

# ADVANCED

T.M. FORMERLY TWO/SIXTEEN

# COMPUTING

*The journal for business, professional, and scientific members of the TRS-80 community*

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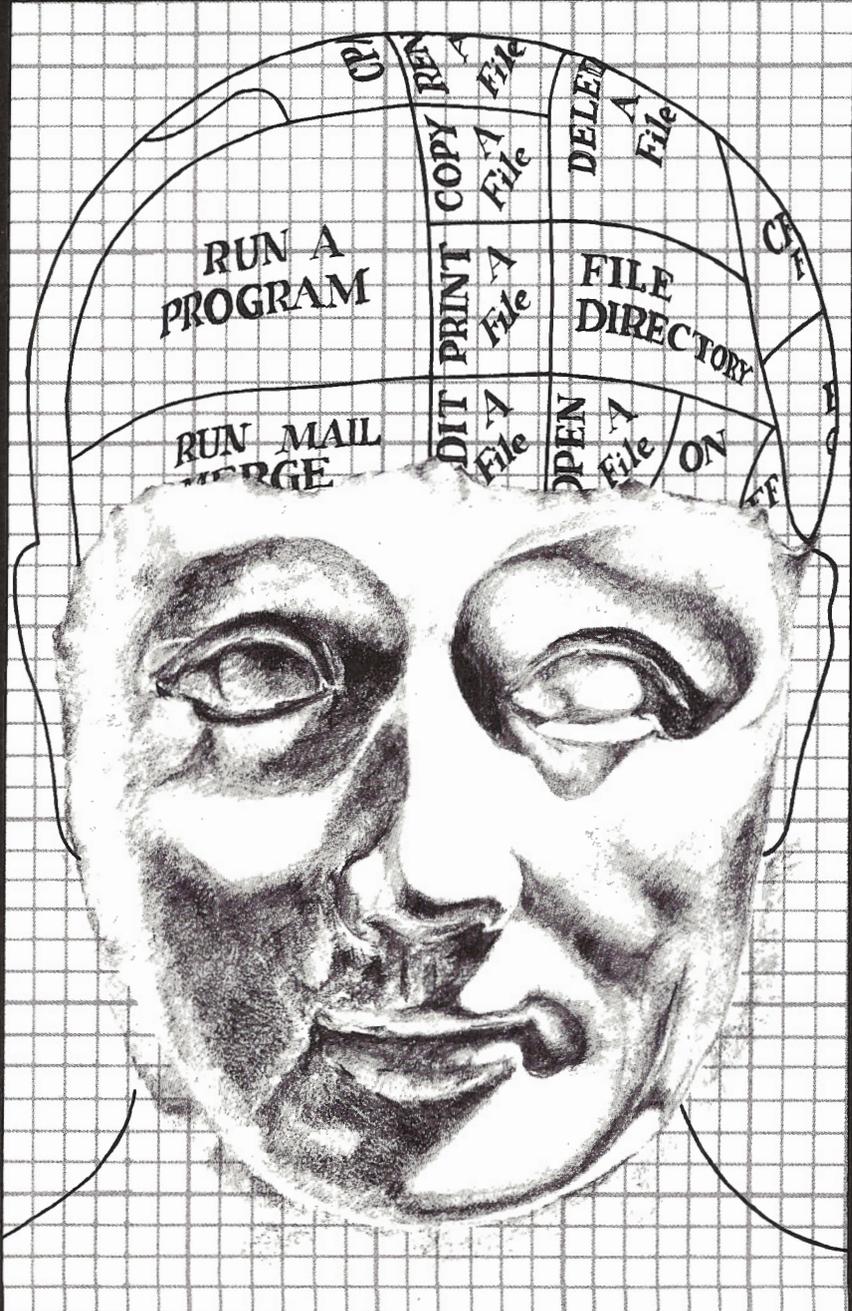
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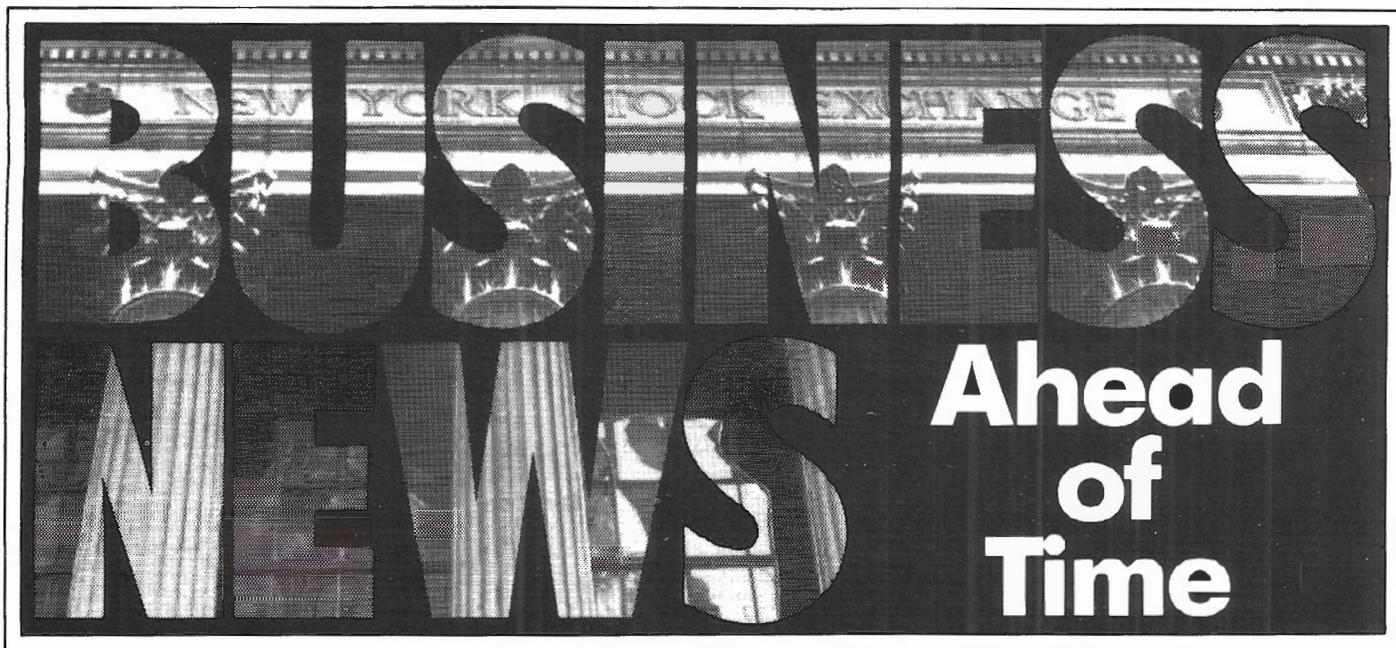
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Typesetting by **Forry & Hacker**  
 Lititz, PA

Printed by **Forry & Hacker**  
 Lititz, PA

**Advanced Computing** (ISSN 0736-8194)  
 is published bi-monthly by  
**Advanced Computing**  
 131 East Orange Street, Lancaster, PA 17602  
 Entire contents copyright 1984  
 by Richard H. Young  
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### Telephones

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 Classified Advertising **717/397-3789**  
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 including change of address (with label) to

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## >>>New name

Considerable confusion has arisen during the last two years about the name two/sixteen. Several people have suggested that it sounded like a magazine for young women. We are almost always omitted from listings of computer magazines in other publications. And new computers, such as the 12 and 2000, make the II/16 numbers less significant than they were in the beginning. So we've changed the name, effective with this issue, to Advanced Computing, which seems to more accurately reflect the nature of our coverage. We are continuing to use the sub-head "The journal for business, professional, and scientific members of the TRS-80 community."

## >>>New service

An expanded service is now available to subscribers. A detailed description was included with the last issue of two/sixteen and in a subsequent mailing. (If you have any questions about this service, please call me at (717) 397-3364.) Until March 1, 1984, we offer a 10% discount plus a refund of all two/sixteen magazine subscriptions paid to date. Please consider this special offer if you are a serious Model II/12/16 computer user. Naturally, those subscribers who do not elect to take the new service will continue to receive Advanced Computing as if nothing had happened.

## >>>Tandy Model 2000, etc.

I've got mixed emotions about this machine. As Radio Shack salesmen will tell you, it isn't an IBM clone. In fact, many of the most popular IBM PC programs (like Lotus 1-2-3, VisiCalc, and WordStar) will not run on the 2000 (according to Tandy literature, although I've been told that many of these programs can be run by using fairly simple, if unconventional, loading methods). Also, some believe that future versions of any incompatible programs will be modified so as to be compatible with the 2000's Intel 80186 chip as well as the PC's Intel 8088. There is widespread belief that the 80186 chip will be used in a large number of new computer designs, and that developers of most new business software will be sure to include the 80186 chip among its target CPUs.

Reports are that the 2000 performs mixed compute/input-output benchmarks in one-half to one-third the time required by the IBM PC. The 2000 handily beats the IBM PC on nearly every significant specification, including standard RAM (double), maximum RAM (20% more), disk capacity (standard is more than double the PC's optional-at-extra-cost maximum), CPU chip data path (double), clock speed (almost double), available board slots (double), color resolution (four times as great), number of colors (double), and keyboard features. Considering the relative prices, why would any informed user buy an IBM PC?

I'm also pleased to see that the machine is labelled TANDY rather than Radio Shack. This should improve its saleability to senior business executives who think of Radio Shack as a not-very-serious supplier of radio hobbyists' supplies.

Many of us who like to prognosticate believe that XENIX will be made available soon for the 2000. (UNIX-type systems are definitely being developed for other 80186-based machines.) However, the 2000 is currently limited to a single 10 megabyte hard disk. This is insufficient disk storage, in my opinion, for a multi-user XENIX system, but I'm told that there is no technical reason why additional hard disks could not be provided in future.

At the moment, it looks like the Model 16B remains a better buy than the 2000 for the serious business user who needs a lot of storage and multi-user capability. However, users who can live with the storage limitations may find the 2000's gra-

phics, along with the mass of MS-DOS software available, an irresistible temptation.

Advanced Computing will be covering business, professional, and scientific applications on the Tandy 2000.

## >>>Other hard disk notes

A Chicago reader advised us in late December that a Center manager has told him that the long-rumored 35 megabyte Radio Shack hard drive will be released in March. No price estimate.

Pickles & Trout CP/M users who are considering the new Radio Shack 15 Mbyte hard disk should be aware that the 15 has a different controller than the 8.7 and 12 Mbyte hard disks and that a new hard disk driver module will be required. P&T is developing the required module.

## >>>XENIX

We're not yet running a Model 16 XENIX system at Advanced Computing, but we plan to put one up in January. In the mean time, nearly all the reports we have from XENIX users are overwhelmingly positive, in spite of some vexing problems, such as multi-user print spooling, which are expected to be fixed in the next release, due soon.

Many XENIX users have called to inquire about availability of XENIX application software in addition to that available from the Shack. Because UNIX is described as a "universal operating system," one might reasonably expect that most of UNIX/XENIX application software should run on machines which use a UNIX-like operating system. To find out if this hypothesis is valid, I've had a few lengthy phone conversations with UNIX/XENIX software developers around the U.S. and Canada, with encouraging but inconclusive results. While no definitive tests have yet been made, some application programs (including some language compilers) are expected to run on TRS-XENIX without modification. Other applications (including some data bases) are expected to require "porting" to the 16, but probably at modest cost (perhaps \$10,000 cost to a program licensee, who would then sell the program to end users).

It looks like there is a great deal of development going on in the UNIX world. (AT&T is expected to announce a line of business oriented micros running under UNIX sometime in January.) We should expect a wide variety of language, data base, and application program software to become available in 1984.

I'm going to stick my neck out and predict that by the end of 1984, UNIX and UNIX-like operating systems will be the de facto standard for business, professional, and scientific processing, and that most sophisticated application programs will be developed under UNIX.

Once again, I recommend that anyone who is using XENIX or seriously contemplating its use should subscribe to:

UNIX REVIEW  
2711 76th Avenue S.E.  
Mercer Island, WA 98040  
(206) 232-6719

Subscriptions are \$23 per year (six issues). The October/November, 1983, issue contains 96 pages of useful information, including many ads for UNIX products.

XENIX users have inquired about the availability of suitable word processing capability for XENIX systems. Rumor (albeit rather authoritative rumor) has it that attempts to adapt Scripsit to XENIX have been very unsatisfactory and that it

will be quite a long time before any usable Scripsit will emerge. In the meantime, we've learned of the availability of two products, a full screen text editor (EMACS) and a word processing system (LEX68) that may fill the bill. Both have very impressive specifications and are available from UniPress Software, Inc., 1164 Raritan Avenue, Highland Park, NJ 08904, (201) 985-8000.

>>>Statistical data and analysis programs  
Data from the 1980 census, historical time-series data on population, housing, and the economy, and a directory of programs for statistical analysis are now available on-line (300/1200 baud) from The Glimpse Corporation, 105A Oronoco Street, Alexandria, VA 22314, (703) 836-6800.

Michigan State University has published an annotated directory of 268 statistical programs for microcomputers, with special attention to IBM, Apple, and CP/M operating systems. The full citation is "An Annotated Directory of Statistical and Related Microcomputer Software for Socio-Economic Data Analysis" by V. Kelly, R. D. Stevens, T. Stilwell, and M. T. Weber, Michigan State University International Working Papers #12, 1983, pp. 165, \$7.00. It may be ordered (check or M. O. must accompany) from the Department of Agricultural Economics, Agriculture Hall, Michigan State University, East Lansing, MI 48824-1039.

>>>Tandy Computer Customer Support Groups  
In December, Tandy reorganized its customer support along software lines and published the following telephone numbers:

Productivity and Special Applications  
(817) 338-2390

This includes VisiCalc, Multiplan, Profile, SCRIPSIT, SuperSCRIPSIT, Business Graphics Analysis, Medical Office System, Time Accounting, etc.

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Operating Systems & Languages (II/12/16)  
(817) 338-2392

Communication Software  
(817) 338-2394

>>>FORTRAN-77 for CP/M-68K  
SVS FORTRAN-77 is described as a full ANSI compatible compiler (as contrasted to the 'subsets' or 'limited implementations' previously available). Run-time performance is said to compare favorably with much larger machines. A "compute-bound" benchmark in common use is the "Sieve of Eratosthenes" (which computes prime numbers). Comparative results on this benchmark are:

IBM 3033*, FORTRAN	2.1 seconds
Model 16, FORTRAN-77	7.6 "
DEC PDP-11/34, FORTRAN	30.0 "
Apple, FORTRAN	509.0 "
Model II, MBASIC	2250.0 "

\* For those not familiar with IBM model designations, the 3033 is a very large, multi-million dollar main frame computer.

