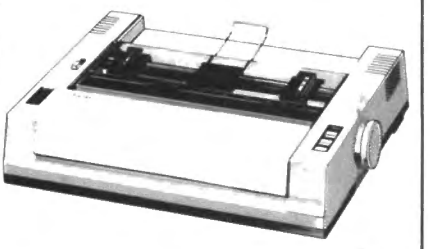
GEMINI 10X
$275.00
also available: **GEMINI 15X**
15" wide carriage **$400.00**



GEMINI ACCESSORIES
Star Universal Commodore Interface . . . **55.00**
Gen-05 Serial Interface w/4K buffer **100.00**
Gen-01 Rep. Rib. (10X/15X)**6/15.00; 12/24.00**

PANASONIC KX-P1090
$275.00

KX-P1090



PANASONIC ACCESSORIES
Replacement Ribbon Cartridges **6.00**
Serial Intreface w/2K buffer **85.00**
4K Buffer (addition to parallel) **65.00**

CABLES FOR GEMINI OR PANASONIC

PA10A 10 ft. 36/36 pin standard parallel **30.00**
IB-PIO 10 ft. 36/25 pin parallel (for IBM) **32.00**
PA6T 6 ft. 36/16 pin parallel (for TI-99/4A) **25.00**
RS10A 10 ft. 25 pin standard RS-232 (fully loaded) **21.00**

Grafstar (for Apple) **70.00**
Grappler Plus (for Apple) **120.00**
Buffered (16K) Graphler Plus (for Apple) **165.00**
Elek-Tek Dust Covers for above printers **5.00**

CALL TOLL FREE 800-621-1269
EXCEPT Illinois, Alaska, Hawaii

Corp. Accts. Invited. Min. Ord. $15.00 Mastercard or Visa by mail or phone. Mail Cashier's Check, Mon. Ord., Pers. Check (2 wks. to clr.) Add $4.00 1st item **(AK, HI, P.R., Canada add $10.00 first item)** $1.00 ea. add'l shpg. & hand. Shpg. to IL address add 6% tax. Prices subj. to change. **WRITE for free catalog. Return policy for defective replacements only. ALL ELEK-TEK MDSE. IS BRAND NEW, 1ST QUALITY AND COMPLETE.**

144

ELEK-TEK, inc.
6557 N. Lincoln Ave., Chicago IL 60645
(800) 621-1269 (312) 677-7660

Listing 1 continued

```
40 A$="......5100 BYTE STORAGE FOR MUSIC DATA IN HERE......"
45 A1=PEEK(VARPTR(A$)+1):A2=PEEK(VARPTR(A$)+2):A0=A1+A2*256:IFA1=0
ORA1=1ORA1=35THENGOSUB5300:ENDELSEA1=A1-1
50 ONERRORGOTO5000:IFO$<>"1"THENIFO$<>"2"THEN1000ELSERETURN
59 'Initialize keyboard entry of music data
60 CLS:PRINT@390,"DO YOU WISH TO TUNE (Y/N/M)? ";:Y(0)=Y1:GOSUB150
0:IFX="N"THEN90ELSEIFX="M"THEN1000ELSEPRINT:PRINT"HIGHER OR LOWER
PITCH (H/L)?";:Y(0)="XHL":GOSUB1500:IFX="H"THEN80
70 PRINT:INPUT"TYPE PORTION OF OCTAVE TO DECREASE PITCH (0.01 TO 0
.4) AND PRESS ENTER";C:IFC<0.01ORC>0.4THENCLS:PRINT"FRACTION BETWE
EN 0.01 AND 0.4 PLEASE":GOTO70ELSECP=INT(CP/(1-C)):GOTO90
80 PRINT:INPUT"TYPE PORTION OF OCTAVE TO INCREASE PITCH (0.01 TO 0
.4) AND PRESS ENTER";C:IFC<0.01ORC>0.4THENCLS:PRINT"FRACTION BETWE
EN 0.01 AND 0.4 PLEASE":GOTO80ELSECP=INT(CP/(1+C))
90 IFO$="4"THENGOSUB300:N2=0:N3=NI:GOSUB2500:RETURNELSECLS:GOSUB30
0:N2=0:N=0:K3=385:GOSUB100:GOTO1000
99 'Keyboard entry for music data in Lines 100-150
100 PRINT@K3,"DO YOU NEED GUIDE FOR DURATION AND NOTE ENTRIES (Y/N
/M)? ";:Y(0)=Y1:GOSUB1500:IFX="M"THEN1000ELSEIFX="Y"THENK2=512:F1=
-1ELSEK2=0:F1=0:IFO$="1"CLS
110 J=N*3:IFF1GOSUB330
120 GOSUB370:PRINT@K2,"TYPE DURATION NUMBER (DN) FROM 1 TO 240 AND
 <ENTER>  OR":PRINT@K2+64,"TYPE <P> TO REPEAT OR <E> TO END PIECE
AND <ENTER>";:INPUTYD:IFYD="E"THENGOSUB320:N3=K9:GOSUB2500:GOTO100
0
130 IFYD="P"ANDN<2THENGOSUB370:PRINT@K2,"***MUST HAVE AT LEAST 2 E
NTRIES TO REPEAT***":GOSUB470:GOTO120ELSEIFYD="P"THENGOSUB370:KF=-
1:GOSUB390:IFF1THENGOSUB330:N=N-1:GOTO150ELSEN=N-1:GOTO150
140 D=VAL(YD):GOSUB360:IFFBTHENFB=0:GOTO120ELSEIFN=K9-1THEN150ELSE
GOSUB370:PRINT@K2+128,"DURATION WAS "D;:PRINT@K2,"";:N9=N:GOSUB421
0:GOSUB375
150 N=N+1:IFN<K9-1THEN110ELSE270
159 'Packing values determined and packed in Lines 160 through 250
160 NX=0:IFZ="R"THENP=D:GOSUB480:GOSUB280:NX=NX+1:GOSUB480:POKEA,1
:NX=NX+1:GOSUB480:POKEA,250:RETURNELSEL$=LEFT$(Z,2):R=VAL(MID$(Z,3
,1)):NN=0:IFRIGHT$(Z,1)="N"NN=-1
170 P=D:GOSUB480:GOSUB280:NX=NX+1:GOSUB480:IFL$="AF"THENR=R-1ELSEI
FL$="AN"THENN9=0:GOTO200ELSEIFL$="AS"ORL$="BF"THENN9=1:GOTO200ELSE
IFL$="BN"ORL$="CF"THENN9=2:GOTO200ELSEIFL$="BS"ORL$="CN"THENN9=3:G
OTO200
180 IFL$="CS"ORL$="DF"THENN9=4:GOTO200ELSEIFL$="DN"THENN9=5:GOTO20
0ELSEIFL$="DS"ORL$="EF"THENN9=6:GOTO200ELSEIFL$="EN"ORL$="FF"THENN
9=7:GOTO200ELSEIFL$="ES"ORL$="FN"THENN9=8:GOTO200
190 IFL$="FS"ORL$="GF"THENN9=9:GOTO200ELSEIFL$="GN"THENN9=10:GOTO2
00ELSEN9=11
200 P=INT(P(N9)/2[(R-1)+.5):IFNNTHENP=INT(P*.59+.5)
230 FORI=1TO10:NO=(I-1)*256:IFP<NO+256THENIFNNTHENPOKEA,I+128:GOSU
B260:RETURNELSEPOKEA,I:GOSUB260:RETURN
240 NEXTI:IFP>2815P=2815
250 POKEA.I:NO=2560:GOSUB260:RETURN
259 'Calculates and pokes LSB of note pitch into A$
260 NX=NX+1:GOSUB480:P=P-NO:GOSUB280:RETURN
270 CLS:PRINT@77,"*** YOU JUST REACHED END OF MEMORY ***":PRINT@20
6,"PLEASE MAKE YOUR CHOICE OF OPTIONS.":PRINT@336,"*** SELECT ANY
BUT OPTION 3 ***":GOSUB470:GOSUB470:GOSUB320:N3=K9:GOSUB2500:GOTO1
000
279 'Subroutine to do the packing
280 IFP=34THENP=33ELSEIFP=0ORP=1THENP=2ELSEIFP=250THENP=249
290 POKEA.P:RETURN
299 'Determine packing value as function of specified tuning
300 FORI=0TO11:P(I)=CP/2[(I/12):NEXTI:RETURN
309 'Breaks down Z() string to D=Duration and Z=note
310 D=VAL(Z(N)):YD=RIGHT$(STR$(D),LEN(STR$(D))-1):Z=RIGHT$(Z(N),LE
N(Z(N))-LEN(YD)):RETURN
319 'Ends musical note entries
320 NI=N:Z(N)="255":RETURN
329 'Provides guide for keyboard note entries
330 PRINT@0,"EXAMPLE DURATIONS (DN-VALUE) AND NOTES";CHR$(217):PRI
NT"DN";TAB(4)"VALUE";TAB(21)"NOTE";TAB(44)"MEANING":PRINT"2";TAB(4
)"32ND";TAB(16)"LOWEST   'AF1'";TAB(33)"A-FLAT 1ST OCTAVE--VIBRATO
"
340 PRINT"4";TAB(4)"16TH";TAB(16)"MIDDLE C 'CN3'";TAB(33)"C-NATURA
L 3RD OCTAVE--VIBRATO":PRINT"8";TAB(4)" 8TH";TAB(16)"HIGHEST  'GS6
'";TAB(33)"G-SHARP 6TH OCTAVE--VIBRATO"
350 PRINT"16";TAB(4)"QUARTER";TAB(16)"HIGHEST  'GS6N'";TAB(33)"G-S
HARP 6TH OCTAVE--NO VIBRATO":PRINT"32";TAB(4)"HALF";TAB(25)"'R'";T
AB(33)"ANY REST":PRINTTAB(5)YG:RETURN
359 'Trap for bad duration entries
360 IFD<1ORD>240THENGOSUB370:PRINT@K2,"DURATION BETWEEN 1 AND 240
PLEASE. TRY ONCE MORE.":GOSUB470:FB=-1:RETURNELSERETURN
369 'Clears screen space for keyboard entries
370 PRINT@K2,CHR$(30);:PRINT@K2+64,CHR$(30);:RETURN
374 'Finds screen location for next entry display
375 V!=K2+192+64*N:IFV!>960THENV=960ELSEV=V!
379 'Prints last music data entry
380 PRINT@V,TAB(16)"ENTRY";N;TAB(28)D;TAB(33)Z;:IFV<960ORO$="6"THE
NRETURNELSEPRINT:RETURN
389 'Provides repeat for entered data--Lines 390 through 450
390 JN=K9-N-1:I9=N-1:PRINT@K2,"LAST ENTRY # WAS"N-1". YOU HAVE SPA
CE FOR"JN"REPEAT ENTRIES":PRINT@K2+64,"DO YOU KNOW STARTING AND EN
DING ENTRY #'S TO REPEAT (Y/N)? ";:Y(0)="XYN":GOSUB1500:IFX="Y"THE
N420ELSEGOSUB370
400 PRINT@K2,"DO YOU WISH TO 'F'IND ENTRY NOS. IN LISTING OR 'A'BO
RT THIS RE- PEAT (F/A)? ";:Y(0)="XFA":GOSUB1500:IFX="A"THENKF=0:RE
TURNELSENI=N:Z(NI)="255":GOSUB3000:N=NI:CLS:IFN<13THENNI=0ELSEI=N-
13
410 GOSUB460:IFF1THENGOSUB330:GOTO390ELSE390
420 GOSUB370:PRINT@K2,"TYPE ENTRY NO. AT START OF REPEAT AND PRESS
 <ENTER>";:INPUTNS:IFNS<0ORNS>N-2GOSUB370:PRINT@K2,"STARTING ENTRY
 NO."NS"IS ILLEGAL":GOSUB470:GOTO420
430 GOSUB370:PRINT@K2,"TYPE ENTRY NO. AT END OF REPEAT AND PRESS <
ENTER>";:INPUTNE:IFNE<=NSTHENJE=1ELSEIFNE>N-1THENJE=2ELSEIFNE>JN+N
S-1THENJE=3
440 GOSUB370:ONJEGOTO5100,5110,5120
450 N=N-1:FORN9=0TONE-NS:N=N+1:J=N*3:NT=NS+N9:Z(N)=Z(NT):GOSUB310:
GOSUB375:NEXT:N=N+1:J=N*3:KF=0:RETURN
459 'Prints table of most recent entries
460 FORN=ITOI9:GOSUB310:GOSUB375:NEXT:RETURN
469 'Delay subroutine
470 FORE=1TO1200:NEXT:RETURN
479 'Determines packing location
480 A!=A0+J+NX:A=A!+65536*(A!>32767):RETURN
999 'Main Options Menu
1000 FL=1:CLS:PRINT@23,"OPTIONS MENU":PRINT@71,YG:PRINT@138,"1)  E
NTER NEW MUSIC DATA":PRINT@202,"2)  ENTER MUSIC DATA FROM DISK":PR
INT@266,"3)  APPEND DATA AT END OF ENTERED MUSIC":PRINT@330,"4)  C
HANGE TUNING OF ENTERED MUSIC"
1010 PRINT@394,"5)  LIST OF NOTES AND DURATIONS ENTERED":PRINT@458
,"6)  MAKE CORRECTIONS IN NOTES AND/OR DURATIONS":PRINT@522,"7)  S
AVE MUSIC DATA ON DISK":PRINT@586,"H)  GET HELP FOR DATA ENTRY":PR
INT@650,"P)  PLAY MUSIC ENTERED WITH OPTIONS 1 OR 2"
1020 PRINT@714,"E)  EXIT PROGRAM":PRINT@911,"SELECT YOUR OPTION?";
```

Listing 1 continued

Tired of swapping Disks from Inventory to Accounts Receivable to Accounts Payable etc.? Now, one system does it all.

Introducing

The M.B.S. Business Management System

At last a completely Integrated, Menu driven System for:

- **INVOICING**
  - Opens Customer Files
  - Opens A/R Accounts
  - Updates Inventory
  - Stores Mail List Files
  - Stores Sales Records
  - Computes Sales Tax
- **CUSTOMER FILES**
  - Maintains Order Status
  - Prints Labels
  - Prints Customer Balances
  - Stores Order Amounts
  - Stores Order Payments
  - Prints Statements
- **MAIL LABELS**
  - Stores by Variable File Names
  - Sorts by Zip Code
  - Sorts by Name
- **INVENTORY**
  - Sets Upper and Lower Limits
  - Generates Purchase Orders
  - Lists Inventory by Vendor
- **ACCOUNTS RECEIVABLE**
  - Open A/R Accounts
  - Generates Monthly Statements
  - Interest and Non-Interest Accounts
  - Listing of Accounts Balances
  - Manually Enter Charges and Payments
- **ACCOUNTS PAYABLE**
  - Enter Charges to Accounts
  - Enter Payments to Accounts
  - List Payable Balances
- **CHECK WRITING**
  - Print or Record Checks
  - Maintains Bank Balance
  - Credit Accounts Payable
  - Stores Expense Totals
- **FINANCIAL STATEMENTS**
  - Prints Sales Reports
  - Prints Operating Statements
  - Prints Receipts Reports
  - Modifies Expense and Sales Totals

Yes, now there is a complete business system for the small business man. With our Business Management System, you can increase sales with our mail label function. Complete your Schedule C in as little as 15 minutes. Know what your business is doing, and maintain other important business functions.

This easy to use system comes complete with instruction manual, and diskette on Dosplus mini TDOS operating system with extended Basic, and one year support. All programs are in Basic, and require two disk drives and 48K RAM. If you have waited for the right business software for your business, your wait is over. Our current users love our system and you will too.

Special Introductory Price $249.95

GAMEMASTER

Do you get complaints from your spouse, family and friends that you isolate yourself from them while "playing" with your computer? Do you wish there was a game that could get everyone involved? Do you enjoy creative expressions as well as playing games? If so, we have a unique Program/Game wich could be the answer. It's called GAMEMASTER.

This program lets you easily develop and play your own adventure games. It does not create a game which you play against the computer, but creates a game which you the game creator, direct the game play while your computer maintains the game conditions and resolves combat.

GAMEMASTER package includes routines for creating player characters, creatures, items (weapons, armour, implements, or treasures), and environment (time, location etc.). Comes on diskette with sample scenerio. Requires one disk drive and 48k ram.

Price $39.95

Specify Model I, Model III, Model IV, or LNW
Dealer Inquiries Invited

PRINTERS		PERIPHERALS		L.N.W.		SOFTWARE	
Prowriter	$ 379	Hayes Smartmodem	$ 219	LNW80II	$1495	DOSPLUS 3.5	$ 119
Prowriter	$ 669	Hayes 300/1200	$ 539	LNDoubler W/DOS	$ 199	DOSPLUS IV	$ 119
Starwriter F10	$1229	Holmes VID 80	$ 259	System Expansion	$ 339	MTERM	$ 69
Okidata 82A	Call	Holmes CPM 2.2	$ 109	**MONITORS**		TRSDOS 6.0 Plus Enhance	$ 45
Okidata 83A	Call	64 K Ram	$ 114	Amdek 300G	$ 149	Super Utility Plus	$ 69
Okidata 92	Call	Holmes DX3DC	$ 157	Amdek 300A	$ 159	Newscript 7.1	$ 99
Okidata 93	Call	Holmes DX4DC	$ 157	Amdek Color I	$ 339	Newscript w/labels	$ 109
Silver Reed	$499	Holmes Sprinter I	$ 89	Amdek Color II	$ 469	File Converter	$ 20
Mannesman Tally	Call	Holmes Sprinter III	$ 89	Taxan Amber	$ 149	Trashman	$ 35
NEC	Call	Holmes Sprinter KX	$ 129	Taxan Green	$ 139	Faster	$ 27
Transtar	Call	Disk Drives	Call	Taxan RGB I	$ 319	Tallymaster	$ 69
		Diskettes	Call	Taxan RGB III	$ 599	Electric Webster	$ 129

Microcomputer Business Systems
14030 South Springfield Road
Brandywine, Maryland 20613
1-800-638-1857
in Maryland 1 (301) 372-8555 — Washington, D.C. Local Call

47

See List of Advertisers on Page 227

Listing 1 continued

```
1030 O$=INKEY$:IFO$=""THENSS=(SS+1)AND7:PRINTCHR$(14AND(SS=1)OR15A
ND(SS=5));:GOTO1030
1040 PRINTCHR$(15):IFO$="1"IFZ(0)=""THEN60ELSEGOSUB11000:IFX="Y"TH
ENCLEAR15550:GOSUB12000:O$="1":GOTO20ELSE1000
1050 IFO$<>"2"THEN1060ELSEIFZ(0)<>""THENGOSUB11000:IFX="Y"THENCLEA
R15550:GOSUB12000:O$="2":GOSUB20ELSE1000
1055 GOSUB2050:GOSUB300:N2=0:N3=NI:GOSUB2500:GOTO1000
1060 IFO$="3"ANDZ(0)=""THEN5200ELSEIFO$="3"THENN=NI:N2=NI:CLS:I9=N
-1:IFN<14THENI=0ELSEI=N-14ELSE1080
1070 IFN=>K9-1THEN270ELSEGOSUB460:N=NI:K3=0:GOSUB100:GOTO1000
1080 IFO$="4"THENIFZ(0)=""THEN5200ELSEGOSUB60:GOTO1000ELSEIFO$="5"
THENGOSUB3000:GOTO1000
1090 IFO$="6"THENIFZ(0)=""THEN5200ELSEGOSUB4000:GOSUB2500:GOTO1000
ELSEIFO$="7"THENIFZ(0)=""THEN5200ELSEGOSUB2150:GOTO1000ELSEIFO$="H
"THENGOSUB6000:GOTO1000ELSEIFO$="P"THEN9000ELSEIFO$="E"THENCLS:END
ELSE1000
1499 'Subroutine that returns with keyboard entries
1500 NL=1:X=INKEY$:I=0:GOSUB1520:PRINTXC;:RETURN
1510 Z="     ":X=INKEY$:PRINTSTRING$(NL,136);STRING$(NL,24);:FORI=1
TO5
1520 FORS=2TO2:X=INKEY$:S=INSTR(Y(I).X):SS=(SS+1)AND7:PRINTCHR$(14
AND(SS=1)OR15AND(SS=5));:NEXT
1530 IFNL=1THENPRINTX;:PRINTCHR$(15):RETURNELSEIFX="R"Z=X:PRINTX;:
I=5:GOTO1520
1540 IFX=XCPRINTX;:IFZ="R"THENZ="     ":I=1:GOTO1520ELSEI=I-1:GOTO1
520
1550 PRINTX;:IFZ="R"THEN1580ELSEIFI=5THEN1570ELSEIFI=4ANDX=CHR$(13
)NL=3:GOTO1570
1560 MID$(Z,I,1)=X:NEXTI
1570 Z=LEFT$(Z,NL)
1580 PRINTCHR$(15);:RETURN
2049 'Input music data from disk
2050 CMD"T":CLS:LINEINPUT"NAME OF MUSIC FILE OR <M> TO RETURN TO M
ENU ";Y:IFY="M"THEN1000
2060 OPEN"I",1,Y$:INPUT#1,NI,CP:FORN=0TONI-1STEP15:INPUT#1,Z(N),Z(
N+1),Z(N+2),Z(N+3),Z(N+4),Z(N+5),Z(N+6),Z(N+7),Z(N+8),Z(N+9),Z(N+1
0),Z(N+11),Z(N+12),Z(N+13),Z(N+14):NEXTN:CLOSE:Z(NI)="255":RETURN
2149 'Save music data on disk
2150 CMD"T":CLS:PRINT"TYPE A NAME FOR YOUR MUSIC FILE OR 'M' FOR M
ENU AND <ENTER>.":PRINT"NAME MUST BEGIN WITH A LETTER.":PRINT"FOLL
OW BY 1 TO 7 LETTERS OR NUMBERS."
2160 LINEINPUT"FILE NAME ";Y:IFY="M"THEN1000
2170 OPEN"O",1,Y:PRINT#1,NI;CP:FORN=0TONI-1STEP15
2180 PRINT#1,Z(N);",";Z(N+1);",";Z(N+2);",";Z(N+3);",";Z(N+4);",";
Z(N+5);",";Z(N+6);",";Z(N+7);",";Z(N+8);",";Z(N+9);",";Z(N+10);","
;Z(N+11);",";Z(N+12);",";Z(N+13);",";Z(N+14):NEXTN:CLOSE:RETURN
2499 'Subroutine to pack music data.
2500 CLS:PRINT"PLEASE WAIT WHILE THE DATA ARE PACKED":J=N2*3-3:N=N
2
2510 J=J+3:NX=0:GOSUB480:IFN=NITHENPOKEA,255:RETURNELSEGOSUB310:GO
SUB160:PRINT@832,"I PACKED ENTRY";N;" D'N";D;" NOTE ";Z;"     ":IFN
=N3THENRETURNELSEN=N+1:GOTO2510
2999 'Lists entered music data
3000 CLS:IFZ(0)=""THENPRINT"NO MUSIC DATA IN MEMORY--WE WILL START
 AGAIN":GOSUB470:RUNELSEPRINT"DO YOU WISH LIST TO SCREEN OR TO A R
EADY PRINTER?":PRINT"TYPE AN 'S' FOR SCREEN OR 'P' FOR PRINTER OR
'M' FOR RETURN ";:Y(0)="XSPM"
3010 GOSUB1500:IFX="P"THEN3500ELSEIFX="M"RETURN
3020 CLS:INPUT"ENTRY NO. TO START LIST";NS:IFNS<0ORNS=>NITHENPRINT
"NUMBER NOT IN RANGE":GOSUB470:GOTO3020
3030 FORN=NSTONS+13:V=64*(N-NS):GOSUB310:GOSUB380:IFNI>N+1THENNEXT
ELSE3080
3040 PRINT:PRINT"HIT <R> TO RETURN: <B> TO PAGE BACK: ANY OTHER KE
Y TO GO ON."
3050 X=INKEY$:IFX=""THEN3050ELSEIFX="R"THENRETURN
3060 NS=N:IFX="B"THENNS=N-28:IFNS<0NS=0
3070 CLS:GOTO3030
3080 PRINT:PRINT"END OF LIST--PRESS <B> TO BACKUP OR ANY KEY TO RE
TURN."
3090 X=INKEY$:IF X=""THEN3090ELSEIFX="B"THEN3060ELSERETURN
3500 I1=(NI-1)/5:I2=I1+1:FORI=0TO4:LPRINTTAB(I*16)"ENTRY"TAB(I*16+
6)"D'N";TAB(I*16+11)"NOTE";:NEXT:LPRINT" "
3510 FORL=0TOI1:FORI=0TO3:N=L+I*I2:GOSUB310:LPRINTTAB(I*16)N;TAB(I
*16+5)D;TAB(I*16+11)Z;:NEXT:N=L+I*I2:IFNI>NTHENGOSUB310:LPRINTTAB(
64)N;TAB(69)D;TAB(75)Z:GOTO3530
3520 IFNI=NTHENLPRINTTAB(64)NI;TAB(70)"END"ELSELPRINT" "
3530 NEXTL:RETURN
3999 'Entry for editing subroutines
4000 CLS:PRINT"TYPE A NUMBER THAT IS NEAR ENTRY NO. OF NOTE TO COR
RECT.":PRINT"OR TYPE 'M' FOR MENU AND PRESS <ENTER>."
4010 INPUTY:IFY="M"THEN1000ELSEIFASC(LEFT$(Y,1))>57THEN4000ELSEN1=
VAL(Y):N2=N1:IFN1<0ORN1>NI-1THENPRINT"YOUR NUMBER"N1"WAS NOT IN RA
NGE--PLEASE TRY AGAIN":GOTO4010ELSENM=N1:CLS:L=15:GOSUB4170:V=0:VC
=14:N9=N1
4020 GOSUB4140:IFX="I"ORX="D"THENCLS:GOSUB4060:GOTO4040ELSEIFX="C"
THEN4030ELSEIFX="E"THEN4050ELSE4020
4030 CLS:PRINT@320,"YOU CHOSE THIS ENTRY FOR CHANGING":V=384:N=N9:
GOSUB310:GOSUB380:PRINT:GOSUB4200
4039 'Return from Change, Insert, or Delete to editing
screen display
4040 CLS:V=(N9-N1)*64:IFV<961THENVT=V:GOSUB4170:V=VT:VC=
V+14:GOTO4020ELSEN1=N9-5:GOSUB4170:V=320:VC=334:GOTO4020
4049 'Return to pack edited data and then to main options
4050 IFF8THENF8=0:N3=NI:RETURNELSEN3=NM:RETURN
4059 'Subroutines for insertion or deletion
4060 IFX="D"THEN4090ELSEPRINT:PRINT"MEMORY PERMITS NO MORE THAN";K
9-NI-1;"INSERTS":INPUT"TYPE AND <ENTER> NUMBER OF INSERTS YOU WISH
 HERE";NN:IFNN=0ORNI>=K9THENRETURN
4070 IFNN>K9-NI-1THEN4060ELSEF8=-1:PRINT"**PLEASE WAIT WHILE I MAK
E SPACE**":FORI=NITON9STEP-1:Z(I+NN)=Z(I):NEXT:NI=NI+NN:I9=I
4080 FORN8=0TONN-1:N=I9+N8:GOSUB310:PRINT:PRINT"THIS INSERTION FOL
LOWS ENTRY";N;"DURATION";D;"NOTE ";Z:GOSUB4200:N9=N9+1:NEXT:RETURN
4090 PRINT:PRINT"YOU CAN DELETE NO MORE THAN";NI-N9;"ENTRIES AT TH
IS POINT":INPUT"TYPE AND <ENTER> NUMBER OF DELETIONS YOU WISH";NN:
IFNN=0ORN9>=NITHENRETURNELSEIFNN>NI-N9THEN4090ELSEF8=-1:PRINT"PLEA
SE WAIT WHILE I DELETE AND RENUMBER":I=N9
4100 Z(I)=Z(I+NN):IFZ(I)="255"THENNI=I:RETURNELSEI=I+1:GOTO4100
4109 'To move screen pointer downward
4110 N9=N9+1:IFN9>NI-1N9=N9-1:GOTO4140ELSEGOSUB4160:IFV<>960V=V+64
:VC=V+14:GOTO4140
4120 N1=N1+1:N=N9:GOSUB310:PRINT:GOSUB380:GOSUB4180:VC=V+14:GOTO41
40
4129 'Moves pointer upward--USR call for reverse scroll
4130 IFV<>0THENV=V-64:N9=N9-1:GOSUB4160:VC=V+14:GOTO4140ELSEN1=N1-
1:IFN1<0THENN1=0:N9=N1:N2=0:GOTO4140ELSEN9=N1:GOSUB4160:F=USR1(0):
N=N9:GOSUB310:GOSUB380:GOSUB4180:VC=14
4139 'Handles pointer movement
4140 PRINT@VC,W;
4150 X=INKEY$:IFX=""THEN4150ELSEPRINT@VC,CHR$(32);:IFASC(X)=10THEN
4110ELSEIFASC(X)=91THEN4130ELSERETURN
4159 'Determines first and last entries to pack on return from edi
```

Listing 1 continued

NOCONA

ELECTRONICS

MODEL 4 **MODEL 16** **MODEL 12**

MOD 2000 W/MONO MONITOR	2299.00
16K MODEL 4	799.00
64K MODEL 4 2 DR RS 232	1579.00
64K MODEL 4 PORTABLE	1399.00
80K MODEL 12 1 DR	2189.00
80K MODEL 12 2 DR	2719.00
256K MODEL 16 1 DR	3099.00
256K MODEL 16 2 DR	3699.00
256K MODEL 16 1 DR W/HD	5049.00
8K MODEL 100 PORTABLE	649.00
24K MODEL 100 PORTABLE	799.00
15 MEG HD MOD 12/16	2369.00
5 MEG HD MODEL III/4	1579.00
1 DR. EXP. MOD 12/16	1049.00

COLOR MONITOR FOR MOD 2000	549.00
DMP 120 PRINTER	399.00
DMP 200 PRINTER	499.00
DMP 420 PRINTER	699.00
DMP 500 PRINTER	1029.00
DMP 2100 PRINTER	1499.00
DWP II DAISY WHEEL	1499.00
DWP 210 DAISY WHEEL	599.00
DWP 410 DAISY WHEEL	1059.00
DWP 210 TRACTOR FEED	120.00
DWP 410 TRACTOR FEED	179.00
DWP II TRACTOR FEED	199.00
PARALLEL PRINTER SWITCH	96.00
64K PRINTER CONTROLLER	200.00

100% RS COMPONENTS NO FOREIGN DRIVES OR MEMORY FULL WARRANTY
ALL RS SOFTWARE 20% OFF CATALOG PRICE
CASHIERS CHECK OR MONEY ORDER MUST ACCOMPANY ALL ORDERS

(817) 825-4027

NOCONA ELECTRONICS • BOX 593 • NOCONA, TX 76255

232

See List of Advertisers on Page 227

Listing 1 continued

```
ting
4160 IFNM<N9THENNM=N9:RETURNELSEIFN2>N9THENN2=N9:RETURNELSERETURN
4169 'Sets screen for editing
4170 FORN=N1TON1+L:IFN<>NITHENV=64*(N-N1):GOSUB310:GOSUB380:NEXT
4180 FORI=40TO936STEP64:PRINT@I,"                ";:NEXT:PRI
NT@41," USE UP ARROW TO MOVE";:PRINT@105,"POINTER UP SCREEN.";:PRI
NT@169," USE DOWN ARROW TO";:PRINT@233,"MOVE POINTER DOWN.";:PRINT
@296,"==========================";
4190 PRINT@361," WHEN POINTER IS AT";:PRINT@425,"ENTRY YOU WISH TO
 ";:PRINT@489,"EDIT, PRESS---";:PRINT@620,"<C> TO CHANGE";:PRINT@68
4,"<I> TO INSERT";:PRINT@817,"OR";:PRINT@748,"<D> TO DELETE";:PRIN
T@876,"<E> TO END EDIT";:RETURN
4199 'Keyboard entry subroutine for duration and notes
4200 INPUT"TYPE CORRECT DURATION AND PRESS <ENTER>";YD:D=VAL(YD):N
=N9:K2=896:GOSUB360:IFFBTHENFB=0:GOTO4200
4210 PRINT"TYPE 3-CHARACTER NOTE OR AN 'R' FOR REST AND <ENTER>":P
RINT"TYPE 'N' AS 4TH CHARACTER AND <ENTER> FOR NO VIBRATO ";:NL=4:
GOSUB1510:Z(N9)=YD+Z:RETURN
4999 'Trap for disk I/O errors
5000 E1=ERL:E2=ERR/2+1:IFE1=2060ANDE2=54THENPRINT:PRINT"FILE WAS N
OT FOUND IN DIRECTORY. PLEASE SELECT OPTION":GOSUB470:RESUME1000EL
SEIFE1=2060ANDE2=65THENPRINT:PRINT"YOU ENTERED A BAD FILE NAME. PL
EASE TRY AGAIN":GOSUB470:RESUME2050
5010 IFE1=2180ANDE2=65THENPRINT:PRINT"THAT FILE NAME WAS BAD. PLE
ASE TRY AGAIN":GOSUB470:RESUME2160ELSECLS:PRINT"ERROR IN LINE"E1"E
RROR CODE"E2:PRINT"IF ERROR WAS IN DATA ENTRY, PLEASE BEGIN AGAIN
BY SELECTING OP- TION 1 OR 2 ON RETURN TO MENU."
5020 PRINT@896,"***PRESS ANY KEY TO RETURN***"
5030 X=INKEY$:IFX=""THEN5030ELSERESUME1000
5099 'Error handling in repeat routine
5100 PRINT@K2,"ENDING ENTRY # MUST BE GREATER THAN"NS:GOTO5130
5110 PRINT@K2,"ENDING ENTRY # MUST BE LESS THAN"N:GOTO5130
5120 PRINT@K2,"ENDING ENTRY # WAS TOO LARGE FOR THE"JN"SPACE ALLOW
ED."
5130 JE=0:GOSUB470:GOTO430
5199 'Error message for no data
5200 CLS:PRINT@384,"NO MUSIC DATA EXIST--PLEASE ENTER BY OPTIONS 1
 OR 2 FIRST":GOSUB470:GOTO1000
5299 'What to do if 0 or 34 will be packed in Line 20
5300 CLS:PRINT@384,"Add a REM Line before Line 20 and then RUN aga
in.":RETURN
5999 'Help for note entries
6000 CLS:PRINT"*SELECT 'N'o for tuning if not sure.":PRINT"*Select
 guide for note entry until experienced.":PRINT"*The higher the du
ration number DN, the longer the note sounds"
6010 PRINT"*For example, an eighth note may have a DN of 8; then a
 quarter note in the same piece would have DN=16 and an eighth dot
ted a  DN=12.":PRINT"*Note entries are 3 or 4 characters long or a
 1 character 'R'    for a Rest.  The 4 characters are:"
6020 PRINTTAB(5)"*The first (A to G) tells the note":PRINTTAB(5)"*
The second (N,S,orF) tells natural, sharp. or flat":PRINTTAB(5)"*T
he third (1 to 6) tells the octave":PRINTTAB(5)"*The fourth is an
optional 'N' for no vibrato"
6030 PRINT"*Example notes are displayed if you select the guide":P
RINT@960,"PRESS ANY KEY TO RETURN TO OPTIONS";
6100 IFINKEY$=""THEN6100ELSERETURN
8999 'Get the tempo and play the music
9000 CLS:PRINT@390,"TYPE CHOICE OF TEMPO FROM METRONOME 40 (SLOWES
T)":PRINT@454,"TO 400 BEATS PER MINUTE (PASTEST)":PRINT@521,"OR 'M
```

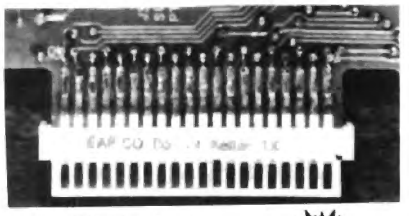
Listing 1 continued

Gold Plug 80

TRS-80+ MOD I, III, COCO, TIMEX 1000, OSBORNE, TI99/4a others

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors. **GOLD PLUG 80** solders to the board edge connector. Use your existing cables. (if gold plated)

GOLD PLUG 80 Mod I Mod III

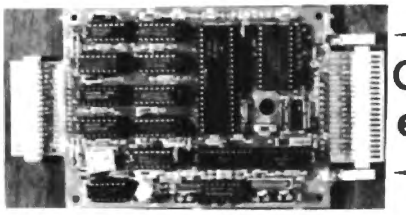


GOLD PLUG 80 Mod I (6)	$44.95
Keyboard/EI (mod I)	15.95
Individual connectors	$7.95
GOLD PLUG 80 Mod III (6)	48.95
Internal 2 Drive Cable	29.95
Mod III Expansion port	9.95

new SPECIAL PRICE

COCO MODULE INSTALLATION AVAILABLE

COCO Disk Module



Ground tab extensions

COCO Disk Module (2)	$16.95
Ground tab extensions	INCL
Disk Drives (all R.S.)	$7.95
Gold Disk Cable 2 Drive	29.95
Four Drive Cable	39.95

new SPECIAL PRICE

The GOLD PLUG 80 extends the existing connection 1/2". The ground tab extensions extend the ground tabs 1/2" to contact the ground clips. The ground reduces the RFI interference to the monitor.

Available at your favorite dealer or order direct from **E.A.P. CO.**

Dealer Inquiries Invited

USA shipping $1.45
Foreign $7.

Can/Mex $4.
TEXAS 5% TAX

VISA

+ trademark Tandy Corp

The Gold Plug 80

GOLD PLUG 80-E.A.P. COMPANY ✓216

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

MasterCard

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
$89.95
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
800-524-0400

DEALER INQUIRIES INVITED • CODs add $3.00 + Shp.

GREAT DEDUCTIONS
SUPPORT SMALL BUSINESS WITH AN ORDER TODAY. THANK YOU!

BUY 2 PROGRAMS—
DEDUCT ANOTHER 5% FROM OUR PRICE**
BUY 3 PROGRAMS—
DEDUCT 5% AND GET CREATOR FREE**
BUY 5 OR MORE—
DEDUCT 10% AND GET CREATOR FREE**

THE CREATOR (NEW VERSION)
PROGRAM GENERATOR WITH SORT/REPORT GENERATOR
MOD 1, 3, 4, 48K/DISK $19.95
HELP UTILITIES DISK $14.95
CP/M VERSION AVAILABLE—CALL OR WRITE FOR INFO

H & E COMPUTRONICS (48K DISK REQUIRED)

	RETAIL	OUR PRICE
VERSALEDGER	$149.95	$ 127.45
VERSAPAYROLL	$ 99.95	$ 84.95
VERSARECEIVABLES	$ 99.95	$ 84.95
VERSAINVENTORY	$ 99.95	$ 84.95
VERSAPAYABLES	$ 99.95	$ 84.95
MASTER PAC 100	$ 99.95	$ 84.95
BUSINESS PAC 100	$ 99.95	$ 84.95
MARKET PAC	$ 99.95	$ 84.95
MAILPAC II	$ 99.95	$ 84.95
CHECKING PLUS	$ 99.95	$ 84.95
MINI-PACS (MOD 1, 2, 3, 4, 100, CP/M DISK/CASSETTE)		
THESE PROGRAMS AVAILABLE FOR MODEL 100 (16K MINIMUM).		
SMALL BUSINESS ACCOUNTANT	$ 49.95	$ 42.45
SMALL BUSINESS PAYROLL	$ 49.95	$ 42.45
SMALL BUSINESS RECEIVABLES	$ 49.95	$ 42.45
SMALL BUSINESS INVOICING	$ 29.95	$ 25.45
SMALL BUSINESS INVENTORY	$ 29.95	$ 25.45
SMALL BUSINESS PAYABLES	$ 29.95	$ 25.45
TRANSOGRAM WRITER	$ 29.95	$ 25.45
INCOME TAX ASSISTANT	$ 49.95	$ 42.45
THE HORSE COMPUTER	$ 29.95	$ 25.45
HOME BUDGET MANAGER	$ 49.95	$ 42.45
MICRO-SYSTEMS SOFTWARE		
DOSPLUS 3.5 & DOSPLUS IV	$149.95	$125.00
DOSPLUS HARD DISK DRIVERS	$ 79.95	$ 67.95
MTERM (TERMINAL PROGRAM)	$ 79.95	$ 67.95
DOSPLUS II (MOD 2, 12, 16)	$249.95	$225.00
TRSDOS 6.0 ENHANCEMENTS (2 DISK)	$ 49.95	$ 42.45
SUPER UTILITY PLUS	$ 79.95	$ 67.95
>>>>**BIBLE MIND (A BIBLE QUIZ GAME)**		$ 12.95

B & B COMPUTING ↙147
(214) 389-3681
HIWAY 27 WEST, RT 3, BOX 170A,
FAIRFIELD TX 75840

CHECKS, MO, COD, VISA & MASTERCHARGE ADD $3 SHIPPING
TEXAS RESIDENTS ADD 5% SALES TAX
PLEASE SPECIFY MODEL, MEMORY, & NUMBER OF DISK DRIVES

TRS80 owners...

End Your Indexing Worries Forever!

New Index Compiler* ends tedious writing and sorting on 3x5 cards. Make each entry once, then with simple commands this amazing program sorts, alphabetizes, combines entries, edits redundancies, and prints out your index!

Index Compiler $65.00 with documentation

Order Your Copy Today!

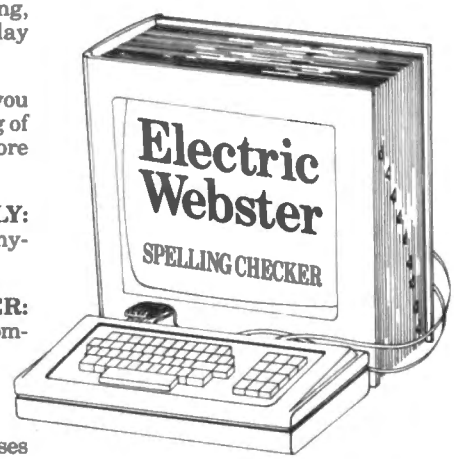
COMPress
Division of Van Nostrand Reinhold
P.O. Box 102, Wentworth, NH 03282
603-764-5831/5234

*Index Compiler is designed for the TRS80 Model I or III, level II computer with 48k memory, 2 disk drives, line printer, and lower case modification.

Orders must be prepaid. Full money back guarantee if not satisfied!

↙311

- **DISPLAYS CORRECT SPELLINGS:** If you don't know the correct spelling, EW will look it up for you, and display the dictionary.
- **VERIFIES CORRECTIONS:** If you think you know the correct spelling of a word, EW will check it for you before making the corrections.
- **HYPHENATES AUTOMATICALLY:** (Optional). Inserts discretionary hyphens throughout text.
- **GRAMMAR & STYLE CHECKER:** (Optional). Identifies 22 types of common errors. Makes suggested corrections with the stroke of a key. Runs within EW.
- **50,000 WORD DICTIONARY:** Uses only 2½ bytes per word; add as many words as you wish.
- **FAST CORRECTING:** In as little as 30 seconds, Electric Webster can return you to your Word Processing program, with your text fully corrected and on your screen.
- **INTEGRATES:** into 11 different word processing programs: Wordstar, Spellbinder, Newscript, Lazy Writer, Super-Scripsit, Scripsit, Electric Pencil, Copy Art, Superscript, Zorlof, and Magic Wand (specify). Begins proofing at the stroke of a key; returns you to word processing automatically.



"The Cadillac"
of spelling checkers
80 Microcomputing, 9/82

VOTED #1: For the second straight year, Electric Webster was voted the #1 spelling checker in the *80 Micro* Reader's Choice Awards. (1/83, 1/84)

"The most helpful program I've found is Electric Webster. After looking at nine proofreading programs, I've settled on Webster . . ." *Creative Computing, 11/83*

ACCLAIMED:
"Electric Webster is the best. Just read any review in any magazine and I don't believe that you will find even one disagreement to that statement." *CINTUG, Cincinnati's Users Group Mag., 4/83*

"Now there's a program called Electric Webster that would let me write to Presidents and Kings and never feel embarrassed. Miss Mulberry would give Electric Webster an A+, and so will you." *Computer User, 1/84*

Performance "Excellent"; Documentation "Good"; Ease of Use "Excellent"; Error Handling "Excellent". *Info World, 8/82*

LOW PRICES:

TRS-80 Electric Webster	$ 89.95
w/Correcting Feature	$149.95
Hyphenation	$ 49.95
Grammar & Style Checker	$ 49.95
CP/M or PC/DOS	
Electric Webster (with Correcting Feature)	$209.95
Hyphenation Option	Included*
Grammar & Style Option	Included*

*Limited Time Only

↙45
CORNUCOPIA SOFTWARE
(415) 524-8098
Post Office Box 6111 Albany, California 94706

↙ See List of Advertisers on Page 227

Listing 1 continued

```
' FOR MENU AND PRESS <ENTER>.":PRINT@909,"";:INPUT"TEMPO = ";Y:IFY
="M"ANDFL=1THEN1000ELSEIFY="M"THEN9000ELSET=VAL(Y)
9010 IFT<40THENT=40ELSEIFT>400T=400
9019 'The constant 102250 set for quarter notes having 64 beats pe
r minute on metronome
9020 T=102250/T:CT=1:FORE=2TO22:C=T/E:B=C-INT(C):IFC>255THENNEXTEL
SEIFCT>BTHENCT=B:C%=E:B%=C:NEXTELSENEXT
9030 IFB%=0THENB%=1ELSEIFB%=34B%=35
9040 CLS:PRINT@384,"'SPACE RESERVED FOR MUSIC TITLE'"
10000 POKES0+46,C%:POKES0+48,B%:POKES0+2,A1:POKES0+3,A2:F=USR(0):I
FFL=1THEN1000ELSE9000
10999 'Traps unwanted clearing of memory
11000 CLS:PRINT@384,"YOU HAVE MUSIC DATA IN MEMORY--DO YOU REALLY
WISH TO ERASE AND":PRINT"START A NEW PIECE (Y/N)? ";:Y(0)=Y1:GOSUB
1500:RETURN
11999 'Initialize and set and locate vibrato flag.
12000 DEFINTA.D,F-V:DEFSTRW-Z:DIMP,A!,NX,L$,A,N,N9,J,Z,D,I,NO,A0,N
N,R,YD,Z(1714),P(11),N3,NI,KF:QV=1:Q=VARPTR(QV):E=Q-65536*(SGN(Q)=
-1)
12100 CP=1197:K9=1700:W=CHR$(62):XC=CHR$(8):YG=STRING$(52,61):Y1="
XYNM":Y(1)="XRABCDEFG":Y(2)="XFNS"+XC:Y(3)="X123456"+XC:Y(4)="XN"+
CHR$(13)+XC:Y(5)="X"+XC+CHR$(13):RETURN
```

End

Program Listing 2. String extender.

```
1 REM String Extender for 48K MODELS I/III TRS-80
2 REM By          Merton L. Davis
3 REM             3A Palmetto Arms
4 REM             Camden S. Carolina 29020
5 REM To use, specify 64000 as Memory Size on entering Basic.
6 REM The string to extend must be the first line in program.  An
example is Line 40 below.
7 REM Line 80 should be entered according to disk or cassette loca
tion of Basic.
8 REM RUN and enter length of string (to 32767) you want.
9 REM LIST after return to Basic
10 REM and try a smaller value for string length if program was un
altered.
30 CLS:PRINT"TYPE DELETE1-31 <ENTER>"
31 PRINT:PRINT"AND THEN RUN AGAIN.":END
40 A$=".."
50 INPUT"STRING LENGTH";L
60 FORX=-69TO-1:READN:S=S+N:POKEX,N:NEXT
70 IFS<>6298THENSTOP
80 DEFUSR=&HFFBB:F=USR(L): REM POKE16526,187:POKE16527,255:F=USR(L
) FOR CASSETTE BASIC
100 DATA 205, 127, 10, 229, 42, 164, 64, 17, 8, 0, 25, 193
110 DATA 229, 237, 74, 218, 25, 26, 237, 91, 177, 64, 205
120 DATA 144, 28, 210, 25, 26, 225, 54, 32, 11, 35, 121, 176
130 DATA 32, 248, 54, 34, 35, 54, 0, 35, 54, 0, 235, 42, 164
140 DATA 64, 115, 35, 114, 19, 18, 19, 18, 33, 249, 64, 115
150 DATA 35, 114, 35, 115, 35, 114, 195, 25, 26
```

End

Program Listing 3. Music generator.

```
1 'PROGRAM TO PACK LINE 20 OF "MUSIKON" WITH MUSIC GENERATOR
2 'AND REVERSE SCROLLER FOR EDITING
4 'By
5 '                    Merton L. Davis
6 '                    3A Palmetto Arms
7 '                    Camden, SC 29020
8 'RUN and Delete all Lines but 20 and 40.
9 'Then fill with lines from Listing 1 except for REMarks
20 S$="....PLACE 169 PERIODS BETWEEN QUOTES IN HERE...."
30 S1=PEEK(VARPTR(S$)+1):S2=PEEK(VARPTR(S$)+2):S0=S1+S2*256
40 A$="...YOUR 5100 BYTE STRING FOR MUSIC DATA SHOULD RESIDE HERE.
.."
100 FOR X=S0TOS0+168:READN:POKEX,N:D=D+N:NEXT
110 IFD=17718THENPRINT"DONE":ENDELSEPRINT"BAD CHECKSUM IN DATA, TR
Y AGAIN":END
120 DATA 253, 33, 1, 1, 205,127,10, 243, 62, 1, 8, 62, 255
130 DATA 253, 190, 1, 32, 2, 251, 201, 253, 126, 1, 245, 253
140 DATA 203, 2, 126, 40, 5,52, 253, 203, 2
150 DATA 190, 217, 253, 94, 3, 253, 86, 2, 107, 98
160 DATA 45, 14, 10, 6, 225, 29, 32, 22, 21, 32, 19, 62, 250
170 DATA 253, 190, 3, 40, 6, 8, 238, 3, 211, 255, 8, 253, 86, 2
180 DATA 253, 94, 3, 217. 126. 217, 254, 2, 40, 26, 45, 32, 23
190 DATA 37, 32, 20, 62, 250, 253, 190, 3, 40, 6, 8, 238, 3
200 DATA 211, 255, 8, 253, 102, 2, 253, 110, 3, 45, 16, 196
210 DATA 13, 32, 191, 241, 61, 245, 32, 184, 24, 2, 24, 146
220 DATA 217, 126, 254, 1, 40, 5, 253, 203, 2, 254, 53
230 DATA 241, 253, 35, 253, 35, 253, 35, 24
240 DATA 234, 17, 255, 63, 33, 191, 63, 1, 192, 3, 237
250 DATA 184, 33, 1, 60, 43. 17, 1, 60, 14, 63, 6, 1, 5, 54
260 DATA 32, 237. 176. 201
```

End

Program Listing 4. Musikon cassette conversion.

```
1 '"MUSIKON" (c) for Models I/III 48K TRS-80
2 '         Cassette Basic Version
3 'Lines shown are those that differ from corresponding lines in t
he Disk Basic version of Listing 1
30 S1=PEEK(VARPTR(S$)+1):S2=PEEK(VARPTR(S$)+2):S0=S1+S2*256:POKE16
526,S1:POKE16527,S2:S4=INT((S0+141)/256):S3=S0+141-S4*256
60 CLS:PRINT@390,"DO YOU WISH TO TUNE (Y/N/M)? ";:Y(0)=Y1:GOSUB150
0:IFX="N"THEN90ELSEIFX="M"THEN1000ELSEPRINT:PRINT"HIGHER OR LOWER
PITCH (H/L)?";:Y(0)="HL":GOSUB1500:IFX="H"THEN80
390 JN=K9-N-1:I9=N-1:PRINT@K2,"LAST ENTRY # WAS"N-1". YOU HAVE SPA
CE FOR"JN"REPEAT ENTRIES":PRINT@K2+64,"DO YOU KNOW STARTING AND EN
DING ENTRY #'S TO REPEAT (Y/N)? ";:Y(0)="YN":GOSUB1500:IFX="Y"THEN
420ELSEGOSUB370
400 PRINT@K2,"DO YOU WISH TO 'F'IND ENTRY NOS. IN LISTING OR 'A'BO
RT THIS RE- PEAT (F/A)? ";:Y(0)="FA":GOSUB1500:IFX="A"THENKF=0:RET
URNELSENI=N:Z(NI)="255":GOSUB3000:N=NI:CLS:IFN<13THENNI=0ELSEI=N-1
3
1000 FL=1:CLS:PRINT@23,"OPTIONS MENU":PRINT@71,YG:PRINT@138,"1)  E
NTER NEW MUSIC DATA":PRINT@202,"2)  ENTER MUSIC DATA FROM TAPE":PR
INT@266,"3)  APPEND DATA AT END OF ENTERED MUSIC":PRINT@330,"4)  C
```

Listing 4 continued

Listing 4 continued

```
HANGE TUNING OF ENTERED MUSIC"
1010 PRINT@394,"5)  LIST OF NOTES AND DURATIONS ENTERED":PRINT@458
,"6)  MAKE CORRECTIONS IN NOTES AND/OR DURATIONS":PRINT@522,"7)  S
AVE MUSIC DATA ON TAPE":PRINT@586,"H)  GET HELP FOR DATA ENTRY":PR
INT@650,"P)  PLAY MUSIC ENTERED WITH OPTIONS 1 OR 2"
1510 Z="":X=INKEY$:PRINTSTRING$(NL,136);STRING$(NL,24);:FORI=1TO5
1520 X=INKEY$:FORS=1TOLEN(Y(I)):SS=(SS+1)AND7:PRINTCHR$(14AND(SS=1
)OR15AND(SS=5));:IFX=MID$(Y(I),S,1)THEN1530ELSENEXT:GOTO1520
1540 IFX=XCPRINTX;:IFZ="R"THENZ="":I=1:GOTO1520ELSEI=I-1:GOTO1520
1550 PRINTX;:IFZ="R"THEN1580ELSEIFI=5THEN1570ELSEIFI=4ANDX=CHR$(13
)X(3)="":GOTO1570
1560 X(I-1)=X:NEXTI
1570 Z=X(0)+X(1)+X(2)+X(3)
2050 CLS:PRINT"PLEASE SET YOUR RECORDER FOR PLAY AND PRESS ANY KEY
 WHEN READY."
2060 X=INKEY$:IFX=""THEN2010ELSEIFX="M"THEN1000
2065 REM The following two lines are not in Listing 1 but must be
included for the cassette Basic version.
2070 INPUT#-1,NI.CP:FORN=0TONISTEP20
2080 INPUT#-1,Z(N),Z(N+1),Z(N+2),Z(N+3),Z(N+4),Z(N+5),Z(N+6),Z(N+7
),Z(N+8),Z(N+9),Z(N+10),Z(N+11),Z(N+12),Z(N+13),Z(N+14),Z(N+15),Z(
N+16),Z(N+17),Z(N+18),Z(N+19):NEXTN:RETURN
2150 CLS:PRINT"PLEASE SET YOUR RECORDER FOR RECORDING AND PRESS AN
Y KEY WHEN   READY."
2160 X=INKEY$:IFX=""THEN2110ELSEIFX="M"THEN1000
2170 PRINT#-1,NI.CP:FORN=0TONISTEP20
2180 PRINT#-1,Z(N),Z(N+1),Z(N+2),Z(N+3),Z(N+4),Z(N+5),Z(N+6),Z(N+7
),Z(N+8),Z(N+9),Z(N+10),Z(N+11),Z(N+12),Z(N+13),Z(N+14),Z(N+15),Z(
N+16),Z(N+17),Z(N+18),Z(N+19)
3000 CLS:IFZ(0)=""THENPRINT"NO MUSIC DATA IN MEMORY--WE WILL START
 AGAIN":GOSUB470:RUNELSEPRINT"DO YOU WISH LIST TO SCREEN OR TO A R
EADY PRINTER?":PRINT"TYPE AN 'S' FOR SCREEN OR 'P' FOR PRINTER ";:
Y(0)="SPM"
4130 IFV<>0THENV=V-64:N9=N9-1:GOSUB4160:VC=V+14:GOTO4140ELSEN1=N1-
1:IFN1<0THENN1=0:N9=N1:N2=0:GOTO4140ELSEN9=N1:GOSUB4160:POKE16526,
S3:POKE16527,S4:F=USR(0):POKE16526,S1:POKE16527,S2:N=N9:GOSUB310:G
OSUB380:GOSUB4180:VC=14
5000 E1=ERL:E2=ERR/2+1
5010 CLS:PRINT"ERROR IN LINE"E1"ERROR CODE"E2:PRINT"IF ERROR WAS I
N DATA ENTRY, PLEASE BEGIN AGAIN BY SELECTING OP- TION 1 OR 2 ON R
ETURN TO MENU."
12000 DEFINTA.D,F-V:DEFSTRW-Z:DIMP,A!,NX,L$,A,N,N9,J,Z,D,I,NO,A0,N
N,R,YD,Z(1719),P(11),N3,NI.KF:QV=1:Q=VARPTR(QV):E=Q-65536*(SGN(Q)=
-1)
12100 CP=1197:K9=1700:W=CHR$(62):XC=CHR$(8):YG=STRING$(52,61):Y1="
YNM":Y(1)="RABCDEFG":Y(2)="FNS"+XC:Y(3)="123456"+XC:Y(4)="N"+CHR$(
13)+XC:Y(5)=XC+CHR$(13):RETURN
```

End

Program Listing 5. String extender source code.

```
00100 ;String Extender to be used with Basic
00110 ;by placing desired string length as
00120 ;argument in USR call.
00130 ;       ORG     0FFBBH
00140 START   CALL    0A7FH       ;String length in HL.
```

Listing 5 continued

TRS-80™ "CAN YOU BUY DIRECT?"

WILL YOU PAY TOO MUCH?

MODEL 4 128K 2 DRIVES

MODEL 12 728K 2 DRIVES

MODEL 16B 728K 1 DRIVE PLUS 15 MEG HARDDRIVE (BUILT-IN)

MODEL 4-P 128K 2 DRIVES

Ask About Our "30 DAYS Buy-Back-Policy"

SAVE SALES TAX* PLUS DISCOUNT

*TEXAS RESIDENTS ADD ONLY 4%

FORT WORTH COMPUTERS

WE ARE SERIOUS ABOUT SAVING YOU MONEY

377 Plaza • GRANBURY • NR FORT WORTH, TEXAS 76048

(Located 30 miles from Fort Worth)

TOLL FREE NUMBER: 1-800-433-S-A-V-E

Monday thru Friday — 9:00 a.m. to 5:00 p.m. Texas Time

(Order Inquiries/Customer Service &) IN TEXAS: 817-573-4111

214

TM: TRADE MARK OF RADIO SHACK

Listing 5 continued

```
00150          PUSH    HL          ;Save.
00160          LD      HL,(16548)  ;Start of Basic in HL.
00170          LD      DE,08       ;Bump to start of
00180          ADD     HL,DE       ;string.
00190          POP     BC          ;Length in BC.
00200          PUSH    HL          ;Save start.
00210          ADC     HL,BC       ;Points to end of string.
00220          JP      C,1A19H     ;Abort if overflow.
00230          LD      DE,(40B1H)  ;End of Basic memory.
00240          CALL    1C98H       ;Less than string length?
00250          JP      NC,1A19H    ;Abort if it is.
00260          POP     HL          ;Point HL to start.
00270 LOOP     LD      (HL),20H    ;Fill with blank spaces.
00280          DEC     BC          ;
00290          INC     HL          ;
00300          LD      A,C         ;Continue until end
00310          OR      B           ;of string.
00320          JR      NZ,LOOP     ;
00330          LD      (HL),22H    ;End quote.
00340          INC     HL          ;
00350          LD      (HL),0      ;End Basic with
00360          INC     HL          ;two bytes of zero.
00370          LD      (HL),0      ;
00380          EX      DE,HL       ;Next line start in DE.
00390          LD      HL,(16548)  ;Next line pointer in HL.
00400          LD      (HL),E      ;LSB of next line location.
00410          INC     HL          ;
00420          LD      (HL),D      ;MSB of next line location.
00430          INC     DE          ;Bump to start of
00440          LD      (DE),A      ;variables and
00460          INC     DE          ;zero on the way there.
00470          LD      (DE),A      ;
00480          LD      HL,16633    ;Final housekeeping.
00490          LD      (HL),E      ;Points to
00500          INC     HL          ;start of variables
00510          LD      (HL),D      ;for ROM.
00520          INC     HL          ;
00530          LD      (HL),E      ;
00540          INC     HL          ;
00550          LD      (HL),D      ;
00560          JP      1A19H       ;Back to Basic.
00570          END     START
```

Program Listing 6. Music generator source code.

```
00100 ;"MUSIKON" (c) Z80 Source Code
00110 ;COPYRIGHT 1983--ALL RIGHTS RESERVED
00120 ;A Leo Christopherson tone generator enhanced for
00130 ;6 octaves and for optional vibrato.
00140 ;For MODELS I-III TRS-80 Computer.
00150 ;By     Merton L. Davis
00160 ;       3A Palmetto Arms
00170 ;       Camden S. Carolina 29020
00180 ;
00190 ;       ORG     0FF01H
00200 MUSIC   LD      IY,0101H  ;Points IY to START-1
00210         CALL    0A7FH     ;Points HL to Basic Flag.
00220         DI                ;No interrupts.
00230         LD      A,01H     ;Pulse code.
00240         EX      AF,AF'    ;Save it.
00250 LOOP1   LD      A,255     ;End of piece?
00260         CP      (IY+1)    ;Return to Basic
00270         JR      NZ,NOTES  ;if so.
00280         EI                ;
00290         RET               ;
00300 NOTES   LD      A,(IY+1)  ;Else get duration
00310         PUSH    AF        ;and save it.
00320         BIT     7,(IY+2)  ;Vibrato?
00330         JR      Z,RGLD    ;Go if yes.
00340         INC     (HL)      ;Else flag no vibrato
00350         RES     7,(IY+2)  ;and zero BIT 7.
00360 RGLD    EXX               ;Save flag location.
00370         LD      E,(IY+3)  ;Load registers with
00380         LD      D,(IY+2)  ;period of pitch of
00390         LD      L,E       ;next note.
00400         LD      H,D       ;
00410         DEC     L         ;Start countdown in HL
00420 LOOP2   LD      C,0AH     ;Cycles in outer loop.
00430 LOOP3   LD      B,0E1H    ;Cycles in inner loop.
00440 LOOP4   DEC     E         ;Start countdown in DE
00450         JR      NZ,DELAY  ;Continue delay if
00460         DEC     D         ;not zero.
00470         JR      NZ,DELAY  ;
00480         LD      A,250     ;Rest?
00490         CP      (IY+3)    ;Bypass if yes.
00500         JR      Z,REST1   ;
00510         EX      AF,AF'    ;Else get pulse code.
00520         XOR     03H       ;Toggle and
00530         OUT     (0FFH),A  ;send one vibe.
00540         EX      AF,AF'    ;Save toggled code.
00550 REST1   LD      D,(IY+2)  ;Reload period of pitch
00560         LD      E,(IY+3)  ;in DE.
00570 DELAY   EXX               ;Get flag into
00580         LD      A,(HL)    ;A register.
00590         EXX               ;Save location.
00600         CP      02H       ;Is it no vibrato?
00610         JR      Z,LOOP    ;Go if yes.
00620         DEC     L         ;Continue HL countdown
00630         JR      NZ,LOOP   ;and go
00640         DEC     H         ;until zero.
00650         JR      NZ,LOOP   ;
00660         LD      A,250     ;Rest?
00670         CP      (IY+3)    ;
00680         JR      Z,REST2   ;Bypass if yes.
00690         EX      AF,AF'    ;Else send another
00700         XOR     03H       ;vibe and again
00710         OUT     (0FFH),A  ;save toggled
00720         EX      AF,AF'    ;code.
00730 REST2   LD      H,(IY+2)  ;Reload HL with
00740         LD      L,(IY+3)  ;period of pitch.
00750         DEC     L         ;Start countdown.
00760 LOOP    DJNZ    LOOP4     ;Inner loop delay.
00770         DEC     C         ;Outer loop
00780         JR      NZ,LOOP3  ;delay.
00790         POP     AF        ;Get duration
00800         DEC     A         ;Countdown.
00810         PUSH    AF        ;And again save.
00820         JR      NZ,LOOP2  ;Continue same note
00830         JR      RESET     ;until end of duration.
00840         JR      LOOP1     ;Functions as relay.
00850 RESET   EXX               ;Get flag location.
00860         LD      A,(HL)    ;Set BIT 7 of period of
00870         CP      01H       ;pitch again if vibrato
00880         JR      Z,FIN     ;was off in last note.
00890         SET     7,(IY+2)  ;
00900         DEC     (HL)      ;Set flag for vibrato
00910 FIN     POP     AF        ;and prepare for next
00920         INC     IY        ;note by pointing IY to
00930         INC     IY        ;next duration
00940         INC     IY        ;minus one.
00950         JR      RESET-2   ;Relay back to LOOP1.
00960         END     MUSIC
```

SOFTWARE TOOLS

MicroComm - RS232 terminal program with upload, download and printer features. Works with the SOURCE and COMPUSERVE. Includes HEX/ASCII conversion utility

BCross - Produces a cross reference list of all variables and line numbers in a BASIC program. Includes a listing utility, good for all programs, ideal for packed programs.

RollCall - Mini Data Base Manager Designed for club and organization membership control. Make up mailing labels, membership and committee lists. Sorting features included

PrintPac - 7 useful printing programs. Generate banners, block lettering for title sheets or view graphs, mailing labels, product labels and initialize printer settings. For MX-80 & others.

$24.95 each on 5-1/4" diskette ✔ 123
for 48K TRS-80 Models I, III and IV

MicroSmith Computer Technology
P.O.Box 1473 Elkhart, IN 46515

At last ... FOR THE TRS-80® talking

ADVENTURE GAMES

software packages include both voice and standard program versions

PRICE: $39.95 each

· Shogun · Scavenger Hunt
· Ninja Fighter · Majic Sword

voice synthesizer required for speech

Adventure Master's
409 East End Ave., Pgh., PA 15221
Please state computer

✔ 197

The Expert

Chess Knowledge System
by William Fink

Sfinks 4.0 Chess

The highest rated chess program available for any microcomputer. Rated 1793/5* by the United States Chess Federation.

Features: various levels of play, 32 book openings, problem set-up, move suggestions and take back, game save, optional printer, audio alert and more.

Please specify Model I, III, or 4.
48K disk **Only $49.95**

Opening Book U1

Upgrade Sfinks 4.0 to play with the book opening knowledge of a master (Sfinks 4.0 Chess is required).

Features: 1152 opening variations up to 19 moves deep for Model III or 4. 640 variations, up to 17 moves deep for Model I, plus other enhancements to Sfinks 4.0

Please specify Model I, III, or 4.
48K disk **Only $24.95**

Sfinks Chess Tutor

Learn to play chess! Programmed instructions teach the movement of the chess pieces, their relative power, the object of the game and more. Includes a chess playing program with 3 levels of play.

Please specify Model I, III, or 4.
32K disk **Only $24.95**

To order, please see your dealer or send check plus $2.00 shipping to:

WILLIAM FINK
Suite 24-B, 1105 N. Main St.
Gainesville, FL 32601
or call (904) 377-4847

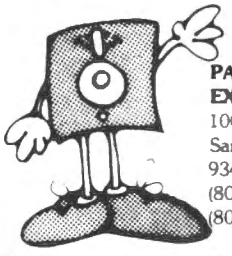
MasterCard VISA ✔ 226

Florida residents add 5% sales tax.
*On Model 3 w/speedup by Holmes Eng.

MEMOREX
FLEXIBLE DISCS

WE WILL NOT BE UNDERSOLD!! Call Free **(800)235-4137** for prices and information. Dealer inquiries invited and C.O.D.'s accepted.

VISA

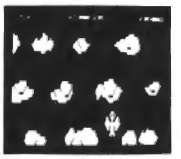


PACIFIC EXCHANGES
100 Foothill Blvd.
San Luis Obispo, CA 93401 In Cal. call (800)592-5935 or (805)543-1037

✔ 207

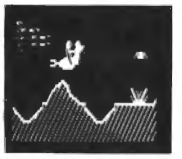
GAME DISK 1

Lance-a-lot



Birdman

Three games for the price of one!
Machine language
Fast graphics
With sound



Bug Zap

Model I III disk compatible
Specify MI or MIII when ordering
Send $15.00 (check or money order) to:

CCD SOFTWARE ✔ 173
PO BOX 4359, VIRGINIA BEACH, VA 23454

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.

THE PROPERTY MANAGEMENT SYSTEM

TRS 80 Models III/4

THE professional income property management system for owners and managers. Professionally documented. Powerful. Effective. Maintains complete records of income, expenses, vacancies, lease expirations, checks, budgets and profit and loss.

Menu-driven and easy to use
Handles up to 100 units per complex—multiple complexes
Complete resident reporting
Income, Late and Vacancy Reports
Charge Code and Payee Reports
Financial Reports—monthly and yearly
Prints and addresses checks
Fully supported

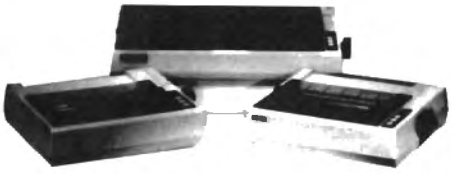
****** $360.00 pp ******

Send check or money order to:
Citation Systems ✔ 269
683 Cumberland Rd./Atlanta, GA 30306
(404) 881-6328

✔ See List of Advertisers on Page 227

DISPLAYED VIDEO IS DRIVING DOWN PRICES ON DISKS!

FREE SHIPPING!



TEC'S NEW HALF-HIGH 40 TRACK DISK DRIVE W/CASE & POWER SUPPLY AT AN INCREDIBLE LOW PRICE!

$195.00!!!!

NEW!

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!

"YOU CAN BUY THE REST BUT WHY NOT BUY ONE OF THE BEST!"

TEAC's NEW SLIMLINE 40 TRACK W/CASE & POWER SUPPLY $220.00
TANDON 40 TRACK TM-100-1 W/CASE & POWER SUPPLY $205.00

(DOUBLE SIDED 40 TRACK DRIVES ADD $75.00)

TEAC NEW SLIMLINE DOUBLE SIDED 40 TRACK W/CASE & POWER SUPPLY $250.00
TEAC NEW SLIMLINE DOUBLE SIDED 80 TRACK W/CASE & POWER SUPPLY $299.00
TANDON SINGLE SIDED SLIMLINE 8" DISK DRIVE W/DUAL CASE & POWER SUPPLY $545.00
TANDON DOUBLE SIDED SLIMLINE 8" DISK DRIVE W/DUAL CASE & POWER SUPPLY $625.00

TWO DRIVE CASES AVAILABLE AT VARIED PRICES
TWO DRIVE 5 1/4" CABLE (FOR MOST COMPUTERS). **$23.99** WITH GOLD PLATED CONNECTORS

DV'S COLOR COMPUTER 1st DRIVE ONLY $369.00

ONE YEAR WARRANTY ON TEAC DRIVES/180 DAYS ON TEC & TANDON

HAYES SMART MODEM 300 BAUD ..... $220.00 1200 BAUD $515.00
MODEL 1 DOUBLE DENSITY BOARD $89.00

PRINTER PRICES

WE'RE NOT GOING TO MAKE YOU CALL FOR PRICES—HERE THEY ARE IN BLACK AND WHITE!!!

