

Basic Computing

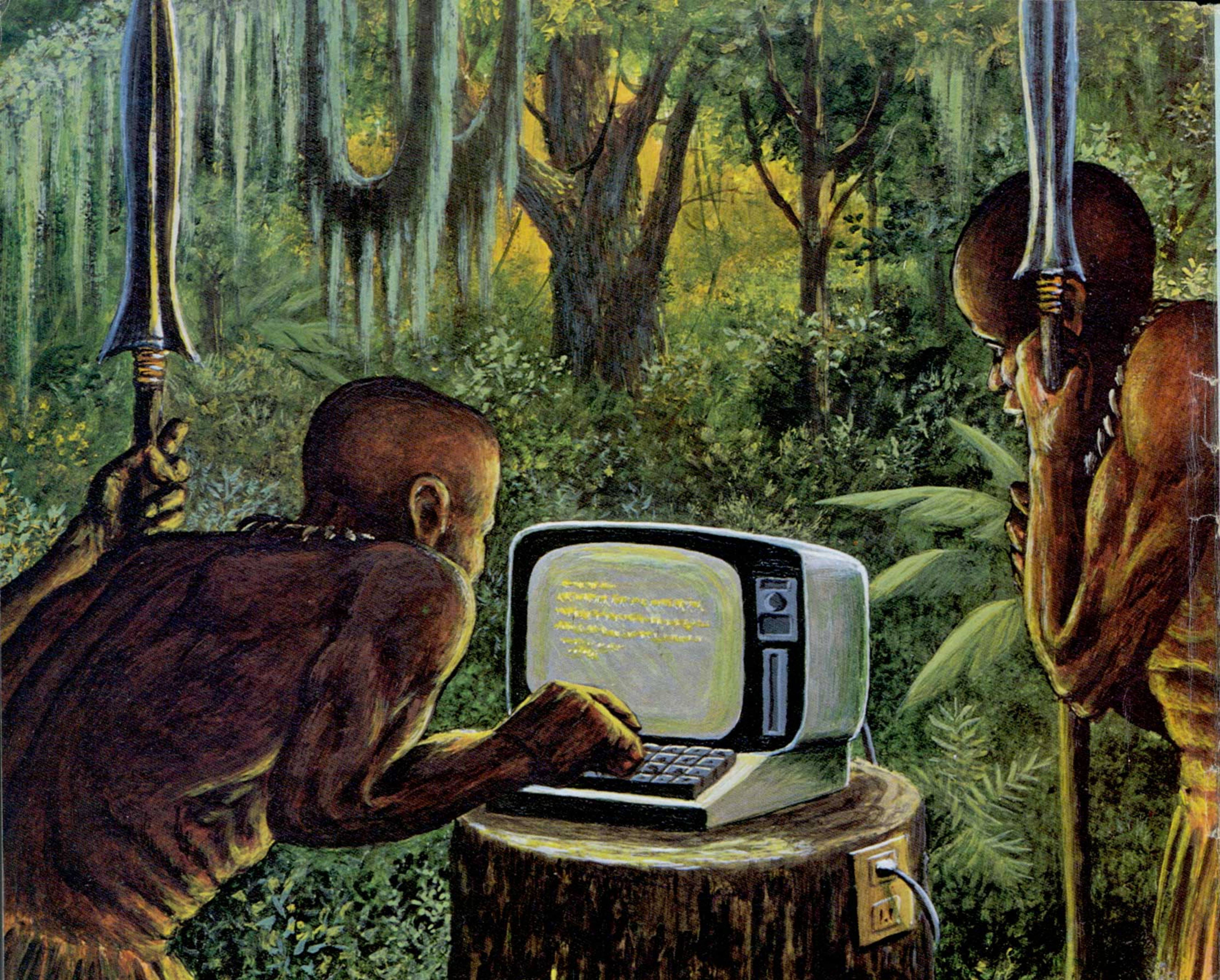
The TRS-80 User Journal

Better than IBM?
Tandy's New Model 2000

- Special Review Section: Compilers, Utilities, Plotters
- Telecommunications: What AT&T's Breakup Means to You
- DOSPLUS IV for the Model 4
- Timelog for Models II/12/16
- Color Computer Game
- Model 100 Expense and Appointment Programs
- Complete 1983 Annual Index
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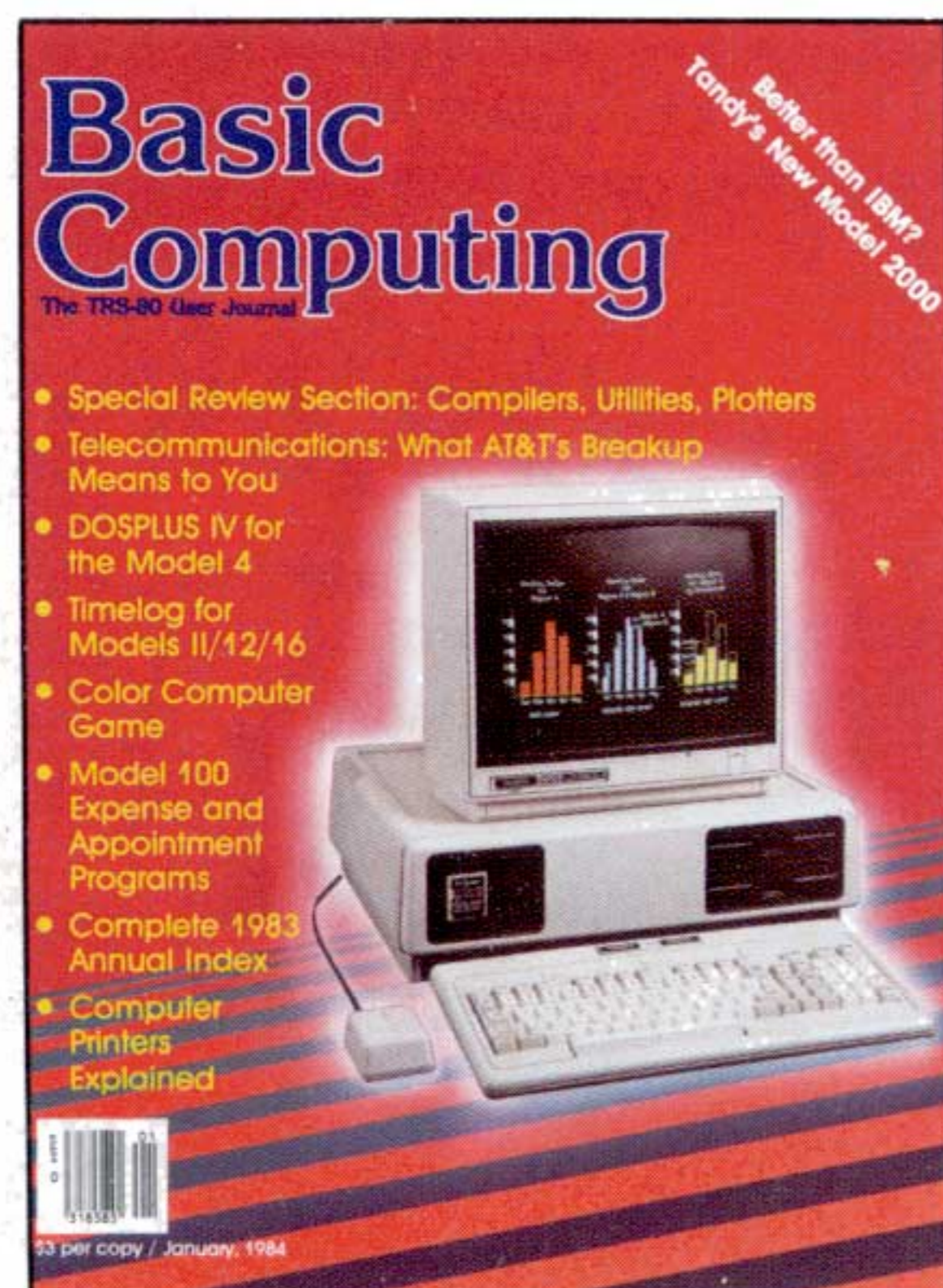
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Our cover shows the new Tandy 2000 microcomputer with its high resolution color monitor. The airbrush background was done by Randy "Tarkas" Hoar of Centralia, WA. Photo courtesy of Radio Shack, a division of Tandy Corporation, Ft. Worth, TX.

Basic Computing

The TRS-80 User Journal

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Vol. VII, No. 1 — January, 1984

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#4

Editorial

Cameron C. Brown

It has been a fascinating year. AT&T is hinting at selling computers and Radio Shack is selling telephones. The FBI is confiscating computers from kids' bedrooms. The President of the United States thinks that the boy in the movie War Games knows a lot about computers. We had numerous rumors that the Japanese were going to wipe out the American computer companies.

If I had to pick one story that typified 1983, it has to be IBM. Their Peanut or PC Junior got more press than almost any presidential candidate, and it had yet to be seen. Until November, IBM didn't say anything about it. They wouldn't even confirm its existence. Hints about its production caused almost every other manufacturer to think twice about their own sales projections. It is to Tandy's credit that they decided to meet the IBM-PC head-on with the Model 2000. The battle lines for 1984 have been drawn.

IBM wasn't the only story. Coleco was able to get the same play for the Adam computer. Story after story told how it was going to take over the low-end home computer market. Prices ranged from \$60 to \$900. One magazine even gave it a cover story and a review. It was on the second page of the review that the author told us he was just working from literature and had not seen a working machine. Coleco even held a press conference with the Adam behind a glass case. Reporters could see it, but not touch it.

Texas Instruments was selling more machines than anyone ever thought possible. It looked like every home would have a TI hooked up to its television. People jumped on the TI bandwagon and found it to be a fast ride to a dead

end. After selling over one million machines and losing over 200 million dollars, Texas Instruments decided to quit the home computer market. One immediate result was that TI stock jumped by 24 points the very next day. Our sympathies to those who tried to develop a magazine or software company for that market.

Many of the companies that advertised with us in 1979 are no longer in business. One of our major headaches is getting a review into print before the company folds its tent. Osborne is out, Lobo is sold, Exatron is sold, Atari may never recover and I have my own doubts about Apple's ability to hold on.

There appear to be two morals here. Consumers should view any purchase in the below-\$1000 market as disposable. If you are happy with your Adam or 99/4A great. If you own a CoCo, it's even better. Our view is that Tandy will be around for a long time.

The other moral is that silence really is golden. I was one of the ones who complained in the early part of 1983 about the lack of Radio Shack's presence in the media. They were never included in market surveys or announcements giving the number of machines sold. Fort Worth was never a topic for the gossip columns about what was coming next. Instead, Tandy just introduced eight new machines. Sure, the Models 4, 4P, 12, 16B, and Color Computer II were improvements to their existing line, but the Models 100 and 2000 are definite proof that they know what will sell now, and in the future. Tandy's board of directors must have big smiles as they look back on 1983. We will have to be content with that. I doubt that we will ever hear them laughing out loud.

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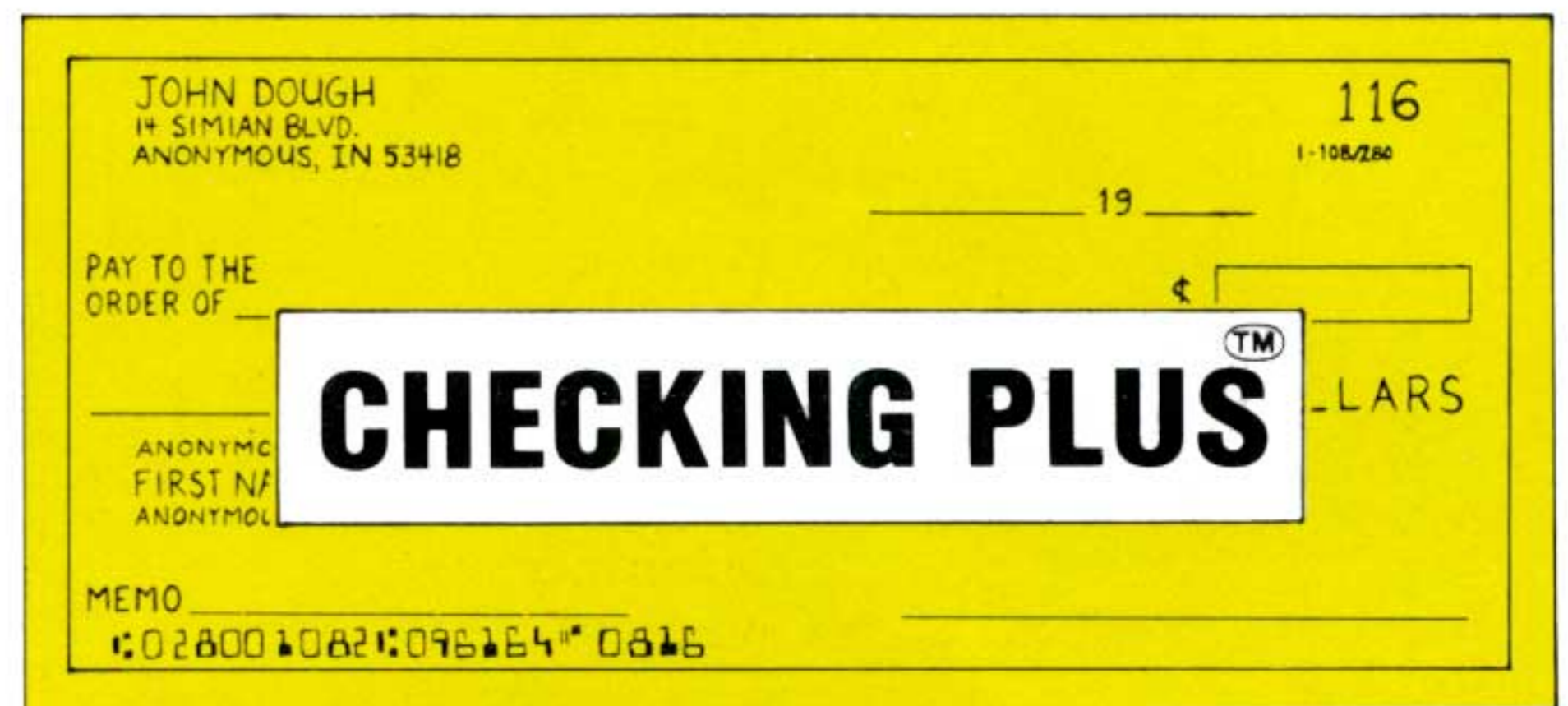
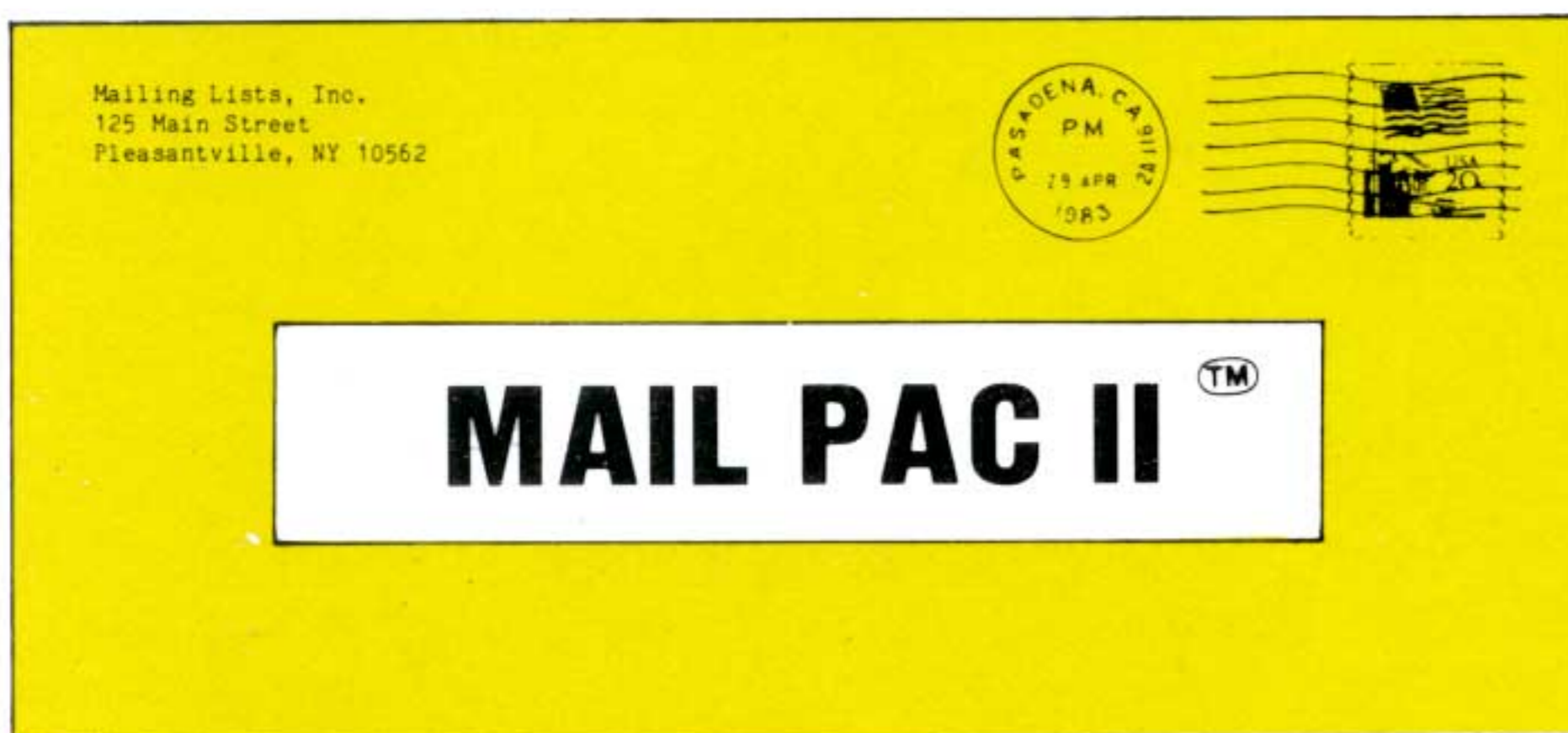
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The TRS-80 User Journal

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Directions

I. Mike Schmidt

This is the time of the year when most editors and publishers make predictions about the industry for the coming year. It's always fun to try to anticipate what will happen.

Last year, I made an easy prediction that Tandy would probably produce some new models in 1983. I was thinking along the lines of maybe one or two. Boy, was I wrong! As soon as that was in print, they announced no less than six machines in the *Wall Street Journal*, and then produced them.

Who would have expected Texas Instruments to drop their home computer line? Our advertising manager left us and started his own TI magazine. He got his first issue out, was starting work on the second when the announcement caught him, and he scrapped the idea.

Last year, I also predicted that there would be many more "load and run" programs, like VisiCalc. That was an easy one, too. The complexion of the typical computer user has (and is) changing. Lotus 1-2-3 and dBase II-types of programs seem to be what the current computerists are after. The numbers of hackers and hardware buffs are diminishing. The computer is moving into middle management as a working tool, not a toy. The under-\$100 computer which hooks to your television will find a place on a garage shelf along with other fads like Odyssey I and II of about ten years ago.

There is going to be a shakeout of computer manufacturers in 1984. With the deregulation of the tele-

phone company in 1984, I fully expect to see AT&T in the computer hardware and software market. Up until now, they couldn't because of government regulation, but don't forget who wrote Unix. If they get into the computer game (and I believe they will), even IBM will have to run hard and fast to keep up.

Speaking of IBM, they will probably forsake MS-DOS for their own operating system. I would expect it to be something entirely different than we have all been acquainted with. It will most likely be upward-compatible with their current applications software.

This year will be a crucial one for the home and small-business computing industry. Look for major changes.

1983 was an interesting year for us. We saw TI fold, *Computer User* start, *80-Micro* was sold, and *80-U.S. Journal* became *Basic Computing*. We have more than doubled our circulation during the year, going from 30,000 copies one year ago to a total circulation of around 75,000. We are now audited by Business Publications Audit of Circulation, Inc. and our reader service is being handled by an agency in Chicago.

This was our first year with a new printer and we were finally on "slick" paper. Our association with Volkmoth Printers of St. Cloud, Minnesota, has been more than rewarding. Our thanks to the whole group back there.

A special thanks to all of you who read our publication and advertise in it. Happy holidays to all of you from all of us at *Basic Computing*.

Letters to the editor

Cameron C. Brown

I must be one of the very few guys who reads your publication and does not own a TRS-80!

I hope that you will not be disturbed by the fact that I own and use an Apple computer, but I find your editorials most enlightening, directed to the interest of all of us with computers. Your interests, and those of your staff, are obviously directed more to the use of computers than in making a buck!

Because I would like to continue reading your editorials and comments, and because I am able to

get good ideas for programs to enter into my Apple (although I have to change the syntax a bit), and particularly because of the neat article by Bud Meyers, "Pictures without Graphics," September, 1983, I would like to subscribe -- if I may.

Paul Raymer
Las Vegas, NV

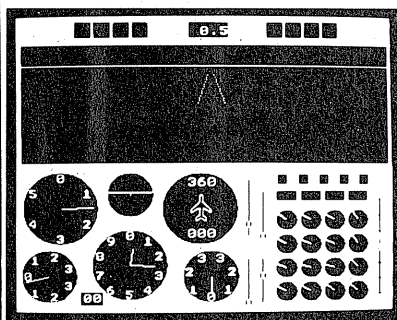
Welcome aboard. We have an excellent article on converting Apple programs to the TRS-80 scheduled for our March issue. It should be helpful to you, although you will have to read it backward. -- Ed.

4 running in Model III mode. We will also be using 1611 to denote a Model 16 running in Model II mode. Perhaps advertisers of TRS-80 software should do the same. --Ed.

A recent word processing review, "Zorloff II," November, 1983, stated that it was the only one outside of CP/M and 400-odd dollars to have separately definable odd and even page headers and footers. In fact, Newsprint has offered this since early 1981, and it sells for \$124.95.

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A problem has arisen and is proliferating regarding TRS-80 software advertising. Software being advertised as useable on the Model 4 is found to be a Model III version and not useable on the Model 4 at all. I know that a Model III version of a program will run on that side of my Model 4. When I order a Model 4 version of a program, I want to have an 80 x 24 character screen, and when appropriate, reverse video, 128K capability, sound, and use of the function and control keys.

At this time there is a paucity of Model 4 software, but each month there are more advertisements. The difficulty is in determining which are true Model 4 programs. If I have a choice, I will not buy a Model III program if a Model 4 version is, or will be, available soon.

Marvin E. Decker
San Antonio, TX

We have found the confusion to exist among other readers as well. We have taken steps to correct that. From now on, the notation 4111 will be used in our articles to denote a Model

I have sad news for Mr. Diagle of Antioch, CA. He wrote about his LP VII and its hang-ups, (Letters to editor, November, 1983). I went through all the same problems with mine. The manual tells you not to use paper heavier than 15 pounds. I did that and it still had problems. Using labels? Forget it, they keep peeling off at the ribbon area. I switched to an Epson RX-80. . . the best solution is to get a new printer.

Dr. S. J. Tassinari
St. James, NY

We had some other responses regarding the LP VII's inability to print labels or multi-part forms. All reported the same solution, get a different printer. --Ed.

Regarding the review of Number Cruncher, November, 1983. It is true that there is a Model II version, but there are several deficiencies in the program. Chiefly, the Model II version does not have the "print from screen" option. When I talked to Dr. Hintze (about his program) he was very friendly and clearly wanted to be helpful. He said that he

had never actually used the Model II version, which was prepared for him by a contract programmer, and he did not know much about the details of its operation. He urged that I buy the CP/M version, in CBASIC, in preference to the TRSDOS version. He added that many improvements and enhancements had been made in producing the CP/M package.

I wanted to stay with TRSDOS and have modified the BASIC to print at the key points where I need hardcopy. I also found the menu options curiously restrictive and awkward in use. Nothing that couldn't be handled, but still tiresome. I have to admit that I'd rather work with Number Cruncher than try to write and debug all that BASIC for all those different statistics.

**Putnam Barber
Seattle, WA**

After my husband had used and enjoyed our TRS-80 Model I for five years, I have joined the ranks of the home hobbyist. Only recently did we subscribe to *Basic Computing*. Reading about computing is almost as much fun as computing. But if you wish to keep some of us women happy, please do not give us programs to file our recipes, do our bookkeeping, and save us money. If we wanted that, we'd hire a housewife.

No! Give us cute programs with robots and Android Nims! Make it fun. We all know you don't save money with this hobby, you spend it. Might as well have a good time doing it . . . I want to have the Battle of Life with Snake Eggs, but I promise to Bee Wary if you'll only tell me where to beg, borrow, plagiarize, or otherwise obtain a disk of such goodies. Thanks loads and keep on keyboarding in those great programs. My gradebook is updated, my Robot Math fractions are being reduced. You may tell Leo Christopherson that another junior high science and math teacher has bit the dust!

**Mrs. Bonnie Breig
Charleston, IL**

Most of the programs you refer to were written by Leo years ago. We no longer sell software and there are no retailers that we know of who still market those programs. Sorry for

that. But wait until next month. Our February theme is games and there will be a number of chuckles and challenges in it for you. -Ed.

I typed in your "Universal Printer Driver," August, 1983, assembled it, and wrote it to my Scripsit 3.2 disk.

All of the user sequences worked except those for proportional and 16.7 cpi mono-spaced characters and their "fat brothers." I have a Model III with 48K, two disk drives and a LP IV printer. I have both the tape version (26-2111) and disk version (26-1563) of Scripsit and neither manual has the patch you mentioned. I wonder if my printer has some idiosyncrasies that were corrected in the 739.

**Louis B. Kelley
Crescent City, FL**

Please help me with the source code, line numbers, and the names for the modules "SCRIPDRV/ASM" and "TABLE/ASM" in Gary Shade's "Universal Printer Driver" article. The source code you printed was assembled using Radio Shack's Series I Editor Assembler, on a Model III, using TRSDOS. I am aware of the instructions in the article to put in the names of the modules, but I am a novice with assembly language and do not know where, nor in what format, to enter those names. (*The letter was accompanied by assembled code in which all the label locations were 33 bytes off from the printed listing. -Ed.*)

**Maj. Glenn R. Willauer
Ft. Washington, MD**

Mr. Shade's reply:

First, in response to Maj. Willauer's letter, it is a most interesting problem. Let's examine what could cause the locations to change as he indicated. The first oddity I noticed is that every label listed by him as being in error is offset by exactly 33 (decimal) bytes. My suspicion is perhaps when the Major entered the code, a DEFS was entered and not a DEFBS, in one or more of the table entries. The difference between a DEFS and DEFBS pseudo-op instruction is that DEFS reserves "X" number of memory locations for later storage. DEFBS defines the byte as a value following the instruction.

The Major should check exactly

where the offset begins to appear. Are the table entries and their memory assignments in accord with the listing? If not, be precise about where the abnormality appears, in either the line or immediately following the line containing the problem. 33 bytes of code have mysteriously appeared in his program.

The 16.7 cpi mono-spaced characters and their "fat brothers" do not program properly when using the driver. Mr. Kelley is correct. The 16.7 cpi mode does not work in the manner depicted in the programming example. The code is correct, it's the example that is incorrect. The rules for changing pitch to 16.7 cpi when using Scripsit are: First turn off the left margin capability (set it to zero), just prior to using the 16.7 cpi command. Using the codes in the article, do the following to your document:

```
>LM=0
#B
>LM=10
```

The first line sets the left margin to zero. If this is not done, Scripsit will send a number of spaces (code 20H) to the printer. In effect, this sets your margin. It moves the print head away from the left margin to the point you have specified. The manual for the LP IV states that you cannot mix 10 cpi and 16.7 cpi characters on the same line. The spaces are printed characters and they are sent in 10 cpi format. Therefore, 16.7 cpi can never be entered unless the left margin is zeroed prior to using the sequence (suppressing any characters in 10 CPI), and restored to the desired margin after the condensed mode is entered. No changes are necessary in the driver. It works, just not in the manner I prescribed.

My congratulations to the readers who attempted the driver. Many who wrote me had no problems, other than the 16.7 cpi mode, and for many it was their first attempt at assembly language programming. If anyone else would like to write to me, do so by sending a self-addressed, stamped envelope and your questions to the address below.

**Gary A. Shade
c/o Argonaut Systems
P.O. Box 2492
Northbrook, IL 60062**

Notes, etc.

Cameron C. Brown

Article Headings

A few readers have been confused with our heading of an article. We assumed that programs headed I/III/4 would imply Model 4 in Model III mode as well as Models I and III. The same problem exists with Models II/12/16 notation. To clarify that, we now have the following scheme. The notation "4_{III}" means Model 4 in Model III mode. The notation "16_{II}" means Model 16 running in Model II mode. Now when a program is labeled Model 4, you can be assured we mean Model 4, TRSDOS 6.0 mode. Also, Model 16 with no subscript will mean Model 16 running in true TRSDOS-16 mode.

Good Company Award

Some magazines have an annual award for a specific product. We receive letters about some mail-order companies and their poor support, service, or delivery. Rarely do readers discuss a problem, or praise, for a specific product. Sometimes, but not always, the writer is asking for our help because the company happens to be an advertiser in our magazine. Sometimes the problem is the fault of the customer, sometimes not. No computer magazine has the resources to give "Good Housekeeping Seals of Approval" to so many new and small companies.

We cannot screen companies, but your input can be put to good use. We want to hear from you about those companies that provide excellent support, service, and delivery. Problems arise all the time, but some companies bend over backwards to serve their customers. Use the Editorial Feedback card in this issue to let us know the company, or

companies, you recommend. We want to hear about the good companies, not the bad ones. Get your vote to us by April 6, 1984. We will publish the results in our July issue. We may never be able to eliminate all the bad apples, but we can give some polish to the good ones.

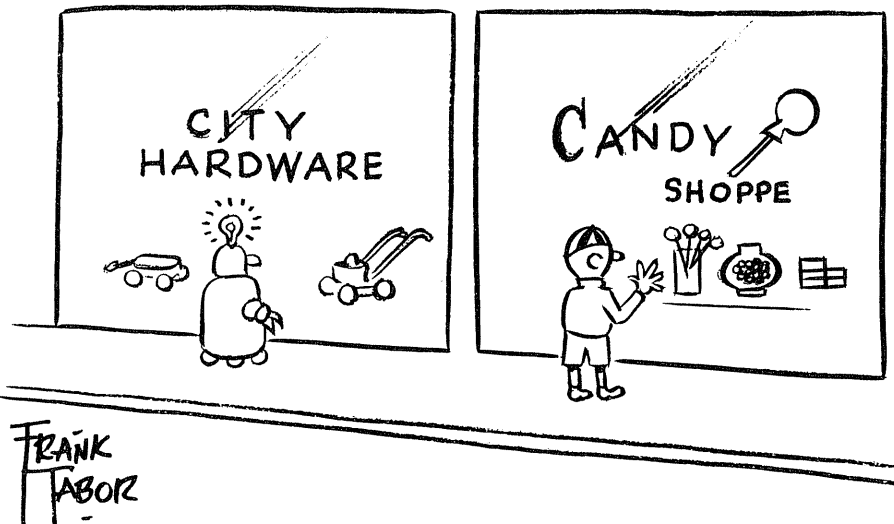
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Puzzler

We have been flooded with responses to our November Puzzler. The winner will be announced next month after we wade through all the paper. This month we are using a

problem that came from the May, 1981 International Computer Problem Solving Contest sponsored by the University of Wisconsin-Parkside. The digital product of a positive integer, N , is defined to be the product of its nonzero decimal digits. For example, the digital product of 99 is 81. The digital product root of a positive integer, N , is obtained by repeatedly taking digital products until a single digit is obtained. Write a program which will accept input of a positive integer up to 10 decimal digits in length, and which will print the intermediate steps in computing its digital product root. For an input of 999999999, the output will be: 999999999, 3486784401, 516096, 1620, 12, and 2. So, the digital product root is 2. Run your program on the numbers 100, and 123456789. Send your output on a postcard to January Puzzler, 3838 So. Warner, Tacoma, WA 98409. The winner will be selected at random from the correct solutions.



FRANK
TAVOR

Corrections

"DOS Fix," November, 1983 had a reference in the text to a DOSFIX 21. That patch was for TRSDOS 4.1 and does not apply to TRSDOS 4.2. We deleted it from the listing but missed it in the text.

"Eat and Run," November, 1983 needs a correction to program line 5130. It should read 5130 LINE (I,63)-(I+12,63-A),I,B:LINE (I,63)-(I+12,63-10*R(X,Y2)),I,BF:IF 10*R(X,Y2)>A THEN LINE(I,63-A)-(I+12,63-A),0,B.

The ,B was missing from the end of the code. If you wish to make a cosmetic change to the program, delete the code A\$=INPUT\$(1) from line 200 and insert the lines 250 A\$=INPUT\$(1) and 385 GOTO 250. This will prevent errors occurring when the wrong keys are pressed.

"The Computerized Shrink," November, 1983 was labeled as running on the Model II/12/16. We omitted including the needed changes in the article. For Model II/12/16 users, delete all POKE commands in lines 180, 270, 300, 410, 440, and 610. Add the following screen display loops, line 185 FOR I=1 TO 9000:NEXT I and line 445 FOR I=1 TO 9000:NEXT I.

"A Potpourri of Puzzlers," November, 1983 had a typo in Listing 1, the GOTO N routine. Change the 255 in line 110 of the BASIC listing to a 225. The assembler listing (Listing 2) is fine.

Mr. Jack Baldwin of Tucson wrote to let us know that there is a conflict with TRSDOS BUILD files and the location of "Keytoken," October, 1983, by David Lewis. Move the location of Keytoken to FC00 or FD00 and you will stay away from the BUILD files which load into memory at FE00.

In This Issue

Our theme is reviews. We have loaded this issue with reviews, evaluations, and discussions on a number of items. We look at operating systems, utilities, games, books, application programs, even a brand new machine from Tandy. If your Christmas money hasn't all been spent, there are some good buys in here. Why not start out the new year with new software?

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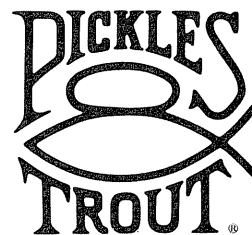
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#7

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Basic Computing interviews

Chuck and Debbie Tesler

The forces behind Prosoft

For all readers

Jim Klapproth, Associate editor

Tell us briefly about your backgrounds.

Chuck: Debbie and I had joined IBM in 1962 as systems engineers, which basically involved programming, teaching, sales support, and installation of computer systems. Debbie worked there five years until she had our son Glenn and then decided it was a good idea to raise the kids and give them the attention they deserved. I kept working at IBM and in 1977 my career was going very, very well. I got the last promotion that was possible as a technician. I had developed some nice software products and they were selling well. I was happy.

One of the guys in my group was going home every night and building a microcomputer (a Digital Group from a kit). I kept saying to him, "Dick, why are you playing with these toys when we have these big computers that are so fast, have great I/O, good operating systems, everything works, it's so much fun, and we get paid for using them?" He very diplomatically kept his mouth shut, and probably was thinking, "Fool!"

Finally, we went over to his house and he brought up Oasis, which was very much like the operating system I was using, called CMS, and it had some improvements! This was a revelation to me. I knew about

micros and I figured that in due time IBM would get into the micro field, straighten it up (whatever that meant), and make micros work the way they were supposed to. There was a great deal of ignorance on my part. I had written a BASIC compiler in 1970, so I had the right background. When I saw this micro actually running, as compared to

I chose the TRS-80 and bought it for Glenn, my eleven year-old, the same way a father buys trains for his kids and says, "If you ever touch the trains, I'll kill you!" It turns out that he liked it and I liked it.

the Apples and the Pets I had seen playing games, I got very interested. I looked at the Pet and discarded it. It was not until the end of 1978 that I was trying to choose between the Apple and the TRS-80. I chose the TRS-80 and bought it for Glenn, my eleven year-old, the same way a father buys trains for his kids and

says, "If you ever touch the trains, I'll kill you!" It turns out that he liked it and I liked it.

How did Prosoft come into being?

Chuck: By 1980, there had been some management changes that made me very unhappy. Number two, one of the products that I had developed for IBM was selling well. They paid a royalty and the royalty had a ceiling. The sales passed the ceiling in a few months, after which I did not get another penny. IBM was taking in two million dollars a year of pure profit on the software. I was doing the maintenance and was not being paid for it. I felt that, in fairness, I deserved to be paid a great deal of money for this unexpected success. They wouldn't pay me any more, and I had this TRS-80 which had become worse than any drug addiction. I always liked playing with computers. Debbie will never let me forget our first anniversary. We went to a very nice restaurant and on the way back home, I said that I wanted to stop at IBM for a couple of minutes. We spent several hours there while I ran some programs . . . on our first anniversary!

Debbie: Wasn't that romantic?

Chuck: I like playing with computers. Until 1979, I had never worked a day in my life. I considered it all play. Then, the company made

Tesler

me unhappy, I couldn't find anything interesting to do, and I had a problem with my manager. With the TRS-80, it was like re-living 18 years, only now I had all the experience. I wasn't guessing how to do things. I knew how to do them.

Early in 1980, I was starting to put out feelers to start a mainframe consulting business and I went to the Radio Shack store down the street to buy Scripsit. At that time, I had been using word processing on a mainframe for ten years. I had written editors, text processors... in other words, Newscrip was not my first effort. I had done these on mainframes in 1970 and revised them in 1973. I've worked with a lot of word processors. I am accustomed to features that are still beyond the possibility of micros. These features are extensive and they need too much memory. So, there's nothing new.

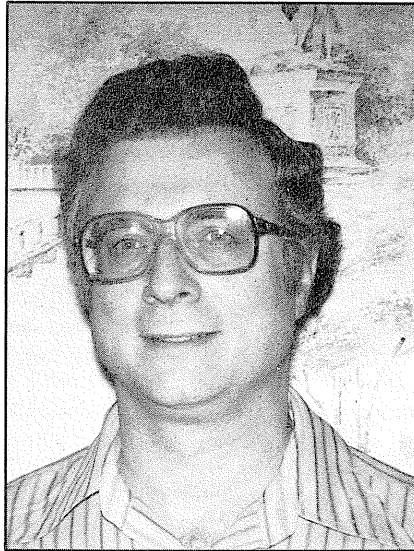
When I saw Scripsit, I found it so inadequate that I went back home and started writing an editor that very night. This was not to be a commercial product. June came, and another friend had bought a Line Printer IV with proportional printing. All the ads said that it would do proportional printing with Scripsit. He bought the printer for \$1000, got it home and discovered the problem. Well, this guy calls his good buddy, Chuck, and tells me he has this printer that will do right justified proportional, but he doesn't think that it can be done on a TRS-80. It was impossible. He knew that the way IBM always managed to motivate me was to tell me it was impossible.

He loaned the printer to me for three days. I wrote a little BASIC program, but it was too slow, so I put in a machine language routine to do the right justification. I called it PROP (for proportional). I already had an editor half-written, so I wrote a formatter, and called it Subscript. Meanwhile, Glenn had found some bugs in the Model I ROM and he wrote a nine page paper and submitted it to *Byte* magazine. Here was Glenn saying that there are problems in the Microsoft ROM and I'm saying, he's just a kid.

Was Glenn involved in the original development of Subscript?

Chuck: Not from day one. I wrote

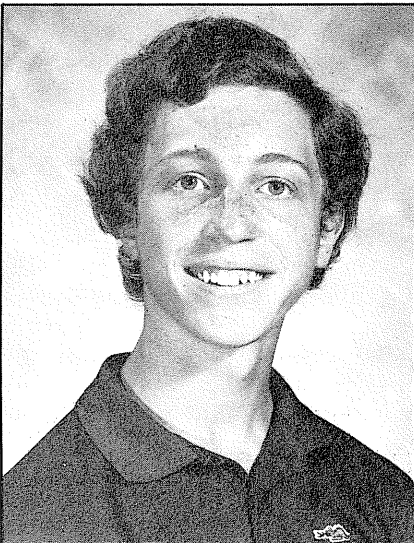
Chuck Tesler



Debbie Tesler



Glenn Tesler



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#9

Tesler

the editor and formatter all by myself. He got involved in a couple of ways. When string compression, or "the silent death" hit, as it did in Subscript, instead of locking up the keyboard, I wanted the program to signal it. So, Glenn wrote this little detection routine. He had also written a keyboard driver for me, not for Subscript, but for other things that I wanted to do. The result was MININIT, for "minimum initialization," that is still there today in Newscrip. By the end of the summer, it was pretty clear that I was going to leave IBM, so we sent an ad off to *Basic Computing* (then *80-U.S. Journal*) and another magazine. A month later, we started selling Subscript.

Did you have any idea about the size of the market for Subscript?

Chuck: Yes, I did. This is hilarious. The product was selling for \$35 and we grossed about \$1400 the first month. I figured we could live on that if we had to. I had no concept about the cost of advertising or the little details (that we had spent \$3000 on the computer, \$1000 printing the manuals), all the business expenses — I just didn't know about them.

Debbie: And we were working out of this living room.

Chuck: Until mid-1982, Prosoft was still right here with seven adults working in this confined space all day long.

Debbie: Our house was really a pain because all the shipping was done in our dining room. Chuck was working at a computer in the little den. Ron was answering the phone, also in the small den. Darlene sat on the sofa. Phyllis and I were at the kitchen table filling the orders and packing the boxes. I had to run back and forth trying to keep everybody happy and get my work done at the same time.

Debbie, you were involved in the business from the start. In what way?

Debbie: In the beginning, it was interesting. I didn't want to work full time, but it was a marvelous way to put in a few hours each day. I'd do the advertising, a little art work, and run down to the post office . . . just a few hours a week. Well, a few months later, it was seven days a week, 18 hours a day. Chuck did let

me get six hours of sleep . . . sometimes.

Chuck: You see, I was consulting on mainframes five days a week. I had all the work I wanted. I would come home about six at night and take customer calls until about 11. Debbie had been taking the orders and packing. I would program until two or three a.m. and then have to get up in the morning to go consulting.

Did you have any previous business experience?

Chuck: I worked for IBM for 18 years. I was a technician, not a salesman. I knew nothing about running a business.

Debbie: I had even less experience than Chuck. We had so many things to learn. We found out after a few months that we were losing money on each sale.

Chuck: We actually lost about \$2 on every copy of Subscript that we sold. Fortunately, we had only sold about 300 of them.

Now that you are fairly successful, what challenges you the most?

Chuck: (Pause.) Radio Shack . . . without question. Radio Shack is trying to commit suicide. They have the God-given right to cut their throats, but I resent their cutting everybody else's throat at the same time.

Can you elaborate on that?

Chuck: Radio Shack had, and still has, a predatory attitude toward anybody else that wants to sell anything pertaining to the TRS-80. Whether you're selling memory chips, disk drives, printers or software. My honest view (and I know that they will say that I am a lunatic and I am wrong) is that, from Fort Worth's viewpoint, there are two categories of human beings in this world: those that work at One Tandy Center and deadly enemies. They will tell people that it's not safe to buy mail order. They don't support us.

This recent campaign where they said they would give help and support and promotion? False! It's worse than a joke. Bob Snapp said that he isn't even going to touch it. At the time, I figured I was going to. Bob Snapp was right. He had a lot more insight than I did.

I applied and went through the whole thing. Newscrip was

returned unopened, saying that it was a competitive product and not to submit it again. I said to them that they should realize that it only competes partially. There are people who like IBM-style word processors and you don't have one. You are not going to sell computers to those people unless they have Newsprint. There are people with printers not sold by you. You don't support those printers and you are never going to. They will be very unhappy with you. But, if they have Newsprint, they can at least use their TRS-80s. This is a case that if you own a Diablo or a Spinwriter, you will not buy a Radio Shack computer. Their printers do not have those print styles available.

Nonetheless, they said that it is a competitive product and returned it unopened. They took Trashman and Faster and put them in their independent outside software catalog. They had also said that they would accept products for their own sales. I asked the guy about that and he didn't know what I was talking about. This was the manager of the program. I asked him to submit the programs. That was five months ago and I have not heard a word since.

Compare Radio Shack's attitude to Apple's. Their software comes mostly from independent software houses. Apple has done fabulously well. The IBM-PC is mostly supported by independent software. They recognized from day one the value of outside support.