FORTRAN-77 requires the CP/M-68K operating system and a minimum of 256k memory. It sells for \$495 from TriSoft, 4102 Avenue G, Austin, TX 78751, (800) 531-5170 (in Texas, call (512) 453-2233.

>>>Another COBOL programming service  
We've been advised by SARJ associates of Washington, D. C., that they offer custom COBOL programming services, including custom modifications to the Radio Shack "3-disk" accounting system. For

more information, contact Rich Hanson, president, SARJ Associates, 4229 Brandywine St. NW, Washington, D. C. 20016, (202) 363-5722.

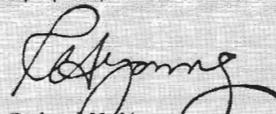
>>>Users' Group in Montreal  
The Montreal TRS-80 Users' Group has been formed by Saturnus True Data Services, Ltd., which outlines some unusual services which are offered to members. For instance, if a member's equipment is "down," MTUG arranges for the use of another member's equipment. A discount purchasing plan is included, along with a bulletin board which includes electronic mail and a classified ad section. For more information, contact Willem P. H. Bagchus, vice president, Montreal TRS-80 Users' Group, 1176 Phillips Place, Suite 201, Montreal, Quebec, Canada H3B 3C8.

>>>Model 16 memory upgrades from Snapp  
Bob Snapp is offering a series of memory upgrades for the Model 16. The most interesting of these provides up to one megabyte of memory plus up to nine users on a Model 16a (or upgraded II). This is done by moving the 68000 memory cards from the regular card cage to a private cage, freeing up two slots and equalling the capacity of the 16b. The entire upgrade, including two 512K memory boards and two multi-user kits, costs \$3700 less whatever trade-in applies to the existing boards. The upgrade must be performed at Snapp's office in Cincinnati. Freight and insurance in both directions is included.

Also offered separately are the K512 board which contains a full half-meg on a single board (at \$1200 less any applicable trade-in), the K256 (at \$500), and a set up upgrade chips to convert a 128K board to 256K (at less than half the Shack price). Multi-user boards (Shack manufacture) are available at \$300 complete with three extender cables and the patches necessary to extend XENIX 1.3 from six to nine users.

>>>PC Telemart software marketing pilot test  
Twelve Radio Shack Computer Centers and four Computer Departments in the Washington, D. C., area are participating in a pilot test of a revolutionary new method of software selection and purchase. Here's how it works: there is a kiosk set up in the middle of the Computer Center; it is fitted with microcomputers which you can use to access a remote computer which contains a data base of available software (from outside vendors as well as Radio Shack). You enter data about the software (application, operating system, host computer, etc.) you need. The system lists all available software which meets your specifications, along with its features, reviews and evaluations, and costs. If you find what you need, you can order it on the spot with your credit card. We understand that future enhancements will be added to the system, including the ability to download and demonstrate the software on the kiosk's micros. If the pilot test works, PC Telemart kiosks will be turning up wherever Tandy micros are sold. I'm convinced that the idea is right for the current market, and believe that it will be a great service to users as well as a very powerful sales aid for Tandy computers.

>>>Investment portfolio analysis system  
INVESTMENT MATRIX consists of an investment data base manager, a portfolio manager, and a portfolio analyzer. It can project after tax cash flows, internal rate of return, and net present value for the portfolio as a whole. Available for CP/M systems at \$399 from Financometrics Inc., P. O. Box 1788, Lafayette, CA 94549, (415) 376-9455.

  
Richard H. Young  
Publisher

Tired of looking at the WordStar logo every time? Make it disappear! Want to make the arrow keys work like arrow keys when using WordStar? Read on to find out how to achieve these results and others by using CP/M's Debugging Tool DDT to get to the heart of WordStar.

# HACKER'S GUIDE TO WORDSTAR

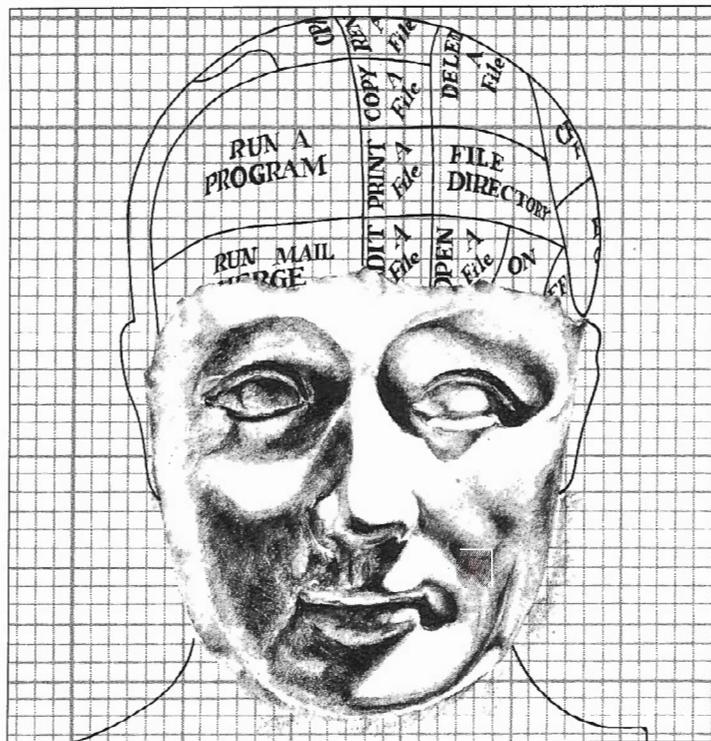
BY ROBERT P. VANNATTA

If you are determined to be a hacker, one of the things you have to get comfortable with is DDT. Skill at using DDT is not easily acquired, and few "Idiot's Guides to DDT" are to be found. One of the reasons for this lack is that DDT has so many diverse uses. You can use it to write and modify programs, trace the execution of programs, disassemble programs, move files from one place to another, or examine the contents of your memory.

If you are going to use DDT, the first thing you need to understand is the use of the SAVE command. It is a built-in command like DIR and REN, but is not so well understood.

SAVE is used to write a portion of memory out to a disk file. In CP/M 80, SAVE will always start at 100h in memory and extend upwards a distance, determined by the number immediately following the word SAVE. The most difficult part of using SAVE is computing the size of the SAVE command necessary. For reasons now lost in history, the size of the SAVE command must be entered as a decimal number. Nearly everything else you will see with respect to DDT will be in HEXIDECIMAL numbers. So, you are going

Robert P. VanNatta  
222 South First Street  
St. Helens, OR 97051



to need a conversion chart showing HEX and Decimal equivalents. Fortunately, tables with this information are readily available and are included in the back of nearly every Radio Shack operator's manual (usually in an appendix).

The SAVE value should be the decimal value of the high-order byte of the highest address that you want saved. This is a mouthful, but here is an example that might make it easier.

Set up a disk for experimentation that you don't value too much (in case of disaster). This disk should include DDT and several other files. Just for fun, have an empty disk available as well. For this

first example, we are going to play with STAT.COM. Enter the command:

```
DDT STAT.COM
```

Don't put any quote marks or anything else with it. You may use drive references if necessary or convenient. If all goes well, you should get echo like this:

```
DDT VERS 2.2  
NEXT PC  
1580 0100  
-
```

If that famous user-friendly "q" appears instead of the words NEXT PC, you are supposed to understand that the filename STAT.COM wasn't found.

The numbers are telling you that the file you loaded went into memory from 0100h to

1580h. For our purposes, the most important number is the high-order byte of the first number. In plain English, this means the first two digits or the 15.

Exit DDT by hitting <Break> (Control C), which will take you back to the operating system without delay.

At this point you are ready to experiment with SAVE. You know that 15 is the magic number, but first, it must be converted into a decimal number. After reviewing the table of equivalents, you will find that 15h converts into 21 in decimal. So, enter the SAVE command by typing at the A>

```
SAVE 21 SS.COM
```

When selecting a filename, be careful to use a new filename because if you specify one that already exists, you will overwrite and destroy any file on the drive with the same name.

You should now have a perfectly functional copy of STAT.COM written on your disk under the name of SS.COM. Don't test it out just yet because if you do, you will destroy the memory image.

Put another disk in your computer. You can swap disks in drive A:, or if you have multiple drives, insert a disk in another drive. Hit the BREAK key as necessary to inform the operating system of the disk change. Now do the SAVE routine again. Enter once again

SAVE B:SS.COM

12 rows of numbers. To the left will be a 4-digit number, which is the address of the first byte on that row, followed by 16 numbers, all of which are in HEX notation. To the right will be the ASCII translation (if any). A period will appear for any character that does not have an ASCII VALUE.

Beginning on the third line, right after the number 0130, you should see the words DDT VERS. We are going to guess that this is where the similarly worded message is stored. To prove our guess, we are going to change a character of that message, exit DDT, SAVE the file, and check it out.

We must compute the address of the byte we want to change, which isn't too hard if you can count to 16 in Hex nota-

**Y**ou can use DDT to write and modify programs, trace the execution of programs, disassemble programs, move files from one place to another, or examine the contents of your memory.

You can save the same memory image as many times as you like, under as many file names as you like, without any limitation relative to disk swaps. This is also one of the few ways to move a file from one user area to another. To do this, simply change user numbers between saves.

Stay with it until you master using the SAVE command because if you don't figure it out, anything you might do with DDT is going to be a waste of time.

We are now ready to attempt a simple patch to demonstrate our abilities. Our first task is going to be to patch DDT itself so that the DDT VERS 2.2 will read dDT vers 2.2. Specifically, we are going to endeavor to change the first "D" in DDT to "d". To do this, we use DDT to load DDT.COM as follows at the system prompt A>:

DT DDT.COM

Note that the high-order byte is 14 (See Figure 1) so we will be using 20 as our SAVE parameter when we get done. Enter the letter "D" to display some memory on the screen; you should get

tion. The third row, for example, will contain addresses 0130 to 013F. In this example, the first "D" of DDT appears in position 0130.

Accordingly, we are ready to start the actual patch. Enter:

S0130

to SET a value at address 0130. The value of that address will now appear on the screen with the cursor beside it. You are expected to enter a new value. The value echoed should be a 44 as that is the Hex value of an upper case D. Since we want to change this to a lower case d, enter the number 64. As soon as you push <Enter>, the value of the next address will be echoed, and the process will repeat itself until you enter a "." to signify that you are done.

Since we are only patching one byte, enter a period in response to the second 44. We should have something looking like this:

```
- S0130
44 64
44 .
```

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SAVE 20 DX.COM

DX.COM should be a patched version of DDT.COM. To test our work, load DX. DX.COM should be a perfectly working version of DDT.COM, except that the first D of DDT VERS should appear on the screen in lower case.

Think for a moment what would happen if you put the hex value of the operating system's "clear screen" code in this location instead of a lower case d. Let's try it.

Use the same patch routine again, except this time put in a 1A (if you have Lifeboat or ATON CP/M) or a 0C (for Pickles and Trout CP/M). The screen should clear itself each time you load this newly patched version.

By using this technique, a brave hacker will find that he can patch his frequently used programs to clear the screen or otherwise initialize the terminal. I have occasionally found that a thoughtful programmer has left one or more line-feeds (0Ah) right in front of the copyright notice on the program. It is often possible to change one of them to a clear screen code, thus getting the program to clear the screen instead of simply rolling down a couple of lines when it loads.

Any such modification is obviously made at your own risk on a trial and error basis. Therein lies the art of hacking. You don't really know ahead of time whether a particular modification will work or not, but with lots of trials and lots of errors, you can learn all sorts of interesting things.

The following remarks are written specifically on the assumption that you have the current version of Pickles and Trout CP/M (2.2m) and WordStar 3.3. It is believed that these patches will work on earlier versions of P & T CP/M. Some of them will work with Lifeboat and ATON CP/M as well. It is further assumed that you have a working version of WordStar 3.3. Pickles and Trout has a patch dated August 12, 1983 that must be installed to get Version 3.3 to work with the video board; it should be installed before attempting the following hacks.\*

One thing you can do to WordStar to make it a little easier to use is to adjust the timing. WordStar has several built-in delays which are easily adjustable, and one of those delays controls the time that you must stare at the logo and the copyright notice. The other major delay controls the time sequence between help screens. Once you have used WordStar a few times, you will likely find the long delays in loading the main menu maddening. The remedy is as follows:

```
-S02B2
02B2 40 00
03B3 09 .
```

In this example we have patched a single byte from 40 to 00 and then signified that patching was complete by entering the period.

**A**ny modifications are made at your own risk on a trial and error basis. Therein lies the art of hacking.

This patch is useful on any WordStar installation of version 3.3, regardless of whether it is on Radio Shack equipment or not. It will send you zipping right past the logo and copyright notice. Similar results may be obtained on Version 3.0 by patching address 02D2 to zero (any smaller number will cause a proportionate increase in speed). All of these patches are installed using DDT, and

\*To patch P&T CP/M 2.2m or 2.2H so that WordStar version 3.3 will work, first execute WINSTALL. Then (1) select the Pickles & Trout terminal option, (2) leave the printer options unchanged, and (3) exit WINSTALL using the "A" option. Patch the WS.COM file this procedure created.

Execute the PATCH utility. The file you wish to patch is WS.COM. Press <ENTER> when asked if you wish to use a file or type in the patch directly, and then type in the following code as prompted by the line numbers:

```
Line 1 --> RAC IIO ARA CIL OHR ALF
Line 2 --> CKE OOR ACK KML QAC IGM
Line 3 --> IML QAC IILN CQA CKE NJJ
Line 4 --> JQA CKK OFQ ACJ PPP QAJ
Line 5 --> ACK PAK AKU PEO GCC
```

You may use WINSTALL.COM to install any WordStar option except a terminal driver on this newly patched version of WS.COM.

you must execute an appropriate SAVE command at their conclusion.

The next thing you might want to do is to suppress the display of that rather ugly logo altogether. This patch will work on any 8-bit installation of WordStar 3.3. The patch is:

```
-S410F
410F CD 00
4110 CD .
```

The logic of this patch is built around the fact that the logo display is simply a long string, and it seems that WordStar uses a null byte (00h) as a string terminator. By simply patching the first byte of the logo to null, WordStar is fooled into displaying nothing.