EPSON

RX80 FT W/GRAPHTRAX PLUS $469.00
MX100 W/GRAPHTRAX PLUS $639.00
RX80 W/GRAPHTRAX PLUS $299.00
FX80 W/GRAPHTRAX PLUS $569.00
FX100 W/GRAPHTRAX PLUS $759.00

STAR

GEMINI 10X $295.00
GEMINI 15X $449.00
CITOH PROWRITER 8510 ..... $369.00
STARWRITER F10 ..... $1169.00
DWP 210 ..... $649.00

PRINTER CABLE 10' LONG W/GOLD PLATED CONNECTORS STARTING AT $25.99
DAISY WHEEL PRINTERS AVAILABLE AT VARIED PRICES

Visit our two retail locations at:
886 Ecorse Road
Ypsilanti, MI 48197
(313) 426-5086/(313) 482-4424
or
111 Marshall Street
Litchfield, MI 49252
(517) 542-3280
(517) 542-3939
(517) 542-3947

WE CARRY TRS80, LNW, & SANYO COMPUTERS

IMMEDIATE DELIVERY
180 Days Parts and Labor Warranty
DEALER INQUIRIES INVITED
Free Shipping in the U.S.
48 Contiguous States

TO ORDER: Call (313) 426-5086 or (313) 482-4424 or (517) 542-3280
(517) 542-3939 (517) 542-3947
OR WRITE: DISPLAYED VIDEO 111 MARSHALL ST., LITCHFIELD, MI 49252

FREE SHIPPING!!

*TRS-80 is a trademark of the Tandy Corporation

Prices & Specifications subject to change without notice

DISPLAYED VIDEO IS DRIVING DOWN PRICES ON DISKS!

4 DRIVES!

"NO YOU'RE NOT SEEING THINGS. THAT'S FOUR INTERNAL DRIVES IN A MODEL 4

$1999.00

AVAILABLE NOW, ONLY FROM DISPLAYED VIDEO!

$1999.00

4 DRIVES!

DISPLAYED VIDEO HAS DONE IT AGAIN!

THE STORAGE CAPACITY YOU'VE ALWAYS WANTED AT THE LOWEST PRICE EVER CONCEIVED!

FOUR DRIVES IN A MODEL 4, 64K.....**$1999.00**/128K.....**$2079.00**

QUALITY BACKED UP BY DV'S SIX MONTH YOU CAN'T LOSE WARRANTY!

DISPLAYED VIDEO is offering TRS-80* MODEL 4 disk drive systems for **INCREDIBLY** low prices, quality backed up by DV's six month you can't loose warranty.

MODEL 4 with 64K dual 40 track double density disk drives with TRSDOS 6.0 and TEN DISKETTES.

*PLUG IT IN AND GO.....***$1599.00**/128K...**$1679.00**

MODEL 4 with 64K dual 40/40 track double density disk drives with TRSDOS 6.0 and TEN DISKETTES.

*PLUG IT IN AND GO.....***$1849.00**/128K.....**$1920.00**

MODEL 4 with 64K dual 80/80 track double density internal disk drives, with TRSDOS 6.0 and TEN DISKETTES.

*PLUG IT IN AND GO.....***$2199.00**/128K.....**$2279.00**

New MODEL 4P (Portable) $1625.00

The answer to the IBM P.C. New Tandy 2000 ..... $2549.00

MODEL 4 with 64K four internal drives of any configuration available to achieve up to 4 meg of disk storage ..... CALL

MODEL III/4 Internal Two Drive Kit: Includes controller board, dual drive mounting bracket, dual power supply, all hardware cable; and connectors (gold plated) & TEC Drive $399.00

4 DRIVE KIT MINUS DRIVE **$349.00**

MODEL 100 8K.....**$679.00** 24K.....**$839.00** DV'S MODEL I DOUBLE DENSITY BOARDS.....**$89.00**

WE CARRY TRS80, LNW, & SANYO COMPUTERS

Visit our retail location at:

111 Marshall Street
Litchfield, MI 49252
(313) 426-5086
(313) 482-4424
(517) 542-3280
(517) 542-3939
(517) 542-3947

DISPLAYED VIDEO

FREE SHIPPING!!

IMMEDIATE DELIVERY
DV'S SIX MONTH
PARTS AND LABOR WARRANTY

Authorized Dealership at:
111 Marshall Street, Litchfield, Michigan 49252 **P142**
To Order: Call (313) 426-5086; (313) 482-4424; (517) 542-3280
(517) 542-3939; (517) 542-3947
OR WRITE:
Displayed Video, 111 Marshall St., Litchfield, MI 49252

*TRS-80 is a trademark of the Tandy Corporation Prices subject to change without notice.

FREE WHAT?

MODEL 4

FREE
10 diskettes with the purchase of a 128K, Model 4, 2dr, VR RS232, Sound Generator & TRS-DOS 6.0 & Manual @ $1699.00

16K to 64K RAM upgrade kit $69.00
64K to 128K RAM upgrade (includes PAL) ... 84.00
PAL only for 64K to 128K upgrade 34.95

DISK III KITS

FREE
5 diskettes, with the purchase of any Disk III kit. Includes: internal floppy disk drives 40 track, single sided with power supply, controller, mounting hardware and applicable cables.

Disk III kit without drives $218.95
Disk III kit with 1 drive (SS,DD) 394.95
Disk III kit with 2 drives (SS,DD) 595.00

EXTERNAL DRIVES

FREE
Extender cable with purchase of External Drive

External floppy disk drives (includes power supply & enclosure)		$229.00
80 track or 2 sides	Add	99.00
80 track and 2 sides	Add	199.00
Power Supply and Enclosure only (Model I, III, 4)		45.00

PRINTERS

FREE cable with the purchase of a printer OR
FREE Printer Stand (while supplies last)

Gemini 10X	Epson RX80 • Cheap	Okidata 82 • Cheap
15X	Epson FX80 • Cheap	Okidata 83 • Cheap
	Epson FX100 • Cheap	Okidata 92 • Cheap
		Okidata 93 • Cheap

Many others • Call for specific units

VR RS232C — Direct replacement for 26-1148 for Model III & Model 4 $77.95

SERVICE

TRS-80 Model I	IBM-PC, XT
TRS-80 Model III	Apple II, II+, IIe, III
TRS-80 Model 4	Many printers — Please call

CUSTOM CABLES

You want to adapt a WHAT to a WHAT?
And Want it how long? Call for special cable needs: large run cable assembly capability — in house.

90 day Warranty on all repairs • Fully equipped Service Center
We repair & maintain floppy disk drives — Tandon • MPI • CDC • Shugart

OTHER GOODIES

Nashua diskettes
5¼" SS,DD Bulk — $1.89 ea., 25 per pk
Verbatim 525-01
$26.90/10 per pk

Paper, continuous
9¼ x 11 — $29.95
14⅞ x 11 — $34.95
Percom Doubler $169.00
Smith-Corona Ribbons $4.50

Modems
Hayes Smartmodem 300 — $229.00
Hayes Smartmodem 1200 — $599.00

Coming Soon

Model III/4 Internal • Modem/RS232 upgrade
Call or Watch for our new ads

CALL TOLL FREE • 800-345-8102

Published prices reflect cash discount. All prices are subject to change without notice TRS-80 and TRSDOS are trademarks of Tandy Corp.

Telephone Hours 8:30am - 7pm MON -FRI., SAT 10-3 EST
CABLE "VR DATA"

VR data
(215) 461-5300
777 Henderson Blvd.
Folcroft, PA 19032 ~10

MasterCard VISA AMERICAN EXPRESS

VR DATA-WEST
WATONGA, OK
1-405-623-8664

by Mark D. Goodwin

Restored ART

Model 4 Basic lacks three Model III graphics commands—Set, Reset and Point. Now you can access them.

Model 4 Basic is a powerful Basic interpreter, but it lacks graphics commands. To remedy this, I've written three machine-language subroutines that perform the Set, Reset, and Point functions. I include all three subroutines in a single program called Graph (see Program Listing 1).

Setting Up Graph

You can easily assemble Graph with an editor/assembler. For those of you who don't have one, I've included Program Listing 2, which POKEs the subroutines into high memory.

Set the high memory pointer to FF86 hexadecimal before executing Listing 2. To do this from Basic, type in CLEAR, FF86; from TRSDOS Ready, type in MEMORY (H=X'FF86'). The program produces a CMD file of the subroutines, once they're in high memory.

Using the Subroutines

You access the three subroutines using the Call command and the syntax given in the Table.

The Figure presents a job control language (JCL) file that automatically sets the high memory for the program and loads it into RAM. To execute the JCL file, type in DO GRAPH from TRSDOS Ready.

Program Listing 3 demonstrates how you can use these routines in your own programs. If you type in this program, you'll notice that every third line looks squashed. I suspect that this squashing effect is necessary to accommodate the Model 4's 80-column by 24-line display. However, the squashing shouldn't hamper your programming as long as you keep it in mind when designing your graphics. ■

Write to Mark D. Goodwin at Star Route 79 Box 103, Orland, ME 04472.

```
BUILD GRAPH/JCL <enter>
MEMORY (H=X'FF86') <enter>
LOAD GRAPH/CMD <enter>
//EXIT <enter>
<control><shift><@>
```

Figure. A sample JCL file. Type in these commands at the TRSDOS Ready prompt and save them. When you want to run the Graph program, simply type in DO GRAPH at the TRSDOS Ready prompt.

The Key Box

Model 4
16K RAM
Assembly Language or Disk Basic
Editor/Assembler Optional

Command	Function	Example
CALL SET(X,Y)	Sets a pixel at the coordinate specified by X and Y.	SET=&HFFB3 X>=0 and X<=159 Y>=0 and Y<=71
CALL RESET(X,Y)	Resets a pixel at the coordinate specified by X and Y.	RESET=&HFFA2 X>=0 and X<=159 Y>=0 and Y<=71
CALL POINT(X,Y,PNT)	Tests a pixel at the coordinate specified by X and Y. The result will be returned as: PNT=−1 if the pixel is set. PNT=0 if the pixel is reset.	POINT=&HFF87 X>=0 and X<=159 Y>=0 and Y<=71

In the above examples, variables X, Y and PNT must be integer variables. However, their variable names can differ; I use X, Y, and PNT here as illustrations. You can also use different variable names for Set, Reset, and Point.

Table. Subroutine syntax.

Sure it's insured?

SAFEWARE™ 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:

1-800-848-3469

In Ohio call (614) 262-0559

SAFEWARE ✓368

SAFEWARE, THE INSURANCE AGENCY INC.

SEND AND RECEIVE

MORSE CODE

•TRIPLE SPLIT SCREEN
•SPEED: 1-200 WPM

This 4.5k assembly language program runs on your TRS-80™ Model I, III, or 4. The decoded Morse Code is displayed on the screen and may be printed. The keyboard buffer is active while either sending or receiving. The output is either tone or keyed. I/O is via the cassette interface. The program runs from tape or disk (TRSDOS 2.3 or 1.3). Use it "on-the-air" or for code practice.

satisfaction guaranteed or your money back

Cassette with booklet only $19.95 postpaid.

ROGO Computer Products
4752 DeBeers Drive
El Paso, Texas 79924 ✓343

Program Listing 1. Graph/CMD comprises three subroutines that perform the Set, Reset, and Point graphics functions on the Model 4.

```
                00100 ;
                00110 ; Model 4 SET,RESET, and POINT Routines
                00120 ; By Mark D. Goodwin
                00140 ;
FF87            00150         ORG     0FF87H
                00160 ;
                00170 ; POINT Routine
                00180 ;
FF87 CDC5FF     00190 POINT   CALL    CHKXY   ;Go evaluate X and Y.
FF8A D0         00200         RET     NC      ;Return if either is out of range.
FF8B C5         00210         PUSH    BC      ;Save the return VARPTR.
FF8C CDE4FF     00220         CALL    FIGXY   ;Figure row, column, and bit mask.
FF8F CDD3FF     00230         CALL    GETCHR  ;Get the current video character.
FF92 A0         00240         AND     B       ;Mask the character for the proper bit.
FF93 6F         00250         LD      L,A     ;L=Masked video character.
FF94 2600       00260         LD      H,0     ;HL=Masked video character.
FF96 01FFFF     00270         LD      BC,0FFFFH;BC=Adjustment value.
FF99 09         00280         ADD     HL,BC   ;(True) Carry=1,(False) Carry=0.
FF9A ED62       00290         SBC     HL,HL   ;(True) HL=-1,(False) HL=0.
FF9C E3         00300         EX      (SP),HL ;HL=Return VARPTR.
FF9D C1         00310         POP     BC      ;BC=True/False value.
FF9E 71         00320         LD      (HL),C  ;Save the LSB of the True/False value.
FF9F 23         00330         INC     HL      ;Bump the VARPTR.
FFA0 70         00340         LD      (HL),B  ;Save the MSB of the True/False value.
FFA1 C9         00350         RET             ;Return.
                00360 ;
                00370 ; RESET Routine
                00380 ;
FFA2 CDC5FF     00390 RESET   CALL    CHKXY   ;Go evaluate X and Y.
FFA5 D0         00400         RET     NC      ;Return if either is out of range.
FFA6 CDE4FF     00410         CALL    FIGXY   ;Figure row, column, and bit mask.
FFA9 CDD3FF     00420         CALL    GETCHR  ;Get the current video character.
FFAC F5         00430         PUSH    AF      ;Save the video character.
FFAD 78         00440         LD      A,B     ;A=Bit mask.
FFAE 2F         00450         CPL             ;Invert the bit mask.
FFAF C1         00460         POP     BC      ;B=Video character.
FFB0 A0         00470         AND     B       ;RESET the pixel.
FFB1 180B       00480         JR      PUTCHR  ;Go display the new character.
                00490 ;
                00500 ; SET Routine
                00510 ;
FFB3 CDC5FF     00520 SET     CALL    CHKXY   ;Go evaluate X and Y.
FFB6 D0         00530         RET     NC      ;Return if either is out of range.
FFB7 CDE4FF     00540         CALL    FIGXY   ;Figure row, column, and bit mask.
FFBA CDD3FF     00550         CALL    GETCHR  ;Get the current video character.
FFBD B0         00560         OR      B       ;SET the pixel.
FFBE 4F         00570 PUTCHR  LD      C,A     ;C=New character to be displayed.
FFBF 0602       00580         LD      B,2     ;B=Put character code.
FFC1 3E0F       00590         LD      A,15    ;A=SVC number.
FFC3 EF         00600         RST     28H     ;Call SVC 15.
FFC4 C9         00610         RET             ;Return.
                00620 ;
                00630 ; Evaluate the X and Y Values Routine
                00640 ;
FFC5 E5         00650 CHKXY   PUSH    HL      ;Save the X VARPTR.
FFC6 EB         00660         EX      DE,HL   ;HL=Y VARPTR.
FFC7 56         00670         LD      D,(HL)  ;D=Y value.
FFC8 E1         00680         POP     HL      ;HL=X VARPTR.
FFC9 6E         00690         LD      L,(HL)  ;L=X value.
FFCA 62         00700         LD      H,D     ;H=Y value.
FFCB 7C         00710         LD      A,H     ;A=Y value.
FFCC FE48       00720         CP      72      ;Is Y >= 72?
FFCE D0         00730         RET     NC      ;Return if Y >= 72.
FFCF 7D         00740         LD      A,L     ;A=X value.
FFD0 FEA0       00750         CP      160     ;Is X >= 160?
FFD2 C9         00760         RET             ;Return.
```

Listing 1 continued

CHILD'S PLAY

AN EDUCATIONAL PROGRAM FOR CHILDREN AGES 2 TO 7 YEARS

This machine language program contains fast **animation, sound effects, tunes,** and **speech.** The speech has two options: it can be generated by computer or by a VS100 speech synthesizer (speech options described later). The program is easily controlled by a friendly menu-man who points to the options that may be chosen. The main menu contains four sections: • **Learn the Alphabet** • **Learn to Count** • **Learn Shapes** • **Learn Words** Each section contains three subsections which can easily be manipulated, giving twelve games in all. The menu selection is accompanied by a different nursery rhyme tune for each menu.

LETTERS

This option allows the child to select letters at random, match the current letter displayed, or type in the next letter. When a correct response is given, an animation associated with the letter moves across the screen, e.g., Z for Zebra. The computer says the letters also.

NUMBERS

This option allows the child to select the numbers zero to nine at random, match the current number displayed, or type in the next number. Men walk out on the screen equal to the number chosen. This section also contains speech.

SHAPES

This section allows the child to control the menu-man, moving shapes from the left hand of the screen to the right hand of the screen. The first level allows the child to pick up shapes using the spacebar. The second level, in addition, allows the child to control the menu-man with the arrow keys. The third level puts a small 'Bee' on the screen which the child must avoid while manipulating the menu-man and shapes.

WORDS

This final section allows the child to type in letters to form words. The first level asks for a word to be typed in, then to be repeated before another word can be tried. The second level prompts the child with a word which must be matched before an animation will appear on the screen. The last level shows the animation on the screen. Then the child must type in the correct word before the next animation is shown. This section contains speech also.

SPEECH

The program can be bought as a stand-alone program with computer-generated speech, which uses 'your' speaker amplifier. However, we have also made the program compatible with an 'Alpha Products VS100' speech synthesizer for improved speech quality. (This can be purchased from 'Alpha Products' subject to availability). The speech is not available for a 16K machine.

Software available for the **TRS80* Models 1, III, and IV.** Also soon available for the **Timex.** 16K tape (no speech). 32K tape. 32K disk. 48K disk. All programs for. **$29.95**

(Indiana residents add 5% sales tax. COD add $2.00)

Name _____ Address _____

City/State/Zip _____

Total Enclosed $ _____ (Allow 2 weeks to clear checks)

Charge my VISA ☐ MasterCharge ☐

Card # _____ Exp. Date / /

Signature _____

✓352

INDIANA SOFTWARE GROUP, INC.
P.O. BOX 627 • COLUMBUS, INDIANA 47202

TELEPHONE (812) 372-4042

*TRS80 is a registered trademark of Tandy Corp

Listing 1 continued

```
                    00770 ;
                    00780 ; Get the Current Video Character Routine
                    00790 ;
FFD3 F5             00800 GETCHR  PUSH    AF        ;Save the bit mask.
FFD4 0601           00810         LD      B,1       ;B=Get character code.
FFD6 3E0F           00820         LD      A,15      ;A=SVC number.
FFD8 EF             00830         RST     28H       ;Call SVC 15.
FFD9 C1             00840         POP     BC        ;B=Bit mask.
FFDA B7             00850         OR      A         ;Is the character < 128?
FFDB F2E1FF         00860         JP      P,GETCHR1;Jump if it's < 128.
FFDE FEC0           00870         CP      192       ;Is it a graphic character.
FFE0 D8             00880         RET     C         ;Return if it's graphic.
FFE1 3E80           00890 GETCHR1 LD      A,80H     ;A=Blank graphic character.
FFE3 C9             00900         RET               ;Return.
                    00910 ;
                    00920 ; Figure the Row, the Column, and the Bit Mask Routine
                    00930 ;
FFE4 7C             00940 FIGXY   LD      A,H       ;A=Y value.
FFE5 26FF           00950         LD      H,0FFH    ;H=-1.
FFE7 24             00960 FIGXY1  INC     H         ;Bump the row number.
FFE8 D603           00970         SUB     3         ;Subtract three.
FFEA 30FB           00980         JR      NC,FIGXY1;Loop till Y/3 is complete.
FFEC C603           00990         ADD     A,3       ;Adjust it for the remainder.
FFEE 47             01000         LD      B,A       ;B=Y/3 remainder.
FFEF CB3D           01010         SRL     L         ;L=Column number.
FFF1 3E01           01020         LD      A,1       ;A=Starting bit mask.
FFF3 3002           01030         JR      NC,FIGXY2;Jump if it's an even column.
FFF5 CB27           01040         SLA     A         ;Shift the bit mask.
FFF7 04             01050 FIGXY2  INC     B         ;Bump the Y/3 remainder.
FFF8 05             01060 FIGXY3  DEC     B         ;Bit mask complete?
FFF9 C8             01070         RET     Z         ;Return if it's complete.
FFFA CB27           01080         SLA     A         ;Shift the bit mask.
FFFC CB27           01090         SLA     A         ;Shift the bit mask.
FFFE 18F8           01100         JR      FIGXY3    ;Loop till done.
0000                01110         END
00000 Total errors
```

Program Listing 2. This program POKEs the subroutines from Listing 1 into high memory.

```
10 ' POKE Program for Graphics Subroutines
20 ' By Mark D. Goodwin
30 FOR I=&HFF87 TO &HFFFF
40 READ J
50 POKE I,J
60 NEXT
70 SYSTEM "DUMP GRAPH/CMD:0 (S=X'FF87',E=X'FFFF')"
80 END
90 DATA 205,197,255,208,197.205,228,255
100 DATA 205,211,255,160,111,38,0,1
110 DATA 255,255,9,237,98,227,193,113
120 DATA 35,112,201,205,197,255,208,205
130 DATA 228,255,205,211,255,245,120,47
140 DATA 193,160,24,11,205,197.255,208
150 DATA 205,228,255,205,211,255,176,79
160 DATA 6,2,62,15,239,201,229,235
170 DATA 86,225,110,98,124,254,72,208
180 DATA 125,254,160,201,245,6,1,62
190 DATA 15,239,193,183,242,225,255,254
200 DATA 192,216,62,128,201,124,38,255
210 DATA 36,214,3,48,251,198,3,71
220 DATA 203,61,62,1,48,2,203,39
230 DATA 4,5,200,203,39,203,39,24
240 DATA 248
```

End

Program Listing 3. Graphics demonstration program.

```
10 ' Model 4 Graphics Demonstration Program
20 ' By Mark D. Goodwin
30 ' Set the variables to integers & predefine the variables used
40 DEFINT A-Z
50 DIM X,Y,SET,RESET,POINT,PNT
60 ' Set the subroutines' starting addresses
70 SET=&HFFB3
80 RESET=&HFFA2
90 POINT=&HFF87
100 ' Clear the screen and turn off the cursor
110 CLS
120 PRINT CHR$(15)
130 ' SET every other line
140 FOR Y=0 TO 71 STEP 2
150 FOR X=0 TO 159
160 CALL SET(X,Y)
170 NEXT X
180 NEXT Y
190 ' Reverse the display
200 FOR X=0 TO 159
210 FOR Y=0 TO 71
220 CALL POINT(X,Y,PNT):IF PNT THEN CALL RESET(X,Y) ELSE CALL SET(X,Y)
230 NEXT Y
240 NEXT X
250 ' Clear the screen and turn on the cursor
260 CLS
270 PRINT CHR$(14)
```

End

PASCAL 80

When the BEST is a bargain - Don't pay more or get less!

As Reviewed in

80 Micro 12/82	Access 7/82
80 US 2/83	Byte 12/81
Electronic Learning 6/83	LDOS Quarterly 1/83
	SoftSide #36

Standard Pascal with many special features including random files up to 16 megabytes, peek, poke, and call, accessable pointer variables (like C), include, chain, and rename, graphics. Call or write for FREE descriptive brochure.

NOTE: We do have a trade-in available for those who purchased the old obsolete Ramware or Ram Parts Pascal 80.

NEW! High Resolution Graphics package (requires Radio Shack board) including character generator and turtle graphics.

Pascal 80 **$79+ $2 shipping**
Pascal 80 School Package **$295**
Pascal 80 Trial Version **$14.77**
Graphics Package **$39.95**

NEW CLASSICS SOFTWARE

239 Fox Hill Road
Denville, NJ 07834
201-625-8838

255

MasterCard VISA

See List of Advertisers on Page 227

by C. David Wilson

Oops . . . WRONG DISK

You'll never write data to the wrong file with this utility to identify your Model III disks

The rhythm of exchanging disks with either single- or multi-drive Model II systems while executing multi-swap routines can hypnotize even the most seasoned computerist into hitting the wrong key at the wrong time. It was just this experience that led me to write a simple routine that you can incorporate into Basic programs to identify your disks.

Disk ID

The Basic statement

```
OPEN "D", 1, "XXX:0(RED)"
```

opens a file called XXX on the disk in drive zero no matter what the name of the disk. (RED) identifies the disk name, but only the Copy command looks at that name. All other commands ignore it. Basic programmers need a way to check the name of the disk once it's booted up.

Program Listing 1 (DISKID/CMD) shows the Assembly-language routine that calls SVC 15 and then returns the name of the disk residing in the drive you specified in the Basic calling routine.

The program assembles at the usable top of RAM for a 64K TRSDOS 2.0 system. The simplest way to incorporate it is to debug the 22 hexadecimal (hex) bytes of machine code into RAM addresses EFEA to EFFF hex.

At the TRSDOS Ready prompt, type DEBUG ON and press the enter key. Then type DEBUG and press the enter key. When the question-mark prompt appears, press the M key. When A= appears on the screen, type EFEA, which then appears in the top left of the screen. Then press the F1 key. The cursor will flash over byte EFEA.

Enter the hexadecimal code in the Figure. When you've entered the code D5–C9, press the F2 key. Press the O key (not the zero key). At TRSDOS Ready, type:

```
DUMP DISKID/CMD START=EFEA,END=
EFFF
```

Finally, build this routine into your Basic programs, calling it with the user (USR) function (see Program Listing 2). Line 100 calls the subroutine to high RAM, line 110 protects it from Basic, and line 120 defines the entry address.

Line 140 represents a neat way to pass the disk drive number to the subroutine, the zero simply being a dummy character; line 150 transfers program control to the machine-language subroutine, which reads the selected drive and returns the disk name to the caller in variable ID$.

You can also think of the USR0 as a function call in:

```
PRINT USR0(ID$)
```

You might want to build the fragment shown in Program Listing 3, or something like it, into your Model II Basic programs. ■

You can reach C. David Wilson at P.O. Box 272, Madawaska, ME 04756.

The Key Box

Model II
64K RAM
Disk Basic
Assembly Language
Editor/Assembler or Debug

Program Listing 1. DISKID/CMD.

```
                00100 ;*****************************************************
                00110 ;* DISKID/OBJ - This subroutine receives the Drive#   *
                00120 ;* from a calling BASIC routine and returns the name *
                00130 ;* of the disk resident in that drive.  No error     *
                00140 ;* checking is performed.                            *
                00150 ;*   Entry: DE-->Argument Storage Area.              *
                00160 ;*          First byte of ASA contains Drive #       *
                00170 ;*          2nd & 3rd bytes contain string address   *
                00180 ;*   Exit:  DE-->ASA                                 *
                00190 ;*          First byte of ASA = 8                    *
                00200 ;*          Disk Name is now in string area          *
                00210 ;*****************************************************
EFE2            00220          ORG     0EFE2H  ;Top of debuggable RAM
0008            00230 IDBUFF   DEFS    8       ;8 bytes of buffer space
EFEA D5         00240 ENTRY    PUSH    DE      ;Save ASA pointer
EFEB EB         00250          EX      DE,HL   ;HL-->ASA
EFEC 46         00260          LD      B,(HL)  ;Drive # to register B
EFED 3608       00270          LD      (HL),8  ;String length to ASA
EFEF 23         00280          INC     HL      ;Bump ASA pointer
EFF0 5E         00290          LD      E,(HL)  ;LSB of string address
EFF1 23         00300          INC     HL      ;Bump ASA pointer
EFF2 56         00310          LD      D,(HL)  ;MSB of string address
EFF3 21E2EF     00320          LD      HL,IDBUFF ;HL-->buffer
EFF6 3E0F       00330          LD      A,15    ;Select DISKID
EFF8 CF         00340          RST     8       ;SVC puts name in buffer
EFF9 010800     00350          LD      BC,8    ;Length for move
EFFC EDB0       00360          LDIR            ;Move name to string area
EFFE D1         00370          POP     DE      ;Restore ASA pointer
EFFF C9         00380          RET
0000            00390          END
00000 Total Errors
```

Program Listing 2. USR function.

```
100 SYSTEM "LOAD DISKID/OBJ"
110 CLEAR 50, &HEFE1
120 DEFUSR0 = &HEFEA
130 INPUT "Drive #" ; DR
140 ID$ = STRING$(DR,"0")
150 ID$ = USR0(ID$)
160 IF ID$ = "RED" + STRING$(5," ") THEN 180
170 PRINT "OOPS!...Wrong Diskette"
180 PRINT "Drive" DR "diskette name is " ID$
190 END
```

End

Program Listing 3. Sample subroutine.

```
10 'Listing 3, as mentioned in the text,
20 'is simply a fragment which does not contain
30 'the necessary preliminaries and, of course,
40 'will not run alone
50 '
60 INPUT "Insert Diskette RED into Drive 2...READY" ; Z$
70 ID$ = "00"    'Length of string is the Drive #
80 IF USR0(ID$) = "RED      " THEN 120
90 PRINT "OOPS!... Wrong Diskette"
100 GOTO 60
```

End

Figure. Hexadecimal code for disk identification.

```
TRS-80 Model II DEBUG Program
EFEA    D5 EB 46 36 08 23 5E 23   56 21 E2 EF 3E 0F CF 01   ..F6.#^#V!..>...
EFFA    08 00 ED B0 D1 C9 00 00   00 00 00 00 00 00 00 00   ................
F00A    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
F01A    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
F02A    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
F03A    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
F04A    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
F05A    00 00 00 00 00 00 00 00   00 00 00 00 00 00 00 00   ................
```


LARGE CAPACITY SYSTEM LARGE CAPACITY SYSTEM L

LARGE CAPACITY
ACCOUNTING PROGRAMS
Model 1, 3/4, LNW, LOBO

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.

GENERAL LEDGER
400+ ACCOUNTS
5000+ TRANSACTIONS/MONTH
NO OTHER SYSTEM OFFERS...
† REPORT FLEXIBILITY/CAPACITY
† DEPARTMENT P & I (UP TO 9)
† USE 100+ SUB-TOTALS
† STATEMENT OF CHANGES (ASSETS)
† PERCENT P & L + ACCOUNT DETAIL

149.95 Each ★ Both for 199.95

355

Manual & Demo disk $20.00 ea.
add $50.00 ea. for Hard Disk

SUPER P/R payroll $225.00
Manual & Demo Disk $55.00
REWRITE Labels 9.95 per 100
reusable diskette labels

H. D. P.
2059 West Lincoln
Oroville, CA 95965
916 - 533-5992

Add $3.00
Shipping & Handling
Postman Collects
Cash If Sent COD
VISA or M/C

LARGE CAPACITY SYSTEM LARGE CAPACITY SYSTEM LARGE CAPACITY SYSTEM LARGE CAPACITY SYSTEM LARGE CAPACITY SYSTEM L

WORD PROCESSING ON YOUR TRS-80 BECOMES CHILD'S PLAY WITH

Using Scripsit

by William James Haga

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
10 Davis Dr. • Belmont, CA 94002
TOLL FREE 1-800-354-9706

305

ALL ORDERS MUST BE PREPAID AND SHOULD BE SENT TO: WADSWORTH ELECTRONIC PUBLISHING COMPANY, 10 Davis Dr, Belmont, CA 94002. **Postage and handling will be paid by the publisher.**

Please send me ____copies of USING SCRIPSIT @ $21.95 $ ____
Residents of CA, KY, MA, MI, NJ, NY, NC, WA please add sales tax $ ____
TOTAL $ ____

☐ Enclosed is my check.
☐ Please charge my ☐ VISA ☐ MasterCard
☐ Please send complete WEPCO catalogue

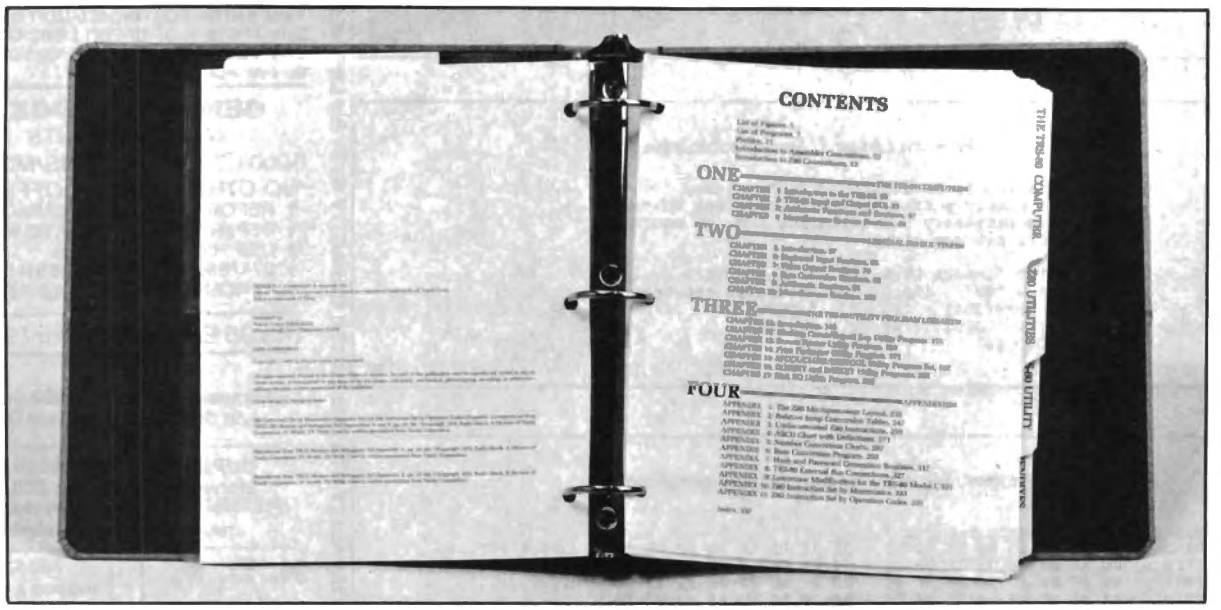
Card # ____ Exp Date ____
Name ____
Address ____
City ____ State ____ Zip ____
Signature for Credit Card ____

For credit card orders you can also call
TOLL FREE 1-800-354-9706

***Using Scripsit* is also available at your local computer dealer. If not, have them contact Wadsworth Electronic Publishing Company.** M

See List of Advertisers on Page 227

Every Z80 assembly-language programmer needs this book.



Programming in assembly language requires good tools. *TRS-80/Z80 Assembly Language Library*, a complete reference book on TRS-80 Model I assembly language, is the best tool you can find. In over 300 pages, 45 figures, and 75 program listings, author Craig A. Lindley explains the details of Model I hardware and software and shows you how to write programs that squeeze every bit of performance out of your computer. This book will teach you:

- how to use ROM and DOS routines in your own programs
- how to perform disk input/output
- how to access the video display and keyboard
- how to write easy-to-use programs
- how to perform arithmetic operations
- how to use the undocumented Z80 instructions

You'll also learn about disk operating systems, device handling, base conversion, parameter passing, and more.

TRS-80/Z80 Assembly Language Library contains a library of ready-to-run utility programs that are worth many times the book's cost. Included with the book are two Model I TRSDOS-compatible disks* containing utilities for printer formatting and spooling, single-key entry of strings, disk editing, base conversion, password encoding and decoding, and more. You get more than 15 valuable utilities, and the source code files are included, so you can examine, modify, and learn from every program.

Many of the programs also run on the Model III, and those that do not require only minor modification. One of the book's four sections is dedicated to routines and programs that run on any Z80-based system. No matter what Z80 computer you program, this book has something for you.

It's a book that's designed to be used. The text is set in large type, and the book is bound in an 8½-× 11-inch easel-backed binder that stands up next to your computer. So there's no squinting at tiny type and fighting to keep the book open.

The whole package—book, disks, and binder—is yours by mail for the **unbelievable price of only $34.97.** And if you charge it, you can even call toll-free to order.

TRS-80/Z80 Assembly Language Library. It's the assembly-language book for the '80s.

*Disks do not contain a disk operating system; two disk drives or a disk copy utility are required to transfer the files.

Call **Toll-Free 1-800-258-5473** for credit card orders or send $34.97 plus $4.50 shipping and handling to Wayne Green Books, Retail Sales, Peterborough NH 03458. Dealer inquiries invited.

TRS-80/Z80 Assembly Language Library is a Wayne Green publication
TRS-80, TRSDOS, Model I, Model III are registered trademarks of the Radio Shack Division of Tandy Corp.
Z80 is a registered trademark of Zilog

I need *TRS-80/Z80 Assembly Language Library*. ✓77

Send me _____ copies of *TRS-80/Z80 Assembly Language Library* (BK7395) @ $34.97 each. I have enclosed $4.50 per system for shipping and handling.

☐ MasterCard ☐ VISA ☐ AmEx ☐ payment enclosed

Card #_____ Expires_____

InterBank#_____ Signature_____

Name _____

Address _____

City_____ State_____ Zip_____

Wayne Green Books, Retail Sales, Peterborough, NH 03458

344B8Z

NEW FROM

Wayne Green Books

You Can Design Electronic Circuits The Easy Way

With Programs for Electronic Circuit Design

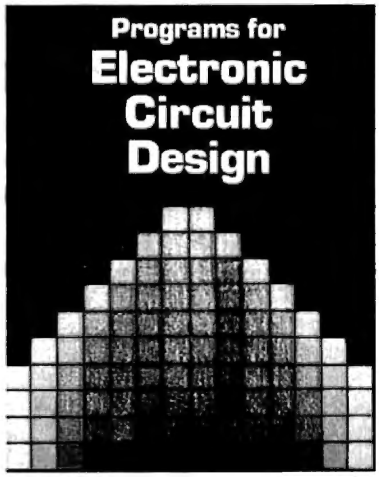
Use your microcomputer and *Programs for Electronic Circuit Design* help you select the correct value for each component in an electronic circuit. The programs are adaptable to most microcomputer systems and are also available on disk for the Apple, IBM and TRS-80. Each chapter contains a program involving several different types of applications that use the same electronic components.

The thirteen programs can be used individually, or they can be combined, using a master menu, as explained in the book. The book provides documentation for the programs, and some of the programs refer to schematics and diagrams in the book.

If you have an elementary knowledge of electronics and familiarity with the basic components, you will find *Programs for Electronic Circuit Design* an invaluable aid in circuit design.

Topics covered include:

- resistor, capacitor and inductor circuits
- circuits that have combinations of resistors, capacitors and inductors



- series and parallel circuits
- Ohm's law computations
- voltage dividers
- impedance and frequency computations
- phase angles
- operational amplifiers
- 555 timers
- filters
- transistor circuits

Programs for Electronic Circuit Design
David Leithauser
$14.95 ISBN 0-88006-068-9
softcover 7 by 9 approx. 100 pp. 1984
BK7400
Book and disk packages. $24.95
Apple CC740011
IBM PC CC740012
TRS-80 CC740013

To order, call toll-free 1-800-258-5473 for credit card orders. Or mail your order with check or money order or complete credit card information to: Wayne Green Books, Retail Sales, Peterborough, NH 03458. Please include $1.50 for the first item and $1.00 for each additional item for shipping and handling.

✓68

Send me _____ copies of *Programs for Electronic Circuit Design* (BK7400) at $14.95 each.
Book and disk packages: _____ Apple (CC740011) _____ IBM PC (CC740012)
_____ TRS-80 (CC740013) at $24.95 each.
Shipping and handling is $1.50 for the first item; $1.00 for each additional item.

Card # _____ MC bank # _____

☐payment enclosed ☐MasterCard ☐Visa ☐Am. Ex.

Expiration date _____ Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Wayne Green Books, Peterborough, NH 03458

344B8E

See List of Advertisers on Page 227

DUMP SITE

Store up to three full screens of data in your Model I/III's video memory, then dump them to your printer.

This screen dump routine for the Models I and III costs nothing, requires very little memory, and integrates easily into any program.

The routine fools the Basic interpreter into thinking it holds a screen full of string data stored in memory. Instead of defining a string array as located in the high memory pool, the program defines its location in video memory. In short, the data strings become whatever appears on the screen.

While I've written the program for text, you can modify it for graphics.

Representing Strings in Basic

Each string variable is represented internally by a 1- or 2-byte variable name, a 1-byte length counter, and a 2-byte address pointing to the location in memory where the string begins. For a simple variable such as A$, the program stores this information along with other simple numeric variables as shown in Fig. 1.

The VARPTR command gives N as the variable address (see Fig. 1). If you type PRINT VARPTR(A$), you get the value of N. If you type PRINT PEEK(VARPTR(A$)), you get the contents of the length-of-string box (see Fig. 1).

The program stores array variables similarly, except that a header block follows the variable name, providing information about the array size.

A table of 3-byte entries like boxes N, N+1, and N+2 in Fig. 1, one block for each element in the array, follows the header block. With array variables, VARPTR gives the same information: it points to the byte containing the length of the string. The only difference is that N−1 and N−2 don't contain the variable names.

To set up an array to represent the contents of the video screen, first dimension a string array 16 elements long:

```
10 DIMA$(16)
```

The lengths are set to zero, and the addresses point to somewhere in high memory where Basic keeps a pool of memory reserved for building and storing strings. This is the memory set aside by the Clear NNNNN command, where NNNNN represents the number of bytes set aside for string storage.

To make this routine work, replace the length and address bytes Basic set up to represent the location and length of the 16 strings A$(1)–A$(16) with your own lengths and addresses. The addresses represent the starting address of each of the 16 lines of the video screen, and the lengths are all set to 64 characters, the length of one line of video. So every time you ask for the value of an element of A$(N), you get the line of text or graphics on line N of the screen.

A simple loop sets up the lengths and addresses (see Program Listing 1). In line 20, I% is an integer variable; that is, the program stores its value in 2 bytes, making it easy to POKE its value into the array address locations as you go along. The address of the first character of the first video line is 15296 minus 64. Line 30 loops through 16 elements of A$(and line 40 makes each string 64 bytes long.

With each successive iteration, I% increases by 64, representing the address of each successive video line (see line 50). Like the 2-byte address you need, the program stores the I% variable internally, so POKE the 2 bytes of I% into the appropriate locations N+1, N+2 (line 60).

Typing in the loop takes about three minutes and a few hundred bytes. Here's what you get for your effort: At any given moment, the A$ permanently stores the entire contents of the video screen, so long as an element of the A$ array never appears on the left side of an equals sign in a string equation.

Try the following experiment: Clear the screen, then type THIS IS THE FIRST LINE OF VIDEO and hit the break key. The program displays:

```
THIS IS THE FIRST LINE OF THE VIDEO
>_
```

Now type PRINTA$(1) and press the enter key. You should see the top line of video printed over again. Type

```
FOR I=1 TO 16:PRINT A$(I);:NEXT
```

Press the enter key and watch what happens.

If you want to save the screen from inside a program, add 100 DIM B$(16) and the subroutine:

```
1000 FOR I=1 TO 16:B$(I)=A$(I):NEXT:
RETURN.
```

The subroutine in line 1000 snags the entire contents of the screen from the A$ array and keeps it in B$, where successive changes on the screen have no effect. You can get a printout of the 16 strings or the screen at any time. You can also store a screen of prompts, graphics, or data, and later recall it for reference—the applications are unlimited. I use an array of 256 elements to store 16 screens full of text for a text editor.

The Key Box

LOAD 80

Models I and III
16K RAM Cassette Basic
32K RAM Disk Basic
Printer

You've Got TOTAL ACCESS™

TO YOUR COMPUTER HARDWARE & SOFTWARE NEEDS. CALL ROSE TODAY!

AEROCOMP DISK DRIVES

External drives for TRS80 Mod. I or III, IBM PC & TI 99/4A are complete with power supply & enclosure.

40 Track Single Side (Tandon)	$199
40 Track SS "Flippy" (MPI)	239
40 Track Dual Head (Tandon/MPI)	279
80 Track SS (MPI)	299
80 Track SS "Flippy" (MPI)	329
80 Track Dual Head (Tandon)	379
Color Computer Add-On Drives (2nd & 3rd)	199

8" EXPANSION BOX

Complete system with power supply & fan (slimline)

Two 8" Single Side	$699
Two 8" Double Side	849

***All New! Half-High Drives Available Now. Call For Prices.**

BARE DRIVES

Internal drives for TRS80 Mod. III, IBM PC & TI 99/41 (controller required)

40 Track SS (Tandon)	$169
40 Track Dual Head (Tandon/MPI)	249
80 Track SS (MPI)	269
80 Track Dual Head (Tandon)	339
8 inch Single Side Thinline	260
8 inch Dual Head Thinline	375

MODEL III DRIVES

Complete internal drive kits with 40 track drives, disk controller, power supply, all hardware & cables.

Drive Kit Only (no drives)	**$199**
One Drive System Kit	369
Two Drive System Kit	**539**

MODEL I DOUBLE DENSITY CONTROLLER

AEROCOMP "DDC"	**$99**
AEROCOMP "DDC" w/LDOS	169
AEROCOMP "DDS" (Double dens. data separator for Percom Doubler, LNDoubler or Superbrain	49
AEROCOMP "SDS" (Single dens. data separator)	29

MISCELLANEOUS DRIVE STUFF

TRSDOS 2.3 Disk & Manual	$20
LDOS (Mod. I or III)	119
NEWDOS/80, 2.0 (Mod. I or III)	129
Diskettes (10 in library box)	23
MX80 Ribbons	$9
Drive Power Supply & Enclosure (5.25")	59
2-Drive cable	24
4-Drive cable	34
Extender cable	13

© Total Access 1983

MICRO DECISION

$1299

64K CP/M 2.2, two serial ports
MBASIC - WordStar - Logicalc
BaZic - Correct-IT
12" Green Video 80 x 25
Double Density (200K) Drive

FRANKLIN ACE1000
Uses APPLE Software
Call, it may be cheaper by now **$999**

brother.
EM-1 Electronic Typewriter
HR1 PRINTER
Choose Either One
$799

EPSON FX-80
160cps Friction/Tractor ($32 Option)
10,12,16.5 cpi
+ Doublewide 6,8,12 1pi
$569

TRS-80 SPECIAL EQUIPMENT

80 x 24 Video Board for the Model III	$199
112K CP/M 2.2 for the Model III	$399
16K Memory, 200nsec, Guar 1 yr	8/$12
64K Memory, 200nsec, Guar 1 yr	8/$48
12" Green Phosphor Monitor	$87

SOFTWARE

Super Utility Plus 3.0 by Kim Watt	$59
Alcor PASCAL, Model I or III	169
P&T CP/M for the Mod II	159
P&T CP/M for the Mod 16	189
P&T CP/M for the Hard Disk	199
All SNAPPWARE	**10%** OFF

I have lots of other software. Call me now for your needs. All at discount.

MEDIA & SUPPLIES

8" disks SS DblDen, Guar. Forever	$29
8" disks DS DblDen, Same Guarantee	39
5" Flipsort, holds 75 disks	19
8" Flipsort, same deal	29
5" Library boxes	$2.50
8" Library boxes	$3.50
5" or 8" Head cleaning kit	9
Tractor paper, letter size 2900 sheets	25

LNW COMPUTERS

128K LNW-80 Model II, Both NTSC & RGB outputs. RS232 and parallel printer port. Uses both 5" and 8" drives. Works on all known TRS-80 DOS's. Comes with DOSPLUS. Also works with CP/M 2.2 which is included at no extra cost. Now a FREE 12" GREEN PHOSPHOR monitor and cable included. All for the low price of $1695

PRINTERS & OTHER ACCESSORIES

ANADEX DP-9500A or 9501A	$1239
ANADEX DP-9620A, 200 cps	1399
ANADEX WP-6000, 284 cps, NLQ	2695
PROWRITER, 120 cps, 10" Friction/Tractor	375
PROWRITER 2, 120 cps, 15" Fric/Trac	669
STARWRITER F-10, 40 cps Daisy Wheel	1250
PRINTMASTER F-10, 55 cps Daisy	1499
Rutishauser Bidirectional Tractor	199
Rutishauser Sheet Feeder	895

PERIPHERALS –

32K LNW Expansion Interface w/RS232	$329
Mod III RS232 complete, ready to install	79
Signalman Mk I Modem 300 baud, direct connect	89

Please add $5 handling charge to all orders under $24

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. Please add $5 handling charge to all orders under $24. Texas orders add 5% tax. No tax added on shipments outside Texas. Order up – I need the money!

TOTAL ACCESS™
P.O. BOX 790276
DALLAS, TX 75379
214-458-1966 ⌐81

NEXT DAY SHIPMENT on all in stock Merchandise.

⌐ See List of Advertisers on Page 227

COST-EFFECTIVE, TIME-SAVING

SOFTWARE for INVESTORS

STOCK MARKET ADVISOR SYSTEM — SMAS 2.0

SMAS employs both fundamental and advanced technical analysis. Its refined procedures that correlate three moving averages and other factors have been validated by applications to both stocks and portfolios. SMAS is different.

- Sophisticated procedures yield weekly appraisals of market trend and advisories **(with action price ranges)** to buy, to sell, to hold, and not to buy specific stocks.
- Data base includes 196 stocks, A/D file, and 4 indexes.
- **Data base stocks were selected on fundamentals.**
- You can use SMAS' results the very first week.
- Metropolitan papers print data required by SMAS.
- SMAS is menu driven, with both built-in checks for accuracy and efficient utility routines.
- SMAS is especially valuable to investors seeking long-term capital gains. Minimizes emotional involvement.
- SMAS works with Nebula and printer; with TRSDOS, LDOS, NEWDOS/80, & DOSPLUS on TRS-80 (TM Tandy Corp.) Models I and III (48K). SMAS version 2.0 only $169.95 + $3.00 for shipping.*

NEBULA STOCK DATA RETRIEVAL

"I paid $1,000 for an equivalent program for my Apple!"

Nebula (Models 1 & 3, 48K, 1 drive, 300 baud modem, RS232, optional printer, TRSDOS 2.3 or LDOS 5.0) retrieves stock, bond, option, and T-Bill prices from Dow Jones Service. Stores symbols in data statements and returned prices & volumes on disk in data file. Automatically disconnects. **Does not need a terminal program.** Dates & times are logged for reconciling service bill. Available either for independent operation ($52.00 + $3.00 shipping) or for use with SMAS (**Special 1984 combination offer:** Only $199.95 + $6.00 shipping for SMAS 2.0 and Nebula together).*

ANDROMEDA STOCK TRADER & CALCULATOR

Andromeda records transactions, including purchase/sale prices & dates, dividends, total cost & net realization. Andromeda does not use special commands. **Learning time is nil.** When positions are closed, it posts transactions to the sales file. Reports include Active Security and Security Sales Summaries, Portfolio Summary, and a summary table (either 80 or 132 col.) for use with IRS Schedule D. Requires TRS-80 Model I, 48K, one drive with TRSDOS 2.3 or LDOS 5.0. Andromeda is regularly only $51.95 plus $3.00 shipping.

*Remittance by VISA, MASTERCARD, cashier's check, or M.O. brings prompt shipment. Shipment is made after personal checks clear (about 3 weeks). Software is sent insured.

'92

SPIRAL ENTERPRISES

Phone your order now: (817) 441-8901

P.O. Box 5219, Fort Worth, TX 76108
308 Crown Road, Willow Park, TX 76086

SPIRAL ENTERPRISES IS REGISTERED WITH THE S.E.C. AS AN INVESTMENT ADVISOR

N−2	N−1	N	N+1	N+2
variable name byte 1	variable name byte 2	length of string	low-order address of string	high-order address of string

Figure. Numeric variable storage.

Key	Function
Enter	Prints out
Clear	Saves screen
Shift-clear	Clears screen and starts over
Shift/up-arrow	Moves up one line
Down arrow	Moves down one line
Shift/right-arrow	Advances one space
Shift/left-arrow	Backs up one space
Right arrow	Tabs eight spaces
Left arrow	Deletes

Table. Command descriptions.

Running the Sample Program

My scaled-down screen editor sample uses strings to capture the screen contents (see Program Listing 2). Though editing is possible with this technique, my demonstration program doesn't support it.

To run the sample screen editor, familiarize yourself with the key instructions (see the Table), press any key, and wait for the top line to clear to the word "Begin." Then start typing and get the idea of what the cursor keys do. You can type anywhere on the screen at

Program Listing 1. Loop for string lengths and addresses.

```
20 I%=15296:'
30 FOR J=1 TO 16:'
40 POKE VARPTR( A$(J) ),64:'
50 I%=I% + 64:'
60 POKE VARPTR( A$(J) )+1,PEEK( VARPTR(I%) ):'
70 POKE VARPTR( A$(J) )+2, PEEK( VARPTR(I%)+1 ):'
80 NEXT J:'
```

End

Program Listing 2. Screen editor sample.

```
10 '================================================
11 '            SAMPLE SCREEN-EDITOR,               *
12 '    DEMONSTRATING ONE USE FOR THE SCREEN-       *
13 '    TO STRING ALGORITHM DESCRIBED IN THE        *
14 '              MANUSCRIPT                        *
15 '================================================
20 '
30 '----  GREGG WEISSMAN            1-16-83  --------
35 '
45 CLS:PRINT@70,"SIMPLE BASIC SCREEN-EDITOR USING SCREEN/STRING
ARRAY"
46 PRINT:PRINT"YOU CAN STORE UP TO 3 SCREENS OF TEXT, AND THEN P
RINT THE":PRINT"TEXT TO YOUR LINE PRINTER.  YOU MUST SAVE EACH S
CREEN OF":PRINT"TEXT BEFORE THE SCREEN SCROLLS, OR THE TOP LINE
WILL BE LOST"
47 PRINT"TO GO DIRECTLY TO PRINT-OUT, TYPE <ENTER>. TO SAVE THE
SCREEN":PRINT"TYPE <CLEAR>. TO CLEAR SCREEN & START OVER TYPE <S
HIFT-CLEAR>":PRINT"<SHIFT UP ARROW>=MOVE UP ONE LINE. <DOWN ARRO
W>=DOWN ONE LINE"
48 PRINT"<SHIFT RIGHT ARROW>=ADVANCE ONE. <SHIFT LEFT ARROW>=BAC
K ONE":PRINT"<RIGHT ARROW>=ADVANCE 8. <LEFT ARROW>=DELETE. WHEN
READY,":PRINT"STRIKE ANY KEY.";
50 '
60 '
70 IFINKEY$=""THEN70
90 '
------   INITIALIZE THE ENTIRE PROGRAM VARIABLE LIST  ------

100 CLEAR 5000:DEFINT I-N:I=0:J=0:K=0:L=15296:M=64:N=0
110 I$="#";C$=CHR$(9)+CHR$(10)+CHR$(31)+CHR$(91)+CHR$(13)
115 DIM A$(16),B$(49)
120 CLS:PRINT"WHEN THE CURSOR APPEARS YOU MAY BEGIN"
125 '
130 N=VARPTR(L):FORI=1TO16:K=VARPTR(A$(I))
140 L=L+M:POKE K,M:POKE K+1,PEEK(N):POKE K+2,PEEK(N+1)
150 NEXT
160 '------------ A$ ARRAY NOW LOOKS AT SCREEN  ---------
165 N=0:L=1:' --- SET UP N AS PAGE CONT-1, L AS LINE COUNTER
170 '
```

Listing 2 continued

will. When the first screen fills, press the clear key; the screen clears and prints the second screen message. Continue typing until you want to print out or fill up three screens, whichever comes first.

When you fill three screens, the program asks if you want to print. If you don't, the program presents you with the first screen again. If you do want to print, or if you initiated printing by depressing the enter key earlier, the program asks how many spaces to indent each line, how many lines per page to allocate, and then line-prints the stored text.

That's all there is to it. After the program prints your screen, it returns to page 1, and you can continue to enter and print more text.

One word of caution: using the format

```
A$(3)= "123" +
```

changes the pointer and counter for the A$ element so that it no longer points to the video screen. You'd have to re-POKE the proper parameters to restore the screen-saving function.

Variations on a Theme

I wrote the code in lines 10–80 in the subroutine in Program Listing 1 with clarity in mind. For maximum speed and minimum space, try the version in Program Listing 3.

Another program variation is to include only a portion or window of the screen for storage. Setting up eight array elements produces the top half of the screen; setting N = 32 in line 10 and changing line 30 to read K = K + N + N gives you only half of the screen. Setting K = 15328 and N = 32 as in the last modification results in the right half of the screen. You can easily think of other options. ■

You can contact Gregg Weissman at C.N.P. Inc., 72 Fifth Ave., Suite 602, New York, NY 10011.

Listing 2 continued

```
-------------------------------------------------------------
                    THE EDITOR LOOPS
                         HERE
-------------------------------------------------------------
180 N=N+1:IF N=4 THEN PRINT"SCREEN STORAGE IS FULL! ";:GOTO500
190 PRINT@0,"SCREEN # ";N;STRING$(12,32);:FORI=1TO1200:NEXT:PRIN
T@0,STRING$(32,32);:PRINT@0,CHR$(14);
195 '
200 FORI=0TO1STEP0:I$=INKEY$:IFI$=""THENNEXTELSEIFI$>=" "ANDI$<=
"Z"THENPRINTI$;CHR$(14);:NEXT
210 FORJ=1TO6:IFI$><MID$(C$,J,1)THENNEXTJ:PRINTI$;CHR$(14);:NEXT
215 '
220 ON J GOTO 230,240,250,270,510
225 '
230 PRINTSTRING$(8,25);CHR$(14);:NEXTI:' QUICK WAY ACROSS SCREEN

240 PRINTCHR$(26);CHR$(14);:NEXTI:' LINE FEED W/OUT CARRIAGE RET
250 IFPEEK(14464)><0THENCLS:GOTO190:'  IF <SHIFT><CLEAR>
255 '
260 PRINTCHR$(15);"";:FORI=1TO16:B$(L)=A$(I):L=L+1:NEXT:CLS:GOTO
180
270 PRINTCHR$(27);CHR$(14);:NEXTI
280 '
400 '=================   END EDITOR LOOP  ====================
410 '
------  HERE IS AS SIMPLE A LINE-PRINTER OUTPUT YOU CAN GET:
500 PRINT"DO YOU WISH TO PRINT?";:FORI=0TO1STEP0:I$=INKEY$:IFI$=
"N"THENCLS:GOTO165 ELSEIFI$><"Y"THENNEXT
505 GOTO520
510 FORI=1TO16:B$(L)=A$(I):L=L+1:NEXT:'  THIS ENTRY POINT IF
                                          COMING FROM <RETURN>
515 '
520 CLS:INPUT"LEFT MARGIN";J:INPUT"LINES PER PAGE";N:M=N
530 FORI=1 TO L:IF I><N AND I><1 THEN540 ELSE LPRINTCHR$(12):N=N
+M
540 LPRINTTAB(J);B$(I)
550 NEXT
560 PRINT"PRINTING COMPLETE !":GOTO165
```

End

Program Listing 3. Subroutine modification.

```
10 DEFINT I-N:I=0:J=0:K=15296:L=0:N=64:DIM A$(16)
:J=VARPTR(K)
20 FOR I=1 TO 16:L=VARPTR(A$(I))
30 POKE L,N:K=K+N:POKE L+1,PEEK(J):POKE L+2,PEEK(J+1)
40 NEXT
50 '- - -END SET-UP A$- - -
```

End

Join the parade to

Micro-Ed

educational software

Send for free catalogs
- TRS-80 Color Computer
- TRS-80 Model III

telephone us at
1-800-MICRO-ED

Micro-Ed Inc.
P.O. Box 444005
Eden Prairie, MN 55344

434

See List of Advertisers on Page 227

ROUTINE ACCESS

You're no longer limited to a single USR routine in Level II Cassette Basic. This utility gives you access to up to 10 such routines.

You can make your Level II tape- or stringy floppy-based system more powerful than it is now with access to up to 10 USR routines. Normally, this number of routines is available only with machine-language patches or through Disk Basic. But with the utility presented here, you can invoke the routines through Level II Basic itself.

Standard Level II Basic allows only one USR. You POKE the entry address of your machine-language routines into memory locations 16526 and 16527 (408E hexadecimal [hex] and 408F hex). If you want to use more than one routine—say a search routine and a sort routine—you have to POKE the entry address each time you change from one routine to the other. It would be easier (and would often save memory) to POKE the entry addresses for several routines simultaneously and then call them when necessary.

Words	POKE Locations
CVI	16723 16724
CVS	16729 16730
CVD	16735 16736
EOF	16738 16739
LOC	16741 16742
LOF	16744 16745
MKI$	16747 16748
MKS$	16750 16751
MKD$	16753 16754
(USR	16526 16527)

Table 1. Disk Basic words and POKE locations.

The Key Box

Model I and III
16K Cassette Basic

Disk Basic Words

If you're familiar with Disk Basic, or if you've ever looked at a program written for disk, you've noticed a number of Basic words that aren't used in Level II Basic. Level II ROM recognizes Disk Basic words like CVI, LOC, and CVS. It even sets aside a table of addresses for them in RAM. But the code that implements these Basic words isn't there. If you attempt to use them in your program you'll get an L3 error (Disk Basic only).

It's these Disk Basic words that let you access multiple USR routines. The key is the table of jump addresses in RAM located between 16722 and 16805 (4152 hex to 41A5 hex).

Three bytes represent each Disk Basic word. Initially, these all contain a jump to the ROM routine that prints the L3 error message. If you POKE a different address into the proper place (see Table 1), you can use many of these Disk Basic words and their syntax just like USR. For example, instead of:

```
100 POKE 16526,44: POKE 16527,2: X=USR(0)
```

you can use:

```
100 POKE 16723,44: POKE 16724,2: X=CVI(0)
```

These two program lines produce the same effect, including passing variables to and from the routine if necessary. Try it. Take any program you have that uses USRs. Change every occurrence of POKE 16526 to POKE 16723. Change POKE 16527 to POKE 16724. Finally, change USR to CVI. Run the program. If you didn't make any typing errors, it should work exactly as before.

Table 1 lists all the POKE locations for the Disk Basic words that work exactly like USR. Together with the USR this makes for 10 possible machine-language routines in a Level II program. To use any of them, simply substitute the locations given and POKE in the same value you would have POKEd into 16526 and 16527. Then use the Disk Basic word instead of the USR.

The Listings

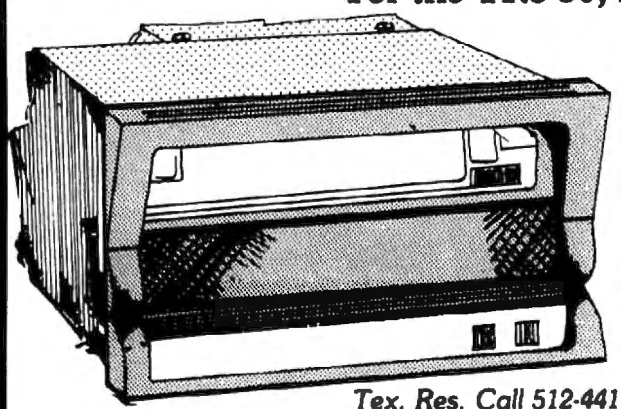
Program Listing 1 substitutes the Disk Basic words for USR. Line 10 POKEs a 7-byte machine-language routine into the Remark line. All the routine does is take the number you pass to it, double it, and return it—showing

MICRO DESIGN INTRODUCES

REMOVABLE

WINCHESTER HARD DISK SYSTEM

For the TRS-80, IBM & Apple Computer



FEATURES

- *Approximately nine times faster than standard floppy disk drives*
- *Mix & Match Fixed & Removable drives for a custom system*
- *Up to 45 megabyte on-line storage* • *Built-in error detection & correction.*

Starting At **$1799.95**

MICRO DESIGN

6301 Manchaca Rd. Suite B • Austin, TX 78745

Tex. Res. Call 512-441-7890

1-800-531-5002

UPGRADE

Micro-Designs System-Upgrade for the TRS Model III and 4

The Micro-Design TRS-80 upgrade includes Micro-Design's exceptional MDX-6 disk controller board, one 40 Track Disk Drive, necessary installation cables and hardware. Will also control external 8" Disk Drive Systems.

FOR MORE INFORMATION & FREE LITERATURE
CALL OR WRITE

MICRO-DESIGN
6301 Manchaca Road, Suite B
Austin, Texas 78745

TOLL FREE
1-800-531-5002
Texas Res. call 512-441-7890

$399.00

463

See List of Advertisers on Page 227

that you can pass variables back and forth to a machine-language routine using the Disk Basic words.

Program Listing 2 is a short routine to save and restore your screen. It was written by Hubert C. Borrmann and appeared in the February 1981 issue of *80 Microcomputing* (p. 236). I have rewritten it slightly to make use of the Disk Basic words and to allow for 32K and 48K machines.

More Routines

Another useful machine-language routine is built into the Level II ROM at memory location 0556 (022C hex). (The LSB = 2 and the MSB = 44.) This routine blinks an asterisk on and off in the upper right-hand corner of the screen. If your program requires much time to swap strings or read data statements, you can use this time to ascertain if the computer is operating and not stuck in an endless loop. Just add a line like this to your program:

100 POKE 16723,44: POKE 16724,2

Then insert

<any variable> = CVI(0)

in your loops. For example:

110 FOR X = 0 TO 500: B = CVI(0):
READ B: POKE AD + X,B: NEXT

You can use many routines without any knowledge of Assembly language by POKEing from data statements within your Basic program.

If you are using Cassette Basic, you should limit yourself to the shorter routines which you can POKE from within your Basic program. Having to load a long system tape before loading your Basic program probably wouldn't be worth the effort.

However, the Entrepo Stringy Floppy and some of the fast tape programs let you load machine-language programs from within your Basic program. In this case you can create your machine-language file using the editor/assembler or by POKEing it into memory and save it to tape or a stringy floppy wafer separate from your Basic program.

I am using this method regularly with a long mailing list program I wrote. The program uses Disk Basic words to access sort, search, string compression, and input routines—merrily passing string pointers, and so on, back and forth. I have yet to run into a problem using the Disk Basic words from the table instead of USR. ■

Contact Wayne King at 36 Sickles St., Apt. 2D, New York, NY 10040.

Program Listing 1. USR demonstration.

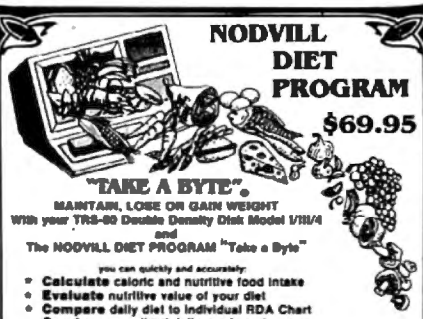
```
10 '1234567
20 CLS: DEFINT A-Z
30 L=PEEK (16548) + 256*PEEK (16549) + 7
40 FOR X=0 TO 6: READ B: POKE L+X,B: NEXT
50 DATA 205,127,10,41,195,154,10
51 ' CALL     0A7FH
52 ' ADD      HL,HL
53 ' JP       0A9AH
60 MS = INT (L/256):LS = L-256*MS
70 FOR X=1 TO 10
80 READ U: POKE U,LS: POKE U+1,MS: NEXT
90 DATA 16526, 16723, 16729, 16735, 16738
100 DATA 16741, 16744, 16747, 16750, 16753
110 INPUT "NUMBER BETWEEN -32768 AND 32767"; X1
120 IF X1 <-32768 OR X1 >32767 THEN 110 ELSE X=X1
130 PRINT USR(X)
140 PRINT CVI(X)
150 PRINT CVS(X)
160 PRINT EOF(X)
170 PRINT LOC(X)
180 PRINT LOF(X)
190 PRINT MKI$(X)
200 PRINT MKS$(X)
210 PRINT MKD$(X)
220 GOTO 110
```

End

Program Listing 2. Save and restore screen.

```
1 '* SAVE & RESTORE SCREEN *
2 '     By Hubert Borrmann
3 '     80 Microcomputing February 1981 page 236
4 '* Revisions by Wayne A. King
5 '               36 Sickles St. Apt. 2D
6 '               New York NY 10040
7 '    To allow use of EOF & LOF
8 '    and provision for 32K and 48K
9 '*** Set MEMORY SIZE 31699-16K  48083-32K  64467-48K ***
10 CLS:GOSUB 1000
20 FOR Y=6 TO 46 STEP 2
30 FOR X=0 TO 126 STEP 2
40 SET(X,Y)
50 NEXT:NEXT
60 FOR Y=47 TO 6 STEP -4
70 FOR X=127 TO 0 STEP -4
80 SET(X,Y)
90 NEXT:NEXT
100 PRINT " We Have Saved This Pattern" CHR$(30);:X=EOF(0)
110 FOR X=0 TO 1000
120 IF INKEY$=""NEXT
130 CLS: PRINT "Press Key To Restore Old Screen"
140 IF INKEY$<>"" X=LOF(X): GOTO 110
150 X=LOC(0): GOTO 140
995 '     *** SAVE & RESTORE SCREEN SUBROUTINE ***
996 '  * 16K Version
997 '  * FOR 32K LC=48084-65536
998 '  * 48K LC=64468-65536
1000 LC=31700
1010 FOR X=0 TO 23
1020 READ B: POKE LC+X,B:NEXT
1030 DATA 33,0,60,17,254
1036 '  * Change Next Line
1037 '  * FOR 32K 'DATA 187'
1038 '  * FOR 48K 'DATA 251'
1040 DATA 123
1050 DATA 1,0,4,237,176,201,33,254
1056 '  * Change next line
1057 '  * FOR 32K 'DATA 187'
1058 '  * FOR 48K 'DATA 251'
1060 DATA 123
1070 DATA 17,0,60,1,0,4,237,176,201
1079 '    EOF=SAVE SCREEN
1080 POKE 16738,212
1090 POKE 16739,123 :' * 32K,187   48K,251
1099 '    LOF=RESTORE SCREEN
1100 POKE 16744,224
1110 POKE 16745,123 :' * 32K,187 48K,251
1119 '    LOC=BLINK ASTERISK
1120 POKE 16741,44
1130 POKE 16742,2
1140 RETURN
1141 '          * Change the indicated lines for 32K or 48K
1142 '          Type in with AUTO
1143 '          Leave out remarks and odd numbered lines
```

End



NODVILL DIET PROGRAM

$69.95

"TAKE A BYTE"®

MAINTAIN, LOSE OR GAIN WEIGHT
With your TRS-80 Double Density Disk Model I/III/4
and
The NODVILL DIET PROGRAM "Take a Byte"

you can quickly and accurately:

- **Calculate** caloric and nutritive food intake
- **Evaluate** nutritive value of your diet
- **Compare** daily diet to individual RDA Chart
- **Create** personalized daily meals and menus
- **Plan** varied daily menus based on sound nutrition
- **Save** records of daily meals and menus for future planning
- **Print** nutrition charts, food, meal, menu and grocery lists

"Take a Byte" is a Modular **BASIC** Program

MAIN Program Menu

(1) Recommended Daily Dietary Allowance (RDA) CHART
(2) 733 Expandable Random Access FOOD LIST Data File
(3) 28 Nutritional MEAL LIST Data File Examples
(4) 7 Balanced DAILY MENU LIST Data File Examples
(5) GROCERY LIST Program Module
(6) 25 Page USER'S MANUAL including Charts and Tables

ALL Data Files can be EXPANDED and MODIFIED automatically and flexibly to reflect your personal diet, your choices of diet food, or your doctor's suggested diet.