Tandy is the only company that keeps trying to block all of us, even if we don't compete with them. What has happened, as a result (and Prosoft has done much better than most companies), is that a number of companies have either gone out of business or abandoned the TRS-80 market. Your readers know this because their ads are no longer appearing in the magazines. Radio Shack has created such a bad image in the public's eye that the public is buying elsewhere.

Debbie: Another thing was the way they announced Superscript.

Chuck: Oh, yes! There's a thing known as a "paper tiger." A company announces a product that doesn't exist for the purpose of blocking the sales of a competitor.

There are very strong laws against it. Radio Shack announced Superscript in the fall of 1981 and it was going to have proportional printing, support for every printer in the world, and have every feature in the world. What do you think happened to Newsprint sales when that announcement came out? I'll give you a hint — they didn't go up. Superscript finally came out a year after they announced it. We probably should have taken legal action against Tandy for advertising a paper tiger.

Do you feel that Tandy's posture represents a greater threat to your existence than the wholesale piracy that is taking place?


Chuck: At the emotional level, I care a lot more about the piracy than a stunt like Radio Shack pulled. On the financial level, I worry about both of them. Piracy on the TRS-80 is not as organized as it is on the Apple or on CP/M. We probably won't be going into the CP/M market because of that. We should see a permanent solution to the problem in about a year when a hardware fix becomes a reality.

Can we discuss some of the future products that you are planning?

Chuck: In general. My IBM training is such that I would be more comfortable not talking about the future at all. I certainly would not want to be accused of creating a "paper tiger." Also, there are those who will say that they will wait and not buy Newsprint because a new word processor is coming out. Two comments. First, I don't know when it's coming out and I'm one of the authors. I could lie and give you a date. Our new list manager will be out very soon, but we had originally expected it to be out 15 months ago. The bottom line is that a product simply doesn't exist until it's for sale. Secondly, the offer that we are going to make to existing Newsprint owners will be such that they will end up spending less by having bought Newsprint first. When the product has finished beta test, every registered Newsprint owner will get an announcement with a special upgrade offer. Newsprint will continue to be sold, so after a certain length of time, the offer will expire.

So, we are going to see a list manager and a new word processor.

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Are there any other products planned?

Chuck: The ads are out already for a new program that keeps track of all of your video tapes. It's a special purpose list manager that we will be selling for \$29.95. It does everything you need. I know because I have video tapes. There is no tailoring, no initialization, no thinking involved. It's simple and fast. It even prints labels for the tapes.

What advice would you offer an entrepreneur who would like to go into the software business?

Chuck: Don't go into software for the TRS-80. That's not because I'm trying to chase away the competition. We are looking to go into other markets. I won't say which markets. There are a few critical things: one is identifying the correct market places and even more important, avoiding the wrong ones. You don't have to pick the best one, but you would be well-advised not to pick one that is about to go out of business. Radio Shack is not about to go out of business, but there are some that are.

We've avoided the IBM and we have an IBM computer. The reason we avoided it is that everybody is going to go into that market. Look at PC magazine. How is your ad going to be seen in a 630-page issue? I don't think that's a good market. If you're Peachtree or Microsoft, go into IBM. But, if you're small, it's going to be hard to be recognized. A guy once said that it's better to be a big fish in a little pond than a little fish in a big pond. I think it would be best to find a market that will be stable, solid, and have demand in it, but not as popular as the IBM-PC. Also, you have to learn about business and that's an art, not a science.

Debbie: It would be helpful to have some business classes, even at a junior college. Talk to as many people as you can about computers, mail order operations, and anything related to the area you are going into.

Would you care to make any predictions on the future of the industry?

Chuck: My comments will be worth what you're paying for my opinions. All the years that I worked for IBM, I always felt that the computer industry was waiting to be

born. I now feel that it has been born. Computers are in the process of changing our society, our economy and our everyday lives. That's going to accelerate more dramatically and significantly than anything we've seen in the past. Things that were virtually impossible to accomplish in the past are now trivial tasks to computers.

VisiCalc is fabulous. It never existed on a mainframe and it makes it possible for people to do things never done before. It is obvious that computers in some form or another are going to be coming into our homes. Not as game or business machines, but into things. An automated house? Why not? IBM has been working on this for a long time. Why not vacuum cleaners that can come rolling out of the closet automatically when there's nobody home and clean up the house? Refrigerators that are far more energy conservative. Servos that are thermal sensitive so that windows can open and close automatically?

On the negative side, the people who are ignoring what computers and information are doing, are doing a great disservice to their children. They simply will not be able to compete in the world that our children will have to live in. We all understand why our children have to read, write, and do arithmetic, but if they can't use computers effectively (I don't mean computer programmers, I mean being comfortable sitting at a keyboard), they will be at a real disadvantage.

I have a Master's degree and I went two-thirds of the way to a PhD. The most important course I took, outside of IBM, was touch typing in junior high school. I can type over 100 words per minute, which means that I can get my ideas into a computer several times faster than most people. That means that I get my results several times faster and get more work done than a person who types 20 words per minute. Voice recognition is still in the distance. I think it will be quite a while before we have a computer that could correctly transcribe this interview. Even if it does come out shortly, it won't be available at a price that we can afford. Learn how to use that keyboard. ■

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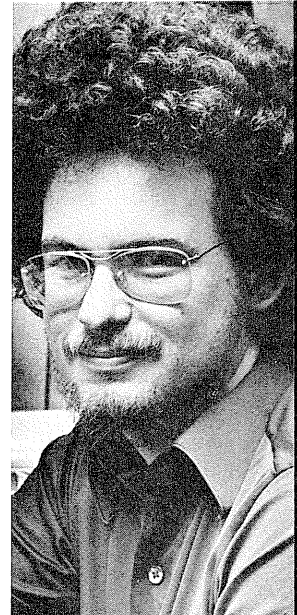
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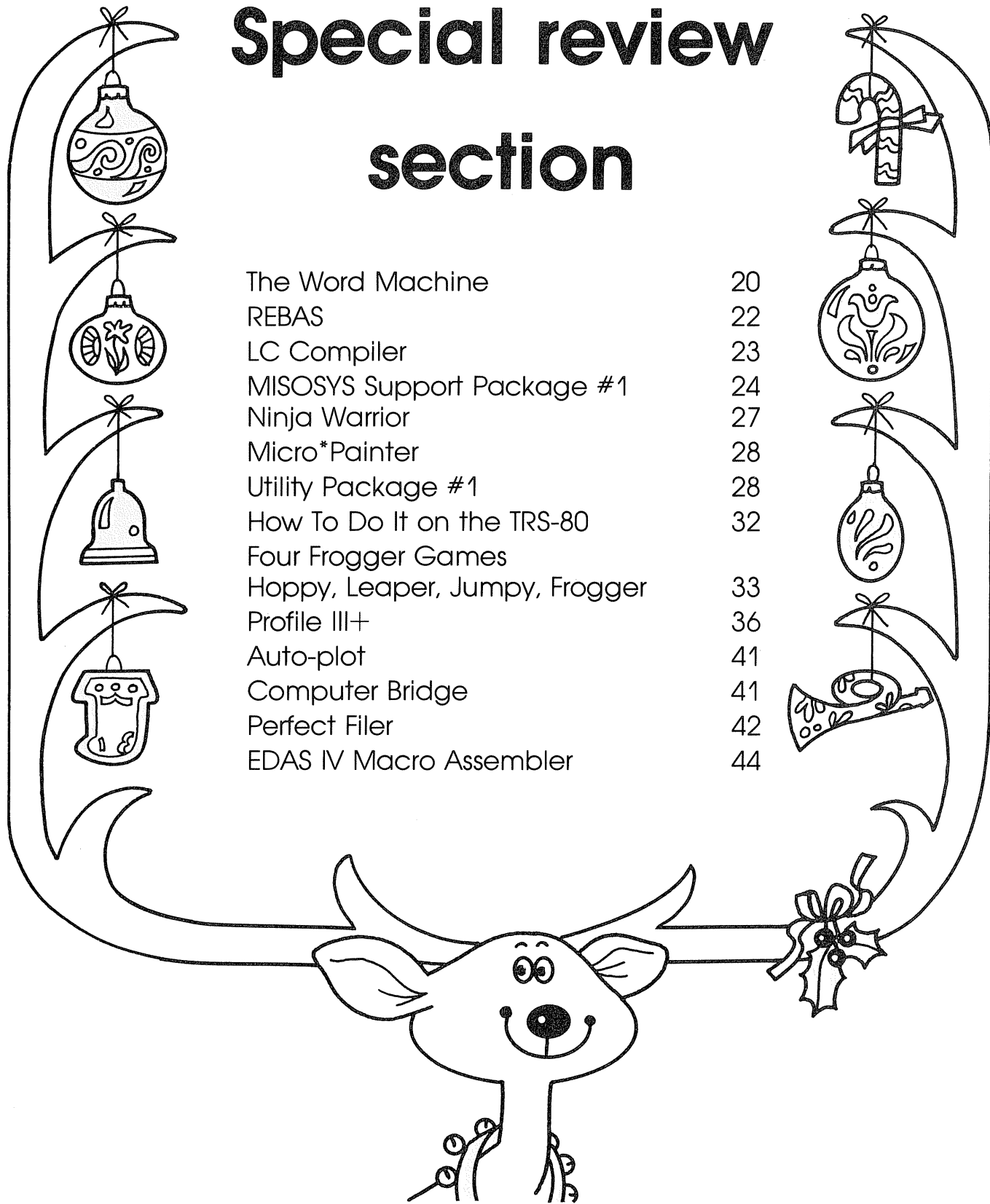
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20 Basic Computing

I must confess that, when I was asked to review the new \$20 word processor from Pel-Tek, I was less than enthusiastic. After all, how good could a word processor selling for a price this low really be? After I had spent only about an hour with

The Word Machine, I was pleasantly surprised.

Actually, "word processor" is somewhat of a misnomer, as it is with Scripsit. "Text editor and print formatter" would be a better description of both. The Word

Reviews

Two different versions are included on the disk. One is for a 32K machine and the other for 48K of RAM. With the 48K version, you may enter up to 290 lines of material, each with a length of 80 characters. The 32K version will allow up to 90 lines to be entered. I used the program with LDOS, but it is said to run with all popular operating

systems.

Although I cannot recommend this software for the professional writer, law office, or software development house, it is an excellent value for those doing small amounts of writing. It is far more convenient than a typewriter and a good deal more powerful. It has many nice features one would not expect for

this price. I highly recommend it for the casual writer on a limited budget, or for the individual who wishes to learn some of the basic concepts of word processing.

C.P. Knight

An enhanced version, The Word Machine 3.0 Plus, which incorporates a spelling checker, is also available. It retails for \$65. —Ed.

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The REBAS package from RACET Computes, written by Doug Kavner, is a series of enhancements to Microsoft BASIC 1.2. It can be applied to the BASIC on a Model II, 12, or 16. It is compatible with

TRSDOS 2.0, 2.0a, 2.0b, 4.0, 4.1, 4.2, and the RACET HSDS Hard Disk Operating system.

REBAS patches the Disk BASIC files and requires no user memory. Besides retaining all the existing features on your current BASIC, it gives you many new options. You can merge non-ASCII programs as well as load, merge and continue program execution without losing variables or closing files.

Editing BASIC programs has been made much easier. Program lines can be moved and the renumber utility has been expanded. Programmers can now run programs, edit lines from command mode and continue execution. Some single stroke editing commands are now possible (comma “,” to edit, downarrow to list next line, and period “. ” is also an abbreviation for EDIT). They worked as advertised but I did note that, for some reason, the hold key would not function as quickly as usual when listing a program to the screen.

Key typeahead of up to 80 characters is now available in BASIC, not just TRSDOS. Screen and reverse-screen scroll and protect routines can be invoked through a simple USR command. The break key can be redirected to another location (CTRL 6 is recommended) or disabled completely. When entering BASIC, the default parameters are altered to be three files open and 1000 bytes of string space.

One of REBAS's key features is labeled line referencing. Now you can write code such as GOTO ERROR TRAP, GOSUB ROUND-OFF, or IF A\$=B\$ THEN GOTO PART1 ELSE GOTO PART2 and not have to look up easily forgotten


linenumbers. Extensive use of labeled lines may slow down your programs slightly (RACET estimates about one percent at most.)

The merge and run ability makes it easy to develop program modules and common subroutines. Sections of code can be dynamically deleted during program execution. Since variables and files are preserved under a merge and run, developing an extensive library of routines can be worthwhile. The existing BASIC on TRSDOS forces programmers to try to incorporate all features within one program, or go through numerous file reading and writing to save variable values. RACET has eliminated that problem for you.

Compatibility cannot be guaranteed for all programs you may be running. REBAS moves literal strings which are assigned to a variable into string space. (A\$=“This is a literal string.”) The effect is that you may need to clear more string space than usual to run your BASIC program. My system disk contains numerous BASIC programs, commercial as well as my own, and not one failed to run under REBAS.

The programs you develop that use the unique features of REBAS will require that REBAS be present. That means you can't expect to give your program to another user without him also owning and using REBAS. That will be a serious drawback to commercial programmers. Even so, the editing features make the package worth it. Professional programmers who wish to retail material using the REBAS features should contact RACET Computes regarding distribution requirements. RACET

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The package is well conceived and all parts worked as advertised. It comes on a special boot and

installation disk. I had no problems installing it on a Model II TRSDOS 2.0a disk. The documentation is a 27-page booklet and a two page update concerning a patch to the BASIC TAB command that you may or may not want. The diskette includes a

demonstration program that puts REBAS through its paces for you. Your best guide to REBAS will be practice and experimentation. RACET Computes has given you a lot of power and flexibility.

Cameron C. Brown

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PRO-LC (Model 4)

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LC (pronounced "Elsie") is MISOSYS' compiler and development system for the C programming language. The LC package includes EDAS IV (available separately), the latest in a series of Z-80 assemblers from MISOSYS. EDAS IV supports macros and libraries of assembly language routines.

Roy Soltoff of MISOSYS is well-known for his work as systems analyst for the popular LDOS operating system. Roy's association with the LDOS project explains why these products (LC and EDAS IV) run only under the LDOS operating system (not included). You may think of this as a restriction, but by requiring LDOS, these products can take advantage of its many features to provide a well-integrated, easy-to-use system.

LC comes in a quality three-ring binder containing two single-density, 35-track disks and over 220 pages of documentation. One disk contains the LC compiler, several function libraries, and a program (an LDOS "filter") that provides graphic representation on the Model I for some of C's special characters (left and right bracket, backslash, caret and tilde). The other disk contains the EDAS IV assembler and XREF, a cross-reference program. Although I tested LC on a Model I TRS-80, both the LC package and LC-compiled programs are completely portable from Model I to Model III machines running LDOS. For software authors, there is no royalty charge when selling programs developed under the LC system.

The LC Language

C is often described as an "intermediate-level" language, combining the elegance of a high-level, structured language like Pascal, with the bit-fiddling power of assembly language. LC is a compatible subset of the "standard" C found on most Unix systems. LC provides most of the major C language features, missing only multi-dimensional arrays (one-dimensional arrays are supported), structures (like Pascal RECORDs), unions, typedefs, and the "sizeof" operator.

Both the GOTO statement and SWITCH-CASE are supported.

There are some implementation restrictions. Function calls, "for" loop control statements, and character literals must fit on a single input line and functions can have no more than 16 arguments.

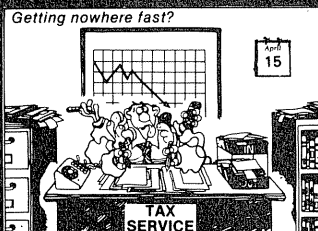
LC allows variable names to be any length, but the first eight characters must be unique. Variables can be declared as "external" and thus shared between separately-compiled LC programs.

Just as in UNIX C, LC supports command line redirection of I/O. This means you can write a program that gets input from the "standard input file," which by default is the

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Reviews

keyboard, and writes its output to the "standard output file," which by default is the CRT screen. When you run your program from the "LDOS Ready" prompt, you can redirect input and output to any disk file or device.

The LC compiler produces assembly code as its output. This assembly source code is fed to the EDAS assembler to create an executable Z-80 code file (a /CMD file). Compiled C functions (EDAS source files) are kept in PDS libraries, which are managed by the MISOSYS Partitioned Data Set utility, available separately. EDAS IV has a *SEARCH command that looks through a library and only assembles the functions your program needs. This keeps your /CMD files compact and speeds the assembly phase of LC compiles. Even better, it speeds the development of new programs, since you can easily incorporate previously written and debugged C functions.

LC comes with three PDS library files. LC/LIB provides the standard C language functions for I/O, memory allocation, and string manipulation. Using these functions helps to keep your LC programs portable, meaning that you can easily compile and run them on other C systems. When getting the most from your TRS-80 hardware is more important than portability, you will find what you need in the "installation library" (IN/LIB). This library includes functions to perform TRS-80 graphics, string manipulation, INKEY (like BASIC), input and output to Z-80 ports, retrieval of system date and time, and system and user assembly language calls. There is even a function that lets you execute an LDOS command and

then exit or return to your LC program.

LC does not implement floating point directly, but via another library (FP/LIB). Everything you can do from BASIC is supported since the TRS-80 BASIC ROM routines are used to implement floating point. (*Note: The Model 4 version, PRO-LC, does not have floating point at this time, but it will be sent to purchasers at no charge when it is implemented. —Ed*)

Running LC

MISOSYS' philosophy of integrating software into systems helps make the use of LC very smooth and easy. A JCL (LDOS Job Control Language) file is included to make compilation and assembly a one-command process. The LC compiler does a good job of detecting, diagnosing and recovering from errors. I have had no problems understanding compiler error messages and correcting my mistakes.

A C program can be debugged using an assembly language debugger (such as the LDOS DEBUG program) and the listing from EDAS. A compiler option lets you see the assembly language statements generated for each LC program line, making it fairly easy to set breakpoints and follow the flow of execution.

LC programs take awhile to compile and assemble. A 335-line program compiled in 3 minutes, 50 seconds on my Model I with double-density disk drives. The assembly phase took 7 minutes more, totaling over 10 minutes for the procedure.

While not quite as fast, nor as small, as carefully hand-coded assembly language routines, LC is a lot closer to assembly language in speed than BASIC. An Eratosthe-

nes Sieve prime number-generator program ran in 122 seconds, compared to 4470 seconds in TRS-80 Disk BASIC. This 38-line program (including the STDIO/CSH file) took 55 seconds to compile; 3 minutes, 20 seconds to assemble and produced a 4.5K /CMD file.

Documentation

The LC manual is well-written and easy to understand. It is not a tutorial on C or programming, but it does contain a complete description of the LC version of C. Operation of the LC system is thoroughly explained. Every library function is described, and examples are given for most of them. There are four appendices containing a summary of the LC language operators, library functions, compiler error messages and sample programs. The manual has a good table of contents, but alas, there is no index. Since LC includes EDAS IV, you get a complete EDAS IV manual in addition to the LC manual, and it is of approximately the same size and quality.

Wrap-up

I am very enthusiastic about the LC package. It is well thought out, well implemented and hangs together well. The author has promised an update for the very few minor bugs in the first release. If you are used to BASIC's fast, interactive programming environment, LC's 5- or 10-minute compiles take some adjustment. If you want a good implementation of C for your TRS-80, LC is an excellent choice. I think you will continue to use this system long after the learning period is over, unlike some language systems that have teaching value but little practical use.

Rowland Archer, Jr.

MSP-01

Model I/III version, MSP-01
Model 4 TRSDOS 6.0
version PRO-GENY
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Alexandria, VA 22303-0848
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24 Basic Computing

MSP-01 stands for "MISOSYS Support Package Number 1" and is a package of four separate utility programs for the LDOS user. They are DOAUTO/CMD, DOCONFIG/CMD, MEMDIR/CMD, and PARMDIR/CMD. As a package, they are a good buy for \$50. They are published by MISOSYS Software of Alexandria, VA and were, except for

MEMDIR, written by Roy Soltoff, the author of LDOS.

DOAUTO/CMD

The DOAUTO program is the shortest of the utilities on the disk. This utility allows you to execute the auto command normally executed at BOOT time. There is no requirement that the disk whose auto command

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Reviews

is to be executed reside on any particular drive. The program is well written but, frankly, I can see little use for a program like this.

The syntax is DOAUTO :d, where d is the drive containing the disk whose auto command is to be executed. If the disk is in drive 0, it would be just as easy to type BOOT and let LDOS take care of executing the command, but this does change your configuration. If it isn't in drive 0, it probably isn't a system disk and wouldn't have an AUTO command. It might also be just as easy to type in the command rather than execute it this way. If this were the only program on the disk, I'd recommend that you save your money and pass this program up. Fortunately, any one of the other programs on the disk would justify the package price, so don't let this deter you from buying the package.

DOCONFIG

DOCONFIG will allow you to save any configuration you might have in memory just like the SYSTEM

(SYSGEN) command. But, you can even execute this one to change configurations during JCL execution. If you have two or more standard configurations you like to use with different applications, this utility will prove to be very useful. It saves disk space by not requiring you to maintain different copies of differently-configured LDOS's and re-booting every time you want to make a major change in your configuration.

To save the current memory configuration on disk, type: DOCONFIGspec:d(SYSSGEN). To load a different configuration, simply type the same, but omit the (SYSGEN) parameter. You can even execute the standard CONFIG/SYS file by specifying its password (.CCC) after the filespec. If you frequently need to change your LDOS high memory, you'll come to appreciate this program as a real time saver.

MEMDIR

Have you often wondered just what you had up there in high memory, or how much memory each option was taking up? This utility by Scott Loomer will solve the problem for you admirably. Simply typing MEMDIR will show you the length of your high memory configuration, where it starts and ends, how long each item in it is, and where it starts and ends. It will do this only as long as the module obeys the LDOS requirements for high memory drivers and filters, but there should be only a few such filters and drivers from the early days of LDOS 5.0 left. This isn't likely to be a problem for you. It isn't for me. If MEMDIR can't follow the trace, it will tell you where it lost it. Then, if you are adventurous enough, you can examine this memory with DEBUG to find the offending module. Everything that MISOSYS or Logical Systems Software have offered for LDOS 5.1 adheres to the specifications, so you won't have any problems unless you write your own filters and don't follow the rules laid out in the LDOS documentation. MEMDIR will even dump the information to your printer by using the parameter: (P). If there are more than 14 items, it will page the video for you. This is a well-written utility

that I find useful enough to keep on my LDOS system disk all the time.

PARMDIR

If DOAUTO wasn't very good, PARMDIR makes up for it many times over. Its main purpose is to write JCL files for you. Now, it doesn't replace the build command or Scripsit. It isn't an editor. It reads the directory of a disk and builds a JCL file from the information contained in that directory, matching (if you wish) parameters that you supply. It's extremely fast in what it does. This is a fairly complicated utility, the full power of which might not be apparent at first. You could create a JCL file to give the invisible attribute to every file on the disk. It would be done this way: PARMDIR: :0 EXAMPLE: 1 (A="ATTRIB ",X="(INV)"). It results in the following JCL file being written to the file EXAMPLE/JCL on drive 1:

```
PARMDIR: :0 EXAMPLE:1(="
ATTRIB ",X="(INV)")
ATTRIB CMDFILE/CMD:0 (INV
ATTRIB CONV/CMD:0 (INV
ATTRIB DOCONFIG/CMD:0 (INV
ATTRIB EDAS/CMD:0 (INV
ATTRIB FEC/CMD:0 (INV
ATTRIB LCOMM/CMD:0 (INV
ATTRIB LSCRIPT/CMD:0 (INV
ATTRIB LZAP/CMD:0 (INV
ATTRIB MEMDIR/CMD:0 (INV
ATTRIB MONITOR/CMD:0 (INV
ATTRIB MONITOR/CMD:0 (INV
ATTRIB PATCH/CMD:0 (INV
ATTRIB PR/FLT:0 (INV
ATTRIB SOLE/CMD:0 (INV
ATTRIB SOLE/CMD:0 (INV
ATTRIB ULINE/FLT:0 (INV
ATTRIB VISICALC/CMD:0 (INV
//exit
```

If you had the above fifteen files on the disk, executing this JCL file would make each file on the disk invisible. All you would need to do to execute it is type DO IT. Instead of ATTRIB, you could have used COPY.

You can even have the PARMDIR output directed to a device that is routed to a file and build a catalog of all the programs on your disks. It would be an alphabetized list by disk number and would be readable by LBasic as a standard sequential file. This might be an easy way for you to build that catalog of all your files that you've been putting off.

```
=====
. . . * . . .
@ . . * . . % . .
. . . @ . . . . .
. . . * . . . . .
=====
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=====
```


PARMDIR will support all the versatility that the DIR command in LDOS allows. You may specify a date or range of dates, modification status, or wild-card characters. PARMDIR will build your JCL file to contain only those files that match the specifications. Unfortunately for PDS users, PARMDIR will ignore closing parentheses. If

you have much need for this character, you may substitute another character and use the global search and replace function of Scripsit to change it later, but I would like to see this corrected in a later release.

LDOS doesn't require the closing parenthesis, so this is only a problem when PARMDIR is used to

create JCL files that will be used to create partitioned data sets with the MISOSYS PDS utility program. Except for this, it is a superb program and justifies the price of the entire package because of its great versatility. If you use your LDOS a lot, this package would make a worthwhile investment.

C.P. Knight

Ninja Warrior

Color Computer
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\$29.95

I was faced with a common dilemma for all computer owners: is the price of a particular piece of software too much to pay for what you get? My skeptical mind cautiously asked, "Is \$29.95 too much to pay for a 16K tape Color Computer arcade game?"

The packaging of this particular

program (Ninja Warrior, by The Programmer's Guild) simply oozed quality with its slick, full-color boxed container. On impulse, I threw caution to the wind and gave my credit card to the local dealer.

I am overjoyed to report that Ninja Warrior exceeded my wildest expectations!

In Ninja Warrior, you assume the identity of a typical Kung-fu fighter. Your mission is to survive all *fifteen* levels of performance to meet your final challenge — the Ultimate Ninja! I may never meet him . . . I can't get past level nine.

This very colorful graphic game shows the ninja running from left to right with a superb, 3-D effect incorporated into the background. It starts out easy enough — you must avoid different obstacles by either jumping over them or (get this!) leaping into the air and giving them a Kung-fu kick, thus splattering them into a million harmless fragments. And that is only level one . . .

After the first level, it really gets tough. Some glowing boulders are really meteorites that are presumably radioactive and cannot

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Reviews

be kicked. In fact, eventually these meteors begin to fall out of the sky and you have to kick them in mid-air.

Sound effects enhance this well-

written, challenging program. As a fast-action machine language program, you don't need Extended BASIC to enjoy Ninja Warrior.

Was my investment of \$29.95

worth it? To be honest, I feel a bit guilty about only paying that amount. It is worth much more. Ah, sooo . . .

Bob Krotts

Micro*Painter

Catalog #26-3077

Color Computer, \$34.95

Graphics Pak

Catalog #26-3157

Color Computer \$39.95

Available from Radio Shack
Computer Centers and stores

Micro*Painter and Graphic Pak are ROM-paks that make it easy to use high-resolution graphics on a 16K Color Computer.

Micro*Painter converts the Color Computer into a high-resolution coloring book. It provides the user with a choice of several drawings (stored on tape) that can be filled in using the color sets available on the Color Computer. By using the four arrow keys, or the right joystick, a flashing cursor can be placed anywhere on the drawing. Pressing "S," followed by two color choices, and then the "P" key, causes the area under the cursor to be filled with stripes. To fill the area with checks, simply enter "C" followed by two color choices. To paint an area in a solid color, make both color choices the same.

If the 21 drawings currently available are not enough (nine on

the original tape and twelve more on Images III), the "artist" has the ability to create his own drawings to be colored in.

One special feature of the Micro*Painter is the Periscopik-Elektron-Magnifier (P.E.M. for short). Centering the flashing cursor over a particularly detailed part of the drawing, and then pressing the spacebar, causes that portion of the drawing to be blown up to fill the entire screen! This makes it extremely easy to fill in all the tiny details that crop up on many of the drawings.

The only real complaint that I have about Micro*Painter is the control (or lack of control) when using the joystick. A slight touch of the joystick sends the flashing cursor scurrying across the screen almost too fast for your eyes to follow. The lack of control is really evident when compared to the great deal of control obtained with the arrow keys.

If Micro*Painter turns the Color Computer into an electronic coloring book, the Graph-Pak turns it into a bona fide business computer capable of displaying graphs and charts almost at the touch of a button.

Graph-Pak (now called Graphics Pack —Ed) is a menu-driven program that allows you to easily create pie, bar, line and key charts. These charts are easily reduced or increased in size and can be displayed to the printer or the video. Once created, the charts can be saved and loaded from tape.

Each type of chart is thoroughly discussed in the manual and the user is lead through the steps of creating a particular type of chart. The sample session provides typical values used for the various prompts, and explains what the default value will be if enter is pressed.

Charts can also be loaded into memory and edited using the Graph-Pak editor. The editor also provides an audible beep if you have made an error, or tried to move the cursor to the wrong place.

Creating logos is just as easy as creating charts. An entire appendix is devoted to this feature.

The manual is very thorough and contains many examples and diagrams that make learning to use this complex program quick and painless.

The program is an excellent buy for the small or large businessman.

Charles A. Quante

Utility Package #1

Models I/III/4 III

Logical Systems, Inc.

P.O. Box 23956

Milwaukee, WI 53223

(414) 355-5454

\$39

The Logical Systems Utility package for LDOS consists of the following 14 utility programs for use only with LDOS on a TRS-80 Model I or III, or a Lobo Max-80 computer. (I tried them out on a Max-80 and on a Model I. I also tried the WRTEST/CMD program on a Model III.)

COMP/CMD is a utility for

comparing two disk files.

DCT/CMD allows modification of the drive code table.

DIRCHECK/CMD performs a check of disk directory.

FIXGAT/CMD repairs the granule allocation table.

HIGH/CMD displays a directory of high memory drivers.

MAKE/CMD contains enhancements to the CREATE command.

MAP/CMD shows where a file is stored on a disk.

RAMTEST/CMD tests RAM from 4200H to the top of RAM.

RDTEST/CMD verifies disk readability.

READ40/CMD reads 40-track

disk in an 80-track drive.

READII/CMD allows the reading of Model II disks with LDOS.

TYPEIN/CMD permits /JCL-type operations with INKEY\$.

UNKILL/CMD restores killed files.

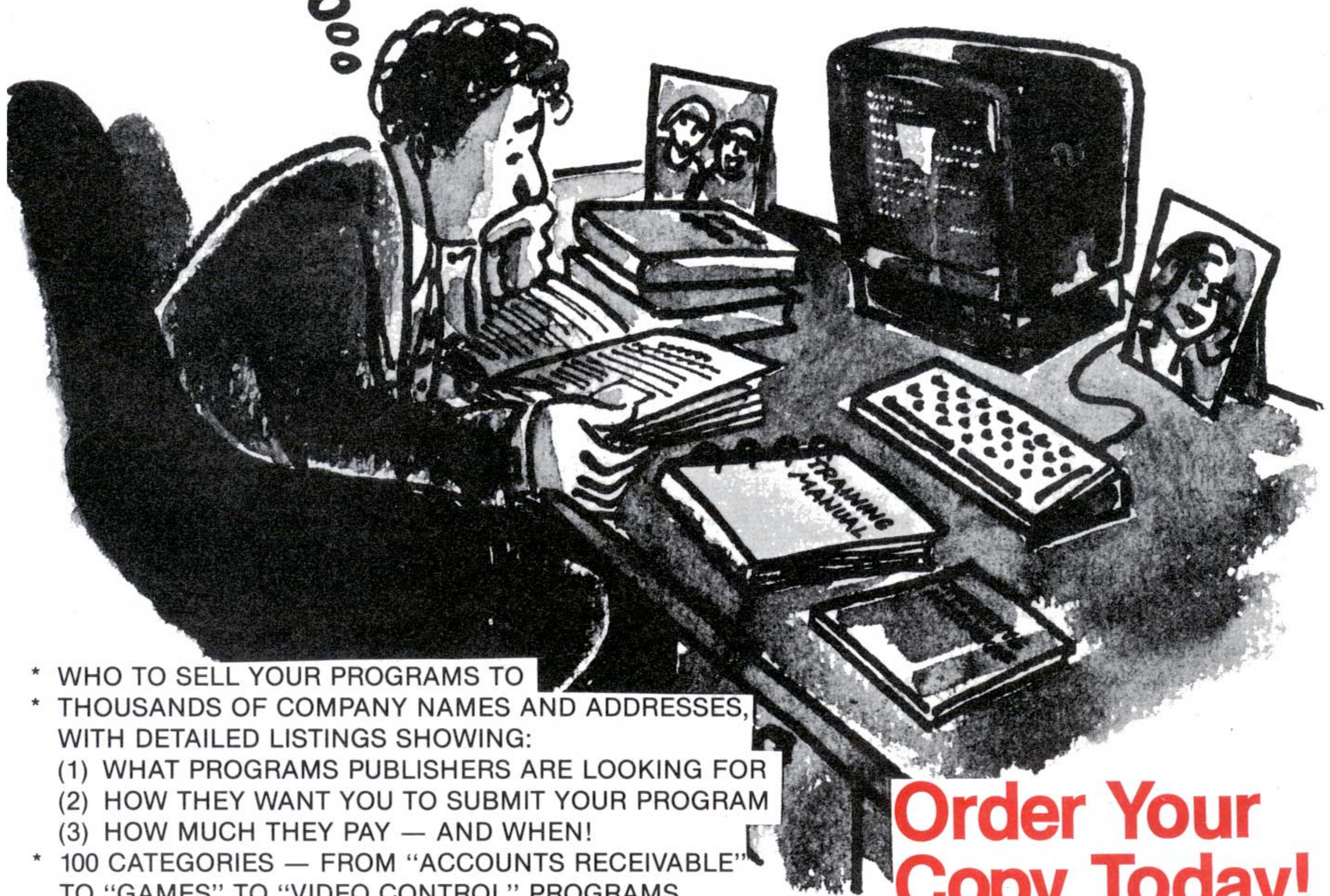
WRTEST/CMD tests the disk drives for writing ability.

If you are constantly modifying disk files, particularly the /CMD variety, the COMP/CMD program will be of great value. You may examine any two files on any two drives. Whenever a byte is found that does not match in both files, it is reported. Thus, you may find just exactly what you have done to a file

programmers

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#20

Reviews

without manually checking every byte. You probably won't use this utility very much, but when you need it, it will be a godsend.

The DCT/CMD program displays all the bytes in the drive code table for a specific drive and allows you to change any one, or more, of them. This may be useful for reading disks with directories located in funny places, or formatted in different densities. The ability to modify the DCT can be dangerous, so if you are unsure of what a DCT is, or how to manually interface with one, it would be best that you not use this utility to tamper with important disks. I also found this utility useful for manually installing the second bank of 64K RAM in the MAX-80 as disk drive number two. This utility is for experienced programmers.

DIRCHECK/CMD is a complete directory-check program. It will tell you if you have bad bytes in any directory entry, in the GAT table, or in the HIT table. If you find problems, the utility FIXGAT/CMD may be of great value. This will only repair problems in a GAT table. Ideally, you should immediately copy programs which have been repaired on a suspect disk to another disk with the CLONE parameter set to OFF. This assures an uncorrupt copy and a correct directory entry. The FIXGAT/CMD utility tells you that you should run DIRCHECK immediately to insure correct operation. I have very few disk problems with LDOS, but the dozen or so times I've used this utility, it has worked flawlessly and saved me much more money than the package cost!

HIGH/CMD is a very handy little utility which will tell you the name and memory locations of all the modules residing in your high memory. If the module contains the standard LDOS header, its name is reported. Otherwise, only memory usage is reported. This program can help you learn about the way LDOS uses high memory. If you are having trouble getting your SYSGEN the way you want it, this utility will be a great help. If you have a disk with a SYSGEN on it that you're not sure of, this utility is your only way of finding out what really is up in high memory without spending lots of time with DEBUG.

The MAKE/CMD utility is an enhancement of the CREATE command within LDOS. It will allow you to create a file of any size up to the limit of your drive capacity and fill it with the byte of your choice. This program would not be a great deal on its own, but it's a nice addition to the package. I can see where there would be a need for it if a file is needed and it is desired to fill it with a specified byte (the way Profile does during initialization).

If you've ever wondered just where the system is putting a file on the disk, the MAP/CMD utility will tell you. Using this utility, I was able to speed the BOOT process up considerably by locating the files used during booting close to the directory. This program did not do the relocating, but it did tell me where LDOS had put it. If you have a file that loads too slowly, this program just might show you why. It runs very fast and produces a pleasing display, but does not page its video output. This is a minus point but, unless you have a very large file spread over a large number of extents, you won't notice this small oversight. If this is a problem, you can have MAP/CMD send its output to the printer very easily. Running MAP is a whole lot easier than searching a file's FDE to find out where it is!

RAMTEST/CMD does exactly what the name implies and does it very well. It tests all memory from 4200H to the top of your machine. It will continue running until you boot your machine because it is testing all the RAM, including the memory where LDOS normally resides. I haven't yet had a bad RAM in my Model I or Max-80, so I cannot comment on the display when a bad chip is found.

According to the documentation, it will tell you which bit is bad and which bank the bad chip is in by displaying the value expected, the value read, and the memory location suspected. Like all such programs, you should only suspect your RAM if you receive repeated indications of the same bad memory location since interference from a power line or nearby appliances can cause a chip to lose its memory once in a while. If you are having problems, this program could be worth its weight in

RAM chips!

Two other diagnostics are included for your disk drives, RDTEST/CMD and WRTEST/CMD. The former reads and verifies every sector on a disk and reports if it cannot be read properly. This information, together with that obtained from MAP/CMD, may be helpful in restoring a damaged file. The WRTEST tests the drive and the diskette by writing onto the disk and reading it back. If you are consistently getting parity errors, this diagnostic could help you by giving you, or your technician, enough information to speed up the repair. If, for example, all write errors seem to be on the inner tracks, either your diskettes are not good quality or your data separator is not working properly. If write errors occur at random, the media is probably not at fault. Of course, this would be the very software to take with you if you are considering the purchase of a used disk drive or system.

On the Max-80 and the Model III, the WRTEST program initially refused to function. A call to LSI revealed that a patch had already been published in the *LDOS Newsletter*, January 1983. After I applied this one-byte patch, it worked properly. On the Model I, the program functioned correctly without patching, though I recommend that the patch be applied in case you ever upgrade your computer to a Max-80 or Model III. According to the documentation, both programs should not test any tracks that had been locked out on the disk. Both RDTEST and WRTEST checked all tracks for me and, though I prefer it this way, it is not what the documentation says will happen. When problems do occur, LSI has always been right there with the needed support.

READ40 is a utility designed to allow LDOS to read a 40-track disk in an 80-track drive. Since I do not have any 80-track drives, I have not tested this utility. I can see, however, where it might be worth the entire package price to someone who owns such a drive.

READII is a program to allow Model II disks to be read by a Model I or III, or Max-80, as long as your system has an 8-inch drive connected. This program will allow

you to transfer files and data, but it will not translate a Model II program so that it will run properly on the Model III. This would, of course, be the programmer's responsibility. The program is very similar in operation to the CONV/CMD that comes with LDOS except, of course, it's for Model II disks. Users should be aware that the Model II stores its BASIC programs differently. If BASIC programs are to be transferred, they must be stored in ASCII or they won't load into a Model I or III.

If you've been wishing that you could control programs such as LSCRIPT from a JCL file, you'll absolutely fall in love with TYPEIN/CMD. It may be used instead of JCL to produce multiple printouts from multiple LSCRIPT files. It may also be used with JCL for more complicated procedures. It would be entirely too involved to explain all the things that can be done with this powerful utility in this limited space. Suffice it to say that it solves all the problems that

JCL has when the application program looks for its keyboard input via INKEY\$ or non-standard input calls.

Unfortunately, programs which repeatedly scan the keyboard looking for BREAK or something else, will clean out the TYPEIN buffer and cause problems. The documentation clearly points this out. As a guide, if typeahead works with the program, so will TYPEIN/CMD. This utility may be used in three ways: with direct input, with input from a file, or from within a JCL file. Using this utility, a new measure of independence from operator attendance is given to your computer.

UNKILL/CMD is another mnemonically-named program. If you've ever accidentally KILLED a file and spent a couple of hours (days, weeks or cusswords) reconstructing it, you'll surely appreciate this little utility. It is intelligent enough that it won't restore a file if the file's disk space has been re-used by another file. Thus, you may be sure that if

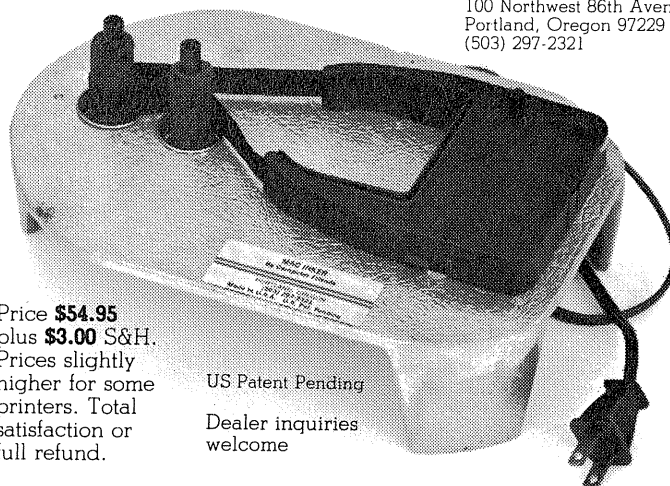
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Reviews

UNKILL does restore the file it is a good copy. This is another program that could save you much more money than it costs. Of course, if you're perfect and never make mistakes, this program would have little value to you. For the rest of us, I think it's great. So does my wife. She

hears noticeably fewer outbursts of uncontrollable language from me since I got this utility.

Chances are, you have a need for one or two of these utilities. If you buy this package, it is unlikely that you'll ever need all of them, but don't let that deter you from purchasing it.

If you find a use for as few as three of these fine programs, the package is easily worth its price. I recommend it highly for even the occasional LDOS user and it is a must-have software package for the more serious user of LDOS.

C.P. Knight

How To Do It on the TRS-80

by William Barden, Jr.

ISBN 0-936200-08-01

IJG, Inc.

1953 West 11th Street

Upland, CA 91786

(714) 946-5805

\$29.95

"How To Do It on the TRS-80," is a book that covers the TRS-80 Models I, II, III, Color and 100 computers. It is, or soon will be, the premier reference source for these computers. How many times have you fumbled through half a dozen manuals, trying to find a description or solution to a rarely-used procedure? If you are like me, you've also amassed reams of hand-written notes, documenting nuances that Tandy either forgot to publish, or are found in the last sentence of the last paragraph in the last place that you look. Why hasn't someone consolidated all this information into one source that I can turn to in my hours of need?

Rejoice! Someone has written such a book, and it's none other than the renowned computer consultant and writer, William Barden, Jr. The book is mammoth, approximately 320 8½x11-inch pages.

The book is written for anyone owning a TRS-80 computer. It is for the novice who may need to know how to read the color code on a resistor (yes, there is even basic electronics within the pages of the book), or how to backup his diskette. It is for the experienced user who may need a quick reference source to find the pin-out on one of the computer's interface connectors. BASIC keywords are covered for all machines. Mr. Barden explains what the keywords are (POKE, PEEK, GOTO, etc.), what they do, and how to use them. There is also a section explaining how the keywords are stored within the

computer as "tokens."

What makes the book so easy to use is the unique index the author has devised. The index makes finding information a breeze. Each piece of information is tagged with a four-letter "key" that makes it easy to find where the information is contained in the book. For example, let's say I forgot how to use the CompuServe information retrieval service (I only use it once a month, so I forget how to sign on). I would look in the manual's index and find "CompuServe, using, Model I." Listed opposite the entry would be the four-letter key "CPSU." I would then turn to the section of the book with the heading "CPSU." There, I would find the exact procedure to follow to connect and successfully sign onto the telecommunications service. There is a printout of a sample session included, just in case I can't understand the plain English the text is written in.