Immediately following the logo is the traditional installation message and serial number display. It, too, has been cluttered up with about 10 lines of obnoxious messages that you will rather not read more than once. The following patch will take care of that message:

```
- S3F1D
3F1D 20 00
3F1E 54 .
```

With the installation of these two patches, the startup display of WordStar 3.3 will be the same as it was with previous versions of WordStar. If your timing patch was successful, you should reach the main menu almost instantly after you start to load the program. No painful waits. It should be noted, however, that reducing the built-in timing delays will make WordStar seem somewhat jumpy. Those same delays that annoy an experienced operator are confidence builders for the inexperienced. The contents of the timing byte merely control the size of the delay loop.

I use zero for maximum performance, but if you find the sudden screen changes unnerving, you can adjust the number to suit your preference.

The byte immediately prior to the timing byte described above (02b1h) is also a timing byte. It is normally 19h and controls the time delay between help-screen changes. It may be similarly adjusted to your personal preference.

The next problem with WordStar relates to the fact that MicroPro does not support arrow keys or special function keys. This is a policy decision on their part and is understandable considering the massive lack of uniformity that exists in the industry relating to special purpose keys.

There are a couple of approaches possible with respect to arrow keys and the like. First, you can (if you have ATON or P & T 2.2m) redefine the operating system so the arrow keys generate the values WordStar expects for cursor movements. The second choice is to change WordStar so it matches the operating system. The disadvantage of changing the operating system is that you may find the changes made to ac-

commodate WordStar mess up some other program you may want to use. If you elect to customize WordStar, you can avoid that trap. The threshold question about the arrow keys must be: "What would you like them to do?"

The question is interlocked with the problem of doing something about a delete key. The default installation implements the down-arrow key (1Fh) as a destructive backspace and the ^Q (arrow down) as a delete-line-left command. This, of course, duplicates the use of the control dash (^-) key, but the latter is relatively inconvenient to use, particularly considering that the destructive backspace is a very frequently used command (at least by strike-over typists like yours truly).

My solution is to redefine the backspace key (^h) so that it is destructive (i.e., "gobble left"). This will free up the down arrow key to be defined to do what arrow keys ought to do, and still leave you with plenty of ways to move the cursor to the left without "gobbling." The ^S key will, of course, do the job, and, if you have a Model 12, so will the <F8> key. Similarly, if you have Pickles & Trout CP/M, the <HOLD> key will

also generate a Control S, unless you change it.

To modify the backspace key in WordStar version 3.3, use the following patch. Incidentally, this patch and the others given here will work with any variant of CP/M but are only usable with version 3.3 of WordStar. The ATON patch for WordStar 3.0 includes some of the same ideas I have described, and does implement the arrow keys, although in a slightly different way than that discussed here.

```
-S04A3
04A3 DA 43
04A4 63 68
04A5 04 .
```

To make the ^QH (backspace) function as a delete-line-left, patch as follows in version 3.3:

```
-S0522
0522 1F 08
0523 44 .
```

Now that we have fixed the backspace key to do our deleting, we can feel free to define the arrow keys as we see fit. The common implementation of arrow keys is to set them up so that they move

# SCRIPFIX\*

One of the weakest points of Model II Scripsit is the fact that if something happens to glitch *ONE* of the documents, the whole document menu is *UNUSEABLE*.

The only advice that Fort Worth has to offer is to make backups. That advice is certainly the best, and as long as you do it often enough you'll never need *SCRIPFIX*. *BUT*, what if you're like most of us and forget, or maybe you were in a hurry and just skipped the backup process the last few times and *THEN* something happens. Disaster . . . Sometimes it's not even just a matter of retyping, which is bad enough, but it could be that creative work is lost. Oh! It's such a sad thing to see a grown-up cry!

Well, dry away the tears, because, now, there's a solution to this all too frequent problem. *SCRIPFIX*\* restores your files to a readable state. After a Scripsit disk has been worked on by *SCRIPFIX*\*, the Scripsit menu will once again be readable. Even files which you purposely deleted will be shown in the menu. So, if you accidentally delete a document that you wanted, *SCRIPFIX*\* will get it back for you.

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the cursor a single space in the direction of the arrow. I have studied the use of WordStar for several years, however, and am convinced that this is not the most efficient implementation. With respect to the left and right arrows, it strikes me as redundant to implement them as a ^S and ^D. The reason for this is that the ^S and ^D keys are easy to reach, not to mention the fact that if you have a Model 12 you have the <F8> and <F3> keys available.

It seems more reasonable to utilize the left and right arrow keys to move the cursor to the end of the line (^QS and ^QD). I find myself using these functions frequently, and they are quite awkward to use. Also, by implementing the arrow keys, you are replacing a three-key combination with a single key.

I have experimented with the idea of using the up and down arrows to move the cursor to the screen limit, but there just doesn't seem to be much demand for that function. I have accordingly stuck with a single line up and a single line down for the up and down arrows. Anyhow, patch as follows (Vers. 3.3 only):

```
-S0655
0655 00 1C
0656 00 00
0657 00 67
0658 00 64
0659 00 1D
065A 00 00
065B 00 49
065C 00 64
065D 00 1E
065E 00 00
065F 00 B4
0660 00 64
0661 00 .
```

```
-S0547
0547 43 9A
0548 68 64
0549 07 .
```

Patches always seem a bit mystical, but the foregoing keyboard modifications are really quite simple, and, with a little imagination, you can make up your own patches to change the keyboard if you don't like my suggestions.

The main information that you need to know in order to hack your own patches to the keyboard is that WordStar contains a keystroke dispatch table beginning at about 0489h. The table consists of four byte sequences which extend to 0655h. The first two bytes of the set are the values of the keystrokes and the second two bytes are the dispatch address of the function. Beginning at 0655h are a number of empty bytes which may be used for defining additional keys.

I obtained the information, for example, for the left arrow patch by reading down the table to 04B9h where I found the sequence: 11 13 67 64. This tells me that the ^QS function is called at address 67 64. Accordingly, I implemented the left arrow key, which generates a 1C, by adding onto the end of the table the sequence 1C 00 67 64.

If I had wanted the left arrow to perform a character left (^S), I would have looked at 049C and found the sequence: 13 00 DA 63. This would have told me that the dispatch address for ^S is DA 63. Accordingly, if I were to patch at 0655 the sequence 1C 00 DA 63, the left arrow key would move the cursor left one character.

For those of you still using older versions of WordStar, you need to know that the keyboard dispatch table is almost the same, but not quite. The addresses for Version 3.0 are a few bytes

I have two bits of advice about hacking: (1) make lots of backups, and (2) keep lots of records about what you do.

different. For example, the keyboard patch area for vers 3.0 begins at 0649h and at 063Dh for version 2.2. If you can learn to read HEX dumps, you can modify any version of the WordStar keyboard anyway you want.

The final modification that I shall discuss is only relevant to memory-mapped installations of WordStar. WordStar annoyingly leaves the screen cluttered on exit to the system. If you are using a standard terminal emulation installation, you can solve this problem by simply putting your terminal clear screen code into the the terminal deinitialization location (vers. 3.3 only). Unfortunately, the memory-mapped installations ignore all the terminal codes so this technique will not work with the P & T memory-mapped installation. This doesn't mean it can't be done; it just means it's more difficult.

The basic tidbit of information you need in order to develop a patch to clear the screen is that WordStar version 3.3 always calls address 028A before shutting down (02A7 on version 3.0).

At that address, you will normally find a C3 followed by two other numbers. If you use the DDT L command, DDT will disassemble the code for you. You do it as follows:

```
-L028A
028A JMP 02D2
(several more lines will follow)
```

This is telling you that as a part of the shutdown routine, WordStar makes a Jump to address 02D2. What we have to do is divert control to our special clear screen routine and then redirect control to the target address found at this location.

The next task is to find a safe place to add a few lines of code. The official location for terminal patches begins about 02E0h; however, in all the memory-mapped installations on the Radio Shack equipment, you will likely find the first part of this area full.

No great magic is involved in finding a place to put some code. In version 3.3 with P & T, the empty space beginning at 02f1 may be used. In Version 3.0 and P & T, I put the patch down in the printer patch area at 0660h because the terminal patch area looked like it was full. With Lifeboat and ATON (vers. 3.0), the patch went in at 339E. I selected this area because it immediately followed the standard Lifeboat shutdown patch located at 336D and appeared to be empty.

A word of warning is in order about slamming in patches here and there, however. The mere fact that you find a hole in the code with a batch of null bytes in a line does not necessarily mean that the area is unused. Check out your results very carefully.

Now comes the time to do a little assembly language programming and maybe get ourselves in a lot of trouble. We will use the "a" command of DDT. (The example is for Vers. 3.3 with P & T CP/M.)

When using the "a" command of DDT, you are expected to enter the "a", followed immediately by the address at which you wish to work. Once this is done, you are expected to enter standard

8080 assembly-language commands and conclude with a "." when done.

Our first task will be to transfer control from 028A to a location where there is more space, since we can't do what we need to do with only three bytes of space. This is accomplished with the following:

```
-A028A
028A JMP 02F1
02A0 .
```

What we have just done is to insert the logical equivalent of a GOTO statement at our intercept point. Execution will JUMP to address 02F1 (for better or worse) whenever WordStar goes into the exit mode.

We are now ready to assemble a clear screen command:

```
-A02F1
02F1 MVI E,0C ; put ^L in register E
02F4 MVI C,02 ; select CP/M function 2
02F6 CALL 0005 ; goto CP/M entry point
02F9 JMP 02D2 ; send the program on about
02FA . ; its business
```

A more cautious programmer might have added a few more lines of code to his routine to save all the registers before executing this routine. If you disassemble the subroutine at 02D2h, you will see how this is done. I have not done this because the intercept vector is a documented location for inserting such routines, and because my years of experience have disclosed no adverse effects from my failure to do so.

It is my notion that if you will take the few hours necessary to learn to use

DDT, you will find yourself richly rewarded. You may not like the particular patches I have described here, but at least part of this article is intended to provide some tips on how to develop your own patches.

I have two bits of advice about hacking: (1) make lots of backups, and (2) keep lots of records about what you do. These two procedures can save you from re-inventing the wheel later. The screen dump feature of P & T 2.2m is ideal for keeping records of hacking attempts. As soon as you enter the patch, and while it is still showing on the screen, you can simply dump the screen to the printer and bingo, you have a paper record of exactly what you did. ■

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Director,  
TCBUG Special Interest Groups  
Pueblo International, Inc.  
G.P.O. 3288  
San Juan, Puerto Rico 00923  
Attn: James E. Larkins

```
A>DDT DDT.COM
DDT VERS 2.2
NEXT PC
1480 0100
-D
0100 01 BC 0F C3 3D 01 43 4F 50 59 52 49 47 48 54 20 ....=..COPYRIGHT
0110 28 43 29 20 31 39 38 30 2C 20 44 49 47 49 54 41 (C) 1980, DIGITA
0120 4C 20 52 45 53 45 41 52 43 48 20 20 20 20 20 20 L RESEARCH
0130 44 44 54 20 56 45 52 53 20 32 2E 32 24 31 00 02 DDT VERS 2.2$1..
0140 C5 C5 11 30 01 0E 09 CD 05 00 C1 21 07 00 7E 3D ...0.....!..~
0150 90 57 1E 00 D5 21 00 02 78 B1 CA 65 01 0B 7E 12 .W...!..x.e.e..~
0160 13 23 C3 58 01 D1 C1 E5 62 78 B1 CA 87 01 0B 7B .#.X....bx.....{
0170 E6 07 C2 7A 01 E3 7E 23 E3 6F 7D 17 6F D2 83 01 ...z...#.o}.o...
0180 1A 84 12 13 C3 69 01 D1 2E 00 E9 0E 10 CD 05 00 .....i.....
0190 32 5F 1E C9 21 66 1E 70 2B 71 2A 65 1E EB 0E 11 2...!f.p+q*e....
01A0 CD 05 00 32 5F 1E C9 11 00 00 0E 12 CD 05 00 32 ...2.....2
01B0 5F 1E C9 21 68 1E 70 2B 71 2A 67 1E EB 0E 13 CD ...!h.p+q*g.....
-S0130
0130 44 64
0131 44 .
-^C
A>SAVE 20 DX.COM
A>DX
DDT VERS 2.2
-^C
A>
```



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# REVIEW OF T/MAKER III

*T/MAKER III combines word processing, spreadsheet capabilities, list sorting/tallying and bar charting into one complete package. Taken separately, each individual function is out-performed by other programs available. The real power of T/MAKER III lies in the integration of its components.*

BY RICHARD TRAHAN

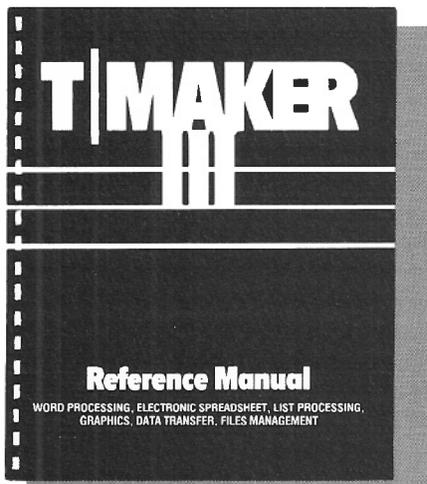
**T**/Maker III is an integrated word processor, spread sheet, file and list processor, and graph generator.

Distributed on CP/M, it must be configured for the target computer, for which a comprehensive utility is provided. Because of the complexity of the BIOS (Basic Input/Output System), configuration is not a trivial task and must be done by someone well versed in the intricacies of the operating system. If the Model II/12/16 user is lucky enough to be using Lifeboat CP/M, configuring is easy, since Model II Lifeboat is on a list of standard systems for which T/Maker III will provide the correct parameters automatically.

For any other CP/M, however, system parameters must be denoted manually which proved to be quite an ordeal for the Pickles & Trout CP/M used for this review. Problems were compounded by the fact that the Model II CRT code sequence given in the manual is wrong; a careful reading of P&T literature was necessary to remedy this. Once done, however, T/Maker III worked smoothly and efficiently and is friendly enough to be operated by non-programmers.

Printer setup is another chore for owners of the R/S Daisy Wheel or any other sophisticated printer. All of the

*Richard Trahan, President  
DATARIGHT Software, Inc.  
203 Main Street, Suite 43  
South Bound Brook, NJ 08880*



special control sequences needed for underlining, boldface, superscript, subscript, proportional spacing, and special characters need to be entered into a printer translation table, and the user is responsible for designating the text codes corresponding to these functions.

Print commands include some very handy features which allow the user to start a new page depending on how many blank lines are left on the current page, place a text line on a specified paper line, send the print image to the screen, selectively exclude pages without aborting the print process, print several documents without user intervention, and avoid line "windowing" in which the first line of a paragraph is stranded on the bottom of a page.

File chaining allows segments of various files to be linked and printed, much like the boilerplate utility found in other word processing programs. A

panelling feature allows documents wider than the page to be printed on separate sheets.