For more information: Call: (203) 431-0449
To Order: Mail a check or money order for $69.95 to:

NODVILL Software
24 Nod Road
Ridgefield, Conn. 06877

TRS-80 is a Trademark of the Tandy Corporation

✓54

DISK BACKUP, ALL DOS'S*, MODELS I, III, 4

1 OR MORE MEGABYTE OF DISK IMAGES ON A STANDARD C-60 CASSETTE TAPE, HELPS SAVE MONEY AND GIVES SECURITY FOR YOUR SOFTWARE INVESTMENT

JUST PLUG IT IN AND BOOT!

*Except Model I R/S Double Density Board TRSDOS 2.7

Tokenizes "Not Used" Sectors and Does Not Store Them on Tape. This Speeds up Thoughtput, as an Example Store a Clean Data Disk 40 Tracks 18 Sectors Per Track on About 1 Minute of Tape. Worst Case Conditions all Sectors "Used" is About 12 Minutes. Beta-DTS Automatically Stores a Disk on Cassette Tape, and Automatically Retrieves a Disk From Cassette Tape with Formatting of Destination Disk. Beta-DTS is Easy to Use. You Don't Have to Know How Many Tracks or Sectors on the Disk, or the Density. Beta-DTS Figures it out. Just Plug it in and Boot! Also has Disk to Disk Backup Feature. Comes with Recorder Controller, Ribbon Cable, Power Dupply, Selfboot Operating System Diskette and Manual. Minimum Requirements are Recorder W/Cable, One Disk Drive, 32K of Memory, and Either a Model I, III, 4 TRS80 Computer.

BETA-DTS Model I $109.95 + $3.50 S/H
BETA-DTS MODELS III, 4 $113.95 + $3.50 S/H

BETA ENTERPRISES INC.
14049 Settlement Acres Drive
Cleveland, Ohio 44142
(216) 362-6191

✓25

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 40 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 or Model III Basic ROM

AVAILABLE FOR MODEL 1 & 3

REMASSEM (tape) **$74.95**
REMASSEM (disc) **$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 and 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.

REMSOFT, INC.
571 E. 185 St.
Euclid, Ohio 44119
(216) 531-1338

✓129

SHIPPING CHARGES:
$2.50 WITHIN UNITED STATES
$5.00 CANADA AND MEXICO
OTHER FOREIGN ORDERS ADD 20%
OHIO RESIDENTS ADD 6½% SALES TAX

TRS-80® IS A TRADEMARK OF TANDY CORP.

Radio Shack TRS-80™ Computers

At Guaranteed Savings

from
Pan American Electronics

1117 Conway Ave.
Dept. EM
Mission, Texas 78572
Ph. 512/581-2766
Telex 767339

TO ORDER
CALL TOLL FREE
800-531-7466

Full Line Computers, Printers & Peripherals

✓122

HI-SPEED TAPE FOR MODEL I

Data transfer to/from unmodified CTR-41, CTR-80 or CCR-81 cassette recorders at 7000 baud.

- **SAVE & LOAD Basic programs 12X faster**
- **WRITE & READ system programs Load 12K program in less than 20 sec.**
- **CATALOG tape contents by name/size Six (6) character program/file names**
- **PUT & GET hi-speed interface to Basic Access/store data up to 50X faster**
- **USER'S MANUAL with many examples Requires Level II ROMs**
- **Error correction for high reliability**
- **Uses inexpensive cassette tapes**
- **Does not interfere with 500 baud mode**
- **Switch between hi-speed and normal mode**
- **Assembled & tested — guaranteed**
- **Complete installation instructions**
- **Test programs for checkout**

★ *Complete HHCI Tape System is $49.95 (includes instructions & USER MANUAL)*
★ *USER'S MANUAL separately is $8.95 (credit to purchase of full system)*

HHCI Tape Systems
725 Idlewild Road
Bel Air, MD 21014
1-301-836-7692

✓113

✓56

TRSDOS↔CP/M with REFORMATTER®

Model II users! Convert files between TRSDOS and CP/MI

- **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
- $249.00 from stock.

✓380

CP/M—IBM, TRSDOS—DEC, and CP/M—DEC versions of **REFORMATTER** also available at $350.00 from MicroTech Exports, Inc., 467 Hamilton Ave., Palo Alto, CA 94301
☐ Tel: 415/324-9114 ☐ TWX: 910-370-7457 MUH-ALTOS

✓ See List of Advertisers on Page 227

BRICK by BRICK

by Douglas Payne

Listing 1 continued from p. 72

```
06710           RET     C               ; ERROR IF < 'A'
06720           ADD     A,A             ; DOUBLE FOR WORD OFFSET
06730           CP      LABNUM+LABNUM   ; ERROR IF > 'Z'
06740           CCF
06750           RET                     ; RETURN TO CALLER
06760
06770 ;---------------------------------------------------------
06780 ;       DETERMINE TYPE AND VALUE OF STRING (HL)
06790 ;       RETURNS B = TYPE : 0 = STRING, 1 = NUMERIC
06800 ;                C = LENGTH
06810 ;                DE = NUMERIC VALUE
06820 ;---------------------------------------------------------
06830
06840 EVALOP    EQU     $
06850           PUSH    HL              ; SAVE STRING ADDRESS
06860           CALL    NEXTBL          ; COMPUTE LENGTH
06870           POP     DE
06880           PUSH    DE
06890           OR      A
06900           SBC     HL,DE
06910           LD      B,L             ; B = LENGTH
06920           EX      (SP),HL         ; SAVE LENGTH, TYPE
06930           PUSH    HL              ; HL = ADDRESS
06940           CALL    CVBIN           ; CHECK TYPE, CONVERT
06950           POP     HL              ; RESTORE ADDRESS
06960           POP     BC              ; RESTORE LENGTH, TYPE
06970           RET     C               ; NUMERIC ?
06980           INC     B               ; YES - SET TYPE
06990           RET                     ; RETURN
07000
07010 ;---------------------------------------------------------
07020 ;       DETERMINE TYPE OF RELATIONAL OPERATOR (HL)
07030 ;       RETURNS CS IF ERROR, A = TYPE
07040 ;---------------------------------------------------------
07050
07060 RELOP     EQU     $
07070           PUSH    HL              ; SAVE PTR
07080           LD      E,(HL)          ; GET OPERATOR IN DE
07090           INC     HL
07100           LD      D,(HL)
07110           LD      HL,ROPTAB       ; OPERATOR TABLE
07120           LD      B,6             ; # OPERATORS
07130 OPLOOP    EQU     $
07140           LD      A,(HL)          ; COMPARE
07150           INC     HL
07160           LD      C,(HL)
07170           INC     HL
07180           PUSH    HL
07190           LD      H,C
07200           LD      L,A
07210           OR      A
07220           SBC     HL,DE
07230           POP     HL
07240           JR      Z,OPFND         ; EXIT IF FOUND
07250           DJNZ    OPLOOP          ; LOOP THROUGH TABLE
07260           POP     HL              ; NOT FOUND
07270           SCF                     ; INDICATE ERROR
07280           RET                     ; RETURN
07290
07300 OPFND     EQU     $
07310           LD      DE,ROPTAB+2     ; COMPUTE TYPE
07320           SBC     HL,DE
07330           LD      A,L             ; GET TYPE
07340           POP     HL              ; RESTORE PTR
07350           RET                     ; RETURN
07360
07370 ;---------------------------------------------------------
07380 ;       NUMERIC COMPARISONS
07390 ;       A = 0, CONDITION CODE SET FROM HL-DE
07400 ;---------------------------------------------------------
07410
07420 NMEQ      EQU     $               ; EQUALS
07430           RET     NZ
07440           CPL
07450           RET
07460
07470 ;---------------------------------------------------------
07480
07490 NMNE      EQU     $               ; NOT EQUALS
07500           RET     Z
07510           CPL
07520           RET
07530
07540 ;---------------------------------------------------------
07550
07560 NMGT      EQU     $               ; GREATER THAN
07570           RET     C
07580           RET     Z
07590           CPL
07600           RET
07610
07620 ;---------------------------------------------------------
07630
07640 NMLT      EQU     $               ; LESS THAN
07650           RET     NC
07660           CPL
07670           RET
07680
07690 ;---------------------------------------------------------
07700
07710 NMGE      EQU     $               ; GREATER THAN OR EQUALS
07720           RET     C
07730           CPL
07740           RET
07750
07760 ;---------------------------------------------------------
07770
07780 NMLE      EQU     $               ; LESS THAN OR EQUALS
07790           JR      Z,CCLE1
07800           RET     NC
07810 CCLE1     EQU     $
07820           CPL
07830           RET
07840
07850 ;---------------------------------------------------------
07860 ;       STRING COMPARISONS
07870 ;---------------------------------------------------------
```

Listing 1 continued

Listing 1 continued

```
07880
07890 STEQ    EQU     $               ; EQUALS
07900         LD      A,B             ; EQ IFF LENGTHS EQUAL
07910         CP      C
07920         LD      A,0
07930         RET     NZ
07940         LD      B,A
07950 EQLOOP  EQU     $
07960         LD      A,(DE)
07970         INC     DE
07980         CPI
07990         LD      A,0
08000         RET     NZ
08010         JP      PE,EQLOOP
08020         CPL
08030         RET
08040
08050 ;---------------------------------------------------------
08060
08070 STNE    EQU     $               ; NOT EQUALS
08080         CALL    STEQ            ; NE IS INVERSE OF EQ
08090         CPL
08100         RET
08110
08120 ;---------------------------------------------------------
08130
08140 STLT    EQU     $               ; LESS THAN
08150         PUSH    BC              ; SAVE LENGTHS
08160         LD      A,B             ; GET SMALLER LENGTH
08170         CP      C
08180         JR      NC,STLT1
08190         LD      C,B
08200 STLT1   EQU     $
08210         LD      B,C
08220         CALL    STEQ            ; SMALLER SEGMENTS EQ ?
08230         OR      A
08240         JR      NZ,STLT2
08250         POP     BC              ; NO - RESTORE LENGTHS
08260         DEC     HL
08270         DEC     DE              ; COMPARE UNEQUAL CHARS
08280         LD      A,(DE)
08290         CP      (HL)
08300         LD      A,0
08310         RET     C               ; NOT LT
08320         CPL
08330         RET                     ; LT
08340 STLT2   EQU     $
08350         POP     BC              ; SMALLER SEGMENTS ARE =
08360         LD      A,B             ; WHICH WAS LONGER ?
08370         SUB     C
08380         RET     Z               ; NOT LT IF EQUAL LENGTH
08390         LD      A,0
08400         RET     NC              ; NOT LT IF STR1 LONGER
08410         CPL
08420         RET                     ; LT IF STR2 LONGER
08430
08440 ;---------------------------------------------------------
08450
08460 STGT    EQU     $               ; GREATER THAN
08470         PUSH    HL              ; SAVE REGS
08480         PUSH    DE
08490         PUSH    BC
```

Listing 1 continued

MODEL-16 FORTRAN-77

TriSoft is pleased to announce the availability of SVS FORTRAN-77 under TriSoft CP/M-68K for the Radio Shack Model-16 computer. This FORTRAN implements the full ANSI-77 standard and is not the subset FORTRAN-77 available on most mircrocomputers.

Full ANSI-77 FORTRAN on a 68000 based computer gives the user the power and flexibility of a mainframe computer at a fraction of the cost. FORTRAN has been the primary language for scientific, mathematical and statistical applications for many years. A vast wealth of programs already exist for a variety of applications but require a mainframe environment. FORTRAN-77 running under TriSoft CP/M-68K provides a suitable environment to allow the user to take advantage of these programs.

In addition to supporting the full ANSI-77 standard, the FORTRAN package allows you to link in routines written in DRI 'C' and 68000 Assembly languages.

SVS FORTRAN-77 is a native code compiler. This combined with the efficiency with which it was designed provides very fast execution speeds.

TriSoft
4102 Avenue G
Austin, Texas 78751
(512) 453-2233
(800) 531-5170

FORTRAN-77	$495.00
CP/M-68K	$395.00
68K-BASIC	$299.00
Pickles & Trout	CP/M 2.2

VISA MasterCard

CP/M-68K™ Digital Research
Model-16™ Tandy

227

```
08500           CALL    STLT            ; LT ?
08510           POP     BC
08520           POP     DE
08530           POP     HL
08540           CPL
08550           OR      A
08560           RET     Z               ; YES - NOT GT
08570           CALL    STEQ            ; EQ ?
08580           CPL                     ; YES - NOT GT
08590           RET                     ; OTHERWISE GT
08600
08610 ;---------------------------------------------------------
08620
08630 STLE      EQU     $               ; LESS THAN OR EQUALS
08640           CALL    STGT            ; LE IS INVERSE OF GT
08650           CPL
08660           RET
08670
08680 ;---------------------------------------------------------
08690
08700 STGE      EQU     $               ; GREATER THAN OR EQUALS
08710           CALL    STLT            ; GE IS INVERSE OF LT
08720           CPL
08730           RET
08740
08750 ;---------------------------------------------------------
08760 ;         &N ARG PROCESSING
08770 ;         (BC) = LINE PTR
08780 ;         (HL) = COMMAND TEXT AREA
08790 ;         (DE) = COMMAND TEXT END
08800 ;         RETURNS CS IF <CR> FOUND OR TEXT FULL
08810 ;---------------------------------------------------------
08820
08830 CHKARG    EQU     $
08840           LD      A,(BC)          ; GET NEXT CHARACTER
08850           INC     BC              ; POINT PAST IT
08860           CP      CR              ; RETURN CS IF <CR>
08870           SCF
08880           RET     Z
08890           CP      '0'             ; IS IT A DIGIT ?
08900           JR      C,NOTDIG
08910           CP      '9'+1
08920           JR      NC,NOTDIG
08930           SUB     '0'             ; YES - MAKE IT BINARY
08940           PUSH    BC              ; SAVE POINTERS
08950           PUSH    HL
08960           LD      HL,PARMS        ; INDEX TO &N PARM
08970           OR      A               ; HAVE IT IF &0
08980           JR      Z,GOTPRM
08990           LD      BC,PRMLEN+1
09000 GETPRM    EQU     $
09010           ADD     HL,BC           ; POINT TO NEXT PARM
09020           DEC     A               ; &N TIMES
09030           JR      NZ,GETPRM
09040 GOTPRM    EQU     $
09050           LD      B,H             ; POINT TO PARM STRING
09060           LD      C,L
09070           POP     HL              ; RESTORE TEXT PTR
09080 CPYPRM    EQU     $
09090           LD      A,(BC)          ; COPY PARM STR TO TEXT
09100           OR      A               ; UNTIL ZERO BYTE
09110           JR      Z,CPYDON
09120           LD      (HL),A
09130           INC     BC              ; ADJUST PARM PTR
09140           CALL    INCPTR          ; ADJUST TEXT PTR
09150           JR      NC,CPYPRM       ; LOOP IF NOT FULL
09160 CPYDON    EQU     $
09170           POP     BC              ; RESTORE LINE PTR
09180           RET                     ; RETURN TO CALLER
09190 NOTDIG    EQU     $
09200           CP      '&'             ; DOUBLE '&' ?
09210           JR      Z,SAVCHR        ; YES - JUST STORE ONE
09220           LD      (HL),'&'        ; NO - STORE LITERAL '&'
09230           CALL    INCPTR          ; ADJUST PTR
09240           RET     C               ; RETURN IF TEXT FULL
09250 SAVCHR    EQU     $
09260           LD      (HL),A          ; STORE TEXT CHARACTER
09270           JP      INCPTR          ; ADJUST PTR & RETURN
09280
09290 ;---------------------------------------------------------
09300 ;         KEYBOARD DRIVER REPLACEMENT
09310 ;---------------------------------------------------------
09320
09330 KBDINT    EQU     $
09340           LD      IX,FLAGS        ; POINT TO FLAGS BYTE
09350           BIT     NKBDPR,(IX+0)   ; NORMAL KEYBOARD ?
09360           JR      NZ,KBNORM       ; YES - BYPASS THIS
09370 CHKEOF    EQU     $
09380           BIT     EOF,(IX+0)      ; END-OF-FILE ?
09390           JR      NZ,KBNORM       ; YES - USE NORMAL DRIVER
09400           BIT     HAVTXT,(IX+0)   ; TEXT AVAILABLE ?
09410           JR      NZ,GETTXT
09420           CALL    PRCLIN          ; NO - PROCESS NEXT LINE
09430           CALL    CHKCTL          ; CHECK IF CTL STMT
09440           JR      C,CHKEOF        ; GET NEXT LINE IF SO
09450           SET     HAVTXT,(IX+0)
09460           LD      (TXTPTR),HL     ; SAVE TEXT ADDRESS
09470           JR      CHKEOF          ; RE-HANDLE
09480 GETTXT    EQU     $
09490           BIT     STACK,(IX+0)    ; HAVE STACKED LINE ?
09500           JR      Z,KBNORM        ; NO - USE NORMAL DRIVER
09510           LD      HL,(TXTPTR)     ; GET NEXT TEXT BYTE
09520           LD      A,(HL)
09530           INC     HL              ; ADJUST PTR
09540           LD      (TXTPTR),HL
09550           CP      CR              ; <CR> OR <BREAK> ?
09560           JR      Z,TXTEND
09570           CP      BREAK
09580           JR      NZ,KBDRET
09590 TXTEND    EQU     $
09600           RES     HAVTXT,(IX+0)   ; YES - END OF TEXT LINE
09610 KBDRET    EQU     $
09620           RET                     ; RETURN CHARACTER
09630
09640 ;         NORMAL KEYBOARD DRIVER
09650
09660 KBNORM    EQU     $
09670           LD      HL,(KBDSAV)     ; GET DRIVER ADDRESS
09680           JP      (HL)            ; GO TO IT
09690
09700 ;---------------------------------------------------------
09710 ;         DOS ERROR CALL HANDLER
09720 ;---------------------------------------------------------
09730
```

```
09740 ERTRAP  EQU     $
09750         PUSH    HL
09760         SET     6,A             ; FORCE DETAILED MESSAGE
09770         BIT     ERQUIT,(HL)     ; QUIT ON ERROR
09780         JR      Z,CHKERR
09790         SET     7,A             ; YES - FORCE END
09800         LD      HL,EXEND
09810         EX      (SP),HL
09820         JR      ERRSAV
09830 CHKERR  EQU     $
09840         POP     HL
09850         BIT     7,A             ; RETURN TO CALLER ?
09860         JR      NZ,ERRSAV       ; YES - LET IT THROUGH
09870         SET     7,A             ; NO - FORCE RET TO ME
09880         LD      HL,EXMAIN
09890         PUSH    HL
09900 ERRSAV  EQU     $
09910         DEFS    4               ; ERR ROUTINE SAVED HERE
09920
09930 ;---------------------------------------------------------
09940 ;       DOS COMMAND HANDLER, NO RETURN
09950 ;---------------------------------------------------------
09960
09970 CMTRAP  EQU     $
09980         PUSH    HL
09990         LD      HL,EXMAIN       ; FORCE RETURN TO ME
10000         EX      (SP),HL
10010         JP      CMDDOS          ; USE RETURN HANDLER
10020
10030 ;---------------------------------------------------------
10040 ;       READ NEXT RECORD FROM /EXE FILE
10050 ;       (HL) = RECORD BUFFER, (DE) = BUFFER END
10060 ;       (IX) = FLAGS BYTE
10070 ;       RETURNS CS IF ERROR, A = ERROR CODE
10080 ;       (HL) = END-OF-RECORD + 1
10090 ;       SETS EOF FLAG IF END-OF-FILE
10100 ;---------------------------------------------------------
10110
10120 GETREC  EQU     $
10130         CALL    GETBYT          ; GET A BYTE
10140         JR      C,GETEND        ; DONE IF ERROR
10150         CP      CR              ; DONE IF <CR>
10160         JR      Z,GETEND
10170         LD      (HL),A          ; STORE IN BUFFER
10180         CALL    INCPTR          ; ADJUST PTR
10190         JR      NC,GETREC       ; GET NEXT IF NOT FULL
10200 FLUSH   EQU     $
10210         CALL    GETBYT          ; FLUSH REST OF RECORD
10220         JR      C,GETEND        ; DONE IF ERROR
10230         CP      CR              ; UNTIL NEXT <CR>
10240         JR      NZ,FLUSH
10250 GETEND  EQU     $
10260         LD      (HL),CR         ; ADD <CR> TO RECORD
10270         INC     HL              ; INCREMENT PTR
10280         RET     NC              ; RETURN IF NO ERROR
10290         CP      FILEOF          ; END-OF-FILE ?
10300         JR      Z,GETEOF
10310         CP      FILEOF+1
10320         SCF
10330         RET     NZ              ; NO - REAL ERROR
10340 GETEOF  EQU     $
10350         SET     EOF,(IX+0)
10360         OR      A               ; CLEAR CARRY
10370         RET                     ; RETURN TO CALLER
10380
10390 ;---------------------------------------------------------
10400 ;       GET NEXT BYTE FROM /EXE FILE
10410 ;       RETURNS A = BYTE, CS IF ERROR
10420 ;---------------------------------------------------------
10430
10440 GETBYT  EQU     $
10450         PUSH    DE              ; SAVE REGISTER
10460         LD      DE,EXEDCB       ; GET BYTE
10470         CALL    GET
10480         SCF
10490         JR      NZ,GETDON       ; EXIT CS IF ERROR
10500         AND     7FH             ; CLEAR HIGH BIT, CARRY
10510 GETDON  EQU     $
10520         POP     DE              ; RESTORE REGISTER
10530         RET                     ; RETURN TO CALLER
10540
10550 ;---------------------------------------------------------
10560 ;       FIND NEXT WORD IN STRING (HL)
10570 ;       RETURNS A = NEXT CHAR, CS IF <CR> FOUND
10580 ;---------------------------------------------------------
10590
10600 NEXTWD  EQU     $
10610         CALL    NEXTBL          ; FIND NEXT BLANK
10620         CALL    NC,SKIPBL       ; SKIP TO NEXT WORD
10630         RET                     ; RETURN TO CALLER
10640
10650 ;---------------------------------------------------------
10660 ;       FIND NEXT BLANK OR TAB IN STRING (HL)
10670 ;       RETURNS A = NEXT CHAR, CS IF <CR> FOUND
10680 ;---------------------------------------------------------
10690
10700 NEXTBL  EQU     $
10710         CALL    CHKBL           ; CHECK NEXT CHARACTER
10720         RET     C               ; RETURN IF <CR>
10730         RET     Z               ; RETURN IF BLANK OR TAB
10740         INC     HL              ; INCREMENT PTR
10750         JR      NEXTBL          ; LOOP
10760
10770 ;---------------------------------------------------------
10780 ;       SKIP OVER BLANKS AND TABS IN STRING (HL)
10790 ;       RETURNS A = NEXT CHARACTER, CS IF <CR> FOUND
10800 ;---------------------------------------------------------
10810
10820 SKIPBL  EQU     $
10830         CALL    CHKBL           ; CHECK NEXT CHARACTER
10840         RET     C               ; RETURN IF <CR>
10850         RET     NZ              ; RETURN IF NOT BLANK
10860         INC     HL              ; INCREMENT PTR
10870         JR      SKIPBL
10880
10890 ;---------------------------------------------------------
10900 ;       CHECK NEXT CHARACTER IN STRING (HL)
10910 ;       RETURNS A = CHARACTER
10920 ;       RETURNS CS IF <CR>
10930 ;       RETURNS ZS IF BLANK OR TAB
10940 ;---------------------------------------------------------
10950
```

```
10960 CHKBL   EQU     $
10970         LD      A,(HL)          ; GET NEXT CHARACTER
10980         CP      CR              ; RETURN CS IF <CR>
10990         SCF
11000         RET     Z
11010         CP      ' '             ; RETURN ZS IF BLANK ...
11020         RET     Z
11030         CP      TAB             ; ... OR TAB
11040         SCF
11050         CCF
11060         RET
11070
11080 ;-------------------------------------------------------
11090 ;       SKIP LINE #'S IN STRING (HL)
11100 ;       RETURNS A = NEXT CHARACTER, CS IF <CR> FOUND
11110 ;-------------------------------------------------------
11120
11130 SKIPLN  EQU     $
11140         LD      A,(HL)          ; NEXT CHARACTER
11150         CP      CR              ; RETURN CS IF <CR>
11160         SCF
11170         RET     Z
11180         CP      '0'             ; RETURN IF NOT DIGIT
11190         CCF
11200         RET     NC
11210         CP      '9'+1
11220         RET     NC
11230         INC     HL              ; INCREMENT PTR
11240         JR      SKIPLN          ; LOOP
11250
11260 ;-------------------------------------------------------
11270 ;       INCREMENT HL, COMPARE TO DE, RETURN CS IF EQUAL
11280 ;-------------------------------------------------------
11290
11300 INCPTR  EQU     $
11310         INC     HL              ; INCREMENT PTR
11320         PUSH    HL              ; SAVE REGISTER
11330         OR      A               ; COMPARE HL TO DE
11340         SBC     HL,DE
11350         POP     HL              ; RESTORE REGISTER
11360         CCF                     ; SET CONDITION
11370         RET                     ; RETURN TO CALLER
11380
11390 ;-------------------------------------------------------
11400 ;       COPY STRING (HL) TO (DE)
11410 ;       TERMINATED BY BLANK OR <CR>
11420 ;       BC = MAX LENGTH TO COPY
11430 ;       RETURNS CS IF <CR> FOUND
11440 ;-------------------------------------------------------
11450
11460 CPYSTR  EQU     $
11470         CALL    CHKBL           ; CHECK NEXT CHARACTER
11480         RET     C               ; RETURN IF <CR>
11490         RET     Z               ; RETURN IF BLANK
11500         LDI                     ; COPY CHARACTER
11510         JP      PE,CPYSTR       ; UNTIL LENGTH EXHAUSTED
11520         JR      NEXTBL          ; FLUSH REMAINDER, RET
11530
11540 ;-------------------------------------------------------
11550 ;       CONVERT STRING (HL) TO BINARY NUMBER
11560 ;       B = STRING LENGTH
11570 ;       RETURNS RESULT IN DE, CS IF NON-NUMERIC
11580 ;-------------------------------------------------------
11590
11600 CVBIN   EQU     $
11610         EX      DE,HL           ; (DE) = STRING
11620         LD      HL,0            ; ACCUMULATOR
11630         JR      CVGCHR          ; GET 1ST CHARACTER
11640 CVLOOP  EQU     $
11650         LD      A,10            ; ACCUMULATOR * 10
11660         PUSH    DE
11670         CALL    DMULT
11680         POP     DE
11690         LD      C,H
11700         LD      H,L
11710         LD      L,A             ; HL = RESULT
11720         LD      A,C             ; OVERFLOW ?
11730         OR      A
11740         SCF
11750         RET     NZ              ; YES - ERROR
11760 CVGCHR  EQU     $
11770         LD      A,(DE)          ; GET NEXT CHARACTER
11780         INC     DE              ; ADJUST PTR
11790         SUB     '0'             ; MAKE IT BINARY
11800         RET     C               ; ERROR IF NOT DIGIT
11810         CP      9+1
11820         CCF
11830         RET     C
11840         PUSH    BC              ; SAVE LENGTH
11850         LD      B,0
11860         LD      C,A             ; ADD TO ACCUMULATOR
11870         ADD     HL,BC
11880         POP     BC
11890         DJNZ    CVLOOP          ; LOOP UNTIL DONE
11900         EX      DE,HL           ; DE = RESULT
11910         OR      A               ; NO ERROR
11920         RET                     ; RETURN TO CALLER
11930
11940 ;-------------------------------------------------------
11950 ;       MESSAGES
11960 ;-------------------------------------------------------
11970
11980 EXEEXT  DEFM    'EXE'           ; /EXE EXTENSION
11990
12000 LABMSG  DEFM    '>>> Invalid label - '
12010 LABLAB  DEFM    ' '
12020         DEFB    CR
12030
12040 STKMSG  DEFM    '>>> Stacked line ignored'
12050         DEFB    CR
12060
12070 CTLMSG  DEFM    '>>> Invalid command - &'
12080 CTLCMD  DEFM    ' '
12090         DEFB    CR
12100
12110 IFERRM  DEFM    '>>> Invalid form of IF'
12120         DEFB    CR
12130
12140 GOERRM  DEFM    '>>> Invalid form of GOTO'
12150         DEFB    CR
12160
12170 WTMSG   DEFM    '>>> Press any key to continue'
```

Listing 1 continued

```
12180           DEFB    CR
12190
12200 ;---------------------------------------------------------
12210 ;       TABLE OF RELATIONAL OPERATORS
12220 ;---------------------------------------------------------
12230
12240 ROPTAB    EQU     $
12250           DEFM    '= '
12260           DEFM    '<>'
12270           DEFM    '> '
12280           DEFM    '< '
12290           DEFM    '>='
12300           DEFM    '<='
12310
12320 ;---------------------------------------------------------
12330 ;       TABLE OF NUMERIC COMPARE ROUTINES
12340 ;---------------------------------------------------------
12350
12360 NMCTAB    EQU     $
12370           DEFW    NMEQ
12380           DEFW    NMNE
12390           DEFW    NMGT
12400           DEFW    NMLT
12410           DEFW    NMGE
12420           DEFW    NMLE
12430
12440 ;---------------------------------------------------------
12450 ;       TABLE OF STRING COMPARE ROUTINES
12460 ;---------------------------------------------------------
12470
12480 STCTAB    EQU     $
12490           DEFW    STEQ
12500           DEFW    STNE
12510           DEFW    STGT
12520           DEFW    STLT
12530           DEFW    STGE
12540           DEFW    STLE
12550
12560 ;---------------------------------------------------------
12570 ;       VARIABLES
12580 ;---------------------------------------------------------
12590
12600 FLAGS     DEFB    0               ; FLAGS BYTE
12610 EOF       EQU     0               ; - /EXE END-OF-FILE
12620 TRACE     EQU     1               ; - TRACE ON
12630 STACK     EQU     2               ; - STACKED LINES
12640 BRKEND    EQU     3               ; - END NEXT WITH <BREAK>
12650 HAVTXT    EQU     4               ; - TEXT CHARS AVAILABLE
12660 ERQUIT    EQU     5               ; - QUIT ON ERROR
12670 CMPTYP    EQU     6               ; - COMPARE TYPE
12680 NKBDPR    EQU     7               ; - NORMAL KEYBOARD INPUT
12690
12700 SPSAVE    DEFS    2               ; STACK PTR SAVE
12710 MESAVE    DEFS    2               ; MEMEND SAVE
12720 KBDSAV    DEFS    2               ; KEYBOARD DRIVER SAVE
12730 DOSSAV    DEFS    2               ; DOS JUMP ADDRESS SAVE
12740 COMSAV    DEFS    3               ; DOS CMD HANDLER SAVE
12750
12760 LABTAB    DEFS    LABNUM+LABNUM   ; LABEL TABLE
12770
12780 PARMS     DEFS    PARMSL          ; &N PARM STRINGS
12790
12800 TXTPTR    DEFS    2               ; KEYBOARD TEXT PTR
12810 CURLIN    DEFS    2               ; CURRENT LINE PTR
12820 CMDSAV    DEFS    TXTLEN+1        ; COMMAND TEXT AREA
12830
12840 GOSTAD    DEFS    2               ; &GOTO STATEMENT ADDRESS
12850 IFSTAD    DEFS    2               ; &IF STATEMENT ADDRESS
12860
12870 IFOP1A    DEFS    2               ; &IF OPERAND 1 ADDRESS
12880 IFOP2A    DEFS    2               ;       "     2    "
12890
12900 IFOP1V    DEFS    2               ;       "     1 VALUE
12910 IFOP2V    DEFS    2               ;       "     2   "
12920
12930 IFOPLN    EQU     $               ;       "     LENGTHS
12940 IFOP2L    DEFS    1               ;       "     2 LENGTH
12950 IFOP1L    DEFS    1               ;       "     1   "
12960
12970 IFROPT    DEFS    2               ; RELATIONAL OP TYPE
12980 IFLAB     DEFS    2               ; &IF GOTO LABEL ADDRESS
12990
13000 EXECHI    EQU     $-1             ; HIGHEST MEMORY USED
13010
13020           END     EXEC
```

Program Listing 2. The CC/EXE execution file.

```
 1  ; Pre-process, compile, assemble,
 2  ; link, and execute C program.
 3    &QUIT YES
 4    &IF .&1 = .  -HELP
 5    &IF .&1 = .? -HELP
 6    &DISPLAY Pre-processing
 7    PRE &1
 8    &DISPLAY Compiling
 9    C80 &1
10    KILL &1/C80
11    &WAIT Insert Assembler/Linker disk
12    &DISPLAY Assembling ...
13    M80 &1=&1
14    KILL &1/MAC
15    &IF .&2 = .NOLINK -EXIT
16    &DISPLAY Linking ...
17    L80 RUNLIB,&1
18    &STACK
19       &2
20       &3
21       &4
22       &1-N-E:CMAIN
23    &END
24    KILL &1/REL
25    &IF .&5 = .NOGO -EXIT
26    &DISPLAY Execution begins ...
27    &1
28    &GOTO -EXIT
29 -HELP
30    &DIS Format is:
31    &DIS EXEC CC filename fn1 fn2 fn3 NOGO
32    &DIS         ?        NOLINK
33 -EXIT
```

End

Calling Wall Street

by Thomas L. Robb

While stock market trading prices fluctuate daily, the Model 100's display remains the same—making it difficult to cram stock quotations from the Dow Jones News/Retrieval Service into the 8-line by 40-column screen.

Few information utilities are set up to work with such a small display. Dow Jones in particular doesn't support the XON/XOFF protocol needed to stop the flow of data from the host. But with DJN/R.BA (Program Listing 1) you won't have to speed-read scrolling stock statistics: The program displays one quotation on the screen at a time.

Making the Connection

You can access the Dow Jones via the Model 100's TELCOM program in two ways. If Tymnet is your packet switcher, you're in luck: Tymnet supports the XON/XOFF protocol. In response to the log-in prompt, simply type control-R before entering DOW1;;. Control-S (or the pause key) stops the scroll; control-Q restarts it—even with a TELCOM line status parameter of D (disable XOFF). In fact, I always use the parameter M7I1D, 10 since I don't find M7I1E, 10 useful in programmed access or the TELCOM mode.

Another way to get a readable columnar display of a single stock quotation (see Fig. 1) when using the Dow Jones stock quote reporter is to enter the command //SIZE32. (//SIZE40, which represents the default screen format, would display 80 characters in two word-wrapped lines, each of up to five stock quotes in columns, one per line.)

Before using DJN/R.BA, insert the 9-pin direct-connect modem adapter cable plug into the phone connection at the back of the Model 100. Plug the RJ-11 telephone jack into the beige adapter on the modem cable, then, to keep the telephone connected, plug the RJ-11 jack on the silver cable into the phone (optional).

Remember to put your local Tymnet telephone number in line 1402 of the program and your password in line 1730.

When you run the program, it auto-dials and signs onto the Dow Jones service via the Tymnet packet switch network. It then displays a screen (see Fig. 2) to prompt you for the symbol of a particular stock. If, for example, you type in IBM in response to the prompt, the program displays the screen depicted in Fig. 3.

```
STOCK            IBM
BID/CLOSE        120 1/2
ASKED/OPEN       120 3/4
HIGH             121 1/4
LOW              120 3/8
LAST             121
VOLUME (100'S)1665
```

Figure 1. Columnar stock quotation obtained using TELCOM with format //SIZE 32.

To end the program, depress the enter key without a stock symbol (see line 620). My remark statements should help you analyze the program.

Problems

The program can hang up. Line 635 requests input from the modem port. If it receives none, control never passes to the next statement. In Model 100 Basic, even with a hardware clock, this program doesn't time-out communications input.

If nothing appears on the screen for 30 to 40 seconds when you're using DJN/R.BA, reset the computer and run the program again. You won't lose your data since I set up the Quote.DO file (see line 636) to capture all the two-way communications between the program and the host. Using the text editor, you can re-create the data exchanges up to the hung condition.

Graphing Stock Statistics

My related program, Graph.BA (see Program Listing 2), also accesses Dow Jones, then gathers historical stock data and graphs the monthly volume and closing price for a selected stock on the Model 100's screen.

You can obtain monthly historical stock data for common and preferred stocks and warrants from 1979 to the present. Available markets include the New York, American, Pacific, Midwest, and national Over the Counter (OTC) stock exchanges. Since the national OTC doesn't carry a monthly closing price, I set up the query (line 627) to exclude a national OTC stock request and to request New York stock exchange data (the 1 following the semicolon). A 2 identifies the American, 3 the Pacific, and 4 the Midwest stock exchanges.

On the graph, double vertical bars represent volume data (the right vertical axis); horizontal dashes represent closing prices (left vertical axis). I omitted units of thousands (000) on the volume scale. The program uses the ON MDM GOSUB command, rather than INPUT or LINE INPUT commands, to capture modem input. Through this logic, you can detect time-out conditions and request retransmissions, thereby avoiding hung programs.

I chose to alternate between two interrupt routines—using one that, during stock transmission, writes the received characters to a RAM file, Quote.DO (see line 390), and the other that, during sign-on and sign-off, doesn't write to the RAM file (see line 380). Even at the slow transmission rate of 300 baud, the combined number of statements you can execute in the program's wait loop (lines 630–635) and the interrupt loop (line 390) is limited. If you require more logic in either

The Key Box

The programs in "Calling Wall Street" require 24K RAM. The programs in "North by Northwest" and "Graphic Results" run in 8K RAM.

loop, you can begin to drop input characters from the RAM file (file 3).

As in DJN/R.BA (Program Listing 1), set up your local Tymnet telephone number (line 1402) and Dow Jones password (line 1730) in Graph (Program Listing 2) before you run the program.

Once you've selected Graph from the main menu, it makes the Dow Jones connection and then prompts you for a stock symbol and a year. The program goes into a timing loop, and if the computer receives no modem input before the loop is over, the program detects a time-out condition.

During normal operation, there will be about a 30-second wait while the program collects data in the temporary file Quote.DO. (You need an available slot for this file in your directory.)

The program then generates and displays the graph. If you hear a beep during the sign-on or data collection phase, the program has timed-out or received garbled data and will request a retransmission. The program terminates after three unsuccessful retransmissions.

The program is in an INKEY$ loop (lines 728–730) when it displays the graph. Depress any key to return to the stock symbol prompt, and then the enter key to terminate the program. The program signs-off, disconnects, displays the connect time and charges, deletes the Quote.DO file, and then returns to the main menu.

Dow Jones News/Retrieval returns a footnote to indicate a special situation associated with the returned data. For example, in the graph of IBM for 1979, a stock split occurred. If the stock symbol in the lower left of the screen is flashing, depress any key to display the footnote.

The Bottom Line

Accessing Dow Jones during prime time (between 5 a.m. and 6 p.m.) costs 90 cents per minute; at other times, the rates drop to 15 cents per minute. ■

Contact Thomas L. Robb at 2632 Sumac Ridge, White Bear, MN 55110.

```
  Dow Jones NEWS/RETRIEVAL Service (C)
            08/16/83  10:10:05
                SYMBOL:
CLOSE(BID) OPEN(ASK)   HIGH        LOW

 LAST              VOLUME(100'S)
```

Figure 2. Screen prompt for individual stock symbol.

```
  Dow Jones NEWS/RETRIEVAL Service (C)
            08/16/83  10:15:21
                SYMBOL: IBM
CLOSE(BID) OPEN(ASK)   HIGH        LOW
 120 1/2   120 3/4    121 1/4    120 3/8

 LAST 121          VOLUME(100'S)  1665
```

Figure 3. Display of IBM stock statistics.

Program Listing 1. DJN/R.BA.

```
300 ' Dow Jones News/Retrieval
        Programmed Access
302 '
305 '     Change History
310 ' 7-20-83 Initial release
400 '
410 CLEAR 512:MAXFILES=3: ' Setup string
space and maximum number of files
415 ON ERROR GOTO 9000: ' General error
paragraph
500 '
501 '     Control paragraph
510 GOSUB 1300: 'Setup system variables
525 GOSUB 1400: ' Dial local TYMNET
number
535 GOSUB 1500: ' Open MODEM files
540 GOSUB 1600: ' Open RAM file
550 GOSUB 1700: ' Dow Jones signon
575 GOSUB 1800: ' Receive signon message
from Dow Jones
585 PRINT @163,"Connect on ";DATE$;" at
";TIME$: ' Screen display
590 FOR I%=1 TO 3000: NEXT: ' Delay
while CONNECT message being displayed
600 '
610 GOSUB 3000: ' Display STOCK
background
615 GOSUB 3100: ' Solicit STOCK symbol
620 IF SYMBOL$="" THEN 900: ' Terminate
if no user input entered
626 GOSUB 3300: ' Clear output fields
627 PRINT #2,",";SYMBOL$: ' Comma (,) is
the DJN/R prefix for Common and
Preferred stocks
629 ' Read data until input stock symbol
found, then format screen display
630 FOR I%=1 TO 25
635  LINE INPUT #1,Z$
636  PRINT #3,Z$: ' Save communications
data to RAM file, QUOTE.DO
637  IF LEFT$(Z$,LEN(SYMBOL$))=SYMBOL$
THEN QUOTE$=Z$: GOSUB 3200: I%=25
640 NEXT
695 GOTO 615: ' Re-loop to solicit next
stock quote
900 'Exit paragraph
905 GOSUB 1900: ' Send disconnect
command
910 GOSUB 2000: ' Capture disconnect
message
915 GOSUB 2100: ' Display elapsed time
and cost (@ $.15/min NON-prime time)
925 CLOSE: ' Close all files
935 CALL 21179: ' Hangup telephone
945 GOSUB 2200: ' Delay before exit to
allow screen display to be read
947 CALL 23164,0,23366: CALL 27795: ' Re
-establish BASIC'S FUNCTION keys
955 MENU: ' Return to system display
995 '
1200 ' Subroutines
1300 '
```

Listing 1 continued

Listing 1 continued

```
1301 ' Initialize system variables
1305 KEY OFF: ' Disable FUNCTION keys
1310 SCREEN 0,0: ' Turn labels OFF
1315 SOUND OFF: ' Turn MODEM sound OFF
1320 CLS: ' Clear screen
1325 RETURN
1400 '
1401 ' Dial TYMNET telephone number
1402 PH$="9,339-5200": M=VARPTR(PH$):
AD=PEEK(M+1)+PEEK(M+2)*256
1403 ' AD points to telephone number
string, PH$.
1405 PRINT @92,"Dialing ";
1410 LINE (116,14) - (170,25),1,B: '
Draw box around dial digits area
1415 CALL 21200: ' Take telephone OFF-
HOOK
1420 CALL 21293,0,AD: ' Dial number
1425 RETURN
1500 '
1501 ' Open MODEM files
1510 OPEN "MDM:7I1D" FOR INPUT AS 1: '
Communications input path
1520 OPEN "MDM:7I1D" FOR OUTPUT AS 2: '
Communications output path
1525 RETURN
1600 '
1601 ' Open scratch pad RAM file
1602 ' This file serves as a record of
the two-way communication dialog between
the program and Dow Jones News/
Retrieval. It can be examined with the
TEXT editor after a telephone call.
1605 OPEN "QUOTE.DO" FOR OUTPUT AS 3
1610 RETURN
1700 '
1701 ' Dow Jones signon
1705 PRINT @173,"Signing on .";: '
Screen display
1710 PRINT #2,"A";: ' Response to
"please type your terminal identifier"
1715 PRINT #2,CHR$(18);"DOW1;;";: PRINT
".";: ' Response to "please log in: "
1720 PRINT #2,"DJNS": PRINT ".";: '
Respone to "WHAT SERVICE PLEASE????"
1730 PRINT #2,"mypassword": PRINT ".";:
' Response to "ENTER PASSWORD"
1735 RETURN
1800 '
1805 ' Look for ENTER QUERY (end of
signon banner)
1810 LINE INPUT #1,Z$
1815 PRINT #3,Z$
1820 IF Z$<>"ENTER QUERY" THEN 1810
1830 RETURN
1900 '
1901 ' Disconnect
1910 PRINT #2,"DISC"
1920 RETURN
2000 '
2001 ' Capture sign-off message
2010 FOR I%=1 TO 25
2015  LINE INPUT #1,Z$:
2020  IF LEFT$(Z$,7)="LOG ON:" THEN
I%=25
2022  PRINT #3,Z$
2025 NEXT
2040 RETURN
2100 '
2101 ' Display elapsed time and cost
2110 Z%=INSTR(1,Z$,"ON: "): F1%=VAL(MID$
(Z$,Z%+4,2)): F2%=VAL(MID$(Z$,Z%+7,2))
2120 Z%=INSTR(1,Z$,"OFF: "): F3%=VAL(
MID$(Z$,Z%+5,2)): F4%=VAL(MID$(Z$,Z%+8,2
))
2125 IF F3%<F1% THEN F3%=F3%+24
2135 F5%=(F3%*60+F4%)-(F1%*60+F2%)
2140 IF F5%=0 THEN F5%=1
2145 CLS: ' Clear screen
2150 PRINT @201,"Elapsed MINUTES: "
USING "###";F5%;
2160 PRINT ";   COST:" USING
"$$###.##";F5%*.15
2180 RETURN
2200 '
2201 ' Delay for 15 secs to display sign
-off message on screen
2210 FOR I%=1 TO 15000: NEXT
2220 RETURN
3000 '
3001 ' Display STOCK background
3002 CLS: ' Clear screen
3005 PRINT "  Dow Jones NEWS/RETRIEVAL
Service (C)"
3010 PRINT @52,DATE$;"  ";TIME$
3015 PRINT @95,"SYMBOL:"
3020 PRINT "CLOSE(BID) OPEN(ASK)  HIGH
    LOW"
3025 PRINT @241,"LAST";: PRINT
@257,"VOLUME(100'S)"
3030 RETURN
3100 '
3101 ' Solicit STOCK symbol
3105 PRINT @103,"";: LINE INPUT
"";SYMBOL$
3110 FOR I%=1 TO LEN(SYMBOL$)
3112 IF SYMBOL$="" THEN RETURN: ' If no
data entered, terminate program
3115  IF ASC(MID$(SYMBOL$,I%,1))=>97 AND
ASC(MID$(SYMBOL$,I%,1))<=122 THEN MID$(
SYMBOL$,I%)=CHR$(ASC(MID$(SYMBOL$,I%))-
32): ' Convert alpha lower case to upper
case to match returning stock symbol
3120 NEXT
3125 RETURN
3200 '
3201 ' Display STOCK quote
3205 PRINT @103,LEFT$(QUOTE$,10);
3210 PRINT @161,MID$(QUOTE$,11,40);
3215 PRINT @246,MID$(QUOTE$,51,10);
3220 PRINT @271,MID$(QUOTE$,61,10);
3230 RETURN
3300 '
3305 ' Clear STOCK background
3310 PRINT @103,SPACE$(10);: PRINT
@161,SPACE$(40);
3315 PRINT @246,SPACE$(10);: PRINT
@271,SPACE$(10);
3330 RETURN
9000 '
9001 ' General ERROR paragraph
9050 CLS: ' Clear screen
9060 PRINT @41,"An application program
error, CODE ";ERR;",";
9065 PRINT "  has occurred at BASIC
program"
9070 PRINT "  line NUMBER ";ERL;"."
9075 GOTO 900: ' Exit
```

End

Program Listing 2. Graph.BA.

```
300 ' Dow Jones HISTORICAL QUOTES
        Programmed Access
301 ' (C) 1983 by Thomas L. Robb WBL,MN
302 '
305 '         Change History
310 '     9-20-83 Initial release
350 '
351 '
355 GOTO 400
375 '
376 ' MODEM interrupt routine
        w/o file 3 print
377 '  (entry at 380)
380 C$=INPUT$(1,1):RX$="Y":RETURN
385 '
386 ' MODEM interrupt routine
         w/ file 3 print
387 '  (entry at 390)
390 C$=INPUT$(1,1):RX$="Y":PRINT
#3,C$;:RETURN
400 '
410 CLEAR 2048: MAXFILES=3: ' Setup
string space and maximum number of files

415 ON ERROR GOTO 9000: ' General error
paragraph
500 '
501 ' Control paragraph
510 GOSUB 1300: ' Setup system variables

525 GOSUB 1400: ' Dial local TYMNET
number
535 GOSUB 1500: ' Open MODEM files
550 GOSUB 1700: ' Dow Jones signon
575 GOSUB 1800: ' Receive signon message
from Dow Jones
580 IF T%=>3 THEN 7000: ' Input time-out

585 PRINT @165,"Connect on ";DATE$;" at
";TIME$: ' Screen display
590 FOR I%=1 TO 3000: NEXT: ' Delay
while CONNECT message being displayed
600 '
610 GOSUB 3000: ' Display STOCK
background display
620 IF SYMBOL$="" THEN 900: ' Terminate
if no user input entered
622 GOSUB 1600: ON MDM GOSUB 390: ' Open
RAM file with interrupt print
625 T%=0: ' Time-out count
627 PRINT #2,";1";SYMBOL$;" ";YEAR$;"
M": ' Semi-colon (;) is the DJN/R prefix
for historical stock quotes
629 ' 1 char received in C$ and written
to file 3 when RX$="Y". If I-count
reaches 500 (time-out) and T-count (
number of time-outs) <3, then sound tone
and resend original request else abort.
630 I%=1: RX$="N"
635 IF RX$="Y" THEN IF C$<>CHR$(30) THEN
630 ELSE 700
640 I%=I%+1: IF I%<500 THEN 635
645 IF T%<3 THEN T%=T%+1: BEEP: GOTO 627
ELSE 7100
698 '
700 '
705 ON MDM GOSUB 380: CLOSE 3: ' Close
RAM file
```

Listing 2 continued

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 then 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.
163

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.

CopyArt II

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, V, VI, VII, VIII and Daisy Wheel II
- Epson MX-80, MX-80/FT, MX-100 with or without graftrax.
- Okidata Microline 80, 82a and 83a
- NEC 8023
- Smith Corona Daisy Wheel TP-1
- Brother Daisy Wheel
- C-Itoh Starwriters and Prowriters all 85 10A, 1550
- PMC Printer
- Diablo 620

OTHERS COMING SOON. Call if you don't see your printer!

24. Unprotected diskette. Unlimited backups can be made.
25. MAILIST/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.

163

Listing 2 continued

```
710 OPEN "QUOTE.DO" FOR INPUT AS 3
725 GOSUB 4000: ' Generate graph
727 CLOSE 3
728 IF FOOTER$<>"" THEN IF (VAL(RIGHT$(
TIME$,1)) AND 1)=0 THEN PRINT
@281,SYMBOL$;: ELSE PRINT @281,"
";: ' Flash stock symbol if a footnote
was received from DJN/R.
730 A$=INKEY$: IF A$="" THEN 728 ELSE IF
FOOTER$<>"" THEN BEEP: CLS: PRINT
@80,FOOTER$;: GOSUB 2200: GOTO 610 ELSE
610: ' Wait for any key to continue;
then display footnote, if received.
900 'Exit paragraph
905 GOSUB 1900: ' Send disconnect
command
910 GOSUB 2000: ' Capture disconnect
message
915 GOSUB 2100: ' Display elapsed time
and cost (@ $.15/min NON-prime time)
925 '
935 CALL 21179: ' Hangup telephone
945 GOSUB 2200: ' Delay before exit to
allow screen display to be read
947 CALL 23164,0,23366: CALL 27795: ' Re
-establish BASIC'S FUNCTION keys
950 CLOSE: ' Hangup telephone, close all
files
952 KILL "QUOTE.DO": ' Delete scratch
pad RAM file
955 MENU: ' Return to system display
1200 ' Subroutines
1300 '
1301 ' Initialize system variables
1305 KEY OFF: ' Disable FUNCTION keys
1310 SCREEN 0,0: ' Turn labels OFF
1315 SOUND OFF: ' Turn MODEM sound OFF
1320 CLS: ' Clear screen
1322 DIM VOLUME#(12), CLOS(12): '
Dimension STOCK VOLUME and CLOSING PRICE
arrays
1325 RETURN
1400 '
1401 ' Dial TYMNET telephone number
1402 PH$="9,339-5200": M=VARPTR(PH$):
AD=PEEK(M+1)+PEEK(M+2)*256
1403 ' AD points to telephone number
string, PH$.
1405 PRINT @92,"Dialing ";
1410 LINE (116,14) - (170,25),1,B: '
Draw box around dial digits area
1415 CALL 21200: ' Take telephone OFF-
HOOK
1420 CALL 21293,0,AD: ' Dial number
1425 RETURN
1500 '
1501 ' Open MODEM files
1510 OPEN "MDM:7I1D" FOR INPUT AS 1: '
Communications input path
1520 OPEN "MDM:7I1D" FOR OUTPUT AS 2: '
Communications output path
1522 ON MDM GOSUB 380: MDM ON: ' Setup
MODEM interrupt routine
1525 RETURN
1600 '
1601 ' Open scratch pad RAM file
1602 ' This file serves as a record of
```

Listing 2 continued

Listing 2 continued

```
the two-way communication dialog between
the program and Dow Jones News/
Retrieval. It is deleted upon program
termination.
1605 OPEN "QUOTE.DO" FOR OUTPUT AS 3
1610 RETURN
1700 '
1701 ' Dow Jones signon
1705 PRINT @173,"Signing on .";: '
Screen display
1710 PRINT #2,"A";: PRINT ".";: '
Response to "please type your terminal
identifier"
1715 PRINT #2,CHR$(18);"DOWl;;";: PRINT
".";: ' Response to "please log in: "
1720 PRINT #2,"DJNS": PRINT ".";: '
Respone to "WHAT SERVICE PLEASE????"
1730 PRINT #2,"mypassword": PRINT ".";:
' Response to "ENTER PASSWORD"
1735 RETURN
1800 '
1805 ' Look for RECORD SEPARATOR (end of
signon banner)
1810 T%=0: ' Time-out count
1815 I%=1: RX$="N"
1820 IF RX$="Y" THEN IF C$<>CHR$(30)
THEN 1815 ELSE RETURN
1830 I%=I%+1: IF I%<500 THEN 1820
1840 IF T%<3 THEN T%=T%+1: BEEP: PRINT
#2,"//COPYRT": GOTO 1815 ELSE RETURN
1900 '
1901 ' Disconnect
1910 PRINT #2,"DISC"
1920 RETURN
2000 '
2001 ' Capture sign-off message
2010 FOR I%=1 TO 25
2015  LINE INPUT #1,Z$:
2020  IF LEFT$(Z$,7)="LOG ON:" THEN
I%=25
2025 NEXT
2040 RETURN
2100 '
2101 ' Display elapsed time and cost
2105 RATE=.15: ' Per minute rate for
QUOTES during NON-prime time hours;
prime time rate is $.90/minute.
2110 Z%=INSTR(1,Z$,"ON: "): F1%=VAL(MID$
(Z$,Z%+4,2)): F2%=VAL(MID$(Z$,Z%+7,2))
2120 Z%=INSTR(1,Z$,"OFF: "): F3%=VAL(
MID$(Z$,Z%+5,2)): F4%=VAL(MID$(Z$,Z%+8,2
))
2125 IF F3%<F1% THEN F3%=F3%+24
2135 F5%=(F3%*60+F4%)-(F1%*60+F2%)
2140 IF F5%=0 THEN F5%=1
2145 CLS: ' Clear screen
2150 PRINT @201,"Elapsed MINUTES: "
USING "###";F5%;
2160 PRINT ";   COST:" USING
"$$###.##";F5%*RATE
2180 RETURN
2201 ' Delay for 15 secs to display sign
-off message on screen
2210 FOR I%=1 TO 15000: NEXT
2220 RETURN
3000 '
3001 ' Display screen background
```

Listing 2 continued

NOW ONLY $99.00

CopyArt II

WILL CHANGE THE WAY YOU THINK ABOUT YOUR TRS-80!

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. Hi-Resolution graphics supported.
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 hastle 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 BOLDFACING etc. Visicalc reports up to 255 wide can be loaded.
31. SPECIAL SCRIPSIT FILE LOADER. Allows you to load your old Scripsit files without having to save them in ASCII. Copyart will also load Pencil files and other normal ASCII files.
32. Similar to Scripsit. If you have used Scripsit, you can use Copy Art in minutes.
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, now works with 4 and 4P.

CopyArt II **THIS PROGRAM DOES IT ALL!**

PLEASE SPECIFY which COMPUTER and PRINTER you have when ordering.

Copyart 11 with one printer driver 99.00
Additional printer drivers ..... 19.95 each

Copyart I owners. Updates available. To registered owners for $15.00.

COD and Credit Cards CALL TOLL FREE to order: 1-800-528-1149
Or send check or money order to:

SIMUTEK
Computer Products Inc.

163

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.

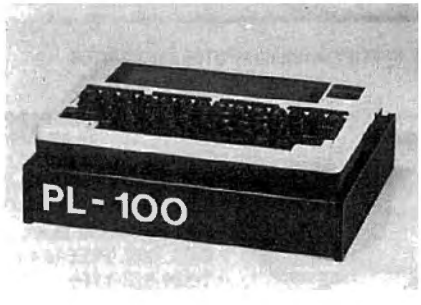
Listing 2 continued

```
3002 CLS: ' Clear screen
3015 PRINT @130,"";: LINE INPUT "market
symbol? ";SYMBOL$
3017 IF SYMBOL$="" THEN RETURN: '
Terminate if no user input entered
3020 PRINT @169,"";: LINE INPUT "graph
for year? 19";YEAR$
3022 IF (1900+VAL(YEAR$))<1979 OR VAL(
YEAR$)>VAL(RIGHT$(DATE$,2)) THEN 7200
3025 CLS: LINE (42,0) - (42,55): LINE (
42,55) - (190,55): LINE (190,55) - (
190,0)
3028 FOR I%=1 TO 7: LINE (39,54-8*(I%-1)
) - (39+2,54-8*(I%-1)): LINE (191,54-8*(
I%-1)) - (191+2,54-8*(I%-1)): NEXT
3030 PRINT @281,SYMBOL$;: PRINT
@315,"19";YEAR$;:
3032 PRINT @209,"Retrieving stock data";

3035 RETURN
4000 '
4001 '   GRAPH ROUTINE
4005 ' Convert SYMBOL$ alpha lower case
to upper case
4015 FOR I%=1 TO LEN(SYMBOL$): IF ASC(
MID$(SYMBOL$,I%,1))=>97 AND ASC(MID$(
SYMBOL$,I%,1))<=122 THEN MID$(SYMBOL$,I%
)=CHR$(ASC(MID$(SYMBOL$,I%))-32)
4020 NEXT
4022 ' Position to STOCK line
4025 IF EOF(3) THEN 7300 ELSE LINE INPUT
#3,Z$
4027 IF LEFT$(Z$,7+LEN(SYMBOL$))<>"STOCK
1"+SYMBOL$ THEN 4025
4050 ' Position to first month line
4055 IF EOF(3) THEN 7300 ELSE LINE INPUT
#3,Z$
4060 IF MID$(Z$,3,3)<>"/"+YEAR$ THEN
4055
4065 FOR I%=1 TO 12: VOLUME#(I%)=0: CLOS
(I%)=0: NEXT
4070 M%=VAL(LEFT$(Z$,2)): M1%=M%
4072 IF LEFT$(Z$,2)=LEFT$(DATE$,2) AND
MID$(Z$,4,2)=RIGHT$(DATE$,2) THEN 4090:
' Don't include current month's data.
4075 GOSUB 4900: ' Extract VOLUME
4077 GOSUB 4950: ' Extract CLOSING PRICE

4078 M%=M%+1
4080 IF EOF(3) THEN 7300 ELSE LINE INPUT
#3,Z$
4085 IF MID$(Z$,3,3)="/"+YEAR$ THEN 4072

4090 '
4092 FOOTER$=""
4094 IF EOF(3) THEN 4100 ELSE LINE INPUT
#3,Z$
4096 IF LEFT$(Z$,1)="*" THEN FOOTER$=Z$:
GOTO 4100
```

Listing 2 continued

EXPANSION TO GO

Battery powered interface for the Model 100. Gives Analog and Digital I/O capabilities to your Radio Shack or NEC portable. Whether in the lab or in the field, Data Acquisition and Process Control are now more affordable than ever. Easy to program using BASIC input and output statements.



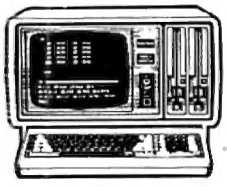
Complete PL-100 System $498 includes:

- Expansion Chassis (holds 3 boards)
- Combination I/O board with
  - 16 Channel 8 Bit Analog Input
  - 4 Channel 8 Bit Analog Output
  - 4 Analog Level Sense Inputs
  - 16 Bits Digital Output
  - 16 Bits Digital Input
- Battery Charger / AC Adapter
- 2 Empty expansion slots
- Interface Cables

- Uses rechargeable batteries
- Provides power to the Model 100
- Expansion boards available:
  - High Accuracy 12 Bit Analog I/O
  - 16 Bit Digital I/O
  - Combination Analog & Digital I/O

ELEXOR ASSOCIATES
P.O. Box 246
Morris Plains, N.J. 07950 ↙209
(201) 299-1615

TRS-80 DISCOUNT



Computers at Guaranteed Low Prices*

ATON CP/M FOR II, 12, 16
EPSON & NEC PRINTERS
DYSAN DISKETTES
HAYES MODEMS

Desert Sound, Inc.
of California

1-800-835-5247

Factory Authorized Dealer

TRS-80 is a Reg. Trademark of Tandy Corp.

*Call for FREE CATALOG and Price Guarantee ↙539

Calif. Res. Call 619-244-6883

Listing 2 continued

```
4098 GOTO 4094
4100 '
4105 PRINT @209,SPACE$(21): ' Clear
Retrieving ... line
4110 ' Find SMALLEST and LARGEST volumes

4115 SVOLUME#=VOLUME#(M1%):
LVOLUME#=VOLUME#(M1%)
4117 FOR I%=M1% TO M%-1
4120  IF SVOLUME#>VOLUME#(I%) THEN
SVOLUME#=VOLUME#(I%)
4125  IF LVOLUME#<VOLUME#(I%) THEN
LVOLUME#=VOLUME#(I%)
4130 NEXT
4135 ' Calculate VOLUME base
4140 G1#=INT(SVOLUME#/1000)*100
4145 ' Calculate VOLUME increment
4150 DELTA=INT((((INT((LVOLUME#+500)/
1000)*100-G1#)/7)+99.5)/100)*100
4200 ' Graph VOLUME labels
4205 GP%=273: FOR I%=1 TO 7
4210  PRINT @GP%,;: PRINT USING
"######";G1#+DELTA*(I%-1);: PRINT "K";:
GP%=GP%-40
4215 NEXT
4217 G7#=G1#+DELTA*7
4220 PRINT @288,"J F M A M J J A S O N
D";
4250 ' Graph VOLUME
4255 GDELTA=G7#-G1#: PXELS%=INT(GDELTA/
56+.5)
4265 FOR I%=M1% TO M%-1
4270  Y2%=INT((VOLUME#(I%)/10-G1#)/
PXELS%+.5)
4272  IF Y2%>54 THEN Y2%=54 ELSE IF Y2%<
1 THEN Y2%=1
4275  LINE (50+12*(I%-1),55) - (50+12*(
I%-1),54-Y2%): LINE (51+12*(I%-1),55) -
(51+12*(I%-1),54-Y2%)
4280 NEXT
4300 '
4310 ' Find LOWEST and HIGHEST closing
prices
4315 SCLOS=CLOS(M1%): LCLOS=CLOS(M1%)
4317 FOR I%=M1% TO M%-1
4320  IF SCLOS>CLOS(I%) THEN SCLOS=CLOS(
I%)
4325  IF LCLOS<CLOS(I%) THEN LCLOS=CLOS(
I%)
4330 NEXT
4335 ' Calculate CLOSING PRICE base
4340 G1=INT(SCLOS)
4345 ' Calculate CLOSING PRICE increment

4350 DELTA=INT((INT(LCLOS+.5-G1))/7+.995
)
4400 ' Graph CLOSING PRICE labels
4405 GP%=241: FOR I%=1 TO 7
4410  PRINT @GP%,;: PRINT USING
"$$###";G1+DELTA*(I%-1);: GP%=GP%-40
```

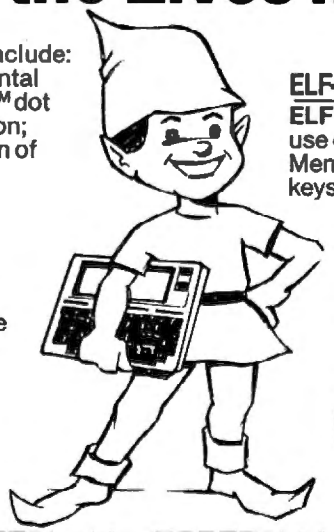
Listing 2 continued

Get more use from your Model 100
Let the Elves help!

ELF-WRITER
Expand your text processor! Features include: — Formatted veiwing mode with horizontal scrolling — Formatting uses Wordstar™ dot commands: Variable margins; Pagination; Headings & Footings; Right justification of text; And Much More!!

ELF-COP
Manage your file space problems! Backup all of your files at one time. A backup report documents your backup. ELF-COP will also Copy, Rename, Delete and Report file sizes.

TM - MicroPro International Corp.



ELF-PAK = ELF 1 + 1 CALCULATOR + ELF-BANKER
ELF 1 + 1 turns your computer into an easy to use calculator. Features: Entry, Total & Memory displays; %, Exponent & Square Root keys; + More!

ELF-BANKER Evaluates your money for the most return. 20 calculations including: Compound Interest, Present value, Loan & Mortgage payments, Annuities & Active Savings accounts.

$39.99 EACH
•SPECIAL OFFER•
All 3 for $90.00
Price includes shipping.

Send the coupon below to:
Ceres Software Inc.
4303 S.W. Chesapeake Ave.
Portland, OR 97201
(503) 245-9011
125

Please send me on cassette:
☐ ELF-WRITER ☐ ELF-COP
☐ ELF-PAK
☐ Special Offer $90.00
☐ Check for _____ enclosed
☐ Send C.O.D.

NAME:_____
STREET:_____
CITY:_____ STATE:_____ ZIP:_____
TELEPHONE:_____

See List of Advertisers on Page 227

Listing 2 continued

```
4415 NEXT
4417 G7=G1+DELTA*7
4450 ' Graph CLOSING PRICE
4455 GDELTA=G7-G1: PXELS=GDELTA/56
4465 FOR I%=M1% TO M%-1
4470  Y2%=INT((CLOS(I%)-G1)/PXELS+.5)
4472  IF Y2%>54 THEN Y2%=54 ELSE IF Y2%<
1 THEN Y2%=1
4475  LINE (48+12*(I%-1),54-Y2%) - (48+
12*(I%-1)+5,54-Y2%)
4480 NEXT
4485 RETURN
4900 '
4905 ' Extract VOLUME data from Z$
string
4910 VOLUME#(M%)=VAL(RIGHT$(Z$,9))
4920 RETURN
4950 '
4955 ' Extract CLOSING PRICE from Z$
string
4960 X$=MID$(Z$,31,10)
4962 IF LEFT$(X$,1)=" " THEN X$=RIGHT$(
X$,LEN(X$)-1): GOTO 4962
4963 IF INSTR(1,X$,"/")=0 THEN CLOS(M%)
=VAL(X$) ELSE SP%=INSTR(1,X$,"/"): IF
SP%<=3 THEN GOSUB 4980 ELSE GOSUB 4985
4965 RETURN
4980 ' Simple fraction
4982 IF SP%=2 THEN CLOS(M%)=VAL(LEFT$(
X$,1))/VAL(MID$(X$,3,2)) ELSE CLOS(M%)
=VAL(LEFT$(X$,2))/VAL(MID$(X$,4,2))
4983 RETURN
4985 ' Mixed number
4987 SP%=INSTR(1,X$," "): CLOS(0)=VAL(
LEFT$(X$,SP%-1)): X$=MID$(X$,SP%+1,10-
SP%): SP%=INSTR(1,X$,"/"): GOSUB 4980:
CLOS(M%)=CLOS(M%)+CLOS(0)
4988 RETURN
7000 '
7005 BEEP: CLS: PRINT @122,"Input
 time-out receiving DJN/R Signon"
7010 GOTO 925
7100 '
7105 BEEP: CLS: PRINT @123,"Input
 time-out receiving DJN/R data"
7110 GOTO 925
7200 '
7205 BEEP: CLS: PRINT @127,"Historical q
uotes exist for";: PRINT @168," years 19
79 to 19"; RIGHT$(DATE$,2);" only"
7210 GOSUB 2200: GOTO 610
7300 '
7305 BEEP: CLS: PRINT @123,"No historica
l stock data available";: PRINT @172,"on
 ";SYMBOL$;" for 19";YEAR$
7310 GOSUB 2200: CLOSE 3: GOTO 610
9000 '
9001 ' General ERROR paragraph
9025 IF ERR=52 AND ERL=952 THEN RESUME
NEXT
9050 P%=0: BEEP: CLS: ' Clear screen
9060 PRINT @41,"An application program
error, CODE ";ERR;",";
9065 PRINT "  has occurred at BASIC
program"
9070 PRINT "  line NUMBER ";ERL;"."
9075 GOTO 925: ' Exit
```

End

North by Northwest

by Smith Harris

If you're a traveler, you may often wonder how far your current position is from your destination, or in what direction your destination lies.

If you're working with distances of less than a few hundred miles, you can answer these questions fairly accurately with a large-scale map. However, when the distance between your destination and current position is more than a few hundred miles, the distortion caused by the curvature of the earth on the flat surface of the map becomes significant.

I wrote an 8K RAM program, Navigate.BA, that accurately determines the distance between any two locations on the surface of the earth, as well as the compass bearing from the first to the second location (see Program Listing 3).

It does so by solving the spherical triangle whose apexes are at your current location, the north pole, and your destination. Spherical triangles, as the name implies, are triangles drawn on the surface of a sphere. They have three angles, like the more familiar plane triangles, but the resemblance stops there. Their sides are segments of great circles and their geometry is more complex than that for plane triangles.