I wonder why the entry indicates it is for Model I usage only? The explanation pertains to all the computers the book discusses.

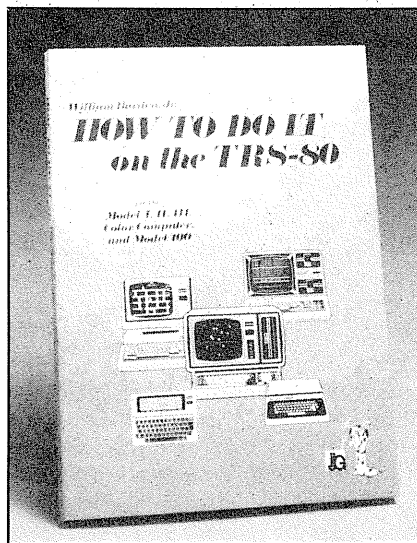
Perhaps it's just an oversight. All other topics are similarly tagged with all the keys appearing in the book in alphabetical order. I have to admit, when I first saw the index, I thought, "Oh, no! How can anyone find the information easier than with a traditional index?" After using it a few times, I really came to appreciate the book's indexing method as opposed to traditional indices.

There is information on disk procedures, and not just for TRSDOS users. Quite a bit of information is included on LDOS. Attention is even given to the editor/assembler EDAS from MISOSYS. Naturally, Radio Shack's EDTASM is also covered. Speed-up modifications (they speed up the clock rate of the CPU) are discussed. The list of topics covered goes on and on and on. As you may have guessed by now, the book is not just a re-written Radio Shack manual. As one person said, "It is the manual Radio Shack should have written."

For Model 100 users, a separate section is devoted entirely to your machine. The same exacting treatment is given the Model 100 as is given to the other computers. The book is very complete. I won't even have to scribble down new discoveries on scattered pieces of paper anymore. The author has included blank pages for notes in each alphabetical category of the book!

I'm sure that it will become one of the most-used books in my reference library. It should be in yours as well. This is the book every Tandy computer owner should have right next to his computer. I recommend that you get your copy. My congratulations to Mr. Barden on another fine work.

Gary A. Shade



Four Frogger Games

One of the most popular video games to emerge in the arcades is called Frogger. This game has enjoyed enormous success as proven by the millions of quarters it has collected in its bottomless bowels. It is only natural that a few home computer programmers have attempted to make their own version of the game that is *similar* to Frogger, yet *different* enough to avoid any legal confrontations with Sega (Frogger's owner).

At this time, there are four obvious versions of the game available for sale for the Model I and III computers. Before these are mentioned, however, a complete description of Frogger and its method of play will be in order.

The object is reasonably simple on the outside: you must manipulate your frog from the bottom of the screen to the safety of the top. This is done by moving horizontally or vertically.

The screen is divided into two halves. The first half is supposed to be a superhighway that appeared to have been created by someone with a warped sense of humor. Each lane of traffic goes in *opposite directions*! There are up to half a dozen lanes of traffic with spaces between the cars and trucks. Your mission is to hop between these spaces until you reach the other side of the road. As the game progresses, the difficulty increases in that the traffic becomes more congested and moves faster and faster.

The space between the two halves of the screen is always safe in the beginning portion of the game. However, a nasty snake slithers back and forth along this section as you advance in the game — and you know how much snakes love to eat frogs!

So far, you have to avoid traffic and snakes. If unsuccessful at first, don't worry! Frogs are like half a cat: you have five lives to start and a bonus frog for over a certain number of points (usually 10,000).

This brings your frog to the top half of the screen. It is filled with logs and turtles that move in long rows similar to the traffic below — in opposite directions. You now have to hop on top of the logs and turtles and

avoid the rapid currents. Otherwise, for some unexplained reason, your frog will drown. And all this time I thought that frogs could swim . . .

Once at the top, you will have your choice of five different homes to hop into at exactly the correct angle — otherwise you hit rocks and subsequently must start over at the beginning. The home on the far left is considered the most difficult due to the direction of the log's movements. An occasional fly and alligator will appear in the homes. Eat the fly and get bonus points. If the alligator gets you, it may burp after it dines on frog legs.

The top half of the game can be the most tricky area you will encounter. Snakes will appear on some of the logs. Beavers will swim up to the left side of logs and jump up and get you if you are on that side at that moment. Long logs may be replaced by jaw-snapping alligators. A cute trick is that you can ride on top of these alligators as long as you are not sitting on their mouths. Otherwise, it is bye-bye froggie.

Occasionally, a lady bug will appear on the row of logs that is near the bottom of this section. If you position your frog over the lady bug, she will jump on your back and ride you to the home at the top of the screen. You receive additional bonus points for getting her safely home.

The rows of turtles can be sneaky for in reality they are diving turtles. During normal operation, they stay at the top. However, if they begin to blink, that is your signal that they are about to dive. If they dive while you are riding them, well . . . next frog, please.

A timer bar crosses the bottom of this 1- or 2-player game. You have 50 seconds to go from the bottom to home or you lose your frog. The reason is never explained. Perhaps it starves to death after the time is up. Any additional time left on the clock after a successful crossing is added as more bonus points.

The sound effects and music are strong reasons for addiction to this game. The music is clear and lively. A good crossing is rewarded with happy music. Television advertisements feature portions of the music for those few unfortunate people who have never played the original

Awesome!

USCF rated
1793/5*

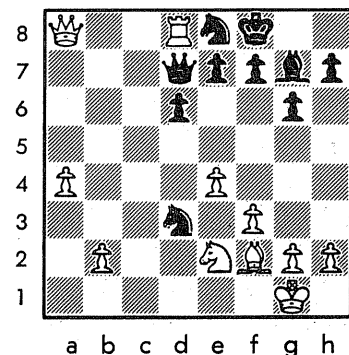
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3. d2-d4	c5-d4	19. e3-f2	b5-b4
4. f1-b5+	c8-d7	20. c2-b3	a6-a5
5. b5-d7+	d8-d7	21. d1-d4!	b7-b5
6. f3-d4	g8-f6	22. c3-b4	a5-b4
7. b1-c3	g7-g6	23. a1-c1!	c4-b6
8. e1-g1	f8-g7	24. c1-c8+	b6-c8
9. c1-e3	e8-g8	25. b3-c4	b5-d7
10. d1-d3	a7-a6	26. c4-b4	c8-a7
11. c3-d5	b7-b5?	27. b4-b8+	f6-e8
12. d5-b6	d7-b7	28. d4-c4	a7-c6
13. b6-a8	b7-a8	29. b8-a8	c6-e5
14. f2-f3	b8-d7	30. c4-c8	g8-f8
15. f1-d1	f8-c8	31. a2-a4	e5-d3
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Reviews

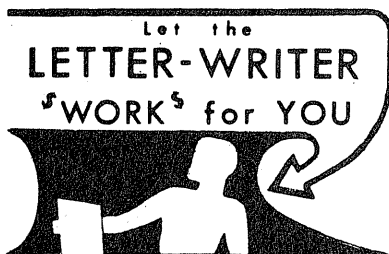
game.

As the player's score increases, the bottom traffic-half of the game gets filled with traffic and the top half reduces the number of logs and turtles to almost nothing. The further you survive, the harder it is to continue.

As a potential buyer for the four currently-available Model I and III similar programs, you must certainly be confused as to the merits of each individual version. All are described in the ads as similar in appearance and function. For the characteristics of each, you may refer to the chart that accompanies this article. This chart, plus the following condensed descriptions, should tell you which game will fit your particular preference.

Hoppy
Models I/III/4III
Cassette \$17.95, Disk \$21.95
Displayed Video
886 Ecorse Rd.
Ypsilanti, MI 48197



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Hoppy was the first program of this type to appear in magazine advertisements. It became available about one month after it was advertised. It was originally marketed by its authors Dubois and McNamara from Australia. They had begun a mail-order business through a location on the west coast of the United States. However, problems arose in marketing and distribution. The authors returned to Australia.

About this time, Displayed Video in Michigan came to their rescue and agreed to market and distribute Hoppy and other programs by Dubois and McNamara. John LaCourse of Displayed Video initiated full-page ads in color for Hoppy. At last, Hoppy appears to be on the right track for success.

One feature that causes Hoppy to be unique in its field is the ability to save your high score to tape or disk and then verify the saved score.

Although it plays similar to Frogger, Hoppy does not look like Frogger! The reason is that it divides the game into two screens. The first screen shows the traffic in over-sized cars and trucks. Once completed, the second screen appears with the top area on the entire screen (logs, turtles, etc.). The game subsequently cannot be viewed as a whole. You can see only half of the game at a time. With Frogger, all of the action can be seen at all times, hence the big difference.

Despite this shortcoming, Hoppy is a fun game. The graphics are creative and the machine language action is rather brisk. Sounds are the usual beeps and buzzes. The title page is a bit unusual as are the instructions, but they are enjoyable. A joystick may be used in this game.

Dubois and McNamara obviously realized that they would not be the only people to come out with a game of this type, but they were the first. Other games after their version would have to be inferior or better. Credit must be given to them for coming out with a version of this caliber on such short notice. Being from Australia, it would have been even better if they had made the main character a kangaroo instead of a frog. Then it would really be Hoppy.

Leaper
Models I/III/4III
Cassette \$15.95, Disk \$19.95
Cedar Software
1943 Woodson Court
Dayton, OH 45459
(513) 435-5966

Leaper was the second version to be found in advertisements. It was written by John DeRegnaucourt of Centerville, Ohio, for his software company, Cedar Software.

Leaper was almost completed at the time the ad for Hoppy appeared in various computer magazines. Discouraged, John nearly gave up on the idea, feeling that someone had already beat him to the punch. He received encouragement from a local software company and completed the game despite the obvious competition. Leaper became available late in the summer of 1982. A successful program was born and John is very happy that he did not give up his programming efforts.

Leaper is the best single-screen version of Frogger that is available for the Model I and III computer.

One obvious advantage is that it is only one screen. This way it looks as close to the original as possible and the player can view all of the action at once. Keyboard control for the arrow keys or joystick is instant for this one- or two-player adventure into the brief life of a frog. It is a fun game as you try to manipulate your graphic character past the slithering snakes and speeding traffic. The first level is relatively simple to master, but a total of 10 different levels (each much more difficult) provides a unique challenge for the experienced video-addicted player (videot).

In addition to the obvious creative sound effects needed in a game of this type, Mr. Deregnacourt (better known as "Mr. Wizard" to his fellow programmers) has recently added voices to Leaper! These are not the crackly, muffled voices found in many programs. His vocal sounds are very crisp and clear. John has implemented quality sounds and voices in Leaper. For those who purchased a Leaper without voice and wish to have the vocal version, send the original tape (plus \$3 for postage) and Cedar Software will replace the older

Reviews

version with the vocal version.

If you are searching for a game that looks and plays similarly to the original, Leaper is for you. Rrrabbit!

Jumpy

Models I/III/4III
No charge with purchase of
The Word Machine
Pel-Tek
P.O. Box 1026
Southampton, PA 18966
(800) 523-2445
In PA (800) 346-7511

Jumpy's appearance in advertisements marked the third appearance of a Frogger-type program for the Model I and III.

The programmer for Jumpy is Ed Levy. He was educated for a systems analyst position and worked for a defense contractor early in his career. He designed and implemented "war game" simulations to aid his company to sell weapons systems. Currently, he is executive officer of a wholesale distribution firm, teaches evening courses at a local community college, and programs evenings and weekends.

Jumpy's parent company, Pel-Tek, is owned and operated by Ed's wife, Pam. It is primarily a mail-order business for arcade games for the home computer.

A remarkable marketing ploy of Pel-Tek is that they advertise their game to be more of a "rabbit" game than frog game. You have to hop your bunny over the same obstacles (graphically). High scores built into the game have names like Peter Cottontail, Bugs, etc. The only reason that is apparent to call it a rabbit game is to avoid lawsuits from the original.

A good feature of Jumpy is that it is a single-board game. All of the action can be viewed at once.

The graphics could be improved a bit. The section of logs and turtles is made of typewriter letters and symbols joined together rather than the more attractive original graphic combinations found in other versions of the game.

Jumpy is a very fast-action game that plays similarly to the original. The sounds are adequate beeps and buzzes.

One nice unexpected feature is that something different happens

once the bunny reaches the top: the action reverses! Suddenly, the logs and turtles are going in the opposite directions. It is a real challenge since your mind has just prepared itself to remember which direction each row travels. Abruptly, what you remember is no longer true. Nifty idea, Mr. Levy!

Advertising for this product has been minimal. However, the game does have merit as a reasonably similar version of Frogger. It does lack the extra enhancements of fancy sound and detailed graphics, but this does not distract the player from realizing that it is an enjoyable reproduction of the original.

Frogger

Models I/III/4III
cassette \$12/94
Close-out sale through
RAMparts, 145 Grove St. Ext.
Peterborough, NH 03458
(603) 924-9882

The most recent version of the Frogger video game finally had the courage to come out and call itself Frogger. Actually, this is the only *authorized* version on the market.

Frogger (for the Model I and III) was written for The Cornsoft Group. You should remember this company as the originators of Scarfman (a version of Pac-Man). The owners of Pac-Man persuaded Cornsoft to halt their manufacture of Scarfman due to its similarity to Pac-Man.

Cornsoft decided to come out with a frog game. However, they contacted Sega (the owners of Frogger) first, to obtain permission. Sega agreed providing they followed their guidelines to allow the game to be as close to the original as possible. Cornsoft complied and the game became available in November, 1982.

The first thing you will notice about this version is that it features the same harmonic music as the arcade version. It is a catchy, addicting tune that plays during the introduction at periodic places during the game's execution. In fact, there is music playing at all times during the game.

The opening introduction features a full-screen frog of interesting design. It is followed by instructions as well as requests for the number of players and game level to begin

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Reviews

(from 0 to 4).

This version is another two-screen copy. The first screen is the traffic, and the second is the logs and turtles. Again, you cannot view the entire game at one time, so it can be a bit distracting.

At its fastest level, this program is darned near impossible to finish. The congested traffic moves almost too fast and the pond is very

treacherous.

The graphics are excellent. However, it sometimes becomes a bit confusing to determine the frog on the rapid log. It tends to blend into the log and, if you are momentarily distracted, you may lose track of your frog.

By the way, Cornsoft is in the process of coming out with a Frogger for the Color Computer. It should be

interesting to discover how many imitators emerge for the CoCo before and after their version becomes available to the general public.

The Cornsoft Group's version of Frogger should delight the kids with its fancy tunes and flashy action. It is a delightful, two-screen rendition of the original arcade game that is suitable for the entire family.

Bob Krotts

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LANGUAGE	MACHINE LANGUAGE	MACHINE LANGUAGE	MACHINE LANGUAGE	MACHINE LANGUAGE
GAME SPEED	BRISK	ACCEPTABLE	FAST RESPONSE	BRISK
OFFICIAL VERSION	NO	YES	NO	NO
SNAKES?	NO	YES	YES	NO
FLY?	NO	YES	NO	YES
CROCODILES?	NO	YES	YES	YES
SINKING TURTLES?	NO	YES	YES	YES
LADY FROG?	YES	YES	NO	NO
GRAPHICS QUALITY	FAIR TO GOOD	GOOD BUT CONFUSING	SUPERB QUALITY	CREATIVE
MARKET APPEARANCE	THIRD APPEARANCE	FOURTH APPEARANCE	SECOND APPEARANCE	FIRST APPEARANCE
NUMBER OF PLAYERS	ONE	TWO	TWO	TWO
NUMBER OF SCREENS	ONE	TWO	ONE	TWO
NUMBER OF POCKETS	FIVE	FIVE	SIX	FIVE
ROWS OF TRAFFIC	FOUR	SEVEN	FIVE	SIX
ROWS OF LOGS	FOUR	SIX	FIVE	SIX
BEAVER ATTACKS?	NO BEAVER	NO BEAVER	NO BEAVER	NO BEAVER
OVERALL SIMILARITY TO FROGGER™	REASONABLE SIMILAR IF THE GRAPHICS WERE BETTER DEFINED	PLAYS THE SAME, BUT IT CAN BECOME A BIT CONFUSING AT TIMES	ALMOST IDENTICAL. OVERALL, THIS IS THE MOST SIMILAR	BEING A 2-BOARD GAME, IT JUST MISSES THE ORIGINAL INTENT

Profile III+

Models III/4III

Available at Radio Shack Computer Centers and Stores

\$199 floppy version

\$299 hard disk version

Profile III+ is Radio Shack's entry into the world of useful Model III Data Base Management (DBM) systems for business applications. It was written by the Small Computer company, Inc., of New York City, and licensed to Radio Shack. Profile III+ has many advanced features found on very few (if any) other microcomputer systems. However, several inconveniences still exist. The machine language software is

provided on two disks — a creation disk and a runtime disk. Both disks are unprotected, and detailed instructions for the backup procedures are included in the manual.

Capacity

The data record may be divided into four "segments." Only fields in the first segment can be used for sorting or for selection of records when searching the file or printing reports and labels. (*The Prosort package allows you to sort on other segments. —Ed.*) Each segment may contain up to 255 characters, distributed as you wish among 16 fields (for a total of 64 fields, and 1020

characters per record). Since only fields in segment one can be sorted or searched, those fields should be chosen with great care. A large number of characters in segment one, however, will significantly slow the search and sort functions.

Total capacity depends upon the number of drives available. Assuming each segment contains 255 characters (most applications will use many fewer), a one-segment file could hold 700, 1400, or 2100 records on two, three or four drives, respectively. With four segments, 110 records would fit on two drives, with 350 records maximum. Each segment, unless the file contains

only one, must be completely contained on one drive. When a segment fills its drive, no more records can be added. Empty space on additional drives will be unusable. Drive zero always contains the runtime programs, so only the smallest segment (if any) should be placed on this disk (< 300 records).

Sorting is done in memory, so the capacity depends upon the sort field length. On a nine-character field, 3130 records can be sorted, but on a 40-character field, 872 records are the limit. If more records exist than can be sorted, you must select a portion of the file to sort at one time. However, if the first three characters of a 15-character field would produce a unique order, the sort can be restricted to look at only those characters. This increases both the sorting capacity and the speed (although the sort is extremely fast).

Profile III+ allows a field to be defined in terms of math formulas, using +, -, *, /. Up to 16 formulas can

be defined, using up to 20 fields per formula. However, a field cannot operate on itself and store the result back in the original field (i.e., $A=A-B$). Dummy fields can be defined to hold intermediate results ($Z=A-B$; $A=Z$), and need not be defined within the actual data base. The math functions can be used to calculate commissions, totals, taxes, etc.

Data Base Creation

The creation disk programs are used only to set up the initial data base format. The separate runtime disk is used for daily access, so that users of the data do not need access to utilities for restructuring the data base. Setting up the data files can be very difficult for an inexperienced user. The manual takes you through the set-up of a complex example and suggests about eight hours to learn the procedure. Upon finishing the instructions, one could easily spend another eight hours designing the first customized data base.

The 202-page manual assumes the reader is a business user unfamiliar with data base software. It is clearly written, and includes a detailed tutorial. A reference section contains a summary of each utility program and its use. A major documentation omission is a quick-reference card. Many keys and cursor controls have different effects depending upon which section of Profile III+ is being used. The screen prompts are sufficient for an experienced user, but the novice must search through the manual for many commands.

When initializing a data base, one first defines the number of segments, the fields to be placed in each segment, and the length of each field. "Associated fields" can be defined within a given segment. If one of these fields is used for a search or sort, all fields associated with it are also processed. For example, an index of articles from *Basic Computing* might include a "SYS" category to distinguish tape-

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Reviews

and disk-related articles. By creating two associated fields, a single entry for a program usable on both types of systems would print out twice — once under tape, and once under disk.

The order of fields within the "key" segment (segment 1) can be important during sorts. The only way to sort by more than one field at a time is to use adjacent fields. When setting up mailing lists, one could begin with the fields: 1—Zip Code (9 characters), and 2—Last Name (15 characters). The sort field can then be specified as field 1, with a length of 24. The records are sorted by zip first, then name. However, it would *not* be possible to later sort by name and then zip. Such limited sorting may cause problems in some applications.

Up to five different 14-line screens can be defined for adding and viewing records. Screens may be protected with separate passwords, allowing certain individuals access to only portions of the data. Specific fields on a screen can be protected from data entry or changes, if

required. When designing screens, a cursor can be positioned at any point, with a counter to indicate the cursor's location and a grid of character positions displayed along the bottom line. Any type of literal information or prompt can be specified, along with the field number and the type of data to be entered. Data types include alphanumeric, numeric, dollars/cents, month/day/year, year/month/day (more useful for sorting), and versions of these which must be filled before the record will be processed as complete (the screen will flash any vacant must-fill fields). To save time when adding records, the must-fill (and the most frequently used) fields should occur first.

Up to five different report and five different label formats can be defined for a data file. All reports and labels can be designed for print widths from 1 to 132 characters. A grid across the top of the screen marks print positions, and the screen acts as a window onto the wider report formats (much like VisiCalc and Scripsit). For reports, two title lines and two heading lines are allowed. The report can have one or two data lines per record, with a space automatically inserted between records. Labels can have up to eight lines, and can be printed up to six across. For labels only, any field can be automatically pushed left to meet the end of the previous field (with one space between them) to eliminate long gaps between fields such as first and last name.

However, several deficiencies are evident. One could design a four-line label for name, company, address, and city-state-zip. If a record with no company entry is printed, a blank line will appear between the name and address. One must define a separate label format containing only three lines, and add a field for each record designating a three- or four-line label. Any sorting would have to occur separately for the four-line labels and the three-line labels. Another difficulty occurs if fields are defined for title (i.e., Mr., Ms., Mr. and Mrs.), first name, and last name, where the first and last names are specified to be moved adjacent to the title. This works fine unless you indent the fields from the

left margin (which is required to have proper spacing on two-across Radio Shack mailing labels). In such cases, if the title field is blank (suppose you do not know if the person is male or female), the name would be printed flush against the left margin, rather than indented, as follows:

Kim Wallace

3708-B Arizona St.

Los Alamos, NM 87544

This looks silly, and can only be avoided by placing a literal character in the label format to the left of the first field specification:

> Kim Wallace

3708-B Arizona St.

Los Alamos, NM 87544

This is not a very satisfactory solution!

Another omission is the ability to print phone-book-type listings. Reports can only be printed in strict columns, allowing space for the entire field length. The "close-up" labels option would have been useful in reports. Nevertheless one might try to define a label format to look like the following (all on one line): Wallace, Richard K. 3708-B Arizona Street, Los Alamos, NM 87544 662-2631

Such a report would be very useful for mailing lists, customer lists, employee records, etc. However, the dots cannot be printed and no literal characters ("") can be printed between compressed fields. The resulting listing is too densely packed to be readable.

Eliminating blank lines from labels, specifying a strict indent for labels, and allowing literals (i.e., "") to be included in the string that is moved adjacent to a previous field, are omissions that could severely limit Profile's usefulness.


Using the Data Base

The runtime disk is used to update the data. Adding, updating and searching for records are all accomplished from the same master program to minimize time delay in using these functions. The break key is under program control and can almost always be used as a safe panic button. When adding records, the corresponding field in the previous record can be duplicated into the current one with a single keystroke. The arrow keys move the

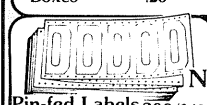
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cursor around on the screen, and enter will skip directly to the first position in the next field. A mark is visible at the end of each field, to indicate its length. Protected fields (maintained through math functions or defined on a previous screen) are automatically skipped.

One slightly annoying feature is the automatic skip at the end of a field. Suppose you are filling in the name, phone and address. The name may not fill its allotted field so, after entering that information, you press enter. When typing in the phone number, the last digit fills the field and the cursor automatically skips to the address field. If you are not careful, you may press enter by habit and skip the address field. Constant monitoring of both the input paper and the screen is required, which slows down operator input.

Records can be accessed directly by record number, scanned one at a time, or searched by any key segment field. A sorted index file can be built to allow rapid searches on

the indexed field, but only one index file is allowed for the data base. Once a record is found, a single keystroke will allow viewing adjacent records, different screens for the current record, or finding the next record meeting the search criterion. Alternatively, the displayed record may be changed and re-stored.

A wild-card search can be specified, so that all records with a given subset-match in the field will be selected. For example, all records with a date field containing the month of March, 1982, could be selected by specifying "03/==/82" as the search criterion. The "=" signs will match any number for the day. However, it is not possible to select all records in which a specified field is *null* (left blank).

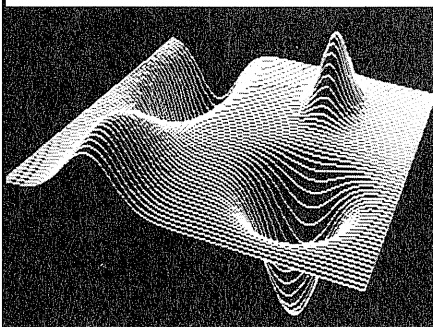
A serious flaw in the search method is that all numeric fields are right-justified. For example, to search for all records which contain a number greater than \$200.00 in a 10-character field, one must specify " 200.00", with four blanks to the

left of the six characters. The exact field lengths must be known and may be difficult to remember, especially if the user did not set up the data base!

Screen review allows only two simultaneous search criteria, but an extended selection feature allows records to be selected for reports or labels based on up to all 16 of the key segment fields. This allows you to specify the field name, the Boolean relationship (=, <, >, not =, etc.) to an operand (i.e., \$200), and a relational operator. If the relational operator is "and," then that field *must* match for the record to be selected. If the relational operator is "or", a non-matching record could still be selected if it matched one of the other "and" search field specifications. In the extended-selection mode, associated fields lose their associations so that the individual fields may be searched for.

Reports and labels can be both sorted and selected by specific fields before printing. No provision, however, is made for 8½-inch wide

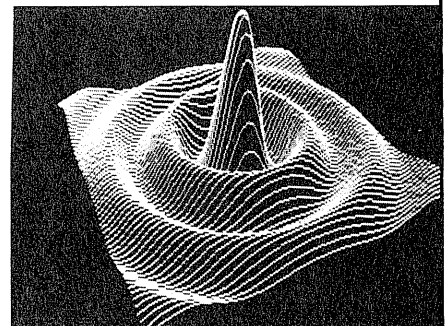
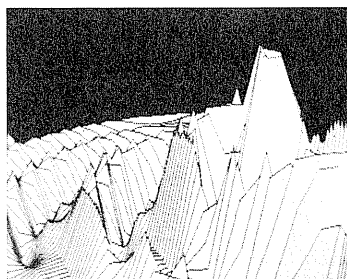
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best results. The documentation contains complete instructions and sample equations so that you will have your computer hard at work without delay. The finished plot can be saved on disk or printed on any of 20 popular printers.

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.)



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Reviews

printers that can print 132 characters. One must first exit to TRSDOS, invoke BASIC, LPRINT the character codes for condensed printing, return to TRSDOS, and run Profile III+ to print the report or labels. A method for sending control codes to the printer from within Profile should have been provided.

All reports must be printed on the lineprinter. Reports can be defined to have 64 characters per line, and it would have been extremely useful to allow printing these records to the screen. This way, a large number of records in a certain category could be scanned much more quickly than by looking at them one at a time, or by printing the whole list on a slow lineprinter.

Another irritating aspect of report generation is that you are only asked if you want continuous (as opposed to single-sheet) printing after the first page is printed. When printing a long report, you must sit at the computer for several minutes waiting for the first page to print. Placing the continuous form prompt after the first report page (or label line) was very poor program organization.

Specialized Features

Profile III+ contains several advanced features to increase program flexibility. A special user menu can be created, which bypasses several of the usually-asked questions and can save some time. This also makes the software package much easier to use for people unfamiliar with the details of computer operation, and reduces the possibilities for error. User menus can be designed to run regular TRSDOS DO files, thus allowing the incorporation of frequently-used sort and selection criteria for printing reports into a single menu option.

Special files can be written by Profile III+ for use with SuperScripsit (not regular Scripsit) and VisiCalc. A form letter can be written with SuperScripsit, then merged with data from Profile III+ to automatically print personalized letters. Similarly, information in selected records can be written to a disk file in VisiCalc format. I also found it easy to write a BASIC program to convert Profile's

SuperScripsit file into one that can be read by Newscrip.

Useful mass operations are also available. Mass recalculate allows changing a value in a math formula, then recalculating relevant fields for all records using that formula. Mass purge first prints, then deletes, all selected records. Mass delete removes the records without first printing them.

Profile III+ marks a significant advance in Model I/III DBM systems and should find wide applicability, despite the formidable price tag. However, several user conveniences were omitted that one would expect to find in a software system of this price.

Merging Profile III+ Data into Newscrip 7.0 Letters

Profile III+ has the capability to produce a file containing names, addresses and other information from selected records in its data base, which can then be read by Radio Shack's SuperScripsit (not regular Scripsit) word processor. A form letter can be written with SuperScripsit, then that program can imbed the Profile III+ information into the form letter and automatically print a set of personalized letters.

The high cost of SuperScripsit (\$200), and the lack of certain features in that program, may cause some people to prefer a different word processor (especially if you already have one). For those readers who would like to use the form letters option with Newscrip 7.0, I have provided a program (Listing 1) that reads the Profile-created SuperScripsit file and writes a file that can be used by Newscrip 7.0 to merge information into form letters. Note that the labels option of Newscrip is not necessary, since Profile can be used to write the mailing labels, and the form letter merge is an integral part of Newscrip itself. Profile III+ writes a file in the following form:

```
@Richard@
@Wallace@
@Los Alamos@
@$350.00@

@Susan@
@Wallace@
@Los Alamos@
@$200.00@
```

Newscrip needs a file of the form:

```
@
@@1 Richard
@@2 Wallace
@@3 Los Alamos
@@4 $350.00
@
@@1 Susan
@@2 Wallace
@@3 Los Alamos
@@4 $200.00
```

The program also allows the first few lines of each record in the Profile-created file to be copied in a literal way. Newscrip can place these lines in the form letter directly, without using variable space (old versions of Newscrip only allowed nine variables; new versions allow 99). The program requires BASIC to be initialized with at least two files.

Profile III+ for Model III, 48K 2-disk is available from Radio Shack Computer Centers and stores for \$199.

Richard Wallace

Listing 1 — Profile III+

```
1 GOTO 10
2 PRINTTAB((64-LEN(H))/2)H
:RETURN
3 LINEINPUT#1,A1:IFA1=""TH
ENRETURNELSEA1=MID$(A1,2,LE
N(A1)-2):RETURN
10 CLS:CLEAR1000:DEFSTR A-
H:DEFINT I-M:H1=STRING$(63
,"-"):DIME1(65),E2(65)
20 H="PROFILE III+ to NEWS
CRIPT":GOSUB2:H="LABELS CO
NVERSION":GOSUB2:PRINT1
30 LINEINPUT"FILESPEC for
Profile label file? ";F1:O
PEN"I",1,F1
40 LINEINPUT"FILESPEC for
Newscrip label file? ";F2
:OPEN"O",2,F2
50 G1="@":PRINT"Newscrip
code character (";G1;")";
INPUTG1:IFLEN(G1)<>1THENPR
INT"ONLY 1 CHARACTER":GOTO
50
60 N1=0:PRINT"Number of li
nes/rec to be copied direc
tly into letter (";N1;")";
:INPUTN1
70 I=1:N2=0
80 GOSUB3:IFA1=""THEN100EL
SEIFI<=N1THENE1(I)=A1ELSEE
2(I-N1)=A1:N2=N2+1
90 I=I+1:GOTO80
100 N3=I-1:PRINT"File ";F2
```



```
;" will contain";N2;"variables"
```

```
110 PRINT#2,G1:FORI=1TON3:
GOSUB3:IFEOF(1)THEN130ELSE
IFI<=N1THENPRINT#2,A1:NEXT
:ELSEA1=G1+G1+MID$(STR$(I-
```

```
N1),2)+" "+A1:PRINT#2,A1:N
EXT
```

```
120 GOSUB3:IFEOF(1)THEN130
ELSE110
```

```
130 CLOSE:IFN1>0THENPRINT"
Literal Lines:":FORI=1TON
```

```
1:PRINTTAB(15),E1(I):NEXT
140 IFN2>0THENPRINT"Variab
les:":FORI=1TON2:PRINTTAB
(11),G1;G1;MID$(STR$(I),2)
;" ";E2(I):NEXT
150 END
```

Auto-plot

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Designed for use with the Radio Shack Model 100 and the CGP-115 Color Graphics Printer from Radio Shack, Autoplot produces color graphs with a choice of line graphs, scatter plots or bar graphs. It can plot mathematical functions or tabulated data and will plot multiple curves. Graph axes are automatically scaled and labeled and there is an optional grid overlay. Linear or logarithmic presentation is possible, as well as numeric integration or differentiation.

The program is provided on a standard cassette tape and a 27-page instruction manual provides detailed instructions.

One option in the program allows the user to draw directly from the keyboard a la Etch-A-Sketch™. Other options allow the use of RAM files for the data to be plotted. Also, the plotted data may be in the form of mathematical expressions contained in lines at the end of the program.

The program is written in BASIC and has the possibilities of infinite variation should the original version not be exactly what you desire. It comes complete with

HELP, TEXT, and LIST commands.

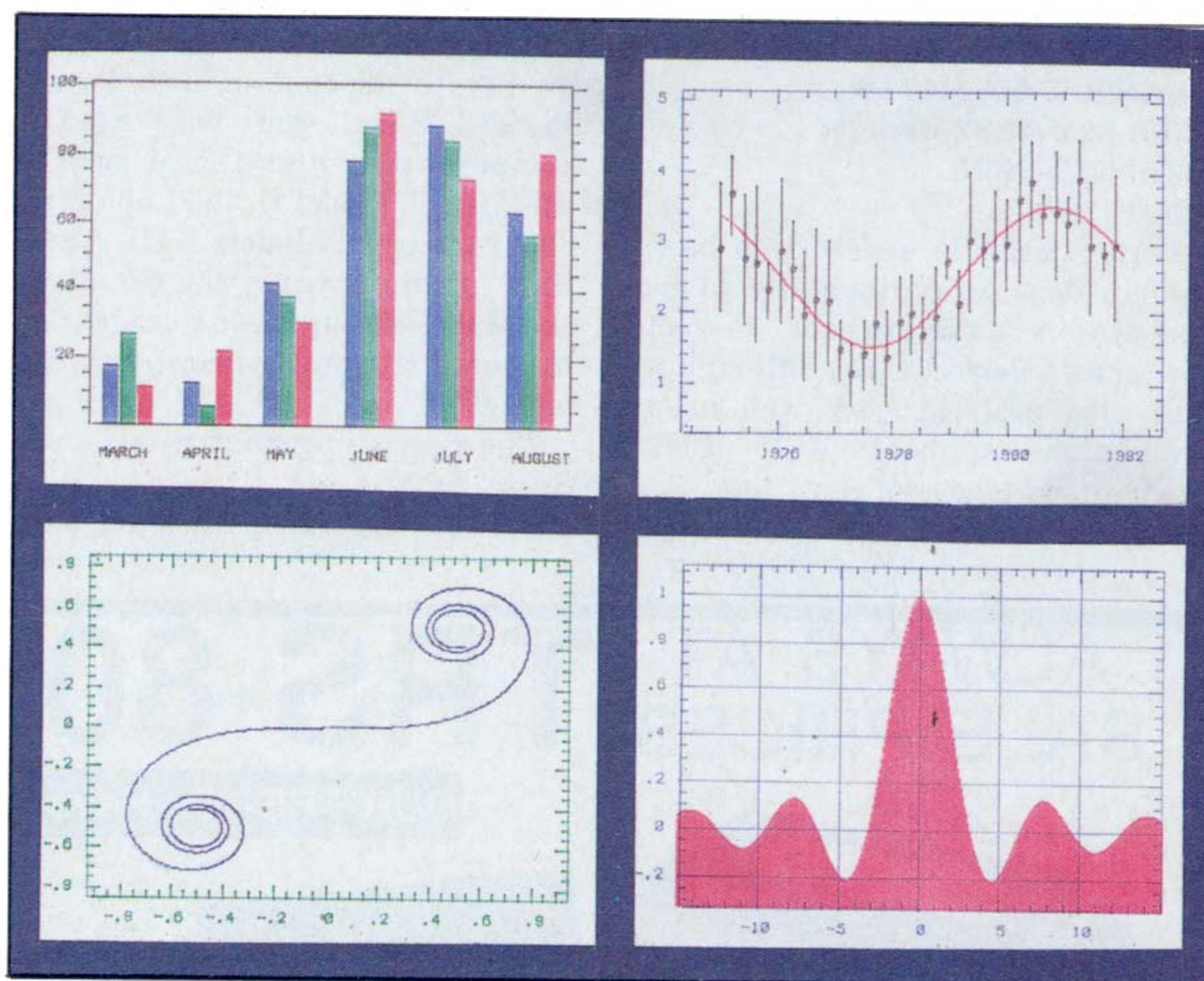
Plotting can be done in four colors: black, red, green and blue. Text characters may be rotated in any of four orientations and the size of the characters can be selected manually or by program control.

I spent a very pleasant Saturday afternoon playing with Autoplot. It took a short time to get used to the commands and I referred to the manual constantly. After a few exploratory plots, it became rather

easy to dream up some very interesting presentations.

For what Autoplot does, the price is right. If you need (or just like) plotting graphs, you should get this one. Incidentally, the CGP-115 plotter makes a perfect companion to the Model 100. They are both small enough to be carried in one large briefcase. The CGP-115 was reviewed in *80-U.S. Journal*, February, 1983, by Jerry Latham.

I. Mike Schmidt



Computer Bridge

by Thomas Throop

Hayden Book Company, Inc.

50 Essex Street

Rochelle Park, NJ 07662

(201) 368-2202

ISBN-O-8104-6253-2

\$9.95 paperback, 134 pages

This book is quite different. It

reviews current bridge playing and tutoring programs that are available for a variety of microcomputers. It has numerous examples that show their sophistication and their flaws. TRS-80 products such as Bridge 2.0 from Dynacomp, Bridge Baron from

Interactive Game Products, and Bridge Partner (no longer available) are discussed as well as programs on CompuServe, The Source, and dedicated machines such as Fidelity's Bridge Challenger and Goren's Bridgemaster from Trymon, Inc. Apple, TI 99/4A, PET,

Reviews

and Atari routines are also discussed.

The author has played a key role in the development of a number of the products, but his analysis of their strengths and weaknesses is quite fair. He gives some of the history behind the development of bridge bidding and playing programs and tells why comprehensive programs are much harder to develop than chess routines.

Don't look for code or programs to enter into your machine. Don't expect this book to replace a classic such as *The Play of the Hand* by Watson. The author takes the time to

show you how the various programs play and bid different hands. He points out which ones play conventions such as Stayman, Gerber, or Forcing Club openings. Some routines will only bid, others bid and defend. Some programs don't switch the north and south cards for easy playing, others do. He has the same hand played on different programs, or he has one program bid and another defend the same hand.

It was interesting to see that a program may cover an honor when it shouldn't and not cover when it should. Most bidding is standard

Goren, with the most popular conventions. Don't expect your computerized partner to understand a psychic bid. Void and 4-4-1 distributions were very difficult for most bidding and responding routines to handle correctly. (I have found that to be true of most of my partners as well.)

Before buying a bridge playing program or a machine dedicated to the game, read this book. It can stop you from making a poor investment. If you are looking for code or instructions on writing your own program, this is not the book for you.

Cameron C. Brown

Perfect Filer

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Perfect Filer is a new data base system designed principally to be companion software for Perfect Writer and Perfect Calc, although it will also perform very well as a stand-alone application. It offers moderately powerful data base capabilities and, when used with

Perfect Writer's editor, mail-merge capability. While it lacks the full power of some other data base programs, it offers an ease of use that is probably as good as any in the industry. It is menu-driven throughout, which contributes greatly to its ease of use. To run Perfect Filer, you will need a computer that runs CP/M such as the TRS-80 Model II, the Lobo Max-80, or modified Models I/III. At the time of this writing, the CP/M for the Model 4 hasn't been released, but it should run on that configuration as well.

The first thing that needs to be done with most new CP/M programs, including this one, is the

running of an installation program. The one which comes with Perfect Filer is one of the worst examples of professional programming that I've seen in quite awhile. It is designed to be easy to perform, and it would be were it not for the extremely poor screen displays. There are 27 selections of possible predefined terminals, but with only 24 lines to display them, two blank lines, and a prompt, most terminals will scroll the selections off the screen much too fast to be read. A list of terminal definitions also suffers from this problem. There are two installation programs. One is for the use of a predefined terminal, the other is for defining your own. This poor

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handling of the display is evident in both of them.

The standard CP/M control-S to pause video output doesn't work from within these programs, so it is necessary to guess what the first six selections are. I solved this by pressing the reset button and holding it in long enough to read the selections and re-executing the program, remembering which selection to make. This technique might not be possible with some computers.

This is inexcusably sloppy programming. Fortunately, the installation procedure needs to be done only once. If this were an example of the quality of the rest of the program, I'd have to recommend against its purchase. Luckily, it is not. An option for the TRS-80 Model II is provided which is far enough down on the screen that it may be seen. I criticize this because it is poor, but I do not think that this would be enough of a problem to recommend against its purchase. You'll experience these problems only the first time you use Perfect Filer, but not afterward.

Perfect Filer comes with two predefined data base programs that will likely work well for many applications. You can start using it as soon as you have finished with the installation procedure. One of these is an individual member data base; the other is an organizational data base. Each is well designed and a delight to use. Their presence is definitely a major advantage of this program over those that give no applications and a "quickie" description of operation in their manual. Even if the predefined data base forms do not exactly suit your needs, they (together with the excellent manual) will enable you to create your own customized data base with much less effort than some programs I have reviewed.

A command structure that is well-integrated with Perfect Writer makes it easy to generate form letters. The full power of printout formatting, which is available with Perfect Writer, isn't accessible from Perfect Filer. But, the essential characteristics of form letter generation are well implemented and creating a large mass mailing will be an easy, pleasant experience.

Up to 20 separate report formats may be defined for any data base. These formats are completely user-definable. You can print name lists, mailing labels, or almost any kind of printout you can imagine. Simultaneous sorting of up to five key fields may be done, an excellent feature. If there is insufficient memory for the sort, Perfect Filer automatically does an external sort which, though noticeably slower, is well programmed and versatile.

Each data record may have up to 20 subset definitions. A subset, which is a group of data base members sharing a common characteristic, may be used singly or in combination with another to produce a nearly unlimited variation of selection criteria for a data base. You may specify the following relational operators when defining a subset: greater than, less than, equal, not equal, greater than or equal, or less than or equal. It is also possible to select members on the basis of the date when they were added to the data base. In a

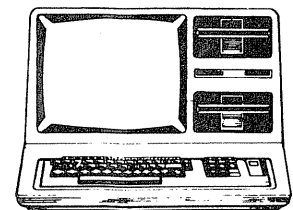
customer data base, this can be a very useful capability enabling one to select a list of all new customers.

The mail merge capability of Perfect Filer is nice, but it uses Perfect Filer rather than Perfect Writer to print the file. Thus, it is impossible to underline, boldface, or use special typefaces. Since Perfect Filer doesn't have a program to "install" a printer, none of your printer's special abilities may be used unless you enable them before using the program. With some printers, this can be a problem. With most printers, it will not make any difference. I'd like to see these abilities added.

Also missing from Perfect Filer is the ability to deal with calculated fields. In an inventory, or accounts receivable or payable, situation this is indispensable. It doesn't purport to have these functions, but if you need to use calculations, you'll have to invest in another software package. For data bases of people, organizations, or items that do not need their prices or quantities

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calculated, Perfect Filer is more than adequate and might serve better than a fancier program that would be harder to use.

The documentation that is provided with Perfect Filer is as good as the install program is bad. It is a paper-back book of 188 well written pages, liberally laced with good examples on the use of the program. The only flaw is the section dealing with the install programs which is only about one-half page in length. The entire manual assumes no previous experience with a data base program and presents its material in a very readable tutorial style. I would rate this documentation among the best I have seen. It more than makes up for the poor installation programs.