The editor is screen oriented, using a 300-character wide slate of height limited only by memory, over which the 80 x 24 window may be scrolled in any direction. A 68000 CPU will allow lines 400 characters wide. The usual WP functions are provided: insert and delete lines and characters, cut and paste, search and replace, set and clear tabs, define macros, break and join lines, center, reformat, forced end of page, blocking, headers and footers, and jump the cursor by entity. There are no alignment tabs or hyphenation capabilities.

String replacement works on all occurrences of the target; if you want to replace only the first few occurrences, you must do it manually or use a macro with a repetition count. Only one macro can be stored at a time. Both overstrike and insert modes are available, and autowrap may be turned on or off. Autowrap does not close up lines when deleting in a backwards direction. A table mode allows lines wider than the screen to be typed, and full column manipulation is provided.

The keystrokes often bear no mnemonic relationship to their functions which makes it difficult to memorize them, but a utility is provided to redefine keys and make them behave more like editors the user is already accustomed to. As a start, it is suggested that cursor movement control keys be

replaced by the HOLD and arrow keys.

Because of the gyrations CP/M must go through to display characters, upward or sideways scrolling require screen repainting which is annoyingly slow. Users of Model II dedicated word processors will have to change their editing habits to avoid these movements frequently.

Frame mode freezes row and column labels so these remain stationary while scrolling through the rest of the slate. Split screen labeling and scrolling is not available.

The spreadsheet capability works a little differently than most others. The row and column layout is set up in the editor, with the addition of special symbols placed in the top and left margins that direct the various computation procedures; then, separate utilities operate on this file.

A full range of arithmetic, trigonometric, and transcendental functions are provided, and there is great

flexibility in ordering computation. Features include horizontal, vertical, or mixed order, suppression of zeroes, growth rates, straight line and compound projections, rounding to any granularity, iteration, and invisible columns. A column is invisible when it is used to hold intermediate results but printing is not desired.

A COMBINE command will merge the spreadsheet in RAM with an identically formatted spreadsheet on disk, with some limited computation done between corresponding cells. This could be used, for example, to sum monthly ledger totals into a yearly total.

The list processing utility consists of eight commands that perform various functions on a text file. ARRANGE reorders the sequence of columns in the working area. (If the reader acquires T/Maker III, take note that the examples in the tutorial will not work for this function because the listed parameters are wrong.) FIND and REPLACE are self-explanatory string functions, and DROP is similar to

FIND and delete. KEEP discards all lines except those containing a specified string. MATCH reports the differences between two files. SORT allows ascending or descending, numeric or alphabetic sorting based on the contents of any field, as determined by column boundaries. TALLY counts like elements in a specified field, and can also total these if they are numeric.

The bar chart utility, brazenly called graphics, creates a chart based on the values in either one column or one row of a table, but BAR commands can be concatenated to produce rows of related bars. The chart itself can be edited before printing. It is easy to prepare tables suitable for both the COMPUTE and BAR commands, so extensive reformatting is not necessary. Various options are available: scaling the width and length of the bar, spacing between bars, space allocated to name and value labels for each bar, scroll enable/disable, and many others. Sets of bars from different files may be stacked in printed output. For example, you might want to compare

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data across several months, each month consisting of a set of bars and residing in a separate file.

A set of file management commands perform a variety of functions: CLIP discards all of a file above the top line displayed on the screen. CREATE establishes a new file. DATA establishes a default disk drive. DELETE removes a file from the disk. DO executes commands from the edit file. FILES lists the T/Maker III files on disk. GET loads a specified file for editing. INFOR displays statistics on the working file. INSERT adds a disk file to the current working file. LIST views a disk file without disturbing working RAM. MERGE superimposes a disk file on the working file. NOTABS and TABS control the saving of tab characters. RENAME, RESET, SAVE, STOP, and WAIT are self-explanatory.

The Data Transfer utility has two commands, LOAD and UNLOAD, used to combine or separate tables from data. This allows creation of a table template, or mask, that can operate on many sets of data. It also permits different computation schemes to be applied to the same set of data; if there is a change in data, only one file need be changed.

T/Maker III is not a paging or virtual system, i.e., it deals only with files small enough to hold in RAM. Despite T/Maker III's many powerful features, this single shortcoming disqualifies T/Maker III from serious business or professional use. Nor does file chaining save it; spreadsheet computations are severely limited by the size of the sheet -- only 21 calculation lines can be "active" at one time.

Even worse, a successful spreadsheet computation can result in a RAM image that can be saved to, but not recalled from, disk. The program should never allow this to happen; if you save it, you ought to be able to get it back. I spent two hours putting my year's business statistics into a spreadsheet, only to be left with an unretrievable file.

As with most applications programs, the file structure is not revealed, making it impractical for a programmer to pare T/Maker III output down to readable size. As a general rule, it is unwise

to use any program whose data file structure is unknown and which does not have a two-way conversion utility like Scripsit's CONVERT or VisiCalc's DIF.

Taken separately, the functions of T/Maker III are outperformed by other programs available for the Model II. The editor is no match for SCRIPSIT, and the spreadsheet is not VisiCalc.

The real power of T/Maker III lies in the integrations of its components, especially the user-defined layout of the spreadsheet.

The manual is well written, and except for some frustrating errors in the tutorial section, appears to accurately represent the behavior of the program. It was printed on an Epson, and the small type, which abounds, is difficult to read; this manner of printing is incongruent with a program of this magnitude.

T/Maker III is available for: CP/M-80, CP/M-86, and MS-DOS; these versions require 250K disk storage. T/MAKER III is also available for PC-DOS which requires 128K for one-double sided disk drive; two single-sided double-density disk drives are needed for 300K disk storage.

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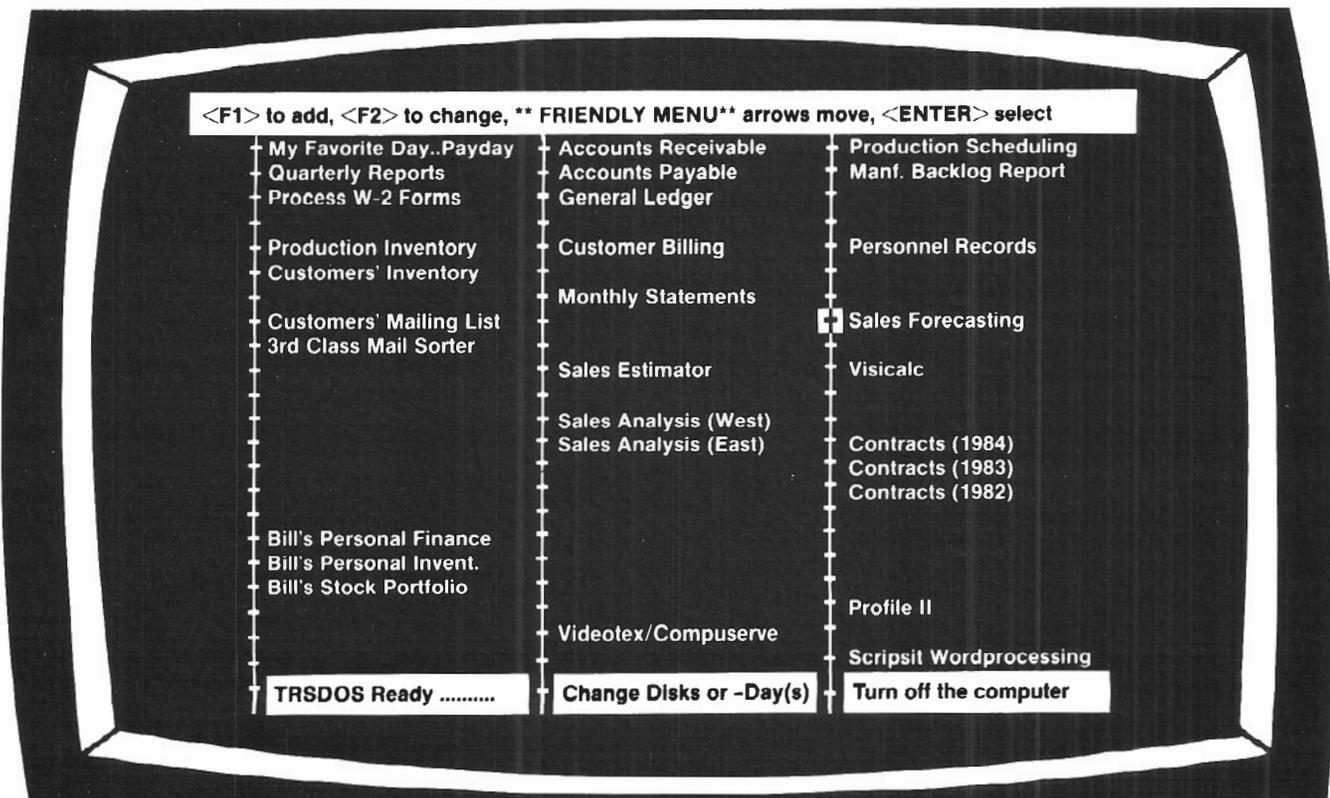
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# AN OVERVIEW OF PROFILE•16

*Profile 16 is Profile II Plus with all the enhancements you could ever dream of for your TRS-XENIX multi-user system.*

BY WILLIAM J. CLEMO, III

**P**rofile 16 was not meant for the user who only wants to convert from manual filing and indexing into a computerized system; that would be a gross under-usage of the program's capabilities. Profile 16 is intended for use by the imaginative and experienced Profile II Plus user.

Profile 16 running on XENIX allows multiple users to access and update the same file at the same time. Other users are automatically locked out (by "record lock-out") if another user is accessing a record. Lock-out occurs on the record level, not the file level.

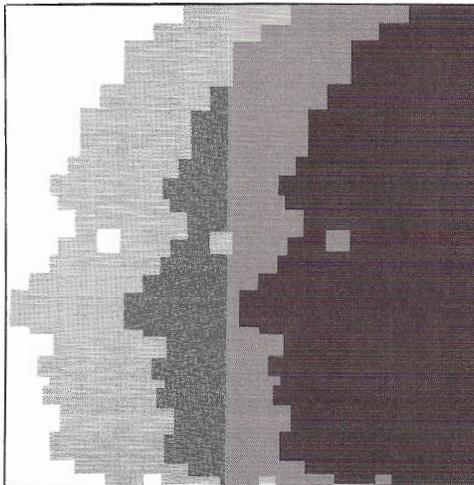
Profile 16 is user friendly to the point that you cannot get lost anywhere within the program. The program is menu driven. Prompts are provided at every screen to lead you deeper into the program or back out to the Main menu. There are no commands or keystrokes to memorize and no stabs in the dark to see if "maybe this will work." Each screen is labeled as to what you are doing or where you are.

It's possible to have up to 16 million records per file, 999 fields per record, and up to 4,608 characters in each record. The only limitation on the number of files you can have is the amount of free disk storage you have left. Any field within the file can be sorted or selected. Each file can be password protected to insure data integrity and prevent accidental deletion.

---

William J. Clemo III  
M & M Technologies Corporation  
P. O. Box 237  
Herndon, PA 17830

---



You can begin work in Profile 16 with a very simple data file structure and then build this data file into a complex and powerful system. A default screen and report are created automatically when you set up your file so you can have a working system in just a short time.

Profile 16 gives you all the full screen graphics that the Model 16 is capable of. You are allowed to have up to 200 fields per screen, and the number of screens you can have is limited only by the amount of free disk space left.

Profile 16 has 17 system maintained fields, some of which are "date of last update," "date last batch updated," "created by whom," "last updated by whom," and "time last updated." This gives you an idea of who is using the system most effectively and allows you to track the input trail of data.

The math functions added to the system allow for four function math (+ - \* /) and conditional math on numeric

fields, date fields, and time fields. Time fields can be converted from hour and minute to decimal format (12:30 → 12.5). Other math functions added are accumulators for cumulative totals, maximums, minimums, and averages. Mass recalculations can be done on all records or a selected group of records.

Output processing allows you to create mailing labels, single page reports, multiple page reports (255 columns by 255 lines) or free form reports (invoices, checks, statements, etc.). This gives you the option of running Profile 16 as your accounting system or using Radio Shack's accounting packages. The report format allows you to specify any graphics character your printer can print. Each report can have up to four subtotal levels (any number of fields can be subtotaled) and one grand total. Mailing labels can be printed horizontally or vertically. You can print reports, labels, invoices, or any other type of output to the screen or printer or batched mode to the printer. More information from other files can be brought together to create one report.

Profile 16 also gives you conditional processing. This allows you to write a processing route for someone to follow.

Conditional processing is the added programming language of Profile 16. Profile 16 gives you If, Then On, Gosub, Return Goto End logical conditionals within each processing statement (AND NOT OR). If you know anything about BASIC programming, this part is a piece of cake to use.

Profile 16 has 18 system edit types built-in (12 types of date fields and two types of time fields are included). Through the define processing option on the main menu, Profile 16 gives you another additional 26 screens besides the 10 screens you can set up with the define screens option.

You can set up user menus so the user does not have to see the Profile 16 menu. Each one of the user menus can lead through a processing mode to let you enter only certain information on that screen. Multiple files can be accessed to display each screen of information.

You can manipulate your files to create small spin-off files, purge off empty records, write new records in a particular order, purge outdated records to a new file or out of the original file, combine files together to create a new file, or add new data items to an existing file without having to recreate the file. Profile 16 lets you look for and organize records by associated groups of information, as well as individual fields.

Profile 16 is data transferable to Multiplan and the soon-to-be released SCRIPSIT-16 (we keep hoping).

Let's go through a point-by-point comparison of the features provided by Profile 16 versus Profile II Plus with enhancements.

**Files:** Profile 16 has increased the number of fields to 999 from the 99 fields of Profile Plus. The number of characters per record has been increased from 853 to 4608. The key segment is no longer limited in size to 85 characters but can be up to 512 characters in Profile 16. The record and field sizes can be changed even after data is entered into the file. The number of segments per file has been reduced to two on Profile 16 from four segment files of Profile Plus.

A full screen is used for setup of 16 fields at a time instead of each separate field one at a time. (Advanced File Definition and Shuffle show 32 fields when setting up a screen, but the file has to be redone to change one field.)

This gives you the opportunity to view larger segments of the file structure and edit each item individually. The whole file doesn't have to be deleted to restructure one field. On Profile 16, the file is automatically restructured when the fields are changed. The field types are set up when the file is created and not on the screen formats as in Profile Plus. Profile 16 allows up to 200 user defined field types. This gives you the flexibility to set up any type of record you might need. You can set up dummy or reserve fields to be used later with 0 field length. Temporary processing fields are now available.