The Program

To use Navigate, enter the names of the two locations and their respective latitudes and longitudes in degrees and decimal fractions of a degree, prefixing south longitudes and east

Program Listing 3. Navigate.BA.

```
10 '            NAVIGATE
20 '               BY
30 '          SMITH HARRIS
40 '        ROUTE 4, BOX 59
50 '      GRAY, GEORGIA 31032
60 '
70 CLS
75 PRINT:PRINT:PRINT
80 INPUT "STARTING LOCATION";A$
90 INPUT "DESTINATION";B$
100 CLS:PRINT "LATITUDE OF ";A$
105 PRINT"(XX.XX DEGREES; - IF SOUTH)
";:INPUT N
110 PRINT "LONGITUDE OF ";A$
115 PRINT"(XX.XX DEGREES; - IF EAST)
";:INPUT O
120 PRINT "LATITUDE OF ";B$
125 PRINT"(XX.XX DEGREES; - IF SOUTH)
";:INPUT P
130 PRINT "LONGITUDE OF ";B$
135 PRINT"(XX.XX DEGREES; - IF EAST)
";:INPUT Q
140 RD=57.2958:DR=.0174533 'RADIANS TO
DEGREES - DEGREES TO RADIANS
150 N=DR*N:O=DR*O:P=DR*P:Q=DR*
Q:X$="#####.#":Y$="####.#"
160 AA=1.5708-P
170 BB=1.5708-N
180 C=O-Q
190 IF C=0 THEN 410  'IF NORTH-SOUTH OR
EAST-WEST
200 IF N=P THEN 430  'SKIP SPHERICAL
TRIANGLE.
210 E=(BB-AA)/2:F=(BB+AA)/2:G=C/2
```

Listing 3 continued

StatPac™

Statistical Analysis Package

A complete data manager and statistical analysis package similar to mainframe SPSS.*

StatPac's features include:
batch processing, variable and value labels, select if, recode, recode if, compute, compute if, sort cases, list cases, write subfile, frequencies, descriptive statistics, crosstabs & chi-square, correlation & linear regression, t-test for matched pairs or independent groups, multiple regression, one and two-way anova, two kinds of multiple variable response.

StatPac can handle fixed or free format data files and 2000 cases with up to 255 columns of information per case. Statistic selections and printing options are available on all analyses including graphics and paper saving ecology feature.

Walonick Associates
5624 Girard Av. S. **612-866-9022**
Minneapolis, MN 55419

The Quality Analysis Package for the Professional

*SPSS is a trademark of SPSS, Inc.

THE ENTREPRENEUR'S SPREADSHEET OFFERS MODEL 100 AND *NEC PC-8201 USER MORE POWER.

- Easy to use
- Budgeting
- Sales Projections
- Financial Forecasting
- Many Other Business Uses

The Entrepreneur's Spreadsheet is a powerful 16-column by 50-row financial management tool. This flexible software has full computation capabilities including summation, exponents, and algabraic equations. Other features are expanded command set, creation of printed reports and ease-of-use. It is completely documented with sample session. This allows you to be up and running right away. Full telephone support for this versatile package is offered. **124.95**

* Also available:
The Entrepreneur's General Ledger **$119.95**

When you order specify computer make & model. Phone Visa or Master Charge number or send cash or money order. Your order will be shipped within 24 hours.

JAMES W. SECOR
Data Processing Consultants
2050 N. Collins, #101, Richardson, Tx 75080
214/699-3649

VISA

*NEC Corporation Tokyo Japan

✓ 254

ALWAYS AT SALE PRICES TRS-80® ALWAYS AT SALE PRICES

OUR TRS-80s Have the Radio Shack warranty

HARD DISK DRIVES

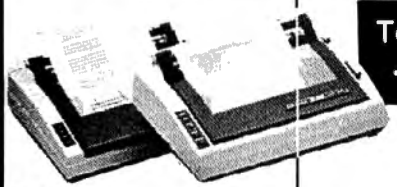
COMPUTER DFW CENTER

WE SHIP FAST! ✓282

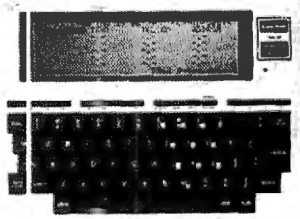
DFW COMPUTER CENTER
326 MAIN ST., GRAPEVINE
TEXAS 76051 — (817) 481-7283

MODEL 12

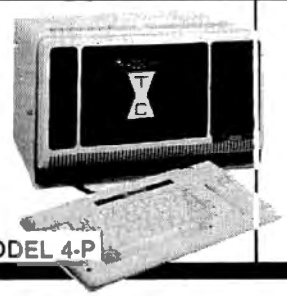
To get YOUR SALE price CALL:
1-800-433-S A L E



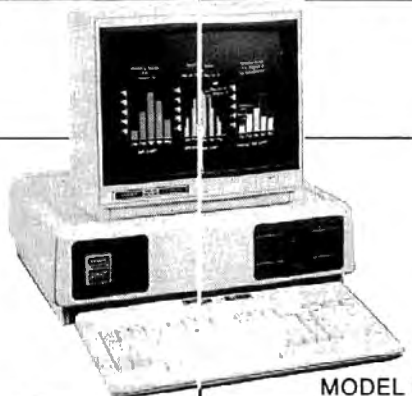
DOT MATRIX PRINTERS
DAISY WHEEL PRINTERS



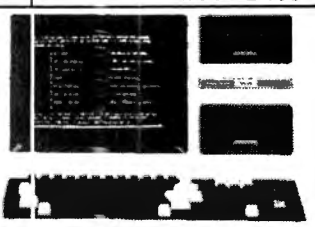
MODEL 100



MODEL 4-P



MODEL 2000



MODEL 4

latitudes with a minus sign.

The computer then solves the triangles and displays the distance between the two locations in international nautical (airline) miles, statute miles, and kilometers. Navigate also indicates the compass bearing from the first to the second location on a 360-degree basis (zero degrees is north, 90 degrees east, 180 degrees south, and 270 degrees west).

The program takes the mean circumference of the earth as 24,860.51 miles, making one degree equivalent to 69.05698 statute miles. It converts statute miles to international nautical (airline) miles and kilometers using conversion factors given in NASA publication SP-7021, *The International System of Units—Physical Constants and Conversion Factors* (1 nautical mile equals 1.150778 statute miles and 1 kilometer equals 0.621371 statute miles).

I chose to express latitudes and longitudes in degrees and decimal fractions of a degree because I find it easier to estimate locations on a map in this manner rather than using minutes and seconds. If you prefer to use minutes and seconds, convert these quantities to decimal fractions of a degree by dividing minutes by 60 and seconds by 3,600. The computer does the conversion for you if you change line 100 to:

```
100 PRINT "LATITUDE OF ";A$;"(DD,MM,SS)(-IF SOUTH)";:
INPUT N,M,S
```

and insert line 105 as follows:

```
105 N=N+M/60+S/3600
```

You should similarly modify lines 110 through 130.

A word of warning is in order. Don't try to fly from New York to San Francisco using the compass bearing obtained in the program. Although it's correct, you must constantly make course corrections to follow a great circle. Otherwise, you'll never get to your destination; instead, you'll follow a path called a loxodrome around the globe in ever-decreasing spirals, approaching but never reaching one of the poles. (You can find out more about great circles, loxodromes, and navigation in general in an encyclopedia.)

Navigators involved in great-circle sailing can easily adapt the program for a pocket computer. It saves a lot of tedious calculations with log tables. ■

Listing 3 continued

```
    'LINES 210 - 310
220 X=COS(E)/(COS(F)*TAN(G))   'SOLVE
230 Y=SIN(E)/(SIN(F)*TAN(G)) 'SPHERICAL
240 XX=ATN(X)*2   'TRIANGLE
250 YY=ATN(Y)*2
260 B=(XX+YY)/2
270 A=XX-B
280 L=(B+A)/2:M=(B-A)/2
290 ZZ=(TAN(E)*SIN(L))/SIN(M)
300 CC=2*ATN(ZZ)
310 A=A*RD:IF A<0 AND C>0 OR A>0 AND C<0
THEN A=180+A ELSE IF A<0 AND C<0 THEN
A=360+A
320 D=CC*60.009*RD:IF D<0 THEN D=-D
330 CLS:PRINT "DISTANCE FROM ";A$;" TO
";B$;":"
340 PRINT USING X$;D;:PRINT " NAUTICAL
MILES"
350 PRINT USING X$;D*1.15078;:PRINT "
STATUTE MILES"
360 PRINT USING X$;D*1.852;:PRINT "
KILOMETERS"
370 PRINT "COMPASS BEARING FROM "
375 PRINTA$;" TO ";B$; ":";:PRINT USING
Y$;A;:PRINT " DEGREES"
380 INPUT "DO YOU WANT TO CONTINUE(Y/N)
";C$
390 IF LEFT$(C$,1)="Y" THEN 70
400 END
410 CC=AA-BB:IF N>P THEN A=180 ELSE A=0
420 GOTO 320
430 CC=C:IF O<Q THEN A=270 ELSE A=90
440 GOTO 320
```

End

Smith Harris can be reached at Route 4, Box 59, Gray, GA 31032.

Graphic Results

by Emmett Carmody

It's often useful to see a graphic representation of how a change in quantitative variables produces different results. I've written two Basic programs that produce illustrative graphs using results from problem-solving routines.

Program Listing 4, Pie.BA, displays a pie chart relating three variables to an available total quantity. Program Listing 5, Bar.BA, lets you solve an equation for X in terms of four variables or constants, A, B, C, and D, and presents a bar chart relating X to a desired maximum. You can change any of the variables to try and get closer to the maximum value.

The Pie Chart

Lines 20–60 in Listing 4 draw a circle on the right side of the screen using the PSET command. Quantity A in these lines is the angle in radians, whose value increases in steps of 0.1 radians from zero to 6.28 (or two times pi). Quantity R is the radius, set at 30 pixels.

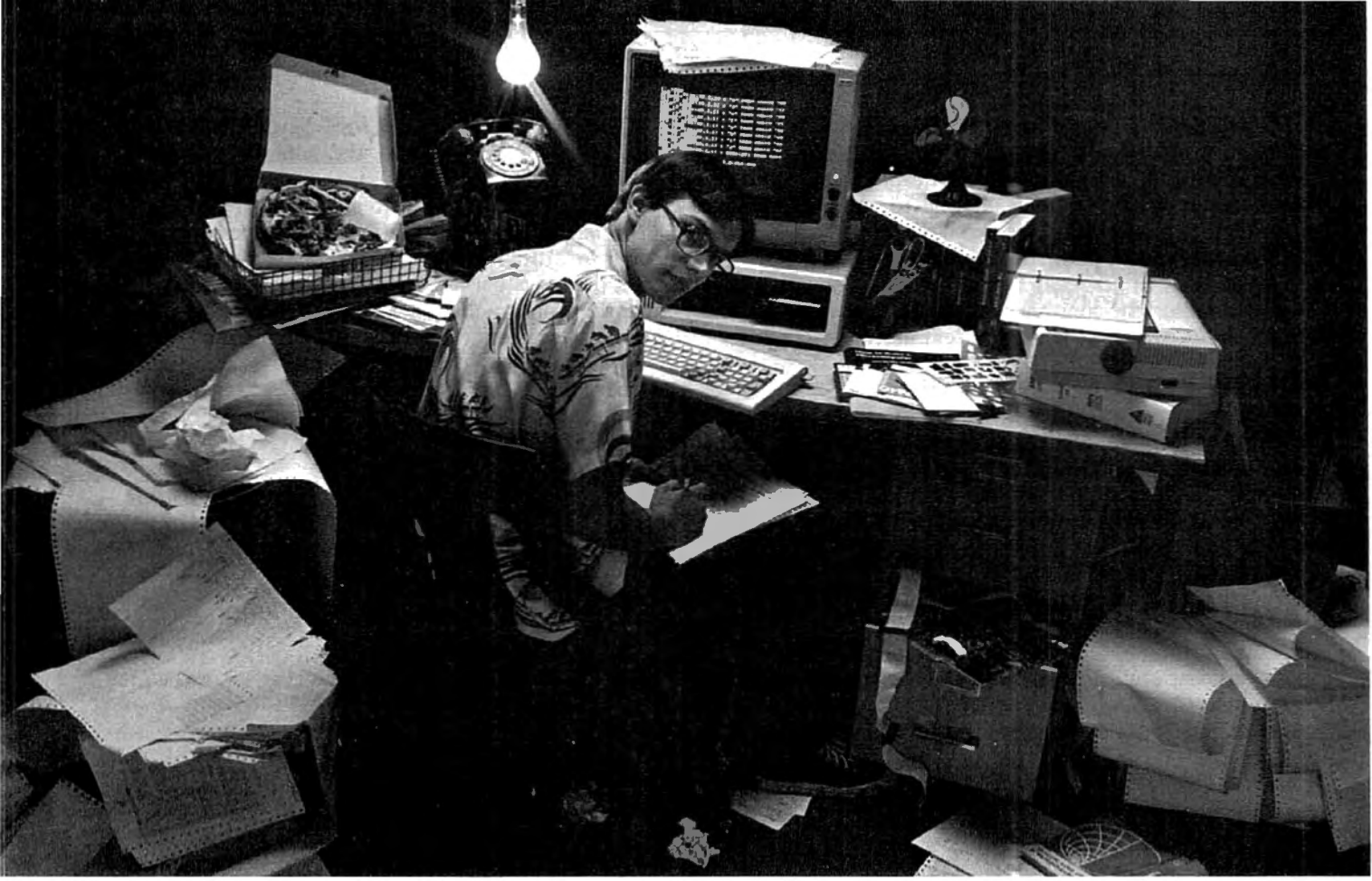
Line 70 asks you for the total quantity of whatever your concern may be (budget dollars, man-hours, supplies, people surveyed, or so on). Input items A, B, and C in line 80. If the sum of A, B, and C exceeds the total, line 90 alerts you to the fact and gives you another chance to input values. If you take up too many lines entering values, the circle is pushed off the screen.

Statements 100–250 draw the pie divisions. Line 110 makes the initial cut, and line 130 converts each item to degrees and percentage. Line 140 computes the angle to place the label of the pie section; line 150 computes the angle of the cut.

Lines 160 and 170 find the point X2Y2 on the circumference of the circle corresponding to the angle figured in 150. Lines 180 and 190 do the same for the point X3Y3—the point where you place the sector label.

A Print@ statement in 240 puts the identifying letter on the screen as close as possible to X3Y3. Lines 200 through 220 find the appropriate character block number (each character block consists of a 6- by 8-pixel rectangle).

Line 230 draws each pie cut; line 240 prints each label. Lines 260 and 270 print out the percentages figured in line 130 and what is left over (if anything). Line 280 keeps everything on the screen. To solve another problem, break and run again.



Got a great new program up your sleeve?

If you write programs, we need each other.
We know that some great software is being developed between the hours of midnight and 6:00 AM, in the silence of America's homes. If you're one of those disk-driven writers, buttoning up by day and hunkering down by night, take heart. Fame and fortune could be right around the corner.

You'll hear from us in 30 days.
I/O WARE is looking for innovative programs for the home and small business markets: word processing, graphic arts, finance, planning, home budgeting, "how-to", etc. Programs that will run on the Commodore 64 (Disk or Tape); IBM PC and PC Jr. (Disk); Apple II (Disk); TRS-80 I, III, IV (Disk), and Color Computer (Disk or Tape). You'll receive our decision in 30 days. If you have what we're looking for we'll immediately send you an advance of *at least* $250.

And that's just the beginning. I/O WARE can give you the kind of exposure (and royalties) you've been dreaming of.

We'll put a cash advance in your pocket.

The I/O WARE Professionals: Duane Manseau, Jim Eastman, Tom Cullity
"We're looking for great new software."

See your name up in bytes.
Every program needs professional documentation, packaging, distribution, and promotion. That's our job. We'll transform your program into a polished, and successful software package.

I/O WARE is part of the team of computer experts publishing the leading computer magazines in the country. Which means your program will have access to major national advertising, direct mail, and hundreds of retail outlets across the country.

So hit us with your best shot—today.
Because we're putting together a very strong line of software. Fast. And there's a good chance you could be a part of the team. Just call Tom Cullity at our software hotline, 603/924-9897, and let us know what you have up your sleeve.

I/O ware

I/O WARE INC.
Peterborough, NH 03458
Attention: Tom Cullity

205

If you need to change the number of pieces in the pie, change lines 80, 90, 120, 260, and 270. If you make too many slices, the labels will print over each other. Also be careful not to enter small quantities adjacent to one another when inputting data. Quantities representing 5 percent or more of the whole should print adjacently without problems.

If you want to get really fancy, figure out how to change the label radius (the constant, 21, in lines 180 and 190) so that labels won't over-print when adjacent in small sectors.

Bar Chart Program

Listing 5 presents a visual indication to accompany the calculated result. Start with an engineering, financial, or mathematical equation. In lines 20 through 50 enter a needed or estimated maximum value, and the value of the variables and constants on which the unknown depends, and change lines 40 and 50 to contain the equation you want to solve.

The listing presents an example with X, the unknown, and a function of four other quantities—A, B, C, and D—for which you input values as the program runs.

Line 60 rounds the answer to two places. Lines 80–160 draw a linear scale at the top of the display; the maximum value entered at line 20 prints at the right, zero at the left. The loop in lines 130–150 computes and prints intermediate scale values.

Program Listing 4. Pie.BA.

```
1 'Pie Chart Program - PIE.BA
2 'Given a total and 3 quantities whose
sum is less than the total, this
programwill graph a pie chart and print
percentages.
3 'By E.J.Carmody
10 CLS:PRINT"PIE CHART PROGRAM"
20 PSET (197,32)
30 FOR A=0TO6.28 STEP .1
40 R=30
50 PSET (197+R*COS(A),32+R*SIN(A))
60 NEXT A
70 INPUT"TOTAL QUANTITY";T
80 INPUT"ITEMS A,B,C";C(1),C(2),C(3)
90 IF T<C(1)+C(2)+C(3) THEN
PRINT@120,"OVER TOTAL":GOTO 80
100 RAD=0
110 LINE (197,32)-(227,32)
120 FOR N=1 TO 3
130 D=C(N)/T*360:
PC(N)=INT(C(N)/T*100+.5)
140 R1=RAD+D/360*3.14
150 RAD=RAD+D/360*6.28
160 X2=197+R*COS(RAD)
170 Y2=32-R*SIN(RAD)
180 X3=197+21*COS(R1)
190 Y3=32-21*SIN(R1)
200 X4=INT(X3/6)
210 Y4=INT(Y3/8)
220 P1=Y4*40+X4
230 LINE(197,32)-(X2,Y2)
240 PRINT@P1,CHR$(96+N)
250 NEXT N
260 PRINT@200,"A=";PC(1);"% B=";PC(2);"%
C=";PC(3);"%"
270 PRINT@240,"LEFT: ";100-PC(1)-PC(2)-
PC(3);"%"
280 GOTO 280
```

End

The ASCII 239 graphic, a solid block, makes up the bar. The value of X indicates the number of blocks used (170–200). When X exceeds the maximum, lines 180 and 250 substitute ASCII 234 to form a dashed bar and alert you.

All values and the equation itself appear below the bar graph in 210 and 220. The program then prompts you to press the space bar to change input. It also asks which variable you want to change. You can select A, B, C, or D and provide new input (lines 260–380). Operation then transfers back to line 40 and the program computes and graphs another solution.

You can easily adapt each of the programs for other applications using pie and bar charting. ■

Contact Emmett Carmody at 2327 Birch Hill Drive, Florissant, MO 63033.

Program Listing 5. Bar.BA.

```
1 'Bar chart program - BAR.BA
2 'A user supplied formula is solved
forX as a function of A,B,C, and D and
graphed as a bar chart.
3 'Values may be changed and the
processrepeated.
4 'By E.J. Carmody
10 CLEAR 100:CLS
20 INPUT"ENTER MAXIMUN VALUE";M
30 INPUT"A,B,C,D= ";A,B,C,D
40 X=5*A^2/SQR(B+C^3)+20*D
50 X$="X=5*A^2/SQR(B+C^3)+20*D"
60 X=INT(X*100+.5)/100
70 CLS:L=M
80 LINE(0,22)-(239,22)
90 FOR I=119 TO 87 STEP -8
100 PRINT@I,CHR$(245):NEXT I
110 PRINT@80,CHR$(245)
120 PRINT@156,L
130 FOR I=149 TO 125 STEP -8
140 L=L-M/5
150 PRINT@I,L:NEXTI
160 PRINT@120,"0"
170 P=239
180 IF X>M THEN 250
190 N=40*X/M
200 PRINT@40,STRING$(N,P)
210 PRINT@160,"X= ";X;"A= ";A;"B=
";B;"C= ";C;"D= ";D
220 PRINT@200,X$
230 PRINT@240,"PRESS SPACEBAR TO CHANGE
INPUT
240 K$=INKEY$:IFK$=CHR$(32)
THEN260ELSE240
250 N=40:P=234:GOTO200
260 INPUT"WHICH VARIABLE";Y$
270 IFY$="A" THEN 320
280 IFY$="B" THEN 340
290 IFY$="C" THEN 360
300 IFY$="D" THEN 380
310 PRINT"VARIABLE INCORRECT":GOTO 260
320 INPUT"A= ";A
330 GOTO 40
340 INPUT"B= ";B
350 GOTO 40
360 INPUT"C= ";C
370 GOTO 40
380 INPUT"D= ";D:GOTO 40
```

End

File Expansion

Line 10 of my BKUPDO program ("Backing Up the 100," February 1984, p. 190) has a problem. As it appears in the listing, the MAXFILES=2 statement nullifies the preceding DIM statement. To allow more than 10 files in the backup list, retype line 10 as:

```
10 CLEAR2E3 :MAXFILES=2 :DIMF$(19)
```

Bryan R. Leipper
714 Terre Court
Reno, NV 89506

Log-On Sequences

Here's a list of auto log-on sequences for the Model 100 (see the Table). It covers the Dow Jones News Service (DJNS), The Source, CompuServe, and the Official Airline Guide (OAG). I developed them for Tymnet, Telenet, Uninet, and for direct connection to CompuServe. When you use the sequences, you should substitute your local access numbers in place of the Fort Lauderdale numbers in the Table.

Since the sequences take up a small amount of memory, I built all 11 into my ADRS.DO file. Now if one line is busy, I can quickly dial up another number.

Also, you can incorporate an unlimited number of stock quote requests into the auto log-on sequence by typing in your list of five stock symbols followed by ΛM (see the Table). Then, before you type in the >: characters, type a comma, six or seven equals signs, five more stock symbols separated by spaces, and an ΛM.

When you have finished your queries, press the right-arrow and colon keys. For example, to get a quote for General Motors, type ?A,GMΛM before pressing the last right-arrow key.

This procedure gives you a lot of automatic stock quote requests using a minimum of memory. However, since you only type <: after the last batch of requests, only the last batch comes to your computer in the terminal mode. The earlier batches hit the Model 100 while it is in the entry mode, so you can view them as they cross the screen, but you can't send them to the printer or download them.

You can overcome this problem if DJNS lets you ask for an unlimited number of quotes at a time; you could forget the M and the series of equals signs after each batch and type one ΛM: at the end.

I'm waiting to hear from DJNS on whether this is a technical limitation. I suspect, however, that the problem is directly related to how much can fit on the Model 100 screen.

Alf L. Erickson
509 Flamingo Drive
Fort Lauderdale, FL 33301

To Err Is Confusing

Most TRS-80 computers identify errors in Basic programs in plain English terminology. The Model 100, however, displays only an error code, along with the line number in which the error occurs. To find out what the error is, you have to look up the code's definition.

I wrote a program called Codes that solves this problem (see the Program Listing). Type in your own programs using lines 1–5998. Line 0 traps errors by switching the program flow to line 5999 and defining the error.

Codes catches all coded errors, but not undefined errors. You might want to include owner's manual page-number references to the errors. After you have the program running, you can delete lines 0 and 5999–7000 before printing or saving your program.

Robert L. Green
P.O. Box 419
Clarkston, GA 30021

Super Text

I recently discovered how to set a left margin when printing on my Epson FX-80 with the Model 100's text processor. To generate the escape code for all Epson printers, type CHR$(155). In Basic type CHR$(27).

On the Epson, you generate a left margin by typing CHR$(27);"1";CHR$(n), where n denotes the number of spaces you want to indent. When using the ASCII character

CompuServe local direct connection	:7723240<==ΛC?U(user ID number)ΛM?P(password)ΛM>:
Dow Jones Tymnet	:4673807<==A?pDOW1;;?WDJNSΛM?P(password)ΛM>:
CompuServe Tymnet	:4673807<==A?pCPSΛM?U(user ID number)ΛM?P(password)ΛM>:
OAG Tymnet	:4673807<==A?pOAGΛM?(account#);(password)ΛM>:
Source Tymnet	:4673807<==A?pSOURCE10;PRIM;ΛM?+ΛMID(user ID number) (password)ΛM>:
Dow Jones Telenet	:7644505<=ΛM=ΛM?TD1ΛM?@C 60942ΛM?WDJNSΛM?D(password)ΛM>:
Source Telenet	:7644505<=ΛM=ΛM?TΛM= ΛM?@C 30124ΛM==ID(user ID number) (password)ΛM>:
CompuServe Telenet	:7644505<=ΛM=ΛM?TD1ΛM?@C 202202ΛM?U(user ID number)ΛM?P(password)ΛM>:
Source Uninet	:4676504<=ΛM.AMS10ΛM?UID(user ID number) (password)ΛM>:
Dow Jones Uninet	:4676504<=ΛM.AMPROF3ΛMDOWΛM?*DJNSΛM?E(password)ΛM>:
OAG Uninet	:4676504<=ΛM.ΛMOAGΛM?P(account number);(password)ΛM>:

Table. Auto log-on sequences for the Model 100.

BIG SAVINGS ON...

TRS-80
FORMS & SUPPLIES

- ✔ Invoices
- ✔ Checks
- ✔ Statements
- ✔ Stationery
- ✔ Diskettes
- ✔ Ribbons

COLWELL COMPUTER FORMS & SUPPLY CATALOG

We're so sure you'll save money, we'll give you a $5.00 check just to prove it. That's right! Colwell has been providing top quality forms and supplies at substantial savings since 1927 and every order comes with a 100% "No Questions Asked" Guarantee...you must be satisfied or your money back.

To get your $5.00 check good towards your first order and free catalog, fill out and return this coupon or call the toll-free number shown.

Send for $5.00 check and FREE catalog today!

Call Toll-Free
800-248-7000
(In Illinois 800-233-7777)

COLWELL ✔202

Colwell Systems, Inc.
201 Kenyon Road
Champaign, Illinois 61820

COLWELL Colwell Systems, Inc.
201 Kenyon Road
Champaign, Illinois 61820

294

NAME/TITLE | PHONE

COMPANY

STREET

CITY,STATE,ZIP

SOFTWARE BRAND | PACKAGE # | ☐ DO OWN PROGRAMMING

COMPUTER BRAND | MODEL | PLAN TO PURCHASE WITHIN

YOUR LINE OF BUSINESS | NUMBER OF EMPLOYEES

I MOST OFTEN USE MY COMPUTER FOR:
☐ WORD PROCESSING ☐ ACCOUNTING ☐ OTHER _____

code tables from page 211 of the Model 100 manual, CHR$(155) is (GRPH)k. This gives you a left-arrow control character.

Next, type a lowercase L, and press control-M to create CHR$(n). You then have a 13-space left margin, the minimum you can set since the control characters A–L leave no recordable character on the screen.

For a margin of 13, Type (GRPH)k 1 and press control-M at the top of your text. The computer displays a left arrow, a lowercase L and a carriage return symbol. These codes will not appear on your printout or interfere with your text formatter code.

You can set elite spacing on the Epson RS-80 and FX-80 by pressing escape-M. Generate the escape function by typing (GRPH)k followed by an uppercase M. The printer now prints in the elite mode. You can also use this technique to print double-width, condensed, emphasized, italicized, superscripted, and subscripted type.

Lorne Nicolson
RR#1
Nelson, B.C.
V1L 5P4 Canada

Program Listing. Codes program of error definitions.

```
0 ON ERROR GOTO 5999
5999 BEEP:CLS:ON ERR GOTO
6001,6002,6003,6004,6005,6006,6007,
6008,6009,6010,6011,6012,6013,6014,
6015,6016,6017,6018,6019,6020,6022,
6051,6052,6053,6054,6055,6056,6057,6058
6000 PRINT"UNDEFINED ERROR":END
6001 PRINT"NEXT WITHOUT FOR":END
6002 PRINT"SYNTAX ERROR":END
6003 PRINT"RETURN WITHOUT GOSUB":END
6004 PRINT"OUR OF DATA":END
6005 PRINT"ILLEGAL FUNCTION CALL":END
6006 PRINT"OVERFLOW":END
6007 PRINT"OUT OF MEMORY":END
6008 PRINT"UNDEFINED LINE":END
6009 PRINT"BAD SUBSCRIPT":END
6010 PRINT"DOUBLY DIMENSIONED
ARRAY":END
6011 PRINT"DIVISION BY ZERO":END
6012 PRINT"ILLEGAL DIRECT":END
6013 PRINT"TYPE MISMATCH":END
6014 PRINT"OUT OF STRING SPACE":END
6015 PRINT"STRING TOO LONG":END
6016 PRINT"STRING FORMULA TOO
COMPLEX":END
6017 PRINT"CAN'T CONTINUE":END
6018 PRINT"I/O ERROR":END
6019 PRINT"NO RESUME":END
6020 PRINT"RESUME WITHOUT ERROR":END
6022 PRINT"MISSING OPERAND":END
6051 PRINT"BAD FILE NUMBER":END
6052 PRINT"FILE NOT FOUND":END
6053 PRINT"ALREADY OPEN":END
6054 PRINT"INPUT PAST END OF FILE":END
6055 PRINT"BAD FILE NAME":END
6056 PRINT"DIRECT STATEMENT IN
FILE":END
6057 PRINT"UNDEFINED ERROR":END
6058 PRINT"FILE NOT OPEN":END
7000 RESUME
```

End

NEW LOWER PRICES

RIBBON CARTRIDGES

PRINTER MAKE, MODEL NUMBER (Contact us if your printer is not listed. We have ribbons FOR MOST PRINTERS)	RIBBON SIZE Inches by Yards	NEW REPLACEMENT CARTRIDGES Price each in quantity of 3	6	12	RIBBON LOOPS L = Loop Z = Zip-Pack P = Pancake Cart. Not Included 8	12
ANADEX 9500	½ x 30	10.00	9.50	9.25	L 30.00	51.00
C. ITOH Prowriter	½ x 14	8.00	7.50	7.25		
DIABLO Hytype II Nylon	5/16 x 17	5.25	4.75	4.50		
DIABLO Hytype II Multi.	5/16 x 135	5.25	4.75	4.50		
EPSON MX70/MX80/FX80	½ x 20	5.50	5.00	4.75	Z 24.00	45.00
EPSON MX100	½ x 25	9.50	9.00	8.75	Z 24.00	45.00
IDS Microprism 480	5/16 x 11.5	6.75	6.25	6.00		
IDS Paper Tiger 460/560	½ x 35	7.00	6.50	6.25		
IDS Prism	¼ x 40	7.50	7.00	6.50		
NEC 5500/7700 Nylon	½ x 15	6.00	5.50	5.25	L 24.00	45.00
Spinwriter Multistrike	¼ x 133	5.75	5.25	5.00	P 18.00	33.00
Spinwriter Multi. High Yield	¼ x 133	6.00	5.50	5.25		
3500 Multistrike	½ x 14	6.75	6.25	6.00		
OKIDATA Microline 84	½ x 40	5.50	5.00	4.75		
80, 82, 83, 92, 93 Dual Spool	½ x 12	3.00	2.50	2.25		
RADIO SHACK LP 1/2/4	9/16 x 16				Z 18.00	33.00
LP 3/5	½ x 13	6.25	5.75	5.50	L 24.00	45.00
LP 6/8 - DMP 400	5/16 x 11.5	6.75	6.25	6.00		
DMP 2100	5/16 x 29	8.00	7.50	7.25		
DW 2 - DWP 410 Multi.	¼ x 130	6.00	5.50	5.25	P 18.00	33.00
SMITH CORONA TP-1/TP-2	Multistrike	8.00	7.50	7.25		
QUME Nylon or Multistrike	Call or Write — All Sizes Available					

CHECK — MONEY ORDER — COD —

All orders shipped U.S. mail. FREE shipping on prepaid orders for USA zip codes.
VISA/MC add $1.50 (include exp. date). COD add $3.00
Foreign must be US funds — Call for Shipping Charges
Phone 5 p.m. - 9 p.m. EST Monday - Friday & 9 a.m. - 6 p.m. Saturday

(302) 492-8463
No Sales Tax

ADEL COMPUTER MART
DEPT 10 BOX 195
HARTLY, DE 19953

356

A B S E E

Integrated Software
- Advanced Editor
- Word Processor
- Smart Terminal

State-of-the-Art Performance From Your Model III/(IV) for $89.95

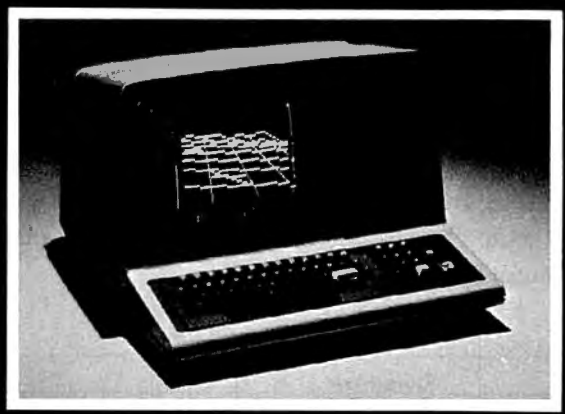
- ADVANCED SCREEN EDITING
  - —Fast hor/vert scrolling
  - —Instant Help Screens
  - —Edits any file /BAS- /CMD
  - —User defined personality
  - —Macros for complex tasks
  - —Screen snapshots (graphs)
  - —Column editing features
  - —Ranges, Vetos, & strings
  - —Block move, load, save
- ON SCREEN WORD PROCESSING
  - —Text justification (L.C.R.)
  - —Paragraphs - indents - margin
  - —Proportional spacing
  - —Odd/even Top & Bot titles
  - —Page numbering (anywhere)
  - —Model III graphics
  - —Customizes to your printer
  - —Word wrap, auto tabs
  - —Partial document printing
- DOS SHELL
  - —Exec DOS cmds and return
  - —Exec BASIC & /CMD prgrms
  - —Use macros in programs
- TELECOMMUNICATIONS
  - —Up to 1200 Baud (interrupt)
  - —Horizontal scrolling screen
  - —Macros handshake with host
- FREEBEE PROGRAMS (source files included)
  - —CONNECT: Supports Hayes SMARTMODEM features
  - —DRAW: Hor/vert scrolling screen graphics editor
  - —LPRINT: Screen images on EPSON, PROWRITER, and OKIDATA (92)
  - —HELP: Frame oriented relational query Data Base

REQUIRES: 48K, 2D. Drives
Unprotected diskette

SUPPORTS: Most Mod III DOSes
Programmed tutorial

Computents Inc.
980 John Adams Parkway, Idaho Falls, ID 83401 119
—Registered owners can upgrade to IBM or Tandy 2000— for a nominal charge (when available)
Master Charge and Visa Welcome — (208) 529-2492 9-5 Mtn.

T80-FS1 Flight Simulator



Available for Model I or Model III. $25.00 on cassette or $33.50 on disk (with enhancements) All versions require 16K.

If you order direct, please specify whether you have Model I or Model III (the media *are* different) and whether you want disk or cassette. 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.

See your dealer!

subLOGIC
Communications Corp.
713 Edgebrook Drive
Champaign, IL 61820
(217) 359-8482
Telex: 206995

NEW FROM

Wayne Green Books

An Easy Way To Organize

Learn to write your own data base manager

Introduction to TRS-80 Data Files is a book-and-disk combination that teaches the basics of writing a data base management program for your TRS-80. Your program will help you organize any data you need to keep—whether it's your income tax records, household expenses, or a mailing list or inventory for a small business.

Introduction to TRS-80 Data Files will teach you the programming techniques you need for writing a data base manager. You'll start with new terms, then go on to sequential and random access files—how they work, their advantages and disadvantages, and how you can use them. You'll see a mailing list program built in sections, first using sequential files, then random access, so you can examine all the parts that make up a data base manager. There is also a section on modifications, which allows you to use the book with the Model I or Model III and gives suggestions for adapting it. All the program listings are included in the book, along with sample printouts.

Learn by doing it yourself.

The *Introduction to TRS-80 Data Files* package—book and disk—is just $24.97. Your do-it-yourself program will give you a data base system customized for your needs. It will have all the capabilities you need, without giving you too much power and eating up memory you could use to store data. Best of all, it will make you a better programmer.

John D. Adams
ISBN 0-88006-066-2
BK7398
approx. 144 pp.
7 by 9
$24.97 66

To order, call **toll-free 1-800-258-5473** for credit card orders. Or mail your order with check or money order or complete credit card information to: **Wayne Green Books, Retail Sales, Peterborough, NH 03458.** Please include shipping and handling ($1.50 for the first book, $1.00 each additional book).

Send me _____ copies of **Introduction to TRS-80 Data Files (BK7398)** at $24.97 each, plus shipping and handling. ($1.50 for the first book, $1.00 each additional book).

☐ payment enclosed ☐ MasterCard ☐ Visa ☐ Am. Ex.

Card #_____ MC bank #_____

Expiration date_____ Signature_____

Name_____

Address_____

City_____ State_____ Zip_____

Wayne Green Books, Peterborough, NH 03458 344B8D

NEW

Wayne Green Books

FROM

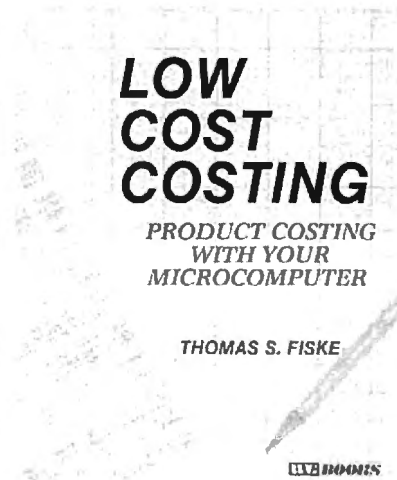
CONTROL YOUR COSTS AND MAXIMIZE YOUR PROFIT

To make a profit, you have to know what your costs are. *Low Cost Costing* is a book-and-software combination that will help you determine production costs for your small business, using your Apple, IBM PC, or TRS-80.

Whether you're a company president, controller, production manager, or anyone responsible for production, you can increase your profits once you know what you're spending. *Low Cost Costing* shows you how to analyze your costs using your profit-and-loss statements and your microcomputer. Once you've found them, you can:

Cut your costs.
Adjust prices for maximum profit.
Set marketing and manufacturing strategies.
Predict the results of changes in volume and fixed or variable costs.
Determine why some products sell and others don't.

The *Low Cost Costing* book and disk are packaged in a



plastic binder that stores and protects them. It's the time- and money-saving combination your small business needs—*Low Cost Costing* and your micro.

Low Cost Costing
Thomas S. Fiske
approx. 112 pp.
$24.97

Apple II, II Plus, IIe
BK7399
ISBN 0-88006-067-0

IBM PC
BK7402
ISBN 0-88006-071-9

TRS-80 Model I, III
BK7403
ISBN 0-88006-072-7

To order, call toll-free 1-800-258-5473 for credit card orders. Or mail your order with check or money order or complete credit card information to: Wayne Green Books, Retail Sales, Peterborough, NH 03458. Please include shipping and handling of $1.50 for the first system, $1.00 for each additional system. ↙67

Yes, I want *Low Cost Costing*. $24.97 per system, plus shipping and handling ($1.50 for the first system, $1.00 for each additional system). Please indicate total number wanted for each system.

_____ Apple (BK7399) _____ IBM PC (BK7402) _____ TRS-80 (BK7403)

☐ payment enclosed ☐ MasterCard ☐ Visa ☐ Am. Ex.

Card # _____ MC bank # _____
Expiration date _____ Signature _____
Name _____
Address _____
City _____ State _____ Zip _____
Wayne Green Books, Peterborough, NH 03458 344B8L

See List of Advertisers on Page 227

Fastdance: Three Seconds Of Your Favorite Tunes

As sold, TRS-80 Models I and III can't carry a tune, and sound capability can be a useful feature. You can use it to indicate errors, to signal an ASCII bell character (see Project 80, January 1984, p. 197), and to provide music for games.

So this month I'll tell you how to construct a tune-generator board that lets you select one of 25 tunes or one of two chimes, all under software control (see the Photo). You can interface the board to the Model I or III without minimum memory requirements or an expansion interface.

The tunes, one- to three-second renditions of popular melodies, won't entertain you by themselves, but they can enhance game-playing and impress your friends.

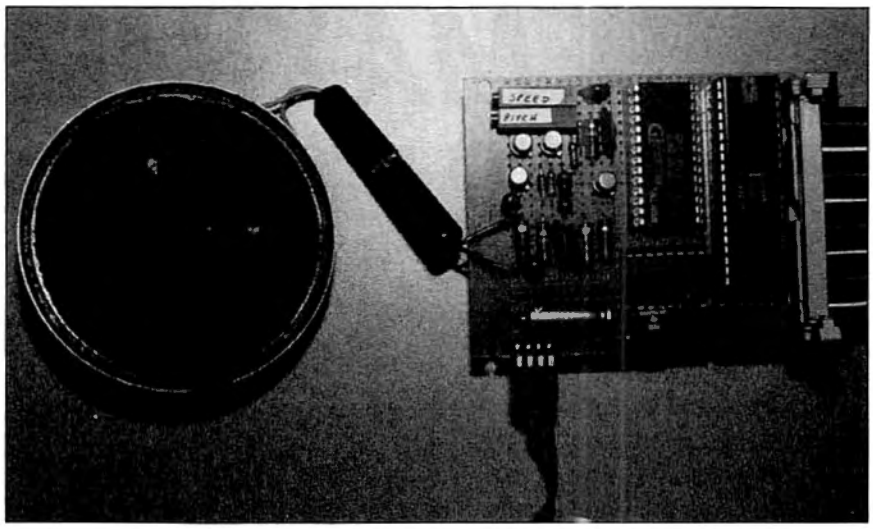


Photo. Tune-generator board.

The Melody Synthesizer

The tunes are short because General Instrument originally designed the main chip for this project, the AY-3-1350, as a doorbell tune generator that plays a different melody at each door in the house (see Table 1 for the parts list and ordering information).

All 25 tunes and two of the three chimes are available on the board (see Table 2). The chip differentiates among them through the various combinations of letters (A–E) and numbers (1–4) in codes defining the tunes.

The AY-3-1350 operates on a single +5V (volt) power supply and allows simple TTL-level (transistor to transistor logic) interfacing.

Constructing the Board

The Intel 8255A programmable peripheral interface (PPI) used as the microprocessor in this project lets you latch specified bit patterns to the AY-3-1350 for tune selection and play commands, and gives the computer access to a status line that indicates when a tune is playing. You use only half of the 24 available input/output (I/O) lines on the 8255A (see the Figure).

As is typical of previous projects in this column, the address decoding section, consisting of a 74LS138 chip and a pair of inverters, lets you choose the address range of the 8255A. I used the configuration indicated on the schematic by dotted lines (see the Figure). The software I'll describe later assumes this configuration (a port address range of 0C hexadecimal [hex] to 0F hex). I've included these and other possible addresses, determined by connecting the 74LS138 enable lines before or after the respective inverters, in Table 3, where slash marks represent the respective inverted address output from the inverter.

A 74LS04 chip is necessary only if you use both address decoding inverters. As I have noted on the schematic (see the Figure), a NOR gate (74LS02) with the two inputs tied together (or one input tied to ground) can substitute for an inverter. (I didn't use a 74LS04 on my board [see the Photo] simply because I used only one address decoding inverter.)

This project requires a fair amount of analog circuitry, so be careful when connecting leads. Identify which leads are the emitter, base, and collector of a transistor, and the anode and cathode of a diode—confusing them is a common mistake in analog circuitry construction. You can use a speaker of any size; the larger the speaker, the greater the sound. Incidentally, while you can select pitch and speed, you can't adjust the volume, so I don't advise a huge speaker; my 3-inch, 8-ohm speaker works well (see the Photo).

You can combine the 4.7k pull-up resistors on the 8255A outputs in a single in-line package (SIP) as I've done, or use separate resistors, as specified in the parts list. If you've built any of my previous projects, you can use the same board-to-computer interconnect cable and will need only a new male header on the board.

Operating the Board

A single +5V power supply at 250 milliamperes (mA) runs the generator. Turn on the board before you turn on

Quantity	Description	Dist.	Part #	Price (each)
1	AY-3-1350 General Instrument melody synthesizer IC	RS	276-1782	$ 5.99
1	8255A programmable peripheral interface IC	JDR	8255	4.49
1	74LS02 quad NOR gate (LS TTL) IC	JDR	74LS02	0.25
1	74LS04 hex inverter (LS TTL) IC	JDR	74LS04	0.24
1	74LS32 quad 2-input OR gate (LS TTL) IC*	JDR	74LS32	0.29
1	74LS138 3-to-8 decoder IC	JDR	74LS138	0.55
1	74LS74 dual d-type flip-flop (LS TTL) IC	JDR	74LS74	0.35
1	4.7k resistor (¼ watt)	RS	271-1330	0.08
3	10k resistor (¼ watt)	RS	271-1335	0.08
1	3.9k resistor (¼ watt)	DK		0.05
1	100k resistor (¼ watt)	RS	271-1347	0.08
1	2.7k resistor (¼ watt)	DK		0.05
1	3.3k resistor (¼ watt)	RS	271-1328	0.08
1	33k resistor (¼ watt)	RS	271-1341	0.08
10	4.7k resistor (¼ watt)	RS	271-1330	0.08
1	330k resistor (¼ watt)	DK		0.05
1	20k potentiometer (pot, PC mount)	RS	271-340	1.49
1	1m potentiometer (pot, PC mount)	RS	271-229	0.59
1	100 μF/10V electrolytic capacitor (PC mount)‡	JDR		0.18
1	100 μF/35V electrolytic capacitor (PC mount)‡	RS	272-1028	0.79
1	.1 μF/50V disk capacitor	RS	272-135	0.25
2	10 μF/16V tantalum capacitor	RS	272-1436	0.69
1	.22 μF/50V epoxy capacitor	RS	272-1070	0.30
1	47 pF/50V disk capacitor	RS	272-121	0.20
1	1N914 small signal diode	RS	276-1122	0.10
4	2N2222 general-purpose transistor (NPN)	RS	276-2009	0.79
1	40-pos. cable header (w/w)†	DK	R241-ND	5.58
1	40-pos. ribbon cable edge connector†	DK	R503-ND	3.80
1	40-pos. ribbon cable socket connector†	DK	R306-ND	3.73
8 inches	40-cond. ribbon cable†	DK	R007-ND	0.00
1	50-pos. cable header (w/w)*	DK	R247-ND	6.93
1	50-pos. ribbon cable edge connector*	RS	276-1566	4.95
1	50-pos. ribbon cable socket connector*	DK	R307-ND	4.65
8 inches	50-cond. ribbon cable*	DK	R008-ND	0.00
1	8-ohm speaker	RS		0.00

*Model III
†Model I
‡The 10V capacitor is sufficient, but you can substitute Radio Shack's 35V capacitor.

Addresses:
Radio Shack (RS), National Parts Division, 900 East Northside Drive, Fort Worth, TX 76102, 817-870-5662.

JDR Microdevices, 1224 S. Bascom Ave., San Jose, CA 95128, 800-538-5000 or 408-995-5430 outside California; 800-662-6279 within California.

Digi-Key Corp. (DK), Highway 32 S., P.O. Box 677, Thief River Falls, MN 56701, 800-346-5144 or 218-681-6674.

Table 1. Parts list and ordering information.

Code	Tune
A0	Toreador
B0	William Tell
C0	Hallelujah Chorus
D0	Star-Spangled Banner
E0	Yankee Doodle
A1	John Brown's Body
B1	Clementine
C1	God Save the Queen
D1	Colonel Bogey
E1	Marseillaise
A2	America, America
B2	Deutschland Leid
C2	Wedding March
D2	Beethoven's 5th
E2	Augustine
A3	O Sole Mio
B3	Santa Lucia
C3	The End
D3	Blue Danube
E3	Brahms' Lullaby
A4	Hell's Bells
B4	Jingle Bells
C4	La Vie en Rose
D4	Star Wars
E4	Beethoven's 9th
	Westminster Chime*
	Simple Chime
	Descending Octave Chime

*Not available on the tune generator board

Table 2. Tunes and chimes availuble through the AY-3-1350 melody synthesizer chip.

the computer to eliminate possible bus-loading problems from the 8255A and to reset the 8255A properly with the TRS-80 reset strobe.

You can operate the entire board from Basic through simple OUT and INP instructions. Keep in mind that, for this discussion, I'm referring to the 0C–0F hex range (port addresses 12–15 in decimal). Most of the operations will be writes to the 8255A, though there is also a status line that is read to indicate tune-playing status. The 74LS74 flip-flop creates the status line, which goes low when a tune is playing and returns high once the tune is over.

Access the letter and number lines on the melody synthesizer via the 8255A output lines (see the Figure). To select a tune, first determine the letter of the tune (see Table 2) and bring low the 8255A port A line corresponding only with that letter. Repeat this procedure for the number portion of the code on port B of the 8255A.

For example, to select "Beethoven's Fifth" (code D2), write a 17 hex (23 decimal) to port A of the 8255A, selecting the AY-3-1350 D line, and a 0D hex (13 decimal) to port B to select the 2 line. The values of the unused port bits (PA5–PA7 and PB4–PB7) are irrelevant.

To start the tune, the AY-3-1350 Backdoor line must be brought low (port C, bit 0). Now look at the status line on port C, bit 4. Wait for the line to go low, indicating that the tune has begun. Once the tune starts, it's safe, as well as necessary, to raise the Backdoor line; otherwise, the tune repeats. If the program needs to know, you can continue to monitor the status line and determine when the tune is over, that is, when the line returns high. After the status line has gone high, you can select and play another tune.

To access the port lines on the 8255A, set the ports up with a com-

mand word sent to the command port (15), telling the 8255A what mode it's in as well as which lines are inputs and which are outputs. (The reset default is Basic I/O mode; all lines are inputs.) The proper command word for the 8255A in this application is 88 hex (136 decimal), which tells the 8255A to remain in Basic I/O mode and to make all lines outputs—excluding the upper four lines of port C, one of which is used to read in the playing-status line.

E2	E3	Address Range
A6/	A5/	4C hex–4F hex
A6/	A5	64 hex–6F hex
A6	A5/	0C hex–0F hex
A6	A5	2C hex–2F hex

Table 3. Address ranges for the tune-generator board.

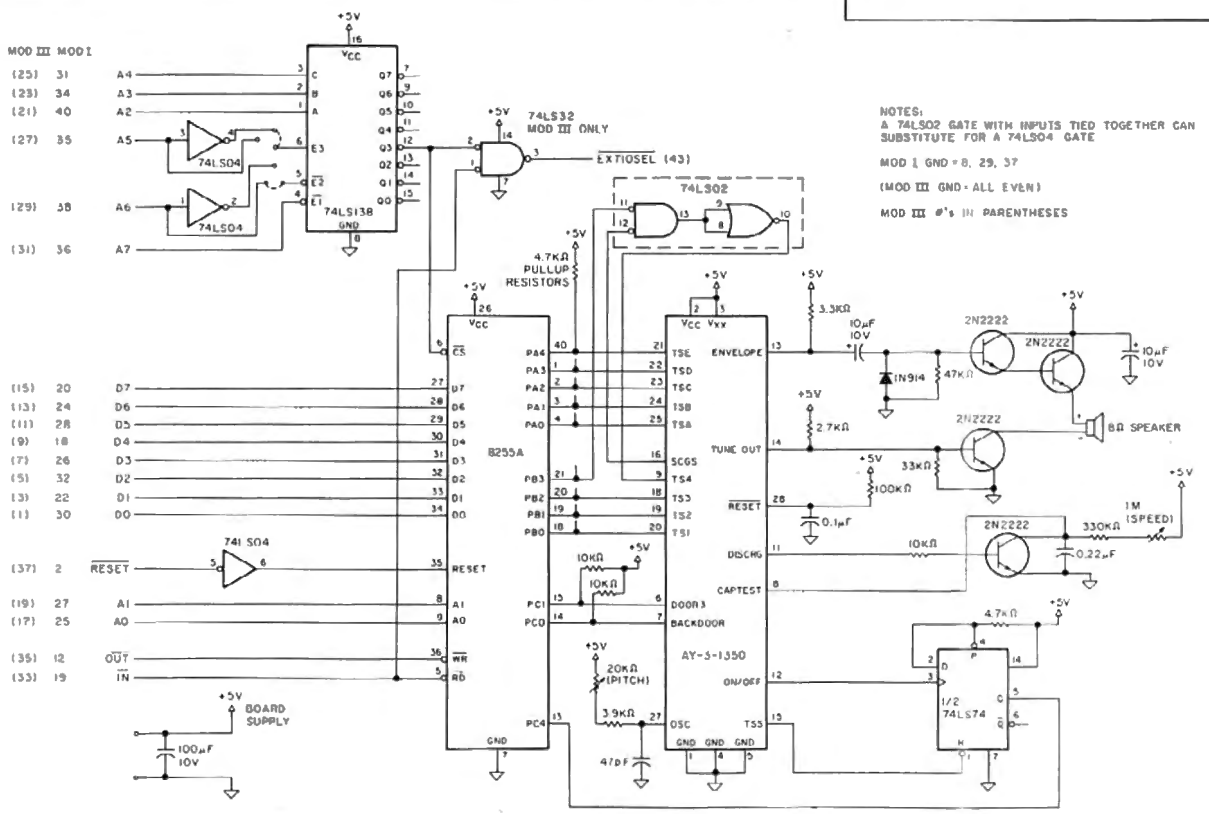
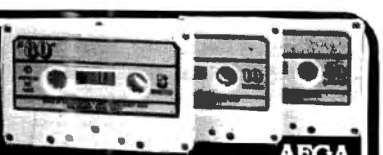


Figure. TRS-80 melody synthesizer.

COMPUSETTE.

NEVER UNDERSOLD



"We'll Meet or Beat ANY Comparible Offers!!"

AFGA PE 611

Diskettes	Qty.	Retail	Sale
40-Track	10 pak	$3.99	$1.99 ea.
Single Sided	20 pak	$3.69	$1.89 ea.
Double Density	50 pak	$2.99	$1.79 ea.
With Hub Rings	100 pak	$2.49	$1.69 ea.
	10 pak case	$4.99	$3.50 ea.

Cassettes	Retail	12-Pak	24-Pak
C-5	99¢	65¢	55¢
C-10	$1.29	69¢	59¢
C-15	$1.49	75¢	65¢
C-20	$1.69	79¢	69¢
Hard Box	49¢	26¢	21¢

—UPS Shipping (48 States) $3.00 Per Pack—

Micro-80™ INC.

2665 E. Busby Road
Oak Harbor, Wash., 98277

132

VISA

MasterCard

IMMEDIATE SHIPMENT

1-(206)-675-6143

PERRY COMPUTERS

CALL TOLL FREE 1-800-248-3823

TRS-80 COMPUTERS
100% PURE RADIO SHACK

TANDY 2000

REVOLUTIONARY TANDY TRS-80 MODEL 2000

The Ultra-High Performance MS-DOS Personal Computer That's Twice the Speed of the IBM PC

$2300.00

		LIST PRICE	OUR PRICE
26-5103	Tandy 2000 Two Disk	$2750.00	$2300.00
26-5104	Tandy 2000 10 Meg HD	$4250.00	$3570.00
26-5111	Monochrome Monitor	$ 249.00	$ 205.00
26-5112	Color Monitor	$ 799.00	$ 670.00
26-5140	Hi Res Graphic Monochrome	$ 449.00	$ 375.00
26-5141	Hi Res Color Graphics Chip	$ 199.00	$ 169.00
26-5142	TV/Joystick Option	$ 249.95	$ 205.00
26-5160	Internal 128K Kit	$ 299.00	$ 250.00
26-5311	Microsoft Multiplan	$ 249.00	$ 209.00
26-5352	dBase II (Data Base)	$ 595.00	$ 499.00

MODEL 4 COMPUTERS

		LIST PRICE	OUR PRICE
26-1067	Model 4 16K Computer	$ 999.00	$ 685.00
26-1068	Model 4 64K 1 Drive Computer	$1699.00	$1385.00
26-1069	Model 4 64K 2 Drive Computer	$1999.00	$1495.00
26-1080	Model 4P Portable	$1799.00	$1495.00
26-1122	64 K Memory Expansion	$ 79.95	$ 67.95
26-1127	0 Drive Model 4 Computer	$ 649.00	$ 550.00
26-1163	1 Drive Model 4 Computer	$ 239.00	$ 205.00
26-1130	5 Meg Hard Drive Primary	$1999.00	$1680.00
26-1131	5 Meg Hard Drive Secondary	$1799.00	$1549.00

BUSINESS COMPUTERS

		LIST PRICE	OUR PRICE
26-4004	Model 12 80K 1 Drive Computer	$2799.00	$2400.00
26-4005	Model 12 80K 2 Drive Computer	$3499.00	$2900.00
26-6004	Model 16B 256K 1 Drive Computer	$3999.00	$3300.00
26-6005	Model 16B 256K 2 Drive Computer	$4699.00	$3900.00
26-6006	Model 16B 256K 15 Meg HD	$6499.00	$5500.00
26-6010	Model 12 To Model 16 Upgrade	$ 899.00	$ 750.00
26-4155	15 Meg Hard Drive Primary	$2495.00	$2100.00
26-4156	15 Meg Hard Drive Secondary	$1995.00	$1675.00
26-4157	Cable Board Kit For Hard Drive	$ 495.00	$ 410.00

MODEL 100 COMPUTERS

		LIST PRICE	OUR PRICE
26-3801	8K Model 100 Computer	$ 799.00	$ 650.00
26-3802	24K Model 100 Computer	$ 999.00	$ 790.00
26-3804	AC Adaptor	$ 5.95	$ 5.00
26-3805	Accoustic Coupler	$ 39.95	$ 34.00
26-3816	8K Memory Expansion	$ 119.95	$ 95.00
26-1409	Printer Cable	$ 14.95	$ 12.70
26-1410	Modem Cable	$ 19.95	$ 17.00
26-3809	Briefcase	$ 49.95	$ 42.50
26-1183	Bar Code Reader	$ 99.95	$ 85.00
26-3822	Personal Finance	$ 19.95	$ 17.00

COLOR COMPUTERS

		LIST PRICE	OUR PRICE
26-3127	64K Color II Computer	$ 259.95	$ 220.00
26-3026	16K Color II Non Extended Basic	$ 159.95	$ 140.00
26-3027	16K Color II Extended Basic	$ 199.95	$ 169.00
26-3022	0 Drive Color Computer	$ 399.95	$ 310.00
26-3023	1,2,3 Color Drives	$ 279.95	$ 230.00
26-3029	0 Drive Color Computer II	$ 399.95	$ 310.00
26-3030	OS-9 With Editor Assembler	$ 69.96	$ 59.50
	VIP Writer		$ 59.00
	VIP Speller		$ 49.00
	Telewriter Disk		$ 59.00

RADIO SHACK PRINTERS

		LIST PRICE	OUR PRICE
26-1250	DWP 410 Daisy Wheel Printer	$1295.00	$1100.00
26-1252	DMP 500 Dot Matrix Printer	$1295.00	$1100.00
26-1254	DMP 200 Dot Matrix Printer	$ 699.00	$ 575.00
26-1255	DMP 120 Dot Matrix Printer	$ 499.00	$ 400.00
26-1256	DMP 2100 Dot Matrix Printer	$1995.00	$1600.00
26-1257	DWP 210 Daisy Wheel Printer	$ 799.00	$ 640.00
26-1258	DW II Daisy Wheel Printer	$1995.00	$1600.00
26-1167	DMP 420 Dot Matrix Printer	$ 999.00	$ 850.00
26-1271	DMP 110 Dot Matrix Printer	$ 399.00	$ 325.00

OTHER MAJOR BRANDS

COMPUTERS	OUR PRICE	PRINTERS	OUR PRICE
Sanyo	$ Call	Epson	$ Call
Columbia	$ Call	C Itoh	$ Call
Epson	$ Call	Okidata	$ Call
Franklin	$ Call	Star (Gemini)	$ Call
Software	$ Call	Hayes Modems	$ Call

We have been in the computer business for over 5 years. Our goal is to satisfy you, the customer. Please write or call (517) 625-4161 for free price list.

Advertised prices are cash prices. Installation and shipping prices not included in advertised prices. For shipping, add 2% (minimum shipping charge $3.00). C.O.D. orders up to $1000.00 ($4.00 charge per carton • call for further C.O.D. information). Mastercharge, Visa American Express: add 3%.

PERRY COMPUTERS

DEPT. NO. A-1 137 NORTH MAIN ST. PERRY, MI 48872

FOR ORDERS
CALL 1-800-248-3823

We also carry a complete line of computer accessories. (Please call for current prices.)

FOR INFORMATION
CALL (517) 625-4161

Computer Case Company

WE MAKE A GREAT CASE FOR YOUR RADIO SHACK.

RS204

One size does not fit all. Our cases are designed for specific hardware configurations. When you put your computer in our case, it fits hand-in-glove. Once your equipment is safely inside the attache-style carrying case, it never has to be taken out again. To operate, simply remove the lid and connect the power. To store your computer, disconnect the power, enclose your disks, working papers, and manuals in the compartments provided, and attach the lid. It's as easy as that.

CALL TOLL FREE: (800) 848-7548

•	RS201	Model I with expansion unit and drives	$109
•	RS204	Model III or IV	129
•	AP106	Amdek Color I, II or III Monitor	119
•	P401	Paper Tiger Printer (400/445/460)	99
•	P402	Centronics 730/737 & Radio Shack Printer	89
•	P403	Epson MX70 or MX80, Microline 82A Printer or Color Computer	89
•	P404	Epson MX100 Printer	99
•	P405	IDS 560 or Prism 132 Printer	109
•	P406	C. Itoh Starwriter/Printmaster F-10 Printer	119
•	P407	Okidata Microline 83A or 84 Printer	99
•	P408	C. Itoh Prowriter 2 Printer	99
•	P409	C. Itoh Prowriter (Apple Dot Matrix) or NEC PC8023 Printer	89
•	P410	Epson FX80 Printer	109
•	IB501	IBM Personal Computer with Keyboard	129
•	IB502	IBM Monochrome Monitor	99
•	CC50	Case Cart	79
•	CC80	Matching Attache Case (5")	85
•	CC90	Matching Attache Case (3")	75
•	CC91	Matching Accessories Case (5¼" Diskettes, Paper, etc.)	95
•	CC92	5.25" Diskette Case (Holds 75 Diskettes)	49

MasterCard VISA

↙139 **Computer Case Company, 5650 Indian Mound Court, Columbus, Ohio 43213 (614) 868-9464**

NEW PRINTERS ADDED! FIND YOURS BELOW.
Good This Month

RIBBON SALE

EXACT REPLACEMENTS

RADIO SHACK • CENTRONICS • COMMODORE • EPSON • ANADEX • BASE 2 • IBM • NEC • C. ITOH • IDS • DATA ROYAL • OTHERS

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™ (DROP IN, NO WINDING! EXACT REPLACEMENTS made in our own shop. Cartridges not included.)	RELOADS (You SEND your used CARTRIDGES to us. We put OUR NEW INSERTS in them.)	NEW CARTRIDGES (from the various manufacturers Subject to availability.*)	SILVER DOLLAR WIND to LOAD
DIABLO 610/620-XEROX MEMORYWRITER 610/620	5/16×230	----------	----------	$15/2 $42/6 $ 72/12	
BASE 2 - DIP 81/82/84/85G	½×20	$15/3 $54/12 $288/72	$7/1 $6 ea/2 or more	$30/2 $87/6 $168/12	
C ITOH Prowriter 1550/8510 - NEC 8023/8025 APPLE DMP - DEC LA50-RA	½×18	$15/3 $54/12 $288/72	$7/1 $6 ea/2 or more	$16/2 $48/6 $ 96/12	
C ITOH Starwriter F10 CARBON FILM BLACK	5/16×145	$24/6 $42/12 $234/72	$5 ea 3-11 $4 ea 12 or more	$18/3 $60/12 $348/72	
DIABLO HYTYPE II FABRIC BLACK	9/16×17	$21/3 $78/12 $510/72	$8/1 $7 ea/2 or more	$18/2 $51/6 $ 96/12	
RADIO SHACK CARBON FILM - DWP-210 (1445) Black	5/16×145	$24/6 $42/12 $234/72	$5 ea 3-11 $4 ea 12 or more	$18/3 $60/12 $348/72	
DAISY WHEEL II-DWP-410 (1419) Black	½×145	$24/6 $42/12 $234/72	$5 ea 3-11 $4 ea 12 or more	$18/3 $60/12 $348/72	
Red, Green, Blue, Brown (1419) Colors	½×130	$30/6 $52/12 $288/72	$6 ea 3-11 $5 ea 12 or more	$21/3 $72/12 $420/72	
FABRIC (Long-Life) DWP-210 (1458) Black	5/16×17	$21/3 $78/12 $510/72	$8/1 $7 ea/2 or more	$18/2 $51/6 $ 96/12	
DAISY WHEEL II (1449) Black	½×25	$21/3 $78/12 $510/72	$8/1 $7 ea/2 or more	$18/2 $51/6 $ 96/12	
LP I-II-IV 700 Zip Pack (1413) CENTRONICS 730/737/739/779	9/16×16	$12/3 $45/12 $252/72	----------	----------	
DMP-200, 120 (1483)	½×20	$15/3 $54/12 $288/72	$7/1 $6 ea/2 or more	$27/2 $81/6 $162/12	
DMP-500 (1482)	½×20	$15/3 $54/12 $288/72	$7/1 $6 ea/2 or more	$24/2 $72/6 $144/12	
DMP-2100 - TOSHIBA P1350 (1442)	½×20	$18/3 $66/12 $360/72	$8/1 $7 ea/2 or more	$24/2 $72/6 $144/12	
LP III-V (1414)	½×15	$15/3 $54/12 $288/72	$7/1 $6 ea/2 or more	$15/2 $42/6 $ 78/12	$12/3 $44/12 $252/72
DMP-400/420, LP VI-VIII (1418)	5/16×14	$15/3 $54/12 $288/72	$7/1 $6 ea/2 or more	$15/2 $42/6 $ 78/12	$11/3 $40/12 $228/72
DMP-100, LP VII (1424) COMMODORE 1525 - GORILLA BANANA	Inker Loop	----------	----------	$16/2 $48/6 $ 96/12	----------
EPSON MX/FX/RX 70/80 - IBM PC	½×20	$15/3 $54/12 $288/72	$7/1 $6 ea/2 or more	$14/2 $36/6 $ 66/12	$12/3 $44/12 $252/72
MX/FX 100 - IBM PC	½×30	$18/3 $66/12 $360/72	$8/1 $7 ea/2 or more	$24/2 $69/6 $132/12	$15/3 $54/12 $288/72
COMMODORE 8023P-CENTRONICS 152-2	½×12	$15/3 $54/12 $288/72	$8/1 $7 ea/2 or more		
ANADEX 9000 Series	½×30	$18/3 $66/12 $360/72	$8/1 $7 ea/2 or more		

SILVER DOLLAR WIND to LOAD

WHY DO WE SELL THESE?

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 rewinding 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.

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. We use the latest state-of-the-art production equipment and are blessed with a fine, dedicated staff. We guarantee everything we make, period. Our ribbons are made fresh daily and our goal is to ship your order within 24 hours. Write for our brochure, price list, and newsletter, INK SPOTS™.

COST PLUS 10%
RADIO SHACK COMPUTERS-SOFTWARE-SUPPLIES-ACCESSORIES
Call Bob Case or write for our COST PLUS 10% FLYER!!!

Bob Case
President

SEND CHECK, MONEY ORDER, OR COD TO:

VISA

BCCOMPCO
800 South 17 Box 246
SUMMERSVILLE, MO 65571

MasterCard

CALL FOR LESS ON SATURDAY! 8:30 to 5:00 (CT)
(417) 932-4196

WE PAY UPS SHIPPING on PREPAID ORDERS ↙152
PLEASE INCLUDE STREET ADDRESS for UPS DELIVERY
FOREIGN ADD 15%, U.S. FUNDS

When the command word is sent to the 8255A, all outputs go low (I don't know why it was designed that way!) so the first thing after the 8255A should be a write of 255 to port C (14) to stop the music. Usually, a tune plays when the 8255A is set up.

After you've set up the PPI, you can send a value to any port merely by writing it to the port address: 12 for port A, 13 for port B, and 14 for port C. The bit pattern written out to port A, for example, will appear on the port A output lines that go to the letter inputs on the AY-3-1350.

Two chimes are available to the TRS-80. To access the first chime (simple chime) merely bring Door3 low, instead of the Backdoor line low (port C, bit 1); the tune code set up is irrelevant. To play the descending octave chime, proceed as for a normal tune, but keep all port A lines high.

My sample program illustrating the operation of the tune-generator board displays a menu of available tunes, and plays the selected tune or chime when you enter the corresponding menu number (see the Program Listing). It includes an option for all 25 tunes to be played consecutively. The names of the tunes are in a specific order in the data statements, letting you determine the correct tune code by using a few simple calculations. When the tune is over, the program displays the menu again. ■

NOTE: The following are changes in the January 1984 Project 80 project, "Hardware That Communicates," p. 197:

1) Better design practice dictates that you reverse the three LEDs (D1–D3) and tie the corresponding current-limiting resistors (R1–R3) to +5V instead of to ground. If you use a CMOS device, such as a 74HCT04, either configuration would be an equally good design because of the symmetrical outputs of CMOS devices.

2) Users without an expansion interface should add three lines to the communication program:

```
01392 LD  A, 0C3H       ;GET JUMP OPCODE
01394 LD  (INTVEC),A    ;STORE IN VECTOR LOC.
01396 LD  A,(37ECH)     ;CLEAR FDC STATUS
```

Tapes purchased from the author include these lines.

3) The following power supply connections for the board ICs were overlooked in the schematic:

U1	*Pin 20 is GND; pin 40 is +5V.*
U2,U7	*Pin 7 is GND; pin 14 is +5V.*
U3,U5	*Pin 7 is GND; pin 14 is +12V, pin 1 is −12V.*
U4,U6	*Pin 7 is GND; pin 14 is +5V.*

For further information send your questions and a self-addressed, stamped envelope to Roger C. Alford, c/o Washtenaw Digital Systems, P.O. Box 2014, Ann Arbor, MI 48106.