Suppose you create a data base program which suits your needs today, but you need to change its structure later on. With many programs, this is either impossible or very difficult. You must re-enter

all your data from scratch. With this program, you may add new fields or eliminate fields you no longer need. You do not need to key in all your data again when doing this with Perfect Filer thanks to the supplied MOVE program. This is an extremely valuable feature, the full benefit of which might be overlooked by the first-time user. Anyone who has had to key in several thousand records a second time might think this feature is the best part of the program.

When defining a new data base, the process is made much easier with the use of "templates." A template is a predefined field, or group of fields, that Perfect Filer recognizes. These may be inserted into your definition with just a few keystrokes. It greatly simplifies the creation of a new data base.

The templates provided are for date, address, name, phone number, time, money, and social security number. These often-used data fields need not be defined either

when creating a new data base or when developing a new report. This is also a very nice feature that works well.

Perfect Filer is not the ultimate data base program. It is, however, a very good choice within its few limitations, particularly if you already use Perfect Writer. Although it is offered as a separate piece of software, it is often sold as a package deal with Perfect Writer and Perfect Calc. When purchased as a part of such a package, it is certainly a good deal even if you don't have an immediate use for it. Other software vendors could learn a great many useful hints about commercial software preparation by studying Perfect Filer. If you're a beginner to computers, it might well be your best choice because of its excellent manual. You can learn to use it easily and you will be able to use it for a long time before you will need to move up to a more powerful data base program.

C.P. Knight

EDAS IV Macro Assembler

MISOSYS

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TRS-80 Models I/III with LDOS

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EDAS IV is the latest in a series of Z-80 editor/assembler programs for the TRS-80 from MISOSYS. It is available for Model I/III and 4 machines running the LDOS operating system, and Model II/12/16 machines running TRSDOS. There are numerous small improvements over EDAS version 3.5, and several major ones including macro processing and library search capabilities. Since earlier versions of EDAS have been reviewed already, I will concentrate on EDAS IV's new features. For those not familiar with EDAS, here is a brief overview of the product.

The basic functions of EDAS are similar to EDTASM, the Radio Shack tape-based editor assembler. Additional features include storage of source and object files on disk, assemble codes to memory, test and return to EDAS. You can execute DOS commands DIR, FREE, KILL and LIST from within EDAS. It allows lowercase and there are text editing commands for global find, replace and move.

One indication of the power and reliability of EDAS is the fact that the entire LDOS operating system is assembled by it! With that in mind, let's get into the features that distinguish EDAS IV from the earlier versions, starting with the macro capability.

Macros

For some reason, assembly language macros are often considered a complex, even impenetrable subject. Maybe it's the opaque documentation that has accompanied previous systems, especially the notorious manual for the Microsoft/Radio Shack macro assembler. Fortunately, EDAS's manual is much clearer. In addition to reviewing EDAS IV's implementation of macros, I will give some examples to show how macros can actually make assembly language programming easier. If you are just starting to learn assembly, you will need to understand "straight" assembly language programming before you can take on macros.

The basic concept of macros is extremely simple. You define a macro and then use it. The definition of a macro gives a name to one or more lines of assembly code. You use the macro by giving its name. The macro assembler substitutes the assembly code that you typed when you defined the macro. This substitution takes place every time you use the macro.

Here is an example of an EDAS IV macro definition. This macro, named CLS (example 1) contains the assembly code to clear the TRS-80's screen.

Once you have defined CLS by typing these lines into your source code, EDAS will generate the code to clear the screen when you type CLS in place of an assembly language instruction. In a sense, you have added a new instruction called CLS to the assembler's repertoire. This "instruction" just happens to correspond to six native Z-80 instructions.

Reviews

CLS is a perfectly valid macro, but it is not terribly interesting because it always generates the same code. If you had to use CLS more than once in a program, you would probably write CLS as an assembly language subroutine and CALL it, instead of using a macro. The real power of macros becomes apparent when you add the concept of macro parameters. Let's rewrite CLS with one difference, and name it LDS for "Load Screen" (example 2).

Did you notice the difference? In the first line, the parameter #CHAR follows the word MACRO. In the second line, the A register is loaded with #CHAR instead of with a blank. When we invoke LDS, we must supply a value for #CHAR, and it will be substituted for #CHAR everywhere it occurs in the macro. We can duplicate the function of CLS by invoking LDS as in example 3.

The advantage of LDS over CLS is that we can now do something like example 4 and fill the screen with 191, the ASCII code for a graphics block character. Every time we invoke LDS, we can supply a different character and EDAS will substitute that character for the #CHAR operand in the LD A,#CHAR instruction.

So, what has the macro bought us? It doesn't save any space and it doesn't make our program run faster. It does make it easier to write assembly language programs. Once CLS is defined, we can generate six lines of code by typing CLS, a real time-saver. Furthermore, a lot of details can be "remembered" by a macro definition. For example, you can use CLS without having to remember the address of the TRS-80 screen.

EDAS IV macros can be made even smarter. You can define a default value for a parameter by putting the default in the MACRO definition (example 5). The "=32" after #CHAR establishes a blank as the default value for #CHAR. Now, if the LDS macro is called with no argument, the same code is generated as when LDS 32 is used to call the macro. If we type LDS 191, the 191 overrides the default and the code to fill the screen with graphics blocks is generated.

Macros can have more than one parameter. Let's look at one more version of LDS, this time with more parameters. We will call it LDB (example 6), which stands for Load Block.

This version of the macro has been completely "parameterized." If we just type LDB with no arguments, we still get the effect of the original CLS command due to our choice of defaults. We can now easily generate the assembly code to fill any block of memory, of any size (up to the limits allowed by the Z-80 LDIR instruction), with any byte. This macro has become substantially more powerful than the original one, yet it is still easy to use. To fill a 100-byte block starting at 700H with zeroes, call LDB as in example 7.

Just as in a BASIC DEF FN defined function, each argument in the macro call corresponds to a parameter in the same position in the macro definition. But EDAS gives you a choice here. If you forget the order but remember the names of the formal parameters, you can type in example 8.

By specifying the names of the parameters, EDAS will find the right parameters to fill in the macro call and the order that you write them in no longer matters. Even more flexibly, you can leave individual parameters out

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and EDAS will substitute defaults for only the missing parameters (example 9) and fill the screen with graphics blocks. The missing #START and #COUNT parameters get substituted for by the defaults of 3C00H and 1024, respectively.

Advanced Features

Now that you have the basic idea of macros, let's look briefly at some of the more advanced things EDAS IV macros can do.

If you are very astute, you may be wondering what happens if a line in a macro includes a label. Since the macro code is generated every time the macro is called, a label would be multiply-defined, resulting in assembly-time errors.

EDAS IV gets around this problem in the following manner. If your labels include the character "?", EDAS will substitute a different character for "?" every time it expands the macro. Suppose your macro definition contains a line with a label like example 10. The first time you invoke the macro, EDAS will generate the label "LABELA"; the second time, "LABELB"; and so forth, cycling from A to Z, then AA to AZ, all the way to ZZ — a total of 702 different labels. If you need more than this, the *PREFIX command lets you tell EDAS to put another character in the expansion of "?". *PREFIX '\$', for example, would cause the first expansion of "LABEL?" to be "LABEL\$A".

EDAS IV includes a series of macro commands that provide conditional assembly capability. Conditional assembly operators are a series of IF statements: IFEQ tests whether its operands are equal; IFGT tests if the first is greater than the second, etc. If the result of the test is true, all the code up to the next ELSE or matching ENDIF statement will be assembled. If the test is false, the corresponding code is skipped. If there is a matching ELSE, the code between the ELSE and the matching ENDIF is assembled.

Suppose that we don't want to allow the #COUNT parameter to have a value greater than 1024. We could code this test in our LDB macro as in example 11. Now, if LDB is invoked with a value or more than 1024 for #COUNT, the IFGT test will be true and the ERR statement assembled, forcing an assembly-time error and printing the error message.

Examples of the use of conditional assembly include testing for errors, generating different code for different machines (e.g., Model I versus Model III), or generating different code based on different values of the macro parameters.

EDAS IV has these additional advanced features: There are IF statements to compare strings as well as numbers. IFDEF and IFREF test if their operands are defined or referenced in your program. IF,ELSE, and ENDIF can be nested up to 16 levels deep. The number of arguments in a macro call and the length of any argument can be determined. LOG sets the load origin different from the assembly origin. New expression operators .NOT., .NE., and .EQ. are included. One restriction is that macros cannot be recursive.

One of the most powerful features of EDAS IV is the *SEARCH command. To take full advantage of *SEARCH, you need the MISOSYS PDS (partitioned

Example 1

```
CLS          MACRO          ;Clear TRS-80 Screen
LD           A,32           ;Load A with a blank (ASCII 32)
LD           HL,3C00H       ;Address of first screen location
LD           (HL),A         ;Stuff blank there
LD           DE,3C01H       ;Second screen location
LD           BC,1023        ;Number screen locations - 1;
LDIR        ;Move blanks to all screen locations
ENDM        ;End of macro CLS
```

Example 2

```
LDS          MACRO          #CHAR ;Load TRS-80 Screen with #CHAR
LD           A,#CHAR        ;Load A with #CHAR
LD           HL,3C00H       ;Address of first screen location
LD           (HL),A         ;Stuff #CHAR there
LD           DE,3C01H       ;Address of second screen location
LD           BC,1023        ;Number of screen locations - 1;
LDIR        ;Move #CHAR to all screen locations
ENDM        ;End of macro LDS
```

Example 3

```
LDS          32             ;Fill screen with blanks
```

Example 4

```
LDS          191
```

Example 5

```
LDS          MACRO          #CHAR=32
```

Example 6

```
; LDB -- Load memory block at #START with #COUNT bytes of #CHAR
; Defaults to loading the screen with blanks
LDB          MACRO          #CHAR=32,#START=3C00H,#COUNT=1024
LD           A,#CHAR        ;Load A with #CHAR
LD           HL,#START      ;Address of first location
LD           (HL),A         ;Stuff #CHAR there
LD           DE,#START+1    ;Second location
LD           BC,#COUNT-1   ;Size of block - 1
LDIR        ;Fill block with #CHAR
ENDM        ;End of macro LDB
```

Example 7

```
LDB          0,7000H,100    ;Store 100 bytes of 0 at 7000H
```

Example 8

```
LDB          #COUNT=100,#CHAR=0,#START=7000H
```

Example 9

```
LDB          191
```

Example 10

```
LABEL?      LD           A,0           ;Some arbitrary code
```

Example 11

```
IFGT        #COUNT,1024
ERR          Count must be <= 1024!
ENDIF
```


data set) utility, available at extra cost. PDS lets you build a single library file that contains multiple sub-files and an index header block that points to the sub-files. If you put assembly language subroutines into a PDS file, EDAS IV can search the PDS file and only assemble the subroutines your program uses.

Even if you don't have PDS, you can still selectively assemble using *GET and IFREF. First, you build a file of subroutines, surrounding each subroutine with "IFREF routine-name" and ENFIF. Then you *GET the subroutine file. If your main program REFERENCES a subroutine, the IFREF test will be true and the subroutine code will be assembled. This method takes longer than *SEARCHing a PDS file since the whole file is processed by *GET, even though only part of it is assembled.

Documentation

EDAS IV's documentation lives up to the quality standards of previous EDAS manuals. The manual is not a tutorial on assembly language programming, but it does explain things clearly and it includes lots of examples. If you can program in Z-80 assembly language, you should be able to learn to use the macro processing features of EDAS IV by reading the manual and experimenting with the examples.

The main text has over 100 pages describing the system. A complete listing of error messages with

explanations is given. The format of source, object and cross-reference files is described. The manual has a good table of contents but no index.

Utilities

EDAS IV includes a utility called XREF that generates a cross-reference listing of your assembly program's symbols. If your assembly includes *GET or *SEARCH directives, the name of the file containing the symbol is indicated on the cross reference. A nice extra is the EQU option. XREF can generate a file containing assembly language EQU statements for the symbols in your program.

TTD is a utility that transfers assembly language source files from tape to disk. It accepts source code produced by Radio Shack's cassette-based EDTASM assembler.

EDAS IV is a powerful program development tool. The fact that Roy Soltoff not only wrote EDAS IV but also uses it extensively has helped to keep the enhancements useful and well-tested. Its macros add a new dimension to Z-80 assembly language programming. If you do much assembly language programming, I urge you to try the combination of LDOS, EDAS IV, and PDS. These products should quickly pay for themselves in savings of your most valuable resource: time.

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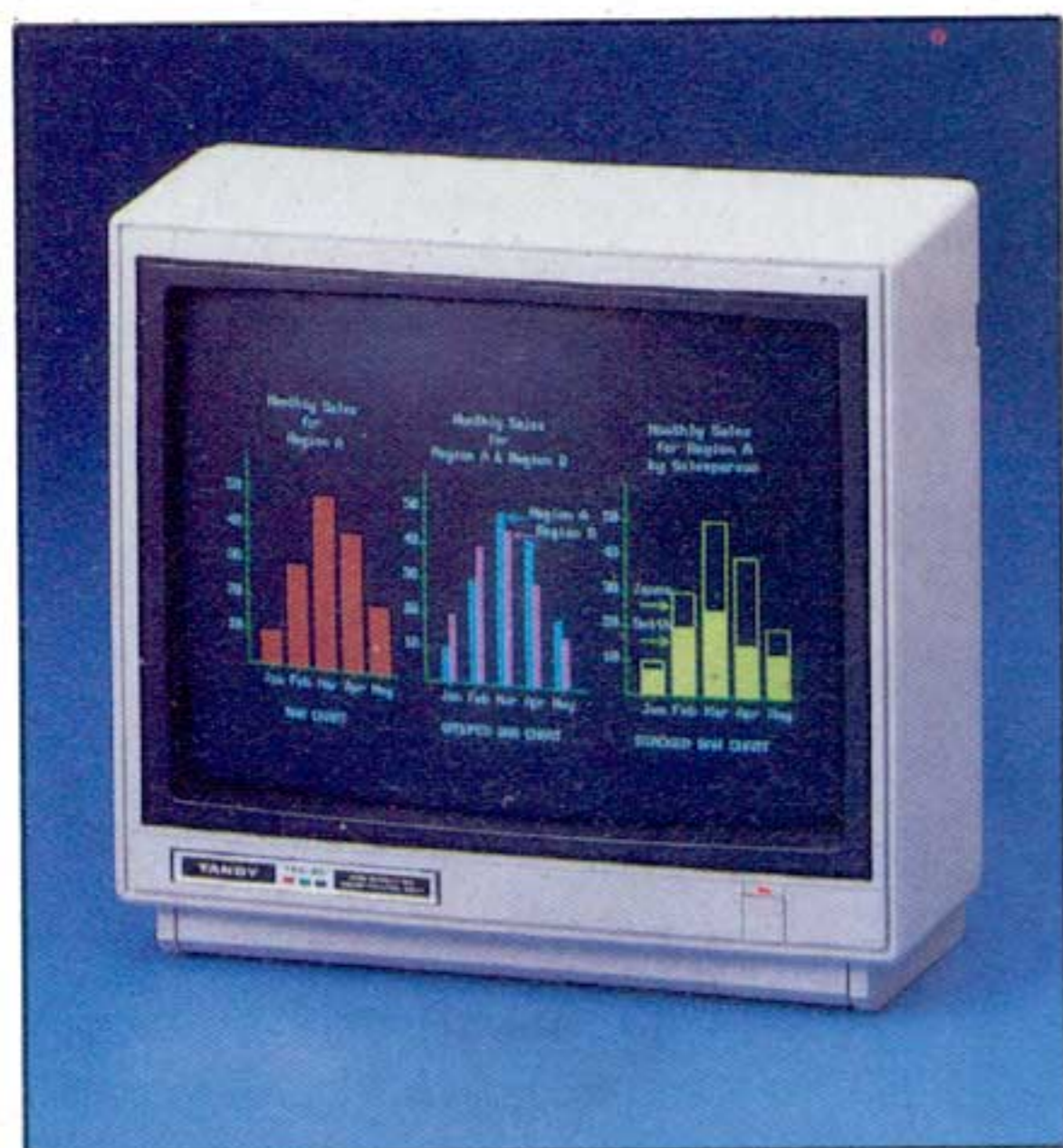
Tandy 2000

For all readers

Cameron C. Brown

For over a year, the story has been IBM, IBM, and more IBM. For months, rumors about an IBM-compatible machine from Tandy have been reported. Now we know. Tandy is attacking Big Blue head-on. The Tandy Model 2000 Personal Computer offers more than just compatibility. It has more RAM,

High-resolution graphics on the CM-1 Color Monitor (\$799). Its use requires the High-resolution Graphics Board (\$449) and Color Graphics Option (\$199).



High-resolution graphics on the VM-1 Monochrome Monitor (\$249).

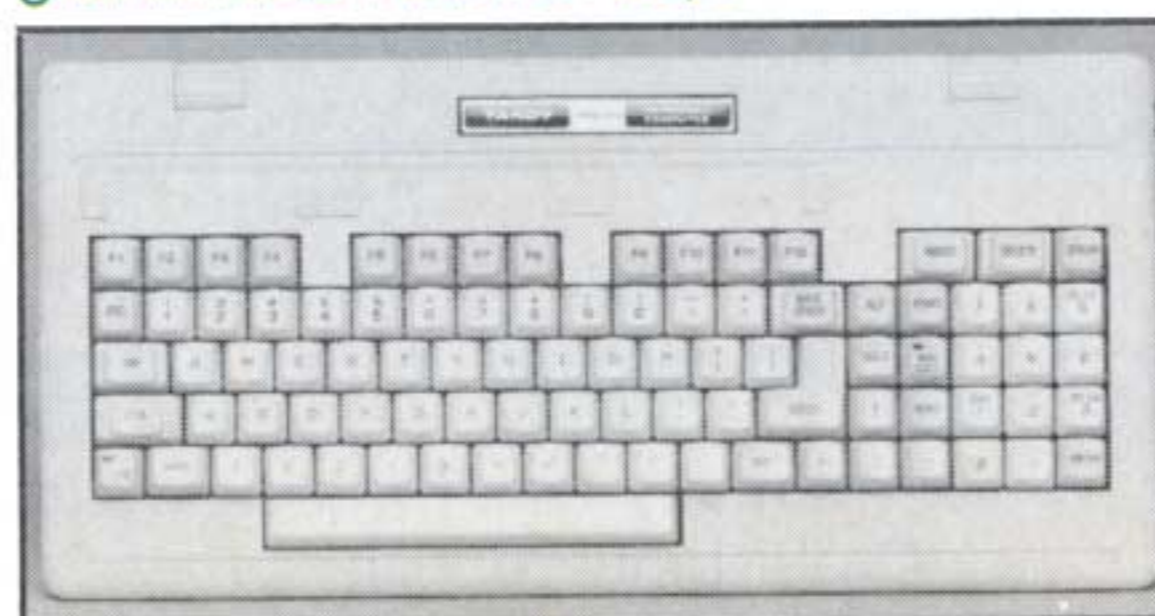


more disk storage, more expandability, more graphics than the IBM-PC (and plenty of well-known software programs) as well as a much lower price. If you were worried about Tandy's ability to hold onto, or increase, their share of the computer market, the Model 2000 is a bright beacon of hope. This machine is a whole new breed and it represents a drastic departure from Radio Shack's previous policy in using third-party software. It comes with MS-DOS 2.0 and Tandy has lined up some of the world's best software for it. The Tandy Model 2000 Personal Computer will make any potential buyer of the IBM-PC, Texas Instruments Professional, or Compaq think twice. Look at Table 1 and you will see that Tandy's Model 2000 out-performs the IBM-PC in almost every category. Table 2 gives a price comparison of the Model 2000 to other manufacturers. The data in both tables comes from Tandy literature. Clearly, Tandy is not saying "Me too," but "I'm better!"

The System

The Tandy Model 2000 Personal Computer uses a true 16-bit CPU with a 16-bit data path — the new 80186 processor from Intel. The CPU has a clock speed of 8 Mhz, almost twice that of IBM's PC. The machine comes with 128K internal memory, two dual-sided double-density disk drives that have 720K capacity each, four expansion slots, RS-232, parallel printer port, MS-DOS 2.0,

The 90-key keyboard with 12 user-programmable function keys.



and your choice of a monochrome or color monitor.

The 80186 CPU

The 80186 processor from Intel gives true 16-bit processing and data path. According to Doug Dillhoff, software manager for the Model 2000, it easily out-performs the IBM-PC's 8088. When running the benchmark tests from the January, 1983 issue of *BYTE*, the Model 2000 ran 2.5 to almost three times faster than the IBM-PC. The rated clock speed of the 80186 is 8 MHz, versus 4.7 MHz for the 8088.

RAM can be expanded to 768K. 256K can be put onto the motherboard and an additional 512K can be added using the expansion slots. Upgrading to full capacity would take up two of the four slots that are available. If you buy the hard disk version, it comes with 256K RAM already installed.

The 90-key keyboard is sculptured and has a very low profile. Key response is excellent, with positive feedback and a slight click (not software-generated as in the Model 12). To me, the layout of the keys is superb, but it took time to get used to seeing 90 keys. The 10-key numeric pad is level and the five-key has a slight raise on it for easy positioning of your fingers. There are four cursor keys, 12 user-programmable function keys, and retractable legs for elevating the keyboard when it is on a desktop.

The Model 2000 shows that Tandy has taken state-of-the-art ergonomics seriously. Little features such as the removable labels for the function keys give you the feeling that this machine was truly designed with the end-user in mind.

Disk Storage

The basic unit comes with two built-in 5 $\frac{1}{4}$ -inch thinline disk drives.

Each one holds 720K bytes. That gives you 1.4 Meg of floppy storage before going to a hard disk. Adding a 10 Megabyte, *built-in*, hard drive is easy and the drive fits inside the existing CPU box. The only visible difference is that the logo is changed to read Tandy Model 2000 HD. The MS-DOS 2.0 operating system is ready to accept the hard disk drivers and they are added when you upgrade. The hard disk version is shipped from Fort Worth with 256K RAM and one floppy drive.

Monitors

You can choose between a 12-inch green phosphor monochrome or a 14-inch sixteen-color monitor. Either one will give you high

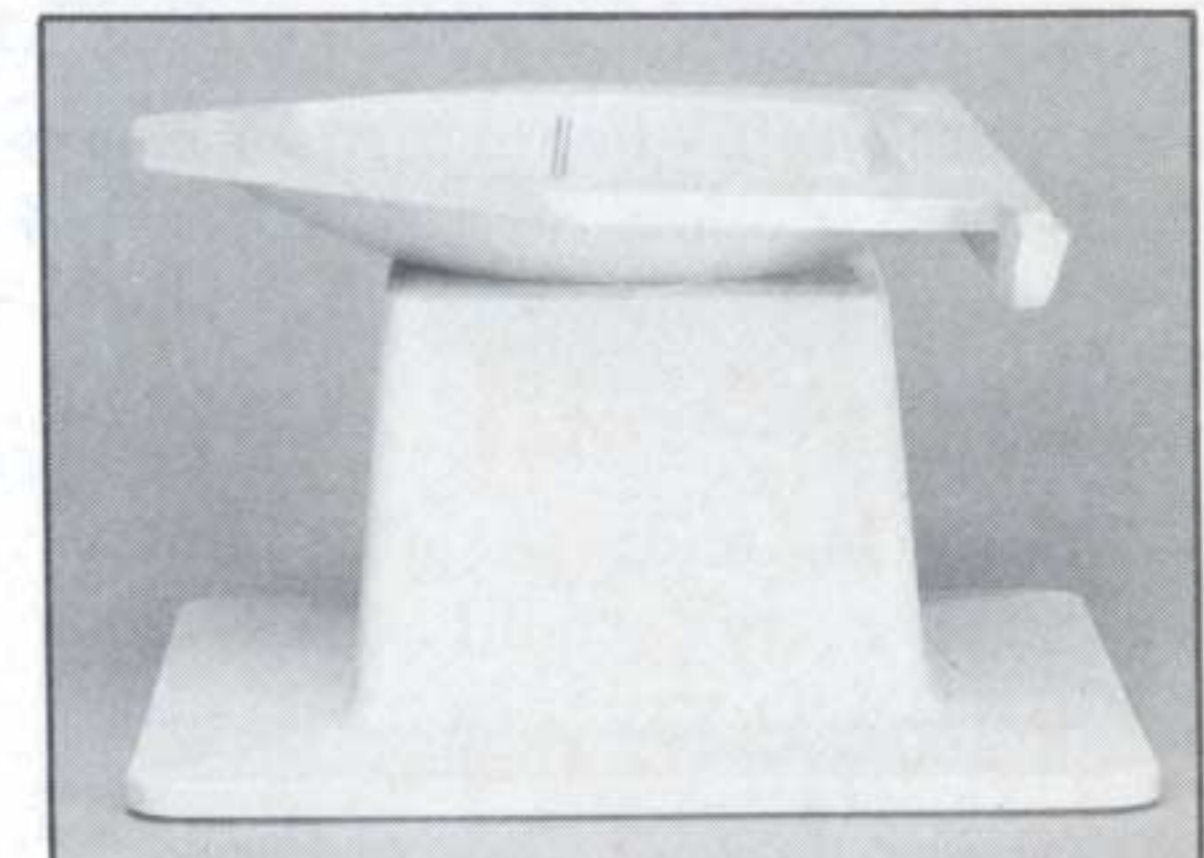
resolution graphics that are far beyond what the TRS-80 or IBM-PC user is accustomed to. Normal display is 80 or 40 characters per line by 25 lines. You have a user-definable character set, upper- and lowercase, reverse video, underline, blank, blink, double-width, smooth scrolling, and split screen. Users may select between the IBM character fonts as well as Radio Shack's. I did find the video display of the letter z to look too much like the numeral 2. Normal resolution gives you 640 x 400 pixels.

High resolution options give you 640 X 400 bit-mapped graphics on either monitor. The color monitor allows you to select and display any eight colors out of sixteen (red,

The Model 2000 Personal Computer with floor stand and monitor pedestal. Notice the Digi™-Mouse option (\$119.95), available in March, 1984.



The Monitor Pedestal will accommodate the VM-1 monitor.



The floor stand (\$145) allows the Model 2000 to consume very little desk space. Cables allow the CPU to be up to eight feet away from the monitor and keyboard. Even the logo on the CPU rotates so that it can be upright when mounted on the stand. (This was overlooked in this photo.)

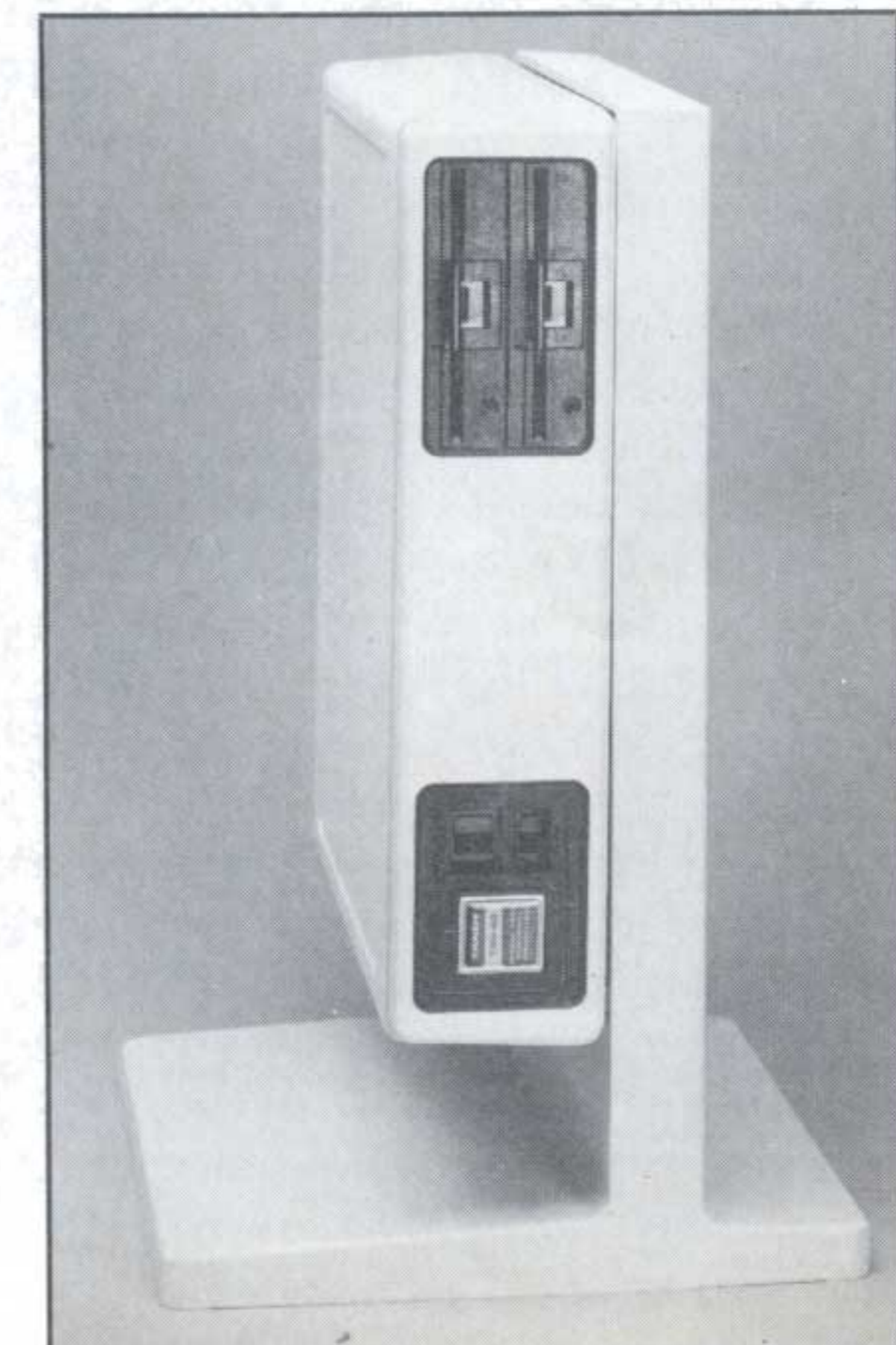


Table 1 — Performance Comparison to the IBM-PC

Feature:	Model 2000	IBM-PC
Internal Memory	128K	64K
Disk Capacity	720K	160K (320K opt.)
Speed.....	8MHz	4.7MHz
Microprocessor	16-bit 80186	16-bit 8088
CPU Data Path.....	16-bit	8-bit
Expansion Slots	4	2
Graphics Options:		
Color Resolution	640 x 400	320 x 200
Number of Colors	8	4
Monochrome Graphics	Yes	No

Table 2 — Price Comparison to IBM, Texas Instruments, and Compaq

Floppy Disk Version:	Tandy	IBM	TI	Comp.
Base Unit	\$2750	\$2104	\$2195	\$2995
Second Drive	incl	529	475	595
Monochrome Monitor	249	345	incl	incl
Display Adapter	incl	335	incl	incl
128K RAM Upgrade	incl	165	300	incl
RS-232.....	incl	120	225	145
MS-DOS 2.0	incl	60	60	60
Printer Interface	incl	option	incl	incl
Total Cost	\$2999	\$3658	\$3255	\$3795
Hard Disk Version:				
Base Unit	\$4250	\$4995	\$5490	\$4995
Drive Capacity	10Meg	10Meg	5Meg	10Meg
Monochrome Monitor	249	345	incl	incl
Display Adapter	incl	335	incl	incl
Standard RAM	256K	128K	256K	128K
Floppy Capacity	720K	360K	320K	320K
MS-DOS 2.0	incl	60	60	incl
RS-232.....	incl	incl	225	145
Total	\$4499	\$5735	\$5715	\$5140

Compaq prices as of January 1, 1983; IBM prices as of March 8, 1983. TI and Compaq hard disk prices as of November 28, 1983

Tandy 2000

white, yellow, cyan, green, magenta, blue, and black at full or half intensity). According to Don White, the Model 2000 Product Manager, "The higher bandwidth of these monitors give them a more vivid stable display than any other now on the market for any personal computer." The pitch-black background on the color monitor made its graphics jump off the screen. The use of a color or monochrome monitor can be specified within BASIC code.

Adding high resolution graphics requires using one of the expansion slots. The same board is used for adding the chips for color, so you can start out with a high resolution monochrome monitor, add color later and not lose your investment. You can add a different expansion board and use your own TV set or monitor. The TV board also includes a joystick option for use with the TRS-80 Color Computer joysticks.

Options

Tandy is ready to offer almost everything you could want. The CPU has four expansion slots that

are user accessible. They are for high resolution graphics (\$449 monochrome, additional \$199 for color), TV/Joystick connections (\$249.95), Digi™-Mouse and battery operated real-time clock (\$119.95), and additional external RAM (\$499 first 128K, \$299 next 128K). That's just what you can put inside the box.

Tandy clearly sees this system in offices of every type. The floor stand allows you to put the CPU and disk drives away from your desktop. Even if you don't use the floor stand, the keyboard can be slid partly under the CPU to put it out of the way. The monitor pedestal lets you tilt and rotate the monitor for easy viewing. By putting the CPU on the floor and the monitor on its stand, you occupy very little desk space. The Model 2000 is comfortable as well as attractive.

Software

The hardware is state of the art, but what Tandy is doing about the software is a revolution for them. In April, I ran into Don White at the West Coast Computer Faire. I couldn't quite understand why a

Tandy product manager would be at a fair that was dominated by IBM users and IBM products. The Radio Shack presence at that fair was minimal. I assumed he was looking for any hints about the "Japanese invasion" that was to be coming in 1983. Now we know. He was lining up "The best of the best software that is available."

MS-DOS 2.0 has become the standard for minicomputers. We can now add Tandy to a list that includes IBM, Hewlett Packard, DEC, Wang, and Compaq. Tandy will be offering Model 2000 owners software that has been proven in the marketplace. Imagine buying Ashton-Tate's dBase II, not a Radio Shack implementation, at your local Computer Center. At the same time, you will have Radio Shack's support and service for the software as well as the hardware.

The list of software is impressive, but they are not inexpensive. Already lined up are dBase II (\$595) from Ashton Tate, Microsoft's Multiplan (\$249), MultiMate word processing (\$249.95) from Softword Systems, Inc., PFS-File (\$140) and

Another bowling ball?

There is an old joke about the Model 16 that asks, "How are a Model 16 and a bowling ball alike?" The answer is, "There is no software for either one." Tandy has stated that they will never again release a machine without having software ready at the same time. We fervently hope that is true. If the Model 2000 can run off-the-shelf MS-DOS 2.0 software, the potential for the machine is excellent. If it can't, we may have another bowling ball.

To find out what will run on the Model 2000, I talked to three companies: Intel, Microsoft, and Tandy. There is reason for concern. John C. Dvorak's column in *Infoworld*, Volume 5, Number 45, pointed out that MS-

DOS (which was developed for IBM's PC which uses Intel's 8088 chip) will not, in general, run on the 80186. Remember, the 80186 is Intel's improvement of the 8088 and it is the chip that is in the Model 2000. Also remember that documentation for the 8088 clearly pointed out that certain vectors were reserved for future development (such as those in the 80186). The blame was put on Microsoft's shoulders. In a later phone conversation with Mr. Dvorak, he pointed out that the MS-DOS implementation on the PC Junior's 80186 chip was hampered due to changes made by IBM. (The PC Junior was redesigned and released using the 8088.) Perhaps, Microsoft is in the clear.

We were told by someone at Intel that the 80186 C version chip had four bugs in it and a new version was being produced. Were these the bugs that made MS-DOS 2.0 not fully functional? We couldn't find out. A new version will be up to full production around December 1, 1983. That happens to be Tandy's announcement date for the Model 2000! Don't expect to be able to buy a Model 2000 right away at your local Computer Center. Add to that the facts that there is already a serious nationwide chip shortage, and IBM now owns about 25 percent of the Intel Corporation.

I called Microsoft and asked, "What will run on an MS-DOS 2.0 and an 80186 cpu?" The reply

PFS-Report (\$125) from Software Publishing Corporation. Word processing, file management, relational data base managers, spreadsheets, and languages are to be available at the same time the machine is released. Graphics packages, other word processors and a compiler will be coming later.

No longer will a buyer of a Radio Shack computer be limited to TRSDOS or other operating systems that have little outside support. If you find software you like running on Microsoft's MS-DOS, it should be ready to run on the Model 2000. Be sure to read the panel to see why I say should run instead of will run. The last time I looked at *PC World* it was over 600 pages. The number of programs for sale that use MS-DOS is astounding. According to Don White, "If developers follow the rules and use DOS calls that do not tap directly into the hardware, the product will work." Radio Shack is planning to release lists of outside software they have confirmed will run on the Model 2000. It should be quite a list.

Small business accounting is

destined to be one of the Model 2000's biggest uses. For years, Basic Four has built a reputation for their minicomputers and fully-integrated accounting software. Radio Shack now has the MAI/Basic Four General Ledger, Accounts Payable, and Accounts Receivable running on MS-DOS 2.0. Inventory control, order entry, purchase orders, and payroll are under development and should be available soon.

Languages

The operating system comes with GW-BASIC. It is similar to Model 100 BASIC. It also includes graphics and music commands. According to Doug Dillhoff its precision is "... less than the Model 100's. It checks out as okay according to a benchmark developed by David Ahl in *Creative Computing*." The Microsoft Pascal Compiler (\$299.95), FORTRAN (\$349.95), and Assembler (\$99.95) are available now. COBOL and a GW-BASIC Compiler are under development.

While playing with the Model 2000's BASIC, I discovered that it came with a full-screen editor.

Imagine listing a program and editing code by just moving the cursor keys. The drives are whisper-quiet. The function keys already incorporate the most used commands such as SAVE, RUN, LIST, EDIT, INSERT, DELETE, and more. We will be reporting more on the Model 2000's capabilities, uses, and limitations in future issues.

If you want the best performance and price on a single-user system, take a serious look at the Model 2000. It is powerful and offers you the opportunity to use very sophisticated software. It is not just an IBM-PC compatible or add-on. It is not just an upgrade of their Z-80 machines. It represents a new direction for the Tandy computer line. Radio Shack has produced a single-user 16-bit minicomputer for those that want only the best, at a price that will appeal to even the most cost-conscious of companies. For those who felt that a computer with the name Shack on it was something they didn't want in their office, Tandy even changed that. What more could you ask for?

was, "***The Model 2000 is not compatible with IBM-PC ROM calls, probably to avoid copyright problems.***" That is not necessarily bad. The Model 2000 will be compatible on the operating system level with MS-DOS 2.0 software.

To clarify that statement, I called Tandy. The question was, "***Is the Model 2000 compatible with MS-DOS 2.0 software?***" Don White's answer was, "***Phrased that way, yes. Software that follows the documented rules of MS-DOS 2.0 will work. If IBM-PC software bypasses the operating system and interfaces directly with the hardware, we can't say.***"

The Model 2000 has a different keyboard than the IBM-PC. Can

we expect IBM-PC program documentation to be accurate for a Model 2000 owner? If dBase II expects an F3 key to invoke some action, will the F3 key on the Model 2000 give the same signal? Again, Tandy's answer was very carefully worded: "***We can generate all the keyboard codes of the IBM-PC.***" Does that mean we can expect IBM-PC software documentation to be accurate for a Model 2000 owner? Don White's answer: "***We are checking numerous off-the-shelf programs. From a list of 100 already investigated, one-half of them ran fine. The working programs even include some that were written under MS-DOS 1.0 and 1.1, and included graphics. When***

the machine is released, we will be publishing a list of software that we have checked and know works on our machine."

What does it mean to you? The Model 2000 will be in short supply for awhile. IBM-PC software written under MS-DOS 2.0 may run. Its documentation may be accurate. Implementation of IBM-PC software on the Model 2000 may be a breeze, or impossible. Large sales of the Model 2000 will entice a number of IBM software houses to make sure their product works on Tandy's machine. A small volume will probably give us another bowling ball, with software only coming from Radio Shack-authorized versions.

Chango

A not too-easy-to-solve puzzle game

Color Computer

Lance Wolstrup, Tampa, FL

Chango is a puzzle game for anyone who likes a mental challenge. While not as difficult, or confusing, as Rubik's Cube, it is, nevertheless, not easy to solve.

The object of the game is to turn each of the six squares from blue to red. Sounds simple, doesn't it? Well, good luck!

You must observe the following rules:

The square on the extreme right (#6) can be changed at any time.

Each of the remaining squares (1-5) can be changed *only* if the square on the immediate right is blue and all other squares on the right are red.

In order to get a perfect score, all the squares must be red after move number 42. Getting a score between 43 and 50 is very respectable, while 51 to 55 moves will qualify you as an average problem solver. If you get scores above 55, just rip your hair out, kick the wall, yell at your friends, or whatever else you do when you are frustrated. Then, try again. You just might do better. One final tip. Just to make it interesting, trying to make an illegal move adds two points to the score. That should keep you on your toes.

Chango is written for the 16K non-extended Color Computer. However, by changing the program as follows, it should fit in 4K of RAM:

Delete lines 1 through 8.

Delete CLEAR319 in line 10.

Delete lines 20, 30, 210, 220, 240, 250, 260, 270 and 280.