Associated fields now have subfields per associated field in Profile 16.

There are 17 system-maintained fields in Profile 16 versus the one system-maintained date field in Profile Plus.

The number of records has increased from 64 thousand on Profile Plus to 16 million on Profile 16. The files no longer need to be expanded. The "Add Record" option automatically expands

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(All the above require at least 2 Disk drives [or a Hard Disk], and Profile+.)

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as necessary. The file expansion program is still included to have data files span hard or floppy drives.

Profile 16 running under TRS-XENIX means that multiple users can access the same file simultaneously. Record lock is used to stop two users from being able to access the same record at the same time.

A creation password can be set when the file is created so data formats cannot be deleted by someone who doesn't have the password. File formats, complete data files, or just the data within the file can be viewed or deleted from the Profile 16 directory.

**Screens:** Profile 16 has added a default screen (Screen 0) that is automatically created when the file is created. The number of screens has been increased to 10 (0 through 9) on Profile 16 from the five on Profile Plus. Screens A through Z have been added as a part of the processing routines in Profile 16. This gives you a total of 36 screens per file. The guess work about where you are on the screen during setup has been taken out of Profile 16 by giving you a line and position counter on the bottom of the screen.

The path which the cursor follows through the screen can also be defined.

**Reports, Labels, and Special Forms:** You are not limited to five report, five label, and five merge formats per file on Profile 16 as in Profile Plus. The number of report formats is only limited by disk space available. Each report format has a filename on Profile 16. You can use any character that your printer can print on a report. Profile 16 has added the ability to print a report, label, or special form right from Inquire Update and Add mode. You can also input information into the report while the report is being printed. The print parameters for each report are set up when the report is created and not at print time. Profile 16 gives you both subtotals (up to four subtotal levels) and grand totals, unlike Profile Plus's grand total and one subtotal level. Profile 16 now includes up to eight sort levels per report, and full math capabilities are now a part of report formatting.

**Inquire, Update, and Add:** A form or mailing label can be generated directly from Inquire, Update, and Add option. When you press <ESC> to record a screen, the automatic processing can put you in the Update mode on another screen.

Profile 16 provides two levels of error checking: (1) processing options on the input characters, and (2) edit types for the type of input (dollars and cents format, date or zip code type fields). Information can be looked up before displaying the screen or after certain processing requirements are met or specific data is input.

**P**rofile 16 was not meant for the user who only wants to convert from manual filing and indexing into a computerized system.

Profile 16 now allows for string manipulation of data (same as the BASIC statement MID\$). With the processing tables, you can ask for input after the screen has been recorded, or even add input to the record itself. The Add Records mode automatically expands the file size when records are added. Mass update and purge are now user definable functions (but only during processing).

**Indexing:** The number of indexes has been increased to twelve on Profile 16 from the one index per file on Profile Plus. Profile 16 maintains two indexes automatically (A and B) (the automatic indexes have to be set up prior to use in each file) and the other ten (0 through 9) are user definable. The indexes can organize output as well as access records for inquiry.

**Math Formulas:** Cumulative totals of fields with the total as a data item is now allowed in Profile 16. Conditional math has also been added. Profile 16 allows parentheses in math formulas,

and mass recalculation is now a user-defined process (only during processing).

**Batch Processing:** The ability to archive records between files that are different file sizes has been added to Profile 16. Now you can open a file and add a record while processing another record from another file. Multiple files can be used in a screen format or reports or to create a new file. Profile 16 also gives you the posting option. You can use this to look at a transaction file and use the transaction file to update a master file.

**Menus:** User menus now have the capability of up to 24 entries in a one- or two-column format. Profile Plus only allowed twelve entries in a single column format. Profile 16 user menus return you to the menu where you came from, not the main menu as in Profile Plus. A utility menu has been added to ease the backup and restore functions.

**Sorts and Selections:** Profile 16 places no restrictions on the type of date fields that can be used accurately in a selection format. Profile Plus had to have the date in a year-month-day format to sort correctly. Selections options can be made when the selection format is created in Profile 16 and not re-entered each time the selection process is used as in Profile Plus.

Demand Indexing and output printing now have eight sort levels. There are extended selections for Inquire, Update and Add, demand indexing and output printing, plus each selection set can be referenced within other selections.

**Other Capabilities:** Profile 16 interfaces with multi-user Multiplan.

The file name can be preset from the program main menu, and as long as you're in Profile 16, the file name will be filled in for you automatically when you are prompted for a filename.

*The next issues of Advanced Computing will contain articles with more technical information on each of the Profile 16 menu items, discussions of the bugs and shortcomings of the Profile 16 system, things you can do with Profile 16 that aren't documented in the manual, and how to interface Radio Shack's accounting packages with Profile 16.* ■

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We've received lots of calls from subscribers interested in finding out more about our new Advanced Computing Service. The question most often asked is: "What are you *really* going to include?" They're especially interested in both the diskettes and the bi-weekly newsletter we're offering as part of the Service.

The diskettes will be sent to Advanced Computing Service subscribers five or six times per year. The material included on these diskettes will be divided into three general categories: (1) everything *two/sixteen magazine* (or *Advanced Computing*) has ever published that includes program code; (2) programs that have been received by *two/sixteen magazine* but were not publishable because they were too long, or too esoteric for the general readership; (3) public domain programs that will be made more valuable than those found on bulletin boards because they will have been tested and, if necessary, the source code fixed so they will run on TRS-80 Models II, 12, 16, or 2000. At least one diskette per year will be devoted exclusively to each of the major operating systems (TRSDOS, CP/M, XENIX, and MS-DOS).

The Advanced Computing Service Newsletter, to be sent to subscribers 26 times per year, will differ from *Advanced Computing Magazine* in one very important respect: the ACS Newsletter will bring you timely information where *Advanced Computing Magazine*, because of its publishing schedule, is not able to keep its readers up-to-the-minute with the latest pertinent developments in the microcomputer industry. The ACS Newsletter will feature new product announcements for exciting new programs and peripherals that will work on your business micros. The ACS Newsletter will also include abstracts of articles drawn from a large base of respected microcomputer magazines that you don't have time to read for yourself. The Newsletter will carry only articles of interest to serious microcomputer users.

We're happy to discuss the available features of Advanced Computing Service. After all, telephone consulting is also a part of the Advanced Computing Service! Call us at 717/397-3364 with your questions.

## UPDATE

# "MASTER YOUR QWERTY"

In the September-October 1983 issue of *two/sixteen magazine* (Vol. 2, No. 2, p. 30), we published a touch-typing tutorial by Waldo T. Boyd entitled "Master Your QWERTY." The program included with the article has been causing problems for some people, and Mr. Boyd has been kind enough to forward the following minor modification:

Line	910	delete
	970	delete last part beginning with the colon (leave line number and PRINT CHR\$(2) intact).
	1100	delete
	1110	delete
	1120	delete

Mr. Boyd explains: "These lines were involved originally in placing a blow-by-blow accuracy and speed report on screen. This proved to be distracting to the user so I stripped it out ... only it seems the above escaped my not-so-eagle eye."

Also, for those of you who might be interested, Mr. Boyd will copy the complete "Master Your QWERTY" program onto anyone's *pre-formatted* (important!) diskette for \$25.00 postpaid USA, \$27.00 Canada. Send to:

Waldo T. Boyd  
P. O. Box 86  
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# HOW TO GET MORE OUT OF P&T CP/M 2.2M

BY CHRISTINE PICKLES

**W**e at Pickles & Trout were pleased to see Mr. Robert VanNatta's recent review of our new CP/M 2.2m operating system for Radio Shack's Models II/12/16 (*two/sixteen*, Nov/Dec, 1983). While we disagreed with a few of his opinions, we do not feel that it is necessary to comment on them. Rather, we would like to point out some of the capabilities of P&T CP/M 2.2m which have apparently not yet influenced Mr. VanNatta's operations and which we believe can help both Mr. VanNatta and other *two/sixteen* readers to use the system more effectively.

As Mr. VanNatta indicated, P&T CP/M 2.2m includes many features which make it a unique CP/M system. Of these, we believe the following are the most noteworthy.

First, the P&T master diskette was designed so that it would automatically make a copy of itself, thereby insuring that a new user can have the system backed up and ready to run within minutes.

Second, we modularized the system so that it could easily be configured to run a variety of Radio Shack and non-Radio Shack peripherals and so that we could offer our users a variety of useful utility modules. The four utility modules that are presently available allow them to (a) program up to five keys with character strings and/or command lines, (b) change the codes transmitted by up to 16 keys, (c) print the screen at anytime, and (d) make the P&T screen driver emulate an ADM 3A terminal.

Third, we included three alternative methods for performing system operations. Thus, a user may take advantage of:

1. A system MENU program that was designed to make it exceedingly easy for even our most inexperienced customers to organize and use the system effectively.
2. More than twenty P&T utility programs, most of which can be executed both interactively from the screen and from command lines.
3. Thirty-five P&T "Special System Functions" that allow a user to alter the system's parameters from programs written in many higher level languages.

Finally, we added a special, preconfigured version of the VEDIT editor for customers who require the use of a full-screen editor.

The value of each of these features should be fairly obvious. On the other hand, we realize that even our more experienced users might overlook how easily they can combine these features to create an exceptionally friendly environment for inexperienced end-users. The following paragraphs provide a few hints on how this can be done.

Many business offices now have both serial and centronics printers. Too often, this fact can require the presence of someone who knows how to alter the operating system to communicate with one printer or the other. With 2.2m, the delays and frustrations this entails can easily be overcome by following these four steps:

1. Use Vedit to write a simple SUBMIT file that looks something like the following:

```
:  
: Press <ctrl-4> to use the letter-  
: quality printer.  
: Press <ctrl-5> to use the dot-matrix  
: printer.  
:
```

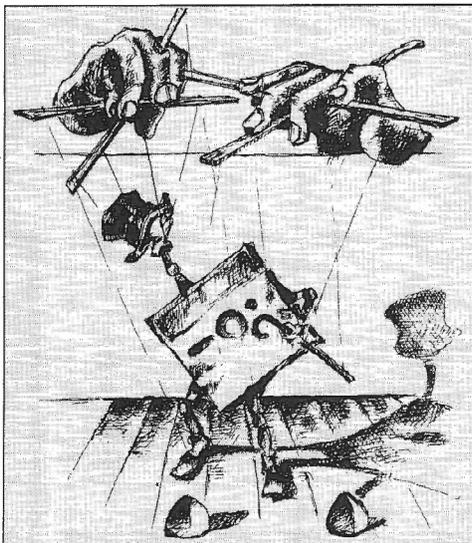
2. Auto-execute this SUBMIT file after every cold boot to remind the end-user of the options.

3. Program <ctrl-4> and <ctrl-5> with the strings "ASSIGN LST:=SIOA<esc><enter>" and "ASSIGN LST:=CENTRON<esc><enter>" respectively. And then

4. Save these keys using the KT option of MENU.

It is almost as simple to combine a programmable key and SUBMIT file to insure that data files are properly backed up. For instance, if an office manager made <ctrl-1> the office-wide "back up" key, he or she could then program this key to execute the command line "SUBMIT BACK<esc><enter>" on every system diskette in the office. BACK.SUB might then be written as follows:

```
FORMAT DRIVE=B: DD V PMOUNT  
CLONE B:=A: ALL V
```



A brief explanation of this file is perhaps desirable. The first of these commands will prompt the user to mount the diskette to be formatted (PMOUNT), format the diskette on drive B (DRIVE=B:) at double density (DD), and verify it (V). The second command will make an image copy of everything (ALL) on the diskette in drive A onto the diskette in drive B (B:=A:) and then verify (V) the accuracy of the copy. (One could of course use PIP to write more precise copy commands: e.g., PIP B:=A:\*.DBF[v] will copy dBase II data files from drive A to drive B.)

Many more complex operations can be organized, especially if a user has some programming background. For instance, since there is nothing more unnerving to new users than system error messages which do not tell them what they should do to remedy the situation, a programmer may want to set up the system so that he or she determines what messages are sent to the end-user. Fortunately, it is relatively easy to do this if the utility programs are being executed from a file like BACK.SUB (described above). Only two steps are involved: (1) modify each utility's command line so that its error messages are sent to a file rather than to the screen, and (2) write a short program that scans the output file for error messages and determines what instructions should be sent to the end-user. An appropriately modified version of BACK.SUB indicates how this should be done:

```
FORMAT DRIVE=B: DD V PMOUNT /A:CHECK1.ERR
MBASIC CHKPGM1
CLONE B:=A: ALL V /A:CHECK2.ERR
MBASIC CHKPGM2
```

In this case, each utility sends its error messages to its CHECKn.ERR file, which is then scanned by the corresponding CHKPGMn program. (Please note: since there is a sample MBASIC program of this type in the *P&T User's Manual* and on the P&T master diskette, even a neophyte programmer can use this technique.)

A second example: one can easily standardize the keyboard interface to different programs by using 2.2m's ability to "translate" up to sixteen keys. There is a system utility, called KXEDIT, which allows any user to translate the keys interactively from the screen. However, anyone with even a little programming experience can make it even easier than this for the end-user by (1) writing one small "key translation" program for each software package used, and (2) combining each set of programs in appropriately named SUBMIT files. For instance, the following BASIC program will translate the arrow keys so that they will send appropriate codes to WordStar (e.g., so that the <up arrow> key will transmit the <ctrl-E> code):

```
10 ' Program to translate arrow keys
20 ' Alert KEYXLATE that codes follow
30 PRINT CHR$(27);CHR$(24);
40 ' Send codes of keys being translated
50 PRINT CHR$(28);CHR$(29);CHR$(30);CHR$(31);
60 FOR I=1 TO 12 : PRINT CHR$(128); :NEXT;
70 ' Send new codes of keys being translated
80 PRINT CHR$(19);CHR$(4);CHR$(5);CHR$(24);
90 FOR I=1 TO 12 : PRINT CHR$(128); :NEXT;
```

If this little program is executed just before Wordstar in a SUBMIT file (called, for instance, WS.SUB), it will automatically re-configure the keyboard so that the arrow keys will work like arrow keys are supposed to work.

We might profitably add two further notes on translating the keyboard. First, since there is a modified version of the above program in our manual and on the P&T master diskette, a user can easily create several different key translation programs using it as a model. Second, there is an alternative (albeit somewhat more limited) procedure for non-programmers that allows them to use VEDIT to create a key translation file. The user need merely TYPE such a file to the screen to change the key translations.