Program Listing. Tune-generator selection.

```
5  ' ********************************************
10 ' ***** TUNE GENERATOR SELECTION PROGRAM *****
20 ' *****      CREATED DECEMBER, 1983       *****
30 ' *****      BY ROGER C. ALFORD           *****
35 ' ********************************************
40 '
50 ' ALL 25 TUNES PLAYABLE BY THE GENERAL INSTRUMENT AY-3-1350
60 ' MELODY SYNTHESIZER IC ARE ACCESSIBLE FROM THE TRS-80.
70 ' THE AVAILABLE TUNES ARE DISPLAYED IN MENU FORM, MERELY
80 ' SELECT THE DESIRED TUNE. TWO CHIMES AND "ALL 25 TUNES"
85 ' ARE ALSO AVAILABLE AS SELECTIONS.
87 '
90 OUT 15,136:OUT 14,255
100 I=0:FL=0:CLS
110 READ A$:IF A$="FLAG" THEN 160
120 I=I+1
130 PRINT USING "##";I;:PRINT " ";A$;
140 IF FL=0 THEN PRINT TAB(32);:FL=1 ELSE PRINT:FL=0
150 GOTO 110
160 RESTORE:PRINT:INPUT"SELECT TUNE ";A%
170 IF A%<1 OR A%>I THEN 100
180 IF A%>25 THEN 200
190 GOSUB 500:GOTO 100
200 IF A%<>26 THEN 230
210 FOR I%=1 TO 25
220 A%=I%:GOSUB 500
224 FOR J%=1 TO 300:NEXT J%
228 NEXT I%:GOTO 100
230 OUT 12,255
240 IF A%=27 THEN OUT 14,254 ELSE OUT 14,253
250 GOSUB 540:GOTO 100
500 A=(A%-1)/5:B=A%/5:B=(B-INT(B))*5:IF B=0 THEN B=5
510 IF INT(A)=0 THEN T1=0 ELSE T1=2[(INT(A)-1)
520 PB=255-T1:PA=255-2[(B-1)
530 OUT 12,PA:OUT 13,PB:OUT 14,254
540 T2=INP(14) AND 16:IF T2<>0 THEN 540
550 OUT 14,255
560 T2=INP(14) AND 16:IF T2=0 THEN 560 ELSE RETURN
1000 DATA "TOREADOR","WILLIAM TELL","HALLELUJAH CHORUS"
1010 DATA "STAR SPANGLED BANNER","YANKEE DOODLE","JOHN BROWN'S B
ODY"
1020 DATA "CLEMENTINE","GOD SAVE THE QUEEN","COLONEL BOGEY"
1030 DATA "MARSEILLAISE","AMERICA, AMERICA","DEUTSCHLAND LEID"
1040 DATA "WEDDING MARCH","BEETHOVEN'S 5TH","AUGUSTINE"
1050 DATA "O SOLE MIO","SANTA LUCIA","THE END"
1060 DATA "BLUE DANUBE","BRAHM'S LULLABY","HELL'S BELLS"
1070 DATA "JINGLE BELLS","LA VIE EN ROSE","STAR WARS"
1080 DATA "BEETHOVEN'S 9TH","ALL 25 TUNES","SIMPLE CHIME"
1090 DATA "DESCENDING CHIME","FLAG"
```

End

Z80 MATH ROUTINES !

VPM Math Pak provides multiple precision floating point math routines in Z80 and 8080 code. Use in your own programs and pay no royalty if resold. Commented source code in EDAS format, demo program, and instructions. Zeus Editor/Assembler is the perfect companion.

VPM Math Pak $69.95
ZEUS Editor/Assembler $79.99

BASIC LAZYFONT

If you can write an LPRINT statement and you have an Epson or Prowriter printer, you can use the new BASIC version of LazyFont. Created as a driver for Lazy Writer, LazyFont can now be combined with BASIC programs to print custom graphics. Create your own, use GEAP fonts, or use the eight FREE FONTS that come with LazyFont. Comes on mini MULTIDOS.

BASIC version LazyFont $49.95

ATTENTION VID-80 OWNERS

If you've installed a Holmes Engineering VID-80 board in your Model III, now you can use the Lazy Writer word processor and get 80 x 24 characters. Works on any Model III DOS.

Lazy Writer for VID-80 .... $175.00

AlphaBit Communications, Inc.
13349 Michigan Ave.
Dearborn, Michigan 48126
(313) 581-2896
476
MasterCard/Visa Accepted

See List of Advertisers on Page 227

Game Over: Max's Last Report

This is the last installment of the Gamer's Cafe.

There's really no point in continuing. Mercedes is home in Baltimore, doomed to the life of a normal preteen. Rodney wanders aimlessly through the dark corridors of time. I alone am left to tell the tale.

So I'm going to tell it, and then head into the sunset.

As Rodney explained in his last column, we had taken Mercedes to Logan Airport. We were both still stunned by her sudden transformation. One moment she was writing a disassembler in Pilot on a HoJo's placemat, and the next she didn't even know how to boot a TRSDOS disk.

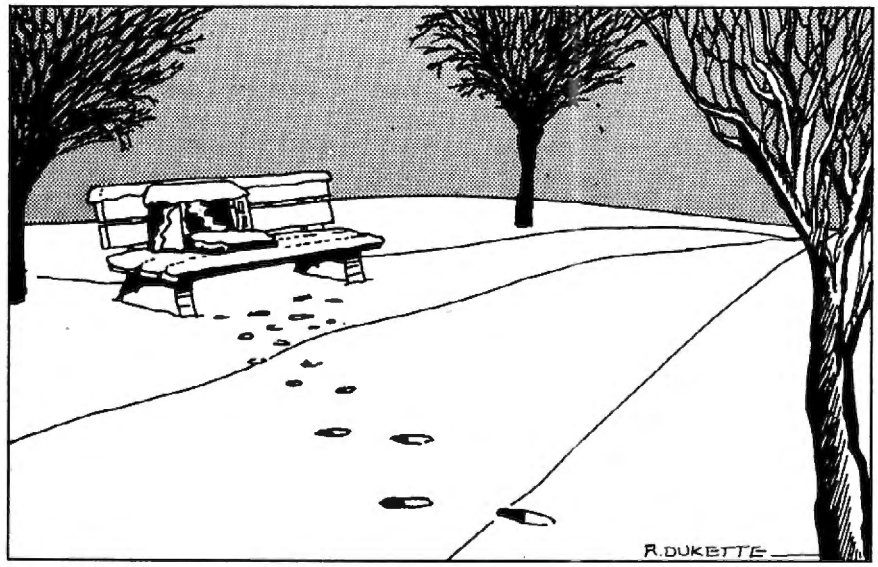
"Poor Mercedes," I said. "Her ROMs blown by the power surge of puberty."

"It was the Mach 4," Rodney mumbled. "That monster, that—that Godless beast—"

"Take it easy," I said. "At least we know they'll never get the thing up and running without Mercedes."

Despite my calm exterior, I, too, wondered if the Mach 4 had claimed its creator as its first victim. How many months had Mercedes been working obsessively on the project? A normal person would have lost an oar a long time ago. But then, we had never thought of Mercedes as normal, which perhaps was our big mistake.

We arrived in Cambridge and quickly went to the Mach 4 bunker deep beneath the earth. The only person there was Wilbur, the last in Mercedes' long line of student assistants. He was in the control room playing a holographic version of Galaxy Invasion. It was a little frill Mercedes had given the Mach 4 during a coffee break one afternoon.



"Hi," he grunted.

I looked up at the TV that monitored the Mach 4 in its chamber. There it sat, humming luminescently, like something out of a "Lost in Space" rerun.

"Has it acted up today?" I asked.

"Nothing serious," he said. "Burped around noon. Blew out the Green Line down to Copley Square."

I glanced at Rodney. He was staring at the monitor, transfixed. For the first time I noticed that he was pale, and that little beads of sweat were forming on his brow.

"That horror," he said. "It must be destroyed. It must be destroyed before it destroys us all."

"Huh?" Wilbur said, and looked up for the first time.

"Don't mind him," I said. "He's had a rough week." I turned to Rodney. "Don't worry about it. In another couple of weeks, they'll be selling the Mach 4 for parts."

Wilbur perked up. "Oh, no," he said brightly. "Haven't you heard? Those guys from Washington found someone to finish the project."

I felt my heart sink into my socks. "What?" I said. "Why, that's absurd. No one can finish the Mach 4 now. The operating system isn't debugged yet. And the warp drive controller isn't complete. Only Mercedes knew the software well enough. Only Mercedes—"

I stopped. Voices were coming from the hall. One was that of Dr. Gruber, Mercedes' adviser. I didn't recognize the other. But something about it made me nervous. It was thin, high-pitched.

Like a child's.

"Hello Max, Rodney," Dr. Gruber said. "I'd like you to meet Cleo. She's going to finish the Mach 4 for us."

I nearly fainted. Cleo wasn't a day over 11.

"I've heard about you," she said.

THE INTERNATIONAL VIDEO GAME OF THE YEAR COMPETITION HERALDS THE "NEW AGE" IN VIDEO/COMPUTER GAMES

$175,000 TO BE WON

AND THAT'S JUST FOR STARTERS!

International Video Game of the Year

Create a brilliant, new video game and you could be on your way to becoming a millionaire. This fantastic competition, organised by I.R.P. (The International Register of Independent Computer Programmers Ltd) and the famous Mark McCormack International Management Group, offers programmers and inventors the opportunity of a life time. There are huge, immediate cash prizes and the on-going revenue of 10% of the sales of all games to distributors throughout the world, plus the chance to appear on an international TV show. Your skill and imagination could bring you fame and fortune!

$100,000 FIRST PRIZE! PLUS FIVE $15,000 RUNNER-UP PRIZES!

Devise a totally original new video game in one of these categories: SPORTS, SIMULATORS, ARCADE, STRATEGY, ADVENTURE/FANTASY or a special section which covers programmes that are not necessarily games but have outstanding Educational or Entertainment merit. We'll also be announcing a number of 'MERIT' awards which will be entitled to carry the message 'An International Video Game of the Year MERIT AWARD' on their retail packaging. It's a great challenge. And the rewards, both financially and in terms of prestige, are tremendous. This is the most exciting competition ever for creative computer and video enthusiasts.

YOU'RE A TV STAR TOO!

All six winning games and their inventors will be featured on an internationally distributed, spectacular TV special. That's going to make your name!

✓270

HOW TO ENTER

Just send in your game, or games, programmed on cassette for any popular home computer. Use the coupon, today, and we'll send you all the facts you need.

CLOSING DATE FOR ENTRIES IS 31st MAY 1984

To: IRP Limited, Pinewood Film Studios, Iver, Bucks, England.

Name .....

Address .....

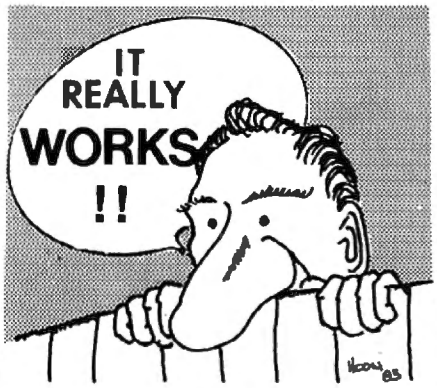
.....

.....

8M1

.....

✓ See List of Advertisers on Page 227



WOW!

FILE TRANSFER PROGRAMS

TRS ⟶ IBM
APPLE ⟶ IBM
CP/M ⟶ IBM

You really CAN use your VISICALC files on the IBM and compatibles. In fact your Visicalc files once transferred with our package can be used on the IBM under VISICALC, MULTIPLAN or 1-2-3! You can also transfer programs and data to the IBM.

- No more retyping or wasted time
- Fast transfers - 110-9600 baud
- Send files of any length
- Transfer ASCII files, random files, text files, data files, binary files, high level language programs (Basic, Pascal, Fortran, Cobol, etc.), electronic spread sheet data, word processor files, etc.; it all gets transferred!

MODELS SUPPORTED:

TRS Model I, II, III, 4, 12, 16, 100 (or compatible machine) APPLE II, II+, IIe, III (or compatible machine) IBM PC, XT, PC Jr. (or compatible machine) PCDOS 1.10, 2.00, 2.10) Machines running CP/M

ALSO:

LNW, FRANKLIN, BASIS, CORONA COLUMBIA, EAGLE, COMPAQ - call for others

The File Transfer Program comes complete with all instructions, hardware and software.

FILE TRANSFER PROGRAM
$129.95

Plus $2 shipping & handling
CA residents add 6.5% sales tax
State computer models when ordering

MC/VISA/COD/CHECK OK

Phone orders call
(408) 988-0164

PERSONAL COMPUTER PRODUCTS

1400 Coleman Avenue, Suite C-18,
Santa Clara, California 95050

IBM, PCDOS, APPLE II, II+, IIe, III, Visicalc, are respectively registered trademarks of International Business Machines Corp., Apple Computer, Inc., VisiCorp. CP/M, Multiplan, 1-2-3, are respectively trademarks of Digital Research, Inc., Microsoft Corp., Lotus Dev. Corp.

↩176

THE GAMER'S CAFE

The Big Board

Alien Cresta	6,913	Mike Bach, Brisbane, Australia
Alien Taxi	20,300	Dave Westfall, N. Olmsted, OH
Ape	84,000	Mark Adams, Tampa, FL
Apple Panic	287,620	Mary Phinney, Stockbridge, MI
Arex	875,030	Rob Mitchell, Peterborough, NH
Assault	97,457	Zagros Sadjadi, Petaluma, CA
Astroball	317,240	Stefan Kunze, Moers, W. Germany
Attack Force	1,800,990	John MacDonell, Antigonish, Nova Scotia
Bable Terror	8,857	Mad Max
Barricade	17,520	Troy Scrapchansky, Uncasville, CT
Caterpillar	362,883	Alvah Werner, New Albany, OH
Centipedes	94,836	Belinda Chron, Tempe, AZ
Chicken	13,460	Geoff Bain, Salisbury, Australia
Clash	174,300	Zagros Sadjadi, Petaluma, CA
Convoy	34,770	Rick Sayre, Stockton, CA
Crazy Painter	1,087,000	Mike Beebe, Sacramento, CA
Cyborg	590,890	Brett Falkenberg, Des Plaines, IL
Danger in Orbit	69,640	Steve Sustacek, Danube, MN
Defence Penetrator	21,310	Glenn Butler, Belrose, N.S.W.
Defense Command	128,230	Bette Dufraine, Bolton, CT
Demise/Defend	165,000	David Russell, Ardrossan, Scotland
Demon Seed	103,160	Markus Blum, Ludwigshafen, W. Germany
Desert Peril	84,400	Jay McLain, Clatskanie, OR
Devil's Tower	25,700	Rick Sayre, Stockton, CA
Dungeon Escape	10,500	David Forbis, Wilmington, DE
Evade	27,300	Mark Adams, Tampa, FL
Firebird	185,000	Jorg Janischewski, Engelskirchen, W. Germany
Flying Saucers	12,365	Michael Bridgers, Savannah, GA
Fortress	515,925	Greg Samson, Loudonville, NY
Frogger	754,750	Jay Wallace, Tucson, AZ
Fury	46,120	Amy Campbell, Peterborough, NH
Galactic Empire	2,010	Mike Bach, Brisbane, Australia
Galaxy Invasion Plus	3,000,000	Shawn Lipman, Nelspruit, S. Africa
Gauntlet	58,360	David Schwartz, San Jose, CA
Ghost Hunter	43,190	Lance Smith, Auckland, N.Z.
Gobbleman	64,310	Mike Bach, Brisbane, Australia
Hamburger Sam	34,300	Mark Adams, Tampa, FL

Big Board continued

"Tough luck about Silver. Well, the job looks pretty routine to me. I already cleaned up some of the I/O routines. Boy, what a kludge. Didn't anybody teach her about flowcharts?"

"Mercedes didn't need flowcharts," I said indignantly.

"Would have saved us a lot of trouble. No matter. I've been building my own VAX. This'll be a piece of cake in comparison. After all, it's only a microcomputer."

"Only a microcomputer?" Rodney, suddenly aroused, grumbled.

I looked at Cleo, then at Dr. Gruber, and said, "Where'd you find this brat?"

He cleared his throat. "Well, she's a bit overbearing," he admitted. "But she's got talent. And she's the only one that can handle the Mach 4."

"I've got six Ph.D.'s," she boasted. "When I was three, I built a fully operational scale-model UNIVAC out of old transistor radios. Last week, I developed a data communications network for the Western hemisphere that will be immune from the electromagnetic pulse of a nuclear exchange."

"I'm really sorry about this," Dr. Gruber said. "But we had no choice. After all, Mercedes is, well, how should I put it—"

"Baked," Cleo finished. "But I probably would have had to clean this mess up anyway."

"What loyalty," I said. "What concern. Mercedes has a little lapse, and she's tossed aside like an old printer ribbon."

"Hey," Wilbur interrupted. He was pointing to the monitor. "What's he doing in there?"

We all looked up. Rodney had somehow slipped away unnoticed. He was in the Mach 4 chamber, waving a steel pipe menacingly at the machine.

Dr. Gruber and I ran down the hall. The great vault door was open. We

Big Board continued

Hoppy	70,381	Mike Bach, Brisbane, Australia
Insect Frenzy	691,156	Tommy Seniuk, Vegreville, Alta.
Invaders from Space	655,360	Darren Cotter, Oceanside, CA
Jovian	311,320	Mark Brinkman, Burlington, KS
Jungle Boy	851,900	Zagros Sadjadi, Petaluma, CA
Killer Gorilla	28,312	Alex Poon, Baton Rouge, LA
Laserball	112,520	Betty Simmonds, Surrey, B.C.
Laser Defense	1,504,610	Greg Samson, Loudonville, NY
Leaper	144,500	Tommy Seniuk, Vegreville, Alta.
Lunar Lander	18,000	Graham Williams, Ballaarat, Australia
Mad Mines	10,220	Gorman Miller, Titusville, FL
Meteor Mission 2	124,990	Andy Anderson, Orangeville, Ont.
Monster Invaders	32,620	Troy Scrapchansky, Uncasville, CT
Moon Rover	8,530	Mark Adams, Tampa, FL
Olympic Decathlon	10,856	Adrie van Geffen, Hoogvliet, Netherlands
Outhouse	1,000,000	Kyle Hoyt, Titusville, FL
Panik	85,075	Mark Owens, Houston, TX
Penguin	39,250	Mark Adams, Tampa, FL
Planetoids	56,450	Carl Pflanzer, Gillette, NJ
Rear Guard	195,240	John Hope, Kingston, Ont.
Rescue at Rigel	456	Glenn Butler, Belrose, N.S.W.
Sea Dragon	610,180*	Robert Fitzwilliam, Houston, TX
Sky Sweep	1,000,540	Tommy Seniuk, Vegreville, Alta.
Space Castle	69,750	Rick Sayre, Stockton, CA
Space Intruders	14,030	Ron Johnston, Emporia, KS
Space Rocks	32,600	John Dunkelberg Jr., Winston-Salem, NC
Star Blazer	52,750	Mark Adams, Tampa, FL
Star Quest	59,375	Chris Kaufman, Inver Grove Heights, MN
Stellar Escort	625,000	Kevin Josephson, Chilliwack, B.C.
Super Nova	2,138,710	Mark Fertig, Northville, MI
Swamp Wars	59,130	Farhad Abrishami, Silver Spring, MD
Temple of Apshai	390	Carl Pflanzer, Gillette, NJ
Time Bandit	180,430	Adam Wallas, Franklin, TN
Time Runner	162,354	Detlef Sturm, Schauenburg, W. Germany
Voyager 1	1,599	Al Ayer, Mechanicsburg, PA
Weerd	61,180	Tommy Seniuk, Vegreville, Alta.
Wild West	47,000	Dave Westfall, N. Olmsted, OH

*Expert mode: 339,080 (David Smith, Kingwood, TX).

could hear the Mach 4 vibrating. Inside, Rodney was running about wildly, the pipe poised for action.

"The end is near!" he shouted, and charged the machine.

"Good God," Dr. Gruber breathed. "We'll all be killed!"

Rodney's first blow glanced off the platinum case and struck an adjacent control panel. Sparks flew. A bolt of electricity jumped from the Mach 4 and gouged a chunk of concrete from the wall next to me.

"Let's get out of here," Dr. Gruber said. He pushed me into the hall and pressed a button. The steel door slammed shut.

In the control room, Wilbur and Cleo stared aghast at the monitor. Rodney was going for the Mach 4's VDT. His pipe glowed yellow like something out of *Star Wars*. A blue halo enveloped him. The walls around us began to shake.

"The computer!" I said. "It's fighting back!"

"I wanna go home," Cleo whined.

"Shut up or you'll be grading Intro to Basic assignments next semester," Dr. Gruber snapped.

Suddenly Rodney froze. The blue halo grew until it filled the whole room like smoke. Rodney became translucent, then transparent. Then he disappeared.

We stood silent.

"Wow," Cleo said. "A time displacement. Sucked into the fourth dimension. Maybe I underestimated this thing."

* * * * *

That's about all there is to tell.

The Mach 4 was fortunately beyond repair. I went on a crazed month-long binge, wandering the streets of Boston drinking tequila milk shakes. When I came out of my stupor, I called Mercedes and gave her the news. She cried and apologized for making the Mach 4, even if she no longer understood

Rodney's first blow glanced off the platinum case and struck an adjacent control panel. Sparks flew. A bolt of electricity jumped from the Mach 4.

how or why. I told her not to worry about it.

"Say," she said as we were about to hang up. "Was this Cleo that great?"

"Bah," I said. "You would have cleaned her clock. You were good, kid—real good. You could do hex to octal conversions faster than a PDP-11. You could build a disk drive from old inner tubes. You were the best."

But as I talked, I thought of Cleo, and in a way was glad that Mercedes was just a normal kid.

Oh—the van. Unfortunately, I left it in a metered zone and the city towed it. I had to sell the computers to pay for the fines and storage charges. Then I offered the van to the Smithsonian, but they didn't want it. So I sold it for $75 to a pump jockey at Eddie's Filling Station.

Actually, I didn't sell all of the computers. I kept the PMC ½. I hooked it up to a car battery, put it on a park bench in the Boston Common, and booted Lunar Lander. Then I walked away. When I got to Boylston Street, I turned around for one last look. Dusk was falling on a cold and grey day. Flakes of snow were drifting in the wind. I could still see the PMC's flickering screen. It cast its ghostly green light across the months, to the time when I first met Rodney and Mercedes. We'd embarked on a heck of a journey together. Now, it was finished.

I turned my back and headed for the subway.

As for me, I'm going to hit the road again. But who knows? Maybe some day I'll buy another computer. And get a van. And find some people to ride across country with, playing games and writing a magazine column.

Stranger things have happened. ■

Unmasking the Disk Access Conspiracy of Silence

Novice programmers often feel they're facing a conspiracy of silence regarding how to use machine language to directly access disk files. Assembly-language programming books rarely cover the topic, and magazine articles often either ignore it or make it much more difficult than necessary.

Take heart: writers aren't intentionally leaving you out in the cold. Even disk access from Basic can be confusing, and most Assembly-language books stick to introductory material.

One problem people have in discussing machine-language disk access is that it is actually two topics in one: You can either use DOS calls to create and handle files, or you can directly access the disk through the floppy disk controller, in essence creating your own tiny operating system.

The situation is further complicated by inconsistencies between operating systems, confusing documentation supplied with some operating systems, problems of disk density and track numbers, and fundamental differences between Model I and Model III disk hardware.

In order to keep this month's column within the covers of this magazine, I'll limit my discussion to DOS-supported direct disk access under TRSDOS-compatible operating systems (which means most Model I/III DOSes). The demonstration routine (see the Program Listing) should explain the first steps of the process and also help you better understand the technical section of your DOS manual.

If you want to bypass the DOS completely and use direct disk access, I recommend you read Michael Wagner's *Machine Language Disk I/O & Other Mysteries* (IJG Inc., Upland, CA 91786).

Terminology

The link between your program and a disk file is established through a data structure that the TRSDOS manual calls a data control block (DCB). Since DCB is also the abbreviation for device control block (which is a region of low memory used by the system to control keyboard, video, and printer I/O), I'll use the alternate term, file control block (FCB), what some writers refer to as an input/output block. All other terminology in what follows is based on the TRSDOS manuals; your DOS might use slightly different words.

The FCB need not be located in a particular area of memory, but you must protect and maintain it during disk access. Before you open the file (i.e., before you establish a link between your program and the file), the FCB must contain the complete filespec of the disk file.

While the file is open, the FCB holds information about the file, including which disk it is on, the length of its records, the next record number and last record number, and the location of the last valid byte in the last sector of the file. When you close the file, DOS returns the file name to the FCB. If you are using TRSDOS 1.3, allocate 50 bytes for each FCB; most other operating systems require only 32 bytes.

You must also establish a 256-byte file buffer somewhere in memory. The DOS uses this buffer to transfer an image of each sector, one at a time, from the disk to memory. After you open the file, the FCB stores the buffer's address.

Each disk file stored in the directory has a logical record length (LRL). If the LRL is 256, then each sector comprises a logical record. If the LRL is a lower value (it can't be greater than 256), you must provide a third memory area called a user record (UREC) equal to the logical record length.

DOS moves each record to the UREC for you. Since the LRL is stored in a single byte both in the directory and in the FCB, the computer represents a record length of 256 bytes with a zero.

To keep ROM and DOS routine names separate from those in your own programs, use a special symbol. In the following discussion, I'll follow the convention of the TRSDOS 1.3 manual and prefix all such routines with a dollar sign; LDOS uses an "@" symbol instead. Since many assemblers don't support such signs, I've excluded them from my listing.

SALE

DISK DRIVES

Slimline Bare Drives

40 Track Single Sided	$169.95
40 Track Double Sided	$199.95
80 Track Double Sided	$249.95

Power Supply & Cabinet for the above Drives
$49.95
(One or two drives may be used with this power supply. We'll install and test drives at no charge!)

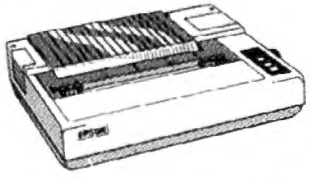
Full Size Bare Drives

40 Track Single Sided	$179.95
40 Track Double Sided	$269.95
80 Track Double Sided	$349.95

Verbatim Diskettes
$19.95

Model 3 Drive 0 Kit
$369.95

PRINTERS



Gemini 10x **$299.95**
Gemini 15x **$419.95**
Delta 10 ..... *Call for Price!*

Mannesmann Tally Spirit — **$299.95**
Epson RX-80. RX-80 FT. RX-100 FX-80, FX-100
Call for the BEST PRICES AVAILABLE!

SANYO COMPUTERS

MSDOS
Compatible Systems
Only **$895!**

64K, 2-Double Drives, CPM, Word Processor, Spreadsheet, Database, RS-232, Printer Port,
All for **$1795!**

Need a Complete Catalog?
Call Our Answering Service!
1-800-331-3896
Quick Information Hot-Line

HAYES SMART MODEMS

300 Baud..... **$229.95**
300/1200 Baud **$549.95**

128K Printer Controller
(Quadram Microfazer)
Only **$279.95**

Cheap
TRS-80
Equipment!
Call

WEBSTER ELECTRONICS
(918) 456-6759
1027 S. Muskogee
Tahlequah, Oklahoma 74464

Prices Subject to Change Without Notice

Check Out Our Retail Stores —
THE DATA STATION

3729 S. Memorial
Tulsa, OK. 74145
(918) 665-7955

713 S. Main
Stillwater, OK. 74074
(405) 743-2471

AMERICAN
Small Business COMPUTERS

✓217

118 SO. MILL ST
PRYOR, OK 74361
(918) 825-4844

Program Listing. File display.

```
                00100 ;*********************************
                00110 ;*                               *
                00120 ;* FILE DISPLAY PROGRAM          *
                00130 ;*                               *
                00140 ;* Assemble as DISPLAY/CMD       *
                00150 ;*                               *
                00160 ;* Use: DISPLAY 'filespec'       *
                00170 ;*                               *
                00180 ;*********************************
                00190 ;
                00200 ;TRSDOS 1.3 Equates:
                00210 ;
441C            00220 SYNTAX  EQU     441CH           ;Move filespec to FCB
4424            00230 OPEN    EQU     4424H           ;Establish link to file
4436            00240 READ    EQU     4436H           ;Read current record
4428            00250 CLOSE   EQU     4428H           ;Close file & break link
4409            00260 ERRDSP  EQU     4409H           ;Display DOS Errors
402D            00270 JP2DOS  EQU     402DH           ;Return to DOS READY
                00280 ;
                00290 ;ROM Routines:
                00300 ;
01C9            00310 CLS     EQU     01C9H           ;Clear screen
0049            00320 WATKEY  EQU     0049H           ;Wait for keystroke
                00330 ;
                00340 ;
                00350 ;note -- on entry, HL==> DOS command line
                00360 ;
7000            00370         ORG     7000H
7000 119370     00380         LD      DE,FCB          ;DE==>File Control Block
7003 CD1C44     00390         CALL    SYNTAX          ;Move filespec from DOS
                00400                                 ;command line to FCB
                00410                                 ;Returns with NZ if
                00420                                 ;bad filespec
7006 2044       00430         JR      NZ,SYNERR       ;Go if SYNTAX Error
                00440 ;
7008 21C570     00450         LD      HL,BUFFER       ;HL==>Transfer buffer
700B 119370     00460         LD      DE,FCB          ;DE==>This file's FCB
700E 0600       00470         LD      B,0             ;B holds LRL of 256
7010 CD2444     00480         CALL    OPEN            ;Open file
7013 2037       00490         JR      NZ,SYNERR       ;Go if OPEN Error
                00500 ;
7015 3A9C70     00510         LD      A,(FCB+9)       ;Get current LRL
7018 329270     00520         LD      (LRL),A         ;And save it
701B AF         00530         XOR     A               ;A = 0
701C 329C70     00540         LD      (FCB+9),A       ;Set as LRL of 256
                00550 ;
701F CDC901     00560 LOOP1   CALL    CLS             ;Clear the screen
                00570 ;
7022 0604       00580         LD      B,4             ;Loop2 counter
7024 C5         00590 LOOP2   PUSH    BC              ;Save counter
7025 119370     00600         LD      DE,FCB          ;DE==>File control block
7028 CD3644     00610         CALL    READ            ;Read next sector
702B 280B       00620         JR      Z,OK            ;Go if no error
702D C1         00630         POP     BC              ;Get counter off stack
702E FE1C       00640         CP      1CH             ;Check for EOF
7030 281F       00650         JR      Z,DONE          ;Go if done
7032 FE1D       00660         CP      1DH             ;Check if past end
7034 281B       00670         JR      Z,DONE          ;Go if done
7036 180F       00680         JR      ERROR           ;Handle error
```

Listing continued

Processing Procedure

The technique for accessing a file is reasonably straightforward. First, set up space for the FCB, file buffer, and (if necessary) UREC. Then move a filespec to the FCB by calling the DOS routine $SYNTAX, which will make sure you've used a legal file name. (Both LDOS and NEWDOS use the routine at the same location, 441C hexadecimal [hex], to move the filespec to the FCB. Each, however, uses the OPEN and INIT routines to check your syntax for a valid filespec. Model I TRSDOS 2.3 doesn't document the address of this DOS routine.)

Next, use either $OPEN or $INIT to open the FCB and allow access to the file. $OPEN opens files that already exist; $INIT creates new files. Otherwise, they're the same.

Now you can get records from the file with the $READ routine. If your program calls $READ repeatedly, you can read successive records in the file. If you wish to read a particular record, use $POSN. $POSEOF automatically points to the last record in the file. $REWIND takes you to the beginning of the file, and $BCKSPC sets the file pointer to the previous record.

If you change records, or create new ones, you need to write them back to disk with either the $WRITE or $VERIFY routine. The only difference is that $VERIFY reads each record back after you've written it to disk to ensure that it's copied your data correctly. Finally, before your program ends, the routine restores the directory entry with a call to $CLOSE.

Most operating systems, including TRSDOS 1.3, have other DOS utility calls, but essentially, that's all there is to it. Remember that your program operates with data on a byte-by-byte level, which, while powerful, can be disastrous if you haven't removed all the bugs from a program. Never test your program with crucial data files; the opportunity for catastrophe is too great.

To demonstrate how these techniques can work, the listing shows a utility that is a variation of the List command. From DOS Ready, enter "DISPLAY filespec"; the computer displays the file on the screen in 1K blocks. After you've examined a block, press any key to display the next block; if you wish to terminate the display, press the break key.

After displaying the last block, the program returns to DOS Ready. This program works equally well with TRSDOS 1.3, LDOS 5.1.4, and NEWDOS80 2.0. You'll have to modify it to make it work with some other systems.

Program Explanation

The Equates section of the program, lines 220–320, uses the TRSDOS 1.3 names for disk-handling routines. The addresses for most other Model I/III operating systems are the same though the names may vary.

When you execute any command program from DOS, the HL register pair points to the first non-blank character in the DOS command line following the program name when the program begins. The Call to $SYNTAX in line 390 assumes that the program has correctly positioned HL. If the routine successfully moves the filespec from the command line to the FCB, it sets the zero flag. Otherwise, there's been an error, and the program jumps to its error-handling routine.

Before you call the $OPEN routine, the HL register pair must point to the file buffer, and the DE register pair must point to the FCB. Also, the B register should hold the logical record length you want to use for this file access. To display four full sectors at a time, this program must set the LRL to 256; therefore, it loads the B register with zero in line 470.

Unfortunately, TRSDOS 1.3 has a bug in it that makes it ignore the value in B when you open a file. Instead,

CRB µTools

TRSTUM Tape Reproduction System **TRSDUM**
Tape or Disk
Utility for Model 1, 3, 4

- Read, Write, Verify tape or disk files
- Read and Write any TRS-80 std. protocol tape
- Automatically identifies file type (e.g. BASIC, SYSTEM)
- Change tape file name as desired
- Change speed of tapes, if desired (Mod 3, 4)
- Select cassette port 0 or 1 (Mod 1)
- **OFFSET** memory load addresses automatically
- **UNOFFSET** load addresses, if offset
- Displays full operational status plus . . .
  - diskette directory
  - load map (start-end address sets)
  - Name, Length, Format of files loaded
  - Start, End, Execute addresses of programs
  - Error messages, if any
- Automatic tape/disk protocol conversion
- Single disk-drive copy capability
- Archive disk files on tape to save diskettes
- Run tape programs from disk
  (Tape SCRIPSIT, EDTASM, games, etc.)
- All disk features require TRSDUM

TRSTUM — for cassette-based systems ONLY $16.95
TRSDUM — for TRSDOS disk systems ONLY $17.95

Please specify Model 1, 3 or 4
and add $2.00 postage and handling.

Send check, money order or SASE to

CRB Microtools
"Software µTools for the 80's"
14835 N. First Ave.
Phoenix, AZ 85023 ↙134

TRS-80, TRSDOS, SCRIPSIT are trademarks of TANDY CORP

REG. PRICE
28.95 5¼" SS/DD SOFT SECTOR
39.50 5¼" DS/DD SOFT SECTOR

SPECIAL

VERBATIM	5¼" SS/DD SOFT SECT.	23.00
MEMOREX	5¼" SS/DD SOFT SECT.	23.00
3M - SCOTCH	5¼" SS/DD SOFT SECT	22.00

Add $2.00 Handling in USA
VISA C.O.D. MasterCard
5% Tax in Fla. Only
APO/Box No's & Canada
Add 3.50 Shipping

MEGA BYTE INDUSTRIES
4699 S.W. 45th Street
Ft Lauderdale, Florida 33314
305-587-1130
1-800-327-1013

1 Buy 2 to 4 Boxes
Get a Library Case With Ea. Box Free
or
10% OFF REG. PRICE $4.00 VALUE

2 maxell Buy 5 to 9 Boxes
Get a Plastic Storage Flip n File Box (Holds 75 Mini-Disks) Free
or
15% OFF REG. PRICE $35.00 VALUE

3 maxell Buy 10 Boxes
Get a Complete Computer Maintenance Kit Free
or
25% OFF REG. PRICE $45.00 VALUE

↙199

Allow one week delivery. This offer may be retracted anytime.

MASTER HORSE HANDICAPPER™

EVALUATES FROM RACING FORM!

Age	Gender	Post (Today)
Class	Jockey (Today)	Post (Last)
Condition	Jockey (Last)	Speed
Consistency	Length	Trainer
Earnings	Time of Year	Workouts

And gives you GRAPHIC REPRESENTATION of finish

ADAPTS TO ANY TRACK IN THE WORLD

Quickly and easily be changing data statements relating to local track records/jockeys and trainers.

COMPLETE INSTRUCTIONS INCLUDED

A. Thoroughbred/Maiden
Full featured menu driven throroughbred handicapping program with graphic finish. Contains special "maiden analysis" for first time starters . . .
MEM 16K $59.95

B. Quarterhorse/Maiden
Complete quarterhorse analysis with "maiden" feature and graphic finish . . .
MEM 16K $59.95

C. Thoroughbred/Pace
The same as Program A except contains a "pace from finish" analysis that is a must for "close" races, early season, and longshots . . .
MEM 32K $79.95

D. Master Handicapper™
"ALL" of the programs listed above in ONE PROGRAM with interactive instructions . . .
MEM 48K $99.95

All programs above come complete with instruction manual

PROGRAMS AVAILABLE FOR	WE CARRY
TRS-80 I, III, 4	MANY
Apple™ II, II+, IIE	ITEMS
CPM 2.2, 3.0	NOT
SOON: MS-DOS, MOD 100	LISTED

71% "IN MONEY" FOR 1983

DEALER INQUIRIES INVITED

SPRING RACING SPECIAL

COMPLETE PROFESSIONAL SYSTEM:
A. Deluxe Master Handicapper™ or Master Dog Analysis™
B. Master Bettor™
C. Track Management™
D. Manual and Instructions

Prof. Jones' Price $199.95 DISK ONLY

DLX. Deluxe Master Handicapper™ *NEW*
Contains Program D and also includes: 1) Print Mode 2) Escape Mode 3) 14 Horse Fields 4) Internal Instruction and Manual
MEM 48K $129.95

MB. Master Bettor™ *NEW*
A compliment to ALL Master Handicapper Programs, includes: 1) Win/Place/Show 2) Quinella 3) Exacta 4) Trifecta 5) Pik Six 6) Daily Double 7) Money Management 8) Odds Analysis 9) and Much More
MEM 16K $59.95

DA. Master Dog Analysis™
The only professional dog handicapper on the market, includes: 1) Speed 2) Post Today 3) Kennel 4) Post Lane 5) Distance 6) Condition 7) Running Style 8) Weight 9) plus much more. If you are near a greyhound track, *you can't afford not to use this program.*
MEM 32K $99.95

Professor Jones' Football Predictor, Prof. Pix
This complete football analysis will predict: 1) Overlays 2) Point Spreads 3) "Superplays" 4) "Over/Under" Bets. For NFL/USL/College. Specify Mod I/III
T — $19.95 D — $24.95

Track Management™ *NEW*
A revolutionary data base program designed to keep records on "ALL" horses or dogs running at a track. Can also be used to expand Jockey/Trainer stats in all Master Handicapper™ programs. **A MUST FOR THE SERIOUS HANDICAPPER.**
(48K, Disk Only) $69.95

PROFESSIONAL SYSTEMS

LNW II (96K) — COMPLETE SOFTWARE PACKAGE —

With/
Green Monitor
— 2 Tandon drives
— Cables, etc.
AND *ALL SOFTWARE*

retail $4109

(LNW Business Series)
General Ledger / Payroll
Accounts Payable / Accounts Receivable
Electric Spread Sheet™
Electric Pencil™ — WP program
Micro Term™ — modem program
Chart Ex — graphics pkg.
LNW Basic
DOS plus 3.4 Micro Soft Basic
CP/M 2.2
AND
MASTER PACE HANDICAPPER by Prof. Jones

MOST POWERFUL PROGRAMS AVAILABLE

Prof. Jones' Price For Whole System **CALL** Price Too Low to Print ready to plug in

PROFESSIONAL BUSINESS SOFTWARE		SALE PRICE
Micro Cash — retail bus.	149.95	129.95
Accounts receivable — inv.	149.95	129.95
M/Zal — editor/assembler	149.95	129.95
Maxi CRAS — check reg.	99.95	79.95
Maxi Mail — mail system	99.95	79.95
Maxi Stat — powerful stats	199.95	149.95
DOS plus 3.5	149.95	129.95
New DOS 80	149.95	129.95
DOS plus 3.4 (Mod I)	149.95	99.95

Minimum 15% Discount on **Most Other Software**

Send check / money order / VISA / Mastercharge (Include expiration date) to.

48 HOUR SHIPPING ↙449
Call 208-342-6939
M-F 8-7 MST

Prof. Jones
1114 N. 24th St.
Boise, ID 83702

VISA MasterCard

TERMS: FREE SHIPPING ALL SOFTWARE.
Add $6.00 hardware / C.O.D. Add $6.00 / Add 3 weeks personal checks / Add 4.5% ID residents / Add $6.00 outside U.S.A. / Prices subject to change.

↙ See List of Advertisers on Page 227

Listing continued

```
7038 CD5D70   00690 OK      CALL    PRBUF           ;Print buffer
703B C1       00700         POP     BC              ;Recover loop counter
703C 10E6     00710         DJNZ    LOOP2           ;Repeat for 4 sectors
              00720 ;
703E CD4900   00730         CALL    WATKEY          ;Wait for keystroke
7041 FE01     00740         CP      01H             ;Is it a <BREAK>?
7043 280C     00750         JR      Z,DONE          ;Go if it is
7045 18D8     00760         JR      LOOP1           ;Else get next screen
              00770 ;
7047 F5       00780 ERROR   PUSH    AF              ;Save error code
7048 CD7C70   00790         CALL    CLOSIT          ;Close file
704B F1       00800         POP     AF              ;Recover error code
704C F640     00810 SYNERR  OR      40H             ;Set bit 6 for error
              00820                                 ;description
704E C30944   00830         JP      ERRDSP          ;Display error/Go to DOS
              00840 ;
              00850 ;
7051 CD7C70   00860 DONE    CALL    CLOSIT          ;Close file
7054 CD4900   00870         CALL    WATKEY          ;Wait for key stroke
7057 CDC901   00880         CALL    CLS             ;Clear the screen
705A C32D40   00890         JP      JP2DOS          ;Return to DOS
              00900 ;
705D E5       00910 PRBUF   PUSH    HL              ;Save registers
705E D5       00920         PUSH    DE
705F C5       00930         PUSH    BC
7060 21C570   00940         LD      HL,BUFFER       ;HL==>File buffer
7063 ED5B9D70 00950         LD      DE,(SCRPOS)     ;DE==>Current screen posn
7067 010001   00960         LD      BC,256          ;BC = 1 SECTOR
706A EDB0     00970         LDIR                    ;Copy buffer to screen
706C 7A       00980         LD      A,D             ;Get MSB of screen posn
706D FE40     00990         CP      40H             ;Off the screen?
706F 2003     01000         JR      NZ,PR2          ;Go if not
7071 11003C   01010         LD      DE,3C00H        ;Else DE==> top of screen
7074 ED539D70 01020 PR2     LD      (SCRPOS),DE     ;Set new position
7078 C1       01030         POP     BC              ;Recover registers
7079 D1       01040         POP     DE
707A E1       01050         POP     HL
707B C9       01060         RET                     ;Return
              01070 ;
707C 3A9270   01080 CLOSIT  LD      A,(LRL)         ;Get old LRL
707F 329C70   01090         LD      (FCB+9),A       ;Set back into FCB
7082 119370   01100         LD      DE,FCB          ;DE==> File control block
7085 CD2844   01110         CALL    CLOSE           ;Close file
7088 C8       01120         RET     Z               ;Return if no error
7089 F6C0     01130         OR      0C0H            ;Set bits for description
              01140                                 ;and return to here
708B CD8944   01150         CALL    ERRDSP          ;Show the error
708E 18EC     01160         JR      CLOSIT          ;And try again
              01170 ;
7090 003C     01180 SCRPOS  DEFW    3C00H           ;Top of screen
7092 00       01190 LRL     DEFB    00H             ;LRL storage
0032          01200 FCB     DEFS    50D             ;50 Bytes for FCB
0100          01210 BUFFER  DEFS    256D            ;Space for file buffer
              01220 ;
71C5          01230 LAST    EQU     $
              01240 ;
7000          01250         END     7000H
00000 TOTAL ERRORS
27691  TEXT AREA BYTES LEFT
```

TRSDOS always opens a file with an LRL equal to that stored in the disk directory. Lines 510–540 overcome this problem by removing the old LRL from the DCB and replacing it with zero, fooling TRSDOS into acting as if the file has a record length of 256 whether or not it does.

After clearing the screen, the outer loop of the main program, LOOP1, reads and displays four sectors of the file at once. The inner loop, LOOP2, calls the $READ routine and detects disk errors.

End-of-file and read-past-end errors are not considered errors in this program; instead, they're indications that the program has displayed the complete file. If either of these errors occurs, the program jumps to the Done subroutine; if any other error occurs, the program invokes the Error subroutine, the internal error-handling procedure.

What types of errors are likely to occur? With a program this simple, the only disk errors you should see are those involving unreadable sectors on the disk, such as a parity error or an error indicating "Sector Not Found." The Error routine first closes the file, then displays the error message (as opposed to the error number) and returns to DOS Ready through DOS's $ERRDSP routine.

Whenever a DOS file-handling routine can't complete its task, it resets the Z flag to NZ and returns an error code of between zero and 64 in the A register. To display the error, your program must use $ERRDSP. If you don't change the A register, the error number appears and control passes to DOS Ready.

If you set bit 6, the entire error message appears, not simply the error number. If you set bit 7, the message or number displays, and control returns to your program. Line 810 ORs the error number in the A register with 40 hex so the message is displayed and the computer returns control to DOS Ready.

You can't leave this program without closing the file (short of pushing the reset button). Even if your program only reads data from a file without writing anything new, always close your files before ending a program in either machine language or Basic. If you write to, or extend, a file, you must close that file or the program won't update its directory and your next access of the file may end in chaos.

This program does let you stop execution before viewing the last sectors. Lines 740 and 750 check to see if you've pressed the break key. If you have, they call the closing routine, Done; if not, the program displays the next four sectors. However, because Done also waits for a keystroke, you must press the break key and any other key to return to DOS Ready.

For anything other than a homegrown utility, this double keystroke would be unacceptable, and most programmers would write a second closing routine. I didn't include a second routine in order to keep the structure of the program as clear as possible.

You should see a pattern in the disk-access sections of the program: point the DE register to the FCB, adjust HL and B as needed, call the disk-access routine, and check for an error. Strickly speaking, you don't need to reset the DE register as often as I've indicated in the program, because most of the disk access calls return with DE unchanged.

The extra 6 bytes seem minimal, and the 10 t-states wasted during each disk access are miniscule compared to the time required to move information between the disk and memory. You're better off using those few extra bytes and t-states to produce clear, easily debugged code. A long and complex program that assumes register contents is likely to make false assumptions.

Program Enhancements

While the demonstration program can be a useful utility, I only intend it to get you started. Writing a primitive

FINALLY!!

ARCADE GAMES AND
GOOD GRAPHICS FOR

MODEL 2, 12, 16

$19.95 each - or two for $29.95!

Galactic Invaders.....Munchman
Quest for Adventure.....Meteors
Space Trek.....Wormy
Computer Casino.....Bust-out
The Wrath of Ken.....Chess
Racer X.....Othello

Call or write for full game list
KUZEL COMPUTER SERVICES
8654 W. Berwyn Ave. #3S
Chicago, Illinois 60656
(312) 399-0273 ↙354

wabash®

six-year warranteed ↙367

DISKETTES!
$18.95/box (10)
with FREE library case!

5¼" single-side, single-density; double-density add $2/box. 8" disks comparably priced. Add $2 per order shipping. *In Illinois add 6% sales tax.* Immediate shipment on VISA, Master Card or Money Order; Add 14 days for personal checks.

CALL TOLL FREE
(800) 222-1248
In Illinois Call (312) 882-8315
DEALERS! SCHOOLS! USER GROUPS!
Call for our low volume discount prices!

DIGITAL IMAGES
Box 941005, Schaumburg IL 60194

MODEL I UPGRADE

Who said the Model I is dead?

- Run CP/M 2.2 AND Model I DOS
- 96K RAM with E/I bank switching
- Optionally overlay ROM with RAM
- 2.7K protected RAM above ROM

$169 BIGMEM kit or $199 installed.
$20 Utility disk incl. print spooler.
$34 VisiCalc patch for 55K storage.
$119 CP/M 2.2 with manuals.
Send SASE for flyer with details.

MICROHATCH
PO Box 501
DeWitt, NY 13214
(315)446-8031 after 6PM

VISICALC TM VISICORP, BIGMEM TM MICROHATCH, CP/M TM DIGITAL RESEARCH INC.

↙419

THE NEXT STEP

zap utility, or any machine-language program for disk files, isn't much more difficult than this. The best way to learn to write machine-language programs that access disk files is to experiment, but observe two precautions.

First, never use important data files. Second, be sure to use back-up disks. Until you've completely debugged your program, you can cause irretrievable damage to disk files by unintentionally altering data.

Although using sequential files is easier than using random files in Basic, the opposite is true in machine language. Fixed-length records are easier to manipulate because you and your program always know each record's length. Special format disk files generated by NEWDOS80 are particularly difficult to manipulate in machine language.

A Personal Note to Readers

I appreciate your letters, both written and electronic, about items in The Next Step. Your ideas and questions about the programs I've presented here have helped me learn more about computers and have generated ideas for many of the columns.

Because of the amount of mail I receive, I cannot send a personal reply unless you enclose a stamped, self-addressed envelope. Readers from outside the U.S. should include an international reply coupon instead.

Some of you have asked me to write about a particular topic "next month." The mechanics of magazine publishing make such a request impossible to fulfill. I must write these columns far in advance of the magazine's publication date. By the time you read this, I will have completed my July column.

Also, if you write to me via CompuServe, I'd prefer to receive the comments on the message board of the Software and Authors' Special Interest Group (GO PCS-117) rather than by e-mail. For one thing, the SIG message editor is easier to use than e-mail's. For another, if I can't answer your question, others in the SIG probably can.

Leave your questions addressed to me on section zero of the message board. Feel free to join in discussions started by other readers. ■

MOST WANTED LIST

SUPER UTILITY PLUS 3.2

"THE JAWS OF LIFE" rated FIVE STARS in the Oct. '83 80-MICRO! A MUST-HAVE program if you have disks, as reviewed by all the TRS-80 magazines. They all agree that SU+ is a standard in the industry. This new version is the ULTIMATE and features better documentation. Includes directions for use on the Mod 4.

$79.95

PowerMAIL PLUS

The most powerful mailing/information system yet for the TRS-80. Runs under most current DOSes as well as hard drives. 100% machine language for maximum speed! Features 24 definable "flags", 10 level sort, mounting new data disks, and machine compatible data files. It also "converts" many other mailing programs' data to PowerMAIL+ format. Eliminates re-typing!

Only $150 each

Please specify:
MOD I/III
MOD 4 TRUE Mod 4 Mode!
MOD II/12/16 (Comes on DP-II Kernel System)

POWERDOT II

A GRAPHICS BREAKTHROUGH! The ULTIMATE in graphics design. This version is MUCH MORE POWERFUL than previous versions and includes BETTER documentation as well. New features include AUTODRAW™ and CIRCLE commands. Now allows you to design your own character sets! Includes lots of examples on disk. Your screen is only a "picture window" to a much larger drawing area! You are only limited by disk storage...not memory! Works on EPSON Series (Graftrax of Graftrax+ required) or the C.Itoh 8510 (PROWRITER or NEC version). Coming soon for DMP-2100, DMP-400, and LP-8

$59.95

POWERDRAW

A full screen graphics/text editor. Allows you to design your graphics and merge them with your BASIC or assembly program in SIX different formats. The files may be used alone or chained together for animation effects. MANY programs being produced commercially today incorporate POWERDRAW graphics! No royalties to pay, and they're easy to do! Has received EXCELLENT reviews in many magazines.

$39.95

POWERDRIVERs for use with SuperScripsit™

Allows you to use ALL of SuperScripsit's™ features with your EPSON, PROWRITER, or F-10 STARWRITER printers! Includes patches for running SuperScripsit on LDOS with floppy or hard drive. Now includes DISKFILE driver. Save formatted text to disk now!

Only $29.95 each

Please Specify:
PowerDRIVER/P - C.Itoh 8510 PROWRITER
PowerDRIVER/E - EPSON or GEMINI Series
PowerDRIVER/F - C.Itoh STARWRITER (Leading Edge)

The TOOLBOX for LDOS™

"The utilities to perfect LDOS™ are available in PowerSOFT's TOOLBOX. You also get patches and filters to make your system manageable." "The TOOLBOX should be part of every LDOS™ users' system," quoted from Sept. '83 80-MICRO, who gave TOOLBOX a FOUR STAR rating!

$89.95

US/Canada Please add $2.50 Shipping/handling - Foreign $10

THE ABOVE PROGRAMS CANNOT BE EXPLAINED IN THIS SMALL AD SPACE. PLEASE WRITE FOR COMPLETE CATALOG WITH FULL DETAILS. DEALER INQUIRIES INVITED. AVAILABLE THROUGH SELECTED DEALERS EVERYWHERE

POWERSOFT
PRODUCTS FROM BREEZE/QSD, INC.

11500 Stemmons Fwy.
Suite 125
Dallas, Texas 75229
(214) 484-2976 ↙306

SuperScripsit is a Trademark of Tandy Corp.
LDOS is a trademark of LSI

DiskCount Data™

WHERE QUALITY PROGRAMS MEET COMPETITIVE PRICES

204

2701-C W. 15th • SUITE 324 • PLANO, TX 75075 • (214) 680-8268

BIGGER THAN EVER DISCOUNTS

50% OFF (ON SELECTED PACKAGES)

All MOD III programs specified in this ad will run on the Model 4 (in the MOD III mode).

SUPER UTILITY PLUS VERSION 3.2

By Powersoft

SU+ 3.2	79.95
Inside SU+	19.95
Retail	99.90

SALE 74.95

25% SAVINGS

NEW SUPER UTILITY+ VERSION 3.2
Includes Operators Manual and 2nd Backup Disk
The Book Inside SU+ 3.0 Included FREE
A 19.95 Value at no extra charge
Experience a legend with the program voted as the outstanding utility of 1982.

MOD I or MOD III — Protected Media

INFOSCAN

By The Small Systems Center

Retail 49.95
Special 44.95

NOW 44.95

InfoScan is an information utility that is used to organize, store and retrieve any type of useful information in any format.
It combines the features of a word processor, data base manager and information retrieval and display utility. You compose information records on the screen using the word processing feature in any format you like. Each record is described by 1 17 character key phrase that you specify. Once created the information files keyphrases can be scanned as a list on the screen using an impressive key scan feature. You scroll the keyphrases thru the brackets with the arrow keys on your keyboard. When the desired Keyphrase is found, you press a single Key and the corresponding information record is retrieved from disk and displayed on the screen. The record displays in exactly the same format as you used to create it. You can even design your own forms to fill in.
A stunning visual presentation, it utilizes the display window technique. Menus, keyphrase lists, displayed text and status information are displayed in a series of display windows on your screen. Impressive graphic display panels are used to enhance the visual orientation of the product and your information.

MOD I/III MINIMUM 48K 1 Drive

OPERATING SYSTEMS

SAVE

ALL ON SALE

DOSPLUS 4 w/MZAL	139.95
DOSPLUS 4	119.95
DOSPLUS 3.5 I or III.	119.95
DOSPLUS 3.4 MODIS	59.95
DOSPLUS 3.3 MOD I S or D.	44.95
MULTIDOS 1.6 I/III.	84.95
LDOS 5.1 MOD I/III	119.95

THE TOOLBOX for LDOS

by Powersoft

Previously 99.95
Reduced to 69.95

SPECIAL 59.50 SALE

SAVE 15%

PCHECK/CMD	PCOMPARE/CMD
PFIX/CMD	PCLEAR/CMD
PREFORM/CMD	PSS/CMD
PVU/CMD	PMAP/CMD
PERASE/CMD	PMX/FLT MX80
PMOVE/CMD	PHELP/CMD
PDIRT/CMD	PBOOT/CMD
PASSGO/CMD	PFILT/FLT
PUN/CMD	DVORAK/FLT
PEX/CMD	DVORAK/JCL
PMOD/CMD	CODE/JCL
PFIND/CMD	DECODE/JCL

MOD I or MOD III

POWERDOT II

by Powersoft

NEW VERSION
RETAIL $59.95

SALE 54.99

The ULTIMATE in graphics design. This version is MUCH MORE POWERFUL than previous versions and includes BETTER documentation as well. New features include AUTODRAW™ and CIRCLE commands. Now allows you to design your own character sets! Includes lots of examples on disk. Your screen is only a "picture window" to a much larger drawing area! You are only limited by disk storage, not memory! Works on EPSON Series (Graftrax of Graftrax+ required) or the C.Itoh 8510 (PROWRITER or NEC version). Now available for DMP-2100, DMP400 and LP-8. SPECIFY PRINTER

LC COMPILER AND EDAS

By Misosys

LC Compiler Retail	$100
EDAS Retail	$100
SPECIAL BUY BOTH FOR	$139.99

SAVE OVER $80

Now program in the "C" language compiler subset for LDOS. LC generates Z-80 EDAS IV source code as output. Compiled programs run on both MOD I and MOD III. Save $60.00 with the best LDOS editor assembler package on the market. Over 200 pages of documentation. Requires 2 drives and 48K.

FOR LDOS MOD I/III MOD 4 SPECIFY

ICS PROFESSIONAL

by Freeman Software

INVENTORY CONTROL
SALES REGISTER
INVOICING

ONLY 149.95

This complete retail inventory, invoicing and sales register system will maintain over 2,500 items on MOD III floppies. With built in accounting for sales tax, sales type and 9 different sales people. Prints sales registers, invoices and many different inventory reports on 80 or 132 col Printer. Tracks backorders and will also re-order on predetermined quantities. Also maintains cost of entire inventory. A GREAT VALUE!

MOD I/III

MASTER DIRECTORY III

Advanced Operating Systems

SALE $29.95

STORE YOUR MOD III PROGRAM LIBRARY

Keep track of over 9000 file-names on up to 575 disk sides seven different ways. Print a complete alphabetical directory. Disk savings can be made by finding free space or file duplications. Reads most Model I and Model III directories, except those with pseudotracks.

RETAIL 39.95

MACRO-MON THE SHADOW

by Jake Commander

BELOW DEALER COST

A HUGE DISKCOUNT DATA BUY PASSES THESE UNBELIEVABLE SAVINGS ON TO YOU

Formerly Manufactured by
ADVANCED OPERATING SYSTEMS

Now a DiskCount Data exclusive

The industry's standard and the finest break point disassembler and machine language monitor available. The package includes a rich padded navel binder and complete 2 color documentation. Now single step through your CMD files, view & change assembly op-codes, memory, etc. Used by Kim Watt for the editing of Superzimm+

MOD III Disk	69.95	Now Only	34.99
MOD I Disk	64.95	Now Only	32.99
MOD I Tape	59.95	Now Only	29.99

Quantities Limited & Subject to Prior Sale

BBS-80

by MicroSystems Software

ONLY 74.95

Your computer becomes a mini-communications network. BBS-80 allows a person to exchange messages or information via the telephone. Access can be completely public, private to authorized users or limited to certain individuals. BBS-80 can leave messages on another terminal acting as a rapid, electronic mailman. BBS-80 provides some of the most advanced and most convenient features ever incorporated in a microcomputer bulletin board system including: Users may send private messages that may be ready only by the addressee. Multi-level system security allows up to 15 levels of security in both the message base and the upload/download database. BBS-80 "remembers" each regular user and stores terminal information, security access levels, last message retrieved during last call etc. Individual user passwords. Users may "upload", or transmit, data and programs files to BBS-80. These programs may then be "downloaded" to other BBS-80 users. BBS-80 is self maintaining. Message space is automatically reclaimed when messages are deleted.

MOD I or III

6.0 PLUS

by MicroSystems Software

Enhance Your Model 4 TRSDOS 6.0 and Disk Basic

39.95

A great value from the DOSPLUS folks, these utilities for your MOD 4 DOS add some really important features.
Enhancements include:

DISKZAP	MAP	REF
DISKDUMP	RESTORE	RESOLVE
DIRCHECK	SORT	BE1
	SR	BE2

MOD 4

THE TOOLBELT MOD 4

by Powersoft

49.95

Powersoft does it again with a collection of 16 of the most popular LDOS TOOLBOX utilities re-published for TRSDOS 6.0 running on the MODEL 4. Now enhance your MOD 4 TRSDOS with this powerful set of utilities. Complete with detailed manual on how to use each utility program to do the many things the TOOLBOX for LDOS was famous for.

Model 4

ELECTRIC WEBSTER

by Comucopia Software

149.95 SAVE 20% WITH CORRECTING FEATURE

ONLY 119.95

Reviewed as the best proofreader and spelling checker on the market. Works with SCRIPSIT LAZY-WRITER ELECTRIC PENCIL, ZORLOF, NEWSCRIPT, COPYART, and ACORN'S SUPERSCRIPSIT. Separate version available for R/S SUPERSCRIPSIT. Sold with correcting feature for 149.95.

OUR PRICE	119.95
HYPHENATION OPTION*	39.95
GRAMMAR & STYLE CHECKER*	39.95

MOD I/III

*Note hyphenation & grammar options are not available for all word processors. Ask when ordering.

POWERDRIVER

By Powersoft

$29.95

NEW PRINTER DRIVERS

This new generation of custom printer drivers allows you to utilize all of SUPERSCRIPSIT'S features with your EPSON (Graftrax Required), PROWRITER and C.ITOH F-10 STARWRITER printers. You can now utilize all of the printers custom features such as compressed, expanded print, underlining, bold-face, super-scripting, and subscripting. 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.ITOH PROWRITER
POWERDRIVER S	C.ITOH STARWRITER

MOD I or MOD III

ULTRATERM

by United Software

ULTRATERM NOW 49.95
Version 2.0 w/Auto Logon 67.95

OVER 15% OFF

This communications package is one of the most versatile available. It includes a full featured intelligent terminal program, host program, direct file transfer function and hex conversion utilities for bulletin board downloading plus ● Support for virtually all manual and auto dial modems ● Exclusive Ultra Term direct disk file transfer function allows full control from the transmitting computer and unattended operation at the receiving computer ● Split screen feature lets you type outgoing messages on the bottom half of the screen, while incoming messages are displayed on the top of the screen ● Full Line printer support ● Universal ASCII format file transmission and reception with memory input/output buffer supports delays between characters, delays between lines, and prompt controlled transmission for compatability with virtually all systems. A counter continuously displays the amount of free memory remaining whenever the buffer is in use. ● Full featured host program that supports PRINT and PRINT graphics from basic and automatically relocates and protects itself in the top of memory is included ● Auto Dial phone numbers stored in program with single Key Auto Dial

MOD I or MOD III

CP/M 2.2

TRS-80 MODEL 4
Only 199.95

Now, run CP/M on your Model 4 and unleash the powerful features resident in your computer.

● Includes INTERCHANGE™, a utility that allows reading, writing and copying 20 different manufacturers' disk formats such as IBM, KAYPRO, OSBORNE, XEROX, etc. ● Includes MEMLINK™, a unique feature that uses the optional 64K RAM memory as a fast disk drive. ● Complete with all these CP/M utilities: ASM, DDT, DUMP, ED, LOAD, PIP, STAT, and SYSGEN ● Includes MODEM 7, a powerful public domain communications program. ● Supports 80 x 24 video, reverse video, direct cursor addressing and more. ● Utilizes the Model 4 function keys and allows user defined keys. ● FORMAT utility permits up to 52 disk formats to be constructed, all menu driven. ● Ready to run in the standard 64K Model 4. The additional, extra cost, 64K RAM upgrade not required!

SAMS SOFTWARE ELECTRONICS PACKAGES

40% OFF INDIVIDUAL PROGRAMS

ELECTRONICS 1 PACKAGE
(5 Programs) For Basic Electronics

- 555 TIMER DESIGN
- HEAT-SINK SELECTION AND DESIGN
- TRANSISTOR BIAS PARAMETERS
- ZENER DIODE VOLTAGE REGULATOR DESIGN

Retail 34.95 **Now 20.99**

ELECTRONICS II PACKAGE
(7 Programs) Common Elect. Math

- FOUR QUADRANT ARCTANGENT
- INVERSE LAPLACE TRANSFORMS OF A TRANSFER FUNCTION
- MINIMUM & MAXIMUM VALUES OF AN ARRAY
- RECTANGULAR/POLAR CONVERSION
- ROOTS OF POLYNOMIALS WITH REAL COEFFICIENTS
- SOLUTION OF SIMULTANEOUS EQUATIONS WITH REAL COEFFICIENTS

Retail 34.95 **Now 20.99**

ELECTRONICS III PACKAGE
(8 Programs) Analyze Periodic & Aperiodic Waveforms

- ANALYSIS OF DAMPED OSCILLATIONS
- ATTENUATOR PAD DESIGN
- AVERAGE AND RMS VALUES OF A PERIODIC FUNCTION
- DELTA-WYE TRANSFORMS
- FOURIER SERIES EXPANSION OF A PERIODIC FUNCTION
- FOURIER TRANSFORM
- LOSSLESS L-C PAD DESIGN
- LOSSLESS L-C PAD WITH PHASE SHIFT

Retail 34.95 **Now 20.99**

Each Package is for MOD I/III Cassette-Programs Can Be Moved to Disk

SAVE OVER 50% BUY ALL 4 For 69.99

ACTIVE FILTER DESIGN
(6 Programs)

- LOW AND HIGH PASS (BESSEL, BUTTERWORTH, 1, 2, AND 3-DB CHEBYSHEV).
- STATE-VARIABLE FILTER.
- BANDPASS FILTERS WITH Q'S LESS THAN 10 AND 50.
- STAGGERED-TUNED BUTTERWORTH BANDPASS FILTERS (2, 3, OR 5 STATES).
- NOTCH FILTER.

Retail 34.95 **NOW 20.99**

SAMS TECHNICAL SOFTWARE

DESCRIPTIVE STATISTICS & REGRESSION ANALYSIS (3 Programs)

- DESCRIPTIVE STATISTICS (MEAN, STANDARD DEVIATION, VARIANCE, KURTOSIS, Z-SCORES).
- CURVILINEAR REGRESSION (LINEAR, INVERSE, POLYNOMIAL, EXPONENTIAL, LOGARITHMIC).
- MULTIVARIABLE LINEAR REGRESSION.

Retail 34.95 **Now 20.99**

PLOTTING GRAPHS FOR VIDEO DISPLAY (5 Programs)

- HISTOGRAMS.
- CARTESIAN PLOTS.
- SEMI-LOGARITHMIC PLOTS.
- LOG-LOG PLOTS.
- POLAR PLOTS.

Retail 34.95 **Now 20.99**

PLOTTING GRAPHS FOR LINE PRINTER (3 Programs)

- CARTESIAN PLOTS.
- SEMI-LOGARITHMIC PLOTS.
- POLAR PLOTS.

Retail 34.95 **Now 20.99**

Each Package is MOD I/III Cassette Based - all Programs can be placed on disk

SAVE 50%

BUY ALL 3 FOR 51.99

NOTICE

WE HAVE PURCHASED THE REMAINING TRS-80 PROGRAM INVENTORY OF AOS/SAMS SOFTWARE. ALL AOS/SAMS PROGRAMS LISTED ON THIS PAGE ARE OFFERED BRAND NEW, AS IS, AT CLOSEOUT PRICES. BUY NOW AND ADD THEM TO YOUR TRS-80 LIBRARY WHILE THEY ARE STILL AVAILABLE. QUANTITIES LIMITED AND SUBJECT TO PRIOR SALE.

THE HOME ACCOUNTANT III	69.95
IMPAKT (for BASIC PROGRAMMERS) MOD I/III	39.95
LYNN VIDEO TAPES VHS OR BETA	36.99
LYNN TAPES MOD III OR MOD I BASIC	46.99
SUPERDIRECTORY MOD I/III	44.95
DATAGRAPH I, III, MAX 80 (SPECIFY)	74.99
DATAGRAPH PIE CHART OPTION	34.95
TRS-80/Z80 ASSEMBLY LANGUAGE LIBRARY	31.95
PRO-CESS MOD 4	37.95
PRO-CREATE MOD 4	94.95
PRO-CURE MOD 4	46.95
PRO-DUCE MOD 4	37.95
PRO-PADS MOD 4	37.95
GREEN WINDOW (CRT ENHANCER) SPECIFY MODEL	16.95
ENIGMA BY POWERSOFT I/III	39.95
GRAPHIT BY POWERSOFT I/III	39.95
EPSON DRIVER COMPILER BY POWERSOFT I/III	29.95
BASIC FASTER & BETTER (DEMO DISK) I/III	16.95
BASIC FASTER & BETTER (LIBRARY DISK) I/III	16.95
GAMEPAK 3 I/III (FUNNYFACE, MATCHMAKER, REPEAT)	29.95
VOYAGE OF THE VALKYRIE DISK (GRAPHIC ADVENTURE)	29.95
VOYAGE OF THE VALKYRIE TAPE	19.95
AGRI-CALC FEEDER PIG PROGRAM	39.95
EE LADDER NETWORK DISK I/III	39.95
EE LADDER NETWORK TAPE I/III	29.95
POWERDRAW	34.95
THE TEST GENERATOR (SEE EARLIER AD FOR DETAILS)	34.95
THE BASIC CHECKBOOK	64.95
BASIC S COMPILER SYSTEM I/III	39.95
MICROTERM I, III or 4	69.95
SCRIPLUS (NOW POWERSCRIPT, NEW VERSION)	34.95
DOSPLUS II MOD II/12 or Z-80 MOD 16	199.95
M-ZAL EDITOR ASSEMBLER RELEASE 3 MOD I or III	84.95
ZUES EDITOR ASSEMBLER MOD I/III/4	74.95
MASTER MECHANICS SET FOR LDOS (9 UTILITIES) I/III	34.99
LOAN AMORTIZATION (FULL AMORT SCHEDULE) III	29.95
E-BASIC (SPECIFY DOS)	49.95
SUPER UTILITY TECH MANUAL 3.(X)	13.95
INSIDER SUPER UTILITY 3.(X)	16.95
THE CUSTOM TRS-80 & OTHER MYSTERIES	26.95
HOW TO DO IT ON THE TRS-80 & OTHER MYSTERIES	26.95
TRSDOS 2.3 DECODED & OTHER MYSTERIES	26.95
MICROSOFT BASIC DECODED & OTHER MYSTERIES	26.95
BASIC FASTER & BETTER & OTHER MYSTERIES	26.95
MACHINE LANGUAGE DISK I/O & OTHER MYSTERIES	26.95
BASIC DISK I/O & OTHER MYSTERIES	26.95
TRS-80 DISK AND OTHER MYSTERIES	19.95
DISKETTES 5¼ IN. SSDD, IN PLASTIC BOX	24.95
ELECTRIC PENCIL 2.0Z. I/III	79.95
POWERSCRIPT (FOR SCRIPSIT)	34.95
POWERMAIL PLUS MOD I/III or 4 (SPECIFY)	124.95
SYSTEM DIAGNOSTIC (HOWE SOFTWARE) MOD I OR III SPECIFY	89.99
TRSDOS 6/LDOS PROGRAMMERS GUIDE (OVER 200 PAGES)	17.95
FULL SCREEN TEXT EDITOR FOR BASIC MOD I/III DISK	32.95
PROFILE 3+ COMMANDS (17x22 WALL CHART)	*4.00
VISICALC COMMANDS (17x22 WALL CHART)	*4.00
SUPERSCRIPSIT COMMANDS (17x22 WALL CHART)	*4.00
MODEL III BASIC COMMANDS (17x22 WALL CHART)	*4.00

*NOT SHIPPED SEPARATELY

ADVANCED OPERATING SYSTEMS

MOSTLY BASIC SCIENTIFIC

- BASIC TELEPHONE DIALER
- COMBINATION LOCK
- CONSTELLATION 10
- HEX TO DECIMAL AND DECIMAL TO HEX CONVERSIONS
- THE SUN
- TIME MACHINE CLOCK
- WORD BOARD

Retail 24.95 **NOW 14.99**

MOSTLY BASIC HOUSEHOLD

- AMORTIZATION SCHEDULE
- BASIC DIET
- DIGITAL STOPWATCH
- ELECTRIC ENERGY USAGE
- GAS MILEAGE CALCULATOR
- HOUSE BUYING GUIDE
- MEDICAL EXPENSE RECORD
- MESSAGE TAKER
- RECIPE AMOUNT CALCULATOR
- TAROT CARD READER

Retail 24.95 **NOW 14.99**

MOSTLY BASIC EDUCATIONAL

- DUNGEON OF HTAM
- LANGUAGE FLASH CARDS
- MATH 4
- MEMORY CHALLENGER
- READING PACER
- SPELLING TEST
- VISUAL PERCEPTION TEST

Retail 24.95 **NOW 14.99**

Each Package is MOD I/III Cassette Based - all Programs can be placed on disk

SAVE 50% BUY ALL 3 For 37.99

CLEAN SLATE by Advanced Operating Systems

RETAIL $79.95

ONLY 49.95

A very unique word processing package. Clean Slate has many features not found in word processors at twice the price. It allows full customization of printer drivers and direct control of this printer from text. Features user definable repeat keys, non-destructive cursor, graphics print offset, custom keyboard driver and has its own built-in comm program for file transmission and receipt. Can build a separate glossary file and a names list for auto from letter insertion. You can also create and edit assembly source or basic program files. We found a treasure chest of this little known jewel at the right price. Two color documentation in a padded easle binder. It is an outstanding value for this price.