Program Listing for Chango

```
1 *****
2 *CHANGO *
3 *BY LANCE WOLSTRUP *
4 *4452 E SAN GABRIEL AVE *
5 *FRESNO, CA. 93726 *
6 *(209) 221-6259 *
7 *(C) MARCH 1983 *
8 *****
10 CLS: CLEAR319: PRINT@10, "C H A N G O"; :
FORX=1 TO 24: A$=A$+CHR$(128): NEXTX: CC=0
```

```
20 C$=""
```

```
" : REM 154 SPACES
30 C$=C$+"
```

```
" : REM 100
```

```
SPACES
```

```
40 FORC=1 TO 6: B$(C)=CHR$(175)+CHR$(175)+C
HR$(175): D$(C)=CHR$(191)+CHR$(191)+CHR$(
191): NEXTC
```

```
50 PRINT@67, A$; : PRINT@195, A$;
```

```
60 X=67: FORZ=1 TO 7: FORY=X TO X+128 STEP
32: PRINT@Y, CHR$(128); : NEXTY: X=X+4: NEXTZ
70 L1=100
```

```
80 FORZ=1 TO 3: PRINT@L1, B$(1); : L1=L1+32:
NEXTZ
```

```
90 L2=104: GOSUB610
```

```
100 FORZ=1 TO 3: PRINT@L2, B$(2); : L2=L2+32
: NEXTZ
```

```
110 L3=108: GOSUB610
```

```
120 FORZ=1 TO 3: PRINT@L3, B$(3); : L3=L3+32
: NEXTZ
```

```
130 L4=112: GOSUB610
```

```
140 FORZ=1 TO 3: PRINT@L4, B$(4); : L4=L4+32
: NEXTZ
```

```
150 L5=116: GOSUB610
```

```
160 FORZ=1 TO 3: PRINT@L5, B$(5); : L5=L5+32
: NEXTZ
```

```
170 L6=120: GOSUB610
```

```
180 FORZ=1 TO 3: PRINT@L6, B$(6); : L6=L6+32
: NEXTZ
```

```
190 X=228
```

```
200 FOR Y=1 TO 6: PRINT@X, Y; : X=X+4: NEXTY
```

```
210 PRINT@289, "DO YOU NEED INSTRUCTIONS
(Y/N)"
```

```
220 I$=INKEY$: IF I$="" THEN 220 ELSE IF I$
="N" THEN SOUND 200, 2: SOUND 75, 1: GOTO 290 E
LSE IF I$ <> "Y" THEN 220
```

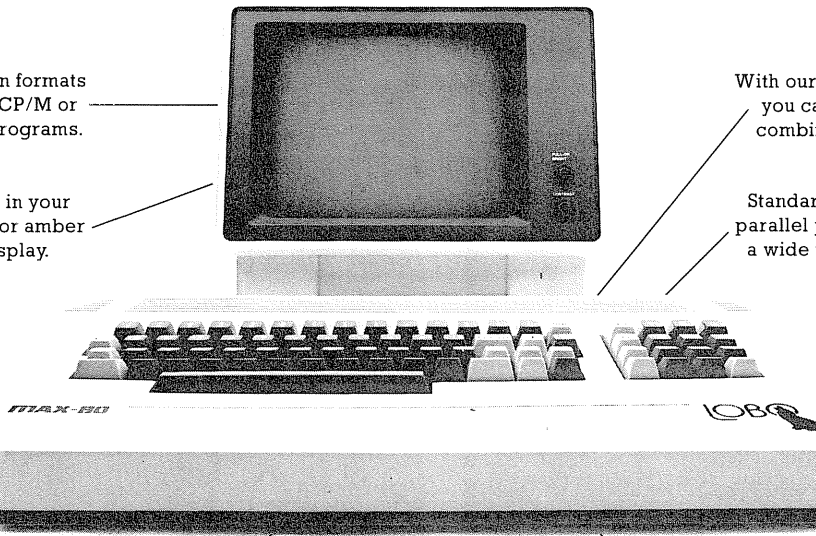

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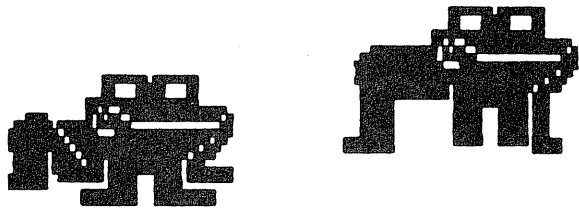
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#29

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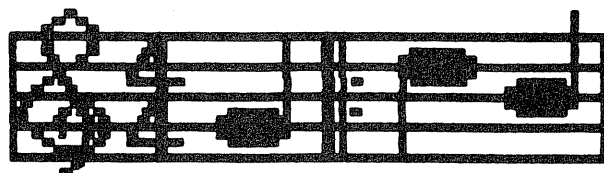


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#30

Chango

```

230 FORX=1TO4:SOUND100,1:SOUND175,1:SOUN
D50,1:SOUND100,1
240 PRINT@289,"
";
250 PRINT@256,"CHANGE ALL THE BLOCKS FRO
M BLUE TO RED. BLOCK #6 CAN BE CHANGED A
T ANY TIME. ALL OTHER BLOCKS CAN BE CH
ANGED ONLY IF ---- THE NEIGHBOR BLOC
K TO THE RIGHT IS BLUE -- AND ALL OTHER
BLOCKS ON THE RIGHT ARE RED."
260 PRINT@482,"PRESS ANY KEY TO START GA
ME.";
270 I$=INKEY$:IF I$=""THEN260
280 PRINT@256,C$;
290 PRINT@289,"
";
300 PRINT@292,"CHANGE WHICH BLOCK ?"
310 I$=INKEY$:IF I$="" THEN310
320 F=VAL(I$):IF F<1 OR F>6 THEN 310
330 ON F GOSUB 370,410,450,490,530,570
340 PRINT@485,"YOUR SCORE IS: ";CC;
350 IF B(1)+B(2)+B(3)+B(4)+B(5)+B(6)=24
THEN GOTO620
360 GOTO 290
370 L1=100:SOUNDRND(255),1
380 IF B(1)=0 AND B(2)=0 AND B(3)=4 AND
B(4)=4 AND B(5)=4 AND B(6)=4 THEN FORZ=1
TO 3:PRINT@L1,D$(1);:L1=L1+32:NEXTZ:B(1
)=4:GOSUB600:RETURN
390 IF B(1)=4 AND B(2)=0 AND B(3)=4 AND
B(4)=4 AND B(5)=4 AND B(6)=4 THEN FOR Z=
1 TO 3:PRINT@L1,B$(1);:L1=L1+32:NEXTZ:B(
1)=0:GOSUB600:RETURN
400 GOTO 560
410 L2=104:SOUNDRND(255),1
420 IF B(2)=0 AND B(3)=0 AND B(4)=4 AND
B(5)=4 AND B(6)=4 THEN FOR Z=1 TO 3:PRIN
T@L2,D$(2);:L2=L2+32:NEXTZ:B(2)=4:GOSUB6
00:RETURN
430 IF B(2)=4 AND B(3)=0 AND B(4)=4 AND
B(5)=4 AND B(6)=4 THEN FOR Z=1 TO 3:PRIN
T@L2,B$(2);:L2=L2+32:NEXTZ:B(2)=0:GOSUB6
00:RETURN
440 GOTO560
450 L3=108:SOUNDRND(255),1
460 IF B(3)=0 AND B(4)=0 AND B(5)=4 AND
B(6)=4 THEN FORZ=1TO3:PRINT@L3,D$(3);:L3
=L3+32:NEXTZ:B(3)=4:GOSUB600:RETURN
470 IF B(3)=4 AND B(4)=0 AND B(5)=4 AND
B(6)=4 THEN FOR Z=1 TO 3:PRINT@L3,B$(3);
:L3=L3+32:NEXTZ:B(3)=0:GOSUB600:RETURN
480 GOTO560
490 L4=112:SOUNDRND(255),1
500 IF B(4)=0 AND B(5)=0 AND B(6)=4 THEN
FORZ=1TO3:PRINT@L4,D$(4);:L4=L4+32:NEXT
Z:B(4)=4:GOSUB600:RETURN
510 IF B(4)=4 AND B(5)=0 AND B(6)=4 THEN

```


Chango

```

FORZ=1 TO 3:PRINT@L4,B$(4);:L4=L4+32:NE
XTZ:B(4)=0:GOSUB600:RETURN
520 GOTO560
530 L5=116:SOUNDRND(255),1
540 IF B(5)=0 AND B(6)=0 THEN FORZ=1 TO
3:PRINT@L5,D$(5);:L5=L5+32:NEXTZ:B(5)=4:
GOSUB600:RETURN
550 IF B(5)=4 AND B(6)=0 THEN FORZ=1 TO
3:PRINT@L5,B$(5);:L5=L5+32:NEXTZ:B(5)=0:
GOSUB600:RETURN
560 PRINT@292,"ILLEGAL MOVE - TRY AGAIN"
:SOUND25,12:CC=CC+2:FORZ=1TO1000:NEXTZ:R
ETURN
570 L6=120:SOUNDRND(255),1:IF B(6)=0 THE
N FORZ=1TO3:PRINT@L6,D$(6);:L6=L6+32:NEX
TZ:B(6)=4:GOSUB600:RETURN:ELSE IF B(6)=
4 THEN FORZ=1 TO3:PRINT@L6,B$(6);:L6=L6+
32:NEXTZ:B(6)=0:GOSUB600:RETURN
580 FORZ=1TO3:PRINT@L6,D$(6);:L6=L6+32:N
EXTZ:L6=120
590 RETURN
600 CC=CC+1:RETURN
610 SOUNDRND(255),1:SOUNDRND(255),1:RETU
RN
620 PRINT@292,"

```

":RE

```

M 100 SPACES
630 PRINT@392,"

```

":REM 93 SP

```

ACES
640 IF CC=42 THEN 650 ELSE IF CC=>43 AND
CC<50 THEN 680 ELSE IF CC=>50 AND CC=<=5
5 THEN 690 ELSE IF CC>55 THEN 700
650 PRINT@290,"YOUR SCORE OF 42 ";:SOUND
100,1:SOUND150,2:SOUND100,1:PRINT"IS PER
FECT.":FORX=1TO3:SOUND50,1:SOUND100,1:SO
UND150,1:NEXT
660 PRINT@388,"YOU ARE A "
670 FORX=1 TO 5:PRINT@399,"MASTER SOLVER
":FORY=1TO 4:SOUND200,1:SOUND100,1:SOUND
50,1:SOUND175,1:NEXTY:PRINT@399,"master
solver":FORY=1TO4:SOUND50,1:SOUND100,1:S
OUND150,1:SOUND200,1:NEXTY:NEXTX:GOTO710
680 PRINT@292,"WHILE NOT PERFECT....."
:SOUND100,2:SOUND31,2:SOUND167,3:PRINT@3
23,CC;"IS A VERY GOOD SCORE.":SOUND31,2:
SOUND100,4:SOUND167,2:GOTO710
690 PRINT@290,"YOUR SCORE OF";CC;"IS AVE
RAGE.":SOUND100,2:SOUND25,6:GOTO710
700 PRINT@290,"YOU NEED A LOT MORE PRACT
ICE":SOUND1,25
710 PRINT@485," ANOTHER GAME (Y/N)";
720 IS=INKEY$:IFI$="" THEN 720 ELSE IF I
$="N" THEN CLS:END:ELSEIFI$<>"Y"THEN 720
ELSE RUN

```

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Files and foibles

Expense account and things-to-do programs for those on the go

Model 100

Terry R. Dettmann, Associate editor

The past months have been very busy for me and I haven't been in one place with anything (other than my Model 100) long enough to do more than sneeze. Rather than spend time discussing my travels, I'd like to offer a few ideas, and programs, that I worked out with my Model 100 while on the road.

As with most people making a business trip, there are many things that I have to take care of to get everything done that I need to do. In particular, my attention turned to time management and expense reporting.

Using my Model 100, I put together a couple of simple, yet useful, programs that have made my traveling life easier. The two programs included here are, first, a simple program that takes information from a file called `note.do` (Model 100 owners will recognize that as their schedule file) and builds a simple expense report.

The second program uses the same `note.do` file and makes a file of items that need doing. The list includes things due today, those overdue, and those which are important but have no assigned date. These items are prioritized and sorted by both date and priority.

The programs are "bare-bones." They don't include fancy error checking, they don't have loads of selectable features, but what they do have is ease of use.

On one occasion, while on a flight from New York to Seattle, I prepared a trip and expense report using my expense program and the Model 100 text editor. Within two hours after arrival, I had six copies of the report distributed to the people who needed them as well as an expense report to the accountant. That feat alone qualifies the Model 100 as the best investment I've made in awhile.

To do expenses, I used the existing facilities of the text editor (and the recommended format for expense entries in the `note.do` file) to add entries as I go along. Whenever I want to, I can see the current status of the expense entries by running my expense program.

The key decision to make when writing a bare bones program is to be sure that you establish good habits. You must be careful that you consistently enter the data correctly or there will be errors and you won't get the right results.

The program will have to do some file handling to read the input information, but you aren't writing the program to put that information there in the first place. You've got to make it work with every entry.

Once you've made the decision to keep it simple, you've got to stick with that decision and not go for fancy bells and whistles. The point of a simple program is to do one job well, not handle all variations. If you keep it simple you can put it together very quickly.

The opposite of a keep it simple philosophy, KISS, is to not leave out anything that makes the program useful. After my preliminary design of the expense program, I found that I wanted to go to either the printer, the RS-232 port, or the screen. To make this possible, I added a subroutine that handled the proper output files.

Let's start with the expense program, Listing 1, and see how it's put together. It is closely related to the things-to-do program in Listing 2.

Simple file processing programs almost always have the same basic structure:

1. Determine the file needed and get it ready.
2. Scan the file one record at a time, process it, and write the processed record to output.
3. Close out the files and provide any summaries that may be needed.

In this case, the needed input file was determined automatically. It is the `note.do` file that is used by the Model 100 Schedule program. Output was more complex since it required diversion to one of three possible outputs, not all of which were files.

On the Model 100, the diversion was simple since all outputs could be handled as files. Just use LCD for the display, LPT for the printer, and COM for the RS-232 port. Once the file was determined, I simply opened the appropriate file and the rest of the program didn't care which one it was.

Even if you're not working on a Model 100, it's useful to try to get this independence in your programs. You may have to do it with special subroutines, but it can be

Figure 1 Example expense report for Listing 1. Data is shown as it appears going to the screen.

```
$3.25 Cost of doing business
$22.35 I went to dinner
$15.00 Paid for a cab

Total Expenses to date: $ 40.60
```


Files

done.

Processing a line-oriented file is simple. In BASIC, the function EOF() is true only when the file referred to is actually at the end of file. If it is not, you can safely get a line from the file without getting an error. Once the line is in memory, it only needs to be processed and output to the appropriate output file.

In the case of the expense program, the processing consists of looking at the first character of the line. If it's a dollar sign, \$, it must be an expense entry. If it's an expense, the next thing on the line is the value of the expense. Everything after that point is simply comment area.

Now it's time to recognize what the VAL function can and cannot do. When we read the line to get the amount we know that the first character of the line was a '\$', so we use MID\$ to get over it. (Did you know that MID\$, when used with only two instead of three arguments gives us the rest of the line, starting at the first character?)

Starting a VAL at the second character of the line translates everything up to a non-recognized character (like a letter) into a number. For example, if we have IN\$="\$4.25CHARGE", the line will be selected, and the VAL function will return 4.25. The VAL function automatically stops at the right place.

If IN\$="\$4.252Burgers", then VAL will return 4.252, even though I really meant two hamburgers for \$4.25. VAL is dumb, but if you recognize its limitations, it can make life easier. If VAL sees a space, it doesn't stop. It simply ignores the space and continues on. Making IN\$="\$4.25 2 BURGERS" wouldn't help.

The VAL is used to pull out total expenses for my reports. A special subroutine, line 1000, does nothing but print the line as copied from the 'note.do' file to my selected output file. Why is it only one line long and do I really need a subroutine there?

Figure 2 Example of a note.do file for Listing 2

```
* Write this article
* Write more Files & Foibles
10/15 Nothing to do
10/20 Call someone about something
10/20 Drop by to see someone
10/21 More to do
$3.25 Cost of doing business
$22.35 I went to dinner
$15.00 Paid for a cab
```

Figure 3 Example of a today.do file for Listing 2

```
a:* Write more Files & Foibles
a:* Write this article
a:10/20 Drop by to see someone
b:10/20 Call someone about something
b:10/21 More to do
c:10/15 Nothing to do
```

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#32

Files

The answers to those questions leads to a simple idea you should keep in mind. By using a subroutine it's easy to start with a trivial version of the subroutine (as with the one line here), make the program work, and *only if necessary*, replace it with a more complicated routine that does whatever else you need.

After writing this program, I found I had no need to replace the subroutine, so I left it. But I could just as easily have replaced it with fancy formatting options or an output-dependent layout.

But, for simple programs such as this, the overhead from the unnecessary subroutine call is minimal and the usefulness during design is a great aid to making the whole program work. Subroutines can make your life simpler if you use them correctly.

The second program, the to-do list, is more complicated since it has to sort items by priority and/or date due. Even with these extra requirements imposed on it, you'll notice that the layout of the program is very similar to the expense program.

The to-do list has this structure:

1. Get the input file and determine today's date from the DATE\$ function.

2. Look at each line of the input file and determine if it is:

a) due today or before, or

b) important, but no due date (*').

In either case, the line is retained in memory for later

use and a letter priority (a, b, c) is attached to it.

3. After all lines have been read, sort the lines into order by priority and date.

4. Write the lines to the standard file 'today.do' which can then be printed or referred to.

The first part of the program (lines 5-40) sets everything up. I have arbitrarily chosen 20 as the number of items I would allow during a day. If it goes over that, I am not managing my time well!

After opening the file and getting the month and day from the DATE\$ function, the next task was to read in the tasks for today and assign their priorities. Lines 50-100 deal with inputting lines one at a time and if they are items to be done, a priority is assigned.

The subroutine at lines 1100-1170 decides whether a date in the file is an item to be done. It does that by ignoring any date later than today's date. This requires that all dates in the file *have to have five characters*. In other words, January 5th will have to be 01/05.

For dates earlier than today's date, it could be that we are in December and already have dates in January in the file. To prevent picking up January dates as earlier, lines 1150-1160 require the month to be within the previous 10 months. If all the conditions are met, the subroutine returns a value of EF=1. If for any reason an entry is rejected, EF is set to zero.

If subroutine 1100 returns EF=1, or if the first character on the line is tested and found to be an asterisk

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(*), subroutine 1000 is called to prioritize the task.

Subroutine 1000 displays the item, requests that a priority be assigned, and places the priority at the beginning of the item string in the memory array T\$. The item counter (I) is incremented for the next item to be added.

Line 75 checks the item counter to see if more than 21 items (numbered 0 through 20) have been selected. If the list is full, a message is printed and the program continues on.

Whenever the end of file is reached (in line 50, EOF(1) is true), we close the input file (line 100) and sort the list by priority (subroutine 2000).

Subroutine 2000 is a sorting procedure known as the Shell sort. If you've been reading Files & Foibles for some time, you've seen it before. The operation is very simple: check items separated by GAP spaces in the array. If they are in the wrong order, switch them. As long as we are still making changes, keep checking at the current gap. Whenever a pass is made with no changes, cut the gap in half and try again.

The subroutine at 2100 is used to actually switch elements of the array. Notice a little trick about the items: when I put an item in the file, it has the date as the very first thing on the line (unless it has a '*'). When I assign priority, I put the priority before the date. When the sort is done the items will be in order, first by priority, then by date, with '*' items coming before any

date. Even though I've done only one sort, I've managed to sort by two fields, priority and date with priority being first!

Once the sort is completed, I simply copy the array of information out to the today.do file that was opened in line 110 and I'm done. Now I use the Model 100 editor to look at the file, print it, or do whatever is necessary.

Look over the programs and the figures to see if you can follow the workings of the program. If you are using a machine other than a Model 100, you could adapt the programs by modifying the Model 100-specific code to do equivalent things for your machine. Good Luck!

Listing 1 — Expense Program

```

5  REM SETUP FOR EXPENSES
10 CLEAR2000:DEFINT A-Z
15 CLS:PRINT"Expense Report"
19 REM MAKE PRINTOUT SELECTIONS
20 GOSUB 1500
25 REM GET THE FILE OF INFORMATION
30 OPEN "note.do" FOR INPUT AS 1
35 REM SCAN FOR EXPENSE ENTRIES
40 IF EOF(1) THEN 100
50   LINE INPUT #1, IN$
55   REM EXPENSE ENTRIES ALWAYS BEGIN
56   REM THE LINE WITH A '$'

```

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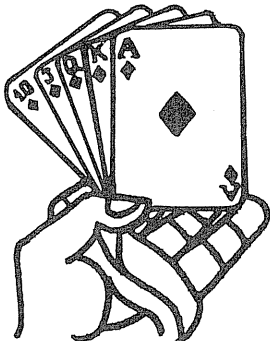
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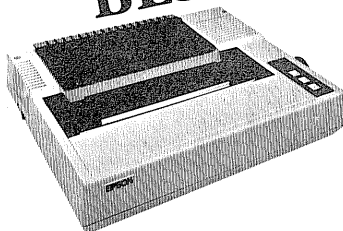
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Files

```

60 IF MID$(IN$,1,1)="$" THEN GOSUB1000
65 REM TOTALIZE THE EXPENSES FOR THE R
EPORT
70 V! = VAL(MID$(IN$,2)):T!=T!+V!
80 GOTO40
100 CLOSE#1
105 PRINT#2,
110 PRINT#2,USING"Total Expenses to date
: $####.##";T!
115 REM WAIT HERE SO WE CAN READ IT
120 LINEINPUT"Press ENTER";IN$
130 MENU
1000 REM account for it
1005 REM COULD HAVE MORE COMPLICATED ACC
OUNTING HERE
1010 PRINT#2, IN$
1020 RETURN
1500 REM printout selection
1510 PRINT:LINEINPUT"(P/S) Printer/Seria
l - screen default: ";LC$
1515 REM DEFAULT GO TO MOD 100 SCREEN
1520 IF LC$="" THEN PR$="LCD:":GOTO1550
1525 REM GO TO SERIAL PORT
1530 IF LC$="s" OR LC$="S" THEN PR$="COM
:57ile":GOTO1550
1535 REM GO TO PARALLEL PORT
1540 IF LC$="p" OR LC$="P" THEN PR$="LPT
:":GOTO1550
1544 REM SOMEONE GOOFED!
1545 GOTO1510
1549 REM OPEN THE OUTPUT FILE
1550 OPEN PR$ FOR OUTPUT AS 2
1553 REM IF IT'S NOT THE SCREEN, THEN
1554 REM PRINT A HEADER LINE
1555 IF LC$<>"" THEN PRINT#2,"Expense Re
port prepared: ";DATE$
1560 RETURN
    
```

Listing 2 — To-Do Program

```

1 REM INITIAL SETUP - 20 ITEMS
5 CLEAR 2000:DEFINTA-Z:DIM T$(20):I=0
10 OPEN "note.do" FOR INPUT AS 1
30 CLS:PRINT"to Do List":PRINT
40 TD$=MID$(DATE$,1,5)
45 REM LOOK AT EACH ITEM IN THE FILE
50 IF EOF(1) THEN 100
60 LINEINPUT#1,IN$
65 REM CHECK FOR DATE
70 GOSUB1100:IF EF=1 THEN GOSUB1000
71 REM CHECK FOR MAJOR PROJECT
72 IF MID$(IN$,1,1)="*" THEN GOSUB1000
74 REM HAVE WE FILLED THE LIST
75 IF I>20 THEN PRINT"LIST FULL":GOTO1
00
80 GOTO50
    
```


Files

```

100 CLOSE
104 REM SORT THE LIST IN PRIORITY ORDER
105 GOSUB 2000
109 REM WRITE THE LIST OUT TO A FILE
110 OPEN "today.do" FOR OUTPUT AS 2
114 REM NOTHING SELECTED
115 IF I=0 THEN 200
120 FOR J=0 TO I-1
130 PRINT#2,T$(J)
140 NEXTJ
150 CLOSE
160 MENU
200 PRINT#2,"NOTHING IN LIST"
210 CLOSE
220 MENU
1000 REM enter an item
1010 PRINT"Item: ";IN$
1020 PRINT"Priority (a, b, or c)"
1030 LINE INPUT P$
1035 REM NOTE THE TRICK HERE FOR SORTING
1040 T$(I)=P$+"": "+IN$
1045 I=I+1
1050 RETURN
1100 REM decision
1110 EF=0
1120 X$=MID$(IN$,1,5)
1125 REM IGNORE DATES LATER IN YEAR
1130 IF X$>TD$ THEN RETURN
1135 REM CHECK FOR ILLEGAL DATES
1140 IF X$<"00/00" THEN RETURN
1145 REM CHECK FOR 10 MONTHS
1150 X=VAL(X$)-VAL(TD$)
1160 IF X>0 AND X<10 THEN RETURN
1165 REM DATE PASSED ALL TESTS, SAVE IT
1170 EF=1:RETURN
2000 REM sort the list
2005 PRINT"SORTING"
2010 GAP = I
2020 IF GAP<=1 THEN PRINT"DONE":RETURN
2030 GAP = INT(GAP/2)
2035 REM FLG IS USED TO MARK THE FACT
2036 REM THAT CHANGES WERE MADE
2040 FLG = 0
2045 REM LOOK AT ALL PAIRS AT THIS GAP
2050 FOR J=0 TO I-1-GAP
2055 REM PAIR OUT OF ORDER, SWAP IT
2060 IF T$(J)>T$(J+GAP) THEN GOSUB2
100
2070 NEXT J
2075 REM IF NO SWAPS WERE MADE, THEN
2076 REM CUT THE GAP IN HALF, OTHERWISE
2077 REM REDO THE SCAN AT THIS GAP
2080 IF FLG=0 THEN 2020 ELSE 2040
2100 TM$=T$(J):T$(J)=T$(J+GAP):T$(J+GAP)
=TM$
2110 FLG=1:RETURN

```



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DOSPLUS IV is Micro-Systems Software's new operating system for the TRS-80 Model 4 computer. It is superb. I consider DOSPLUS IV to offer more power, flexibility and utility than any DOS I have used on a Z-80-based TRS-80, including previous versions of DOSPLUS. In fact, the system is so cleanly and logically designed that it is easy to overlook the inherent flexibility and power until you need it. In keeping with the DOSPLUS tradition of ease-of-use, its power and flexibility does not force itself upon the user in a way that he has to wade through a jungle of illogical and unrelated commands.

Design Philosophy

I'm sure you have used software products that you felt were designed by committee. One very popular operating system has a command to set the RS-232 parameters, such as baud rate, but it has no command that allows you to see how those parameters are currently set. Kind of like one hand not knowing what the other is doing. In these committee-designed systems there are likely to be other parts of the system where the logic flow is broken or a procedure does not resolve itself to a satisfying conclusion. This design defect makes a system frustrating to work with.

I perceive DOSPLUS to be like a musical piece that flows from one

movement to the next without any parts pulling against the other, finally resolving itself to a logical and satisfying conclusion. (*Mr. Carr is a professional musician. —Ed.*)

Operating Environment

A feature of the Model 4 is that the sound generator can be used to click every time a key is pressed on the keyboard. This helps achieve feedback which is reinforcing to the user. Let's activate key click with TRSDOS 6.0, then with DOSPLUS IV:

```
Using TRSDOS 6.0:  
SET *D1 CLICK/FLT  
FILTER *KI *D1
```

```
Using DOSPLUS IV:  
SYSTEM, CLICK = ON
```

As you can see, DOSPLUS IV gives the computer user what can be termed a "pleasant and sensible environment" to work in. The DOSPLUS IV keyclick also sounds more realistic than the static-electricity-sounding keyclick of TRSDOS 6.0.

DOSPLUS IV adds another psychologically reinforcing use of the Model 4 sound generator called "error beep." Any time that an error message is generated by the system, it is accompanied by a short audible beep. For example, if I wanted to execute BASIC and mistakenly typed "BASIX," DOSPLUS IV would generate a "file not found" message on the video display, along with an audible beep.

DOSPLUS IV is delivered with a simulated-leather-covered manual. It is a rear-mounted O-ring style, which makes paging through the manual much easier than conventional center-mounted styles. The manual is well laid-out with colored tabs for each section. The

Pete Carr, Port Orange, FL

sections cover "DOS Operations, Library Commands, Utilities, Job Control Language, Disk BASIC, Drivers and Filters, and Technical Information." It is written in a clear, easy-to-understand style with numerous examples. There is an index. The DOSPLUS IV manual is as good as any I have seen and better than most. It should satisfy the needs of experienced pros and new users alike.

After I read through the manual, I inserted DOSPLUS IV into my Model 4 and pressed reset. I was greeted with the DOSPLUS IV logo and a prompt for the date and time. DOSPLUS IV tries to give the user as much flexibility as possible. I could have entered the date in several formats, depending on my preference, such as: "09/01/83 09/01/1983 9.1.83." For times when a user doesn't need or want to be prompted for the date, or time, when he boots DOSPLUS IV, he may disable them with the SYSTEM command. The SYSTEM command allows the user to configure the system in just about anyway he chooses. A useful feature of SYSTEM is its ability to save your current system configuration (filters, drivers, etc.) to a disk file. After I setup my system the way that I wanted, with my favorite filters and drivers, I could enter SYSTEM MYFAV/CMD. Now, anytime I wanted to restore the system to my favorite configuration, I would just execute MYFAV. It is useful to have different configuration files for different purposes saved on a disk, ready to be executed in a flash.

The MEDIC Shell

After the date and time are



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DOSPLUS IV

entered, a unique, powerful system utility called "MEDIC" is executed. MEDIC stands for Menu Environment DOS Interface Controller. Don't let that complicated sounding acronym scare you. MEDIC is anything but complicated. Its sole purpose is to make the computer easier to use. MEDIC could also be called a "Mini-Shell," with shell being a term used to describe operating system/user interfaces that are common to much bigger multi-user, multi-tasking operating systems such as Unix and Xenix. MEDIC is used to display some, or all, of the files on a user-chosen diskette on the computer's screen in alphabetical order. After the disk files are displayed on the screen, a rectangular block cursor can be placed on any of the displayed files or programs to perform a given function, such as executing a BASIC or CMD program, multiple file copy, multiple file kill, list, dir, or rename. The cursor covers a whole file or program name at a time in a "blinking from inverse to normal"

video fashion. To use MEDIC, you just use the arrow keys to place the cursor over the file/files that you want.

Assume that I have booted up and MEDIC has just executed. Displayed on the video screen are five files called "BACKUP BASIC GRAPH1 GRAPH2 GRAPH3." Now, let's suppose I want to copy GRAPH1, GRAPH2 and GRAPH3 to a disk in drive one. I would first place the cursor on GRAPH1, (press space bar), then place the cursor on GRAPH2, (press space bar), and do the same with GRAPH3. The pressing of the space bar would "mark" those files, and they would now be displayed in reverse video to indicate that they have been marked. Next, I would press the letter C (for copy) and MEDIC would ask me to which drive do I want to copy the marked files. By entering 1, MEDIC would then copy all the marked files to drive one without any further user action. You can execute BASIC or utility programs such as BACKUP from MEDIC, as well. To execute a BASIC program, let's say GRAPH1, I would just place the cursor over GRAPH1, and press the enter key. MEDIC would then load BASIC, and the GRAPH1 program would be executed.

The DOSPLUS IV master disk is delivered with the AUTO command set to automatically execute MEDIC at boot-up. After MEDIC is loaded, the inverse cursor is located over the BACKUP utility. This is a great way for the new user to make that all important backup of the master disk and also a great introduction to DOSPLUS IV and MEDIC. With the cursor over BACKUP, you just press enter, and answer the prompts. After the backup is finished, you are returned to MEDIC. Anytime you execute a program from MEDIC you are always returned back to MEDIC instead of the DOSPLUS operating system. A user could operate the system without ever going into the DOS command level of the system. This is a fantastic way for users who are uncomfortable working with an operating system to insulate themselves from that part of the system. MEDIC can be invoked anytime from the DOSPLUS prompt, using flexible, selective (wild-card) command line formats

like "MEDIC:0*/CMD" or "MEDIC :1 */BAS." The first command line would display only files with the extension CMD on the screen; the second would display only files with the /BAS extension. You can mark all files on the screen by pressing the F2 key, or restore all marked files to an un-marked state by pressing the F3 key. I can't begin to describe just how nice MEDIC is to use. It certainly is one of the most useful ideas I have seen included with any TRS-80 operating system.

Library Commands

DOSPLUS IV has a useful spread of library commands and features — about 44 in all. HELP should be the first to familiarize yourself with. For instance, if you wanted to jog your memory on syntax and possible usage of the COPY command, you would just enter HELP COPY from the DOSPLUS prompt. HELP displays a large amount of information to the user, but it is not meant to be a complete manual. Depending on the HELP information requested, there is only enough information displayed to help you remember how to use the command. A short command like DATE would be displayed like this:

HELP DATE would display:

```
DATE
DATE mm/dd/yy
DATE CAL
DATE CAL mm/yy
```

Notice the CAL parameter of DATE. If it is used, it will display a full calendar for the month that was typed in during boot-up. DATE CAL is not restricted to showing you the current month, however, it can be used to display a calendar for any month and year of your choice by adding the month and year at the end of DATE CAL. DATE CAL 01/84 would display a calendar for January, 1984.

DOSPLUS IV has the power to redirect the system's device output to another device or disk file. I put it to good use in writing this article. I used the DOSPLUS IV command "ROUTE @PR ARTICLE/TXT", after which all output usually sent to the printer would be redirected to a disk file called ARTICLE/TXT. After the redirection was setup, I typed HELP DATE @PR which would usually send the information

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 #41 

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DOSPLUS IV

to my printer, but, in this case, the information was intercepted and redirected to the disk file called ARTICLE/TXT. I just chained the ARTICLE/TXT file onto the end of my Scripsit DOSPLUS IV article, and block-moved the information to where I wanted it.

There are many other library commands, and they all are useful and well integrated. Most of the commands can be used in their simplest forms, or the user can use the powerful extensions and parameters of the commands. You're not locked in to having to memorize long, complicated command lines to do a simple procedure like copying a file from drive:0 to drive:1. A useful feature of the DOSPLUS IV command line is the ability to execute multiple commands on a single line by separating each command with a semicolon. (For example: "KILL TEST1;KILL TEST2".) This multi-command line is a fundamental design that will soon spoil any DOSPLUS IV user.

Utilities

DOSPLUS IV comes with some useful utility programs that many other operating systems force you to purchase at extra cost. There are two, well-done disk zap or disk file modification programs (both use the inverse video of the Model 4 very tastefully), a directory check/repair program called DIRCHECK and a RESTORE which can bring back a mistakenly killed file from the dead. There are others like PATCH, MAP (displays a map of where files are located on a disk), and TRAP (intercepts certain disk I/O errors). One utility called SYSGEN allows you to optimally install the DOSPLUS IV system onto disk media different from the usual, single-sided, 40-track disk drive. I have double-sided, 40-track drives installed in my Model 4, and SYSGEN made it easy for me to create an optimized, double-sided, DOSPLUS IV system disk. SYSGEN can also be used to install the DOSPLUS IV system to a memdisk.

Job Control Language

Included with the system is an expanded form of JCL. This is

actually a systems-level language that can be used to make multi-step system operations quickly and simply. It is easy to learn and use. It may look complicated, but it's not. It differs from TRSDOS 6.0's JCL in that it resides in memory instead of on the disk. It is flexible and, because it resides in memory, it works very fast. Of course, since it resides in memory, it leaves less memory for the user. I find this not to be a problem because most JCL applications are not used in areas of programming (like running BASIC programs) that require the user to have all the available RAM he can get. I like trading a little RAM for the extra speed of in-memory operations. I wrote a JCL procedure that simplifies the steps of compiling, linking and running programs with the Microsoft BASIC compiler. When I type EX COMPILE at the DOSPLUS prompt, I'm asked for the name of the file I want to compile and the drive number it is stored on. JCL takes over and does the usually multi-step procedure of compiling, linking, etc., without any further action necessary. After the compiling and linking are done, the program is run. (Note: Since there is no Microsoft Compiler available for the Model 4 mode, I used the Model III mode DOSPLUS 3.5 JCL. Both JCLs are identical, however.)

Disk BASIC

DOSPLUS IV includes a BASIC interpreter identical to Model 4 BASIC as well as some of the best extensions available for Microsoft BASIC. DOSPLUS IV adds a complete line of shorthand features, about 20, which can be categorized into two groups. One group are the abbreviated commands like E for edit, D for delete. The other group is the immediate commands like: "uparrow to list preceding line of program," or "downarrow to list next line of program." Some of my favorite extensions are DI,DU,DR which allow you to move program lines from one area to another with options for deleting the line after it is moved (Delete and Insert), or keeping the original line after it is moved (DU - Duplicate line). Also included is one the best multi-array sorts I have used, a variable

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DOSPLUS IV

referencer and a global search/replace. A very powerful feature of DOSPLUS IV BASIC is that you can use label addressing for subroutines instead of line numbers. You just use the NAME verb to label your subroutines and then GOSUB, GOTO can access these subroutines by their label. This can make for readable, understandable programs. Here is a short example:

```
10 GOSUB DISPLAY.MENU
20 GOSUB SORT.DATA
30 GOTO END.RUN
40 NAME DISPLAY. MENU :
PRINT @(0,30),"MENU" :
RETURN
70 NAME SORT. DATA : SYSTEM
"SORT", A(1),B,C : RETURN
90 NAME END.RUN : CLS : END
```

A great finishing touch is the included label resolve utility. If you wrote a program and used the DOSPLUS label feature, it wouldn't run under another BASIC which did not have the label capability. That's okay. By executing SYSTEM "RESOLVE", your program would have all its labels transformed into line numbers and it would run fine. If RESOLVE was used on the above label-example program, "GOSUB DISPLAY. MENU" would be changed to GOSUB 40. This makes it nice if you want to take advantage of the more structured programming offered by using labels and still be able to run those programs with a BASIC which does not offer it. You are not left at a possible dead end, if you want to take advantage of DOSPLUS IV labels. My favorite DOSPLUS extension is INPUT@. It's very powerful and I wish it would become standard in every BASIC. It's that good. It works much like the COBOL accept statement which allows controlled, user data input:

```
INPUT@(10,10),"Enter Last Name
";25,"$";LNAME$
```

This example would print the prompt at line 10, column 10, then print a thin underline that would mark the maximum-allowed, input length of 25 characters. The "\$" means that any alphanumeric character will be accepted and LNAME\$ is the variable which will hold the entered data. If the "\$" were replaced by "#" only numeric data would be allowed. You only have to use INPUT@ once to see how useful

it is. It can save you from writing many lines of code.

Option S

Standard Model 4 BASIC requires that you enter spaces around keywords. This is done so that you may use reserved words in long variable names (and now labels, too). This is one of the nicer features of Model 4 BASIC, but this also means that it is hard to move Model III BASIC programs that have been packed (spaces removed between keywords to save memory) over to the Model 4, and have them run. The OPTION S features will automatically remove the need for spaces around keywords, and allow these Model III programs to be more compatible with Model 4 BASIC. OPTION S can make the difference in your being able to run a favorite program, or not being able to run it. This (and most other features I have mentioned) is exclusive to DOSPLUS IV and demonstrates Micro Systems Software's insight into what the user needs to make the computer more useful.

Drivers and Filters

On most home or single user computers, we are used to having a single directory (a collection of files) for each disk drive device. If you have many files on a disk, the directory becomes disorganized and hard to work with. This is especially true if we are using a hard disk or double-sided drives. It would be much better if we could group these files together by category, with each group of files having its own directory. DOSPLUS IV allows you to create what I call subset directories with the special disk driver called FILE/DVR. The ASSIGN command is used to install all drivers into the system, including FILE/DVR (Example: "ASSIGN :1 FILE/DVR UTL/PDS:0, INSTALL = Y"). In this example, as FILE/DVR initializes itself into the system, it will also assign a new file to drive zero. This new file will be a "Partitioned Data Set - PDS", or a file which can contain a group of files. The operating system will be able to read and write to this PDS file as if it were an actual, physical, disk drive device, with its own device name. Matter of fact, as far as the

system and user will be concerned, it is a separate disk drive with its own directory. With DOSPLUS IV, we can even rename our new pseudo disk. If I grouped all of my utility files into a PDS file, I might rename the pseudo drive that contained the grouping of utility files to :U. I could also use FILE/DVR to set up another file grouping that would contain all my BASIC programs and name that drive :BA, if I wanted. It's a fabulous way to organize your files.

MEMDISK/DVR allows you to use part or all of the extra 64K in a 128K RAM Model 4 for a disk drive. This will greatly speed up any operations that are disk I/O intensive. You can even put the DOSPLUS IV system onto MEMDISK, by using the SYSGEN command. The command "SYSGEN :M, OVL=16" would move all system overlays, from SYS1 to SYS16, to the memdisk we named drive :M. SYS0 is not needed, because it resides in memory from the time you boot-up. Other drivers are MKEY/DVR, a single keystroke, macro key driver, and a printer SPOOL driver which allows you to use part or all of the extra 64K in a 128K Model 4 as a printer buffer. You can split the extra 64K between MEMDISK/DVR and SPOOL/DVR if you wish, giving you a 32K spool buffer and a 32K memdisk.

DOSPLUS can do character translation, or character filtering, as I/O is sent from one device to another. For example, if the 0EH character makes your printer go crazy, you could use the FILTER command to translate the 0EH character to 00H. Then, anytime an 0EH character is transmitted to your printer, the filter would intercept it and translate it to 00H. The character translation feature of DOSPLUS IV is simple. You don't have to write any machine language program, you just save a translation table to the disk in ASCII form. To insert the filter translation table between an I/O device, let's say the printer, you would just enter "FILTER @PR TRANS/FLT".

Pipes

DOSPLUS IV is a device independent system which offers I/O redirection, I/O character

translation, and another type of filtering. DOSPLUS IV is the first operating system to bring to the TRS-80 Model 4 user a powerful filter feature called "pipeing." "Pipeing" allows the screen output from one program to be used as the keyboard input of another. The term "pipe" is actually a verb used to describe what happens to data as it is "piped" from one program to another. A pipe procedure is signalled by the insertion of a vertical bar (CTRL;) in a command line. "LIST TEST/BAS|MORE" would send the output of the command LIST TEST/BAS to the pipe filter called MORE/CMD. The more filter (which is included on the DOSPLUS IV disk as an example) then inserts the prompt "---MORE---" every 22 lines, and pauses the output until you press enter.

You can have more than one pipeline executed by separating each pipe filter with the vertical line. A multi-pipe command line might look like this: "LIST TEST/BAS | REMCTRL | FORMAT". In this example, the command line might

be used to send the listed output of the TEST/BAS file through the first pipe filter, whose purpose could be to remove control characters, then the second pipe filter, whose purpose could be to format the text.

The PIPE concept comes from systems like Unix and Xenix. There is no way that a Z-80 computer can offer the pipeing power offered by bigger 16- or 32-bit systems, but it is still a powerful, useful feature.

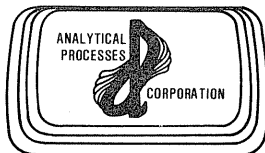
Technical Information

The last part of the manual contains a complete technical information section. It starts at disk organization and goes all the way to system "supervisor calls" or SVCs. By the way, DOSPLUS IV uses the same SVC numbers that TRSDOS 6.0 uses, so the two systems should be very compatible with each other. (We have heard of some incompatibility with some software. -- Ed.) If you want to squeeze out every bit of DOSPLUS IV's inherent power, you can find the information you need here.

I'm happy using DOSPLUS IV. There are many things about the system that you will just have to look into for yourself. Is there anything negative I found about DOSPLUS IV? Yes. It doesn't have type-ahead, and I really miss it. I have yet to see any system that contains every possible ingredient for every user, but as far as I'm concerned DOSPLUS IV has the right kind and amount of ingredients. DOSPLUS IV is tastefully designed.

As of January 1, 1984, DOSPLUS IV will be replaced with DOSPLUS IV/A, an advanced version. The new package will include a complete macro assembler, editor and linker. The addition is the M-ZAL package from Computer Applications Unlimited, now modified for the Model 4. The price for the new system will be \$169.95. Current owners of DOSPLUS IV will be able to upgrade for \$25.00. As of the first of the year, only the advanced version will be available. --Ed.

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Will she still mother us?

What AT&T's breakup means to you

For all readers

Donald L. Stoner, Cameron C. Brown

The new year is starting off with quite a revolution. American Telephone and Telegraph, AT&T, has been ordered to divest itself of all

local operating companies as well as its interest in Western Electric.

Historically, long distance charges subsidized local phone

rates. About 37 percent of each long distance dollar went to pay for local service. On January 1, 1984, phone companies will begin to charge based upon the actual cost of the service. For long distance callers it should mean a reduction in cost. AT&T will continue as a provider of long distance, as well as many new competitors such as Sprint and MCI.

The twenty-two operating companies (such as Pacific Northwest Bell, Southwestern Bell and others) have been regrouped into seven companies. These new companies will provide local service, sell equipment, and give you access to long distance service. Since they no longer collect long distance revenue local rates will be going up. The change has many telecommunication users groups, TUGs, very nervous.

We recently attended a meeting of a TUG. Jeans outnumbered three-piece suits by 20 to one. A Pacific Northwest Bell spokesman was there. He was given quite a reception, and it wasn't very friendly. Developments in Oklahoma, Texas, Colorado, Florida, and Utah have many computer users upset.

The problem to computer users is the manner in which some local companies are attempting to increase their revenues. Besides a



new local access charge (about \$2.00 per month), new rates and tariffs are being considered. Some companies have proposed a \$50 per month modem surcharge. The surcharge would apply to those who call CompuServe once a week as well as a local bank that ties into its database for 24 hours every day.

We found that our local operating company had mixed feelings. Officially, there are no plans to have a modem surcharge, at this time.

The problem to computer users is the manner in which some local companies are attempting to increase their revenues. Besides a new local access charge, new rates and tariffs are being considered.

One person did say that she knew many home computerists who are on the line for eight hours a day. To her a \$50 modem surcharge was quite reasonable.

What does this mean to you?

Your first step is to keep informed. Each local company must apply to its state's tariff or utilities commission for a rate change or increase. Just because Florida has a modem surcharge doesn't mean your state will. Many of those at the meeting held the view that if a charge can get in place in one area, it will soon appear elsewhere.

Let your state utilities commission know that you are an "interested party" and wish to be informed of any rate requests concerning modems, data lines, computers or any other related rates or surcharges. Your own action can be effective. Interested parties in Oklahoma were able to stop the implementation of a \$50 per month modem surcharge by Southwestern Bell.

Keep in touch with your representatives in Congress. Both the House and the Senate are holding hearings on the impact of

the divestiture of AT&T. Contact the Subcommittee on Telecommunications, Consumer Protection, and Finance, B331 Rayburn House Office Bldg., Washington, DC 20515. Rep. Timothy Wirth of Colorado is the chairman. Contact him, as well as your own representative, for information on pending legislation that may impact the home computerist.