A person with somewhat more programming experience can make the system even easier to use by utilizing 2.2m's 35 "Special System Functions". In essence, these are small routines that can be "called" from high-level languages to perform a variety of system operations: e.g., directing output to particular I/O ports, reading system time and date, splitting the screen, sending flashing messages to the screen, etc. Using these capabilities, a programmer can design application packages that require little more of the end-user than the ability to follow simple directions appearing on the screen.

Perhaps the most exciting capability that 2.2m offers programmers and vendors is the means to pre-determine the operating parameters of any 2.2m system on which their programs are installed. The procedure for doing this is extremely simple, because each 2.2m operating system includes one file (BIOSPARM.PNT) which determines exactly which modules, key strings, key codes, serial port parameters, etc. will be loaded into memory when the system is powered up or reset. It also determines what (if any) program will be auto-executed after every cold (or cold and warm) boot. Thus, all the programmer or vendor need do is (1) configure a copy of this file that will work perfectly with his/her own program, and (2) ensure that it is copied to the end-user's P&T CP/M 2 working system diskette (using a SUBMIT file perhaps). The result can be about as perfect a "turn-key" package as can be devised when two complicated computer programs are combined.

We could easily cite numerous other examples, but our main point should be fairly obvious. If we at Pickles & Trout knew exactly what hardware and software our customers would use, we could write a CP/M 2 operating system that is even easier to use than 2.2m. But since we can't, we have designed a system that someone else (who does have this knowledge) can tailor to the particular requirements of any situation. In general, we would suggest that this task be delegated to someone with some prior CP/M and programming experience, but even this is not necessary. Our "first class" documentation (to quote Mr. VanNatta) provides all the information that a diligent beginner needs to tailor the system. If the job is done well, the result can be a well-integrated package that anyone can use with a minimum of training. ■

In our November/December installment of this CompuServe series, Dr. Naitoh showed us how to get signed up with and signed onto CompuServe.

# COMPU SERVE

## Become A Frontiersman In The Land Of Nighttime

BY PAUL NAITOH

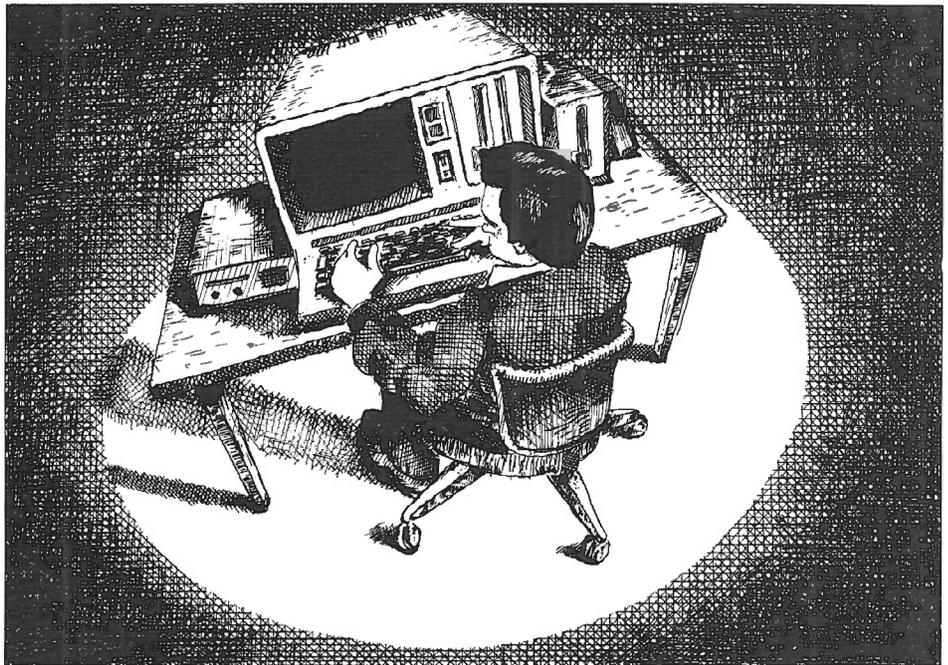
In this article, we'll discuss some tricks you can do with CompuServe. If you own Alfred Glossbrenner's book, *The Complete Handbook of Personal Computer Communications* (N.Y.: St. Martin's Press, 1983; \$14.95), you might try his "Three-Session Approach" to "Getting to Know The Sytem" (pages 113-118). I like to think of these sessions as guided tours of the new frontier-land. Anyway, be sure to check your CompuServe INDEX against Glossbrenner's before you proceed; some page numbers listed by him are no longer current.

### Electronic Mail

Suppose that a friend of yours is a CompuServe subscriber, and you wish to send your friend a letter via electronic mail. In response to the prompt 1, type in GO EMA <ENTER>. This will bring you to Page EMA-1, with its message asking whether you want to read mail addressed to you or whether you wish to compose and send mail. Type <2> to select option #2: write and send mail.

Choosing option #2 will provide you with a menu. To compose your letter, you are going to use CompuServe's FILE Generating and Editing program (FILGE). To know more about FILGE, you must buy a FILGE manual through FEEDBACK (more on FEEDBACK later).

Paul Naitoh, Ph.D.  
4446 Marseilles Street  
San Diego, CA 92107



When you receive the "Ready" message, you can start typing your letter. Each line should be 30 characters or so. This is not a word processor! You have to hit <ENTER> at the end of each line! Before you press <ENTER> to move to another line in your message, be sure to read carefully what you have typed. If you find errors in spelling or you want to rewrite the line, use <BACK SPACE> to erase the unwanted portion of the line, and retype. When you are sure that this line of text is all right, hit <ENTER> to go to the next line, and continue writing the next line of letter. (You can rewrite already entered lines, but for that you must know more about FILGE.)

After you are through writing the letter, you must enter a fresh line by pressing <ENTER> and then typing /EX <ENTER>. The /EX will get you out of letter-writing mode and back to the menu.

CompuServe will permit you to store your letter in your Personal Programming area (which has 128K byte space and is assigned to you as a part of your CompuServe subscription). To send your mail out, press <6>. According to the CompuServe brochure, electronic mail will be delivered within 25 minutes.

Reading your Electronic Mail is simple. At the Electronic mail menu, select option #1: "Read Mail." Then, you can follow the instructions displayed on the CRT to read your mail.

#### **Adding Lowercase to Message**

As you will notice quickly, most CompuServe functions can be chosen from a menu and are friendly to users as CompuServe offers many on-line instructions. However, certain CompuServe options are hidden and are not so obvious. For instance, you will receive all information sent by CompuServe in upper case characters only, even though the Model II has lower case characters as well. You must instruct CompuServe to change "terminal parameters" to have displays of text on your Model II/12/16 in a proper mix of the upper and lower cases.

There are two ways to go about issuing the instruction to give both upper and lower cases. The simplest is to type GO CIS-4 <ENTER> in response to any

prompt (!). On page CIS-4, hit <5> to select option #5 "Changing Terminal Defaults." You'll get the menu to change the "Default" to what you wish. There you should select the lower case capability option and make your option permanent. Immediately after changing the terminal parameters, you will begin to receive CompuServe messages in the upper and lower cases.

Another way is to type GO PCS-71 and then R DEFAULT in response to the prompt, (OK). Type in exactly as DEFAULT. A menu will appear, and you can print out on-line explanations of "terminal parameters."

CompuServe has two distinct areas: Display area with the (!) prompt, and MicroNET area with the (O.K.) prompt. Page PCS-71 is in the MicroNET area, known as the Personal Computing Area. Unlike Display, MicroNET has no menu and generally is more difficult to use. To move out of this area, type in either R DISPLA or EXI.

#### **FEEDBACK**

You use FEEDBACK, located on Page CIS-4, to place an order for instruction manuals and software or to leave messages for CompuServe. (They'll answer you via EMAIL). When using FEEDBACK, you are not charged for standard connect time. FEEDBACK is menu-oriented and easy to use.

#### **Special Interest Group (SIG):MNET80**

Some subscribers of CompuServe might be most anxious to get to know other owners of similar computers and peripherals. The best way to do so will be to join one of the Special Interest Groups (SIGs) in CompuServe. Type in GO PCS- 50.

CompuServe has three SIGs for TRS80s: TRS80 CoCo, MNET80, and POWERSOFT. Before you sign up with a TRS80 SIG, you may wish to just "look around" in these SIGs. To join MNET80 or POWERSOFT, you have to pay an extra fee of \$20 each to gain full access to all SIG data.

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Before you start looking into what MNET80 SIG can offer, it's a good idea to hit <HOLD><Z> to clear the computer memory. (To close off the memory, hit <HOLD><C>.) Then turn your printer on and press <HOLD><R> to start retrieving the SIG's data. If you are an "expert" user, you don't need to have a printer on. Instead, you can hit <HOLD><O> (not zero) to open the Model II's memory to store messages from CompuServe.

If you have selected MNET80 and have typed in MI (Membership Information) at the prompt, MNET80 SIG will display membership information. Some SIGS, such as the CP/M SIG, does not require any membership fee, and you can go right ahead using all of its services from the very moment you start browsing around in it.

does it give an option for UPloading your programs to be shared by all other members.

How can we DOWNload and UPload programs? How can we get to know what kind of people are members of MNET80 SIG? The owners of Models II, 12 and 16 would like to know more about the owners of these models in MNET80. This is where a new subscriber to CompuServe begins to grope in the dark, spending money and time.

#### A Few Handy SIG Commands

The XA command will take you into the SIG database, even though the menu doesn't tell you that you can do this. Just type in XA at the SIG Menu, and you will get a cryptic message ad-

various commands available for the SIG.

Type CAT/DES <ENTER> if you wish to know what sort of programs other SIG members have submitted. This will result in the printing out of a CATALOG of DEScriptions of currently available programs submitted by SIG members exclusively for Model II/12/16.

By the way, don't try this CAT/DES for subgroups 0 or 1 because there are so many programs in these subgroups, your request to print them all up will chew up your time (and money).

If you do not require detailed descriptions of the programs, just type in CAT <ENTER>, and this command will give you a one liner for each program in MNET80, such as:

```
[70045,1457]  HANGMN.BAS
12-APR-83 7515 ACCESS:3 30-May-83
```

Of course, you cannot really tell without a full description what this BASIC program named "HANGMN" will do for you, but this sort of listing is very handy when there are many programs. Each program is identified by the date of submission of the program (e.g., 12-Apr-83 in the above example), memory required for the program (7,515 bytes), the total number of times the program has been accessed by other members of CompuServe (three times for this program), and the last date this program is accessed (30-May-83).

The V command gives you Vitae of the members of the SIG. This is also called the "Interest Log," and you can search for members who are interested in the Model 100 or the Model II, etc.

#### Other SIG Commands

There are additional commands you can enter in response to the SIG/Access prompt: PUB, NOR, CAT, TYP, DOW, KEY, SUB, DEL, EXI, and HEL. In this list, you see the command you have been waiting for: DOW or TYP. These commands make it possible for you to copy the cataloged programs into your own computer memory or even directly to your own diskette. If you have CompuServe VIDTEX, the process of DOWNloading the program is simplicity in itself. Here is how.

**S**ome subscribers of CompuServe might be anxious to get to know other owners of similar computers. The best way to do this is to join one of the Special Interest Groups (SIGs) in CompuServe.

A lot of things can be done in MNET80, but you must learn many commands in the SIG. An inexpensive manual, *Special Interest Group Instructions*, is a necessary investment for that purpose. The menu is given whenever you enter the SIG to show you what you can do in MNET80 SIG.

#### Function menu:

1. (L) Leave a message
  2. (R) Read messages
  3. (RN) Read new messages
  5. (B) Read bulletins
  6. (CO) Online conference
  9. (OP) Change your SIG options
  0. (E) Exit from this SIG
- Enter selection or H for help:

You might be disappointed by this menu, though. It doesn't list an option for DOWNloading SIG's treasure trove of programs of MNET80 members, nor

vising you that you are in the SIG's database.

You will be asked to identify the database you wish to look at, and you must choose from the given options. These options represent the various categories into which the available computer programs are divided. The programs in group 0 are concerned with general topics and are helpful for all TRS80 computer users; Group 1 is set aside for Model I and III owners; the programs in Group 2 are for Color Computer owners; Group 3 contains items of interest for Model II/12/16 owners; and Group 4 is for Model 100 owners.

O.K., so you type <3>. After you are in the SIG data base, it's time for you to dig into the manual, *Special Interest Group Instructions*, so you can use the

First, identify a program you wish to DOWNload to your diskette. Let's say you wish to DOWNload HANGMN.BAS. In response to (SIG/Access:), type in DOW HANGMN.BAS <ENTER>

Then CompuServe will ask you to specify the name you wish to use on your own diskette (that is, an output file name). Type in, for example, HANGMN/BAS.

It is crucial for you to replace the "." in the CompuServe program's name with the TRSDOS "/" when specifying your output file. Otherwise, TRSDOS will drop anything beyond the "." when DOWNloading, and create a disk file under the name HANGMN without any extension! This will get you in a merry game when TRSDOS BASIC cannot recognize HANGMN as a BASIC program. TRSDOS will not RENAME HANGMAN to HANGMN/BAS, because TRSDOS thinks that HANGMN is protected by a special password!

When given an output filename, CompuServe's VIDTEX program (but not Radio Shack VIDTEX program) will open your disk file, and transfer the program from CompuServe to your file. After completion of the program transfer, it will close the disk for you! All you have to do is to wait. Because CompuServe "filters" unnecessary characters involved in transmitting programs through a telephone line, the program you have DOWNloaded can be immediately run with BASIC, without any further editing by you.

If you are using another communications program, such as the Model II's "TERMINAL", you have to edit the DOWNloaded programs by moving them to a SCRIPSIT disk. Be sure to use SCRIPSIT version 2.1.0, as it has a greater space of 13 granules to accept an ASCII file.

Once you are in the SCRIPSIT menu, create a new, empty file under a name of, for example, HANGMN/TXT, and use SCRIPSIT's "C" option to convert the ASCII file (containing a BASIC program, HANGMN/BAS) into a SCRIPSIT file, and then edit the program. After editing, you can call up the C option again, and now change the

SCRIPSIT file back into an ASCII file. Now you can run the program with BASIC. This process becomes tedious very quickly, and you will begin to really appreciate CompuServe's VIDTEX for convenience.

By the way, if you don't have CompuServe's VIDTEX, you must use the "TYP" command (from the SIG/Access menu) to DOWNload the program. The TYP command sends a CompuServe file to you, and if you open your computer memory by <HOLD><O><Z> and make it ready to accept the file, you can store the CompuServe file into your computer's memory.

The TYP command is also handy when you wish to display a program on your Model II monitor, or when you want to list the file with a printer, or when you wish to store a program in your diskette. To store the program after using TYP, hit <HOLD> and either <v> or <S>. These details are given in CompuServe VIDTEX 2.0 manual.