MOD I III

AOS UTILITIES #1

Advanced Operating Systems

Comes in a padded binder

Retail 99.95

SAVE 50% NOW 49.95

DISKEEP
CAN SAVE VARIABLES TO BE PASSED TO OTHER BASIC PROGRAMS. ALLOWS BASIC PROGRAM CHAINING. CONTAINS A BASIC LOADER PROGRAM WHICH DELETES ITSELF TO PROVIDE ADDITIONAL MEMORY SPACE. OCCUPIES 720 BYTES OF USER RAM

SCREENSCRIBER PLUS
ALLOWS DRAWINGS TO BE CREATED BY MOVING A CURSOR AROUND THE SCREEN. PROVIDES A NORMAL TYPEWRITER MODE WHICH PRODUCES UPPER AND LOWER CASE LETTERS. PRODUCES LARGE LETTERS, NINE LETTERS PER LINE, FIVE LINES PER SCREEN. MOD I or MOD III SPECIFY

FREE

Any order of over $100 or more from this ad will receive one choice of the following absolutely FREE

Macro Mon The Shadow
Master Directory
One of the Mostly Basic Series
Plotting Graphs For Video Display
Plotting Graphs For Line Printers
Green Window I, II, III or IV

Any order over $200 will receive one choice of the following

FREE

AOS Utilities
Super Keys Keyboard Utility
Voyage of the Valkyrie tape or disk
E E Ladder Network tape or disk

DiskCount Data TM

214-680-8268

Send Cash, Check or Money Order
Please add $3.00 for postage and handling
additional $2.00 for C.O.D.'s.
Foreign orders welcome, please specify air or surface. All shipping charges assumed by purchaser.
When ordering by mail, please specify computer model number
Phone Your Order In Today Or Mail To:
DISKCOUNT DATA
2701-C W. 15th St., Suite 324
Plano, TX 75075
Office Hours Mon-Fri 10A.M. to 9P.M. C.S.T.

AND VISA Cheerfully Accepted

See List of Advertisers on Page 227

FUN HOUSE

Secrets

by Richard Ramella

This is the final Fun House column, and that's not an April Fools' joke. It's time for all of us to do other things.

If you have a Color Computer at your house, I invite you to drop by Elmer's Arcade, a game column in *HOT CoCo*. Also, soon Wayne Green Books will publish a collection of Fun House programs for the CoCo and MC-10.

Writing Fun House for 20 months and hearing from nearly 800 readers has been a very nice experience for me. Lots of mail comes to the Fun House. It keeps me from getting lonely in the evening, when everyone leaves the amusement park and I have no company except Willamina, the laughing mechanical lady. She appreciates my jokes but never tells any of her own.

I'm always happy to get letters from people who visit here because I get ideas for new Fun House attractions from what people write.

For instance, a boy wrote from Florida to ask how he could make it so only he could run his programs. I sent him the little program that appears this month as Lockout.

Then I started thinking about secret things I enjoyed when I was a kid: hide and seek, invisible writing, codes, diaries, secret handshakes, pig Latin, and other confusing languages....

Why are most kids that way? I think it's because, in a world where kids are told what to do more often than they tell adults what to do, it's fun to have a few secrets. No harm in that!

Let's try some Level II Basic programs for the Models I and III. Every one of them has to do with secrets in some way.

Lockout lets you keep others from running your secret programs. It's far from perfect protection, but you'll never know how good it is until you try it.

Ghost Guard shows you how to put an invisible code in a program. The person who tries the program without knowing that code might not figure out how to run the program.

Shutdown is a funny routine that provides a secret entry code. The code is different every time, but you always know it.

Cryptonice is a kind of word chopper that takes a plainly written sentence and mixes it up in a code you can unmix. Decoder for Cryptonice is just that.

Displacement Code puts a plain statement in a code that includes the secret key for decoding it.

Lockout

You should type in this short program at the beginning of another program you want to keep secret. You might have to renumber its lines so it ends before the other program begins.

When a spy (read that as your little brother) tries to run the program, a prompt asks the user to type his or her age and tap the enter key. This isn't an honest request. The computer doesn't want any number.

It wants the secret code, which is the word CODE. You can change it to your own secret word. If it doesn't get the word CODE (or your own word) as the answer, the program ends.

The Key Box

Models I and III
4K Cassette Basic
32K Disk Basic

How does someone stop this from happening without knowing the secret? All you do is LLIST the first few lines of the program and peek at the code, plainly stated in line 140, so this won't stop anyone for long.

```
100 REM * LOCKOUT * TRS-80 LEVEL II BASIC *
110 REM * FUN HOUSE * APRIL 1984 * RICHARD RAMELLA *
120 CLS
130 INPUT "TYPE YOUR AGE AND TAP ENTER";A$
140 IF A$<>"CODE" THEN PRINT "WRONG": END
150 END
```

Lockout.

Ghost Guard

Looking at this short routine, you wouldn't think it's so amazing. In fact, it won't even run right as it appears in the listing. But I'm going to tell you how to make a code invisible.

After you type in the program, do exactly as I instruct. As best you can, watch the screen to see what happens.

Type EDIT 130 and tap the enter key. Tap the space bar five times. Tap the letter I. Hold down the shift key and tap the left-arrow key once. Tap enter. That's all.

What happened? Line 130 now says A$ + "Z" but it's fibbing. It really equals the letter A, then a back space, then the letter Z. All you see is the Z.

To prove the A is there, type EDIT 130 and tap the enter key, then tap the space bar repeatedly until you come to the end of the line. You will see the A appear, then disappear.

When you run this routine, it asks you to enter the secret code. If you enter the letter A, the program continues. If not, it ends.

This method isn't perfect either. If you LLIST the program on a line printer, the A shows up. But it is a confusing little item, isn't it? Feel free to substitute another letter or keyboard symbol for the A. After all, it's your secret entry symbol.

```
100 REM * GHOST GUARD * TRS-80 LEVEL II BASIC *
110 REM * FUN HOUSE * APRIL 1984 * RICHARD RAMELLA *
120 CLS
130 A$="AZ"
140 INPUT "ENTRY CODE";B$
150 B$=B$+CHR$(24)+"Z"
160 IF B$<>A$ THEN PRINT "WRONG": END
170 PRINT "RIGHT"
180 END
```

Ghost Guard.

```
100 REM * SHUTDOWN * TRS-80 LEVEL II BASIC *
110 REM * FUN HOUSE * APRIL 1984 * RICHARD RAMELLA
120 CLS
130 A=15360
140 FOR B=0 TO 191
150 RANDOM
160 PRINT @ B,CHR$(RND(26)+64);
170 NEXT B
180 INPUT "ENTRY CODE";A$
190 IF A$=CHR$(PEEK(A+64)) THEN PRINT "RIGHT CODE. PROCEED": GOTO
290
200 PRINT
210 PRINT "INTRUDER !"
220 PRINT
230 PRINT "THE PALACE GUARD HAS BEEN ALERTED."
240 FOR T=1 TO 1000
250 NEXT T
260 A=RND(10)
270 IF A=1 THEN PRINT "BEEP "; ELSE PRINT CHR$(32);
280 GOTO 260
290 REM * REGULAR PROGRAM WOULD BEGIN RUNNING HERE."
300 END
```

Shutdown.

You must put this program and the next one, Shutdown, before the starting line of the program you want to protect.

Shutdown

What's nice about Shutdown is that it provides an entry code that is different almost every time and that you don't know before you see it. The secret is that you know where it's going to be.

When you run Shutdown, three lines of random letters appear on the screen. Then the program asks: ENTRY CODE? The answer to this prompt is always the first letter in the second row.

Some people can program in Basic quite well, yet don't know much about the PEEK command. And Shutdown uses the PEEK command in a sneaky way.

If you enter the wrong code letter, the program says: "INTRUDER! THE PALACE GUARD HAS BEEN ALERTED." Then it displays the word BEEP every so often until you tap the break key.

If you enter the right code, the program goes to line 290.

To fit this onto another program you want to hide, make the far right command of line 190 read GOTO and the number of the first line in the real program.

Cryptonice

Here's a simple code maker, and the program that follows it breaks the code.

After you type RUN and tap the enter key, the program asks you to type in your secret message in 250 or fewer letters. Then it mixes up the letters of the message the same way every time. It shows you the encoded message and the program ends.

You can read this code without using the decoder program. When the code appears on the screen, fit a strip of paper to the line of letters so the paper is as long as the line of letters. Then fold the strip in half. Put the strip below the line of letters so its left edge points to the first letter.

The letter above and to the left is the first letter in the uncoded message, and the letter above and to the right of the strip is the second letter. When you know these letters, move the strip to the right one letter and read the left and right letters again. Keep going until the message is clear. You'll get the hang of it.

```
100 REM * CRYPTONICE * TRS-80 LEVEL II BASIC *
110 REM * FUN HOUSE * APRIL 1984 * RICHARD RAMELLA
120 CLS
130 CLEAR 1000
140 PRINT "TYPE IN SECRET MESSAGE IN 250 OR FEWER LETTERS."
150 INPUT A$
160 Z=LEN(A$)
170 IF Z/2<>INT(Z/2) THEN A$=A$+"0"
180 FOR B=1 TO LEN(A$)
190 F$=MID$(A$,B,1)
200 IF B/2=INT(B/2) THEN B$=B$+F$ ELSE C$=C$+F$
210 NEXT B
220 D$=C$+B$
230 PRINT D$
240 END
```

Cryptonice.

```
100 REM * DECODER FOR CRYPTONICE * TRS-80 LEVEL II BASIC *
110 REM * FUN HOUSE * APRIL 1984 * RICHARD RAMELLA *
120 REM * USE TO DECODE MESSAGES FROM PROGRAM CRYPTONICE *
130 INPUT "TYPE THE CODED MESSAGE";A$
140 Z=LEN(A$)/2
150 FOR A=1 TO Z
160 E$=E$+MID$(A$,A,1)+MID$(A$,A+Z,1)
170 NEXT A
180 PRINT
190 PRINT "THE UNCODED MESSAGE IS..."
200 PRINT E$
210 END
```

Decoder for Cryptonice.

Decoder for Cryptonice

So you can try this program, I've encoded a few messages using Cryptonice. To use the program, type RUN and tap the enter key. When the program asks you to type the coded message, try these. Do one at a time or it won't work.

- TEIEQENSISFRMDGSA TDWH C UE AL O AAACRA AN
- PRT ODI HR O IDI U H A A TLNB AG IIAEGL SWEEYUFN TBTTEMPWSSOE YLREJM
- RCADRMLAI ELYNC ELWIHR AEL SARAL IEFLO0

In the last code, the last character is a zero, and the next to last one is the letter O.

```
100 REM * DISPLACE CODE * TRS-80 LEVEL II BASIC *
110 REM * FUN HOUSE * APRIL 1984 * RICHARD RAMELLA *
120 CLS
130 PRINT "THIS IS A DISPLACEMENT CODE MAKER."
140 PRINT "FIRST, ENTER A NUMBER FROM 1 TO 9"
150 PRINT "AND THE MESSAGE YOU WRITE AFTERWARD"
160 PRINT "WILL HAVE LETTERS DISPLACED FORWARD"
170 PRINT "THAT NUMBER OF LETTERS IN THE ALPHABET."
180 PRINT
190 INPUT "ENTER NUMBER NOW";A
200 A=INT(A)
210 IF A<1 OR A>9 THEN CLS: PRINT "MUST BE 1 TO 9": PRINT: PRINT:
GOTO 130
220 CLS
230 PRINT "NOW TYPE IN MESSAGE TO BE CODED IN 250 OR FEWER LETTERS
"
240 INPUT A$
250 CLS
260 B$=STR$(RND(9))+STR$(A)+STR$(RND(9))+CHR$(32)
270 FOR C=1 TO LEN(A$)
280 F=ASC(MID$(A$,C,1))
290 IF F+A>90 THEN F=F+A-26 ELSE F=F+A
300 IF F>32 AND F<42 THEN F=32
310 B$=B$+CHR$(F)
320 NEXT C
330 PRINT B$
340 END
```

Displacement Code.

Displacement Code

Here's a code that you don't need a program to decode—a displacement code.

When you run the program, it explains how it works. You choose a number from one to nine. The encoded version skips

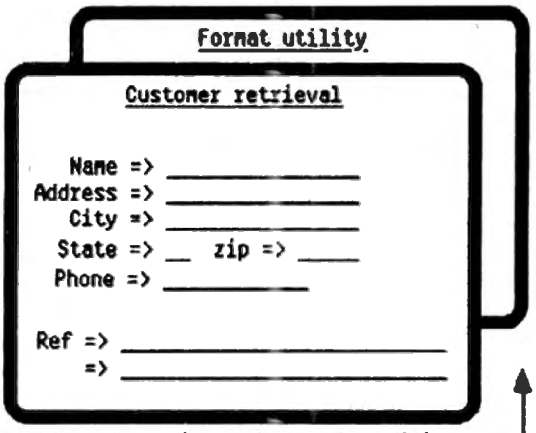
NICE (tm) New Interactive Computing Environment

from XYZT Computer Dimensions, Inc.

Menus

The most friendly user interface utilizing a set of menus. Runs utilities, wordprocessors, games and applications directly from menus. Can be easily modified and customized.

Screens



Full screen input/output, editing, formatting and validation, PF keys, messages, full cursor control. Can be used directly from BASIC.

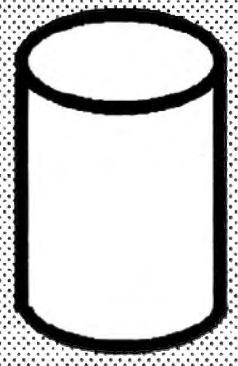
Visicalc (tm) interface

	A	B	C
1	Description	Date	Amount
2			
3	Supplies	08/15/83	$27.86
4	Parking	08/20/83	$15.00
5	Shopping	08/20/83	$73.20
6		Total:	$116.06
7			
8			
9			

The information kept in the database can be processed by Visicalc.

Special **built-in interface** allows data transfer from Database to Visicalc.

Database

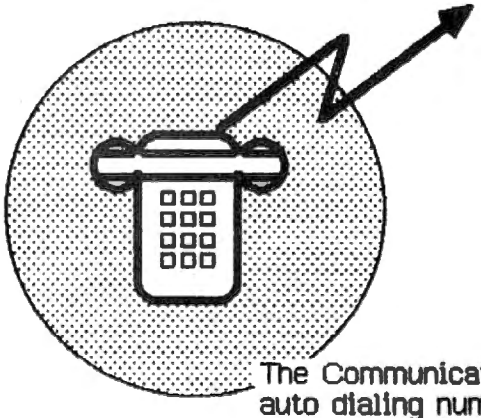


Remarkably universal and efficient data processing system.

Unlimited number of files, true multikey access, **no sorting** required.

Ideal for personal use and business systems.

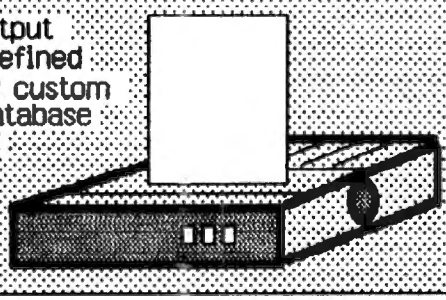
Communications



The Communication facility can be used for text and data transfer, auto dialing numbers from the data base, customized protocols, etc.
(Communications available 1984;priced separately)

Forms & Reports

Information can be output in a variety of user defined formats. Standard and custom letters, merge with database invoices, inquiries and reports can easily be specified and printed



✓158

The System is compatible with TRS-80 mod I/III (min 2 drive 48k) LDOS, NEWDOS/80, DOSPLUS and MULTIDOS

price: $450.00

XYZT Computer Dimensions
2 Penn Plaza, Suite 1500
NY NY 10121 (212)244-3100

✓ See List of Advertisers on Page 227

$1399

MODEL 4 w/

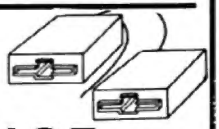
- 64K RAM
- 2 Drives
- 6 mo. warranty
- Sound

CALL FOR CUSTOM CONFIGURATION

★★★★★★★★★★★★★★★★★★★★

The personnel at MICRO EQUIPMENT CORPORATION have been building, upgrading and customizing microcomputers in Atlanta, Georgia for many years, and have been working with Radio Shack products since the Model 1 revolutionized the industry. Our technical staff prides itself on the quality of workmanship and expertise from which every machine we customize benefits. We back our Model 4 products with our exclusive SIX MONTHS LIMITED WARRANTY, longer than any of our competitors. So join the hundreds of satisfied customers who are getting the most out of their Model 3s and Model 4s customized by the experts at MICRO EQUIPMENT CORPORATION. You'll be glad you did – we guarantee it!

Complete
DRIVE SYSTEMS



FROM **$195**

•40 Track, Single Sided

Bare	$159.95
1 Drive System	$195.00
2 Drive System	$389.95

•40 Track, Double Sided

Bare	$219.95
1 Drive System	$269.95
2 Drive System	$509.95

•80 Track, Double Sided

Bare	$269.95
1 Drive System	$319.95
2 Drive System	$609.95

PRINTER Specials

- **•EPSON** — RX-80 $274.95; Others $ CALL
- **•SILVER REED** (Daisy Wheel) Model 500P $419.95

$2000 FREE SOFTWARE

w/ **SANYO** COMPUTERS

INCLUDES: Wordstar, Spellstar, Calcstar Infostar, Mailmerge, Easywriter, and DOS.

- **•MBC 550** — IBM PC Compatible — $999 — Complete w/ MS-DOS, Monitor, & Free Software
- **•MBC 1100** — CPM — $1199 — Complete w/ CPM 2.2, Monitor, & Free Software

DEALER INQUIRIES INVITED

(404)843-3128

MEC MICRO EQUIP CORP

245 W. Wieuca Rd.
Suite 210
Atlanta, Ga. 30342

✓313

MICRO EQUIPMENT CORPORATION

---

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

Reduction of an actual sign

The Banner Machine™

- For the TRS-80 I & III with 32K tape or 48K disk
- For use with any Epson RX, FX, or MX with Graftrax; or Gemini 10 or 10X
- Uses dot graphics instead of TRS-80 block graphics
- Menu-driven program operates like a word processor
- Makes signs up to 10" tall by any length
- 10 sizes of letters from 1" to 8½" high
- Mono or proportional spacing
- Automatic centering; Right and left justifying
- Makes borders of variable width up to 1"

✓335

Order The Banner Machine™—$49.95 from

Cardinal Software
Virginia Micro Systems
13646 Jeff Davis Highway
Woodbridge, Virginia 22191
Phone (703) 491-6502

VITAMIN and MINERAL DEFICIENCY CHART

Your computer will analyze your answers to 192 questions concerning your body and then print a chart showing probable deficiencies of 33 vitamins and minerals plus protein and fat. (Such questions as, Do your eyes hurt when you go out into the sun? Is your hair beginning to grey? Do you sleep well? etc etc.)

Comes complete with 50 questionnaires, 50 blank Nutritional program forms. Instructions on completing the Nutritional forms from your computer generated chart, and an excellent instruction manual and a 5 1/4 inch disk. This program can put you into a business of your own selling nutritional programs.

ALLIED SYSTEMS CO.

P. O. BOX 245 TRONA, CALIF. 93562

FOR MODELS I/III/4 48K — 619 372-5355
C. O. D. AND MONEY ORDERS — $89.50
ARE RUSH ORDERS

✓140

UPGRADE your TRS-80 1,2,3 or 4 with the super-computer, the

LNW80-2+

$1199

* PERIPHERAL PACKAGE SPECIAL *

No-Glare Amber Monitor, Prowriter Printer, and 2 40-TRK slimline disk drives, all for just $999.

EXCELLONIX
7180 Woodrow Wilson Drive
Los Angeles, CA 90068 ✓267
(213) 650-5754 - (714) 973-1939

⁄⁄ FlashSpell ⁄⁄

Spelling word flashes on screen, flash time doubles until spelled correctly.

⁄⁄ Disk storage.
Your child's lists stored for nightly, cumulative review. No retyping.

⁄⁄ Printed scoresheet.
Cram sheet for test day school bus review, shows which words are hard.

Mod 3,4 data disk $14.99 + .85 post, incl. free "Insult". Chilly Disk Software, Dept. EM, 200 N. Cushman, Suite 201, Fairbanks, AK. 99701 ✓118

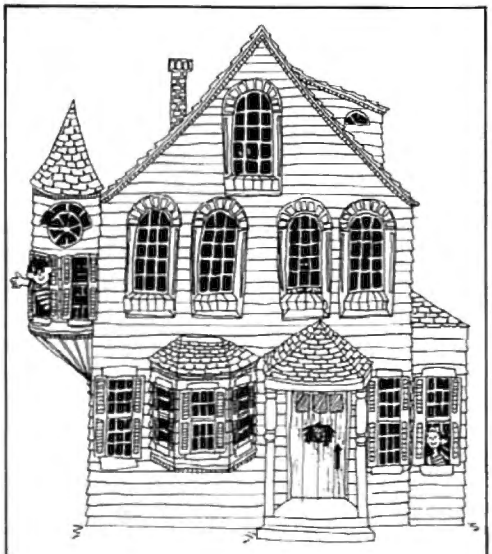
---

this publication is available in microform

University Microfilms International

300 North Zeeb Road
Dept. P.R.
Ann Arbor, MI 48106
U.S.A.

18 Bedford Row
Dept. P.R.
London, WC1R 4EJ
England



past the uncoded letter that number of characters in the alphabet to substitute the letter it finds.

When the coded version appears, a three-digit number is to the left of it. The numbers on either end are dummies. The middle number tells you how many letters forward the program has displaced the coded message.

For example, you choose the number 1, then write your message. To decode, you must go one letter back in the alphabet. The word MOM appears, coded as NPN.

Also, if a letter displaces past the Z in the alphabet, it goes to the A at the beginning and keeps counting. For example, a V displaced forward eight letters would become a D.

If you have trouble getting a Fun House program to work, write me: Richard Ramella, 1493 Mt. View Ave., Chico, CA 95926. I'll try to help if you include a stamped, self-addressed envelope and say what the program is doing wrong.

Now, turn your back and count to 100 slowly. When you turn around, I will be gone. ■

NEW PRICES ... LOWER THAN EVER !

LNW-80 Model II

128K, 5"/8" DISK CONTR., RGB COLOR, HI-RES GRAPHICS, RS 232, PAR PRINTER PORT, 80x24 DISPLAY, 1 YEAR WARRANTY.

YES, We still have PMC 81 with 16K-100% TRS80 Mod I Compatible $475.
PMC 81 Expansion $375.

LNW SYSTEM EXPANSION II

UPGRADE YOUR MOD 1 OR PMC 80/81 WITH DISK CONTROLLER RS 232 PARALLEL PRINTER PORT 32K 200 NS MEMORY GOLD CONNECTORS · TRANSFORM · CASE CABLE **$339**

EXPANSION INTERFACES

MICRO DESIGN MDX-2	$449
MICRO DESIGN MDX-6	$235
LNW DOUBLER w. DOS+ 3.4	$189
DOUBLE DENSITY MULTIPLIER	$95
HOLMES VID 80	$320
MDX6 PLUS 1 TM 100-1	$370
with 2 TM 100-1	$535

PRINTERS

C-ITOH

	PAR	SER
GORILLA	$195	$195
PROWRITER 8510 10"	$359	$520
PROWRITER 1550 15"	$579	$710
F1040 CPS DAISEY WHEEL SER OR PAR		$1,145
F1055 CPS DAISEY WHEEL SER OR PAR		$1,475
F10 TRACTOR FEED		$195

SILVER REED (Daisey Wheel)

EXP 500 14 CPS 10" Carriage	$430
EXP 550 17 CPS 15" Carriage	$639

OKIDATA

80 80CPS	$315
82A 120CPS	$365
92P 160CPS	$475

EPSON

RX80	$370
FX80	$555
MX80 III	$359
MX100	$599
SIEMENS PT88 INK JET PRINTER	$699
TOSHIBA $1350	$1559

MODEMS

SIGNAL MAN MKI RS237	$85
SIGNAL MAN MKXII 300/1200	$269
J-CAT	$104
SMART CAT 212	$399
HAYES SMART MODEM 1200	$472

COMPUTERS

IBM 64K 2 DISK	$2,595
SANYO MBC 550 (IBM COMPATIBLE)	$895
SANYO MBC 555	$1220
SYSCOM II (APPLE COMPATIBLE)	$565
PMC81 (TRS-80 COMPATIBLE)	$475
TRS-80 MODEL 4 2DISK 64K	$1,699
TIMEX-SINCLAIR 1000	$55

CRT MONITORS

GORILLA-AMBER OR GREEN	$94
TAXAN GREEN	$125
TAXAN AMBER	$139
AMDEK 300G GREEN	$139
AMDEK 300A AMBER	$149
AMDEK 310A (IBM)	$179

COLOR MONITORS

TAXAN RBGI Medium Res.	$299
TAXAN RBG II High Res.	$420
TAXAN RBG III Super High Res.	$490
AMDEK COLOR I	$325
AMDEK COLOR III	$

DISK DRIVES

TANDON

	Bare	Compl
TM100-1 40 TR S/S	$159	$199
TM100-2 40 TR D/S	$225	$269
TM101-4 80 TR D/S	$330	$375
TM848 8" SLIM LINE S/S	$395	$525
TM848 8" SLIM LINE D/S	$475	$625

TEAC (Slimline)

FD55A 40TR S/S	$199	$240
FD55B 40TR D/S	$225	$270
FD55F 80TR D/S	$310	$360

APPLE COMPATIBLE DRIVE (Shugart)	$180
DRIVE CONTROLLER CARD	$65

SOFTWARE

LAZYWRITER	$159
ELECTRIC WEBSTER	$119
DOS PLUS 3.5	$99
MULTI DOS	$89
SUPER UTILITY 3.2	$65
OMNITERM	$78
NEWSCRIPT 7.1	$124
PRO SOFT TALLYMASTE	$70

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

The Final Word On Reload 80

This is the last Reload 80 column. While *80 Micro* will still provide Load 80, we've improved Load 80's self-documentation to the point that programs are much easier to load and run, obviating the need for an ancillary column. For instance, Title/BAS, the copyright program that introduces each Load 80 installment, contains hints on running the individual programs. And we now supply Load 80 on Super-Move, the disk transfer utility, so your monthly disk runs on either a Model I or III without conversion. You can transfer the programs from the source disk to any TRSDOS disk.

We supply Load 80 on Super-Move, so disks run on a Model I or III without conversion.

If you buy the Load 80 cassette to transfer your programs to disk, you know how to use the CLOAD command from Disk Basic, the Tape command to transfer /CMD files, the TPSRC command to move /SRC EDTASM files, or some version of the LT command from your editor/assembler to load odd-format /SRC files.

Article	Page	Cassette File Spec	Disk File Spec	Comments
Side A				
----	--	A	TITLE/BAS	Basic
Everything from A to Z	53	B	THREAD/BAS	Basic
Brick by Brick	58	EXEC	EXEC/CMD	System
Brick by Brick	58	*	EXEC/SRC	EDTASM†
April Spool	77	SPOOL	SPOOL/CMD	System
Bugs from Outer Space	82	TEXT2A	TEXT2A/SRC	EDTASM
Bugs from Outer Space	82	TEXT2B	TEXT2B/SRC	EDTASM
Side B				
Relaxed Syntax	120	H	MSG/BAS	Basic
Relaxed Syntax	120	I	KWORD/BAS	Basic
Relaxed Syntax	120	J	SDATA/BAS	Basic
Relaxed Syntax	120	K	FNDX/BAS	Basic
Relaxed Syntax	120	L	FRIEND/BAS	Basic
Dump Site	164	M	SCREEN/BAS	Basic
The Sound of Musikon	138	N	MUSIKON/BAS	Basic
April Spool	77	SPOOL	SPOOL/SRC	EDTASM

*This source code listing is not available on cassette.
†EDTASM is a trademark of Radio Shack and refers to their product.

April Load 80 directory.

If you run a tape-based system, you've used the CLOAD and System commands to get your Basic and /CMD programs, and you've loaded source code listings into your editor/assembler using the L command. But, whether you buy Load 80 on disk or cassette, you have to read the magazine to run the programs.

Be careful not to confuse programs written for disk systems with those written for cassette systems. Changing a Basic program isn't always a big project, but machine-language programs tend to be system-specific. If the author claims his program is "transportable," then simply changing the originate (ORG) statement should do the trick. Cassette programs can originate from 4000 hexadecimal (hex); disk programs must not reside above 6000 hex. The article will tell you if the program is transportable.

Moving machine-language programs between the Models I and III is an unlikely proposition. It requires thorough knowledge of both Model I and Model III ROMs, an intimate knowledge of the original program, and probably many hours of work. If you're that proficient at machine-language programming, you might as well start fresh rather than convert.

Future Support

Even though this column is ending, Load 80's technical editor will be available to answer your questions, either by phone or by mail. And Lori Eaton (603-924-9471) will still provide assistance with any subscription problems you may have. ■

Editor's note: Consult the Table of Contents every month to locate the Load 80 directory.

IT HAD TO GO SOMEWHERE.

There's no reason to deprive you of solid microcomputing information just because it wouldn't fit between the covers of *80 Micro*. Here's the answer—**The Rest of 80**—31 of the best tutorials and utilities, hand-picked from the overflowing files at *80 Micro*. These never-before-published articles for the Model I and Model III were just too good to let them get away. Here are just a few of the chapters you'll find:

An Unlistable, Unbreakable Program
Adding Commands to BASIC
Programming in Tiny Pascal
Line Drawing
Automatic Master Disk Directory
Faster Loading for the Model I
ASCII Converter
A Better LDOS KSM

And more on BASIC, Pascal, and assembly language! Every program is of the same high quality you wait for every month in *80 Micro*. Now try **The Rest of 80**—a welcome addition to your computer library.

ISBN 0-88006-062-X, softcover with spiral binding, 7×9, 232 pp. BK7392 $9.97

Call **TOLL-FREE 1-800-258-5473** for credit card orders. Or mail your order with payment or complete credit card information. Include $1.50 per order for shipping and handling. Send to: Wayne Green Inc., Attn: Book Sales, Peterborough, NH 03458.

80

THE REST OF 80

Yes! Send me _____ copies of **THE REST OF 80**. Enclosed is $9.97 per copy plus $1.50 per order shipping and handling.

☐ MasterCard Bank# _____
☐ VISA ☐ AMEX ☐ Expires _____
Signature _____
Name _____
Address _____
City _____ State _____ Zip _____
Wayne Green Books, Peterborough, NH 03458 **344B8R**

1981 1982 1983

LOAD 80 CASSETTES & DISKS - Back Issues

If you have not yet ordered any Load 80 tapes or disks and wish you had, don't worry. We are now offering a "BACK ISSUE" inventory clearance. You can order nearly any Load 80 starting from September of 1982 to date. We do have limited quantities, so order early to avoid disappointment! Back issues of *80 Micro* are also available. With complete documentation found in the companion magazine, you should have no difficulty loading any of the programs listed on Load 80.

Please send the following:

	Month	Year		Month	Year
Cassettes			**Disks**		

Prices
LOAD 80 cassettes $11.47 each.
LOAD 80 Diskettes $21.47 each
Price includes postage and handling.
Foreign Airmail, please add an additional .45¢ per item.
US. Funds drawn on U.S. Banks only.

☐**Check/Money Order** ☐**MC** ☐**AE** ☐**VISA**

Name: _____
Address: _____
City: _____ State: _____ Zip: _____
Card#: _____ Exp. Date: _____
Signature: _____

Please Allow 3-4 Weeks Delivery
LOAD 80 • Debbie Walsh • 80 Pine Street • Peterborough, NH 03458 4-84

See List of Advertisers on Page 227

VOTED ONE OF THE TOP THREE EDUCATIONAL PROGRAMS OF 1983 BY *80 MICRO* READERS!

Find out what *80 Micro* readers discovered long ago. . . Typing Teacher by Instant Software Inc., is one of the best educational programs of 1983!

This complete seven-part package takes you from initial familiarization with the keyboard, through typing words and phrases, to complete mastery of the keyboard.

On-screen diagrams show you the correct placement for fingers and the programs include practice sessions to develop coordination. Your computer becomes a bottomless page for typing practice. The lessons are tailored to the keyboard, but train you to use any standard typewriter.

Advance from the awkward hunt and peck method to smooth, free-flowing, touch typing with the Typing Teacher program.

Available for the TRS 80:

Mod I & Mod III		
	Tape (99R)	17.95
	Disk (451RD)	22.95
Color Computer		
	Tape (464RC)	17.95
Model 100	Tape (463RH)	17.95

INSTANT SOFTWARE INC. ↩220

Peterborough NH 03458

To Order: Call toll free 1•800•843•6700
NH residents call 1•924•9261
use your VISA, MASTER CARD, AMEX, or mail your check (we pay shipping) to Instant Software.

Continued from p. 40

dataCure's Audience

Publishers who use protection schemes requiring duplication solely from the distribution disk will find dataCure helpful for customers who damage disks and would otherwise have to return the distribution disk.

For end users, dataCure is useful with a working master, as an added precaution for archive disks put into storage, or as protection against copying an entire back-up disk with limited physical or electrical damage.

Assuming that you use a three-disk back-up system and have BAK extension files, how often will you use dataCure to recover data? If you have only a few bad sectors, dataCure will probably repair the disk faster than making a new copy. For extensive damage, you'll need to resort to your back-up disk.

You can buy a lot of back-up disks for the cost of dataCure. If Colorado Online improves the software so that it regenerates large data files, dataCure will be immensely practical. In the meantime, you might save some time correcting disk errors, and it's fascinating to see this program re-create information on damaged disks. ■

The Model 100 And the Market

by Carl Oppedahl

Tele-Stock lets someone unfamiliar with computers, and with the Dow Jones News Service, track daily variations in the prices of up to eight stocks. The program calls the Dow Jones News Service, obtains the latest trading statistics for the specified stocks, and updates a history file for each one. Tele-Stock is a fine program—easy to learn, easy to use, and pleasing in its results. I recommend it to anyone interested in the stock market.

You can initiate the phone call to Dow Jones manually or instruct the program to make it at a specified time.

You can then use function key F3 to display and graph the accumulated information on each stock, going back up to 30 trading days. If you have a printer attached, you can print the display with function key F4.

You can also back up the stock information to tape and reload it using function keys F5 and F6. Finally, you can easily change parameters such as stock symbols, log-in sequence, and time for delayed update (function key F7).

Operation

Tele-Stock is a 300-line Basic program that loads into about 10K of RAM. A small file called PARAM.DO contains the log-in sequence and the stock symbols. You create another do-file to contain the history information for each stock symbol.

Tele-Stock uses a straightforward sequential ASCII file structure; files contain variable-length fields separated by commas. In the event of garbled data (e.g., due to a bad phone connection), this lets you repair the data files through the built-in Model 100 Text program.

Tele-Stock incorporates a number of nice features. If you ask it to call Dow Jones on a Saturday or Sunday, it asks if that is really what you want,

Tele-Stock

★★★½

Telesoft Inc.
939 Deerspring Place
Newbury Park, CA 91320
Model 100, 24K
Cassette recorder
Direct-connect cable or acoustic coupler
AC adapter
$59.95

Easy to use?	★★★★☆
Good docs?	★★★★☆
Bug free?	★★★★☆
Does the job?	★★★★☆

FINALLY, THE TAX PACKAGE YOU'D BEEN LOOKING FOR. . .

1983 TAX PACKAGES

Specifically designed for Tax Services, C.P.A.'s and Individuals

ARE YOU TIRED OF. . .
- Working late into the night doing tax returns?
- Making simple addition errors?
- Not being able to utilize your computer?
- Having to pay hundreds of dollars for tax software?

NOT ANYMORE. . .THOSE DAYS ARE GONE!!

WITH OUR TAX PACKAGES YOU CAN. . .
- Double, triple or quadruple your output.
- Eliminate those embarrassing addition errors.
- Have professional looking returns.
- Let your computer do most of the work.
- Have quality software at a fraction of the price.

Our PROFESSIONAL INCOME TAX PACKAGES are very easy to use. All Programs are menu driven and each follows the tax forms and schedules line by line. You can review all your figures on the screen and be able to change any of your entries before printing. Produces a printout that exactly fits FORM 1040 (or use with our Plastic overlays) and all other FORMS and SCHEDULES printed in IRS Approved format. You can also save client data to disk for later recall.

Our tax programs are designed to run on TRS-80 Models I, III, IV, APPLE II+, IIe and FRANKLIN ACE computers. All versions require a minimum of 48K memory and one disk drive.

TAX PACKAGE I		TAX PACKAGE II		TAX PACKAGE III		TAX PACKAGE IV	
Form 1040	SCH E	Form 1040A	Form 3468	Form 4797	Form 5884	Form 1120	SCH D 1120S
Form 2106	SCH F	Form 1040EZ	Form 3903	Form 4835	INC STATEMENT	1120 WKSH	Form 1041
SCH A	SCH G	Form 1116	Form 4255	PG I 4972	RENTAL STATEMT	SCH D 1120	K1 1041
SCH B	SCH R&RP	Form 2119	Form 4562	Form 5695	I R A	Form 1120S	SCH D 1041
SCH C	SCH SE	Form 2210	Form 4137	Form 6251	ACRS	K1 1120S	Form 1065
SCH D	SCH W	Form 2440	Form 4684	Form 6252	Add & print W2's		K1 1065
		Form 2441		Form 1040X	AND MORE		

FREE

EACH TAX PACKAGE... ONLY $49.95

FREE WITH EACH ORDER...PLASTIC OVERLAYS FOR PAGE 1 AND 2 OF FORM 1040!!

FOR ORDERS OR INFORMATION CALL OR WRITE:

We ship within one day of receiving orders.

When ordering by mail, include your telephone number, credit card information, computer model, memory size, and number of drives. Indiana residents add 5% sales tax.

Please add $3.00 shipping and handling. C.O.D. charge is $5.00

R&S SOFTWARE CO.

R&S Software Co.
Box 81 • Hammond, IN 46320
(312) 891-3502

78

WE ACCEPT
- Visa
- MasterCard
- Checks
- Money Order
- C.O.D.

So Don't Delay. . .Order Your TAX PACKAGE Today!

DEALER INQUIRIES INVITED

HOWE SOFTWARE PRODUCT GUIDE

SYSTEM DIAGNOSTIC

Is your computer working correctly? *Are you sure?* System Diagnostic has complete tests for every component of your TRS-80™ Model 1, 3 or 4.

- ROM: checksum tests
- RAM: three separate tests.
- Video Display: three tests.
- Keyboard: every key contact tested.
- Line Printer: three tests, variable platen.
- Cassette Recorder: read, write, verify.
- Disk Drives: disk controller, formatting, read/write/verify data, disk drive timer, head cleaner. Single or double density, one to ninety-nine tracks.
- RS-232-C Interface: connector, data transmission, framing, data loop, etc.

System Diagnostic $99.95

TYPITALL

The SCRIPSIT™ Compatible Word Processor for the TRS-80™ Model 1, 3 or 4.

- Assign any sequence of keystrokes to a single control key.
- Print to the screen before the printer.
- Send the formatted text to a disk file.
- Merge data from a file while printing.
- Print ANY control or graphic character.
- Same version runs on Model 1/3/4.
- Reenter program with all text intact if you accidentally exit without saving it.
- Read your old SCRIPSIT™ files.

"If you like SCRIPSIT, you'll probably love TYPITALL." **80 Micro.**

TYPITALL (disk only) $129.95

✓175

TRS-80™ MODEL III ASSEMBLY LANGUAGE

A complete course in assembly language, written for the **beginner.** Basic concepts, the Z-80 instruction set, complete Model III ROM and RAM information, programming examples, the disk controller, the TRSDOS™ 1.3 disk operating system, RS-232-C interface.

With the book you can also purchase **Monitor #5,** a comprehensive machine language monitor (specify Model 1 or 3).

Book only $16.95
Monitor #5 only $22.95
Book and Monitor #5 on disk $29.95

24-Hour TOLL-FREE Order Number:
Outside California call:
(800) 428-7825, ext. 169
Inside California call:
(800) 428-7824, ext. 169
Visa, Master Card, or COD orders only.

For information call:
(914) 634-1821

Add $3.00 postage & handling.
New York residents add sales tax

Howe Software
14 Lexington Rd., New City, NY 10956

*TRS-80 is a trademark of Tandy Corp

since the stock exchanges aren't active on either day. Similarly, a request to load from tape to main memory, which might destroy current data, won't proceed without a second confirmation by the user.

The displays and submenus are well suited to the novice, taking full advantage of menus and function keys. The Microsoft Basic statements for the LCD such as Line, Print@, and PSET make pleasing graphs of stock price and trading volume.

You connect, dial, and hang up the telephone line through Basic Call statements invoking ROM subroutines. The called routines are listed on pp. 199–202 of the Model 100 user's manual.

This emphasizes one of Tele-Stock's fine design features—it uses no unpublished ROM calls. Since Radio Shack is unlikely to change published ROM call addresses, the Tele-Stock program will not be invalidated by inevitable ROM updates.

However, Tele-Stock does what it's advertised to do—no more and no less. It doesn't add up the total worth of your portfolio (though it would be easy enough to modify the program to do so), nor will it calculate price/earnings ratios or predict stock trends.

It gently introduces the nervous first-time user to Dow Jones News Service. After watching the computer log in several times, you will be tempted to try logging in, first to get the same price quotations Tele-Stock gets, and later to try the many other services Dow Jones offers.

Using Dow Jones

To use Tele-Stock, you must sign up for an account with the Dow Jones News Service. You can call the toll-free number in the Tele-Stock manual, or send in the application form (which allows one hour of free service) included with the direct-connect modem cable.

Dow Jones assigns you a password that you must provide to the Tele-Stock program, and sends you a number of booklets and other materials, most of which you don't need to understand to proceed with the program.

The calls Tele-Stock places should not cost much. The charge incurred with Dow Jones is small, since the call is brief: less than a minute, at 20 cents per minute. The phone call might be the predominant cost, though if you are in a city served by Tymnet, Telenet, or Uninet, you are only billed for a local call.

Back-up

Two chapters of the manual are devoted to making back-up copies of the various data files and explaining the program's well-designed tape save and tape load functions. Fortunately, Tele-Stock is written so that making a tape back-up of all data files only requires pushing a single function key. Reloading the taped data to RAM also requires only one keystroke.

The good, user-oriented save and load functions are important for back-up purposes and as an aid to freeing up memory and directory space in the Model 100. For example, with Tele-Stock and the data files in place, you might have as little as 3K left in a 24K machine. Furthermore, 10 of the available 19 file names are occupied.

When you want to use the Model 100 for other programs, you can easily save the Tele-Stock data files to tape, kill them from memory, and reload them later.

A statement in the user's manual forbids the purchaser to make even a single back-up copy of the main program, Stock.BA. Instead, you can purchase back-up copies from Telesoft for a unilaterally determined nominal fee.

Documentation and Support

The 27-page manual gives such clear instructions that the untrained user is in control of the program within half an hour. Furthermore, the program prompts are self-explanatory and you're not likely to need the manual again after one or two sessions.

The manual doesn't explain that some sophisticated switchboards do not respond to the Model 100's rotary-dial pulses. Thus, your Model 100 might not be able to autodial the Dow Jones call. You must either arrange for a direct outside phone line or be content to dial each call manually.

Also, if you have a call waiting feature, any incoming call results in a half-second interruption of the phone connection to transmit the beep signal. Unfortunately, this interruption loses some 15 characters, enough to mess

Continued on p. 228

Three Good Reasons To Buy Software From Mumford Micro Systems:

1. Quality. Mumford Micro has been selling software for the TRS-80 since 1978. Nobody survives in this competitive market for that long on poorly written software. Our best references are thousands of satisfied and repeat customers, but if you haven't spoken to one of them, our 10 day money-back guarantee might secure your confidence. Our rate of return? Less than one in 500.

2. Value. Quality software at exorbitant prices is no bargain. Mumford Micro is known for true value in addition to high quality.

3. Service. We are not distributors or "middle men". We are the original producers of every package we sell. Orders are filled promptly and if you have a problem with one of our programs, you can often call and talk to the author. On those occasions when a problem cannot be resolved on the phone, prompt technical help is available from a programmer who is intimately familiar with the program you purchased.

INSTANT ASSEMBLER

The Instant Assembler is a powerful assembly language development system for the TRS-80. If you are already an assembly language programmer, its unique design will greatly increase your productivity. If you are just getting started, there is no better assembler to help you learn machine language programming. Some of its unique features are immediate assembly, which detects syntax errors as source is entered, and a compact source format that allows you to write programs nearly three times as large as other assemblers in the same amount of memory. It will assemble to disk, tape, or directly to memory for immediate debugging with the built-in debugger, and also produces relocatable code modules that can be saved on disk or tape and linked together in memory for large or modular assemblies. You can quickly switch from assembler to debugger without losing your source. The built-in debugger will step though your programs one instruction at a time, showing each disassembled instruction and its effect on the registers and memory. It will load or save both conventional source files and its own condensed source format.

The Instant Assembler package includes six separate programs. The assembler itself includes the editor and built-in debugger. The **Linking Loader** is included in several versions for different memory sizes. A stand-alone version of the debugger **(MicroMind)** is also included. **MicroMind** can be relocated in memory and has commands to single-step, set breakpoints, display or alter registers or memory, find bytes or words, disassemble to screen or printer, convert between hex and decimal numbers, and write SYSTEM tapes. The Instant Assembler comes with a comprehensive 65 page instruction manual with many examples.

Specify Model I or Model III. TAPE INTASM 2.1 ..... $39.95 on tape
Specify Model I or Model III. DISK INTASM 2.1 ..... $49.95 on disk

TELCOM

Mumford Micro offers two telecommunications programs. **TELCOM I** has most of the features needed to communicate with bulletin boards, time share systems, or for file transfers between two disk-based micros over modems or direct wire. It is menu driven and extremely simple to use. Functions include transmit a disk file, receive a disk file, save received data on disk, 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, and programmable character keys.

TELCOM II is an expanded version of this program for the most demanding telecommunications applications. The terminal mode has a help menu and large printer spooler for high baud rates. From within the terminal mode you can load disk files into the memory buffer, type into the buffer, transmit the buffer, or view the buffer or data that has already scrolled off the screen. It has 10 different programmable messages that can each be sent with a single command for auto log-on or auto dialing, and 5 different character translation tables.

TELCOM II also includes an error correction 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 detect and correct errors in transmission. Files can be sent to or fetched from an unattended computer. Both versions of TELCOM come with complete instruction manuals, which are available separately for $5 to help you decide which program is best suited to your needs.

Specify Model I or Model III. TELCOM I ..... $39.95 on disk
Specify Model I or Model III. TELCOM II ..... $69.95 on disk

MODEL I SPEED UP

The SK-2 clock modification allows CPU speeds to be switched between normal, an increase of 50% or 100%, or a 50% reduction. Speeds may be changed with a toggle switch (not included) or on software command. It can also be configured to return to normal speed any time a disk is active. It mounts inside the keyboard unit with only 4 necessary connections and is easily removed if the computer ever needs service. The SK-2 has been field proven by 3 years of use, and comes fully assembled.

Model I only. SK-2 ..... $29.95

TYPESETTERS

Call or write for information on our TRS-80 to Compugraphic support package that will allow you to set type with your word processor and create disks on a Model 3 or 4 that will run in your Compugraphic typesetter.

DISK INDEX

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 2000 programs in less than 60 seconds and will find any program out of 2000 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. You can quickly display the free space left on each disk and the number of copies of each program in the index. 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 2000 programs in each file, and you may build as many files 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, and has special modes to support unusual configurations of LDOS and NEWDOS. **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 3.2 ..... $39.95 on disk

INSIDE LEVEL II

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. 80 Micro 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

DEMON DEBUGGER

DEMON (for DEbugger and MONitor) is a sophisticated tool with which you can explore and debug machine language programs. In the STEP mode, it "emulates" the operation of the Z-80 and allows you to step through any machine language program one instruction at a time, showing you the address, hexadecimal value, Zilog mnemonic, register contents, and step count for each instruction. The 19 different STEP mode commands include step, step to a branch, run in step mode at a variable rate, run for a specified number of steps, change flags or registers, execute a CALL or RST, set breakpoints in RAM or ROM, and break when a number in a defined range appears in any double register. The 26 commands in the MONITOR mode include hex arithmetic, hex to decimal conversion, block move, fill memory, find bytes, jump to address, disassemble to screen, printer, disk, or tape, load memory from disk or tape, write memory to disk or tape, full screen memory edit in hex or ASCII, and relocate other programs or itself. Screen displays may be routed to your line printer for hard copy. **DEMON** includes a comprehensive 40 page manual with many examples.

Specify Model I or Model III. DEMON ..... $39.95 on tape or disk

8748 ASSEMBLER

Assemble programs for the complete Intel MCS-48 family of microcontrollers including the 8741, 8742, 8748, and 8749 on your Model I, III, or IV. Assembles from a source file written on your text editor directly to an object file on disk. It supports the standard Intel mnemonics and features conditional assembly and listing, complete expression evaluation, ten significant characters for symbols, a complete range of pseudo-ops, and informative error messages. It comes with a comprehensive instruction manual which includes the instruction set for each component and sample listings for arithmetic and I/O subroutines. We also offer plans, schematic, and software to help you build your own inexpensive 8748 programmer. The 8748 is an inexpensive ($15) single chip computer that contains RAM, EPROM, clock oscillator, a counter/timer, and 27 I/O lines in a single 40 pin package. A complete computer controller can be built with this one chip, a crystal, three capacitors, and a five volt power supply.

Specify Model I or Model III. CASM48 ..... $125.00 on disk
Plans and software for an 8748 programmer ..... $29.95 on disk

MUMFORD MICRO SYSTEMS

ORDERING: Add $2.50 for postage and handling. California residents add 6% sales tax. Visa, Mastercard, and COD orders are accepted. If not completely satisfied, return your purchase within 10 days for a full refund. Be sure to specify Model I or Model III format.

Box 400-E, Summerland, California 93067 (805) 969-4557

Quality software since 1978

Order directly or ask your college or university bookstore for

BIB/RITE

to write, maintain, learn, and teach bibliographies in a standard form*

Prompts for elements and for form, sort by author and by category, merge keyboard and disk or tape input, semiautomatic journal title entry, edit, print with heading, margins, automatic paging.

Maximum of about 150 citations in 48K, 200 for non-disk Basic. Best for fewer than 100 citations. Slow for 150-200.

Available for tape or disk use. Disk recommended. For TRS-80 Model I Level II with lower case, Model III, or Model 4 in Model III mode. Uses about 14K. Need 32K minimum and printer with caps, lowercase, and underline. Apple, CP/M with MBasic, Model II, 12, & 16 versions in process.

One computer, individual user $45.95 + $2.50 postage and handling. One computer, multiple users $150 + $2.50 postage and handling. Up to 10 user's guides for multiple users, three sent if not specified. User's Guide only (24 pp. 8½" × 11") $3.50 + $1 postage and handling. Applies to purchase.

On approval to institutions. Dealer inquiries invited.

Robert E. Litke, Ph.D.
432 Cottage Avenue
Vermillion, South Dakota 57609
Technical questions:
Phone **(605) 624-2948** evenings
452

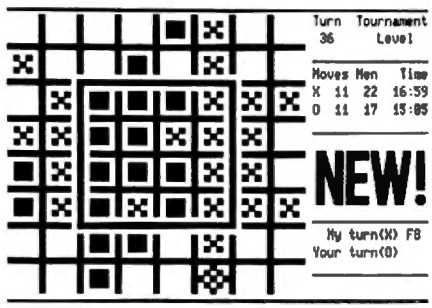
*APA, 1983. Other forms on demand. Trademarks: TRS-80 Tandy Corp.; CP/M Digital Research; MBasic Microsoft Corp.; Apple Computer, Inc.

TOURNAMENT REVERSI

TRS-80 Model I/III/4

Designed for quick response and smooth operation.
Arrow key or joystick controlled moves.
Adaptable Tournament Level,
2 Win Finder Levels, 10 Practice Levels.

Graphics board display with Tournament Clocks, Men Count, Legal Move Count, Turn Number.



26 Execution Options:
Swap Sides, View Legal Moves, Test Move, Suggest Move, Take Back Move to any depth, Change Playing Level, Set Up Position, Review Game, Change Clock Timing, Save/Load Games on Disk, Print Board/Game History, Display Game History, and more.

Complete Instruction Manual includes Game Rules, Execution Option Details, Tips for Skillful Play.

Program diskette and manual only $40.00.
Requires 48K Disk System. Specify Model I, III, or 4.
Send check or money order to:

Rapidynamic SOFTWARE, INC.
14358 Dyer Street, Sylmar, California, 91342
247

Back Issues

January 1980 to June 1980 . . . . . $3.00
July 1980 to May 1983 . . . . . $3.50
June 1983 to present $4.50

Add $1.00 per magazine for shipping. 10 or more magazines add $7.50 per order for shipping.

Free Back Issue Catalogue available. Includes listings of article titles and a brief description of subjects covered in each issue.

Write for your copy today!

80micro®
Back Issue Order Dept.
80 Pine Street
Peterborough, NH 03458

MODEL 4
$1629.00
64K 2 Disks RS232
with 128K—$1760.00

MODEL 12
2 Disks $2995.00

COMPUTERS

PC-2 POCKET	$169.00
PC-3 POCKET	79.95
MODEL 100 8K	675.00
MODEL 100 24K	799.00
MODEL IV 16K	845.00
MODEL 16 128K 2D	4699.00
MODEL 3 to 4 UPGRADE KIT	699.00
MICRO DESIGN	
UPGRADED MODEL 4	1479.00
64K COLOR COMPUTER	219.00
MODEL 4P	1499.00
15 MEG HARD DISK	1899.00

TRS-80
MODEL 2000
starting at **$2450.00**

Ask About our LEMON Guarantee

OKIDATA 80	CALL
OKIDATA 82A	CALL
OKIDATA 83A	CALL
OKIDATA 84	CALL
OKIDATA 92P	CALL
OKIDATA 92S	CALL
GEMINI 10X	270.00
GEMINI 15	380.00
DAISY WHEEL II	1700.00
DWP-410	1050.00

Anti Glare AMBER SCREEN Langley St. Clair for Model 4 $89.00

PRINTERS

DMP-100	$299.00
DMP-120	399.00
DMP-200	535.00
DMP-400	999.00
DMP-500	1159.00
DMP-2100	1750.00
CGP-115	199.00
P.C. PLOT	175.00
SILVER REED	659.00
DMP-420	725.00

ALL SOFTWARE 15% OFF

BODEX CORP.

224 East Main St. Marlboro Mass. 01752 Phone 1 617 485 5115 or 481 1027
HOURS M-Fri. 10-9/Sat. 9:30-6
UPS items shipped FREE!
We can ship C.O.D.
381

TRS 80 is a trademark of Tandy Corporation

80 LIST OF ADVERTISERS

Reader Service Number		Page
166	A & J Micro Drives	105
38	A.C.E. Systems	243
562	About Time Computerware	244
356	Adel Computer Mart	193
56	Adult Video Games	171
197	Adventure Masters	153
82	Aerocomp Inc.	136, 137
140	Allied Systems Company	218
476	Alpha Bit Communications	201
17	Alpha Products Company	15, 111, 113
*	Alphaware	255
374	ALPS	57
217	American Small Business Computers	207
141	Anitek Software Products	32
40	Apparat Inc.	45
390	Applied Microsystems Inc.	103
574	Artic Data Corporation	252
383	Astro-Star Enterprises	237
147	B & B Computing	149
152	BCCOMPCO	200
*	Becks-MFG.	76
25	Beta Enterprises	171
180	Bill Cole Enterprises	125
58	Binary Devices	248
557	Bluestem Productions	242
381	Bodex Corp.	226
*	Bottom Line, The	65
382	Byte General Inc., The	108
173	C.C.D. Software	153
167	C.D.C.	57
134	C.R.B. Microtools	209
125	Ceres Software	185
560	Charleswater Products	256
555	Checks To-Go	248
118	Chilly Disk Software	218
269	Citation Systems	153
202	Colwell Systems	192
311	Compress Co.	149
455	Compukit	247, 248
86	Compulogic Corp.	254
365	Compusoft Publishing	66
119	Computents Inc.	193
139	Computer Case Company	200
357	Computer Friends	117
18	Computer Plus	17
575	Computer Power Solutions	248
336	Copley Press/Cleo	251
45	Cornucopia Software	149, 245
*	Cosmopolitan Software	109
190	Creative Computer	97
223	Crest Software	86
63	Data Base Industries	229
552	Databar Corporation	240
472	Dennison Mfg./Leading Edge	7
539	Desert Sound Inc.	184
282	DFW Computer Center	187
367	Digital Images	211
551	Diskwasher	240
204	DiskCount Data	212, 213
441	Diskette Connection	245
568	Diskus Products	256
62	Displayed Video	154, 155
570	Diversified Educational Enterprises	258
*	80 MICRO	
	Back Issues	226
	Foreign Dealers	235
	Load 80 Back Issues	221
	Load 80/Color Load 80	255
	Review Guide	131
	Subscriptions	130
	Subscription Problems	153
216	EAP Company	148
85	Educational Micro Systems	81
435	Edwards and Associates	253
567	Edwards and Associates	256
325	Ehlen Enterprises	133
322	Ehlen Enterprises	248
114	EJB Electronic Systems	235
144	Elek-Tek, Inc.	143

Reader Service Number		Page
209	Elexor	184
267	Excellonix	218
178	EZ Ware Corporation	249
572	Falcon Safety Products	254
553	Fireside Software	252
214	Fort Worth Computers	151, 253
523	Gibberman Enterprises	129
496	Good Software Corp.	81
9	H & E Computronics	CIII, 25, 27, 29
355	H.D.P.	161
168	Heath Company	4
113	HHCI Tape Systems	171
565	HHCI Tape Systems	242
153	Holmes Engineering Inc.	139
*	HOT CoCo Subscriptions	36
175	Howe Software	224
205	I/O Ware	189
220	I/O Ware	222
352	Indiana Software Group	158
566	Industrial Standard Software Sales	254
177	J & J Electronics/JSOFT	251
101	J & M Systems	12
126	J.M.G. Software Int'l	55
*	jr Subscriptions	67
534	Jameco Electronics	127
254	James W. Secor Data Processing	187
521	Juki Industries of America	3
286	K & L Software	249
485	Kaigio Electronics Company Inc.	149
331	KSOFT	81
354	Kuzel Computer Software	211
462	Langley-St. Clair Instrument Inc.	41
135	Lindbergh Systems Inc.	39
31	LNW Research Corp.	CIV
330	Logical Devices Inc.	243
559	Logical Systems Inc.	240
385	Logix	257
115	Lynn Computer Services	147
128	Macro Systems Software	235
527	Magicomp	232
319	Manx Software Systems	119
241	Marathon Software	235
250	Marymac Industries	257
197	Master Stock Service	251
199	Mega-Byte	209
22	Michtron	121
132	Micro 80 Inc.	198
*	Micro Data Supplies	73, 74, 75
463	Micro Design	169
313	Micro Equipment Corp.	218
96	Micro Management Systems	233
526	Micro Software Systems	49
434	Micro-Ed	167
157	Micro-Images	85
464	Micro-Labs	231
293	Microcomputer Applications	234
573	Microcomputer Applications	254
47	Microcomputer Business Systems	145
419	Microhatch	211
84	Micromatic Programming Corp.	133
123	MicroSmith Computer Tech	153
380	MicroTech Exports Inc.	171
563	MicroTechnics	253
*	Midwest Computer Wholesaler	250
137	Miller Micro	251
107	Misosys	100, 124
411	Montezuma Micro	19
416	Montezuma Micro	63
*	Mumford Micro Systems	225
533	NEBS Computer Forms	125
255	New Classics Software	159, 257
232	Nocona Electronics	147
54	Nodvill Software	171
554	Olympus-80 Computer Systems	248
36	Omnisoft Research	117
195	Omnitek Computers International	254
201	Optimal Technology Inc.	237
151	Orion Instruments	249
108	Orion Systems	257

Reader Service Number		Page
207	Pacific Exchanges	153, 218, 251
122	Pan American Electronics	171
20	Pasadena Technology Press	57
324	Pel/Tek	58
124	Perry Computers	199
176	Personal Computer Products	204
160	Pioneer Software	95
569	PocketInfo Corporation	258
306	Powersoft	211, 231
260	Pro/Am Software	100
59	The Producer	89, 90, 91, 92
449	Prof. Jones/Frogg House	209
248	Programmer & Associates Inc.	231
98	Prosoft	9
91	Prosoft	244
1	Prosoft	69
2	Prosoft	70
8	Prosoft	72
13	Prosoft	71
51	Prosoft	257
194	Quant Systems	249
78	R & S Software	223
558	R.K.S. Industries	242
75	Radio Shack	Gatefold
296	Rainbow, The	245
247	Rapidynamics	226
129	Remsoft	171
518	Rizzo Data Systems	251
452	Robert E. Litke	226
343	Rogo Computer Products	158
*	RUN Subscription	98
368	Safeware	158
277	Saturn Electronics	80
203	Scientific Engineering Labs	257
556	Sherman Electronics	244
12	Simutek	241
163	Simutek	181, 182, 183
245	Small Computer Co.	21
561	Smith Corona	240
492	Softrends	60
116	Softronics Computer Systems	47
57	Softshell	242
564	Software Factory	253
*	Software Support	122, 123
276	Solutions Inc.	228
182	Something Special Sales	234
92	Spiral Enterprises	166
71	Sublogic Communications	193
285	Sun Research Inc.	252
456	Sunlock Systems	100
230	Synergetic Solutions	255
189	Tab Sales	237
59	Texas Computer Systems	52, 133
72	Three State Data	257
81	Total Access	165
430	Transaction Storage Systems	CII
188	Triangle Software	119
227	Trisoft	173
*	University Microfilms	218
*	Vespa Computer Outlet	219
270	Video Games International	203
335	Virginia Micro Systems	218
10	VR Data Corp.	156
305	Wadsworth Electronic Publishing	161
*	Walonick Associates	187
*	Wayne Green Books	
66	Data Files	194
67	Low Cost Costing	195
68	Prog. Eng. Hob	163
80	Rest of 80	221
93	TRS-80 Controller	256
95	Z80 ALL	162
37	Wiley Inc.	243
226	William A. Fink	153
571	Windcrest Software Inc.	258
79	Wooden Hen	251
158	XYZT Computer Dimensions Inc.	217
156	York 10	258

For further information from our advertisers, please use the Reader Service card.

***This advertiser prefers to be contacted directly.**

Continued from p. 224

up at least one stock history file. For this reason, the manual should advise you against using phone lines with the call waiting.

Tele-Stock is unlikely to require much user support. It's easy to use, and probably won't require updates, since it uses only public ROM calls. Like all other stock analysis programs, it requires rewriting if Dow Jones changes its protocols or output formats.

In any event, a phone number appears on the manual and Telesoft answered when I called, so it appears that they intend to provide customer support.

Criticism

Telesoft should display a version number as part of the opening screen, and any patches applied should increment it. When the manufacturer is trying to help a user over the phone, this is helpful information.

Tele-Stock works with both a direct-connect modem cable and an acoustic coupler. When you use the acoustic coupler, you can't use the automatic dialing feature. Telesoft could easily enhance Tele-Stock to determine if the DIR/ACP switch is in the ACP position by checking bit 5 of input port 179.

Then, if you select automatic updating (which requires automatic dialing), it could display a message indicating that the function is available only with the direct-connect cable. Similarly, if you select manual updating, the program would not ask whether you want automatic dialing.

The Dow Jones service expects callers to be in the originate mode. Thus, whenever you select Dow Jones updating, the program should check the position of the ANS/ORIG switch, asking you to change it if it is in the wrong position. You can do this by checking bit 4 of input port 179.

Also, like all graphing routines, the Display function scales its vertical axis based on the range of values to be graphed. Tele-Stock maintains a record of the highest and lowest prices and highest trading volume to ensure that none of the plotted values goes off the graph.

When the program receives each new day's values, it discards the oldest values. Unfortunately, the program doesn't re-evaluate high and low values, so an extreme stock value of many months ago will needlessly compress the graph of recent data.

This is not as bad as it sounds. Many stocks don't vary greatly in value. For a stock that does, you can always delete the stock from memory and reenter it using the parameter-change function; this eliminates the old extreme high and low values. You can also use Text to enter the history file for that symbol and change the offending high or low value.

One minor annoyance is that Tele-Stock changes all the Basic function key labels. If you select Basic on return to the main menu, none of the function keys work. Even pressing the reset button does not restore them.

This Prescription Will save the life of your VISICALC !

— Don't Buy a New Machine to Run it On

— Don't Buy a New Spreadsheet Program

BUY VISICALC ENHANCERS from SOLUTIONS

Saves me many hours every time I run long reports
October 1983 Popular Computing

Sort does exactly what it promises
InfoWorld September 5, 1983

SYMPTOM: Desperate need to sort the rows or columns of a VisiCalc spreadsheet

Rx: SORT™ from SOLUTIONS

SYMPTOM: Bleary Eyes from trying to print a good looking report from VisiCalc

Rx: REPORT™ from SOLUTIONS

SORT

- Sort the rows or columns of your VisiCalc spreadsheet
- Formulas and values move with each row or column
- Sort alphabetically or numerically
- Sort in ascending or descending order
- Use up to four additional keys to break ties or specify secondary sorts

REPORT

- Print with variable width columns
- Segment large spreadsheets into multipage reports
- Repeat columns and rows and multipage reports
- Eliminate unwanted columns
- Align decimal points
- Center or justify labels and values
- Add titles and page numbers to your report
- Write reports to disk for later printing or transmission

Both are Available for TRS-80™ Models I/III/12/16, III, Apple™ II + IIE, III with Business Basic and for the IBM PC™ and compatibles.

Solutions, Inc.

13 State Street, Box 989, Montpelier, Vermont, 05602. Telephone (802) 229-0368

Send me a Free Brochure

PLEASE SEND ME THE FOLLOWING SOFTWARE

☐ SORT $89.00 ☐ REPORT $79.00

☐ Send me BOTH SORT and REPORT for $158.00 (SAVE $10)

ALSO AVAILABLE

☐ **Dow Jones Spread Sheet Link \| $249.00**

☐ **GL Bridge $195.00**

Include $4.00 for US shipping and handling

Computer Model

☐ Check or Money Order Enclosed

☐ Charge My Credit Card ☐ Visa ☐ MasterCard

Card no _____ Exp Date ___/___

Signature _____

Name _____

Address _____

City _____

State _____ Zip _____

VisiCalc® is a trademark of VisiCorp. TRS-80® is a trademark of Tandy Corp. IBM PC™ is a trademark of IBM Corp. Apple® is a trademark of Apple Computers, Inc. -276

Basic reloads its function keys by itself sooner or later, but I haven't figured out how.

During the updating routines, the program displays the message *Connect successful.* Since I sometimes receive this message when the connection is unsuccessful (for example, with the ORIG/ANS switch in the wrong position), a different message might be in order, such as *Connection proceeding* or *Carrier detected.*

At a few points, the program asks you to make a selection numbered 1, 2, 3, and so on. This is a little confusing since you're not sure whether to push a numerical key or a function key.

Telesoft could remedy this by using letters or by arranging for Basic to scan both the function keys and the numerical keys. However, each remedy would use up more of the limited Model 100 RAM.

I emphasize that these criticisms are all minor. Overall, Tele-Stock is a useful program. ■

Dostamer: Soothe The Savage DOS

by Mel Patrick

Dostamer is a neat little utility that lets you execute most DOS commands on your files with a single keystroke. It's menu-driven, the menus are easy to create or modify, and the time you save in typing in extensive command parameters makes this program worthwhile.

Dostamer works by establishing a set of programmable buffers to which you assign DOS commands. By executing a call to those buffers while working on a file, you invoke a command.

Formatting and Running Dostamer

The Dostamer disk contains six programs: the Dostamer driver program, two example menu files, a program that customizes the main program and modifies menu files, a program that tells you the size of machine-language files, and a program that lists your files and their lengths.