As of the start of this year, you may be given the option of having measured or flat-rate service. In Washington state all businesses will be on measured-rate service as of January 1, 1984. Businesses that rely on telecommunications may need to reconsider, or at least reorganize, their data keeping. At best, we can expect telecommunications to become a larger item in a company's budget.

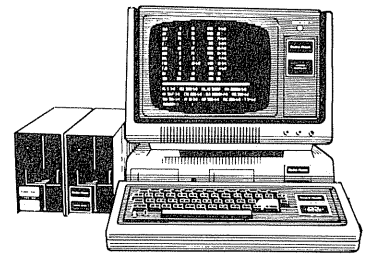
If you are using telecommunications at home, consider keeping the flat-rate service. Initially, measured-rate service looks cheaper. Those of us who use EMail or other services may find it too expensive when the phone company starts billing on a time and distance basis.

Consider getting a faster modem. At 1200 baud you can get in and out over four times faster. On a measured-rate system that can save a lot of money. If only CompuServe didn't charge extra for higher baud rates!

Watch out for special "data line" charges. Except in the most rural areas, voice and data are carried on the same line. The only way the phone company knows you have a modem is if they listen to the conversation, or if you tell them (which you must do according to FCC regulations).

Consider reversing the manner in which you access a database. Call them to tell them you want to communicate and have them call you back. That way the measured charges are not billed to you.

There is some encouragement for the future. AT&T is working to have completely digitized service within the next few years. When that happens modems will no longer be needed and all lines will be of "data quality." We can only hope that a watchful eye now will keep telecommunications from becoming just a rich man's hobby.



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BASIC bits

Using the reset interrupt

Model I Non-disk systems

Thomas L. Quindry, Contributing editor

My last few columns have used hexadecimal notation in BASIC statements. This has inadvertently caused some problems due to an error in the way Model III (and probably Model I) TRSDOS interprets those statements containing hexadecimals. My thanks go out to Greg Sheppard, Technical Editor for *Basic Computing*, for pointing out the solution to the problem.

In the August, 1983 "BASIC bits" column, an innocent-looking statement:

```
30 FOR N=&HBEF0 TO &HBEFC  
:READA:POKEN,A:NEXT
```

caused the problem to surface. If entered exactly as written in the magazine, a syntax error will be indicated. The problem is solved by entering the code without a space between &HBEF0 and the TO, or

between &HBEFC and the ":". Thus,

```
30 FOR N=&HBEF0TO &HBEFC:  
READ A:POKEN,A:NEXT
```

will work. Though readability is enhanced by keeping the space (and it should be legal), the BASIC interpreter in TRSDOS is in error by not interpreting correctly when a space is placed after a hexadecimal number.

There is one other condition that I know of which will produce a syntax error. It is when the hexadecimal code would contain a reserved BASIC word. For example, DEF is a reserved word used in statements like DEFINT and DEFDBL. The statement, PRINT &HFDEF, would print a value of '15 and give you a syntax error. PRINT &HDEF would print a value of 0 (zero) and give a

Figure 1
Screen print of Adventure International's logo.



P R E S E N T S

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Program Listing — BASIC bits

```

00100 ;*****
00110 ;*
00120 ;*          PICTUR          *
00130 ;*      PRINT SCREEN DUMP  *
00140 ;*      BY PRESSING RESET  *
00150 ;*
00160 ;*      BY THOMAS L. QUINDRY *
00170 ;*
00180 ;*
00190 ;*****
00200 ;
00210 ; WHEN USING "PICTUR" THE ONLY
00220 ; COMMANDS AVAILABLE DURING THE
00230 ; SYSTEM PROMPT ARE <PROGRAM NAME>
00240 ; TO BE LOADED, OR </ENTER>.
00250 ; ALL OTHER COMMANDS WILL DEFAULT
00260 ; TO PRINT A SCREEN DUMP
00270 ;
4007          00280          ORG          4007H
4007 5A41      00290          DEFW       START ;PATCH AT RESET INTERRUPT ADDRESS
4152          00300          ORG          16722 ;MEMORY NORMALLY USED BY DISK COMMAN
DS
4152 215A41    00310          LD          HL,START
4155 220740    00320          LD          (4007H),HL
4158 1849      00330          JR          SYSTEM
415A 3AE837    00340  START  LD          A,(37E8H) ;CHECK PRINTER STATUS
415D CB7F      00350          BIT          7,A
415F 2804      00360          JR          Z,PRINT1 ;PRINT IF READY
4161 CB77      00370          BIT          6,A
4163 2035      00380          JR          NZ,RETURN ;RETURN IF NO PAPER OR PRINT
ER OFF
4165 3E0F      00390  PRINT1 LD          A,15 ;CODE FOR COMPRESSED CHARACTERS
4167 CD3B00    00400          CALL         003BH ;CALL PRINT ROUTINE
416A 3E0D      00410          LD          A,0DH ;GET LINEFEED/CARRIAGE RETURN
416C CD3B00    00420          CALL         003BH
416F 21003C    00430          LD          HL,3C00H ;SET TO FIRST SCREEN POSITIO
N
4172 0610      00440          LD          B,16 ;SET TO READ 16 LINES
4174 C5        00450  PICTUR PUSH        BC
4175 0640      00460          LD          B,40H ;SET TO READ 64 CHARACTERS ON EACH L
INE
4177 7E        00470  LINES  LD          A,(HL) ;LOAD A WITH SCREEN CHARACTER
4178 CB7F      00480          BIT          7,A ;CHECK FOR GRAPHICS CHARACTER
417A 2806      00490          JR          Z,PRINT
417C CBB7      00500          RES          6,A ;RESET BIT 6 FOR U/L CASE CHARACTER
GENERATORS
417E EE00      00510          XOR          00 ;SET TO 63 TO REVERSE THE GRAPHICS (
OPTIONAL)
4180 C600      00520          ADD          A,00H ;GRAPHIC PRINTER OFFSET (DIFFERENCE
FROM 80H OF TRS-80 TO PRINTER) SET VALUE TO SUIT YOUR PRINTER
4182 CD3B00    00530  PRINT  CALL         003BH
4185 23        00540          INC          HL
4186 10EF      00550          DJNZ         LINES
4188 3E0D      00560          LD          A,0DH ;GET LINEFEED AND CARRIAGE RETURN
418A CD3B00    00570          CALL         003BH
418D C1        00580          POP          BC
418E 10E4      00590          DJNZ         PICTUR
4190 3E12      00600          LD          A,1B ;RESET FROM COMPRESSED CHARACTER MOD
E
4192 CD3B00    00610          CALL         003BH
4195 3E0D      00620          LD          A,0DH
4197 CD3B00    00630          CALL         003BH
419A CDC901    00640  RETURN  CALL         01C9H ;CLEAR SCREEN
419D 21901C    00650          LD          HL,1C90H
41A0 220740    00660          LD          (4007H),HL
41A3 C3B202    00670  SYSTEM  JP          02B2H
02B2          00700          END          02B2H

```


syntax error.

The moral of the story is to beware when using hexadecimal notation. If it doesn't work as listed, and you think it should, remove spaces or convert to decimal notation.

Now, as promised last month, a program for Model I users. It's not often you can have more capability for less, but in this instance, the Model I user who does not have an expansion interface has an extra control at his fingertips — the reset. I call it recycled reset. Without having to continually qualify my statements, the following application refers to the special case of the Model I with no expansion interface.

Now, what on earth can a reset be used for other than getting back to BASIC? The reset is sort of an interrupt control. With the stated configuration of a Model I, pressing the reset causes a jump to address 4006H via the RST 18H vector. At 4006H, which is in random access memory (RAM), a jump is normally made to the BASIC interpreter. This

is the point where we can put our own machine language command rather than return to BASIC. Thus, we can gain control of the computer in instances when it would normally be impossible.

Think of the following example as not the only application that reset can be used for, but devise your own special routine when you cannot normally get control.

In my capacity as software editor for our metropolitan area computer users group, I review quite a bit of software. When reviewing arcade-type games, I believe it is beneficial to the members to illustrate some of the better graphics displays from these machine language programs. This requires printing graphic characters using a screen dump routine. A printer with TRS-80 graphics capability is required.

At first, I would disassemble just enough of the program to patch my printing routine into the input routine of the commercial program. I would then enter a keyboard

command to print the screen graphics at the precise moment I wanted. This gave me a great deal of satisfaction the first time I accomplished this little task, but after a while, the special sense of accomplishment wore a little thin. Each program required a specialized patch and disassembly was a chore. I decided to write a printing routine that could be accessed independently of the commercial program it was to be used with.

This, is not a simple chore. An article by Dennis Kitz in *The Alternate Source*, Vol. II, No. 2, on interrupts, inspired me. Dennis' article described the interrupts available to the Z-80 microprocessor and then burst my bubble of wondrous things to come by explaining that only one interrupt was available to the TRS-80. That interrupt was interrupt mode 1; triggered by the clock in the expansion interface.

My Model I (then, my only computer) didn't have an expansion

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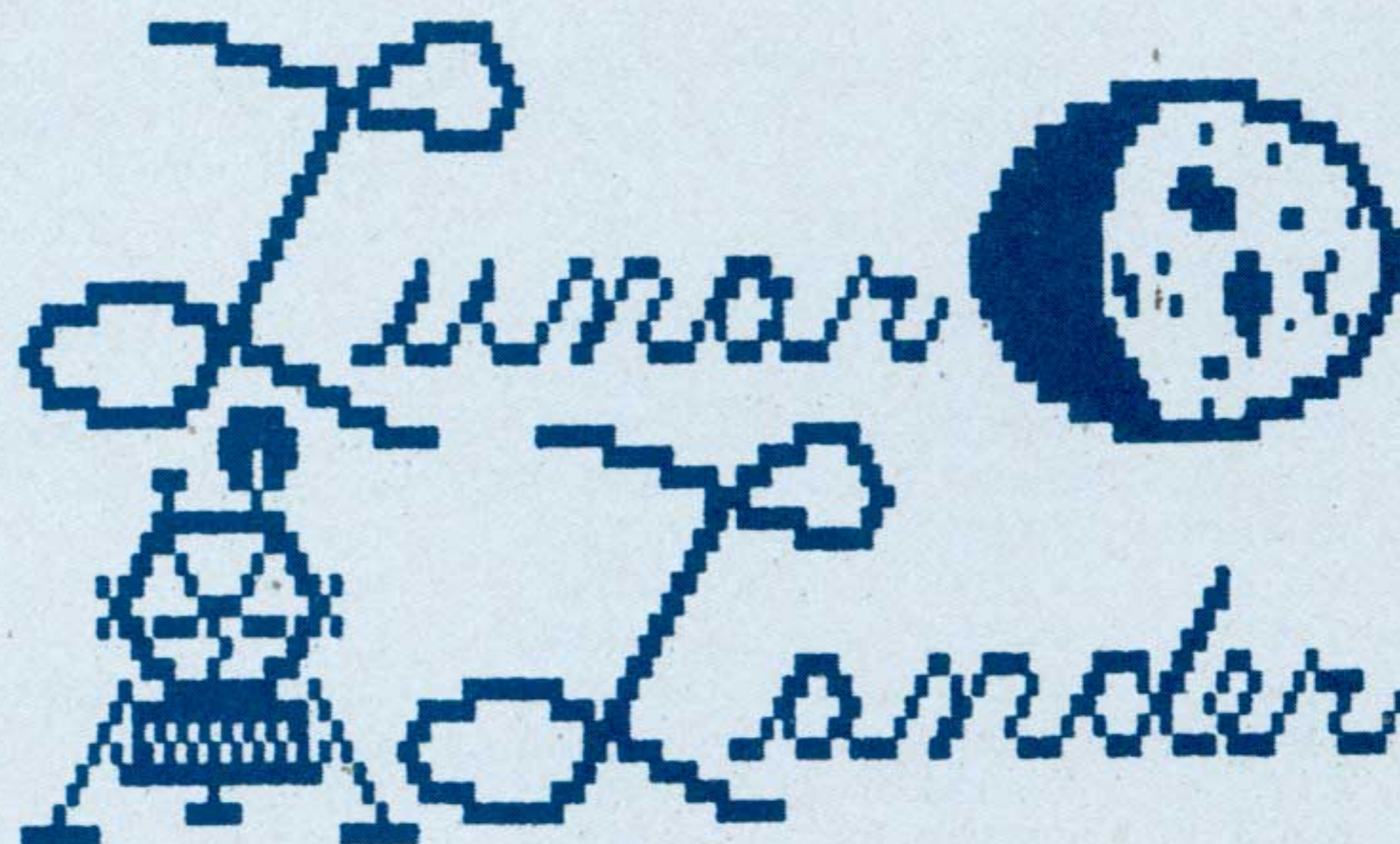
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#46

Figure 2
First screen display for Lunar Lander.



BY MIKE WALL AND JACK MONCRIEF

interface and there was no easy way to cause the interrupt. I thought of building a pulse generator to connect to the CPU edge card. Having no diagram (nor knowledge), I decided against it.

The question was: How could I interrupt a machine language program that was not otherwise accessible? There are many ways to access a machine language program if certain ROM routines such as the keyboard, video, or even printer-driver routines are called. Many ROM routines pass through the Level II vector area from 4000H on up. These vectors contain either a jump back to a ROM routine or a return. The interrupt mode I return is at one of these vectors. The "interrupt" that I am writing about is not, in a strict sense, an interrupt. It is a way to gain control of many machine language programs which are otherwise inaccessible.

One way of altering the natural flow of a machine language program is to push the reset button. When the reset is pushed, the computer executes an RST 18H command. This causes a jump to 0018H, which commands a jump to 4006H, one of our RAM vectors described above. At 4006H, a jump to 1C90H is executed. Eventually, control returns to the ready prompt for the BASIC interpreter. The code at 4006H can be altered to whatever function you would rather have the computer execute.

The graphics screen dump routine takes advantage of this fact and when you press the reset button, the computer will print graphics with your printer. The beauty of this routine is that it is practically program-independent. The only qualifications are that the program you use this technique with does not call ROM routines which pass through, or change, the vector at 4006H. Even if the program performs a DI (disable interrupt), the routine will still work.

Figures 1 and 2 give screen dumps from Lunar Lander, a program distributed by Adventure International. The printing routine in the listing is placed in an area of RAM which is not likely to be used in a non-disk system. It is placed at 4152H, an area reserved for Disk BASIC vectors. This is a good place

for short routines such as this and gives those extra bytes needed to avoid conflicts with most commercial programs.

The printer routine contains three controls which you may, or may not, be able to use and thus you may want to omit them. On lines 390 and 400, the compressed character mode for many Epson-compatible printers is commanded. Line 510 can be changed to XOR 63 if you wish to reverse the graphics of the printout. Line 520 is of interest to Epson MX-80 users and others who have printer graphics characters with a different hexadecimal notation than the TRS-80. For the Epson, the standard-mode graphics characters start at A0H instead of 80H. This code at line 520 would thus be ADD A,20H. This is obtained by the formula $A0H-80H=20H$. Finally, lines 600 and 610 command the printer to return to the 80-character mode. These codes can be changed accordingly.

The graphic screen dump routine is easy to use. You have limited command capability when this routine is entered. You cannot enter any decimal numbers while in the SYSTEM command mode. Doing this would cause you to go through a ROM routine which passes through the RAM vector at 4006H. All you can do at the SYSTEM prompt is either enter the name of another program you plan to load or else / enter, which will run your commercial program. Enter the screen dump program, enter the name of your commercial program, load it, and run it. Turn on your printer if it is not already on, but put it off-line if you have that control. When you see an interesting graphic which you want to print, press the reset button and put your printer on-line. This procedure eliminates a debounce which sometimes occurs when I press reset. In lines 350 to 380, the two printer-ready status bits are tested. If your printer is on, and has paper, the program will wait at line 400 within the print routine in ROM until full printer status is reached. If your printer is off, or out of paper, the program will simply reset the vector starting at 4006H to its normal values and you will return to the system prompt.

The printer subroutine is now

deactivated. Now you can enter either / 16772 enter (to reestablish the screen dump routine), or hit / enter to return to the beginning of your commercial program. Returning to your commercial program may not be possible. It depends on how the program works. Some programs change their command structure after the first pass. After activating the printer subroutine, you can also use / enter to get into your commercial program with the above qualifications.

The discovery of reset control opened up a whole new area for me. Hopefully, you can find other ways to recycle reset to suit your needs.

Remember to send your requests for future column topics, questions and tips to me in care of *Basic Computing*, 3838 South Warner Street, Tacoma, WA 98409. Send a self-addressed, stamped envelope and I'll try to give you a personal reply as long as the answer is not too long and involved. Problems of general interest may be included in future BASIC bits columns.

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#47



Tracktime

Keep track of client's computer time — easily

Models II/12/16_{II}

Rolf Roethlisberger, Geneva, Switzerland

If you use your computer to assist you in providing customer service you want your fees to really cover the time you spend on each customer. One way to accomplish this is to keep track of the computer time. I have developed a program called TRACKTIM/BAS which, as the name implies, keeps track of the time for each session.

Every time you start work for a customer run this program first. It is fully automatic and only prompts you for a filename. The best choice for a filename is the customer's name, and a separate file should be used for each customer. The program determines automatically if it should first create the sequential file for the customer, and if you are logging on or off the session.

Program Flow

In addition to the REM statements in the program, here is some explanation of how the program functions. Lines 100 through 240 initialize the program. The variable EN sets the maximum number of log-ons and log-offs to 50. If you need more, or less, you can change this number. The variable T sets the left-margin in the

sequential file.

Lines 250 through 460 handle most of the file manipulation. After you have answered the question for the filename, the system opens it. If the file is non-existent, the system would normally display an error message and abort the program. The error-handling routine takes care of this and redirects program execution to a special file creation routine. If the file exists the title (TITLE\$), heading (N\$) and flag status (FL) are read. This is followed by a FOR . . . NEXT loop which reads the dates (DA\$), log-on and log-off times (G1\$ and G2\$), and the time difference for each session (HM\$). Note that the variable X stores the number of records in the file. The variable T\$ is used to keep the total time for the customer.

The flag, which is read at the beginning of the process, is used to determine if you are logging on or off. It is a 0 when logging on and a 1 means that you have already started the session and wish to log off.

Lines 470 through 550 assign the actual time (G1\$) and date (DA\$) for logging on and the log-off time (G2\$) and time difference (HM\$) are filled with blanks. The flag is then changed to one and the message "SYSTEM LOGGED ON" is displayed.

When the flag is 1, lines 560 through 780 are used for finishing the session and logging off. This part of the program reads the actual time into variable G2\$ (log-off time) and uses the temporary variables TT, TU, ST, SU, and S1 to calculate the time difference of the most recent entry and the new total time. The result is converted back into a string using temporary variables S1\$ through S4\$. The variables H1\$ through H4\$ reconstruct the new total-time string (HM\$). Any blanks in the time will be replaced with zeroes to dress-up the print out. Finally, the flag is changed to zero and the message "FILE LOGGED OFF" is displayed.

Figure 1 Sample Printout

GUY ACCOUNTING LOGON REPORT			
DATE	LOGON	LOG OFF	HM:MM:SEC
Wed Apr 15 1981	20.10.24	21.35.20	01:24:56
Thu Apr 30 1981	20.21.21	22.47.26	02:26:05
Sat May 23 1981	19.15.21	21.30.21	02:15:00
Sat May 30 1981	10.15.21	14.00.10	03:44:49
Sat Jun 13 1981	09.47.20	11.23.19	01:35:59
Sun Jun 28 1981	18.21.03	20.51.14	02:30:11
Wed Jul 15 1981	18.28.56	21.06.57	02:38:01
Wed Jul 29 1981	20.51.42	22.28.31	01:36:49
Fri Aug 14 1981	19.25.15	20.46.03	01:20:48
Sat Aug 29 1981	10.36.21	11.44.37	01:08:16
Wed Sep 16 1981	18.05.55	19.08.09	01:02:14
Wed Sep 30 1981	19.13.31	21.28.50	02:15:19
TOTAL	23:58:27		



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Tracktime

Lines 790 through 820 handle the opening of a new file and branches to the log-on subroutine. The log-on message is displayed.

Lines 830 through 940 open the files for writing and save all previous, as well as the latest, log-on or log-off records.

Lines 950 through 1000 display that the program is done and prompts for an enter to continue. As written, the program just ENDS in line 1000. You may wish to use a RUN "filename" command instead of END. That way you can run TRACKTIM/BAS, have it log-on for a customer, and then it will run a specific application program such as an accounting or analysis program. You will have to run TRACKTIM/BAS one more time after finishing the application program so that the customer is logged off for the session. By putting a RUN "TRACKTIM/BAS" in the appropriate spot in your application program you can make the whole procedure rather automatic. Note that TRACKTIM/BAS requires you enter BASIC with at least one file open.

Lines 1010 through 1070 make up the error-handling routine. Error 53 traps the non-existent file condition to create a file for a new customer. The program is written to open the customer files on drive 1. You can change this by altering the setting of F\$ in line 230. Notice that all files will have the /LST extension. Error 60 detects an End-of-File error status and branches back to line 800 to close the file and continue.

Printout

To print out a record for a customer, just use the TRSDOS PRINT command. From TRSDOS Ready, enter the command PRINT *Filename*/LST, where *Filename* is the same name used in creating the time record. Figure 1 shows a sample printout. As stated earlier, it is most convenient if you use the customer's name for the filename.

There are several enhancements that you could implement. One would be to extract the time differences and use them in a simple billing program. With some modifications, in particular the time and date assignment routines, the program could be adapted to other models which use slightly different BASICs.

Listing 1 TRACKTIM/BAS

```
100 REM PROGRAM NAME = TRACKTIM/BAS V02B
    (05-OCT-1981)
110 REM CREATED BY ROLF ROETHLISBERGER
120 REM          34 RUE DAUBIN
130 REM          CH-1203 GENEVA
140 REM          SWITZERLAND
150 CLEAR 6000
160 DEFINT A-G, I-R, U-Z
170 ON ERROR GOTO 1020
180 T=10:REM TAB SETTING
190 EN=50:REM MAXIMUM NUMBER OF ENTRIES
    IN FILE
200 DIM DA$(EN), G1$(EN), G2$(EN), HM$(EN)
210 NA$="TIME-TRACK LOG-ON REPORT: "+F$
220 DA$="DATE":G1$="LOGON":G2$="LOG OFF"
```

```
:HM$="HM:MM:SEC"
230 F$="/LST:1"
240 LO$="SYSTEM LOGGED ON":LF$="SYSTEM L
    OGGED OFF"
250 CLS:PRINT CHR$(31);STRING$(39,158)
260 PRINT"          TIME-TRACK PROGRAM "
    :PRINT"          TIME "; TIME$:PRINT STR
    ING$(39,158)
270 PRINT"ENTER FILENAME (NO EXT)":;INPU
    T F1$
280 IF F1$="" THEN PRINT"ERROR - TRY AGA
    IN":GOTO 270
290 F$=F1$+F$
300 PRINT:PRINT "OPENING FILE ";F$
310 PRINT
320 OPEN "I",1,F$
330 INPUT #1,N$
340 IF N$="" THEN CLOSE:GOTO 800
350 INPUT #1,FL
360 INPUT #1,TITLE$
370 FOR X=1TO EN
380 IF EOF(1) THEN 460
390 INPUT #1,D$
400 IF INSTR(D$,"TOTAL")<>0 THEN T$=D$:G
    OTO 460
410 DA$(X)=MID$(D$,1,15)
420 G1$(X)=MID$(D$,22,8)
430 G2$(X)=MID$(D$,36,8)
440 HM$(X)=MID$(D$,52,8)
450 NEXT X
460 CLOSE:X=X-1
470 IF FL<>0 THEN 560
480 REM ***** LOG ON FILE *****
    **
490 X=X+1
500 G1$(X)=TIME$
510 G2$(X)="          "
520 DA$(X)=MID$(DATE$,1,3)+" "+MID$(DATE
    $,4,3)+" "+MID$(DATE$,7,2)+" "+MID$(DATE
    $,9,4)
530 HM$(X)="          "
540 FL=1:IF X=1 THEN RETURN
550 PRINT LO$:GOTO 830
560 REM ***** REM FLAG IS 1 - CAL
    CULATE TIME AND LOG OFF FILE *****
570 G2$(X)=TIME$
580 TT=VAL(MID$(G1$(X),1,2))*60*60
590 TT=TT+VAL(MID$(G1$(X),4,2))*60+VAL(M
    ID$(G1$(X),7,2))
600 TU=VAL(MID$(G2$(X),1,2))*60*60
610 TU=TU+VAL(MID$(G2$(X),4,2))*60+VAL(M
    ID$(G2$(X),7,2))
620 H=TU-TT
630 REM ADD UP TOTAL TIME
640 ST=VAL(MID$(T$,7,2))*60*60
650 ST=ST+VAL(MID$(T$,10,2))*60+VAL(MID$
    (T$,13,2))
```


Tracktime

```

660 SU=ST+H
670 S1=INT(SU/3600):S2=INT(SU-(S1*3600))
:S3=INT(S2/60):S4=INT(S2-(S3*60)+.5)
680 S1$=RIGHT$(STR$(S1),2):IF LEFT$(S1$,
1)=" " THEN S1$="0"+RIGHT$(S1$,1)
690 S3$=RIGHT$(STR$(S3),2):IF LEFT$(S3$,
1)=" " THEN S3$="0"+RIGHT$(S3$,1)
700 S4$=RIGHT$(STR$(S4),2):IF LEFT$(S4$,
1)=" " THEN S4$="0"+RIGHT$(S4$,1)
710 T$="TOTAL "+S1$+" "+S3$+" "+S4$
720 H1=INT(H/3600):H2=INT(H-(H1*3600)):H
3=INT(H2/60):H4=INT(H2-(H3*60)+.5)
730 H1$=RIGHT$(STR$(H1),2):IF LEFT$(H1$,
1)=" " THEN H1$="0"+RIGHT$(H1$,1)
740 H3$=RIGHT$(STR$(H3),2):IF LEFT$(H3$,
1)=" " THEN H3$="0"+RIGHT$(H3$,1)
750 H4$=RIGHT$(STR$(H4),2):IF LEFT$(H4$,
1)=" " THEN H4$="0"+RIGHT$(H4$,1)
760 HM$(X)=H1$+" "+H3$+" "+H4$
770 FL=0
780 PRINT LF$:GOTO 830
790 REM ***** FILE IS EMPTY - CREATE
FIRST ENTRY *****
800 CLOSE
810 X=1:GOSUB 500
820 PRINT LO$
830 REM ***** WRITE BACK TO DISK
LOGGED ON OR OFF *****
840 OPEN"O",1,F$
850 PRINT #1,TAB(T+9);NA$
860 PRINT #1,TAB(T+9);FL
870 D$=DA$+STRING$(17,32)+G1$+STRING$(9,
32)+G2$+STRING$(9,32)+HM$
880 PRINT#1,TAB(T);D$
890 FOR I=1TO X
900 D$=DA$(I)+STRING$(6,32)+G1$(I)+STRIN
G$(6,32)+G2$(I)+STRING$(8,32)+HM$(I)
910 PRINT #1,TAB(T);D$
920 NEXT I
930 PRINT #1,TAB(T);T$
940 CLOSE
950 REM ***** PRINT SIGN OFF MESSAGE
960 PRINT STRING$(39,158)
970 PRINT
980 PRINT"THAT'S IT"
990 INPUT"TYPE <EN> TO CONTINUE";Y$
1000 PRINT CHR$(30):END
1010 REM ***** ERROR HANDLING ROUTIN
E *****
1020 IF ERR<>53 THEN 1060:REM ERROR = FI
LE NOT FOUND
1030 OPEN "O",1,F$
1040 T$="TOTAL 00:00:00"
1050 CLOSE:RESUME 320
1060 IF ERR=60 THEN RESUME 800:REM ERROR
= END OF FILE
1070 PRINT ERRS$:CLOSE:STOP

```

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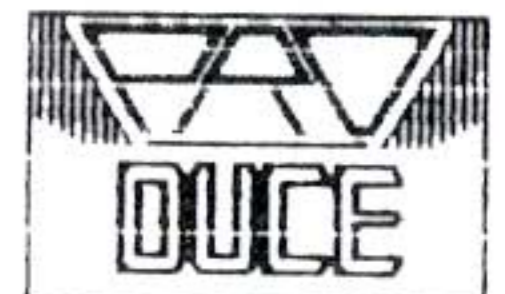
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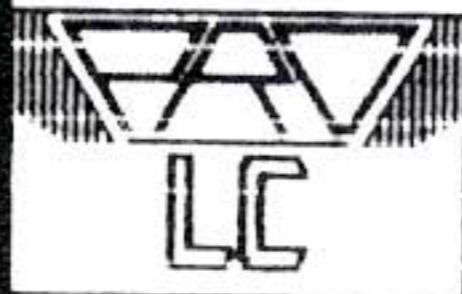
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Tandy topics

What can Microsoft Windows do?

For all readers

Ed Juge, Director Computer Merchandising, Business Computer Products
One Tandy Center, Ft. Worth, TX 76102

Today is November 10, the day of the annual Tandy Shareholders' Meeting. But I'm in New York, for a press conference, announcing Microsoft "Windows." Windows is an exciting new software "environment" for MS-DOS computers. (More about that later.) Participating in the announcement were over 20 equipment manufacturers and some major independent software vendors. There looked to be more than 200 attendees from the press and financial communities.

Of course I expected our participation to raise a few eyebrows, since in early November, the Tandy 2000 was still a pretty well-kept secret. During the presentation, none of the press asked what I was doing there. After the presentation, participants retired to individual suites for meetings with those press members who wanted to question us. A few questions came up, which I couldn't answer with specifics. Our announcement stated simply that by the time Windows ships, Radio Shack expects to have hardware available that will use it. The rumor mill should start churning shortly, and with very good reason . . .

The Exciting New Tandy TRS-80 Model 2000

It's tough to contain my
80 Basic Computing

enthusiasm when we're introducing new computers, yet this issue of *Basic Computing* will contain a full review of the product. I'll try to approach the subject from a different angle and not duplicate their information.

In-house, the Model 2000 was affectionately code named "Model J." And I will answer the mandatory question about every MS-DOS computer — no, it isn't "PC Compatible." Our intent was to create a computer which significantly surpassed the capabilities and features of current MS-DOS offerings. We wanted (and got) an exceptionally high-performance MS-DOS machine. It excels in memory capacity, disk storage, processing speed, graphics, and ergonomics; all at a very competitive price. And it offers Radio Shack's local availability and service capability.

Software: A Key Issue

Will you be able to run all the new "gee whizzie" software products — the MS-DOS best sellers? While "well behaved" (a Bill Gates, President of Microsoft, term for 'doesn't violate the operating system') MS-DOS 2.0 software may plug in and run, compatibility with existing hardware was not a design

objective. Our software strategy is to go to outside vendors for the top-rated programs in the marketplace. The "best of the best" will be available for the Model 2000, running even faster and better, with spectacular graphics. We've found the major vendors very willing, even anxious, to bring their software up on the 2000. The increased speed, storage and performance excited some of them into a super-human effort to get their packages ready to run *and deliver*, by our November 30 introduction date. For that, we say a sincere thank you to them all. Included in the early offerings are items like MAI/Basic Four's outstanding accounting series, dBaseII, the PFS series, Microsoft Word and Plan and several of their languages, Multimate, Home Accountant, Planetfall, Witness, and others. As late as last week (*early November -- Ed.*), we were talking to other vendors about some really breathtaking software which might be demonstrable by the introduction date. In recent weeks, I've seen new software under development, doing things I would never have believed possible! Sorry, no details, it's all under nondisclosure; but stand by!

As we've done with our other new products this year, all of our Computer Centers will have a TRS-

Basically BASIC

Making programs run faster

For all models

Karen Matthews, Bozeman, MT

Can you speed up your BASIC programs? There are a few simple changes which you can add to your programs to increase their speed by up to 25 percent. These hints are easy to add and require only a few changes to most programs. You'll find the difference in speed amazing and perhaps even understand your computer better after exploring these ideas.

The standard BASIC supplied with all Radio Shack computers is an interpreter BASIC. This means that the computer must "interpret" each line of your program as it comes across it. In a standard FOR...NEXT loop, the computer must translate the code each time the computer goes through the loop. In the program:

```
10 FOR X = 1 TO 5000
20 PRINT X
30 NEXT X
```

the computer must translate each line 5000 times!

An optional BASIC is available for most Radio Shack computers which is a compiled BASIC. In this type of BASIC, each line of code is translated into a form the computer can understand all at once instead of one line at a time. A compiler executes programs faster than an interpreter, but requires more time in developing the programs. Your computer comes with an interpreter.

It would seem that the way to speed up a BASIC program would be to keep the code in an efficient form dear to the heart of the computer. What does the computer like? Let's start with short. The shorter the program, the faster the program. It also likes programs kept to a minimum number of lines. BASIC allows you to combine multiple statements on the same line joined by a colon. Take advantage of this and save valuable time. As a benchmark, we have:

```
10 FOR X = 1 TO 5000
20 NEXT X
```

This takes about 13 seconds to run on a Model III. However, this program:

```
10 FOR X = 1 TO 5000
20 REM
30 REM
40 REM
50 REM
60 REM
70 NEXT X
```

takes nearly a minute run — five times longer! The only difference between the two programs is the five blank lines added to the second program. What happened? The computer does not know that the added lines are just comment lines, so it translates each new line 5000 times. If we add ten lines, the program takes 1 minute 35 seconds — ten times longer. The lesson here is simple. Always put as many statements as possible on one line and delete any unnecessary lines (comments) to drastically improve speed.

The next trick is the integer-loop substitution. Wherever you use a FOR...NEXT loop in your program, always declare the index variable as an integer. Once more to the chalkboard:

```
10 DEFINT X
20 FOR X = 1 TO 5000
30 NEXT X
```

```
20 FOR X = 1 TO 5000
30 NEXT X
```

The first program will run in nine seconds, versus 13 seconds for the second. This relationship is continuous for all types of loops. A 10,000-count loop requires 18, versus 26, seconds, etc. This one change can save enormous amounts of time and requires only minor changes to existing programs.

Let's investigate the DEFINT

statement and its function. This statement allows the programmer to "declare" certain variables as integers throughout the program in one step. The format is:

linenumber DEFINT *letter-range*
where *letter-range* may be either one letter, a series of letters, or several letters. These letters indicate which variables will be considered integers. Hence, all variables that begin with the designated letters will be considered integers without further declaration. Some examples:

10 DEFINT A-F would cause any variables that begin with A, B, C, D, E, or F to be considered integers throughout the program.

10 DEFINT A-C, R, S would designate any variables that begin with A, B, C, R, or S to be integers.

You can declare each variable as an integer by adding the "%" next to the variable name each time you use it. The previous loop would look something like this:

```
10 FOR X% = 1 TO 5000
20 NEXT X%
```

This would be just as efficient as using the DEFINT command. It would, however, require that you add the "%" every time you use a variable.

You can also change a variable to another type, after declaring it in a DEFINT statement, by adding another suffix next to the variable. In this code:

```
10 DEFINT A-Z
20 A1# = 1234.1234567
30 A2 = 32000
```

A1 would be a double-precision, 17-digit accuracy number, and A2 would be an integer as declared in line 10.

Integers have another advantage in programs since they require only two bytes to store information. Single-precision requires up to four bytes — twice as much memory. Less memory space used means less

looking for variables and faster programs.

The next trick is the “always variable, never constant” philosophy. This is a creative motto for living as well as programming. Perhaps we have the following short programs:

```
10 Z = 3.14
20 FOR X = 1 TO 500
30 Y = Z
40 NEXT X
```

```
20 FOR X = 1 TO 500
30 Y = 3.14
40 NEXT X
```

The first program will run three times as fast as the second one. The reasoning goes back to the discussion of interpreters. In the second program, line 30 requires the computer to translate the number “3.14” into special code 500 times. In the first program, the computer translates only the variable “Z” into special code. It can translate variables much faster than ordinary numbers. Again, understanding how the computer works leads to faster programs.

The bag of tricks is not quite empty. The DIM statement can also be used to speed up programs. The computer refers to variables in order — sequentially, from start to finish.

An example:

```
10 DEFINT A-Z
20 DIM Z
30 FOR Z = 1 TO 5000
40 NEXT Z
```

```
10 DEFINT A-Z
30 FOR Z = 1 TO 5000
40 NEXT Z
```

In the second program, we told the computer to set up 26 variables. It assumes that they will be stored in order. In the first program, we allocated 26 variables, but used the DIM statement to tell the computer to access the variable “Z” first. Using this trick, we can cut program speed by two-thirds. Always use the DIM statement followed by the variables in order of their intended use. The variables you’ll use most often should be listed first.

There you go . . . some easy ways to speed up even the simplest of

programs. I encourage you to try the sample programs and use my benchmarks for comparison. Yours may vary slightly, depending on the system. Remember to:

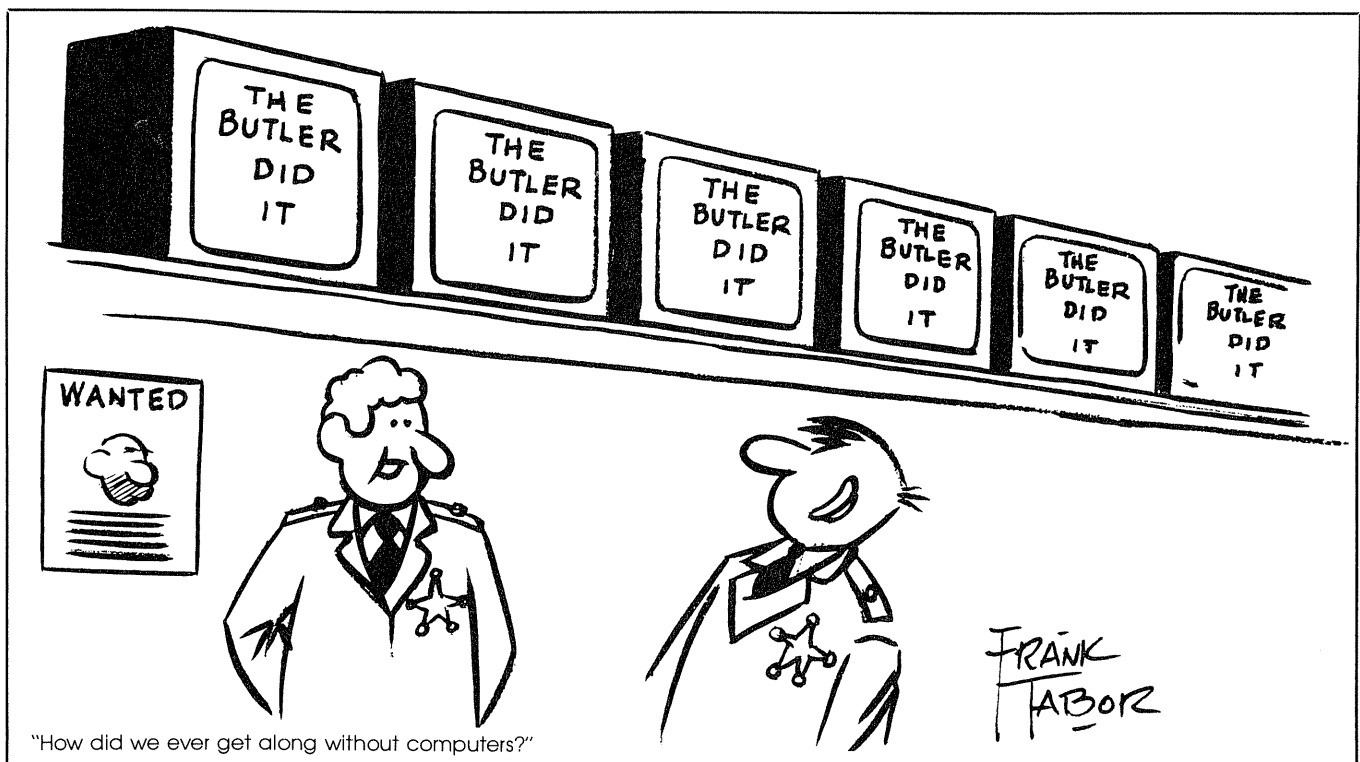
1. Use multiple statements where possible.
2. Delete unnecessary lines.
3. Use variables rather than constants.
4. use integers in FOR . . . NEXT loops.
5. Define the most common variables in DIM statements.

BASIC is the single tool which unites all Radio Shack users. I would enjoy receiving your hints or questions about BASIC. For response to your questions, write to me at *Basic Computing* and include a self-addressed, stamped envelope. That’s it for this month. Be with me next month for more of the BASIC revolution.

Conversions:

This box is where you will find any changes required to run this month’s programs on your computer. If your computer is not listed, you should be able to run the programs unaltered. Let me know if you have any problems with the programs.

Color Computer — There is no DEFINT command or “%” declaration.



“How did we ever get along without computers?”

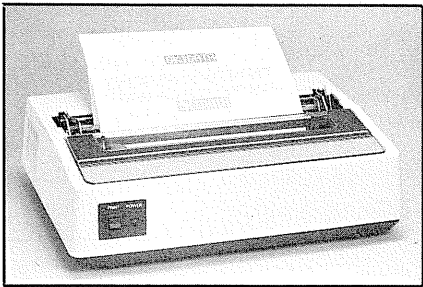
Computer ease

Getting it all down on paper

For all readers

Mark E. Renne, Contributing editor

The Microline 80 — a dot matrix printer with graphics capability.



Perhaps one of the most difficult decisions for computer owners, or prospective computer owners, is which printer to add to their computer system. There are currently hundreds of printers to choose from and the decision is almost as difficult as which computer to buy.

What types of printers are there?

There are two major types of printers — dot matrix and daisy wheel. These are sometimes called

by other names, but these are the most popular ones. There are plotters or ink jet printers, but you'll probably be buying one of the first two for your computer system.

What's a dot matrix?

These printers use dots to make up the letters to be printed. They accomplish this task by moving tiny wires in and out of the print head at very high speeds. If you look closely at the printing from a dot matrix printer, you can actually see the dots that make up the letters. The "matrix" refers to the rows and columns that make up the printing head. For example, a five by seven dot matrix refers to a head that has seven pins that print five times, for 35 total dots.

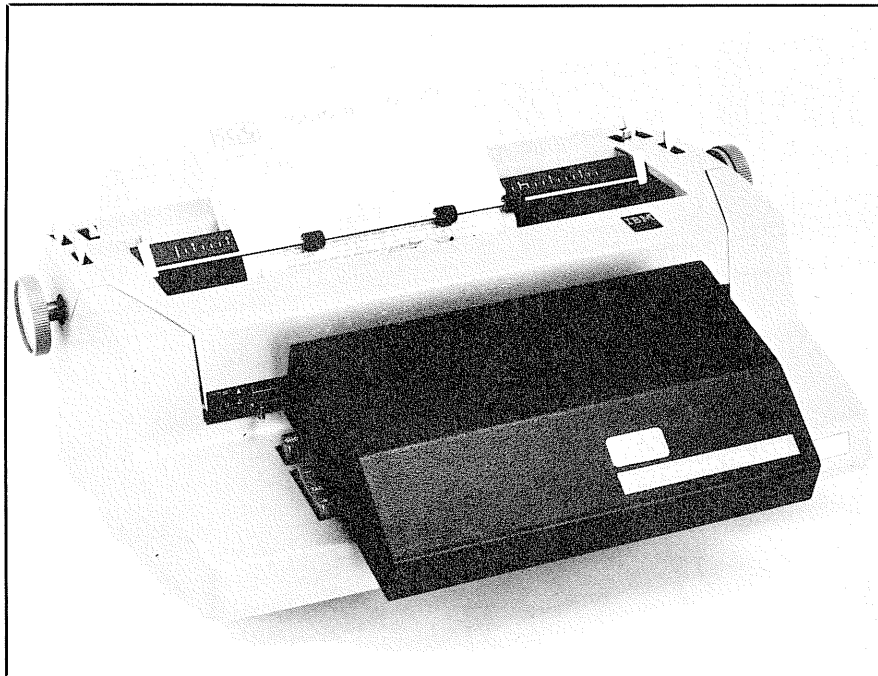
What if I get more pins?