Now, when you are in the SIG/Access mode, you have to type EXI to get back to page PCS- 54.

*Next time, Dr. Naitoh will share with you how his Model II talks to Radio Shack's Model III and even to Apples. In San Diego where he lives, there are 80+ subscribers to CompuServe. A quick scan of these subscribers showed that they have a variety of computers: R/S Models I, II, III, and CoCo; Apple II and IIe; Atari 800; IBM PC; Heath 89A; Vic 20; Commodore-64; Pet; TI-99/4A; Sinclair +81 (64K), and even a "home brew" computer. With CompuServe, Dr. Naitoh and his fellow "CompuServers" can swap program files and information using their computers. Moreover, they can talk to any computer in any place in the United States and Canada, as long as the computers are connected to the CompuServe network by a modem.*

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**A**s a user of SCRIPSIT 2.0, I have found it to be a very friendly and capable word processor. During the past year that my secretary and I have been using SCRIPSIT, we have experienced two SCRIPSIT crashes, both caused by power failures.

At the time of the first crash, the diskette was well backed up, and only a minor amount of typing had to be done to bring the back-up current.

However, in the most recent case, I did not have my diskette backed up. Several calls to the nearest well-equipped Radio Shack Computer Center proved to be no help in recovering my diskette. The personnel at the store were very willing to help but did not have the experience or information to do so. Their effort to obtain SCRIPSIT directory information from Fort Worth was also of no avail. Radio Shack's bottom line was that adequate back-ups should be kept (I know that!), and they would not help to recover my crashed diskette.

I decided to attempt the recovery myself, and indeed, I did recover all documents except the one being written when the power failed. Here's what happened to me and what I learned about how to recover a SCRIPSIT 2.0 diskette that fails.

The most recent crash occurred while I was converting an ASCII file from a TRSDOS diskette in Drive 1 to a SCRIPSIT file on the SCRIPSIT diskette in Drive 0. As soon as the power failed, I pulled the diskettes from both drives to prevent further possible damage during power up.

# HOW TO RECOVER A CRASHED SCRIPSIT 2.0 DISKETTE A. F. NIESSNER

When the power returned, the system was re-started, and SCRIPSIT was brought up in Drive 0.

Everything was OK until the SCRIPSIT directory was displayed. The SCRIPSIT header indicated that I had 17 documents on this diskette; the document being written when the power failed would have been the 17th document on this diskette. The first cell in the directory contained graphics characters -- the ASCII value 00 -- where the document information should be. The remainder of the directory cells were empty.

All attempts to access the files from the SCRIPSIT directory failed. The cursor would not move beyond the cell containing the graphics characters. An attempt to open that document gave no results, and the old documents could not be opened by name either.

Taking the symptoms of the problem, together with the results of a bit of investigating with the TRSDOS List

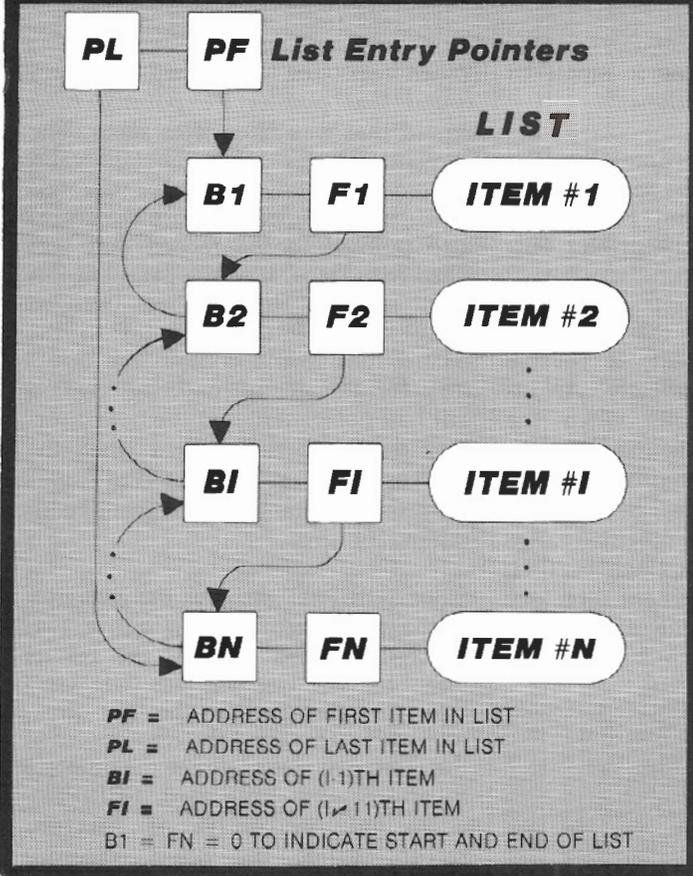
Utility, several things became apparent: (1) All the files on the diskette were unharmed, with the exception of the SCRIPSIT directory; (2) the diskette could be backed up, but the back-up diskette had the same problem with the SCRIPSIT directory; (3) using the crashed diskette in Drive 1 with a good directory in Drive 0 gave the same results when attempting to access the directory from the crashed diskette; (4) a perusal of the file DOCUMENT/CTL using the List utility convinced me that the documents were still intact on the diskette.

Now I had defined the problem enough to know that I had to find the SCRIPSIT Directory information and determine how SCRIPSIT accesses it. Not surprisingly, Radio Shack supplied no information to help.

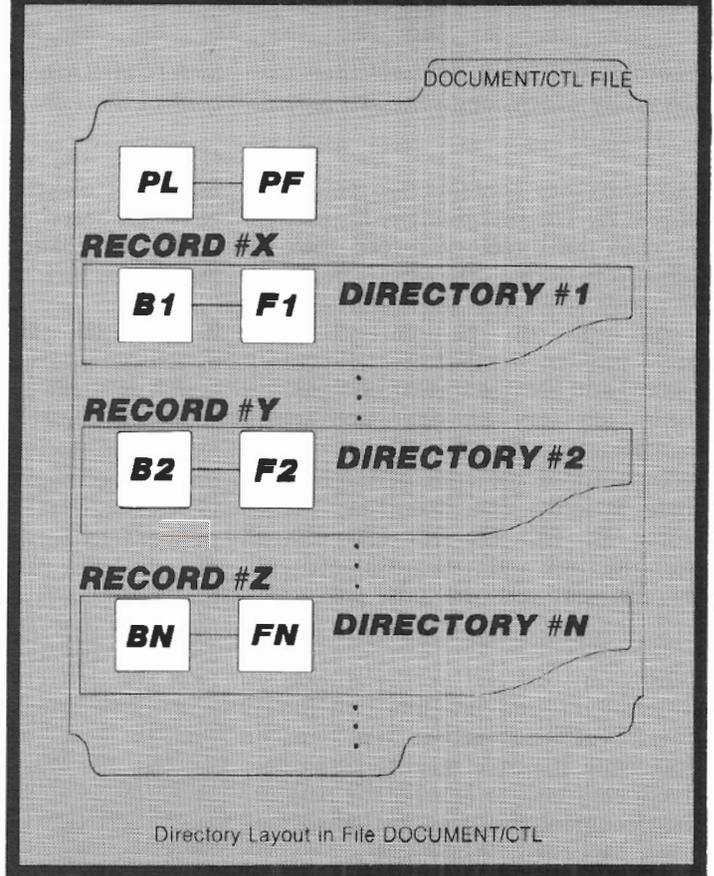
The solution to my problem was found by searching the file DOCUMENT/CTL for the directory information. My search revealed that the needed directory data was scattered throughout DOCUMENT/CTL, with each document's directory data being contained in a 256 byte record. A study of the data in several directory records revealed that the SCRIPSIT directory is a simple linked list. This scheme is shown in Figure 1, and the directory layout in DOCUMENT/CTL is shown in Figure 2.

At the beginning of the file DOCUMENT/CTL, there are two binary numbers (PF and PB) that are pointers to the first (oldest) and last (most recent) directory records. These pointers to the directory records are stored in Z-80 byte reversed format and count the first record in the file as

**FIGURE 1**



**FIGURE 2**



**MODEL II/12/16**

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# A·DO·IT·YOURSELF·GUIDE

record zero. This is different than the List utility which counts the first record as record 1.

Each directory contains two pointers, BI and FI. The first pointer, BI, points back to the directory record that is before it in the list. The second pointer, FI, points forward to the next directory record in the list. The pointers B1 (the back pointer in the first directory record) and FN (the forward pointer in the last directory record) are both zero, indicating to SCRIPSIT that these records are at the ends of the list. If there is only one document being stored in DOCUMENT/CTL, then both the back and forward pointers in this directory record will be zero.

During my search for the directory structure, I found out quite a bit about how SCRIPSIT stores the data for each document. It would seem to be a relatively easy task to recover the part of the document that was lost when the crash happened. In my case, converting an ASCII file to a SCRIPSIT file, it was a simple matter to redo the conversion since the ASCII file was not affected by the crash. Had a major portion of a long document been at stake, a rescue attempt would have been in order.

After my first attempt at recovering a crashed SCRIPSIT diskette, I had to make another SCRIPSIT diskette crash recovery. Tracing out the DOCUMENT/CTL directory pointers using the TRSDOS LIST utility is so tedious, I decided to write a BASIC program to perform this search.

The resultant program, SPATCH/BAS, searches the crashed DOCUMENT/CTL file and extracts the directory pointers and the title and author of each document. The data, as shown in Figures 3 and 4, is displayed on the video screen and is optionally printed on the line printer. The SCRIPSIT directory pointers are given in the same number scheme used by the TRSDOS LIST utility (i.e., 1..N), so that the files can be easily examined using LIST if desired. If a patch to DOCUMENT/CTL is required, a value of one must be subtracted from the pointer so that it will correspond to the DOCUMENT/CTL numbering scheme (i.e., 0..M).

SPATCH/BAS provides a menu to control three search options:

(1) select the drive containing the SCRIPSIT diskette to be searched, (2) select the search direction, Forward or Backward, (3) toggle the printer output, On or Off.

If the initial search of the SCRIPSIT directory is inconsistent, a reverse search is made automatically. An inconsistent search results when the number of documents found does not match the number recorded in the DOCUMENT/CTL file, or when a pointer falls outside the specified range of records for that DOCUMENT/CTL file, or if the last document directory record is not the same as the terminating pointer given in the first DOCUMENT/CTL record.

**B**y using SPATCH/BAS, a crashed SCRIPSIT diskette can be quickly searched and the directory pointers in the DOCUMENT/CTL file listed.

SPATCH/BAS is easy and straight forward to use. From TRSDOS Ready, enter BASIC Spatch/bas -F:1. When run, a program description is written to the video screen. From there, pressing any key will bring up the program option menu.

To run the program with the default options, press the "1" key. The default options will cause SPATCH/BAS to search the available disk drives for the first diskette containing DOCUMENT/CTL. When DOCUMENT/CTL is found, its directory data will be located and listed on the video screen as shown in Figure 3. The display pauses between each page of data, and the listing will continue by pressing any key.

When inspecting the crashed diskette, I found that pointer PL pointed to a record that was filled with zeros. The

When inspecting the crashed diskette, I found that pointer PL pointed to a record that was filled with zeros. The forward pointer from the last valid directory (the directory for the last document completed before the crash) also pointed to the record that was filled with zeros. It was apparent at this point that SCRIPSIT had changed these two pointers to point to the record that would contain the directory for the document being created but had not yet entered the new directory data into that record when the power failed. When SCRIPSIT was restarted, PL pointed to the record containing all zeros.

Since SCRIPSIT displays the directory of the most recent document first, two things happened to give the results noted before. The graphics characters that were displayed in the first directory cell were indeed the zeros found in the directory record. Since the pointers BI and FI were both zero, SCRIPSIT could only find this one directory record. While the other directory records were intact, SCRIPSIT could not access them due to the fractured link in the linked list of directory records.

In order to repair the broken link, the number in PL was changed to the record number of the last complete document's directory. The forward pointer in this directory was set to zero in order to terminate the list.

These changes to DOCUMENT/CTL were made using the TRSDOS Patch utility, which has options for patching program files and data files. I used the data file option to patch DOCUMENT/CTL. The PATCH command to TRSDOS takes the form:

```
PATCH DOCUMENT/CTL R=rr,  
B=bb,F=ff.f,C=cc..c
```

where rr is the record number to be patched, bb is the number of the first byte to be patched, ff.f is the current hex data in the pointer location to be changed, and cc..c is the new hex data to replace the pointer that was in error.

The pointers, PL and PF, are located in the first record of DOCUMENT/CTL. They are byte reversed (least significant byte followed by the most significant byte), 2 byte (16 bits) numbers

## A·DO·IT·YOURSELF·GUIDE

with PL in bytes 7 and 8 and PF in bytes 9 and 10. The pointers BI and FI are located in each directory record. The back pointer is located in bytes 2 and 3, and the forward pointer is located in bytes 4 and 5.

Once the pointers were corrected to point to the last complete document, SCRIPSIT was able to display the directory and access the documents that were thought to be lost.

A problem remains in that the SCRIPSIT header displays a document count which is one greater than the actual number on the diskette. This display could also be corrected with some more work, but it does not seem to create any problems.

The menu provides three search control options, the first of which is "option 2 - Diskette search for DOCUMENT/CTL." The default option "First one found" will perform the normal TRSDOS search for the first drive containing DOCUMENT/CTL as described above. If more than one drive contains SCRIPSIT diskettes, then the drive number of the drive containing the DOCUMENT/CTL file to be searched should be specified. Be sure a DOCUMENT/CTL file is present or TRSDOS will create one, and a program error will occur when a GET is attempted. Should this occur, the DOCUMENT/CTL file should be KILLED to prevent further confusion.

The second option is "option 3 - Forward or Backward Search" which toggles the search direction. A Forward search starts with the oldest document and proceeds to the newest. The Backward search starts with the most recent document and proceeds to the oldest.

The final option, "Option 4 - Output to the Printer," toggles the printer ON or OFF. The data is always displayed on the video screen, but the pause between display pages on the video screen is eliminated if the printer option is ON.

Program termination from the menu is effected by pressing the "5" key.

SPATCH was written on a TRS-80 Model II equipped with a TRS-80 Line Printer VIII. Printed output is obtained

by using the DUAL mode of TRSDOS which is accomplished from BASIC with PRINT CHR\$(14), DUAL ON, and CHR\$(15), DUAL OFF. Unfortunately, this causes a problem with the LP VIII since these same codes start and end the underline mode in the printer. The LPRINTs in program lines 4320 and 5250 are used to remove the problem. However, when a printer is not on line, an IO error will occur when the program tries to execute these lines. They can be avoided when a printer is not on line by DELETE 4320 and DELETE 5250 prior to running SPATCH.