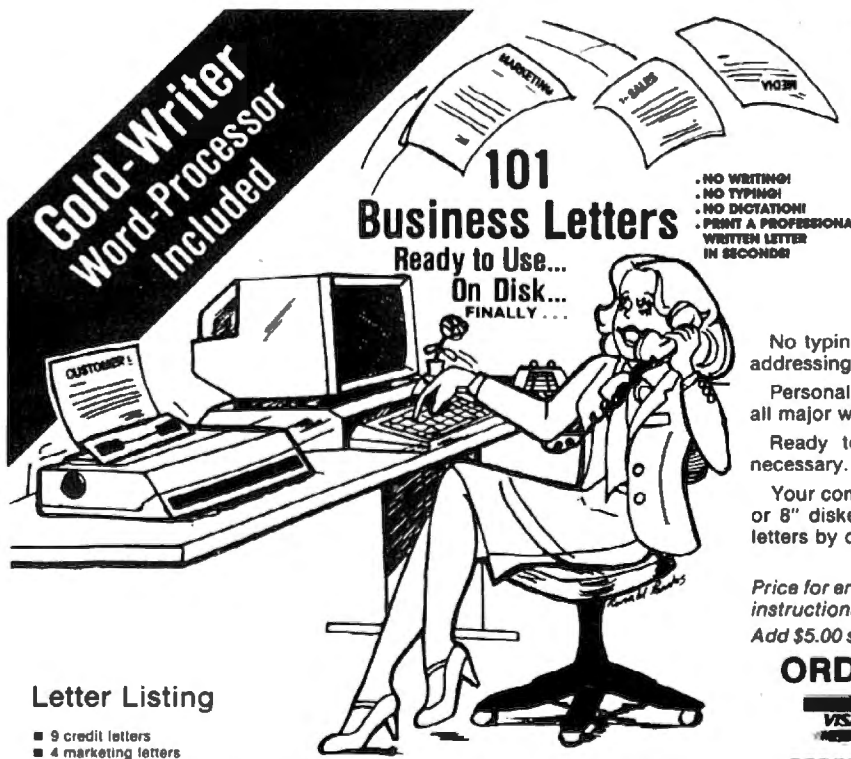
The menu in Fig. 1 is an example of Dostamer's first screen with all the available options. From the main menu, you press the clear key to access

Dostamer

★★★½

CDC
13715 Vanowen St.
Van Nuys, CA 91405
Models I, III, and 4
$39.95

Easy to use?	★★★★☆
Good docs?	★★★★☆
Bug free?	★★★★☆
Does the job?	★★★☆☆



Letter Listing

- 9 credit letters
- 4 marketing letters
- 13 customer relations letters
- 8 employee letters
- 12 contracting products letters
- 6 follow up letters
- 9 sales letters
- 4 media letters
- 7 collection letters
- 2 sympathy letters
- 9 services letters
- 4 procurement letters
- 21 other business letters!

To order by mail, write to:

Data Base Industries

330 W. Felicita Avenue Suite D-6

Escondido, CA 92025

619-480-9616

✓ 63

FINALLY . . .

- Save time
- Keep Business correspondence up to date
- Improve company image
- Speed up collections
- Increase mailing response
- Respond promptly to all customer and prospect queries
- Promote new business
- Keep in touch with clients and vendors

No typing needs, because each letter is complete and ready for addressing.

Personal revisions are easy, because Gold Letters is accessible by all major word processing programs.

Ready to use in minutes, with no programming or typing necessary.

Your complete 101 Gold Letters software package includes a 5¼" or 8" diskette, a binder containing hard copy versions of all 101 letters by category, and instructions for using the Gold Letters.

Available in CP/M, MS/DOS and PCDOS.

Price for entire package: Diskette binder, 101 categorized letters and instructions. $159.00

Add $5.00 shipping & handling costs. CA residents add 6% sales tax.

ORDER *GOLD LETTERS* TODAY!

VISA

FOR IMMEDIATE DELIVERY CALL
800-922-5555

MasterCard

Visa and MasterCard accepted

Yes, send me _____ copies of Gold Letters for $159 each.
Enclosed is $ _____
Name _____
Company _____
Address _____
City/State/Zip _____
Telephone _____
Visa/MC # _____
Exp. _____

✓ See List of Advertisers on Page 227

the user menus. Figure 2 is an example of a typical user menu that was included with Dostamer.

Another set of commands is available at the user menu. The Table provides a complete list of the commands available. You can design each user menu with a total of 13 commands (A–M) and you can develop up to 10 user menus. Add this to Dostamer's main menu selections and you have an impressive library of 143 commands at your disposal. As an additional feature, you can annotate the commands with remarks.

Using Dostamer couldn't be easier. Executing most commands takes a single keystroke; more complex commands, like making a file's attribute either visible or invisible, require two keystrokes.

Dostamer superimposes a graphics block over the first file name on the menu. You move the indicator block around the screen with the arrow keys. The file name under the block is considered the active file and any commands you execute affect that file.

Enter	Executes the file and recognizes some file extensions
Break	Exits to NEWDOS80 Ready
Space	Pages the directory display if necessary
Shift/@	Kills the active file
0–3	Displays disk drive directories
C	Copies the active file to another drive
+/;	Changes a file's attribute to make it visible
=/–	Changes a file's attribute to make it invisible
S	Sets PDRIVE
Clear	Invokes optional user menus
I	Displays only invisible files
V	Displays only visible files
A	Displays all files except system files
L	Lists the active file to the video while normal arrow control keys remain active
P	Lists the active file to the printer
D	Returns to DOS for library command execution
*	Prints the directory
R	Allows renaming the active file
B	Executes Basic and resets high memory
F	Displays the free space on all disks

Table. Dostamer commands.

```
BASIC/CMD:Ø      BUILD/CMD:Ø      CBF/CMD:Ø        CAT/CMD:Ø
DDD/CMD:Ø        DT/CMD:Ø         DTCON/CMD:Ø      DISASSEM/CMD:Ø
DIRCHECK/CMD:Ø   EDTASM/CMD:Ø    LMOFFSET/CMD:Ø   NWD80V2/ILF:Ø
SUPLUS/CMD:Ø     SECTOR/CMD:Ø     SUPERZAP/CMD:Ø   XTRA1:Ø
XTRAØ:Ø
..................... Key <M> To Toggle Menu .....................
<ENTER> Execute  <C>opy (+Drive #)  <I>nv Files     <D>os Command
<BREAK> Exit     <+/;> Attrib Vis   <V>is Files    <*> Print Dir
<SPACE> Page     <=/-> Attrib Inv   <A>ll Files    <R>ename File
<SHIFT @> Kill   <S> Set Pdrive     <L>ist File    <B>asic
<1-3> Get Dir.   <CLEAR> User Key   <P>rnt File    <F>ree Space
```

Figure 1. Dostamer's first screen.

```
A:COPY 1 Ø..CBF,CFWO,FMT,DPDN=1,USR
B:COPY Ø 1,,CBF,CFWO,USR ..........Copy user Files from Ø to 1
C:COPY 1 Ø,,CBF,DPDN=1,FMT,USR .....Copy user files from 1 to Ø
D:COPY 1 Ø,,CBF,CFWO,NFM,/SYS .........Copy system files 1 to Ø
E:COPY Ø 1,,CBF,CFWO,NFMT,UPD ..........Copy updated files only
F:COPY 1 1,,CBF,CFWO,NFMT,USR
G:COPY 1 O,,CBF,CFWO,USR,NFMT
H:FORMAT,1,YOURNAME,,,N
I:FORMAT,1,,,,Y
J:FORMAT,1,,,,N
K:
L:PROT,Ø,RUF .....................Clear update flags on drive Ø
M:PROT,1,RUF .....................Clear update flags on drive 1
... XTRA1 .. <A-M> USER KEYS .. <Ø-9> LOAD XTRA .. <X> ABORT ...

Active File ==> BASIC/CMD:Ø     <==<ENTER> to Execute & Return
```

Figure 2. A typical user menu.

Impressions

To date, I have yet to find an omission or oversight in Dostamer, let alone a bug. The error-trapping covers every contingency and, unless you overwrite the main program, control always returns to Dostamer.

I used Dostamer formatted for NEWDOS80; CDC plans Dostamer versions for DOSPLUS, MULTI-DOS, and LDOS. In addition, they have a new Model 4 Dostamer with enhanced features that include reverse video and function keys.

CDC obviously designed Dostamer with simplicity in mind, and in that they're successful: Dostamer is easy to program and easy to use. ■

Copy Protection From FPS-3

by William R. Gouge

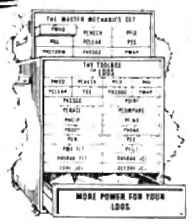
The FPS-3 (front panel simulator for the Model III) claims to back up any protected software by using a hardware interface. I found this product easy to install and well worth its price.

FPS-3 consists of a printed circuit board that you install in your Model III, two miniature toggle switches, and a disk-based monitor program. The circuit board contains a 2K RAM chip that stores the utility monitor once you load it from disk. This board measures 3 inches by 2½ inches and has a 1½- by ¾-inch notch at one end.

Installation

The FPS-3 arrived by parcel post about a week after I sent a money order for its purchase. After reading the installation instructions, I got my screwdriver and started my stop watch.

You install the FPS-3 board by first removing the Model III case and the metal shield covering the main computer board. You then remove



WANTED

TRSDOS 6.X™ or LDOS™ Users

Our ToolBox for LDOS™ was rated FOUR STARS in the Oct '83 80-MICRO as a package to "perfect the use of LDOS". We now have it for the Mod 4 as well! These new disk utilities are intended for TRSDOS 6.x or LDOS 5.1.3/4 only! Unlike SU+, these will work on any combination of single/double sided drives and hard drives! They will work with Mod 4, Mod I or III, single or double density, ALL media formats, including 8 in. drives on a MAX-80. Also works with the Radio Shack, or any hard drive configured for use with LDOS or TRSDOS 6.x.

Utilities include disk repair, disk check, extensive zapper for disk, memory, or files, verifiers, comparers, filters, mapping, password manipulation, password removing, mass file moving, mass file killing, erasing, exercising, search/replace, etc. Each utility also contains a built-in "HELP" command, in case you get lost. All utilities are machine language, contain excellent documentation, and disk is unprotected.

MODEL 4 ToolBelt™ (for TRSDOS 6.x only) 16 utilities with 4 files	**$49.95**
The ToolBox for LDOS™ (MOD I/III) 18 utilities, with 5 files	**$69.95**
MASTER MECHANIC SET for LDOS™ (Mod I/III) 9 utilities from the ToolBox	**$39.95**
LDOS w/Master Mechanic Set Combo	**$149.00**

POWERSOFT ✓306

PRODUCTS FROM BREEZE/QSD, INC
11500 Stemmons Fwy., Suite 125
Dallas, Texas 75229
(214) 484-2976

US/Canada Please add $2.50 Shipping/Handling-Foreign $10. The above programs cannot be explained in this ad space. Please write for complete catalog with full details.

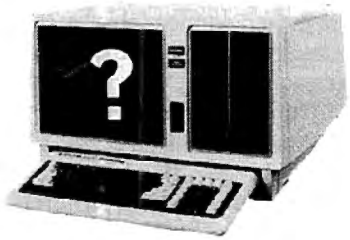
XENIX
MULTI-USER SOFTWARE

WE HAVE THE ANSWER!
MODEL 16 TRS-80 ACCOUNTING

ALSO AVAILABLE AS SINGLE-USER FOR THE MODEL II & 12

NEED SOMETHING SPECIAL?

CALL US!



BUSINESS ANSWERS FOR SERIOUS BUSINESS.
THE PROGRAMMER & ASSOCIATES
YOUR COMPUTER PROFESSIONALS!

- ACCOUNTS RECEIVABLE
- GENERAL LEDGER
- INVENTORY/INVOICING
- ACCOUNTS PAYABLE
- PAYROLL
- JOB COSTING

$595 EACH
(MODIFICATIONS ARE AVAILABLE)

SOON TO BE RELEASED: MANUFACTURING INVENTORY

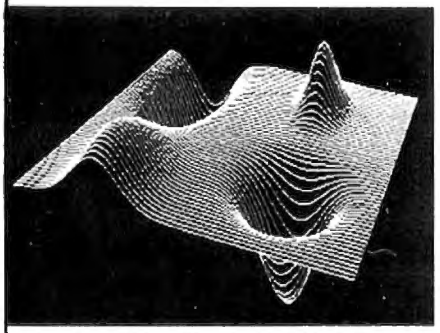
THE PROGRAMMER & ASSOCIATES, INC.
10802 FOREST LANE SUITE 110
DALLAS, TEXAS 75243
1-214-341-9874

✓248

Surface Plot

Now For Mod III and 4

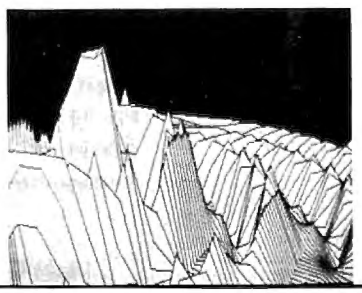
The Grafyx Solution™ with Depth

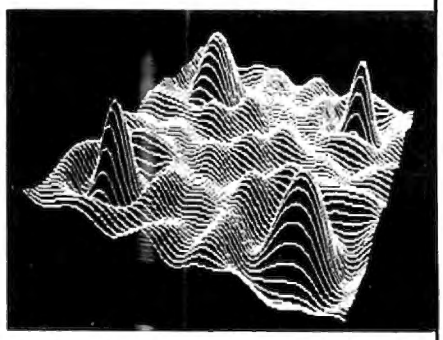


Outstanding Grafyx. SURFACE PLOT lets you broaden your imagination by creating amazing three-dimensional views with Grafyx Solution. Micro-Labs' Grafyx Solution is a plug-in, clip-on board which gives you 98,304 points in a 512 × 192 matrix. That's sixteen times as many points as a standard Model IIII Another unique feature is the ability to display the hi-res screen along with the normal text and low-res screen.

Flexible Grafyx. SURFACE PLOT allows you to enter an equation of the form Z=F(X,Y) where Z is the height above the surface for a given X, Y coordinate. For example, entering the equation $Z=10-X^2$ draws a hill. The final picture can be viewed from any position in space so you can see an image from underneath, above, or even inside a hill or valley on the plot surface. You can also specify the size of the resulting image.

Complete Grafyx. The program automatically removes hidden lines for





best results. The documentation contains complete instructions and sample equations so that you will have your computer hard at work without delay. The finished plot can be saved on disk or printed on any of 20 popular printers.

The Grafyx Solution package is shipped from stock and includes the board, 44 programs including an 80-Column display driver and Extended Graphics Basic, and a 54 page manual all for $299.95. The SURFACE PLOT program, twelve hi-res pictures, and manual is $39.95. Shipping is FREE on pre-paid or COD orders. (Tx. residents add 5% sales tax.)

✓464 MICRO-LABS, INC. 214-235-0915
902 Pinecrest, Richardson, Texas 75080

✓ See List of Advertisers on Page 227

one of the ROM chips from the processor board and install it in the FPS-3 board.

Plug the FPS-3 board into the now empty ROM socket on the Model III processor board. Then you make three other connections to the main computer board via color-coded wires with spring type clips. Installation requires no soldering.

The instruction sheet says to test the normal operation of the computer and reinstall the case if everything checks out. The operational check was fine, but I had trouble trying to put the radio frequency shield back on the main computer board. The ROM chip installed in the FPS-3 board was too high to clear the shield and allow a proper fit.

Since I use the computer with my ham radio equipment, I wanted to reinstall the shield if possible. I used some metal shears to cut the corner of the shield until the ROM chip cleared. Even with this shield modification, the computer was back together in less than half an hour.

You can drill holes in the computer case to accommodate the two toggle switches, or route the cable through the hole on the bottom of the computer that you normally use for the RS-232 board. Since I don't have the RS-232 installed, I chose the latter method.

Of the two switches connected to the FPS-3, the larger is the ROM/RAM switch and the smaller is the non-maskable interrupt (NMI) switch. One side of each switch is painted red for identification purposes. For normal Model III operation, both switch handles point away from the red side.

FPS-3 Hardware Copy System

★★★★

J.E.S. Graphics
P.O. Box 2752
Tulsa, OK 74101
Model III, 48K
One disk drive
$50

Easy to use?	★★★★☆
Good docs?	★★★★☆
Well-made?	★★★★½
Does the job?	★★★★★

Back-up Procedures

To make a back-up, first insert the FPS-3 disk in drive zero and hit the reset button. Select option D from the menu to load the disk version of the FPS-3 monitor.

Flip the ROM/RAM switch to the red position when the screen fills with exclamation marks. When the screen goes blank, type in GC400, and flip the ROM/RAM switch back to normal position. The menu will reappear. Now remove the FPS-3 disk from drive zero.

Insert a disk in drive zero that you've previously formatted with TRSDOS. Select option B from the menu to write a special boot routine to the disk. This will eventually contain the new copy of your program. Remove the formatted disk from the drive.

Next, insert the protected software to be copied in drive zero and hit the reset button. After you load the software, remove the disk.

Once again, put the formatted disk in drive zero. Flip the NMI switch to the red position, then flip the ROM/RAM switch to red. The screen will clear, then display all register contents.

Now, you press the enter key. When the screen clears, press the D key. This dumps the ROM and RAM contents to disk. All this takes fewer than 25 seconds.

Finally, return both switches to their normal positions. You can now hit the reset button to boot the new back-up copy of your once-protected software.

Comments

The disk you've just created will not contain a conventional directory,

MagiCheck can be used for your Personal or Business Checking Account.

It handles up to 8 separate checking accounts and can produce Profit & Loss Statements for up to 199 ledger categories.

MAGICHECK'S OTHER FEATURES INCLUDE:

- Pay-by-Phone Accounting
- Check Writing Capabilities
- Checks can be Divided into Different Ledger Accounts
- A Listing of your Personal Tax Deductable Payments
- Extensive Error Correcting Capabilities
- Automatic Calculation of First Year Depreciation
- Automatic Calculation of your Investment Credit
- Divide Deposits into different Sources to Aid Planning

MAGICHECK

Is The Reason You Bought A Computer !

The cost of the MagiCheck Program is only $30.00. Plus $3.00 for shipping & handling charges. PA residents add $1.98 for sales tax. Call Today 800-Magic 99. In PA call 1-215-473-6599. Or send your check to: MagiComp, 2710 W. Country Club Rd., Philadelphia, PA 19131. Please Specify: Mod1, Mod 3/4; LDOS DOSPLUS, or other operating system. (180K Disk Storage Required) MC & VISA accepted.

527

Free Bulletin Board
215/473-2360 9 PM—1 PM EST.
Leave Orders, Questions or Share Your Suggestions.

It's Simple. . . **CALL AND SAVE MONEY**

1-800-841-0860

CONVENIENT ORDER ENTRY
GA. INFO. 912-377-7120

"Direct Marketing Works For You"

EPSON PRINTERS
RX-80 RX-80 F/T
FX-80 FX-100
$CALL

OKIDATA PRINTERS
FROM **$CALL**
MICROLINE SERIES
•83A
•84P •92P •93P
PACEMARK 2350P

star MICRONICS, INC
GEMINI
10X 15
DELTA - 10
$CALL

TRS-80 COMPUTERS
• PURE RADIO SHACK EQUIPMENT •

UP TO **20%** AND MORE
DISCOUNT
CALL FOR PRICES
ON COMPLETE LINE

TRS-80 PRINTERS
COMPLETE LINE FROM **$CALL**

SCM SMITH CORONA
TP-II DAISY WHEEL PRINTER
FROM **$CALL**

JUKI
$CALL
MANNESMANN TALLY
$CALL

C. Itoh
$CALL
Transtar
$CALL

IBM COMPATIBLES
TRS-80 COMPUTERS
MODEL 2000
EAGLE
COLUMBIA DATA PRODUCTS, INC.
AND OTHERS
$CALL

TRS-80
COMPUTERS
MODEL 4P
TRANSPORTABLE
COLOR 2
$CALL

CALL FOR NEW PRODUCTS AND BEST PRICES

NOTICE
ALL PRODUCTS WE SELL ARE BRAND NEW AND COVERED BY THE MANUFACTURER'S SPECIFIC WARRANTIES. COPIES AVAILABLE UPON REQUEST.
WE DO NOT SELL ANY USED, RECONDITIONED, FOREIGN OR INFERIOR MODIFIED EQUIPMENT.
PRICES AND PRODUCTS SUBJECT TO CHANGE WITHOUT NOTICE.

CABLES
PAPER
$CALL

Verbatim
DISKETTES
QUANTITY DISCOUNTS
$CALL

FREE
UPON REQUEST
•DISCOUNT PRICE LIST & INFORMATION KIT
WRITE
MICRO MANAGEMENT SYSTEMS
TELEMARKET DEPT. # 4

BOTEK
COLOR COMPUTER
SERIAL TO PARALLEL INTERFACE
$CALL

Since 1978

- PIONEER IN DIRECT TO CONSUMER SALES OF MICRO COMPUTERS AND ELECTRONICS
- NAME BRAND PRODUCTS
- LARGE INVENTORIES
- NEXT DAY SHIPMENT ON MOST PRODUCTS

Micro Management Systems, Inc.
2803 Thomasville Road East
Cairo, Georgia 31728
(912) 377-7120

-96

DISCOUNT PRICES
BUY DIRECT
TELEMARKET DEPT. #4

See List of Advertisers on Page 227

so you can't copy it using conventional copy and back-up programs that are part of most DOSes. However, special disk copy utilities such as Trackcess and Super Utility Plus can make copies of the new disk.

You can make more than one copy of a program without going through the whole FPS-3 process from the beginning. You can have two or more formatted disks on hand for writing a special boot and jump back after you make one complete back-up instead of booting the first copy.

You can use this program to make tape copies of protected software distributed on disk. Most steps still apply except you need to select T as your option instead of D. A screen prompt requests your selection of tape baud before the program starts the dump. It takes about 13 minutes to make a 500-baud copy of a program.

The FPS-3 program also contains a monitor utility that might be of interest to machine-language programmers.

This software/hardware combination from J.E.S. Graphics fills a gap left by software copy programs. The hardware installation and operating instructions are clear and easy to follow.

The combination performs exactly as the advertisements claim and the $50 selling price makes FPS-3 a good value. I recommend this product to anyone who owns protected software and wants the security of making back-up copies for his own use. ■

Stock Tracker

★ ★ ★ ★

H & H Trading Co.
P.O. Box 549
Clayton, CA 94517
Models I and III
$295

Easy to use?	★★★☆☆
Good docs?	★★★★★
Bug free?	★★★★★
Does the job?	★★★★★

Stock Tracker: Take a Risk

by Amee Eisenberg
***80 Micro* staff**

Some people consider investing in the stock market just a step above playing the tables in Las Vegas, and in one sense they're right: The stock market can be a gamble. But with some sage advice and a little luck, you might hit the jackpot.

H & H Trading Co. has come out with a product designed to give you at least a fighting chance: Stock Tracker, a software package that gives you stock buying and selling tips based on a technical analysis of stock market trends.

Unlike the conventional analysis most people make when following inside stock information, technical analysis claims to remove chance and emotion from stock evaluation and replace them with profits.

Any investment program is only as good as the theory on which it is predicated. Stock Tracker is based on Joseph E. Granville's On-Balance Volume theory. You remember Granville—he's the Wall Street analyst whose opinion is so highly regarded that when, in July 1983, the *Granville Market Letter* suggested that investors sell all their stocks, the market went into a decline so sharp that it's come to be called the Granville Crash. Could 200,000 investors be wrong?

David K. Howard, an investment adviser registered with the Securities and Exchange Commission, has modified Granville's equations into a volume force technical analysis for individual securities. Stock Tracker is the computerized version of Howard's volume force system.

The volume force theory "holds that (a stock's) volume patterns pre-

UPGRADE? BUY? AN OLD COMPUTER?

RIDICULOUS!

CPM! AND DOS! 128K ROM/RAM 80 COLUMN BOARD! COLOR!
THE LNW "INCREDIBLE!" - HAS IT ALL!!
$1,190!
BRAND NEW!!
ONE YEAR GUAR!!
CALL DICK (212) 232-3500 (OPEN LATE)
SOMETHING SPECIAL SALES CO.
6903-E NEW UTRECHT AVE. BROOKLYN, N.Y. 11228
THIS ONE RIVALS THE BIG BOYS!! ↙ 182
ALL THESE "UPGRADES" WOULD COST MORE THAN A BRAND NEW LNW COMPUTER!

RELAX. LET SUPER-P/R DO YOUR PAYROLL!
Power and flexibility for all your payroll needs . . . from 5 employees to an accounting firm with 40 payrolls. ↙ 293

MACHINE LANGUAGE SORTS • MULTIPLE TAX WITHHOLDING • DEPARTMENTAL PAYROLL JOURNALS • 14 USER DEFINED EARNINGS/DEDUCTION CATEGORIES WITH EMPLOYEE BASE RATES • REPORT GENERATOR FOR W-2's, 941a's AND NON STANDARD REPORTS • PAY DEDUCTED FROM CHECK OPTION FOR TIPS AND MEALS • LARGE EMPLOYEE CAPACITY • MULTIPLE PAYROLLS ON SAME DISK • HARD DISK COMPATIBLE • WORKS WITH ALL DOSES ON MODELS I, III, OR 4 • 160 PAGE COMPREHENSIVE USER'S MANUAL

Complete System $225
Demo System With Manual $45*
Manual Only $25*
Add $2.50 For S & H
CHECKS VISA MC UPS COD
*Full Credit Allowed When Purchase Complete System

USERS SAY SUPER-P/R IS SIMPLY THE BEST! If you don't agree after trying SUPER-P/R for 60 days, return the Complete System for a full refund. Write or call for FREE brochure or additional details.

MICROCOMPUTER APPLICATIONS
3485 MOCK ORANGE CT. S.
SALEM, OR 97302 • (503) 364-1090

Now - Add External Monitors To Your Model III

Plugging in VIDEO MOD lets you plug in your extra Monitor for Big Screen Viewing and Remote Display. Great addition for displaying Home Games, Classroom Instructions, and presenting information at Meetings. Provides full 64 character wide screen display. Works with any program or operating system.

VIDEO MOD only $169.95

---- *Spring Sale Special* ----

20 MHZ Monitor 80 x 25 display *Reg* $199 *Now* $139

Dynax 2 color Daisywheel Printer *Reg* $599 *Now* $469

Optional keyboard and tractors available.

EJB ELECTRONIC SYSTEMS ↙114
2902 Eggert Road
Tonawanda, N.Y. 14150
(716) 837-9411

Mfg. of Specialized Computer Products

Shipping & handling extra
NY residents add 7% sales tax

ATTENTION

FOREIGN COMPUTER STORES/MAGAZINE DEALERS

You have a large technical audience that speaks English and is in need of the kind of microcomputer information the Wayne Green Publications group provides.

Provide your audience with the magazines they need and make money at the same time. For details on selling **Microcomputing, 80 Micro, inCider, HOT CoCo, RUN, jr, and Wayne Green Books contact:**

SANDRA JOSEPH WORLD WIDE MEDIA
386 PARK AVE. SOUTH NEW YORK, N.Y. 10016
PHONE-(212) 686-1520 TELEX-620430

ANNOUNCING: CLEANER 80

The System That Makes Your Cleaning Kit Worth 15 Times The Price You Paid For It.

Cleaner 80 is a software program designed to give you your money's worth — and more — when it comes to cleaning the disk drive head of your TRS-80 computer.

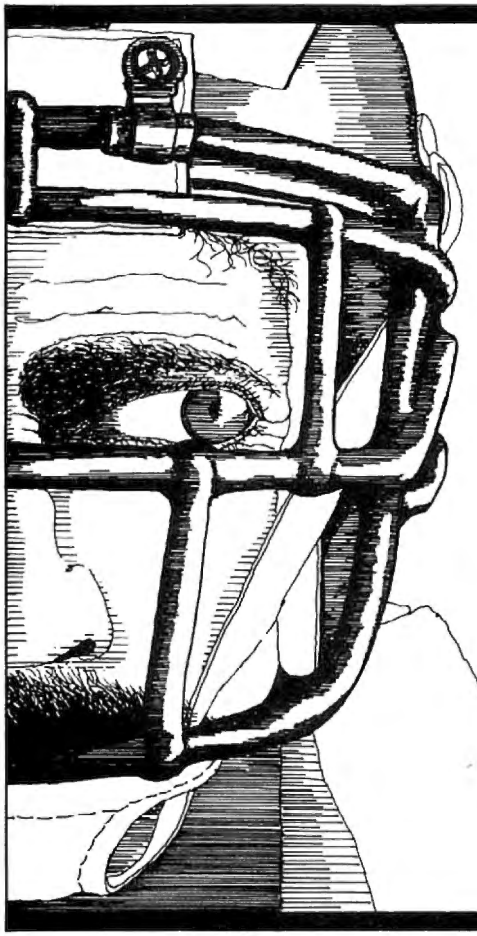
With this system, you can get up to 400 cleanings out of each disk drive head cleaning kit — instead of the 26 cleanings specified by the manufacturer. That's 15 times the number of cleanings you would normally be able to achieve.

Order yours today. Please specify whether you need the TRS-80 Model I or TRS-80 Model III version.

$29.95 Cleaner 80
Disk Drive Head Cleaning System

To order write:
Cleaner 80, ↙128
Disk Drive Head Cleaning System
Macro-Systems Software
P.O. Box 1734
Wichita, Kansas 67201-1734

© Copyright 1983, by J. Russell Jones.



PIK'EM 84

A COMPLETE PRO FOOTBALL PREDICTION PROGRAM FOR THE 1984 USFL FOOTBALL SEASON.

64% **ACCURATE!** Aganist pointspread USFL1983 season.
• Last 15 weeks of the season.•

A 20 minute data input per week will give you the edge. Statistics needed to run this program are available in local newspapers or Marathon will furnish all necessary stats in an easy to read one page format for each week at a small cost of $35.00 for the season.

FEATURES:
- Displays predicted scores.
- Displays schedules, records and results.
- Displays accumulated and average stats/team.
- Hardcopy — All screen displays.
- Auto store data.
- Updateable for 1985.

$39.95 Includes Disc and Documentation.

- For-TRS-80 Model I, III, IV, IBM PC, Apple, II+, IIe, and III.
- Phone orders call (214) 586-8212
- Lines open 24 hours a day.
- VISA, MC, COD

OTHER PROGRAMS:
- PIK'EM 1984 FOR NFL
- Master Budget (Home budget planner)

Total Support From:

MARATHON SOFTWARE Dept. M
P.O. Box 1349 Jacksonville, Texas 75766
(214) 586-8212

↙241

↙ See List of Advertisers on Page 227

cede price patterns." This is in keeping with that bedrock of economic theory, the law of supply and demand. The system determines trends in stock prices based on the amount of shares traded as well as the stock's closing price.

Sustained buying (accumulation) and sustained selling (distribution) affect the price of a stock. Charting a stock's accumulation or distribution can predict when a stock price will change significantly (break out) and whether it will increase or decrease in value.

This theory doesn't take into account insiders' tips or economic events. In short, it circumvents all question of *why* a stock moves in favor of predicting *when* it will move. While other investors buy or sell according to the latest news releases, volume force disciples acknowledge only the power of the market itself.

The Package

Stock Tracker's software is a series of Basic programs that you call from a menu displayed by the software's main program. The program analyzes your data and presents the results in eight different reports and three different graphs. You can view these reports and graphs on your video screen or print them on paper. The graphics are limited only by the infamous TRS-80 character set, not by the program.

The most exciting report Stock Tracker offers is the current action trading signals. This is the one that tells you when to buy or sell. Additionally, the program can write reports summarizing the entire history of your portfolio or of one specific stock.

Last Day reports review the most recent actions you've taken. Decision tables contain the overall data the computer uses to generate trading signals for each security. In short, the program gives you the information in almost any form you'd want.

The manual explains interpretation of these reports. H & H Trading Co. also publishes a periodic newsletter (*Market Tracker*) that helps clarify Howard's volume force theory. The price of a subscription is not included in Stock Tracker's purchase.

The most up-to-date version of this program includes an enhancement package (an additional $195) that lets Stock Tracker interact directly with the Dow Jones News/Retrieval Service. Options are available for receiving the daily quotations with the machine attended or unattended.

To use these features, you need a modem (one with auto-dial if you want the computer to operate unattended) and a Dow Jones account.

Documentation and Error Handling

Stock Tracker comes in a brown loose-leaf folder that includes the program's disks and a 70-odd-page manual. The manual is a masterpiece of clear and precise instructions. It assumes you have no previous experience with computers. To this end, careful directions tell you where to find the computer's On button, how to back up a disk, and which buttons to press when.

All this requires a lot of words and a lot of reading. The authors, while apologetic for the amount of work the investor must do, are uncompromising in regard to its necessity. "Before you do anything else," they begin, "READ THIS MANUAL." That's good advice.

H & H Trading Co. suggests that you run the program from TRSDOS, but it worked fine with my DOSPLUS 3.5. The package has the drawbacks of any complex Basic data-handling program; its disk input/output (I/O) is slow and it spends a lot of time loading information from and writing information to disk.

On the plus side, this program's self-documentation is excellent. At all times, the video display tells you what to do next and how to input information.

The program's error-handling is superb too. If you make a mistake, the program either doesn't accept the data or sends you back to the previous menu. And in case of a program crash, the on-screen message tells you where the program terminated and how to find out what your DOS's cryptic error message really means.

Crashing this program is tough to do. I spent a lot of time making every mistake I could think of. Did the program want a formatted data disk? I fed it a blank disk. Did it call for numerical input? I typed in letters. Through it all, the Stock Tracker software responded with careful corrections and never damaged my data. This is good programming.

Summary

Despite the growing number of market analysts advising investors to use home computers to evaluate their portfolios, few stock analysis programs are available for the TRS-80. This one is excellent, if expensive, software packaged in an attractive format.

Because it is a precision tool, Stock Tracker demands that the investor spend some time learning to operate it. However, I don't believe it could be any simpler to use. I heartily recommend the software.

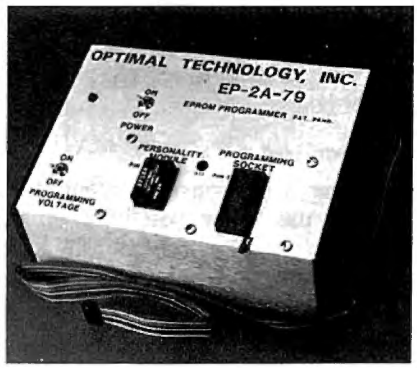
ATTENTION

FOREIGN COMPUTER STORES MAGAZINE DEALERS

You have a large technical audience that speaks English and is in need of the kind of microcomputer information the Wayne Green Publications group provides.

Provide your audience with the magazines they need and make money at the same time. For details on selling *Microcomputing, 80 Micro, inCider, HOT CoCo, RUN, jr,* and *Wayne Green Books* contact:

SANDRA JOSEPH
WORLD WIDE MEDIA
386 PARK AVE. SOUTH
NEW YORK, N.Y. 10016
PHONE—(212) 686-1520
TELEX—620430



EPROM PROGRAMMER

Model EP-2A-79 with software for the Atari, TRS-80 (1&3), Pet, Apple, AIM-65, SYM-1, VIC-20, C-64 Ohio Scientific, H-8, H-89, SS-50, and S-100. Programs 2708, 2716, TMS2716, 2732, 2732A, 2532, 2764, 2564, 27128, and MCM68764 EPROMS; 2816 EEPROM; 8751, 38E70 MPU. Price $169 with personality modules $17 to $35, Software $19 to $40.

Optimal Technology
Earlysville, Va. 22936
804-973-5482
↙201

LETTER-WRITER™
'WORKS' for YOU ↙383

NEW DISK VERSION

ARE YOU BUYING THE "BEST" SOFTWARE?

- Can it be used without training?
- Is it well rated by a test lab?
- Can you return it for a refund?

YOU can use your L-W without "any" training, as noted in the Allenbach SOFTWARE REPORTS tests which rate the machine code L-W with "A"s for:

FEATURES, DOCUMENTATION, EASY USE

YOU can create form letters & labels even ADD / SUB bookkeeping columns.

The L-W is REPLACING old CODE-MODE cotrolled word processors with a new NO-CODE typing and editing system.

YOU GET "EXTRA" FEATURES with a L-W: *Legal Paper Line Numbers *Display is same as Printout *All MODEL I users can see and print upper / lower case. DISK FEATURES: *Graphics* Mass Mailer *Insertion Phrases *Special Printing.

MODELS I, III/IV. We pay tax/USA postage.

TAPE $23.99 (Basic features, 16K min)
DISK $37.99 (More features, 32K min)

TRY your L-W for (3) MONTHS. If not satisfied return it. We make refunds, less $3.50 for our shipping costs.

ASTRO-STAR ENTERPRISES
5905 Stone Hill Dr.
Rocklin, CA 95677 (916) 624-3709

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, TABCO Printer Switches

HAB SALES CO.

704 W Michigan Ave; P.O. Box 8098
Pensacola, FLA 32505

↙189

*TRS-80 is a trademark of Tandy Corporation.

↙ See List of Advertisers on Page 227

Ultimately, before you decide to use Stock Tracker to handle your portfolio, you'll want to study the theory behind its analysis very carefully. On paper, I made a profit; Stock Tracker might do the same for you. ■

Find Your Career Direction

by Christine Adamec

Career Directions is an impressive self-assessment program that pinpoints possible career opportunities based on an analysis of your goals, your work preferences, and your resources. The program bases its recommendation on a data base of 460 possible careers, ranging from 4-H Club agent to zoologist. Then it helps you devise a plan to get there.

While this program is aimed at high school students, I'd recommend it for college students or anyone entering or reentering the job market. You might also want to use it to reassess your own career goals.

Program Use

Career Directions is exceptionally easy to use. After you boot up the disk, the program automatically loads itself. From that point on, prompts lead you through the necessary responses.

The program is divided into four major areas of inquiry: career assessment, career analysis, career exploration, and career planning.

Career assessment consists of a series of eight easy exercises. The first breaks careers down into classes that include scientific, artistic, humanitarian, leadership, and so on. The program delineates your choices by asking you questions that pinpoint a field that might be right for you.

For example, the program defines artistic as "creative expression of feelings and ideas." Types of artistic work include writing short stories or articles, announcing radio and television programs, playing a musical instrument, acting or dancing, and creating or critiquing art works. The program then asks you if you would like to do this type of work and you respond yes or no.

Career Directions

★ ★ ★ ★ ★

Jefferson Software
723 Kanawha Blvd. E.
Charleston, WV 25301
Models III and 4
48K, one disk drive
$89

Easy to use?	★★★★★
Good docs?	★★★★★
Bug free?	★★★★★
Does the job?	★★★★★

REVIEW DIGEST

Supertax III, Rockware Data Corp., P.O. Box 401710, Dallas, TX 75240, Models I, III, and 4, $59.95.

"...You have to know what you are doing when using these programs; all sorts of ridiculous input are allowed. Supertax blithely absorbed one-digit social security numbers, negative numbers of dependents, and IRA contributions far beyond those allowed by law. Even though most users will know better, having error traps built-in can be a convenience.

"...The Supertax programs do what they claim, and accurately. All are handy to have....Those who do only their own taxes, but who want to track their tax progress throughout the year, might find this program useful." *Computer User*, January, p. 23.

TRS-80 Model 16B, Tandy/Radio Shack, One Tandy Center, Fort Worth, TX 76102, $4,999 (256K, one floppy-disk drive).

"The Radio Shack TRS-80 Model 16B computer is a good competitor in the race to computerize America's small businesses. Its drawbacks for an unsophisticated user relate to the traditional Unix user interface and the lack of any real help to a novice from the large stack of manuals shipped with the system. Its advantages include good initial software offerings and the support of a very large company with many dealers and service centers....the Model 16B appears to be a very good choice for people who need a small Unix development environment. Radio Shack has done a good job on the machine, and it deserves serious consideration." *BYTE*, January, p. 288.

Quickpro+Plus 2, ICR FutureSoft, 1718 Kingsley Ave., Box 1446, Orange Park, FL 32067, Models I, III, and 4, $149.

"...Quickpro+Plus 2 lets you write programs as though you were using a simple word processor, without having to know a single thing about Basic or any other language. It is menu-driven, for maximum user-friendliness.

"...Quickpro+Plus 2 isn't for everybody; it is not much use for games or such. But it is highly useful in many areas of business..., education..., and home and hobby uses...." *Creative Computing*, February, p. 256.

Micro-WYL, Overbeek Enterprises, P.O. Box 726, Elgin, IL 60120, Models I and III, CP/M, $29.95.

"Micro-WYL is a line-oriented text editor...that is an excellent tool for entering and editing computer programs.

"...While it may be slightly less easy to use than some of the screen-oriented text editors, it is powerful, fast, and responsive. It is a well thought-out product with a logical command structure, and is a very good buy at $29.95." *Computer User*, January, p. 75.

After you complete each exercise section, the program summarizes your responses and asks you if you're satisfied or would like to repeat the exercise. Thus you can readily correct a hasty answer.

The second exercise contrasts different types of work, such as working with people and operating machines. Then, according to your preferences, you choose either the first or second entry, or "C" if you don't like either choice. One drawback to the program is that it doesn't provide an option should you like both types of work. It seems that choosing one of the jobs rather than option C gives you a wider career choice at the end of the program.

Other exercises in this section ask you to select the subjects you enjoy(ed) in school and which kinds of work activity you prefer (e.g., creative, unusual work or repetitive tasks). You must also rate yourself on general learning ability and verbal and numerical skills.

Then the program asks how much weight you're willing to lift—up to 10 pounds or over 100? And do you want to work mostly inside or outside? Or no preference?

The last exercise in this series asks you how much time you're willing to invest in preparing for a career. Are you willing to go to a vocational school, a college, or graduate school?

During the career analysis portion of the program, it analyzes your responses and tells you for which occupations you're suited. You can print out the results or read them off the screen. This phase takes about five minutes.

The printout summarizes the information you've provided in the exercises and then prints out a list of potential jobs for you, from those requiring the most education to those requiring less than you specified. My printout gave me a total of 23 possibilities (see Fig. 3).

If you want to investigate any of these careers, go back to the main menu and select the career exploration option. Each career has a number code that you type in to learn what school subjects, work situations, and so on that career involves.

I explored city manager (number 169) and found this career falls under the leadership category. School subjects I'd need to take included language/English, social studies, mathematics, and office courses. I'd have to deal with people, perform duties that change frequently, and plan and direct entire activities. I'd also have to express proficiency in general learning, and verbal and numerical skills. The program predicted I'd have to spend over two years and up to four years on education.

RELATED OCCUPATIONS

All of the occupations listed below relate to your career interests. They are blocked in sections according to the amount of education and training required. A reference number (REF #) is also listed next to each occupation. You will need the REF # in the Career Exploration section to look up the specific characteristics of each occupation.

AMOUNT OF EDUCATION & TRAINING REQUIRED - SAME AS YOU SPECIFIED:

REF #	OCCUPATION	REF #	OCCUPATION
39	PSYCHOLOGIST, ENGINEERING	42	PSYCHOLOGIST, SOCIAL
43	PSYCHOMETRIST	464	CORPORATE EXECUTIVE

AMOUNT OF EDUCATION & TRAINING REQUIRED - SOMEWHAT LESS THAN YOU SPECIFIED:

REF #	OCCUPATION	REF #	OCCUPATION
52	HISTORIAN	53	SOCIOLOGIST
137	COLUMNIST/COMMENTATOR	138	NEWSCASTER
139	NEWSWRITER	140	REPORTER
142	SET DECORATOR	152	PURCHASING AGENT
154	PUBLIC RELATIONS REP.	155	MANAGER, PERSONNEL
166	LOAN OFFICER	168	MANAGER, HOTEL OR MOTEL
169	MANAGER, CITY	170	ADVERTISING REP.

AMOUNT OF EDUCATION & TRAINING REQUIRED - MUCH LESS THAN YOU SPECIFIED:

REF #	OCCUPATION	REF #	OCCUPATION
148	ANNOUNCER, BROADCASTING	149	DISC JOCKEY
156	EMPLOYMENT INTERVIEWER	222	CLAIM EXAMINER, BUSINESS
230	TRAVEL AGENT		

Figure 3. Printout of career possibilities.

The career planning section asks questions such as whether you want to go to college and for how long. If your career requires a college degree, you decide what's important to you in a college—cost, location, size, availability of financial aid, ROTC, coed dorms, and so forth.

If you want to start work right away, other exercises ask you who might give you references and where you should check for jobs (with suggestions such as newspaper ads and employment agencies). It even asks prospective job applicants questions like: Is it OK to bring a friend to an interview? Is it important to be on time? Should you discuss salary right away? The answers might seem obvious, unless you're preparing for your first job interview.

Evaluation

I liked this program; it not only makes you consider questions you might not have come up with on your own, it provides a framework of guidance in career planning. I recommend it for high school students from grades 10 to 12, and for college freshmen and sophomores.

I asked a high school guidance counselor to try this package, and she was impressed by its thoroughness and simplicity. Also, its $89 price tag is within the budget of most school systems. Back-up disks cost $10. High schools, colleges, and other organizations can request free 30-day demonstration disks.

Any adult anticipating a career change might also find the program highly useful.

The user's manual is detailed and, because the program's so easy to use, almost superfluous. But it might reassure an inexperienced user. It lists each career field in the data base and contains a brief philosophy of the program.

Although Career Directions does not require a printer, it's probably more useful in a school setting if students can get a printout. ■

Drive Away Dirt

Clean Runner, a menu-driven disk drive cleaner for single- and double-sided drives, is available from Discwasher.

Clean Runner works without chemicals and uses a lint-free cleaning surface bonded to a 5¼-inch polyester disk to direct the drive heads to a new track for each cleaning. In less than 30 seconds, it cleans away magnetic oxide and dust particles that build up on disk heads.

At $24.95 each, Clean Runner provides 20 cleanings. For more information, write Discwasher, P.O. Box 6021, Columbia, MO 65205.

Reader Service ✓ 551

Keep your heads clean with Clean Runner, a disk drive cleaner on a 5¼-inch floppy disk.

Meet Oscar

Oscar (Optical Scanning Reader) is a low-cost optical bar code scanner from Databar Corporation. Powered by four D-cell, batteries, the 4- by 3-inch, 18 ounce unit interfaces with your TRS-80 through its cassette port.

The bar code scanner costs $80 and comes with an introductory software support magazine. Software for Oscar is available in bar code format in a $10-an-issue magazine or as standalone software at $9.95. Databar boasts an extensive software library for applications in home education, games, money management, science and hobbies, health, law, and general interest.

Oscar will be marketed through many large department stores, bookstores, and computer and software stores, as well as through several national catalogs. For more information on Oscar or the nearest retailer, write Customer Service, Databar Corp., 10202 Crosstown Circle-Eden Prairie, MN 55344.

Reader Service ✓ 552

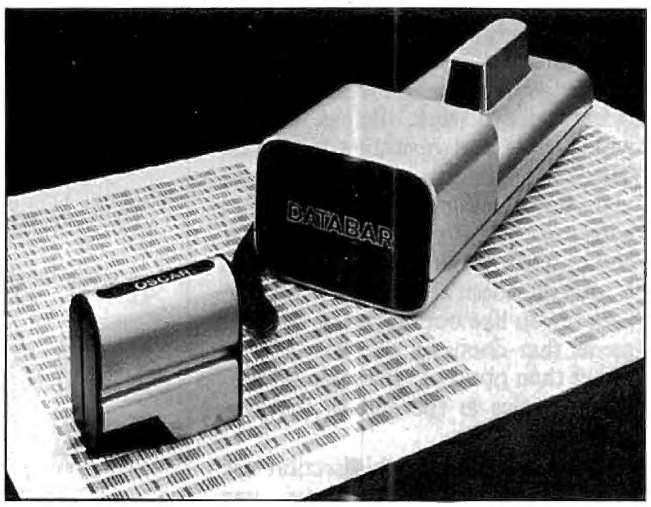
The Emperor's New Disk Drive

Logical Systems Inc. is the emperor, and your Model I, III or 4 is the peon that thinks it has access to a new disk drive. For double-sided, 40- or 80-track drives, or for hard drives, DiskDISK creates logical drive partitions that act as files on the physical drive.

DiskDISK lets you perform all system functions; even mirror-image back-ups function normally.

This disk-within-a-disk system doesn't restrict reading and writing to DiskDISK files. You can segment your hard drive as logical floppy drives, and keep groups of related files together, making back-ups and file maintenance a breeze.

DiskDISK is available for the Model I/III and Lobo's Max-80 running LDOS 5.1. LS-DiskDISK runs on the Model 4 under TRSDOS 6.X. Each version is $99 plus $3 shipping and handling.



With Oscar's help your TRS-80 can read bar code programs.

For more information or for a free catalog, contact Logical Systems Inc., P.O. Box 23956, Milwaukee, WI 53223, 414-355-5454.

Reader Service ✓ 559

Smith-Corona Goes Dot Matrix

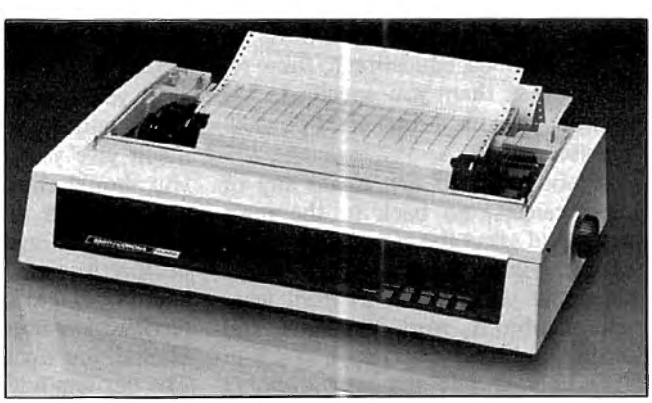
Smith-Corona has entered the dot-matrix market with the introduction of three near-letter-quality printers.

The 132-column D-300 ($795) boasts a printing speed of 140 characters per second (cps). In addition to a standard 9- by 8-dot matrix, the D-300 offers a near-letter-quality 17 by 16 mode. The printer has both friction and tractor feed, and parallel and serial interfaces.

The D-200 ($595) and parallel-interface D-100 ($395) are 80-column printers. They operate at 120 cps and 100 cps respectively.

All three printers offer a choice of six pitches, emphasized or elongated print, and bit-image graphics. They are available from Smith-Corona, 65 Locust Ave., New Canaan, CT 06840.

Reader Service ✓ 561



Smith-Corona's D-300 dot-matrix printer offers 140 cps print speed.

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!

1. *Speed increases of 10-100 times are typical after compilation.*
2. *Compiled code can be RELOCATED to run anywhere in memory. Code is even ROMable!*
3. *ZBASIC 2.2 NOW SUPPORTS BOTH RANDOM and SEQUENTIAL DISK I/O.*
4. *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).*
5. *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.*
6. *ZBASIC 2.2 compiles the ENTIRE PROGRAM into 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.*
7. *NO ROYALTIES imposed on registered ZBASIC owners.*
8. *Typical COMPILATION TIME is TWO SECONDS for a 4K program.*
9. *Use TRS-80 Basic to write ZBASIC programs!*
10. *Compile some existing programs with only minor changes. (BASIC programming experience is required.)*
11. *Fully compatible with both the Model I and the Model III. Mod I compiled programs work on a MODEL III, and vice-versa. ZBASIC works with NEWDOS-80, NEWDOS+, DOSPLUS, LDOS, MULTIDOS, ULTRADOS, TRSDOS etc. (Not TRSDOS Mod I double density)*
12. *BUILT-IN and much improved MUSIC and SOUND EFFECTS commands.*
13. *Improved CHAINING for disk users.*
14. *TIME$ now available on DISK version. (Mod I only)*
15. *ZBASIC 2.2 now has an INPUT @ command (similar to PRINT @).*
16. *The TAB function will now tab 255 columns on a printer. (BASIC cannot tab past column 64.)*
17. *NEWDOS 80 2.0 USERS can use the CMD "dos command" function! (DOSPLUS may use name "dos command")*
18. *NEW and EASIER to use USR COMMANDS.*
19. *New math functions to calculate XOR and INTEGER REMAINDERS of a DIVISION.*
20. *Logical STRING COMPARISONS are now supported.*
21. *The disk commands INSTR, MID$ ASSIGNMENT are now supported on both DISK AND TAPE ZBASIC.*
22. *DEFSTR is now supported.*
23. *Eight disk files may be opened simultaneously; random, sequential or mixed.*
24. *LINE INPUT#, is now supported.*
25. *Invoke the compiler by simply hitting these two keys: " —"*
26. *NEW 60+ PAGE MANUAL WITH DESCRIPTIONS AND EXAMPLE.*
27. *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:

1. ATN, EXP, COS, SIN, LOG, TAN, and exponentiation. (However, subroutines are included in the manual for these functions.)
2. ERROR, ON ERROR GOTO, ERL, ERR RESUME.
3. No direct commands like AUTO, EDIT, LIST, LLIST ETC, although these commands may be used when writing programs.
4. Others NOT supported: CDBL, CINT, CSNG, DEFFN, FIX, FRE.
5. Normal CASSETTE I/O. (ZBASIC supports it's own SPECIAL CASSETTE I/O statements.)
6. SOME BASIC COMMANDS MAY DIFFER IN ZBASIC. For instance, END jumps to DOS READY, STOP jumps to BASIC READY etc.
7. 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 subroutine package.) Program shown exactly as compiled and run in BASIC and ZBASIC.

```
10 '========= ZBASIC 2.2 EXAMPLE PROGRAM AND TIME TEST========
20 CLS:CLEAR100: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=1TO127STEP2 :FOR J=47TO1STEP-3:XX=POINT(I,J):SET(I,J)
50 XX=(I-J)/CC*(7+I+J) :XX=ABS(INT(RND(I*J)-AA)+7) :RESET(I,J)
60 XX=PEEK(I+J) :POKE15360+I+J,J :OUT255,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$,"9"):XX=SQR(I*J)
90 BA$=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 IFPOS(0)>62 THEN TRON:TROFF:PRINT ELSE XX=NOT(RND(99))+100
120 A$=INKEY$:IF A$="Y" OR A$="y" AND I>120 THEN PRINT"TRUE.."
130 RESTORE :READA,C,Z(J),D:GOSUB170:GOSUB170:GOSUB170:GOTO210
140 NEXT :PRINT"*";:NEXTI: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 GOTO140
```

NOTICE ZBASIC 2.0 OWNERS: you can upgrade your ZBASIC 2.0 for no charge. Just send us your original diskette/cassette and $15.00 with your registered serial number and copy of your invoice. We will send your ZBASIC 2.2 and updates to your manual.

VISA, MASTERCARD, AMERICAN EXPRESS, C.O.D. ORDERS CALL

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 ✓12

TRS-80 is tm of Radio Shack, a Tandy Corp.

✓ See List of Advertisers on Page 227

In less time than it took you to recognize this photograph of the eastern seaboard, **Softshell's Multiple Access Programs** *can search your largest disk files.*

MULTIPLE ACCESS PROGRAMS

MICROMAP **$25.00**
Mindex and Search with documentation. For standard text and data files. 80 Micro calls this the fastest file-search program around!

MINIMAP **$45.00**
Mindex, Search and 3by5 (search program and text editor for records up to 255 characters).

MAP **$145.00**
Expanded Mindex, Search and 3by5 (records up to 1023 characters); Includes 5by7 (3by5 with word processing and database management capabilities).

MAP-MATE **$95.00**
Relational database management system for numerical data and structured text.

All programs run on TRS-80 Models II/12/16 and III/IV
MICROMAP also runs on the IBM PC

Send for a brochure on all our Multiple Access Programs.

SOFTSHELL Corporation ✓ 57
P.O. Box 18522, Baltimore, MD 21237

NEW PRODUCTS

Little powerhouses on the prairie: These 6-volt rechargeable batteries give you and your Model 100 more freedom.

The Prairie Away-from-Home Companion

Go ahead, knock that battery off Robert Conrad's shoulder. With Prairie Power you'll never again have to buy an alkaline cell for your Model 100.

Prairie Power is the first external rechargeable battery for the Model 100. The lightweight, palm-sized units with 6-foot, 6-volt cables come in three sizes that outlast any alkaline batteries' 20-hour charge.

The 8-amp unit ($34.95) can power the Model 100 continuously for over 150 hours, the 5.5-amp battery ($29.95) supplies 100 hours of power, and the 2.6-amp unit ($21.95) supplies 50 hours of power.

The charger costs $10.95. Order through Bluestem Productions, Box 334, Wayzata, MN 55391, 612-471-7795.

Reader Service ✓ 557

Stop That Surge

A typical home's electrical devices can experience over 2,000 power spikes and voltage surges a year that could cause severe component damage, misindexed files, data loss, and related problems. To help protect your home electronics, RKS Industries Inc. (4865 Scotts Valley Drive, Scotts Valley, CA 95066, 800-892-1342; in California, 408-438-5760) has developed SurgeSentry products.

A two-outlet model ($89.50) and five-outlet system control unit ($149) use a three-stage, three-way common mode design to shield equipment from voltage spikes and ground-wire transient surges. SurgeSentry lets only the normal voltage through, sending any extra to a power dissipater.

The circuit board detects power spikes in less than 5 picoseconds (compared to the 5 nanoseconds used by conventional surge suppressors) and stops them at levels of up to 1.5 million watts.

Reader Service ✓ 558

The Surge Sentry stops power spikes of up to 1.5 million watts.

What a Baud!

Speed up your Model I tape input/output (I/O) to 7,000 baud. The HHCI Tape System, interfaced to your Level II ROM, reads and writes data through unmodified CTR-41, CTR-80, or CCR-81 cassette players, from Basic programs up to 50 times faster than the normal 500 baud ROM routines. It saves and loads programs 12 times faster. You can select high

EE/EPROM PROGRAMMERS & UV ERASERS

NOW AVAILABLE **PAL PROGRAMMERS**

See us at COMDEX SPRING, ATLANTA

UV ERASERS
QUV-T8/1
$49.95
*HOBBY

QUV-T8/2N
$68.95
*INDUSTRIAL

QUV-T8/2T
$97.50
*WITH TIMER & SAFETY SWITCH

GANGPRO-8™
$995.00
(GANG PROGRAMMER)
Add Shipping

Money Back Guarantee

RS-232 serial, STAND ALONE, INTELLIGENT

*EASY DUPLICATION *USER FRIENDLY *128K BUFFER

SUPPORTS: MOST 8K, 16K, 32K, 64K, 128K, 256K EPROMS
PROMPRO-8: KEY PAD OPTION, EPROM SIMULATION MODE
Microcomputer Chips: 8748 (H), 8749H, 8750, 8751, 8741, 8742, 8755A
SOFTWARE DRIVERS: MDS ISIS, TEKTRONICS 8002, IBM PC, ATARI, APPLE II, CPM, FLEX, TRS-80
DIRECT HOOK UP TO ANY DUMB TERMINAL OR COMPUTER.

AFFORDABLE ★ RELIABLE ★ AVAILABLE

DISTRIBUTOR INQUIRY WELCOME. TO ORDER **1-800-EE1-PROM**

LOGICAL DEVICES INC. ↙330

1321 N.W. 65 Place, Ft. Lauderdale, FL 33309 For Info (305) 974-0967

ONLY
$199

HIGH SPEED CENTRONICS 101A DOT MATRIX LINEPRINTERS

Fully Reconditioned
Heavy Duty Steel Construction
1980 List Price $4800 Our Price $199

- 165 Characters per second (1920 words per minute)
- 2" to 15" Adjustable Tractor Feed
- 132 Columns Expanded Print & Multi-strike Highlighting
- 9 × 7 Matrix with "End of Line" Seeking Carriage Return
- Optional Lower Case Character Sets with Graphics Available
- Compatible with Centronics Parallel Outputs: (TRS-80, Apple, IBM-PC, Franklin Ace, Osborne, Atari, TI-99, Commodore 64, Vic-20, and More)

BRAND NAME COMPUTERS AND PRINTERS
New in stock at competitive prices.
Send for price list.

A.C.E. SYSTEMS
106 E. BROAD ST. BETHLEHEM PA 18018
215-867-5066 ↙38

BASIC
FOR MODELS I AND III
JUST GOT BETTER

INTRODUCING BASRUM. THE ONLY LINKING LOADER & LIBRARY MANAGER FOR BASIC.

BASRUM is designed to manage the subroutines you write and use in your Basic programs. Like an efficient filing system, BASRUM saves you time, energy, and space. Best of all, it makes your program writing FASTER and EASIER.

HOW DOES IT WORK?

BASRUM lets you store your subroutines in "library" files, separate from the programs that use them. ANY Basic program can then use any routine in any file. You can even load up to 256 routines to a special, protected memory area and use them AFTER you load other Basic programs! Naturally, you can replace or delete any routine from memory at any time.

SUPER BENEFITS!

NOW you can write a subroutine ONCE, store it on disk ONCE ... but use it in ANY program at ANY time, AUTOMATICALLY! Load them once, use them all day. You can CHAIN from program to program, keeping the existing subroutines, variables, and file buffers. Your Basic programs, being shorter, will LOAD FASTER. NEED MORE MEMORY? You can break long programs into shorter modules and "overlay" the modules. BASRUM gives you complete control of WHAT is loaded, WHEN it is loaded, and WHERE it is loaded.

THE NITTY GRITTY.

BASRUM was designed specifically for the models I and III for use with any DOS that is compatible with TRSDOS©. It's overlay structure requires only the top 1600 bytes of memory. There is NO LIMIT on the number of working copies.

SIMPLE ENOUGH FOR THE BEGINNER, VERSATILE ENOUGH FOR THE PRO: IF YOU WRITE PROGRAMS IN BASIC YOU NEED BASRUM.

TO ORDER: Money order, check, VISA, MASTERCARD: $149.50
Specify memory size: 16K 32K 48K
Select disk format:
Model I: 35 track, single density
Model III: 40 track, double density

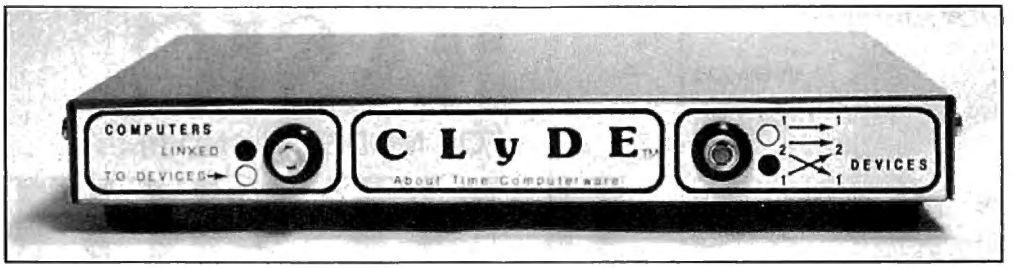
Guaranteed to perform as described or your money back. Orders are shipped via air, most within 24 hours. A complete manual is included. Information only? Send self-addressed, stamped envelope.

BASRUM © by **Wiley, Inc.** ↙37

841 Bishop St., Ste. B-2 Honolulu, HI 96813
(808) 531-4314

TRSDOS is a registered trademark of the Tandy Corp.
BASRUM is a trademark of Wiley, Inc.

↙ See List of Advertisers on Page 227



Clyde lets your computers communicate with each other and share peripherals.

speed or standard tape operation with a switch.

The system has an error-correcting technique boasting an error rate of less than 1 in 2 million bits. The assembled and tested system with installation instructions and a user's manual costs $49.95. You can purchase the user's manual separately for $8.95 (with credit for that amount toward purchase of the complete system).

For more information, contact HHCI Tape Systems, 725 Idlewild Road, Bel Air, MD 21014, 301-838-7692.

Reader Service ✓ 565

Clyde Controls Computers

If your expanding computer system has problems sharing printers and other peripherals, or if your computers can't communicate, Clyde has the answer.

Clyde is a line-switched network controller. While one computer uses the printer, another can use a modem or other device. Clyde shunts device control between computers, and establishes the proper computer link for data communications.

This RS-232 switch box sells for $149.50 from About Time Computerware, 2054 University Ave., Room 209, Berkeley, CA 94704, 415-845-6920.

Reader Service ✓ 562

Briefcase Secrets

If your Model 100 files aren't always suitable for public disclosure, Code Keeper, a cassette-based passcode program, keeps your secrets undercover. It secures all files in RAM from prying eyes, and prohibits anyone without the correct password from running a program. Not even the break and reset keys can crack Code Keeper.

Code Keeper also provides a handy feature: If you inadvertently leave your 100 behind, it displays your name and phone number when someone turns on the machine.

Code Keeper uses 1K of memory and sells for $25 from Sherman Electronics, P.O. Box 63-04, Miami, FL 33163, 305-944-2111.

Reader Service ✓ 556

GIVE YOUR PRINTER A FACE LIFT WITH DOTWRITER 3.0

120 faces, to be exact. That's how many styles and sizes are available for use with this flexible, fully featured graphics text formatter. You can print beautiful letterheads, inter-mix type styles, and even create new ones. Right-justified proportional printing, type sizes from 1/8 to 1 inch, and reversals (white on black) are supported, along with extended word processing features.

DOTWRITER includes the printing programs, a dozen type faces, and a facility to design your own character sets right on the screen. 15 more disks, each with 3-10 complete character sets, are available separately. The optional "Letterset Manipulation Utilities" let you get even fancier.

DOTWRITER can be used with any TRS-80 word processor, such as NEWSCRIPT. Versions are available to support the Epson MX-80 with Graftrax, MX-100 with Graftrax-Plus, RX-80, and FX-80; the C. ITOH 8510/1550; the Microline 84/92/93; and Radio Shack DMP 200/400/500, and 2100. Please specify your printer when ordering!

MOONLITE
LOMBARDIC
Pretorian
BANNER
Gothic Black
SHADED
CAMEO
Nostalgia
TRAJAN
✓ 91

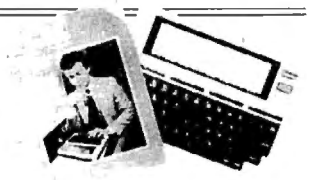
Limited ad space allows us to show you only a few of the 120 DOTWRITER fonts, but free print samples are available on request. If you want to improve the appearance of your output, we suggest you order DOTWRITER today, toll-free.

DOTWRITER 3.0	$79.95
Letterset Manipulation Utilities (LSMU)	39.95
Special: DOTWRITER and LSMU	99.95
Additional Letterset disks (3-10 per disk)	17.95 and 24.95

ORDER NOW, TOLL-FREE
(800) 824-7888, oper. 422
PROSOFT®
Dept. C, Box 560, No. Hollywood, CA 91603
(818) 764-3131 Information and Same-Day Processing
TERMS: VISA, MC, checks, COD. Please add $3.00 shipping in U.S. or Canada, $15.00 overseas, sales tax in Ca. Most orders filled within one day.

Equipment: TRS-80 Model I or III (4 in III mode), 48K, 2 disks.

The Perfect Companion For Your New Portable Computer



There's a new and exciting computer on the block — Radio Shack's TRS-80™ Model 100 Portable Computer. It promises to be one of the most significant advances in personal computing of the 1980's!

And, now, there's a new and just-as-exciting magazine specifically devoted to your Portable Computer. It is called **PCM—The Portable Computing Magazine**, and it is published by the same people who bring you the most popular Color Computer magazine in the world — **the Rainbow**.

PCM—The Portable Computing Magazine sells for $3 per copy and $28 a year by subscription. If, after seeing your first issue, you find it is not for you, just let us know. We'll happily, cheerfully and immediately refund your entire subscription payment. We're that confident that you'll love PCM. After all, it is **The Portable Computing Magazine!**

PCM
THE PORTABLE COMPUTING MAGAZINE

9529 U.S. Highway 42
P.O. Box 209
Prospect, KY 40059
(502) 228-4492

YES! Sign me up for a year (12 issues) of **PCM—The Portable Computing Magazine**

Name _____
Address _____
City _____ *State* _____ *Zip* _____

☐ Payment Enclosed
Charge ☐ VISA ☐ MasterCard ☐ American Express
Account # _____ Interbank # (MC only) _____
Signature _____ Card Expiration Date _____

Subscriptions to **PCM—The Portable Computing Magazine** are $28 a year in the United States. Canadian and Mexican rate is $35 U.S. Surface rate elsewhere $64 U.S. Air mail $85 U.S. All subscriptions begin with the current issue. Please allow 5-6 weeks for first copy

✓296

WANTED

"Buyers," & "We'll pay the shippin'

• CALL FREE (800) 654-4058 •

"Call For Reduced Prices At Various Quantities"

Verbatim.

5¼"	sin·side dbl·den.	2.40
5¼"	dbl·side dbl·den.	3.45
5¼"	sin·side quad	3.20
5¼"	dbl·side quad	4.20
8"	sin·side sin·den.	2.75
8"	sin·side dbl·den.	3.05
8"	dbl·side dbl·den.	3.40

Head Cleaning Kits ....5.20 Refills ..9.55

Prices per ea. 10 per box

Dysan CORPORATION

5¼"	sin·side dbl·den.	3.20
5¼"	dbl·side dbl·den.	4.20
5¼"	sin·side quad	4.45
5¼"	dbl·side quad	4.95
8"	sin·side sin·den.	3.45
8"	sin·side dbl·den.	4.45
8"	dbl·side dbl·den.	4.95

We Stock "Bulk-Packed" Diskettes

3M Scotch®

5¼"	sin·side dbl·den.	2.20
5¼"	dbl·side dbl·den.	3.20
8"	sin·side sin·den.	2.35
8"	sin·side dbl·den.	2.95
8"	dbl·side dbl·den.	3.90

Disk Minder
• Smoked Plastic
• Holds 75 Disks
16.75 ea

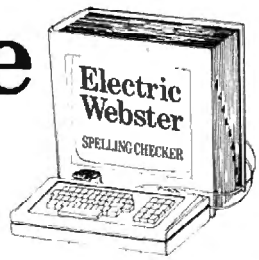
Dealer Inquiries Welcomed

the Diskette Connection™
P.O. Box 1674
Bethany OK. 73008

✓441

*(Continental U.S. only. Add 3.00 on orders under 40.00)

Grammar & Style



Checking for Superscripsit

Checks for 22 categories of errors, including wordy phrases, cliches, repeated words, passive voice, commonly misused words, and double negatives. Suggests improvements. Analyzes average word, sentence and paragraph lengths. Can be run from within Superscripsit and/or Electric Webster.

Also available for Newscript, Lazy Writer, Scripsit and others. For information about Electric Webster, See ad p. 149.

Grammar & Style (Stand Alone)	$69.95
Grammar & Style (for Electric Webster)	$49.95
Correcting Electric Webster (Spelling Checker)	$149.95

Professional Software at an Affordable Price!

VolksTax

$39.95

Personal Tax Writer/Planner

As easy to use as a pencil. Displays IRS forms on the screen. You insert your income information: VolksTax fills in the blanks. Calculates wherever necessary, displays percentages of gross, income averages, and much more. Fills out 1040, SE, A, B, C, D. Other forms and schedules optional. Available for all 48K and 64K computers. Additional schedules available.

	VolksTax	$39.95
Also Available	Accounts Receivable	$39.95
	Payroll	$39.95

CORNUCOPIA SOFTWARE
P.O. BOX 6111, ALBANY, CA 94706
(415) 524-8098

✓45

✓ See List of Advertisers on Page 227

COMPLETE MODEL III/IV HARD DRIVE $1095.