The greater the resolution of the matrix, the greater the resolution of the characters produced. The bigger the matrix, the better looking the output will be. A printer that has a nine by seven matrix will produce a much nicer looking letter "y" than a printer that has only a five by seven matrix. By "nicer," I mean more like that which would be produced by a typewriter.

What's a daisy wheel?

This type of printer produces output exactly like that of a typewriter. The name comes from the printing head that is shaped somewhat like a many-petaled daisy. Each of these petals is rotated into position at just the right time

An IBM typewriter converted for computer use by a mechanical keystroke device.



Computer ease

graphics. Soon, things should settle down and a standard should be adopted.

What's cps?

CPS stands for characters per second. It refers to the speed at which the printer outputs characters. It's much like the MPG (miles per gallon) that car manufacturers attach to new cars. It should only be used for comparison and yours may vary. Some printer makers use a cps that can be obtained only under ideal conditions. Others use a moderate average cps that will come very close to the truth. Radio Shack usually underrates their printers according to the lab tests I've seen. I know it's another plug, but they deserve it. Other printer folks could only achieve their advertised output on a very good day going downhill. The average daisy wheel runs about 35 cps and a dot matrix about 100 cps. A daisy wheel may be slow compared to a dot matrix, but remember that 35 cps is about 300 words per minute. That's still faster than most of us type.

What's a descender and when are they true?

A descender refers to the part of a letter that lies below the character baseline in normal writing. These

are all lowercase letters like the "p," "q," and "y." Some printers don't have true descenders. They squish the letter up above the bottom line giving an odd appearance. A true descender is one that does actually print below the baseline and appears as it normally does on a typewriter. This only applies to dot matrix printers. All daisy wheel printers have true descenders. Most people wonder why anyone would make a printer without descenders. The reason is cost. It is more expensive to make a printer with true descenders. Most \$250 printers don't have true descenders.

What's proportional spacing?

If you look at the letters in the alphabet, you will notice that some letters are wider than others. The "w" is much wider than the "l." Most printers leave the same amount of space around all letters, regardless of their width. Proportional-spacing printers actually leave different amounts of space around the letters, depending on the individual character. Again, this is only critical if you need "print shop quality" output. If you need a daisy wheel printer, make sure you do get proportional spacing with it.

What's the difference between tractor and friction feed?

Both of these terms refer to the way that the paper is moved through the printer. Friction feed is exactly like a typewriter. Paper is moved through the printer by friction between the roller and the platen. A tractor-feed printer uses small pins at the outside of the paper to pull the paper (which has small holes to match the pins) through the printer. The advantage of friction feed is that no special paper is required. You can use ordinary stationery or forms. The disadvantage is that these forms can move from side to side and not be in exactly the same place every time. Tractor feed solves the problem of motion but requires the use of forms with holes on the side.

Wait a minute, my phone bill doesn't have holes on the side.

Ah, that's true because the holes are usually detachable from the form after it has been run through the printer. Forms that have been run through a tractor feed printer usually have a rough edge at the

sides of the form. These include several you run into every day. If you wish to run stationery through a tractor-feed printer, you have a number of options. First, there is some letterhead that is attached by small drops of glue to a backing of tractor-feed paper. After the paper is printed, it can easily be removed from the backing. This produces a perfect letter, but wastes the backing. Second, some paper can now be purchased that uses very fine perforations on the edges of the paper. Where standard forms use only a hundred perforations, these use several thousand. When the tractors are removed, the edge appears almost as smooth as a regular piece of paper.

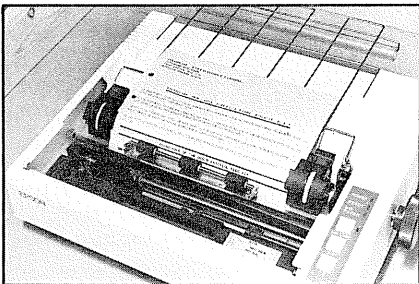
Does a daisy wheel print only one sheet?

Without an additional attachment, daisy wheels must be loaded with one sheet, printed, and then reloaded with another sheet. Again, the analogy is a typewriter. This is fine for standard letters or short contracts, but what about several hundred form letters? Technology steps in to save the day with the sheet feeder. This device can be loaded with several hundred sheets of paper and then feeds them into the daisy wheel printer one sheet at a time when needed. There's also a similar device for envelopes.

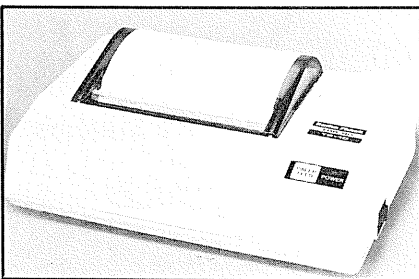
Buying a printer is almost as difficult as buying a computer. The printer must fit the job you are going to use it for. The greater the matrix, the better the resolution of the characters printed on a dot matrix printer. Tractor feed offers exact positioning, but requires special forms. Friction feed uses standard forms but gives less precision. For jobs such as inventory control and accounting, a high-speed dot matrix printer is best. A daisy wheel is best for those jobs that require typewriter-perfect output such as contracts or correspondence.

Questions about computers or peripherals (like, "What's a peripheral?") are welcome. Write to me in care of *Basic Computing*. Enclose a stamped, self-addressed envelope for a guaranteed fast, personal response. Computers should be fun and understanding them is easier than you think. Happy computing!

The Epson MX-80 — a dot matrix printer with tractor feed and sheet feeder.



Radio Shack's low-cost TP-1 thermal printer.



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DSRS Data Storage and Retrieval System

An in-memory data management program

Models I/II/III/4_{III}/12/16_{II}

Gary Small, Scarborough, ME

DSRS is a data storage and retrieval system designed for a TRS-80 Model I disk system, with either 32K or 48K of memory. The program (Listing 1) is intended for home record keeping purposes such as mailing addresses, telephone numbers, lists of books, collections and similar lists. The program utilizes sequential disk-access techniques and the data file is limited in size by the amount of available memory. With 48K of memory, data files of about 25K bytes may be handled, which is more than sufficient for most household purposes. Should a file grow too large, the program has several provisions for creating several files from the original.

The typical home computer user does not really need the size and power of a large, expensive data base system which is intended for business users. Since such systems usually work with individual disk entries, a lot of disk access is typically necessary for even simple operations. The big advantage of the DSRS program is that the entire file is loaded into memory once and remains resident until the user loads another data file. This memory-resident data file results in faster operation than systems which rely on disk-resident data files. Time requirements for search and sort operations are especially improved over random-access disk file techniques.

DSRS is easy to use and all commands are menu selections. The user is prompted for all required information and data entries. Command selections are available to provide numerous options for data retrieval, searching, sorting and printing. Each data file is configured at the time of creation, so the user is not locked into a particular number of data fields. Each data entry consists of a number of named fields such as name, address, or phone number, which are defined by the user. In accordance with standard BASIC characteristics, up to 240 bytes may be typed in for each of the fields of data entry. The use of the `lineinput` command allows the user to include normal punctuation within the line.

File Creation (Command 2)

After typing in DSRS and running the program, you will be presented with a command menu consisting of 13 different commands. The first command you will need to use will be the "create data file" command, which is selection number two of the command menu. Upon selection, you will be asked to supply a name for the data file (not a filespec), the maximum number of items to be entered in the file, and the number of fields (lines) to be supplied for each item to be entered in the file.

As a matter of practice, the number of entries should be made as high as possible, consistent with memory size and the number of fields for each entry. The maximum number you may use is a function of the algorithm used by BASIC in order to allocate memory space. Table 1 presents typical limits for a 48K system.

Table 1

Data File Size Limitations	
Max. # of Items	# of Fields per Item
100	18
350	4
425	3
500	2
700	1

Should you enter numbers which exceed the limits imposed by BASIC, an error message will be generated. Due to an apparent design problem in BASIC, the dimensioning limits of string variables is based on non-string memory. Thus, the program is not able to use all of the computer's memory for string storage. Some amount of non-string memory must be left unreserved to allow the dimensioning of reasonably-sized data files, as shown in Table 1. You will also notice that the product of the number of entries multiplied by the number of fields diminishes rapidly as the number of entries grows. Thus, 1800 lines can be entered into a 100-item file, while only 700 lines can be entered into a 700-item file.

Once you have set up the number of entries and fields, the program will prompt you to enter a name for each field. As an example, you might set up a file to store the title, author and subject of a collection of books. Table 1 indicates you could set up a file of 425 entries with three fields per entry. The fields would then be named title, author and subject.

Once the fields have been named, the program will proceed with the data entry sequence, prompting the user to enter a line of data for each field of each entry. While in this mode, the uparrow key may be used to back up to the previous line of entry in order to correct mistakes. The data entry sequence may be terminated either by filling up the file with data, or by pressing enter in response to the prompt for the *first* field entry of any item. At termination, the user is prompted to save the file

and must supply a filespec name for the disk file.

Modifying the Data File

Three commands are provided for modifying the contents of a data file. These commands allow the user to add entries to the file, delete entries from the file, and modify the contents of any entry. The addition and modification commands prompt the user for all information required by the command. They use the same data entry sequence as was described in the create file command. In order to modify or delete a data file entry, it is necessary to know the data item entry number. This number is easily found by using the listing command described later. It should be noted that a data file must be resident in memory before any of the file modification, search, sort or print commands may be used. Thus, a create file or load file command must be the first command used in any given work session.

Searching and Sorting

Three DSRS commands provide the facility to perform alphanumeric sorts, global searches and limited searches on the data file information. Each of these operations provides the option of saving the results of the operation to a new disk file. This makes it relatively easy to expand an overcrowded file into multiple files, utilizing appropriately-selected categories of search. Options to print the results on either the CRT or the lineprinter are also included.

The sort command will perform an alphanumeric sort of the entire data file. The user is prompted to select a

field to govern the sort. Using our previous example of title, author and subject as fields, it would be very easy to perform three sorts of the data and end up with separate files organized by title, author and subject.

Two search commands provide the user with the capability of flagging all data entries which contain information that matches a user-supplied keyword or sentence. The "search entire file" command will search every field of every entry for a match to the keyword. The "search single field" command limits the search to a single field, selected by the user, of each data entry, thus limiting the responses. In either case, the option is provided to print the results to either the video or the lineprinter. The option of saving a new data file consisting of only those items flagged by the search is also provided.

Printouts

DSRS offers a number of different options for producing printouts of file data. All commands provide the capability of sending the output to either the video or the lineprinter. The user can elect to printout the entire data file if desired. The user also has the option of printing out a single field from each data entry. A good example of this command would be to generate a list of titles from the example data file we have been using.

The third printout command is a powerful command which allows the user to custom-configure the printout, including selection of fields to be printed, width of printout, and lines between fields. This command is

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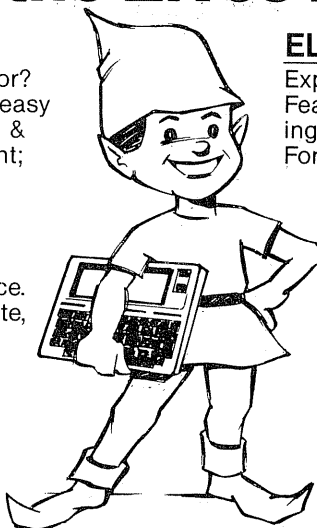
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DSRS

primarily intended for generation of labels, but can also be used to change the order of the fields in a printout.

The final printout command is designed to find and print all items which fall within a user-specified range. This command requests the user to select a field and input upper and lower limits. It then generates a listing of data items that fall within the search parameters.

Program Notes

While DSRS may not compete with high-priced commercial data systems, it does fill a niche for the typical home user. The memory-resident data file provides for relatively fast manipulation of data, and the 25K data file size is more than sufficient for most home uses.

The listing of DSRS is heavily commented and contains notes on details of operation. The comments, of course, should be removed when typing in the program. As with similar systems, the performance of this system depends a great deal on the user. This is particularly true when data is to be recovered by the use of search commands. The INSTR function of BASIC is used to determine matches, so keywords should be chosen carefully. Any entry which has a word which matches the keyword, or which contains the keyword as part of a larger word, will be flagged by a search. To increase selectivity, a keyword may have a space added in front of it, or behind it, or both, to prevent matches with words larger than the keyword.

To increase efficiency, the lineinput command is used

for all data entry, and allows punctuation to be used within a field. As an example, city, state and zip could be the name of a single field, and the city, state, and zip code could be entered with commas separating the items. One must be careful, however, since the field is still treated as a single item and cannot be broken down further, which means you could not generate a listing only of cities, states or zips. Separate listings would require separate fields for each item.

DSRS has a capability to be used as a small database system if the user wants to go to the trouble of creating a descriptor field for each item. An example of this would be the addition of a descriptor field to our title, author, subject file. The descriptor field would contain key words and phrases which would describe the contents of the book. As an example, several books on electronics might be included in the file. Some books might be primarily computer electronics, while others might concentrate on radio. The addition of selected words and phrases would allow a search to be performed on the descriptor field, which would result in only those books associated with computer electronics to be flagged. Employing techniques such as this can considerably expand the usefulness of this program beyond simple recordkeeping.

One last note. If, because of an error or faulty entry, you get bumped out of a command before saving the file, executing a "save data file" command upon re-entering the command selection mode will save whatever entries or modifications you have made to the data file.

How To Enter Our Listings

Our program listings come directly from the submissions of our authors. We do not edit them at all (that's why you sometimes see spelling errors in them). We run all submissions and make sure that they do work.

To enter one of the listings given, make sure you have the type of computer specified and all necessary programs, operating systems, or hardware that the program uses. Type in the program exactly as it appears in the magazine. Be extra careful so you do not confuse 0 (zero) with O or 1 (one) with I or L. Save the program to tape or disk before running it. On long programs it is wise to save it as you go along, thus protecting yourself from having to re-enter the whole program if the lights go out.

Here are some tips to help you catch errors that you may have made in typing. If you get an out of data error, the problem lies in the DATA statements, rarely in the READ line that the computer refers to. Check all DATA lines to see that they are correct and that no commas or values are missing. It might be useful to print each variable after it is read, that way you can follow the computer as it goes through the data. Just insert a :PRINT variable right after the READ variable command.

Many of our authors use a linefeed, or downarrow, in their programs. If you see lines of code that have many blank spaces and then they begin again on the next line with more code, a linefeed was used. Even if you don't use them, the program will run but the video display may be messed up.

You will find the TRON command helpful in following the program's logic. By turning the trace command on, TRON, you can see what lines are being executed by the program. It is very useful in catching GOTO or GOSUB errors and incorrect references to linenumbers. Don't worry about video formatting when the trace is on, it will be quite messy.

If you find yourself getting TM or type mismatch errors, check carefully the use of the \$ symbol. Also look at the beginning of the program to see if you correctly entered the DEFINT or DEFSTR statements.

Function call errors usually occur when a variable has a value that is not allowed. Check all variables that are being used by the function, one of them probably has the wrong value.

If after all that, you can't get it to run, send us a paper listing of your program, what systems you are running it on, and carefully document the error you are getting. We will do what we can to find the flaw. It is very difficult for us to try to help you debug errors over the phone. Check Letters and Notes, etc. in the next few issues for updates or conversions. Many times a reader will tell how to embellish a previously published program.

```
100 GOSUB2720:'SET UP ERROR HANDLER
110 CLS:PRINT "DATA STORAGE AND RETRIEVAL SYSTEM":PRINT:PRINT"BY GARY SMALL, 1983":FORN=1TO900:NEXT:DEFINTA-Z:I0=1
120 GOTO1720:'GO TO COMMAND SELECTION MODULE
130 '
140 '***** ITEM ENTRY ROUTINE **
*****
150 '
160 AA$="ENTER "
170 FORII=1TOIT
180 PRINT"ITEM NUMBER ";II;"*****"
*****
190 A$(II,1)="" :PRINTAA$+CN$(1)+"? ";:LINEINPUTA$(II,1) :INPUT A LINE OF DATA IN TO FIELD #1
200 IFA$(II,1)=""THENIM=II-1:GOTO340:'<ENTER>=EXIT ROUTINE
210 IFA$(II,1)=""["THENGOTO190:'UP-ARROW = BACK-UP TO FIX ERROR
220 IFCM=1THENNEXTII:'IF ONLY 1 FIELD THEN NEXT ENTRY
230 IFCM=1THENGOTO320:'EXIT IF MAX # REACHED AND # OF FIELDS=1
240 FORN=2TOCM:'ENTRY ROUTINE FOR FIELDS 2 THROUGH MAX(CM)
250 IFN=1THENGOTO180:'BACK UP TO 1ST FIE
```



```
LD IF UP-ARROW AND N=2
260 PRINTAAS+CN$(N)+"? ";:LINEINPUTA$(II
,N)
270 IFA$(II,N)=""THEN GOTO290:'ON <ENTER>
,GO TO NEXT FIELD
280 IFA$(II,N)=""["THEN N=N-1:GOTO250:'UP-
ARROW=BACK-UP 1 FIELD TO FIX ERROR
290 NEXTN
300 IM=II
310 NEXTII
320 PRINT:PRINT"MAX. NUMBER OF ITEMS HAS
BEEN ENTERED...":PRINT:PRINT:GOSUB2560
330 IM=II-1
340 GOSUB1960:RETURN:'SAVE FILE AND EXIT
350 '*****
*****
360 '
370 '***** FIELD NAME ENTRY ROUT
INUE *****
380 '
390 FORN=1TOCM:'CM=MAX # OF FIELDS PER I
TEM
400 PRINT"ENTER NAME OF FIELD NUMBER ";N
;"...":LINEINPUTTN$(N):'INPUT FIELD NAM
ES
410 IFTN$(N)=""["ANDN>1THEN N=N-1:GOTO400:
'BACK-UP ONE LINE IF UP-ARROW
420 CN$(N)=TN$(N):NEXT:RETURN
430 '*****
*****
440 '
450 '***** START OF CREATE F
ILE COMMAND *****
460 '
465 'Model II/12/16 users change line 47
0 to CLEAR 20000
470 CLEAR0:IFMEM>18000THENCLEAR25000ELSE
CLEAR12000:'SET ASIDE MEMORY FOR STRING
SPACE
480 CLS:GOSUB2720:N$=""':LINEINPUT"ENTER
NAME OF DATA FILE? ";N$:IFN$=""THEN GOTO4
80:'SET UP ERROR HANDLER AND GET DATA FI
LE NAME
490 IT=0:INPUT"ENTER MAXIMUM NUMBER OF I
TEMS TO BE ENTERED";IT:CM=0:INPUT"ENTER
NUMBER OF FIELDS TO BE PROVIDED FOR EACH
ITEM";CM:'SET UP NUMBER OF ENTRIES AND
FIELDS
500 IFCM=0 OR IT=0 THEN GOSUB2550:GOTO49
0
510 DIMA$(IT,CM),CN$(CM),TN$(CM),CSS$(CM)
,II(IT)
520 I0=1
530 GOSUB390:'GET FIELD NAMES
540 GOSUB160:GOTO1720:'GO TO ITEM ENTRY
ROUTINE,SAVE,AND EXIT
550 '*****
```

```
*****
560 '
570 '***** ADD ENTRIES T
O FILE COMMAND *****
580 '
590 CLS:I0=IM+1:IFI0>IT THEN PRINT"SORRY
,DATA FILE IS FULL...":GOSUB2560:RETURN
:'IM=CURRENT ITEM COUNT,IT=MAX ITEM COUN
T,I0=START COUNT FOR ADDITIONS
600 GOSUB160:RETURN:'GET NEW ENTRIES,SAV
E,AND EXIT
610 '*****
*****
620 '
630 '***** GLOBAL SEARCH COMMAND
*****
640 '
650 CLS:L=1
660 GOSUB2770:SS$=I$:IFSS$=""THEN RETURN:
'RETURN IF <ENTER> PRESSED FOR KEYWORD E
NTRY
670 FORN=1TOIM:FORM=1TOCM:'SET UP SEARCH
OF ALL FIELDS OF ALL ITEMS
680 IFINSTR(A$(N,M),SS$)>0THEN I1(L)=N:L=
L+1:GOTO700:'I1=ARRAY NUMBERS OF ALL ITE
MS WITH POSITIVE MATCH
```

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DSRS

```
690 NEXTM
700 NEXTN
710 IFL=1THENGOSUB2740:GOTO660:'NO MATCH
  FOUND
720 GOSUB2250:'SELECT OUTPUT OPTION
730 FORG=1TOL-1:II=I1(G):GOSUB1090:NEXT:
GOSUB2560:GOSUB190:RETURN:'PRINTOUT RES
ULTS,SAVE,AND EXIT
740 '*****
*****
750 '
760 '***** MODIFY DATA ENTRY CO
MMAND *****
770 '
780 CLS
790 II=0:INPUT"ENTER ITEM NUMBER...":II:
IFII=0THENRETURN:'CANCEL COMMAND IF <ENT
ER> IS PRESSED
800 IFII>IMTHENPRINT"ITEM NUMBER OUT OF
RANGE...":GOTO790
810 GOSUB1090:'PRINT OUT THE SELECTED DA
TA ITEM
820 GOSUB2750:NC$=I$:IFNC$=""THENGOTO790
:'GET NAME OF FIELD,LOOP IF <ENTER> IS P
RESSED
830 FORN=1TOCM
840 IFNC$=CN$(N)THENGOTO860:'WHEN FIELD
FOUND,GO GET NEW DATA
850 NEXT:GOSUB2740:GOTO820:'ENTRY ERROR,
TRY AGAIN
860 PRINT"ENTER NEW FIELD DATA..."
870 LINEINPUTA$(II,N):'GET NEW DATA
880 Y$="":INPUT"DO YOU WISH TO MODIFY AN
Y MORE ENTRIES Y/N":Y$:IFY$="Y"GOTO790
890 GOSUB1960:RETURN:'SAVE FILE AND EXIT
900 '*****
*****
910 '
920 '***** SEARCH DATABASE FIEL
DS FOR MATCH *****
930 '
940 CLS:L=1
950 GOSUB2750:CC$=I$:'GET FIELD NAME
960 IFCC$=""THENRETURN:'CANCEL COMMAND O
N <ENTER>
970 FORN=1TOCM:IFCC$=CN$(N)THENGOTO1000:
'FIND FIELD NAME
980 NEXT
990 GOSUB2740:PRINT:GOTO950:'LOOP IF NAM
E NOT FOUND
1000 L=1:K$="":A3=N:GOSUB2770:K$=I$:IFK$
=""THENGOTO950:'GET KEYWORD,LOOP IF <ENT
ER>
1010 FORG=1TOIM
1020 IFINSTR(A$(G,A3),K$)>0THENI1(L)=G:L
=L+1:'FLAG ALL MATCHES
1030 NEXT
1040 IFL=1THENPRINT"NO ENTRIES FOUND":GO
SUB2560:GOTO940
1050 GOSUB2250:FORG=1TOL-1:II=I1(G):GOSU
B1090:NEXT:GOSUB2560:GOSUB190:RETURN:'S
ELECT PRINT OPTION,PRINT,SAVE,AND EXIT
1060 '*****
*****
1070 '
1080 '***** ROUTINE TO PRINT A
SINGLE ITEM *****
1090 PRINT:IFPS=1THENLPRINT" "
1100 PRINT"ITEM NUMBER ";II:IFPS=1THENLP
RINT"ITEM NUMBER ";II
1110 FORZ=1TOCM
1120 PRINTCN$(Z);" : ";A$(II,Z)
1130 IFPS=1THENLPRINTCN$(Z);" : ";A$(II,
Z)
1140 NEXT:RETURN
1150 '*****
*****
1160 '
1170 '***** SAVE FILE OF ITEMS FOUN
D BY SEARCH *****
1180 '
1190 CLS:INPUT"DO YOU WISH TO SAVE FILE
CONSISTING OF JUST THOSE ITEMS FOUND BY
THIS SEARCH (Y/N)":I$:IFI$<>"Y"THENRETUR
N
1200 CLS:FB$=""
1210 GOSUB2760:IFFB$=""THENRETURN:'GET F
ILESPEC,CANCEL IF <ENTER>
1220 OPEN"O",1,FB$:PRINT#1,I0:L-1;IT;CM:
PRINT#1,N$:'ORIGINAL FILE SIZE,NAME,ETC
ARE RETAINED BY NEW FILE
1230 FORN=1TOCM:PRINT#1,CN$(N):NEXT
1240 FORN=0TOL-1:FORM=1TOCM:PRINT#1,A$(I
1(N),M):NEXTM:NEXTN:CLOSE:RETURN
1250 '*****
*****
1260 '
1270 '***** SAVE DATA FILE COMMAND
*****
1280 '
1290 CLS:FB$=""
1300 GOSUB2760:IFFB$=""THENRETURN:'GET F
ILESPEC,CANCEL IF <ENTER>
1310 OPEN"O",1,FB$
1320 PRINT#1,I0;IM;IT;CM:PRINT#1,N$
1330 FORN=1TOCM:PRINT#1,CN$(N):NEXT
1340 FORN=0TOIM:FORM=1TOCM:PRINT#1,A$(N,
M):NEXTM:NEXTN:CLOSE:RETURN
1350 '*****
*****
1360 '
1370 '***** LOAD DATA FILE *****
*****
1380 '
92 Basic Computing
```



```

1385 'Model II/12/16 users change 1390 t
o CLEAR 20000
1390 CLS: CLEAR0: IF MEM>18000THENCLEAR2
5000ELSECLEAR12000:'SET ASIDE STRING SPA
CE
1400 FB$="":GOSUB2720:GOSUB2760:'SET UP
ERROR HANDLER,GET FILESPEC
1410 IFFB$=""THENGOTO1720:'CANCEL COMMAN
D ON <ENTER>
1420 OPEN" I",1,FB$
1430 INPUT#1,I0,IM,IT,CM:LINEINPUT#1,N$
1440 DIMA$(IT,CM),CN$(CM),TN$(CM),CS$(CM
),II(IM)
1450 FORN=1TOCM:LINEINPUT#1,CN$(N):NEXT
1460 FORN=0TOIM:FORM=1TOCM:LINEINPUT#1,A
$(N,M):NEXT:NEXT:CLOSE:GOTO1720
1470 '*****
*****
1480 '
1490 '***** PRINT OUT ENTIRE DATA F
ILE *****
1500 '
1510 GOSUB2250:PRINTN$:IFPS=1THENLPRINTN
$
1520 FORN=1TOIM
1530 II=N:GOSUBL090:NEXT:GOSUB2560:RETUR
N
1540 '*****
*****
1550 '
1560 '***** SORT DATA FILE *****
*****
1570 '
1580 CLS:CD$="" :GOSUB2750:CD$=I$:IFCD$=""
"THENRETURN:'GET FIELD NAME,CANCEL IF <E
NTER>
1590 FORN=1TOCM:IFCD$=CN$(N)THENGOTO1620
1600 NEXT
1610 GOSUB2740:GOSUB2560:GOTO1580:'LOOP
IF NAME NOT FOUND
1620 A=N:FORI=1TOIM-1:XI=I:FORG=I+1TOIM
1630 IFA$(XI,A)>A$(G,A)THENXI=G
1640 NEXTG:GOSUBL650:NEXTI:GOTO1660
1650 FORY=1TOCM:S$=A$(I,Y):A$(I,Y)=A$(XI
,Y):A$(XI,Y)=S$:NEXTY:RETURN
1660 GOSUB2250:FORII=1TOIM:GOSUBL090:NEX
T:'PRINT OUT SORTED FILE
1670 GOSUB2560:GOSUB1960:RETURN:'SAVE FI
LE OPTION AND EXIT
1680 '*****
*****
1690 '
1700 '***** COMMAND SELECTION
ROUTINE*****
1710 '
1720 CLS:PRINT"LOAD DATA FILE"TAB(60)"1"
1730 PRINT"CREATE DATA FILE"TAB(60)"2"
1740 PRINT"SAVE DATA FILE"TAB(60)"3"
1750 PRINT"MODIFY DATA ENTRY"TAB(60)"4"
1760 PRINT"DELETE DATA ENTRY"TAB(60)"5"
1770 PRINT"ADD DATA ENTRIES TO FILE"TAB(
60)"6"
1780 PRINT"SORT DATA FILE ALPHANUMERICAL
LY AND PRINT LIST"TAB(60)"7"
1790 PRINT"SEARCH ENTIRE FILE AND PRINT
ENTRIES WHICH MATCH KEYWORD"TAB(60)"8"
1800 PRINT"SEARCH SINGLE FIELD OF FILE A
ND PRINT KEYWORD MATCHES"TAB(60)"9"
1810 PRINT"PRINT OUT ENTIRE FILE"TAB(60)
"10"
1820 PRINT"PRINT A LIST OF A SINGLE FIEL
D"TAB(60)"11"
1830 PRINT"PRINT A FORMATTED LIST OF SEL
ECTED FIELDS"TAB(60)"12"
1840 PRINT"PRINT ITEMS FALLING WITHIN A
SPECIFIED RANGE"TAB(60)"13"
1850 I=0:PRINT:INPUT"ENTER COMMAND SELEC
TION";I
1860 IFI=<0ORI>13THENGOTO1720
1870 IFI=1THENGOTO1390:'LOAD FILE
1880 IFI=2THENGOTO470:'CREATE FILE
1890 IFI>2ANDN$=""THENPRINT"YOU MUST LOA
D OR CREATE A DATA FILE BEFOR EXECUTING
THIS COMMAND":GOSUB2560:GOTO1720:'TRAP I
NVALID COMMAND ENTRY
1900 I=I-2:ONIGOSUBL290,780,2140,590,158
0,650,940,1510,2030,2340,2610
1910 GOTO1720
1920 '*****
*****
1930 '
1940 '***** ROUTINE TO SAVE FILE AFT
ER MODIFICATION *****
1950 '
1960 CLS
1970 I$="" :INPUT"DO YOU WISH TO SAVE FIL
E Y/N";I$
1980 IFI$="Y"THENGOSUB1290
1985 RETURN
1990 '*****
*****
2000 '
2010 '***** PRINTOUT OF SINGLE FIELD
*****
2020 '
2030 CLS
2040 GOSUB2750:IFI$=""THENRETURN:'GET FI
ELD NAME,EXIT IF <ENTER>
2050 FORN=1TOCM:IFI$=CN$(N)THENGOTO2070:
'FIELD NAME SEARCH
2060 NEXT:GOSUB2740:GOTO2040:'LOOP IF FI
ELD NAME NOT FOUND
2070 GOSUB2250
2080 FORI=1TOIM:PRINT:PRINTA$(I,N):IFPS=

```


DSRS

```
1THENLPRINT" ":LPRINTA$(I,N)
2090 NEXT:GOSUB2560:RETURN
2100 '*****
*****
2110 '
2120 '***** DELETE ENTRY *****
*****
2130 '
2140 CLS
2150 G=0:INPUT"ENTER ITEM NUMBER TO BE D
ELETED";G:IFG=0RETURN:"CANCEL IF <ENTER>
2160 FORN=1TOCM:A$(G,N)="" :NEXT
2170 FORI=G+1TOIM:FORJ=1TOCM:A$(I-1,J)=A
$(I,J):NEXT:NEXT:IM=IM-1
2180 PRINT"ITEM #";G;" HAS BEEN DELETED.
..
2190 Y$="" :INPUT"DO YOU WISH TO DELETE A
NY MORE ENTRIES Y/N";Y$:IFY$="Y"THENGOTO
2150
2200 GOSUB1960:RETURN
2210 '*****
*****
2220 '
2230 '***** LISTING DESTINATION SELE
CTION *****
2240 '
2250 PS=0:CLS:PRINT"LISTING TO CRT ONLY
1"
2260 PRINT"LISTING TO CRT & PRINTER
2"
2270 PRINT:PRINT:INPUT"ENTER SELECTION";
I:IFI<1ORI>2THENGOTO2270
2280 IFI=1THENPS=0ELSEPS=1
2290 RETURN
2300 '*****
*****
2310 '
2320 '***** FORMATTED PRINTING ROUT
INUE *****
2330 '
2340 CLS
2350 I=0:INPUT"ENTER NUMBER OF SPACE LIN
ES BETWEEN PRINTOUTS";I:IFI<0THENGOSUB25
50:GOTO2350
2360 J=0:INPUT"ENTER MAXIMUM WIDTH IN NU
MBER OF CHARACTERS(<ENTER> DEFAULTS TO 3
0)";J:IFJ=0THENJ=30
2370 IFJ<1THENGOSUB2550:GOTO2360
2380 K=0:INPUT"ENTER NUMBER OF FIELDS TO
BE PRINTED(MAX.OF 10)";K:IFK=0THENK=CM:
IFCM>10THENK=10
2390 IFK>CMTHENPRINT"INPUT GREATER THAN
NUMBER OF FIELDS":GOTO2380
2400 IFK<0THENGOSUB2550:GOTO2380
2410 FORN=1TOK
2420 I$="" :PRINT"ENTER FIELD NAME TO BE
PRINTED ON LINE ";N;"? " :LINEINPUTI$
2430 FORL=1TOCM:IFI$=CN$(L)THENX(N)=L:GO
TO2450
2440 NEXTL:GOSUB2740:GOTO2420
2450 NEXTN
2460 GOSUB2250:FORM=1TOIM
2470 FORN=1TOI:PRINT:LFPS=1THENLPRINTCHR
$(138)
2480 NEXTN
2490 FORN=1TOK:PRINTLEFT$(A$(M,X(N)),J):
IFPS=1THENLPRINTLEFT$(A$(M,X(N)),J)
2500 NEXTN:NEXTM:GOSUB2560:RETURN
2510 '*****
*****
2520 '
2530 '***** GENERAL PURPOSE SUBROUT
INES *****
2540 '
2550 PRINT"ENTRY ERROR*****":GOSUB2
560:RETURN
2560 INPUT"PRESS ENTER TO CONTINUE";I$:R
ETURN
2570 '*****
*****
2580 '
2590 '***** FIND AND PRINT ITEMS FA
LLING WITHIN A RANGE **
2600 '
2610 CLS:I$="" :GOSUB2750:IFI$=""THENRETU
RN:"GET FIELD NAME,CANCEL IF <ENTER>
2620 FORN=1TOCM:IFI$=CN$(N)THENGOTO2640E
LSENEXTN:"FIELD NAME SEARCH
2630 GOSUB2740:GOSUB2560:GOTO2610:"NAME
NOT FOUND
2640 LINEINPUT"ENTER LOWER SEARCH LIMIT?
";LL$:LINEINPUT"ENTER UPPER SEARCH LIM
IT? ";UL$:IFLL$>UL$THENGOSUB2550:GOTO2640
2650 GOSUB2250:FORII=1TOIM
2660 IFA$(II,N)>=LL$ANDAS$(II,N)<=UL$THEN
GOSUB1090:"PRINT ITEMS AS FOUND
2670 NEXTII:GOSUB2560:RETURN
2680 '*****
*****
2690 '
2700 '***** ERROR INTERCEPT AND GE
NERAL SUBROUTINES ****
2710 '
2720 ONERRORGOTO2730:RETURN
2730 CLOSE:CLS:PRINT"SYSTEM ERROR #";ERR
/2+1:INPUT"PRESS ENTER TO CONTINUE";I$:R
ESUME1720
2740 PRINT"NAME NOT FOUND*****":RETURN
2750 I$="" :LINEINPUT"ENTER FIELD NAME? "
:I$:RETURN
2760 FB$="" :INPUT"ENTER FILE NAME";FB$:R
ETURN
2770 I$="" :LINEINPUT"ENTER KEYWORD? ";I$
:RETURN
```


Exploring VisiCalc

Get the precision you desire

Models I/II/III/4_{III}/12/16_{II}

Timothy K. Bowman, Contributing editor

Before I discuss this month's topic, I would like to take care of a few "housekeeping matters." First, I would again like to thank all who have written me or returned reader response cards supporting the column. Questions have come in from all over the world and the inquiries have run the full VisiCalc spectrum. There is no other general interest computer magazine that I am aware of that provides the VisiCalc coverage that you'll find in *Basic Computing*. Mention it to your friends.

Following the introduction of the Model 4, Radio Shack has introduced one new spreadsheet program, Target Planner Calc, which sells for \$99.95, and they made available VisiCalc and Multiplan to run on that computer. All of that software adds up to a significant amount of computing

power available for a relatively small price. Watch *Basic Computing* for my reviews of these new spreadsheets and for ways in which these programs can be used. All of you who are using Models I, II or III, don't despair or think that you have to purchase more programs. You won't be left out. This column will continue to carry information relevant to your needs as well. One last matter, you can now reach me through CompuServe. My CompuServe number is 71016, 1432. Well, let's get down to business.

Accuracy?

One of VisiCalc's notorieties is that it maintains highly-accurate arithmetic precision (usually 11 decimal places). There are, however, times when I have found that less accuracy is desirable. In my occupation, I work largely with

interest and/or dollars and cents computations. While 11-place precision is accurate, I find it often gets in the way. Fortunately, there is a way out using the @INT function.

Figure 2 is the listing of a template that computes an annual amortization schedule for a loan. In order to fully understand this month's column, key in the template, paying particular attention to the global default values. They are important! Of course, the sheet can be readily created using the replicate function by typing in line 8 and replicating columns C through H for lines 9 through 19. Note also that column D has a general format. Otherwise, the spreadsheet would display values of .14 in the cell positions 8 through 19.

Reducing Decimals

Virtually all interest calculations yield results that are many decimals long if carried out with precision. However, if you use dollars and cents, only two decimal places are generally necessary in the final result. If you look at column H you can see the effect of the calculation +C8*(E8/12). It's messy and has the potential of creating rounding differences as the "totals" line 21 shows which compares the results of columns E and H. That is where the formula @INT((+C8*(E8/12)*100+.5))/100 becomes handy.

By taking apart the formula, we can see that we first perform the interest calculation, multiply it by 100, add .5 and then take the integer value (@INT) of that result. The .5 causes the necessary rounding to

Figure 1

	Typical Company 1983 Note Payment Schedule January, 1983					Full Precision	
	Beginning Balance	Monthly Payment	Interest Rate	Monthly Interest	Principal Reduction	Ending Balance	Interest Calculation
January	5289.39	250.00	.135	59.51	190.49	5098.90	59.505638
February	5098.90	250.00	.135	57.36	192.64	4906.26	57.362625
March	4906.26	250.00	.135	55.20	194.80	4711.46	55.195425
April	4711.46	250.00	.135	53.00	197.00	4514.46	53.003925
May	4514.46	250.00	.135	50.79	199.21	4315.25	50.787675
June	4315.25	250.00	.135	48.55	201.45	4113.80	48.546563
July	4113.80	250.00	.135	46.28	203.72	3910.08	46.28025
August	3910.08	250.00	.135	43.99	206.01	3704.07	43.9884
September	3704.07	250.00	.135	41.67	208.33	3495.74	41.670788
October	3495.74	250.00	.135	39.33	210.67	3285.07	39.327075
November	3285.07	250.00	.135	36.96	213.04	3072.03	36.957038
December	3072.03	250.00	.135	34.56	215.44	2856.59	34.560338
Totals				567.20	2432.80		567.18574

Exploring VisiCalc

Figure 2

	A	B	C	D	E	F
1				"Typical Co	"mpany	
2			" 1983	"Note Payme	"nt Schedul	"e"
3				"January, 1	"983	
4						
5		" Beginning	" Monthly	" Interest	" Monthly	" Principal
6		" Balance	" Payment	" Rate	" Interest	" Reduction
7		" -----	" -----	" -----	" -----	" -----
8	"January	5289.39	250	/FG.135	@INT((+B8*(D 8/12)*100+.5))/100	+C8-E8
9	"February	+G8	250	/FG.135	@INT((+B9*(D 9/12)*100+.5))/100	+C9-E9
10	"March	+G9	250	/FG.135	@INT((+B10*(D10/12)*100+ .5))/100	+C10-E10
11	"April	+G10	250	/FG.135	@INT((+B11*(D11/12)*100+ .5))/100	+C11-E11
12	"May	+G11	250	/FG.135	@INT((+B12*(D12/12)*100+ .5))/100	+C12-E12
13	"June	+G12	250	/FG.135	@INT((+B13*(D13/12)*100+ .5))/100	+C13-E13
14	"July	+G13	250	/FG.135	@INT((+B14*(D14/12)*100+ .5))/100	+C14-E14
15	"August	+G14	250	/FG.135	@INT((+B15*(D15/12)*100+ .5))/100	+C15-E15
16	"September	+G15	250	/FG.135	@INT((+B16*(D16/12)*100+ .5))/100	+C16-E16
17	"October	+G16	250	/FG.135	@INT((+B17*(D17/12)*100+ .5))/100	+C17-E17
18	"November	+G17	250	/FG.135	@INT((+B18*(D18/12)*100+ .5))/100	+C18-E18
19	"December	+G18	250	/FG.135	@INT((+B19*(D19/12)*100+ .5))/100	+C19-E19
20				/FG	" -----	" -----
21	"Totals				@SUM(E8...E1 9	@SUM(F8...F1 9
22					" =====	" =====

Global Commands:

- /COR Recalculate by ROW.
- /GRM Manually recalculate by pressing !.
- /GF\$ Non individually formatted values will be displayed rounded to two place
- /CC10 Column width = 10.

take place and the integer value causes all numbers to the right of the decimal point to drop off. Finally, the formula divides the preceding result by 100 to restore our number and retain the desired two decimal places of accuracy. The results of using this @INT formula with the specified global format settings are shown in Figure 1. While the formula may seem imposing at first, it is really quite simple.

Matters of general interest may become the subject matter of future columns.

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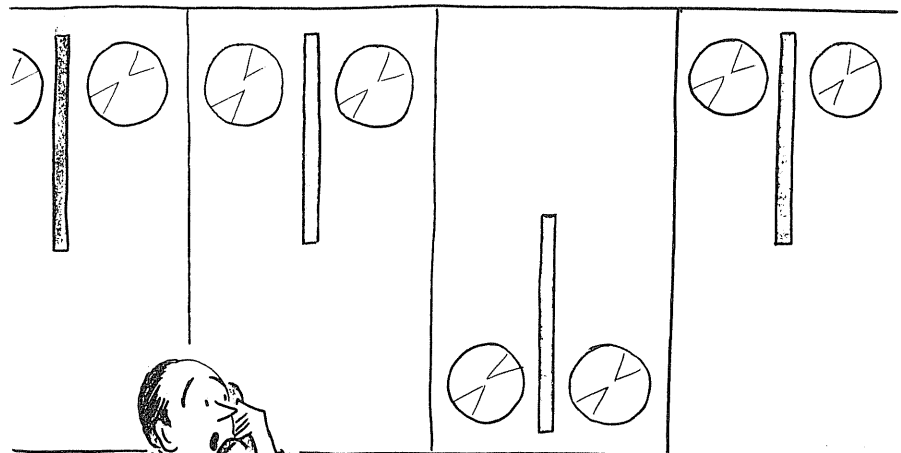
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#59

Further Exploring

With the preceding description, do you see how you can create a spreadsheet that has three decimal places of accuracy? How about six? Try experimenting with different values in the formulas found in column E as well as different global format default values. You might be pleasantly surprised with the results. Who says that we have to be accurate to 11 places?

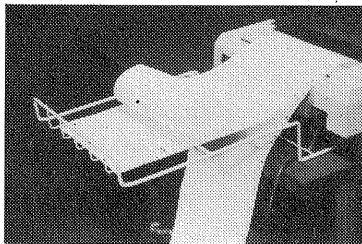
That's all for this month. If you have a VisiCalc question or comment, please write to me in care of *Basic Computing*, enclosing a stamped, self-addressed envelope if you desire a prompt personal reply.



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G	H	IJ
" Ending	" Full Preci	" sion
" Balance	" Interest	" on
" -----	" Calculati	" on
" -----	" -----	
+B8-F8	/FG+B8*(D8/12)	
+B9-F9	/FG+B9*(D9/12)	
+B10-F10	/FG+B10*(D10/12)	
+B11-F11	/FG+B11*(D11/12)	
+B12-F12	/FG+B12*(D12/12)	
+B13-F13	/FG+B13*(D13/12)	
+B14-F14	/FG+B14*(D14/12)	
+B15-F15	/FG+B15*(D15/12)	
+B16-F16	/FG+B16*(D16/12)	
+B17-F17	/FG+B17*(D17/12)	
+B18-F18	/FG+B18*(D18/12)	
+B19-F19	/FG+B19*(D19/12)	
" -----	/FG@SUM(H8..H19)	
" =====		

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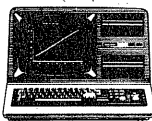
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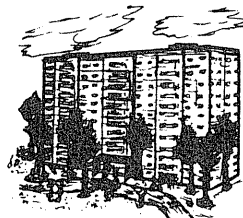
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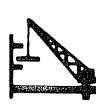
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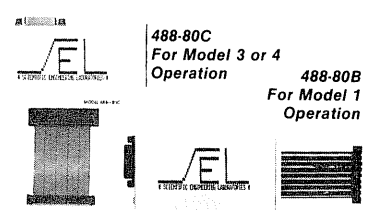
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We have grouped all of our 1983 articles and columns by model. Be sure to look in more than one area for material pertaining to your computer system. For example, Model 4 programs can be found under the Model I/III/4III heading as well as under the Model 4 heading which is for true Model 4 operation. On the far right of each entry, the letter P denotes a program, the letter R denotes a review.

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Graphics a la Cassette Creating and saving video images	Lynard Barnes CC Sep Pg31 P	Exploring VisiCalc Creating command files	Timothy K. Bowman I/II/III May Pg70
Kraft Systems Joysticks from Kraft Systems Co.	Lawrence I. Charters CC Jul Pg118 R	Exploring VisiCalc Using Scriptit with VC files	Timothy K. Bowman I/II/III Jul Pg86
Nanos Reference Card for TRS-80 Color BASIC from Nanos Systems Corp.	Stephen G. Stone, III CC Dec Pg100 R	Exploring VisiCalc Answering reader questions	Timothy K. Bowman I/II/III Aug Pg40
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ROM Remedies Fix ROM paks so you don't lose BASIC	Robert Grater CC Jun Pg42	Exploring VisiCalc a review of Liason from Kjell Engineering	Timothy K. Bowman I/II/III Sep Pg72 R
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Star Trac Plotting & tracking program for amateur astronomer	Richard Giovanoni CC May Pg30 P	Exploring VisiCalc DIF isn't so difficult: Part 2	Timothy K. Bowman I/II/III Nov Pg58 P
The Love Test Analysis of your type of love	Dr. Michael Nugent CC Jul Pg100 P	Exploring VisiCalc Setting printer format codes	Timothy K. Bowman I/II/III Dec Pg72
The Official ZAXXON by Sega from Datasoft, Inc.	Bob Liddil CC Oct Pg86 R	Files and Fobibles Multi-disk handling techniques	Terry R. Dettmann I/II/III Jan Pg84 P
Where does PUT Really GET YOU? Unique uses of these CC commands for graphics	Dale Fawcett CC Jun Pg66 P	Files and Fobibles Compacting BASIC programs	T. R. Dettmann I/II/III Mar Pg93 P
Whirlybird Run from Spectral Associates	Steve Skrzyniarz CC Dec Pg101 R	Files and Fobibles Compacting File Information	Terry R. Dettmann I/II/III Apr Pg100 P
Word Processing on Your Color Computer Correction to Oct 82 program	Staff CC Jan Pg10 P	Files and Fobibles Formatted input routines	Terry R. Dettmann I/II/III Jun Pg92 P

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For immediate release

Model 100 Software

Ceres Software, Inc. has four new programs for the Model 100. ELF-Writer is a formatting utility for text processing. It allows you to see the text as it will be printed and supports numerous word processing features. ELF1+1 is a calculation aid that gives running totals, entry and memory display, and numerical functions such as square root and percent. It works with the ten-key pad as well as the typewriter keys. ELF-Cop is a backup utility that works with any RAM file to any device. It includes an archival report and rename and delete functions. ELF-Banker performs financial calculations such as loan calculations, lease versus buy analysis, present value, and 16 other calculations. Each program sells for \$29.95, contact Ceres Software, Inc., P.O. Box 1629, Portland, OR 97207, (503) 245-9011.

Multimode Matrix Printer

The DS220 multimode matrix printer from Datasouth Computer Corp. gives letter quality print, has dot-addressable graphics, and is useful for high speed data processing. In letter-quality mode, the DS220 has an 18 x 48 dot matrix, prints at 40 cps, has two fonts, two memo fonts, variable pitch, and seven resident international character sets. In normal 9 x 7 mode it prints at 220 cps, with bi-directional logic seeking. Contact Datasouth Computer Corporation, 4216 Stuart Andrew Blvd., Charlotte, NC 28210, (704) 523-8500.

BASIC Reference Book

Microsoft BASIC is now installed in over one million machines. The *Pocket Guide to Microsoft BASIC* from Addison-Wesley is a small spiral-bound guide that explains, with examples, the most common features of Microsoft BASIC. The

guide introduces users to the language and assumes some programming knowledge. Summaries are included for the IBM PC, Apple II, and Zenith Z100 computers as well as error codes and messages and ASCII codes. Contact Addison-Wesley, General Books Division, Reading, MA 01867, (617) 944-3700 or your local bookstore.

TRS-80 Pocket Handbook

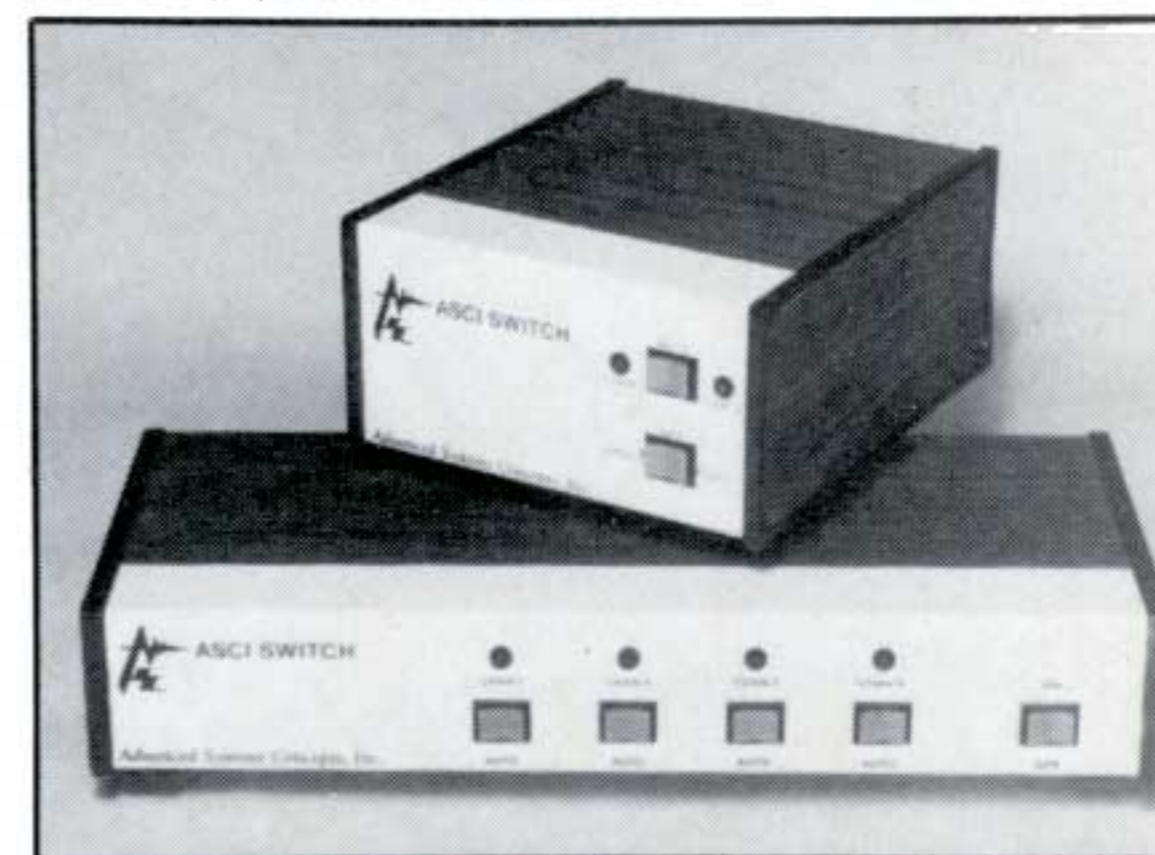
The TRS-80 Pocket BASIC Handbook by William Barden, Jr. is now available at Radio Shack outlets. The small, 3" X 6", vinyl-bound notebook gives one-page summaries of the BASIC commands that are used in the Tandy line of microcomputers. Each command description tells which models and systems implement it, its format, an example of its use, a detailed description, and related commands that are similar or used in conjunction with it. The guide will quickly tell you if a Level II, Model III command is valid on a Color Computer with Disk BASIC, or any

other combination of system and model. This carefully-developed and useful reference guide retails for only \$6.95.

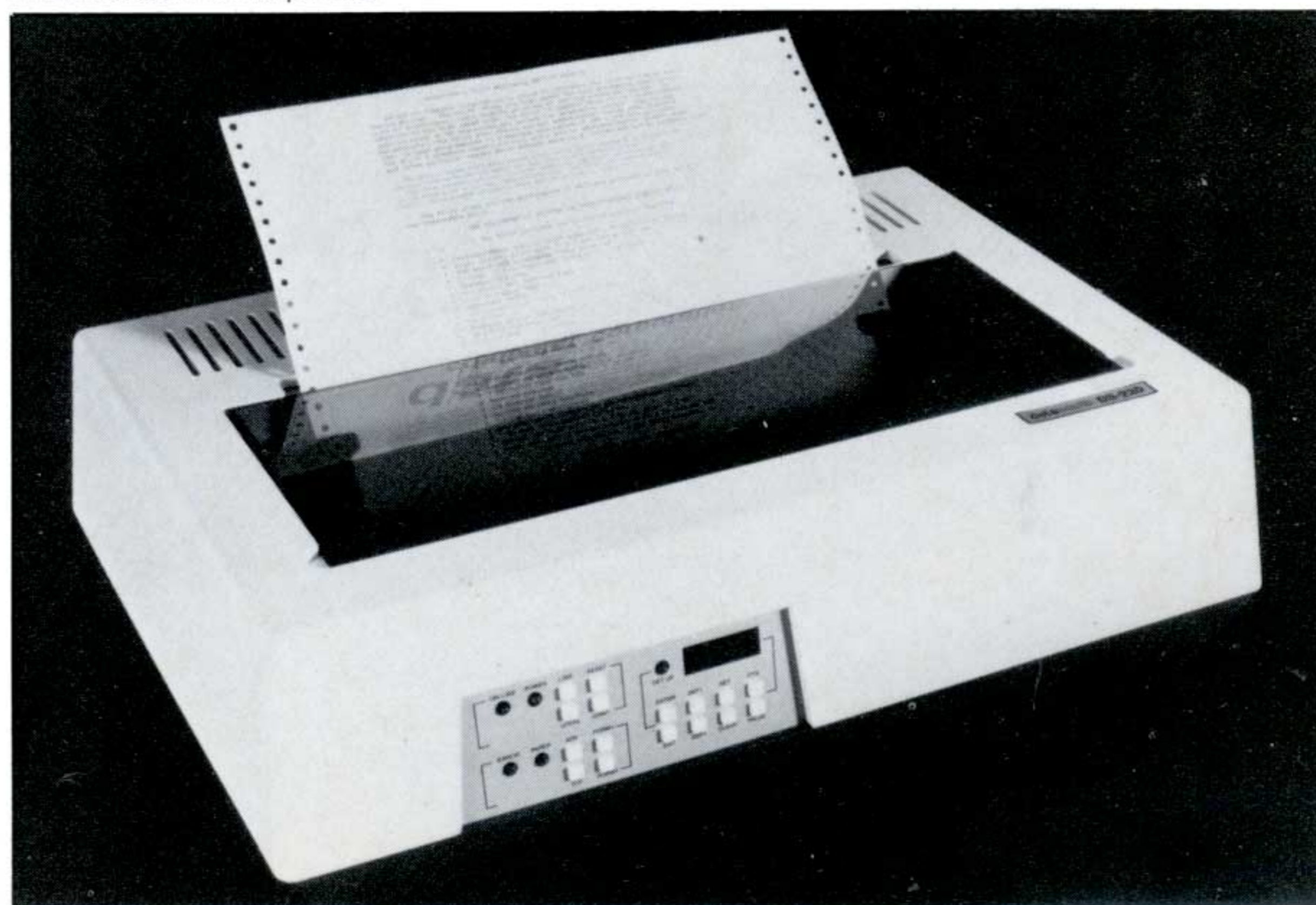
Point of Sale Program

K & L Software offers a point of sale inventory control program for the Models III and 4III. The inventory control program tracks data such as item number, vendor code, stock number, description, item cost, retail price, sixteen fields in all. The cash register portion of the program will keep up with 3,000 line items sold each day, or 1,500 transactions. Provision is made for

Parallel printer switch



Multimode matrix printer



For immediate release

up to 35 employees and 200 vendors. The programs are available in three different versions, ranging in price from \$399 to \$599. For more details contact K & L Software, P.O. Box 39093 Northbridge Station, Charleston, SC 29407, (803) 552-9990.

Parallel Printer Switch

Advanced Systems Concepts, Inc. offers the ASCI-25 intelligent parallel printer switch. It will allow up to four computers or terminals to share a single printer. The device will work with Epson, Diablo, NEC, Okidata, Brothers, and other printers. Other versions will allow a single computer to share and automatically select between two or four printers. Prices start at \$495.

For more information, contact Advanced Systems Concepts, Inc., 435 N. Lake Avenue, Pasadena, CA 91101, (213) 793-8971.

IMPAKT!

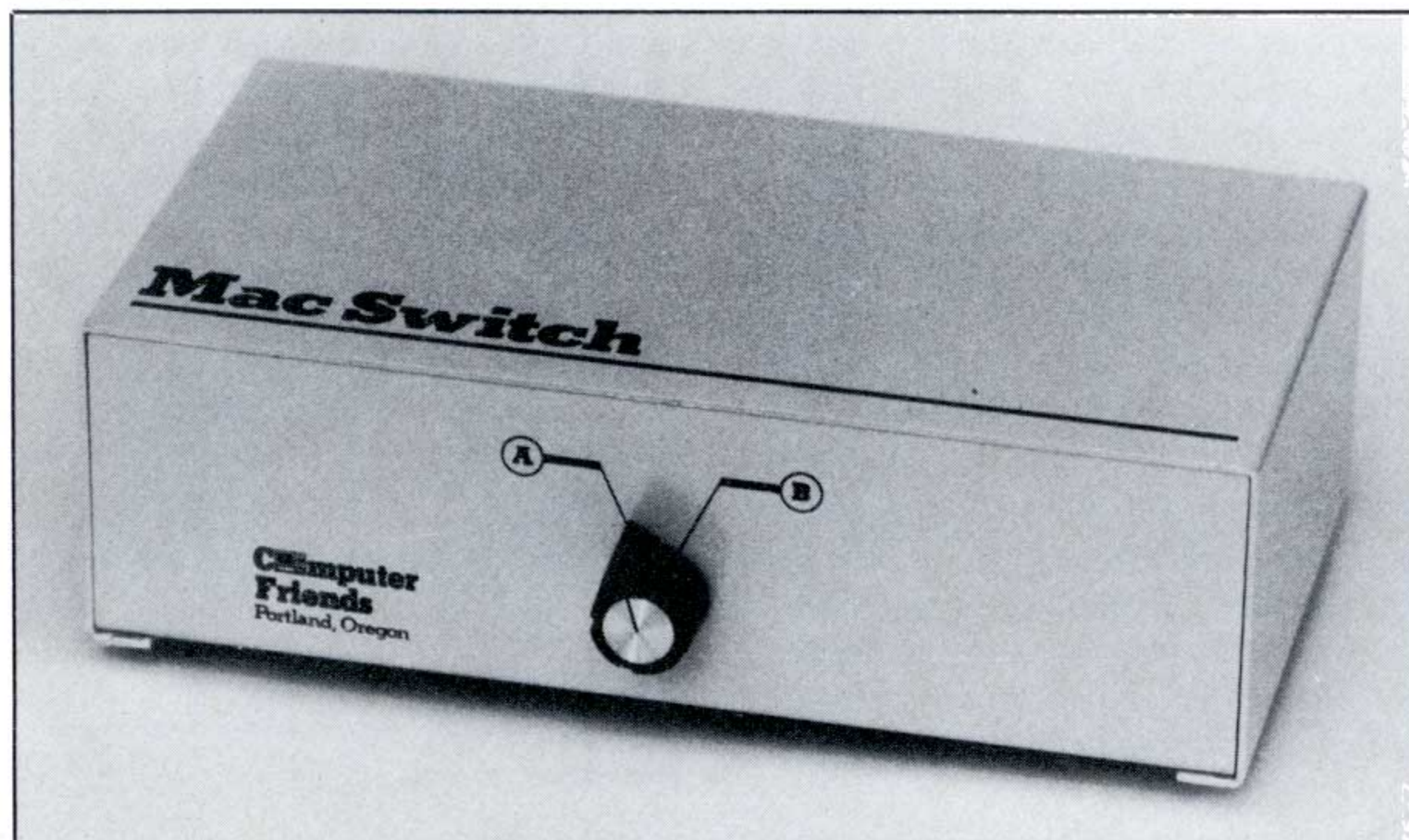
Powersoft has a set of BASIC enhancements for TRSDOS 2.3, 1.3, and LDOS. IMPAKT! is a self-relocating machine language module that gives numerous extended functions to BASIC programmers. It does not require special formats, BASIC commands, or any modification to BASIC/CMD or LBASIC/CMD files. Programs written under it will run under regular BASIC. The package allows single commands for search or replace keyword or string, program compaction and decompression,

renumber, trace without losing display, setting breakpoints, join and copy program lines, and more. The package is not for Model 4 use in true Model 4 mode. For more information, contact Powersoft, 11500 Stemmons Expressway, Suite 125, Dallas, TX 75229, (214) 484-2976.

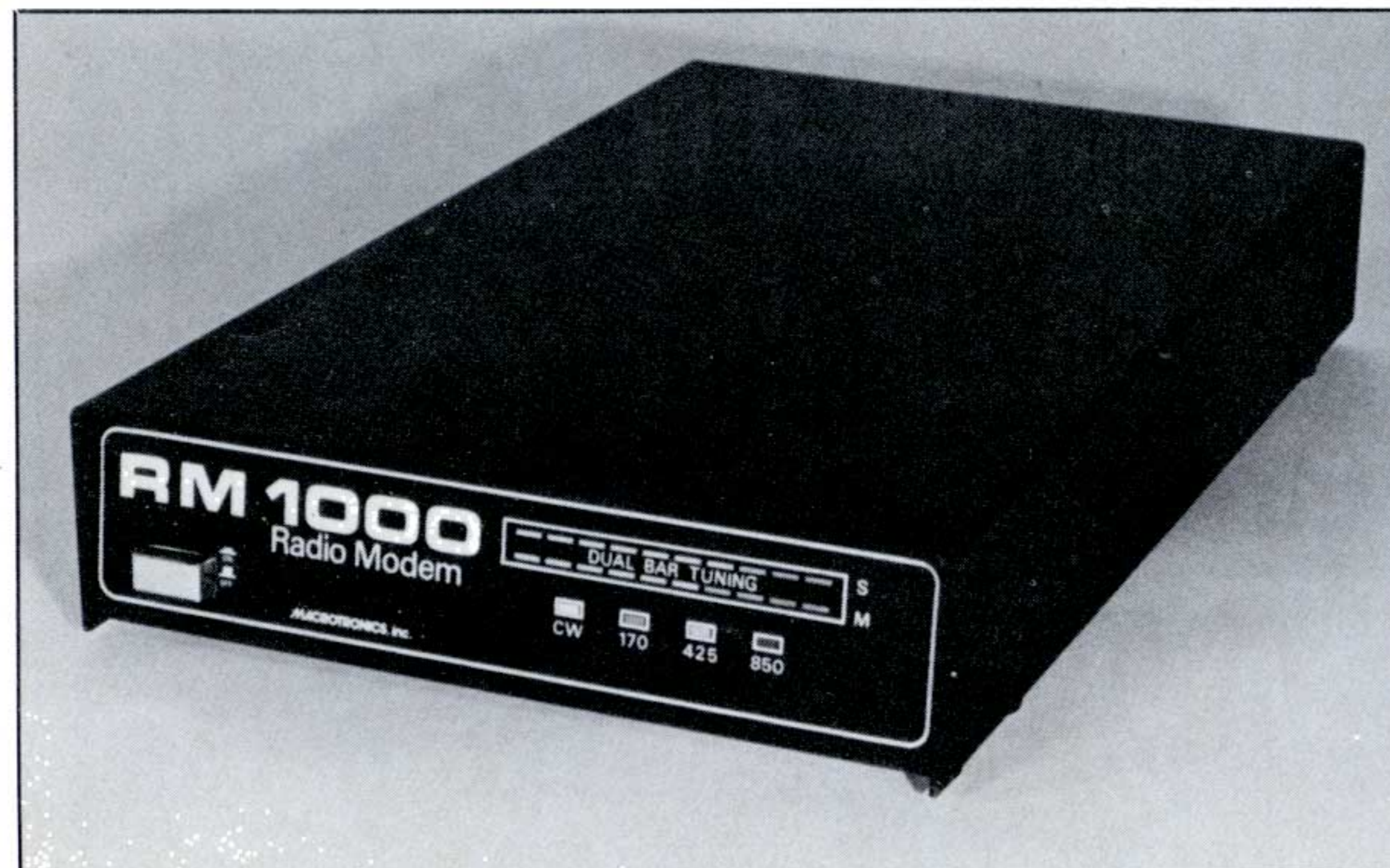
Peripheral Switch

The Mac Switch is a manual switch for connecting two peripherals to one computer, or two computers to one peripheral. It is available in two versions, one for parallel printer use (Centronics interface), and one for serial, RS-232 connections. The 2.5 x 8 x 5 inch device can easily sit on top of a video monitor. Contact Computer Friends, 6415 SW Canyon Ct., #10, Portland, OR 97225, (503) 297-2321.

Peripheral switch



Radio modem



CP/M 2.2m

Pickles and Trout new CP/M operating system for the Models II, 12, and 16 offers a number of new features. The system's menu allows a user to perform common system functions with ease and speed. Utility programs can now be executed from command lines that are typed at the console or embedded in SUBMIT files. The operating system is modularized and users can select just those modules they need. Other features include a fast image-copy utility, an ADM-3A terminal emulation module, error message help, and a new manual. Floppy disk version is \$200, Radio Shack hard disk version is \$250. Contact Pickles & Trout, P.O. Box 1206, Goleta, CA 93116, (805) 685-4641.

Model 100 Tax Records

BOOK is a program designed to meet the income tax bookkeeping needs of small businesses and professionals. It will support up to 52 accounts and is based upon Tax Form 1040, Schedule C. Summaries of accounts and a detailed report of entries by account are easily generated. Contact Chattanooga Systems Associates, P.O. Box 22261, Chattanooga, TN 37422, (615) 892-2339.

Radio Modem

The RM1000 Radio Modem supports Morse, Baudot, and ASCII

codes and can be used by ham operators and shortwave radio listeners for copying news and wire services. The hardware uses multistage active filter demodulators with dual LED bargraph tuning indicators. Three RTTY shifts can be selected from the keyboard. The built-in clock can be user programmed. Software features a split screen display of both transmitted and received text, hardcopy options, and sixteen programmable messages. Disk versions support full disk I/O of data. For more information, contact Macrotronics, Inc., 1125 N. Golden State Blvd., Turlock, CA 95380, (209) 667-2888.

Tech-Pak

Tech-Pak is a software packaging system from S. K. Smith Industries, Inc. The binder and matching slipcase are made from high grade, coated cloth and can accommodate diskette storage and instruction material. Both the binder and slipcase can be custom decorated and they will store your materials in the form of a handsome library set. Contact S. K. Smith Industries, Inc., 2857 N. Western Ave., Chicago, IL 60618, (312) 276-3790.

Insured Surge Protector

The Lemon AC Surge Protector is as easy to use as an extension cord and it comes with a guarantee that is underwritten by Lloyds of London. The Lemon sells for \$59.95 and user's hardware is protected to \$2,500 for repair or replacement due to transient voltage surges. The protector provides protection in excess of 6,000 volts and 200 amps and is housed in a bright yellow case, with two LEDs for verifying line or ground protection. Literature is available from Electronic Protection Devices, Inc., P.O. Box 673, Waltham, MA 02254, (800) 343-1813.

8088 Dual Processor

A 8088 Dual Processor Option (DPO) board is now available for the Models II, 12, and 16. This unique option allows the TRS-80 to run MS-DOS, CP/M-86 and Concurrent CP/M-86. Support for the Radio Shack 8Mb and 12Mb hard disks is included. The 8088 DPO board comes with 128K, upgradable to

256K, resides in one slot in the motherboard, and can coexist with the resident Z-80, MC68000 upgrades, and high resolution graphics boards. An optional 8087 math processor kit is available. Contact Veritas Technology Inc., 2375 Zanker Rd., Suite 245, San Jose, CA 95131, (408) 263-0646.

Solid Oak Computer Furniture

FineTech Furniture, Inc., has introduced a line of fine furniture for personal computers. The Woodbury series is handcrafted of solid oak, in traditional or contemporary styling. Components may be purchased separately. The desk measures 26 x 47 inches, has a top height of 30 inches, adjustable to 31.5 inches. The desk height can be lowered to 27 inches. The shelf system, which fits on top of the desk, has provisions for a monitor and software. The printer stand is mounted on casters. For more information, contact FineTech Furniture, Inc., P.O. Box 280, Woodbury, TN 37190, (615) 765-5921.

Tax Master

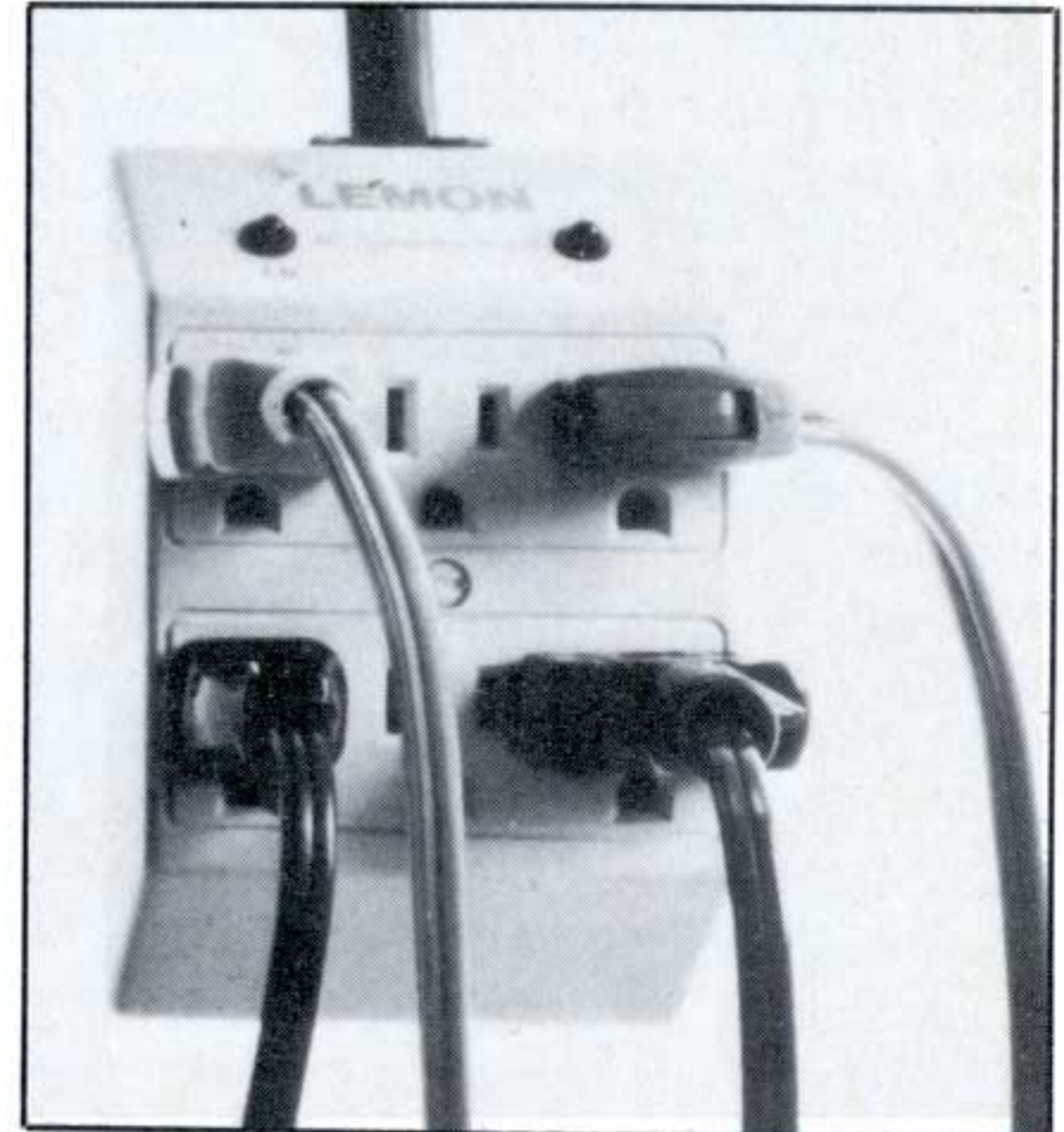
The Tax Master Federal Income Tax Planning and Preparation System is designed for use on the Models II, 12, and 16 computers. All of the lettered schedules and most of the numbered forms are supported. Screen displays are line-for-line images of the IRS forms. They match the IRS versions in line numbers, descriptions and graphics. All arithmetic and cross-referencing is done by the computer, the user only has to enter the raw data. All forms can be reviewed and recalculated. The complete package sells for \$1300, with a \$425 annual update fee after the first year. A demonstration disk and user's manual are available for \$50, creditable towards purchase. Contact IMPACC Associates, P. O. Box 93, Gwynedd Valley, PA 19437, (215) 699-7235.

Foreign Language Software

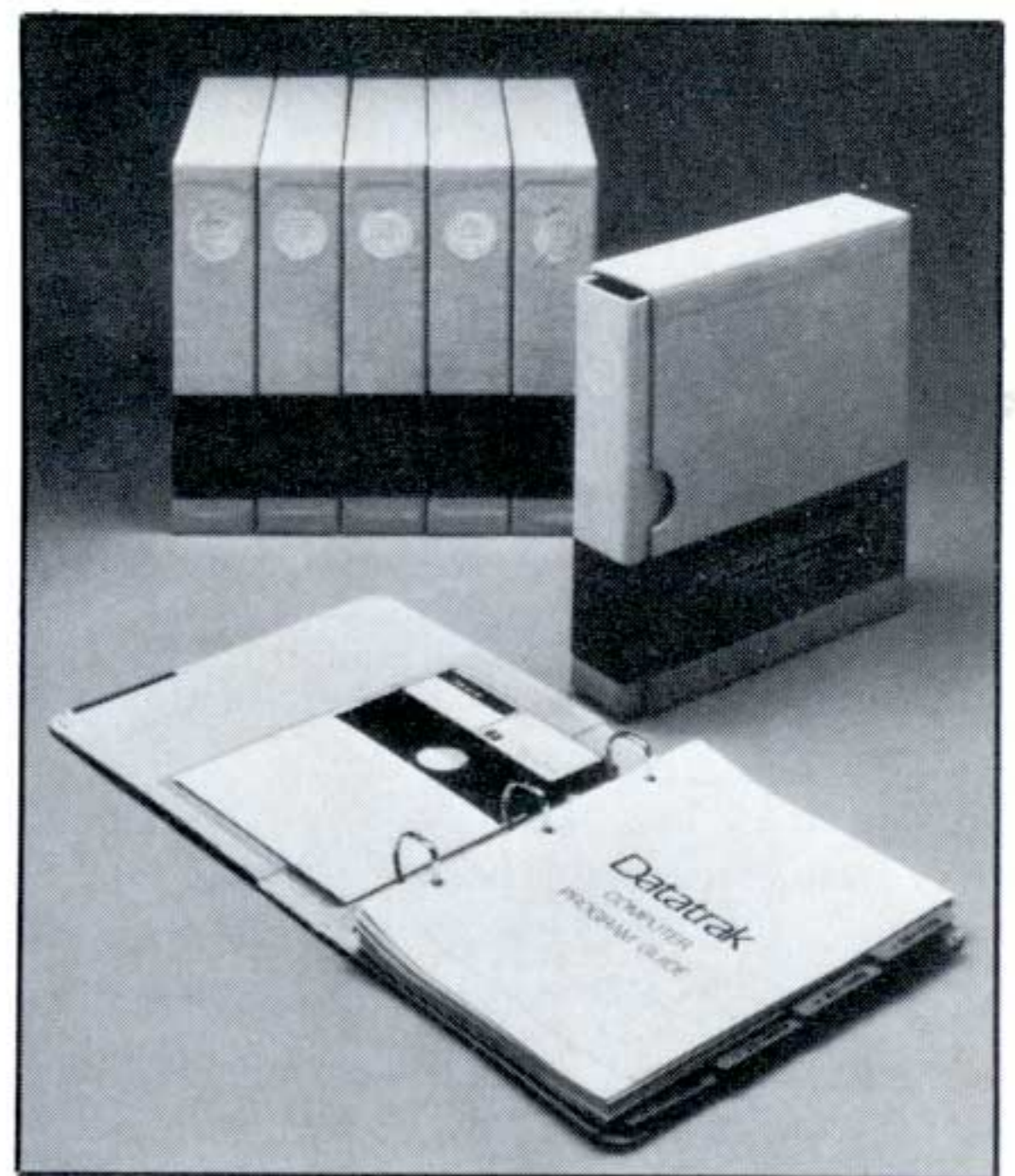
La Guillotine and La Corrida de Toros are French and Spanish versions of the Hangman word game. Settings for the games reflect each country's heritage and they are well suited for educational use. Available for the Models I, III, and 4 computers. Apple II+ and IIe versions support color and sound. The

programs are from Gessler Educational Software, a division of Gessler Publishing Company. Contact local publishing representatives and educational suppliers for more details.

Insured surge protector



Tech-pak



Solid oak computer furniture



Bulletin Board

This bulletin board space is available free to individuals with single or unusual items for sale or trade. Basic Computing reserves the right to reject any commercial advertising in this section and suggests using our display advertising for that purpose.

These notices are free of charge and will be printed one time only on a space available basis. Notices will be accepted from individuals or bona fide computer user clubs only. All these unclassified announcements must be typed, contain 75 words or less and include complete name and address information.

High Speed Cassette Operating System, TC-8 and EP-38, by JPC Products, for sale. Wired, tested, with all manuals. Also Tape Scripsit. For Models I or III. Sell for \$80 or trade for a Model I disk-based database manager or smart terminal program. D. A. Hemmer, RR #1, St. Cloud, MN 56301, (612) 251-8400.

400 Blank computer-grade cassettes (10 minute length, 5 minutes per side) with blank tractor-feed labels. Will sell all for \$110 ppd., or by the dozen for \$4.50 plus \$2.00 shipping. Alex Yurina, 1416 Ridgewood, Apt. 3, Lakewood, OH 44107 (216) 221-6635. Call after 6 PM EST.

For Sale: Model I, 48K, one disk, cassette, with Lobo LX80 Interface, LDOS, Smal-DOS, and more. Over \$400 in software and books. CPU recently overhauled. \$900, or offer. Will ship COD with deposit. Emilio J. Vazquez, 3380 Guilford Ct. S.E., Port Orchard, WA 98366 (206) 871-7583.

Secure Bulletin Board? Frelancin' is a 300/1200 baud, TRS-80 bulletin board in Houston, TX. We solicit you to attempt to crack it. Helpful information can be found in the "Bulletins" section of the primary menu. If you are successful, leave an account of your technique and we'll give you credit in our scoreboard section. Call (713) 488-2003 or (713) 331-2599.

CoCo Math Tapes for 16K Color Computers. Six programs on number matching, counting, addition, subtraction, multiplication, division, and a math invaders game. These math fact programs allow practice and testing for single and double-digit operations with large block numbers. A 4K version is also available. \$9.95 each, Dale Fawcett, 19069 Turkey Meadow Ln., Strongsville, OH 44136 (216) 238-3961.

For Sale to collector or investor. Apple One computer. Write for details. Joe Torzewski, 51625 Chestnut Road, Granger, IN 46530.

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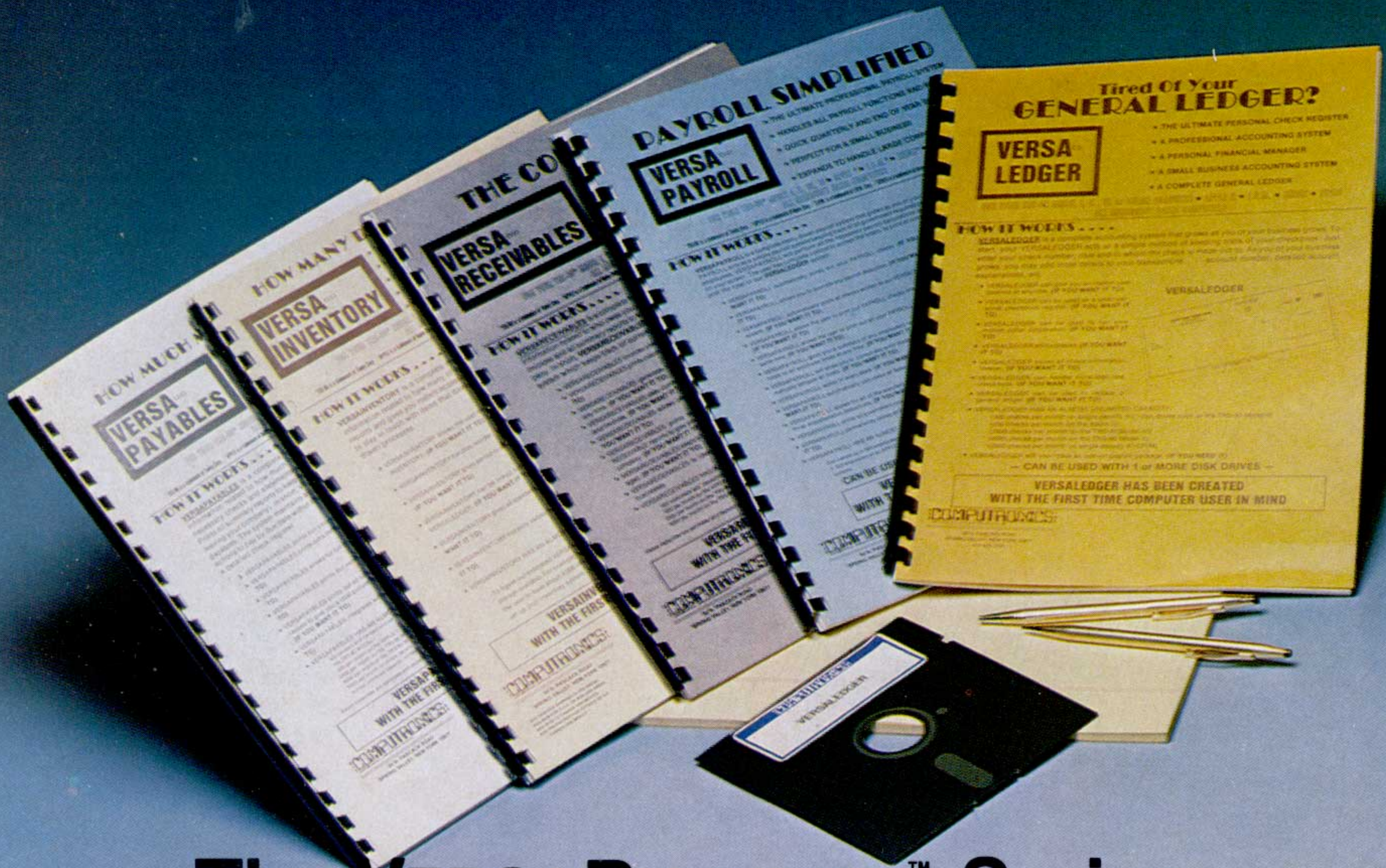
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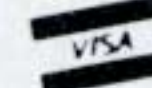
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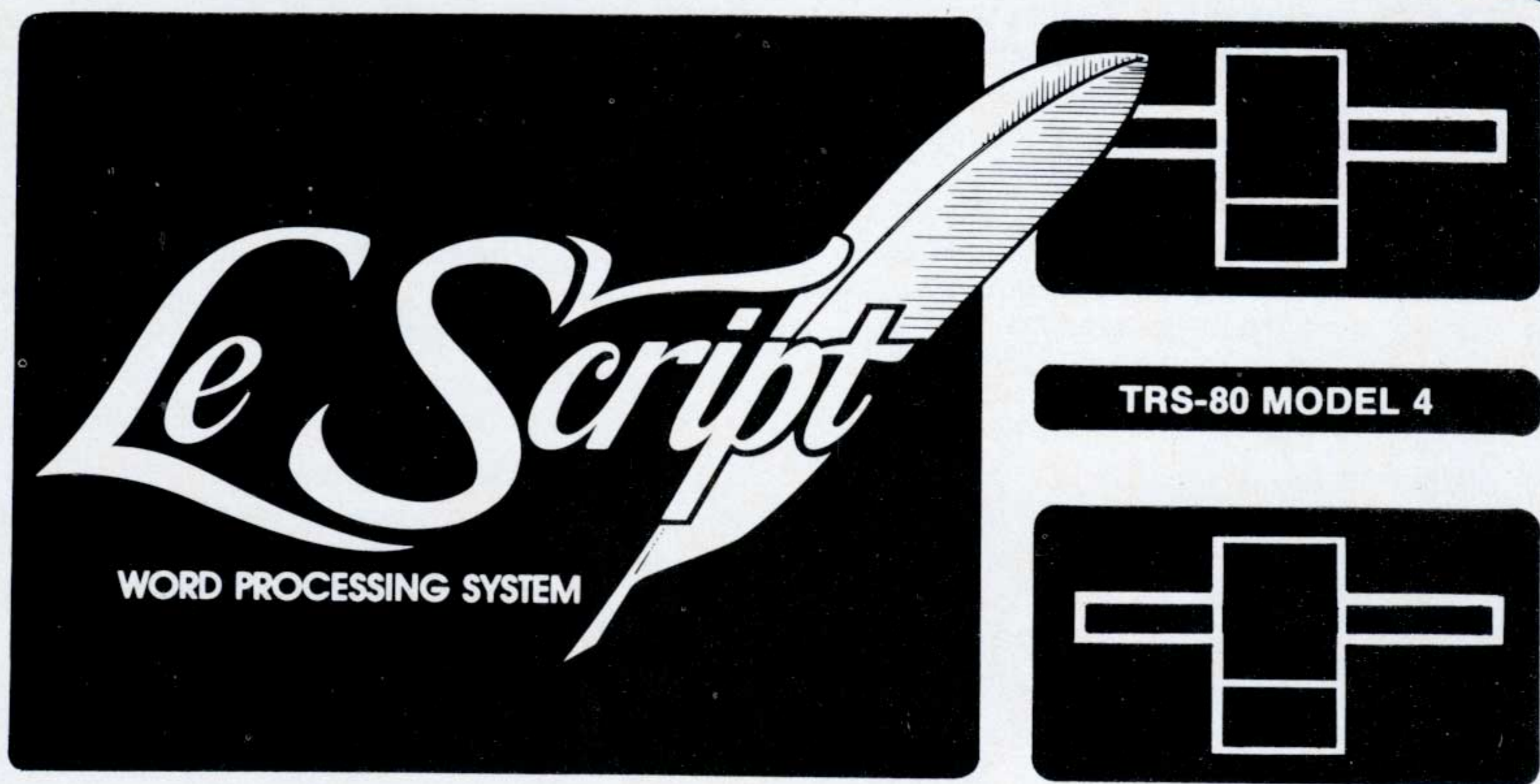
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