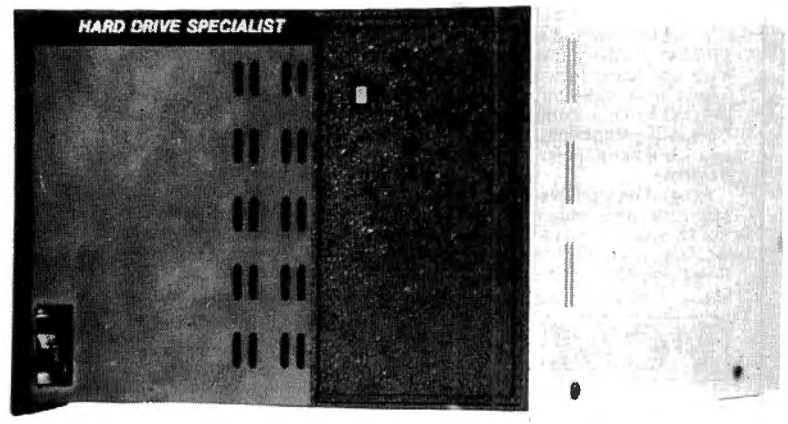
COMPLETE PRIMARY DRIVES

MODEL III & IV

5 MEG $1095.
10 MEG $1395.
15 MEG $1695.
33 MEG $2395.

MODEL I & LNW

5 MEG $1145.
10 MEG $1445.
15 MEG $1745.
33 MEG $2445.

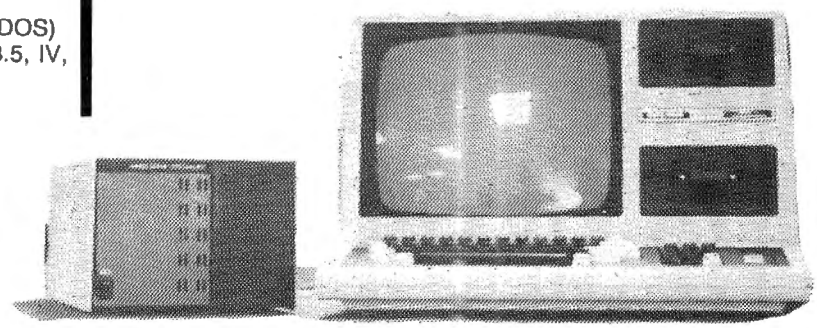


COMPLETE SYSTEM FEATURES
ONE YEAR WARRANTY
SWITCH SELECTABLE HOST
POWER ONE HD POWER SUPPLY
HD COOLING FAN
SIZE 8-1/4" X6-1/2" X13"
ALL DRIVES RATED AFTER FORMAT
COMPLETE READY TO PLUG IN (JUST ADD YOUR DOS)
SUPPORTS NEWDOS 80 V2.5, DOSPLUS 3.4t, 4.0, 3.5, IV, LDOS, and soon TRSDOS 6.0

MODEL 3/4 BOOT ROM $39.95
ALLOWS YOU TO BOOT DIRECTLY FROM YOUR HARD DRIVE FOR DOSPLUS and NEWDOS SYSTEMS ONLY

SECONDARY DRIVES

5 MEG $695.
10 MEG $995.
15 MEG $1295.
(READY TO PLUG INTO YOUR PRIMARY DRIVE)



NEW PRODUCT

MULTIPLEXER $995.

ALLOWS UP TO 4 COMPUTERS TO ACCESS A HDS HARD DRIVE
Includes Master Control Unit and Cable / Host Adapters for externally connecting 2 Computers

NEW PRODUCTS IN THE WORKS

5 MEG REMOVABLE FLOPPY DRIVE ***MODEL 2, 12, 16 HARD DRIVES***

HARD DRIVE SPECIALIST a division of

Ordering Information
We accept Visa, Mastercard, Wire Transfers, and Certified checks for quickest shipping. Orders received on personal checks are held.

1-713-480-6000 Order Line 1-800-231-6671
16206D Hickory Knoll, Houston, Texas 77059

MODEL 4 DRIVE KITS $299

MODEL 4 STUFF

MODEL 4 DISK DRIVE UPGRADE KITS

All of the Compukit Model 4 Disk Drive Upgrade Kits contain these features that other companies usually do not provide. Switching power supplies • Tandon disk drives • 64K of Model 4 RAM • Sound • and an Easy to Use installation Manual. Requires only a screwdriver (no soldering).

The no drive upgrade kit	$299.
One drive upgrade kit	$499.
Two drive upgrade kit	$699.
Two double headed drive kit	$899.

MODEL 4 COMPUTERS

all include an RS232

No charge for shipping on any Compukit Computers

64K one single headed drive	$1495.
64K two single headed drives	$1695.
64K two double headed drives	$1895.
128K systems add only	$99.

MODEL 4 64K UPGRADE $62.95
64K TO 128K UPGRADE $82.95

Prime grade pre-tested RAM with instructions

MODEL 4/III RS232 KIT $69.95

Completed and tested ready for installation

MODEL III TO MODEL 4 UPGRADE $750.

Converts your Model III into a Model 4 (except for cabinet and disk drives). Includes new keyboard, 64K RAM, Sound, and free installation (required). Ship us any working Model III, even if it's not all factory equipment, and get back a Model 4, in your case.

MODEL 4 SOUND UPGRADE $29.95

No soldering required, includes instructions

MODEL III DISK DRIVE UPGRADE KITS

All of the Compukit Model 3 Disk Drive Upgrade Kits contain these features that other companies usually do not provide. Switching power supplies • Tandon disk drives • 32K of Model III RAM • Compukit Doctor • and an Easy to Use installation Manual. Requires only a screwdriver (no soldering)

The no drive upgrade kit	$279.
One drive upgrade kit	$479
Two drive upgrade kit	$679.
Two double headed drive kit	$879.

NEW! COMPUKIT DOCTOR $29.95

Disk based diagnostic software package for the Model I, III, and 4

With RS232 TEST PLUG $39.95

TANDON DISK DRIVES

Perfect for replacement or add on drive for Any 5" drive system.

TM100-1 40 Track Single Sided	$179.
TM100-2 40 Track Double Sided	$279.
TM50-1 20ms trk-trk Single Sided Thinline	$149.
TM50-1 6ms trk-trk Single Sided Thinline	$169.
TM50-2 6ms trk-trk Double Sided Thinline	$219
Single case with extenders with drive above	$49.95
Dual case with extenders for drives above	$79.95
Two Drive Cable	$24.95

64K COCO KIT $62.95

COCO DRIVE O $379.

With a Tandon Thinline

Special introductory price

Dual Drives ..... $529.

MODEL I, III, 4 GREEN PHOSPHOR ANTIGLARE CRT KIT $89.

A complete new CRT, not a filter

COMPUKIT Corporation

455

Ordering Information
We accept Visa, Mastercard, Wire Transfers, and Certified checks for quickest shipping. Orders received on personal checks are held.

1-713-480-6000 order line 1-800-231-6671
16206D Hickory Knoll, Houston, Texas 77059

CONVERT YOUR PARALLEL PRINTER TO SERIAL

The SPC SERIAL to PARALLEL interfaces convert serial ASCII data into parallel format for use with Centronics type parallel printers. The SPC interface accepts serial data from your computer. The 36 contact ribbon connector plugs into your parallel printer. Can be used to add a second parallel printer port to computers which reliably support both serial and parallel printers.

SPC-CC for TRS-80 **Color Computer** $59.95

Model SPC-1 for use with other Computers includes the following Switch Selectable Options.

- 7 or 8 Data Bits per serial word
- Odd or Even parity for serial word
- Parity or No parity for serial word
- 1 or 2 Stop Bits per serial word — SPC-1
- 300, 600, 1200, 2400, or 4800 BAUD — $89.95

All prices U.S. funds. VISA, MASTER CARD, COD, Purchase Orders accepted from schools, major corporations, and government agencies. Shipping and Handling on U.S. orders $4.00. Ten day return period. Ninety day warranty.

BINARY DEVICES
11560 TIMBERLAKE LANE
NOBLESVILLE, IN 46060
(317) 842-5020 ↙58

TRS-80 is a trademark of TANDY

Introducing
I/III to 4 CONVERTER
TRS 80 MODEL 4

I/III to 4 CONVERTER IS THE **EASY** AND **INEXPENSIVE** WAY TO CONVERT YOUR MODEL I/III **BASIC** PROGRAMS TO MODEL 4.

- Completely Menu Driven
- Runs on 1, 2, 3, or 4 Drive Systems
- Inserts necessary spaces between key words
- Prints list of key words and line numbers where exceptions occur for Model 4
- Step-by-step instruction manual included
- Converts "Print @" and "Print Tab ( )" addresses for 80 Column screen.

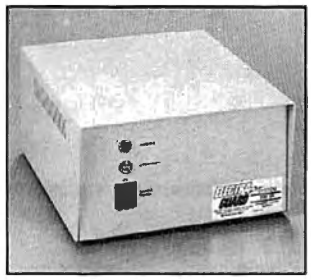
NEXT DAY SHIPMENT ON TELEPHONE/CREDIT CARD ORDERS

VISA $39.95 MasterCard

TO ORDER CALL
(803) 787-7256
TELEX 466528

Ehlen Enterprises
6319 Briarwood Road
Columbia, South Carolina 29206 ↙322

NEW PRODUCTS



During a power-out, Electra Guard System 200VA supplies 200 watts of power for 20 minutes.

More Power to You!

If you live in a potential blackout/brownout area, protect your data with the Electra Guard Standby Power Supply System 200VA (175 watts, 1.5 amperes). In case of emergency, it instantly supplies 200 watts of power for 20 minutes.

At 6 by 11 by 13 inches with audible alarm, the unit has line and battery fuses, and a low battery cut-out to protect against overloads. The unit sells for $499.95 from Computer Power Solutions Inc., 8800 49th St. N., Suite 203, Pinellas Park, FL 33565, 800-237-6010 (813-544-8801 in Florida).

Reader Service ↙ 575

Network Notion

Although you may never need a network of 254 computers, it's nice to know your Model III/4 system has that capability. Olympus-80 Computer Systems' Thor, a local area network with a Model III/4 interface, provides polling for up to 254 computers, printers, modems, or other peripherals and plenty of Winchester disk storage.

The two-serial-port network lets computers of different manufacturers share data files, and offers several types of operating systems. It operates at up to 800K bytes per second.

Ribbon or round communication cable connects computers up to 4,000 feet apart; you can easily add more user stations. Rated at 110/220 volts ac, 50/60 hertz, 25 watts maximum, Thor works with any Winchester disk system, including cartridge disk drives.

A typical four-user installation including 200 feet of cable, four host-interface cards, one network intelligent controller, and a 15 megabyte hard disk drive costs $6,568. For more information, contact Tom Psillas, Olympus-80 Computer Systems, 869 Mill St., E. Berlin, CT 06023, 203-828-0359.

Reader Service ↙ 554

Clean Edge Feeder Paper

Your word processing letterhead takes on a clean-cut appearance with Checks To-Go's special perforated quality paper. The paper shows no residue after you tear off its edges.

Letterheads are available in four colors, three paper types, two sizes, and 24 lb. and 20 lb. stocks. Checks To-Go ships non-imprinted stock within 24 hours. For more information, call 800-854-2750; in California call 800-552-8817.

Reader Service ↙ 555

The Model 16BP

Radio Shack, encouraged by the success of the Model 4P, has introduced a transportable version of its multi-user office system. The Model 16BP features a base unit and two DT-1 data terminals, all with 9-inch screens and detachable keyboards. Now three traveling workstations can share the same TRS-Xenix files.

The Model 16BP is built

P.O.S.I.C. Point Of Sale Inv. Cont. ★★

★ CASH REGISTER
Update Inventory At Sale
Cash,Check,Visa,MC,Amex Supported
Sales Tax Computed

★ INVENTORY
13 User Fields
Up To 8400 Line Items
Update Files Anytime

★ REPORTS
Daily,Weekly,Monthly,Period, Annual & Cash Register
Minimum Quantity
Employee

3600 LINE ITEMS 3 DISK DRIVES ARE REQUIRED
2800 LINE ITEMS 2 DISK DRIVES ARE REQUIRED
6400 LINE ITEMS 4 DISK DRIVES ARE REQUIRED

★★ PLUS MUCH MORE ★★

CASH-2	CASH-3	CASH-4
$399.00	$499.00	$599.00

VISA | DEMO DISK $29.95 | MasterCard

$24.95 SUBROUTINES $24.95
For Data Base Management Prog.
SCRNWRTR Utility $29.95

★SPECIAL★ PRICE ★ Ends MAY 1st.★
ADD $2.00 PER ORDER FOR POSTAGE/HANDLING.

(803) 552-9990
K & L SOFTWARE
P.O. BOX 39093 NORTHBRIDGE STA.
CHARLESTON, S.C. 29407 ↙286
FOR TRS 80 MODEL III + MODEL IV (IN MODEL III MODE)

The Statistician Version 2.0

NEW
First in Its Class and Looking for Work.

TRS-80 1, 2, 3, 4, 12, 16
CPM XENIX

- Multiple Regression
  - Stepwise
  - Ridge
  - All Subsets
  - Backward Elimination
- Time Series Analysis
- Descriptive Statistics
- Transformations
- Survey Research
- Nonparametrics
- X-Y Plots
- ANOVA
- Random Samples
- Data Base
- Search & Sort
- Hypothesis tests

Please call **TOLL FREE**
1-800-334-0854 (Ext. 814)

for more information or write:
Quant Systems ↙194
Box 628
Charleston, SC 29402
·VISA-M/C Accepted

TAX PREP™
Easy 1983 Taxes for MULTIPLAN Users

If you use Multiplan, you **can't afford not to use TAX-PREP** for the **fastest, simplest** tax preparation ever. Enter data only once. User friendly, with manual and tutorial.

Features IRS approved printout of 18 forms and schedules (including A, B, C, D, G, RP, SE, W etc.). Prints on 1040. Computes tax automatically, including income averaging and alternative minimum tax. Use for tax planning.

Multiplan+TAX-PREP= one of the **best, complete** personal income tax systems available.

And the ***price is right!***

TAX-PREP is available on TRS 80, Apple II and IBM compatibles (specify machine) for $89.95 (Pa. add 6% tax) from:

CALL OR WRITE FOR MORE INFORMATION
EZ WARE
17 BRYN MAWR AVE BALA CYNWYD, PA 19004
(215) 667-4064 ↙178

CONVERT YOUR TRS-80 MODEL I, III, OR 4 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/4 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 6½% sales tax.

↙ See List of Advertisers on Page 227

MCW MIDWEST COMPUTER WHOLESALE MCW

AS A WHOLESALER, MCW'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 THESE SAMPLES OF OUR PRODUCTS
GIVE US A CALL IF YOU DON'T FIND
EXACTLY WHAT YOU ARE LOOKING FOR

* * * COMPUTERS * * *
TRS-80 MOD4 64K (2) DRIVE 40TR/SS/DD.....$1449.00
TRS-80 COLOR COMPUTER 2 16K STD BASIC.....$139.00
TRS-80 COLOR COMPUTER 2 16K EXT BASIC.....$209.00
TRS-80 COLOR COMPUTER 2 64K EXT BASIC.....$299.00
COLOR COMPUTER DRIVE 0 KIT, 40TR TANDON.....$319.00
COLOR COMPUTER DRIVE 0+1 IN SINGLE CASE.....$489.00
R/S MODEL 2000 (IBM WORK ALIKE).....$2310.00
R/S MODEL 4-W PORTABLE.....$1511.00
SANYO MODEL 550 (IBM WORK ALIKE).....$CALL

* * * RAW DRIVES (TANDON OR MPI) * * *
40 TRACK SINGLE SIDE DRIVES FROM.....$140.00
40 TRACK DOUBLE SIDE DRIVES FROM.....$184.00
80 TRACK SINGLE SIDE DRIVES FROM.....$202.00
80 TRACK DOUBLE SIDE DRIVES FROM.....$272.00
77 TRACK SINGLE SIDE EIGHT INCH DRIVES FROM.....$357.00
77 TRACK DOUBLE SIDE EIGHT INCH DRIVES FROM.....$462.00
SINGLE 5" CASE AND POWER SUPPLY FROM.....$53.00
DUAL 5" CASE AND POWER SUPPLY FROM.....$86.00
SINGLE OR DUAL 8" CASE AND POWER SUPPLY FROM.....$199.00

* * * WINCHESTER HARD DRIVES (TANDON) * * *
COMPLETE WITH CASE & P/S, MOD 3 OR 4 DOS, 1 YR WARRANTY
6.4 MEG.....$1399.00
12.8 MEG.....$1549.00
19.1 MEG.....$1699.00
31 MEG.....$2199.00
50.6 MEG.....$2799.00

* * * PRINTERS * * *
EPSON:RX-80, RX-80FT, FX-80, MX-100, FX-100.....$CALL
SMITH CORONA DAISY WHEEL.....$CALL
NEW SMITH CORONA DOT MATRIX LINE.....$CALL

* * * CABLES * * *
(2) DISK DRIVES.....$16.00
(4) DISK DRIVES.....$26.00
PARALLEL PRINTER (STD).....$18.00
RS232C.....$15.00
NULL MODEM ADAPTER.....$19.00
SPECIAL CABLES TO YOUR SPEC'S.....$CALL

* * * MISCELLANEOUS * * *
COMPUTER POWERLINE FILTERS FROM.....$25.00
"J"-CAT MODEM 300 BAUD AUTO ANS, D/C.....$109.00
SMART CAT MODEM 300 BAUD AUTO ANS/DIAL, D/C.....$190.00
SMART CAT MODEM 1200 BAUD AUTO ANS/DIAL, D/C.....$445.00
GREEN OR AMBER CRT FILTERS .125" THICK.....$9.50
5.1 MEG MOD 3 SPEED-UP KIT.....$79.00
16K MEM KIT (150NS PRIME CHIPS).....$18.00
64K MEM KIT (150NS PRIME CHIPS).....$59.00
64K TO 128K MOD 4 MEMORY KIT W/PAL.....$89.00
PRINTER SWITCH, 2 PRINTERS ON ONE COMPUTER.....$68.00

DISKETTES, BOXES OF 10.....OPUS.....VERBATIM
40 TRACK SINGLE SIDE, DBL DENSITY.....$19.....$25
40 TRACK DOUBLE SIDE, DBL DENSITY.....$29.....$38
80 TRACK SINGLE SIDE, DBL DENSITY.....$35
80 TRACK DOUBLE SIDE, DBL DENSITY.....$43
40 TR DBL SIDE, DBL DENSITY (FLIPPY)..$30.....

ALL PRICES & SPEC'S SUBJECT TO CHANGE, WITHOUT NOTICE..

TRS-80 IS A TRADEMARK OF RADIO SHACK-DIV OF TANDY CORP. ALL TRS-80'S FROM MCW ARE CONSTRUCTED TO OUR SPEC'S AND ARE COVERED BY OUR WARRANTY SEE NOTE BELOW.

* * * PAYMENTS * * *
WE ACCEPT VISA, M/C, MONEY ORDERS, AND CHECKS. NOTE: NON-CERTIFIED CHECKS REQUIRE (2) WEEKS FOR BANK CLEARANCE. NO SALES TAXES ARE COLLECTED ON SALES OUTSIDE OF MICHIGAN.

* * * DELIVERY * * *
SHIPMENTS ARE MADE PROMPTLY FROM STOCK, VIA UPS, (SIZE PERMITTING), OTHERS, BEST WAY. COSTS UNLESS OTHERWISE NOTIFIED ARE 2.5% OF THE ORDER TOTAL BUT NOT LESS THAN $3

* * * WARRANTY * * *
YOUR HARDWARE PURCHASE IS COVERED BY AN MCW 90 DAY, LIMITED, PARTS AND LABOR WARRANTY OR THE WARRANTY OF THE ITEM'S MANUFACTURER CONFIRM YOUR COVERAGE WHEN PLACING AN ORDER. COPIES OF THE WARRANTY ARE AVAILABLE ON REQUEST.

MIDWEST COMPUTER WHOLESALE
PO BOX 39278 DETROIT, MI. 48239
TELEPHONE ORDER LINE (313) 525-3040

around the same 256K, hard-disk-equipped Model 16B as Tandy's desktop network. Both the base unit (expandable to 768K RAM) and terminals have high-impact plastic cases and built-in carrying handles; 15 feet of non-detachable cord joins each terminal to the base.

The ideal system for today's teams of traveling executives, the Model 16BP costs $7,995 at Radio Shack Computer Centers.

Hostile DOSes

An enhancement to the Model 2000's MS-DOS, Vicious Systems Inc.'s S/M-DOS ($299.95) adds utilities and commands to stymie the most resourceful programmer. Hackers will enjoy hours of frustration as S/M-DOS' directory of discipline (BOOT, CHAIN, and CONFORM) whips programs into shape; for Model I/III/4 owners, the CONV utility transfers TRSDOS 1.3/6.0 files into Aramaic.

Besides S/M-DOS, Vicious Systems offers TUE-DOS/80 ($129.95), an operating system that works only on Tuesdays, and 6.0 Enhanced ($79.95), a collection of irremovable utilities that ensures there'll be no space for even the tiniest files on Model 4 or 4P system disks.

All products are available from Vicious Systems Inc., 323 Rude Road, Cruel & Unusual, NJ 07039.

More Printer Innovations

Mobius Ribbon Inc., makers of the Manu-Script 60 personal correspondence plotter featured in April 1983's *80 Micro*, have announced an upgraded version, as well as the fastest dot-matrix printer in computing history.

The Arachnid 95 ($575) is a plotter that crawls like a giant, noisy spider over a piece of paper taped to the desk, offering two-color graphics at 2 by 5 dots per inch. Its speed pales by comparison to the Rapidot 2000 ($1,395), the first correspondence-quality printer that prints at an astounding 2,000 characters per second.

The Rapidot's secret? Its single, nondirectional print head with a 720- by 2,750-pin matrix, capable of printing an entire 8½- by 11-inch page (up to 80 by 25 characters, each made of 9 by 11 dots) in one second. The Rapidot's built-in Z8 microprocessor lets it accept text from your computer and program the 1,980,000 pins, ready to zap the complete page onto paper, in less than 40 minutes.

Both printers are available from Mobius Ribbon Inc., 30 Pica Drive, Hardcopy, PA 15230.

Very Personal Software

Program your own fate or make a dream come true with this line of interactive, real-world, stimulation programs. Choose from an infinite library including these fantasies: Save Your Marriage ($79.95), Find Mr. Right ($59.95), Get Discovered by a Talent Scout ($39.95), Age 29 Revisited ($1,200), Be Born Again ($10.95), and Climb the Corporate Ladder in a Single Bound ($12,950). Integrated and specialized fantasies are available by special order.

These Model I/III/4 32K disks come handsomly clad in white jackets, from Fantasy Island Software, Rourke Bungalow, Tattoo, HI 54321. Fantasy Island

WE'RE SERIOUS ABOUT FUN!

Software for
Radio Shack's TRS-80
MODELS II/12/16

• GAMES • ADVENTURE
• BUSINESS • LANGUAGE
• EDUCATION

CALL OR WRITE FOR FREE
BROCHURE AND MORE INFORMATION

Rizzo Data Systems Corp.

577 Burlington Rd., P.O. Box 458
Bridgeton, NJ 08302-0356
609/451-7979 ✓518

Personal computer users:

FOR FREE ACCESS TO A BETTER JOB CALL CLEO.

(213) 618-8800 (408) 294-2000
(415) 482-1550 (714) 476-8800
(619) 224-8800 (818) 991-8900
Standard ASCII code
Access assistance:
(213) 618-1525

✓336

CLEO
Computer Listings of Employment Opportunities

FOR TRS-80 MODELS 1, 3 & 4
IBM PC, XT, AND COMPAQ

The MMSFORTH System. Compare.

- The speed, compactness and extensibility of the MMSFORTH total software environment, optimized for the popular IBM PC and TRS-80 Models 1, 3 and 4.
- An integrated system of sophisticated application programs: word processing, database management, communications, general ledger and more, all with powerful capabilities, surprising speed and ease of use.
- With source code, for custom modifications by you or MMS.
- The famous MMS support, including detailed manuals and examples, telephone tips, additional programs and inexpensive program updates, User Groups worldwide, the MMSFORTH Newsletter, Forth-related books, workshops and professional consulting.

MMSFORTH

A World of Difference!

- Personal licensing for TRS-80: $129.95 for MMSFORTH, or "3+4TH" User System with FORTHWRITE, DATAHANDLER and FORTHCOM for $399.95.
- Personal licensing for IBM PC: $249.95 for MMSFORTH, or enhanced "3+4TH" User System with FORTHWRITE, DATAHANDLER-PLUS and FORTHCOM for $549.95.
- Corporate Site License Extensions from $1,000.

If you recognize the difference and want to profit from it, ask us or your dealer about the world of MMSFORTH.

MILLER MICROCOMPUTER SERVICES
61 Lake Shore Road, Natick, MA 01760
(617) 653-6136

✓137

SATISFIED WITH YOUR TRADING PROFITS?

MAKE MONEY IN ANY MARKET
BELIEVE IT.

Especially designed for traders who desire a special look at continuous performing stocks. Computer will pay for itself while you minimize risks and multiply profits.

Buy the strongest stocks

WRITE FOR OUR FREE LITERATURE
EXPLAINING THE CONCEPT

Master Stock Service
409 East End Ave., Pgh., PA 15221

✓197

TRS-80* SOFTWARE

Write for our incredible catalogue of over 100 pages, containing hundreds of programs for the Model I, III, and Color Computer. Catalogue is $5.00 refundable on your first order. All software is unconditionally guaranteed for life!! Canadian manufacturer and distributor for Mollmerx Ltd. of England.

DEALERS WELCOME

GAMES/DOS/UTILITIES/
BUSINESS PROGRAMS

*LDOS	$159.95	*POWERMAIL PLUS	$199.95
*MULTIDOS	$129.95	*AIRBUS	$ 41.95
*ACCEL 4	$139.95	*DATA WRITER	$189.95
*FROGII	$ 23.95	*DRIVER COMPILER	$ 43.95
*JUMBO	$ 40.95	*ENIGMA	$ 36.95

FULLY SUPPORTED
COMPUTER SOFTWARE
*Trademark of Tandy Corporation

JSOFT

P.O. Box 1437, WINNIPEG, Manitoba R3C 2Z4
(204) 942-0963 CANADA

✓177

TABLES & SUCH

A line of solid computer furniture of sufficient size to accomodate your computer with space for your working papers. Designed to be lifted apart for easy cleaning, moving or storage.

The hardwood veneered tops of oak or birch are trimmed with select 11/2" hardwoods. The basic computer table top is 26" x 48" with the printer tabletop of 18" X 24".

Unfinished, the computer table is $90.00 and the printer table is $60.00. Finshed, the computer table is $120.00 and the printer table is $90.00. Plus shipping.

For further information or to order write or call:

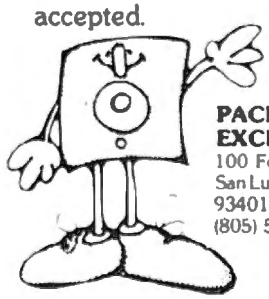
Wooden Hen
4665 Ruhle Rd.
Coleman, Michigan 48618
(517) 465-6441

✓79

TDK flexible disks

Call Free **(800)235-4137**
for prices and information.
Dealer inquiries invited.
C.O.D. and charge cards accepted.

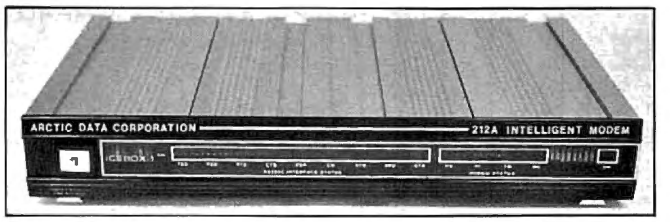
VISA



PACIFIC EXCHANGES
100 Foothill Blvd
San Luis Obispo, CA
93401 (In Cal call
(805) 543-1037)

✓207

✓ See List of Advertisers on Page 227



The Icebox 1, 300/1,200 baud modem, has dual host and dual printer capability.

Software offers technical support for its fantasies but cannot guarantee specific outcome.

Devolutionary Software

Humus Software Corp. announces the release of 3-2-1, the world's first segregated software package. 3-2-1 includes a database manager, a spreadsheet program, and a graphics program, separated into three different packages. Each comes on its own disk, and you must manually transfer information from one program to another.

In addition, the special-function keys are entirely different for each program, and you must learn three distinct operating procedures to use the software.

Humus plans three add-offs, called 6-5-4, that will include a word processor, a communications package, and a mailing list program.

Contact Humus Software Corp., 80186 Carbuncular Drive, Cleveland, OH 00000.

Multi-Function Modem

The Icebox 1 212a is an intelligent 300/1,200 baud duplex modem with memory for 52 32-character/digit telephone numbers or log-on messages and five dialing procedures.

The unit distinguishes between a busy signal, human voice, or modem answer tone, and adjusts baud rate according to the receiving modem.

Its host/peripheral switch lets you send data from your terminal to the modem or to your printer. In the dual printer configuration, send data to the modem or to either of two printers. The dual host configuration lets you transfer data to a printer from one host, while another host sends data to the modem.

Priced at $970, the Icebox 1 is available from Arctic Data Corporation, 1839 1st Ave., Prince George, BC V2L 2Y8, Canada, 604-562-5240.

Reader Service ✓ 574

Futures Shock

Futures, a menu-driven game of buying and selling commodities, can take you from rags to riches (or vice versa) on your disk-based 48K Model III.

You choose a cash amount and the game gives you a choice of five commodities, updating the price every minute. You make transactions or check on a commodity's past history.

UNINTERRUPTIBLE POWER SYSTEMS BY SUN RESEARCH

For complete protection from **Blackout, Brownout, Surge** and **Spike** specify a **MAYDAY** Uninterruptible Power System by **SUN RESEARCH.**

Eliminate costly downtime and lost data caused by those momentary power losses. Protect your software and hardware from damage caused by sudden drops in line voltage. Isolate your computer system completely from the AC wall circuit with a **MAYDAY** continuous (On-Line) Uninterruptible Power System. Give all your components clean 60Hz sine wave power for efficient operation at a price you can afford.

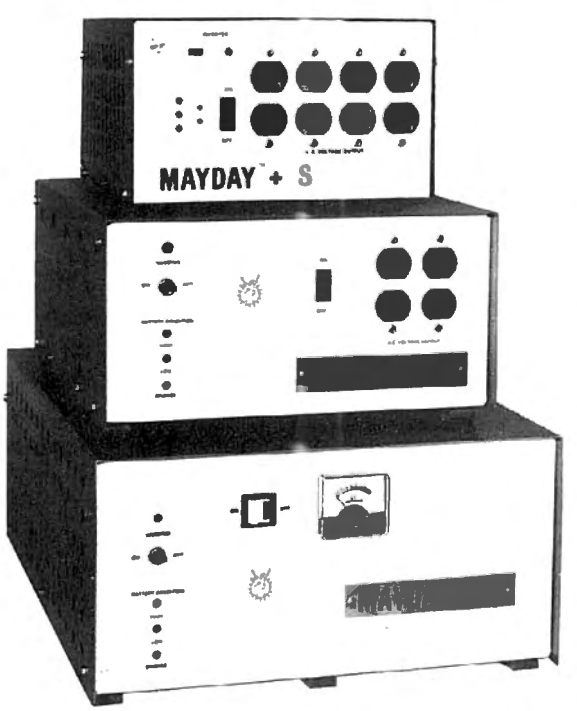
MAYDAY™ UNINTERRUPTIBLE POWER SYSTEMS BY SUN RESEARCH

Available in 150, 300, 600, 1000 and 1500 VA Capacities.

Call 1-603-859-7110

MAYDAY™ Division
SUN RESEARCH, INC.
Old Bay Road
Box 210
New Durham, N.H. 03855

✓285



The more you play the faster you get.

A special surprise option makes the game tougher—entering anything from mother nature to your last living relative to complicate matters.

Futures costs $20. For ordering information contact Fireside Software, RR1 Box 53, Bonaparte, IA 52620, 319-592-3287 evenings.

Reader Service ✓ 553

Maxi Host

MicroTechnics (6780 Laronda, Las Vegas, NV 89115, 702-459-6376) is marketing an RS-232 serial communications driver written in Z80 machine language that goes beyond the duties of your everyday host. Maxihost ($39.95) for 32K Model I/III/4 systems, lets you operate bulletin board systems, data processing, and other computer tasks from a remote terminal.

You control Maxihost from within a program or by executing time options. MicroTechnics supplies custom configuration support software on the disk.

Reader Service ✓ 563

Built for Speed

Four software packages that provide speed-up routines for Basic and extra features for your Model I/III/4 disk system are available from The Software Factory.

AutoPaws ($14.95) prevents data from scrolling off the screen. Press the enter key to clear the screen and continue the scroll, or

An Easy Way to Save Storage Space

Run out of computer storage space less often. Learn how to do it yourself. SAVE $20!

DATA COMPACTOR for TRS-80 is a manual-and-disk combination that teaches the techniques of writing BASIC programs that increase the effective data storage capacity of your computer memory, tape, floppy or hard-disk.

Live demonstration programs & ready-to-use mergeable subroutines on disk that increase alpha & numeric data storage capacity in the range of 25 to 166-2/3% without using machine-code. Routines can be merged into user's programs.

$89.97 for models III/4. $74.97 for models 11/12/16. Specify TRSDOS or CPM. Add $2 for USA S & H
(SC residents add state sales tax.)

Save $20 by enclosing a copy of this ad with the publication date visible within 30 days.

Available for other computers, IBM, Rainbow, etc. - Inquire

VISA, MC & AMEX (include number & validation date)
Telephone: 1-803-788-1557

EDWARDS & ASSOCIATES ✓435
P.O. BOX 42158
COLUMBIA, SOUTH CAROLINA 29240 USA

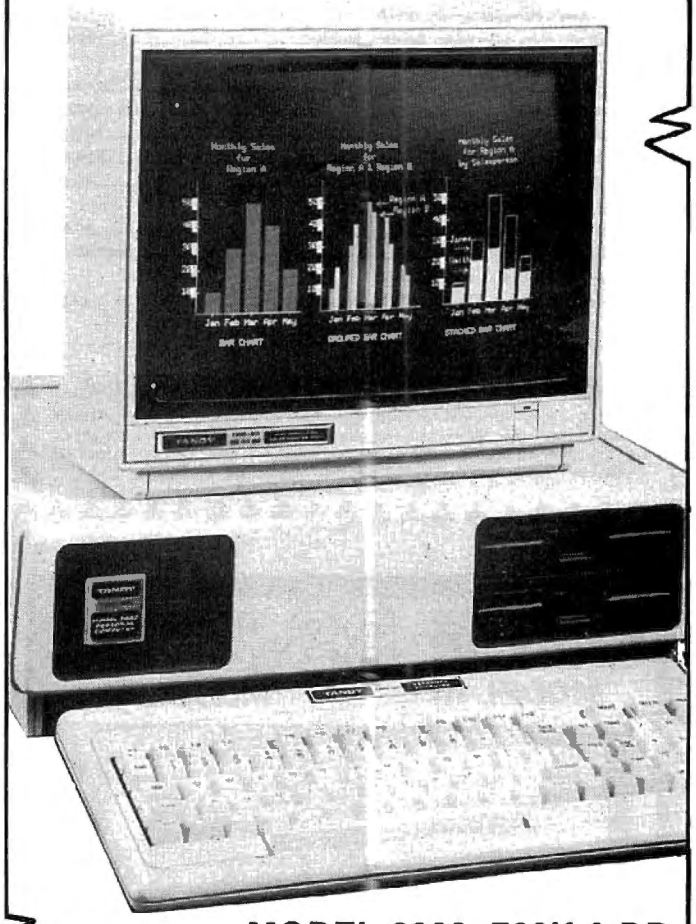
TRS-80®

WILL YOU PAY TOO MUCH?

CAN YOU BUY DIRECT?

Ask About Our "30 DAYS Buy-Back-Policy"

WARRANTY:
the RADIO SHACK warranty accompanies all R. S. merchandise sold by us.



MODEL 2000. 768K 2 DR.
(10 MEG. HARD DRIVE - BUILT IN).

® TRADE MARK OF RADIO SHACK

SAVE SALES TAX*
PLUS DISCOUNT
*TEXAS RESIDENTS ADD ONLY 4%

FORT WORTH COMPUTERS ✓214

WE ARE SERIOUS ABOUT SAVING YOU MONEY

(Located 30 miles from Fort Worth)
377 Plaza • GRANBURY • NR FORT WORTH, TEXAS 76048
TOLL FREE: 1-800-433-S-A-V-E
Monday thru Friday — 9:00 a.m. to 5:00 p.m. Texas Time
(Order Inquiries/Customer Service &) IN TEXAS:817-573-4111

✓ See List of Advertisers on Page 227

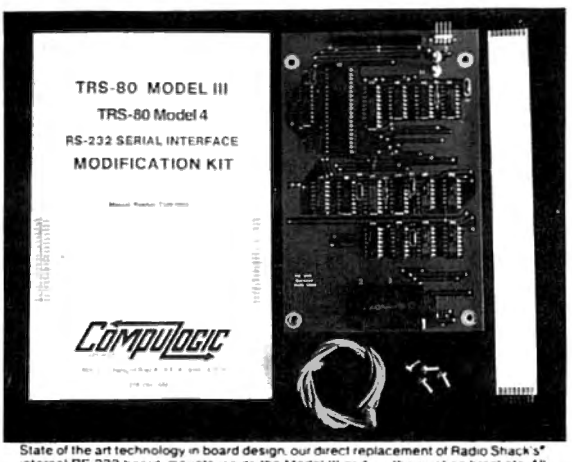
OMNITEK COMPUTERS INTERNATIONAL, INC.
1300 MAIN STREET TEWKSBURY, MASS 01876
617-851-4580 ⌐195

Okidata Microline 82A	359.00
Okidata Microline 83A	549.00
Okidata Microline 92 (160 C.P.S.) corresponds mode	449.00
Okidata Microline 93	699.00
New RX-80 Printer	269.00
13" Green Monitor	99.00
B.M.C. 13" Color Monitor	249.00
Epson FX80 FT	539.00
Epson MX-100	579.00
Columbia (IBM compatible)	CALL
Call for Actrix Portable, Epson, QX10	
40 track economy drive Power Supply with case	179.00
Tandon drives with Power Supply and case	
40 track singlehead	249.00
dual head	339.00
80 track singlehead	299.00
dual head	399.00
5.25" Power Supply and case	45.00
*BASF 40 track D.D. 5¼" new disk drive, as is, no return	89.00
8" Power Supply and case	80.00 or 10 for 650.00
Call for popular D.W. Printer Prices	
Full Commodore Line	CALL

OMNITEK COMPUTERS INTERNATIONAL, INC.

TRS-80 is a reg. trademark of Tandy Corp. Prices are for mail order only TERMS Check, money order, Mastercard and Visa accepted F.O.B. Tewksbury-freight extra. Minimum $5.00 S & H. Mass residents add 5% sales tax. Write for FREE CATALOG

THE RS-232
MODEL III **MODEL 4**



State of the art technology in board design, our direct replacement of Radio Shack's* internal RS-232 board mounts inside the Model III or 4 on the existing brackets. All cables, screws and complete mounting instructions are included. Non-technical people will find that installation is quick, straight forward and simple requiring less than 15 minutes to complete.

Total compatability with Radio Shack* and all existing software is maintained. Software programmable baud rates from 50 to 19,200 baud are supported along with programmable word length, stop bits, and parity. May be utilized in either half of full duplex operation.

Outstanding Value
At Only $69.95
Guaranteed One Full Year
Dealer Inquiries Invited

CompuLogic
1831 SOUTH HAMPTON RD. LB41
DALLAS, TEXAS 75232
214/330-1332

Please forward payment by a cashier's check or money order.
Visa or Mastercharge also accepted.
Add $3.00 shipping & handling
(Foreign orders quoted on request)

⌐86

press the spacebar to scroll one line at a time. You can install the software in a build file.

The Fast4 package ($14.95) operates your Model III software on the Model 4 at full speed. Unlike POKE commands, Fast4 maintains clock accuracy and doesn't affect character width or special characters. It includes an option to switch between two display pages.

UtiliPak ($24.95) is a baker's dozen of assorted utilities including input/output filters, command files, and machine-language speed-up routines.

MenuGen ($54.95) is a multiple-DOS, menu-generating system for the Model III with a graphics editor and Basic speed-up routine. It lets you integrate applications programs from different sources into a single menu-driven system.

For more information, write The Software Factory, 12101 N. Western View, Oklahoma City, OK 73132, CompuServe I.D. number 73105,1650. Add $3 per order for postage and handling.

Reader Service ✓ 564

Profile Plus to Go

Now you can access your Model II Profile Plus while you're on the road or working at home. Industrial Standard Software's package, Comm-100 ($120) lets you access your data base over a phone line with a Model 100 and an auto-answer modem.

It gives you the power to read data formats from Profile, define a screen for the Model 100, and inquire, update, or add to your Profile disk.

Other features let you use up to five screen formats, 84 fields per screen format, 84 search categories, and password protection.

For product information, write Industrial Standard Software Sales, 6043 Hudson Road, Woodbury, MN 55125, 612-738-7852.

Reader Service ✓ 566

Screen Clean System

The CRT ScreenSafe System ($12.95) from Falcon Safety Products, Inc. (Dept. V, 1065 Bristol Road, Mountainside, NJ 07092) removes oil, grime, fingerprints, and smoke particles from CRT screens.

The system contains a 4-ounce bottle of optical-grade cleaning solution, a packet of 6- by 6-inch special wipes, a 3-ounce can of Dust-Off, and pamphlet.

Reader Service ✓ 572

The ScreenSafe System is a complete cleaning and maintenance kit for CRT screens.

General Ledger

Super-G/L ($185) a Model I/III/4 general ledger or accountant's client write-up system, supports up to 500 six-digit account numbers with an optional two-digit department suffix. It validates account and department numbers in high memory using machine-language routines.

Other features include user-defined financial statement formats and ratios, optional data-file security, and scheduling of accounts. Super-G/L integrates with

COLOR LOAD 80

Enjoy Color Load 80 cassettes and get the best in games, utilities, business, and educational programs for your TRS-80 Color Computer.*

Avoid typing in long, time consuming programs. Avoid typing errors. Build your own library. Get more exciting programs.

You'll agree that our programs are better because you get more—from Astronomycal to Zeroram—from word processing to income tax. You'll have more fun with games and graphics. You'll get more from mailing lists to music. And, you'll get more programs per tape—at less cost per program.

Don't miss the best color programs on the market. Refer to corresponding issues of 80 Micro for full instructions and program descriptions. You'll be up and running in no time.

Add color to your life *today*. Just fill out the order form and send it to us at—Load 80, 80 Pine St., Peterborough, NH 03458. Or, color your life more quickly by calling us toll free at 1-800-258-5473 (in New Hampshire call 1-924-9471).

* TRS-80 Color Computer is a Trademark of Tandy Corp.

Yes! Send me COLOR LOAD 80

- ☐ 1st Color Volume (Jan., Feb., March) @ $11.47
- ☐ 2nd Color Volume (Apr., May, June) @ $11.47
- ☐ 3rd Color Volume (August, Sept., Oct.) @ $11.47
- ☐ "Best of '82" @ $16.47

Price includes postage and handling. Foreign Air Mail please add $.45 per item for postage and handling. U.S. Funds drawn on U.S. Bank.

☐ Check/MO ☐ MC ☐ VISA ☐ AE

Card # _____ Exp. date _____

Signature _____

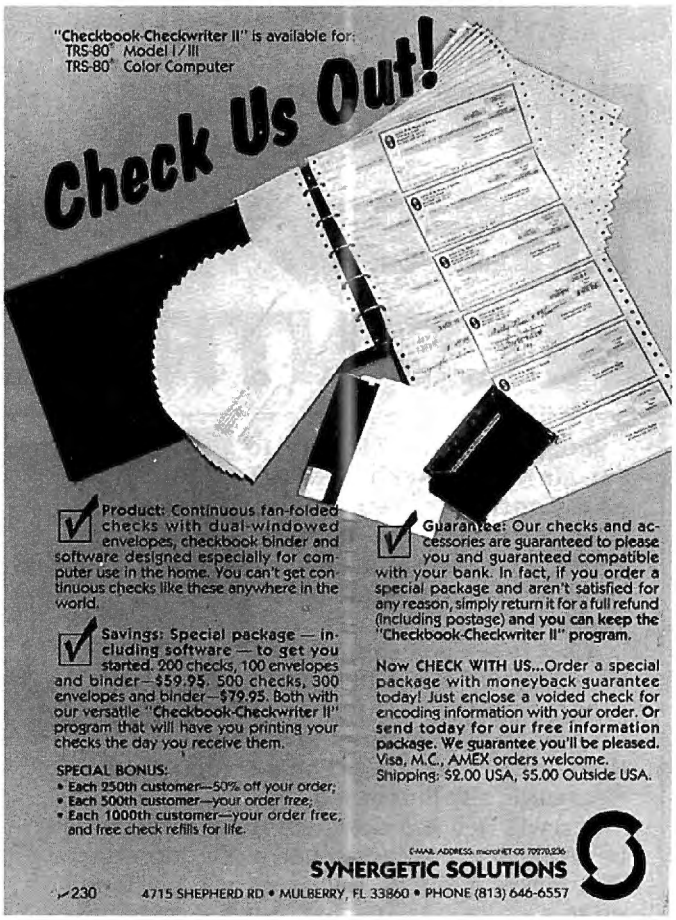
Name _____

Address _____

City _____ State _____ Zip _____

CL-8404

COLOR LOAD 80
80 Pine Street • Peterborough, NH 03458



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.

E-MAIL ADDRESS: microNET-OS 70970,836

SYNERGETIC SOLUTIONS

230 4715 SHEPHERD RD • MULBERRY, FL 33860 • PHONE (813) 646-6557

MODEL 100

3-D GRAPHICS!!!

One of the newest and most exciting advances of the computer revolution is now available for the Model 100 16K and over — exclusively from ALPHAWARE. With **3-D GRAPHICS,** you can draw a figure on the screen, enlarge it, reduce it, or rotate it in any direction by any degree, all with a 'computer-accurate' perspective of depth. Included with the program is a supply of plotting charts and a complete, example-oriented users manual that's basic enough for the beginner but extensive enough for the long-time user. For the Model 100 owner seeking computer literacy, **3-D GRAPHICS** is a MUST!! **USD $49.95**

--ALSO AVAILABLE--

MicroEditor II — a multi-function word processing program with powerful features including an exclusive multiple-data form letter routine. One of the best available. **USD $49.95**

Mail Master — prints mailing labels, sorts mailing lists, prints form letters. MicroEditor II compatible. **USD $29.95**

M100 Cassette Log — a convenient way to organize your cassette files. 50 pages/pad, enough for 50 tapes. **USD $3.50**

ALPHAWARE
INCORPORATED
2100 South Boulevard • Edmond, OK 73034

See List of Advertisers on Page 227

Wayne green books

PUT YOUR TRS-80* IN CONTROL

Interface your TRS-80 to outside devices with ***TRS-80 as a Controller.*** You can use your computer to control lights, switches, and even a small computer you build yourself.

All it takes is a minimum knowledge of electronics and programming. Circuits are simple. Most programs are fewer than fifteen lines long. The instructions are clear and fully illustrated.

Jerry O'Dell has designed these projects to be both easy and inexpensive. You don't need disk drives, plotters, digitizers or other fancy units.

All you need is a TRS-80 Model III with 16K RAM, Level II BASIC, and a few other parts that you will no doubt find useful at a later date. You can also use a Model I, with the conversions provided. The components you'll need are all readily available.

The book begins with a description of the Model III and Z80 and all the chips, circuits, prototyping boards, and other devices used in TRS-80 interfacing. There are also helpful suggestions throughout for expanding the projects into more complex applications.

BK7394 $12.97 softcover ISBN 0-88006-061-1
7 by 9 224 pp. Wayne Green Books 1983

For credit card orders, call **TOLL-FREE 1-800-258-5473** or mail your order with payment of $12.97 each plus $1.50 per book shipping and handling to: Wayne Green Books Sales, Peterborough, NH 03458.

* **TRS-80 is a trademark of the Radio Shack division of Tandy Corp.**

Put my TRS-80 in control. ✓93

Please rush me _____ copies of **TRS-80 as a Controller** (BK7394) at $12.97 each.

☐ Enclosed is $12.97 per copy plus $1.50 each for shipping and handling.

☐ MASTERCARD ☐ VISA ☐ AMEX MC bank #_____

Card #_____ Expires_____

Signature_____

Name _____

Address _____

City _____ State_____ Zip_____

All orders shipped UPS if complete street address is given.
Wayne Green Books Peterborough, NH 03458 344B8C

NEW PRODUCTS

the Super-P/R payroll system, and is available through Microcomputer Applications, 3485 Mock Orange Court S., Salem, OR 97302, 503-364-1090. Add $2.50 shipping.

Reader Service ✓ 573

More from Less

Increase your computer's memory, tape, floppy- or hard-disk capacity by 25 to 166.67 percent by using less space to store data. Data Compactor, a how-to manual with disk, contains 26 demonstration programs and 28 mergeable subroutines using Basic source code for the Disk Basic interpreter. Many principles apply to other languages such as Cobol, Fortran, PL/1, and Pascal.

Included are non-system disks for the Model III/4/4P ($69.97) and Model II/12/16/16B ($74.97) containing all demonstration programs and subroutines. These are also available in CP/M formats.

Write or call Edwards & Associates, P.O. Box 42158, Columbia, SC 29240, 803-788-1557.

Reader Service ✓ 567

Stand Up

This Model 100 desktop stand improves the typing and viewing angle, and cuts reflective glare from the LCD display. It fits neatly around the computer,

DIFFERENT TRACK

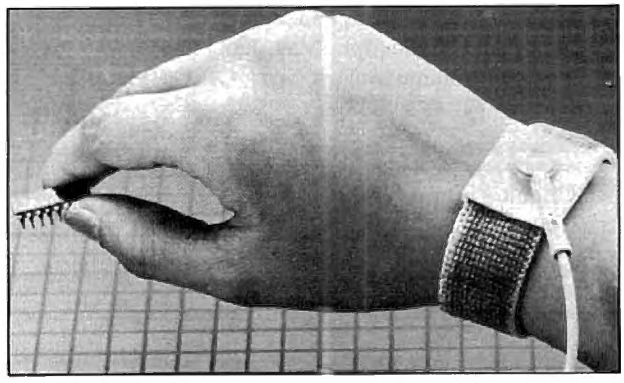
You're Grounded!

The perfect gift for the hacker who has everything is this athletic-looking, conductive wrist band. The elastic polyester ¾-inch band fastens with a hook and loop for a comfortable, snug fit on the wrist. It is available in two color-coded sizes: brown for wrists up to 6½ inches in diameter, and blue for wrists up to 8 inches around.

It creates less than 10^3 ohms resistivity on the interior. A coiled grounding strap with a 1 megohm resistor snaps on the top of the band. Straps are available in 4- and 6-inch lengths.

Aptly named the CP407 Elastic Wrist Band, the 6½-inch band with 4-foot grounding strap sells for $15. For ordering information contact Charleswater Products Inc., 93 Border St., W. Newton, MA 02165, 617-964-8370.

Reader Service ✓ 560



Don't let hardware repair become a shocking experience.

NEW!

"Where *is* that Movie?"

Find it quickly, easily with

VIDEO TAPE TRACKER

Takes the work out of managing your video library: easy to use • stores over 1,000 titles • prints numbered labels • lists by tape and/or title • searches by tape, title, or performer • very fast • ready to use

TAPE TRACKER is a real time saver, and the price is right. Make your life easier, order today, toll free

(800) 824-7888, oper. 422

PLEASE SPECIFY:
IBM PC 64K, 1 disk
—or—
TRS-80 I or III 48K, 2 disks

ALL THIS FOR ONLY:
$39.95

PROSOFT ✓51
Dept. , Box 560
No. Hollywood, CA 91603
(818) 764-3131

TERMS VISA MC checks COD Please add $2.00 shipping in U.S. or Canada. $5.00 overseas. Sales tax in CA. Most orders filled within 48 hrs.

WAIT NO LONGER

Whether you need the full power of a debugging monitor, or just a few simple commands, "CMON" is for you. Check out these features.

FEATURES: STANDARD MONITOR COMMANDS + USER PROGRAM EXECUTION WITH REGISTER DISPLAY. RAM, ROM BREAKPOINTS. READ — WRITE OBJECT FILES TO DISK. DISPLAY TO CRT OR PRINTER. AND MORE.

Available on non-system disk or cassette. Specify media type and M1-M3 format. Cost is $23.00 pp.

NEW !

Need to read/write an object files from/to disk. Then these programs are for you. Package includes disk read/write routines, plus misc. utility subroutines. Included are discriptions of the read/write routines. Supplied in manual form only for $12.00 pp.

TERMS: Money order or cashiers check. Allow 2 weeks on personal checks. VA residents please add 4% sales tax.

THREE STATE DATA
14453 TURIN LANE
CENTREVILLE, VA 22020
✓72

"Any other Pascal is too much hassle!"

Picture this: you want to make a change in a 1000 line Pascal program. You read the source code from disk into a full screen editor and make your changes. You type control Q to quit the editor and R (for run). In 15 seconds, without further disk access, your program has compiled and is executing.

Pascal 80 is so interactive and easy to use that many people have given up Basic completely, even for hasty ten line programs! We do trade some power for interactivity, but at this price you can use **Pascal 80** as a "front" end for another system to have both ease of use and power. Many of our users develop and test their software with **Pascal 80,** then recompile our source code on another system.

Thousands of satisfied users worldwide! (We have a liberal return policy and have had only 2 returns per thousand copies sold.) Many top universities use **Pascal 80** to teach Pascal. (Names on request)

Features — Standard Pascal, writes ASCII source, p-code and com files. Full screen editor, compilation from memory or disk, include function. Pointer variables are addressable (like C). Limitations — Variant records, with, and page not implemented. Mark and release instead of Dispose.

PASCAL 80CPM —
***Special introductory price* — $39.95**

Requires CP/M 80. 8"SSSD, Epson, Kaypro, Apple CP/M, Morrow formats available. Call for information on other formats. Free brochure on request.

✓255

NEW CLASSICS SOFTWARE

239 Fox Hill Road
Denville, NJ 07834
201-625-8838

See our other ad for TRSDOS version

ASSEMBLIT MEMORY UPGRADE KITS

64-128K	For the Model 4, Includes PLA.	$85.95
16-64K	For the Model 4.	$59.95
16-64K	Upgrade for any rev. CoCo! (May require some soldering.)	$64.95
16K SETS	For the Model 3.	$16.95

Logix is the DISK SOURCE.

NEW! TIGER

Diskettes in red, orange, yellow, blue, green!
Single sided, double density 5¼"
Super excellent quality 6 year guarantee
box of 10 **$ 26.95**

BASF	26.95	3M Scotch	23.95
TDK	26.95	maxell	26.95
		Verbatim	27.95

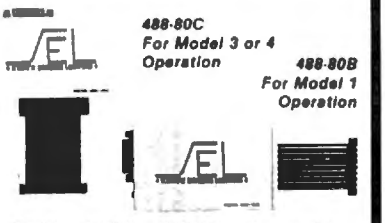
5¼" single sided double density boxes of 10

Add $3.00 shipping. Add $2.10 for Cash COD. Texas residents include 5% Sales Tax. Certified Checks or Money Orders for fastest shipment. Personal Checks subject to clearance.

Logix ✓385
P.O. Box 18982
Austin, TX 78760
1606 Chippeway Lane
Austin, TX 78745
512/445-2275

IEEE-488 TO TRS-80* INTERFACE

Everything needed to add *powerful* BASIC GPIB-488 controller capability to TRS-80 Model 1, 3 or 4, Level 2 or DOS with a minimum of 16K.



488-80C
For Model 3 or 4 Operation

488-80B
For Model 1 Operation

Model 488-80B or 488-80C Price: $425
+ shipping, insurance & tax

WHEN ORDERING SPECIFY DISK OR TAPE

SCIENTIFIC ENGINEERING LABORATORIES
11 Neil Drive • Old Bethpage, NY 11804
Telephone: (516) 694-3370
✓203

**Trademark of Tandy Corp*

There is no affiliation between Scientific Engineering Laboratories and Tandy Corp. or Radio Shack.

Best Prices On TRS-80 Computers

Our 7th year of discounts
Ed or Joe McManus
Fgt. Prepaid. Save Tax.
Toll Free 800-231-3680

Marymac Industries, Inc.
22511 Katy Fwy., Katy
(Houston) Tx 77450
1-713-392-0747
Telex 774132

See us in the Wall Street Journal every Tues. and Thurs.
✓250

PROGRAM ***eXchange*** / ORION SYSTEMS INC.

TRADE YOUR USED, UNWANTED (GOOD CONDITION) SOFTWARE FOR SOFTWARE NOT IN YOUR LIBRARY. WE HAVE GAMES, EDUCATION, AND BUSINESS SOFTWARE ☆ IN STOCK ☆ DON'T SPEND $20 $30 $40 OR MORE WHEN YOU CAN EXCHANGE PROGRAMS FOR ONLY

☆☆☆ $7.95 ☆☆☆

For more information:
ORION SYSTEMS INC.
12275 59th STREET N.
ROYAL PALM BEACH, FL 33411
✓108

✓ See List of Advertisers on Page 227

YORK 10™ CASSETTES

COMPUTER GRADE DATA TRAC BLANK CASSETTES

C-05, C-06, C-10, C-12, C-20, C-24, C-32

From the leading supplier of Computer Cassettes, new, longer length C-12's (6 minutes per side) provide the extra few feet needed for some 16K programs.

- **BASF-LHD (DPS) world standard tape. Premium 5 screw shell with leader.**
- **Internationally acclaimed. Thousands of repeat users.**
- **Error Free • Money back guarantee.** ✓156

500 C-12's or C-10's — 38¢ each
(w/labels, add 4¢ • Shipping $17./500
500 Boxes 13¢ ea. • Shipping $10./500
(Free Caddy offer does not apply)

CASSETTE STORAGE CADDY $2.95
Holds 12 cassettes w/o boxes
Includes edge labels and index card

FREE
1 CADDY WITH EVERY 4 DOZ. CASSETTES PURCHASED
(does not apply to 500 quantity offer)

NEW **TRACTOR FEED • DIE-CUT BLANK CASSETTE LABELS**
WHITE: $3.00/100 $20.00/1000
COLORED LABELS • Pastels - Red, Blue, Green, Yellow, Lavender
$4.00/100 $30.00/1000

VISA **Call: 213/700-0330** for IMMEDIATE SHIPMENT on Credit Card Orders MasterCard

ORDER NOW . . . MAIL TO . . . **YORK 10™** 9525 Vassar Ave. #80 Chatsworth, CA 91311

ORDER FORM

ITEM	1 DOZEN	2 DOZEN	TOTAL
C-05	☐ 7.00	☐ 13.00	
C-06	☐ 7.00	☐ 13.00	
C-10	☐ 7.50	☐ 14.00	
C-12	☐ 7.50	☐ 14.00	
C-20	☐ 8.75	☐ 16.50	
C-24	☐ 9.00	☐ 17.00	
C-32	☐ 11.00	☐ 21.00	
Hard Box	☐ 2.50	☐ 4.00	
White Labels	☐ 3.00/100	☐ 20.00/1000	
Colored Labels Color	☐ 4.00/100	☐ 30.00/1000	
DESCRIPTION	PRICE	QUANTITY	
Storage Caddy	2.95		
		SUB TOTAL	
Calif. residents add sales tax			
Shipping/handling (any quantity — using prices above)			3.50
Outside 48 Continental States — Additional $1 per caddy; per doz. cassettes or boxes.			
		TOTAL	

#80

Each cassette includes two YORK 10 labels only. Boxes are sold separately. We prefer to ship by UPS as being the fastest and safest. If you need shipment by Parcel Post, check here ☐.

NOTE: Additional charges outside 48 Continental States. Shipments to AK, HI, and USA possessions go by Priority Mail. Canada & Mexico— Airmail; All others— Sea Mail.

Ask about our DUPLICATING SERVICE

CHECK OR M.O. ENCLOSED ☐ Charge to Credit Card: VISA ☐ MASTERCARD ☐
☐ PLEASE SEND QUANTITY DISCOUNTS

Card No. _____ Exp. _____

Name _____

Address _____

City _____ State/Zip _____

Signature _____ Phone _____

Computer make & model _____ Disk? (y/n) _____

doubling as a protector when carried in a briefcase or bag.

The Poco stand sells for $17.95 (add $2 shipping) from Diskus Products, 6003 Bandini Blvd., Los Angeles, CA 90040, 213-726-3088.

Reader Service ✓ 568

Line Interrupt

Lapcom, a Model 100 telecommunications utility, lets you view, copy, and kill files, and check free memory space without disconnecting the phone line.

Menu and function keys give you quick access to operations—including displaying the file directory, executing Basic commands, or checking the time. It not only automatically calls and disconnects, uploads and downloads files, and directs output to the printer, it also displays, stores, and prints text simultaneously while downloading.

These features aid in memory management and control interaction while you communicate with a host computer. An annotated source code is included.

Lapcomm sells for $39.95 on cassette and includes a manual. Write or phone PocketInfo Corp., P.O. Box 152, Beaverton, OR 97075, 503-649-8145.

Reader Service ✓ 569

Educational Software

Diversified Educational Enterprises (725 Main St., Lafayette, IN 47901, 317-742-2690) offers three 32K Model I/III/4 programs for elementary-school students.

Balance ($70), a predator-prey simulation, lets you manipulate food supply, carrying capacity, environmental conditions, and external pressures, and displays results in tabular and graphic output.

Niche ($60), an ecological game, asks students to place one of five organisms in its proper ecological niche, specifying environment, range, and competitor.

Math Skills ($40) contains two programs. Pirate requires the student to use deductive logic and math to find a hidden treasure in a 10 by 10 matrix. Rounding drills a student in rounding numbers. All programs come with a manual and supportive material.

Reader Service ✓ 570

Keyboard Quarterback

Gridiron Offense/Defense ($29.95) is a 32K Model I/III football simulation that lets you call the plays. Analyze and stage your own Super Bowl contest where you pick the teams and plan the strategy based on real statistics.

You can play your favorite professional, college, or high school teams, or create your own dream team using actual or ideal player statistics.

The software supplies data files for all the Super Bowl teams and provides updates. Use your own numbers to prepare a data file for your favorite teams. Then kick off!

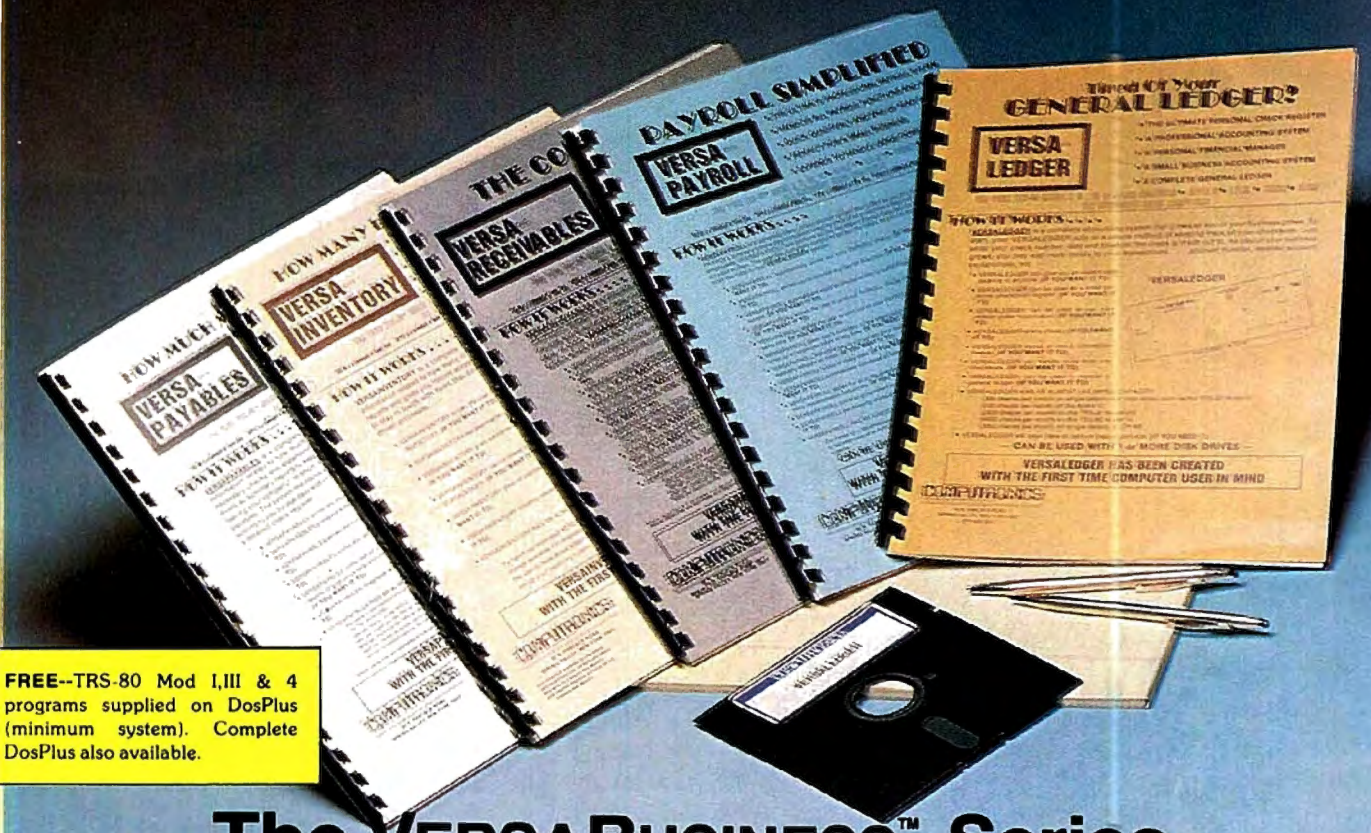
A 16K cassette version ($24.95) is also available from Windcrest Software Inc., P.O. Box 423, Waynesboro, PA 17268.

Reader Service ✓ 571

New Products listings are based on information supplied in manufacturer's press releases. 80 Micro *has not tested or reviewed these products and cannot guarantee any claims.*

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • KAYPRO™



FREE--TRS-80 Mod I,III & 4 programs supplied on DosPlus (minimum system). Complete DosPlus also available.

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.

ERSARECEIVABLES™ $99.95

RSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and nthly statement-generating system. It keeps track of all information related to who es you or your company money, and can provide automatic billing for past due ac- nts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary orts and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

ERSAPAYABLES™ $99.95

RSAPAYABLES™ is designed to keep track of current and aged payables, keeping you touch with all information regarding how much money your company owes, and to om. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, eck registers, vouchers, transaction reports, aged payables reports, vendor reports, d more. With VERSAPAYABLES™, you can even let your computer automatically select ch vouchers are to be paid.

ERSAPAYROLL™ $99.95

RSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that eps track of all government-required payroll information. Complete employee records maintained, and all necessary payroll calculations are performed automatically, with als displayed on screen for operator approval. A payroll can be run totally, automati- y, or the operator can intervene to prevent a check from being printed, or to alter rmation on it. If desired, totals may be posted to the VERSALEDGER II™ system.

ERSAINVENTORY™ $99.95

RSAINVENTORY™ is a complete inventory control system that gives you instant access data on any item. VERSAINVENTORY™ keeps track of all information related to what ns are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts when an item falls below a preset reorder point, and allows you to enter and print oices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints needed inventory listings, reports of items below reorder point, inventory value re- ts, 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.
All CP/M-based Computers must be equipped with Microsoft BASIC (MBASIC or BASIC-80)

To Order:
Write or call Toll-free (800) 431-2818 ⌐9
(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 INC

N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

TRS-80 trademark Tandy Corp. - APPLE trademark Apple Corp. - IBM PC trademark IBM Corp. - OSBORNE trademark Osborne Corp. - XEROX trademark Xerox Corp. - KAYPRO trademark Non-Linear Systems, Inc. - TELEVIDEO trademark Televideo Systems, Inc. - SANYO trademark Sanyo Corp. - NEC trademark NEC Corp. - DEC trademark Digital Equipment Corp. - ZENITH trademark Zenith Corp.

That's what you get with the LNW80 Model 2—undoubtedly the most versatile, powerful and fully equipped microcomputer in its class today. A machine so superior in concept and design, that it will define the standards of microcomputer performance for years to come.

VERSATILITY

The LNW80 2 performs wonders with the most complete library of software available to any microcomputer on the market today. Every LNW80 2 comes complete with this outstanding library of Business Software. **LNW SMALL BUSINESS AND PROFESSIONAL ACCOUNTING SERIES™** General Ledger, Accounts Receivable, Accounts Payable, Payroll; **ELECTRIC SPREADSHEET™; ELECTRIC PENCIL™ WORDPROCESSOR; MICROTERM™ MODEM PROGRAM; CHART EX™ HIGH RESOLUTION BUSINESS GRAPHICS CHARTING PROGRAM; CP/M 2.2®; DOSPLUS™; LNW-BASIC™;MICROSOFT BASIC.™** In addition to a comprehensive line of LNW80 2 Software, it is also fully compatible with software from TRS80® (Models 1, 3, 4), CP/M® and Cromemco® worlds—a capability which gives you access to the most extensive and mature libraries of business, scientific, engineering and entertainment software applications. So no matter how far you expand into user applications, the LNW80 2 will expand right along with you.

POWER

The LNW80 2 performs miracles with the computing power of 96K RAM (standard) of user memory matched with a mass storage capability which handles 5¼" floppy disks and 5¼" hard disk drives. And while the unit comes with built-in controllers for 5¼" and 8" floppy disks (single/double sided, single/double density, up to 4.5 Megabytes capacity), the LNW80 2 also gives you the unique ability to read and write diskettes from a greater variety of other popular computers than does any other microcomputer. So regardless of how big you grow, you will never end up with thumb-twiddling down time while you expand to a more powerful system. The LNW80 2 will always have enough muscle to handle your biggest and toughest jobs.

FULLY EQUIPPED

The LNW80 2 was developed to anticipate the needs of both expansion and compatibility. So the computer was designed with enough built-in features to keep you from having to spend a small fortune as you move down the road to higher levels of user sophistication. Standard features include high and low resolution graphics in both color and black-and-white, an asynchronous serial communication channel, and a wide variety of tape, printer, monitor and hardware expansion ports. In addition, the LNW80 2 contains an array of quality construction features that fully justify its remarkable one-year limited warranty.

So if you're looking for a microcomputer that will satisfy your performance needs as you grow and develop, take a long, hard look at the LNW80 2. It's the one microcomputer built to meet the challenges of tomorrow—for a long time to come.

For more information and the name of the dealer nearest you, write or telephone:

LNW Computers
2620 Walnut, Tustin, California 92680
Telephone: 714/544-5744

SPECIAL ANNOUNCEMENT

80x24 HARDWARE VIDEO NOW STANDARD. MEMORY EXPANDABLE TO 160K.

$1395.* computer keyboard only.

$1995.* computer keyboard, 12" monitor and dual 5¼" single-sided, slimline disk drives.

(*Software not included)

STATE-OF-THE-ART ENGINEERING
STATE OF TOMORROW PERFORMANCE.

LNW COMPUTERS