Other printers may have the same problem with the CHR\$(14) and CHR\$(15) control codes. The corrective action will depend on the particular printer being used.

You might encounter a BASIC IE error when you try to use SPATCH to search a crashed SCRIPSIT diskette if the last SCRIPSIT session was not terminated using SCRIPSIT's End command. The cause of this error is not understood, but it does not occur if the program is run a second time. Should this happen when the program is first run, simply run the program a second time.

By using SPATCH/BAS, a crashed SCRIPSIT diskette can be quickly searched and the directory pointers in the DOCUMENT/CTL file listed. Once the broken pointer linkage is found, a repair can be effected using the TRSDOS PATCH utility as described above. ■

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*Advanced Computing* will accept Classified Ads for publication in the magazine. Subscribers may place one ad per issue at the rate of \$7 per column inch. Ads must be for hardware, software, or services which would be of interest to Model II/12/16/2000 users. Ads will be set in the same size type as the text in the magazine.

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**Figure 3**  
**Sample printout from a Forward search.**

\*\*\* I Forward I Search of the Scripsit file DOCUMENT/CTL \*\*\*

The Spatch search of record one shows:

The number of 256 byte records is: 1060  
 The number of Documents is: 23  
 The Forward pointer is to record number: 74  
 The Back pointer is to record number: 523

\*\*\* Document data is now being loaded into the data arrays \*\*\*  
 Press any key to terminate the search

Record Number	Forward Pointer	Back Pointer	Document Title	Author
74	121	1	Qpmod1/bas	A.F.Niessner
121	135	74	Ada Letter	A.F.Niessner
135	150	121	Double Pres Math	A.F.Niessner
150	174	135	Filter Data	A.F.Niessner
174	206	150	DRAS Letter	A.F.Niessner
206	323	174	CREATOR/BAS	A.F.Niessner
323	366	206	DEMO/BAS	A.F.Niessner
366	421	323	IOtest Pascal	A.F.Niessner
421	374	366	ATV Depth Data	A.F.Niessner
374	392	421	GTV Slowdown	A.F.Niessner
392	388	374	PPC development	A.F.Niessner
388	412	392	GTV Operation	A.F.Niessner
412	470	388	Computer Memo	A.F.Niessner, Jr.
470	568	412	Commonality	A.F.Niessner
568	578	470	AFN Consulting	A.F.Niessner
578	588	568	TRS-80 Transfer	A.F.Niessner
588	372	578	Expense Account	A.F.Niessner
372	450	588	AFN Resume	A.F.Niessner
450	458	372	Travel Response	A.F.Niessner, Jr.
458	489	450	AAI Tasks	A.F.Niessner
489	491	458	Rolling Wave 826	A.F.Niessner
491	523	489	Arctic Trip Rpt	A.F.Niessner
523	1	491	Rolling Wave 91	A.F.Niessner

\*\*\* Normal termination of the Scripsit Directory search \*\*\*

Press any key to continue.

**Figure 4**  
**Sample printout from a Backward search.**

\*\*\* I Backward I Search of the Scripsit file DOCUMENT/CTL \*\*\*

The Spatch search of record one shows:

The number of 256 byte records is: 1060  
 The number of Documents is: 23  
 The Forward pointer is to record number: 74  
 The Back pointer is to record number: 523

\*\*\* Document data is now being loaded into the data arrays \*\*\*  
 Press any key to terminate the search

Record Number	Forward Pointer	Back Pointer	Document Title	Author
523	1	491	Rolling Wave 91	A.F.Niessner
491	523	489	Arctic Trip Rpt	A.F.Niessner
489	491	458	Rolling Wave 826	A.F.Niessner
458	489	450	AAI Tasks	A.F.Niessner
450	458	372	Travel Response	A.F.Niessner, Jr.
372	450	588	AFN Resume	A.F.Niessner
588	372	578	Expense Account	A.F.Niessner
578	588	568	TRS-80 Transfer	A.F.Niessner
568	578	470	AFN Consulting	A.F.Niessner
470	568	412	Commonality	A.F.Niessner
412	470	388	Computer Memo	A.F.Niessner, Jr.
388	412	392	GTV Operation	A.F.Niessner
392	388	374	PPC development	A.F.Niessner
374	392	421	GTV Slowdown	A.F.Niessner
421	374	366	ATV Depth Data	A.F.Niessner
366	421	323	IOtest Pascal	A.F.Niessner
323	366	206	DEMO/BAS	A.F.Niessner
206	323	174	CREATOR/BAS	A.F.Niessner
174	206	150	DRAS Letter	A.F.Niessner
150	174	135	Filter Data	A.F.Niessner
135	150	121	Double Pres Math	A.F.Niessner
121	135	74	Ada Letter	A.F.Niessner
74	121	1	Qpmod1/bas	A.F.Niessner

\*\*\* Normal termination of the Scripsit Directory search \*\*\*

Press any key to continue.

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PROGRAM LISTING I

```

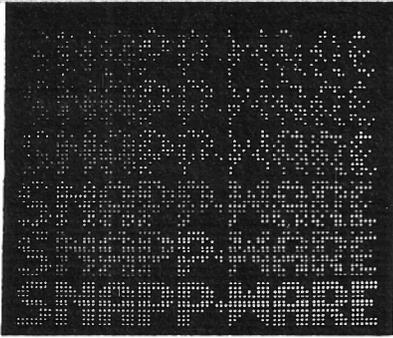
1000 *
1010 * *****
1020 *
1030 *      Program - Spatch/bas
1040 *      by - A.F.Niessner
1050 *      Date June 1983
1060 *
1070 * A program to search the Scripsit file 'DOCUMENT/CTL'
1080 * and locate the directory pointer data to effect a patch
1090 * to a crashed Scripsit directory.
1100 *
1110 * *****
1120 *
1130 *
1140 *
1200 * *** Set up the program constants ***
1210 *
1220 CLEAR 5000
1230 DEFINT F,N,P,R
1240 DEFSTR A,F,N,S,T
1250 PE="DOCUMENT/CTL"
1260 LOGS
1270 NU="  - "
1280 PM=0
1290 DN=3
1300 DN#=" "
1310 MI=" *** The search was terminated by the operator ***"
1320 M2=" *** Normal termination of the Scripsit Directory search ***"
1330 M3="*** Abnormal termination - Pointer outside the range of Record Number
s ***"
1340 M4=" *** Abnormal termination - Back loop does not close. ***"
1350 M5=" *** Abnormal termination - Forward loop does not close. ***"
1360 NF=18
1370 ES=0
1380 IS=0
1390 *
1400 * *** Define the functions ***
1410 *
1420 DEF FNNI(SX,NS)=ASC(MID$(SX,NS,1))
1430 DEF FNNZ(S,NL)=FNNI(SX,NL)+256+FNNI(SX,NL+1)
1440 DEF FNTI(T)=CHR$(26)+T+CHR$(25)
1450 DEF FNLI(T)=(74-LEN(T))/2
1460 DEF FNRR(X,Y)=(X\1) OR (Y\1)
1470 *
1480 * *** Initialize the system and write the logo to the screen ***
1490 *
1500 *
1510
1520 SYSTEM "I"
1530 GOSUB 3620'Set Menu Defaults
1540 GOSUB 3120'Print the Logo
1550 GOSUB 3220'Print the description
1560 *
2000 * *** Start of Main Program ***
2010 *
2020 GOSUB 3120'Print the Logo again
2030 GOSUB 3420'Print the Menu
2040 GOSUB 5430'Select an option
2050 ON J GOSUB 4020,3720,3920,2080,2080,2080,2080,2080
2060 IF J=1 THEN RUN
2070 GOTO 2020
2080 PRINT: PRINT: PRINT: STOP
2090 *
2100 *
3000 * *****
3010 *
3020 *      Start of Subroutines
3030 *
3040 * *****
3050 *
3060 *
3100 * *** Subroutine to Print the Logo ***
3110 *
3120 CLS: PRINT: PRINT
3130 RESTORE
3140 READ A$: IF A$<<"Logo" THEN GOTO 3140
3150 READ A$: IF A$="EOT" THEN GOTO 3170
3160 PRINT TAB(FNLI(A$)) FNTI(A$): GOTO 3150
3170 T(9)=" Press any key to continue "
3180 RETURN
3190 *
3200 * *** Subroutine to Print the Program Description ***
3210 *
3220 PRINT: PRINT: PRINT
3230 RESTORE
3240 READ A$: IF A$<<"Description" THEN GOTO 3240
3250 READ A$: IF A$="EOT" THEN GOTO 3270
3260 PRINT TAB(10) A$: GOTO 3250
3270 PRINT: PRINT: PRINT TAB(10#6) FNTI(T(9)):
3280 IF INKEY$="" THEN GOTO 3280
3290 RETURN
3300 *
3400 * *** Subroutine to Print the Menu ***
3410 *
3420 PRINT
3430 RESTORE
3440 READ MI: IF MI<<"Menu Items" THEN GOTO 3440
3450 READ NI
3460 FOR I=1 TO NI
3470 READ MI: PRINT @ (PM+I*2.6), FNTI(MO(I)): PRINT
3480 NEXT I
3490 PRINT: PRINT
3500 RETURN
3510 *
3600 * *** Subroutine to load the default Menu values ***
3610 *
3620 RESTORE
3630 READ MI: IF MI<<"Menu Items" THEN GOTO 3630
3640 READ NI
3650 FOR I=1 TO NI
3660 HEAD MI: READ MD(I): MO(I)=MD(I)
3670 NEXT I
3680 RETURN
3690 *
3700 * *** Subroutine to get a Drive Number ***
3710 *
3720 PRINT @ (POM(X),0), STRING$(78," ")
3730 PRINT @ (ROU(X),0), "Press the Number of the Drive containing "FNTI(PS) " or
3740 PRINT TAB(29) "Press enter for the Default """:
3750 AS=""
3760 AS=INKEY$: IF AS="" THEN GOTO 3760
3770 IF AS=CHR$(13) THEN DN#="": MO(J)=MD(J): RETURN
3780 IF (AS="0") OR (AS)CHR$(DD+47) THEN GOTO 3750
3790 MO(J)=" Drive "+AS+": " DN#="": AS#
3800 RETURN
3810 *
3900 * *** Subroutine to toggle the Menu Option ***
3910 *
3920 IF MO(J)<MD(J) THEN MO(J)=MD(J): RETURN
3930 IF J=3 THEN MO(J)=" Backward "
3940 IF J=4 THEN MO(J)=" Yes "

```

```

3950 RETURN
3960 *
4000 * *** Subroutine to Open the 'DOCUMENT/CTL' File ***
4010 *
4020 FA=PS+DN#
4030 OPEN "D":1,FA
4040 *
4100 * *** Define the field and get the first record ***
4110 *
4120 FIELD 1, 128 AS S1, 128 AS S2
4130 GET 1,1
4140 *
4200 * *** Calculate the File Control Information ***
4210 *
4220 NI=FNNZ(S1,5)
4230 NO=FNNI(S1,15)
4240 PI=FNNZ(S1,9)+1
4250 PL=FNNZ(S1,7)+1
4260 CLS
4270 *
4300 * *** Turn on the Printer if requested ***
4310 *
4320 IF MO(4)=" No " THEN PRINT CHR$(15): LPRINT CHR$(14): ELSE PRINT CHR$(14):
4330 PRINT CHR$(12) "Top of Form if Printer is on"
4340 *
4400 * *** Print the Document control information ***
4410 *
4420 PRINT TAB(5) "*** " FNTI(MO(3)): " Search of the Scripsit file: DOCUMENT/
CTL "": PRINT: PRINT
4430 PRINT " The Spatch search of record one shows:" PRINT
4440 PRINT " The number of 256 byte records is: "INT
4450 PRINT " The number of Documents is: "IND
4460 PRINT " The Forward pointer is to record number: "FPI
4470 PRINT " The Back pointer is to record number: "BPL
4480 PRINT: PRINT " *** Document data is now being loaded into the data array
4490 PRINT TAB(15) "Press any key to terminate the search:" PRINT
4500 *
4600 * *** Dimension the data arrays ***
4610 *
4620 IF IS=1 THEN GOTO 4720
4630 NA=ND+25
4640 DIM RN(NA),PF(NA),PE(NA),TL(NA),TA(NA)
4650 *
4700 * *** Get the data from 'DOCUMENT/CTL' ***
4710 *
4720 NR=1
4730 IF MO(3)=MD(3) THEN PF=PI ELSE PF=PL
4740 GET 1,PF
4750 RN(NR)=PF
4760 PE(NR)=FNNI(S1,4)+1
4770 PI(NR)=FNNZ(S1,2)+1
4780 TL(NR)=MID$(S1,6,16)
4790 TA(NR)=MID$(S1,42,20)
4800 A=INKEY$: IF A="" THEN NR=NR+1: GOTO 4800
4810 IF MO(3)=MD(3) THEN PF=PF(NR) ELSE PF=PE(NR)
4820 IF PF=1 THEN ME=M2: GOSUB 5020: GOTO 4850
4830 IF FNRR(PF,NT) THEN ME=M3: ES=1: GOTO 4850
4840 NR=NR+1: GOTO 4740
4850 CLOSE
4860 *
5000 * *** Print the data ***
5010 *
5020 IF (M(4))=" No " THEN NB=(NF-1): NF=0 ELSE NB=(NF-1): NF=NR-NF
5030 NE=NE+NF: NF=NF+NF: IF NE THEN NF=NF
5040 PRINT "Record" TAB(10) "Forward" TAB(12): "Back","Document"," Author"
5050 PRINT "Number" TAB(10) "Pointer" TAB(12): "Pointer","Title"
5060 PRINT
5070 FOR I=NR TO NF
5080 PRINT RI(1) TAB(10) PE(I) TAB(20) PF(I), TL(I): " (TA(I)
5090 NEXT I
5100 IF NF=NR THEN GOSUB 5320: (LF: GOTO 5030
5110 *
5200 * *** Print the status message ***
5210 *
5220 PRINT: PRINT ME: IF NR=ND THEN ES=1: PRINT: PRINT "The number of Document
found was "FPI: PRINT "Versus "IND:" given in the document control data."
5230 PRINT: PRINT
5240 GOSUB 5320
5250 PRINT CHR$(15): LPRINT CHR$(14):
5260 IF (NF=MI) AND (ES=1) AND (IS=0) THEN GOSUB 5520: GOTO 4820
5270 RETURN
5280 *
5300 * *** Subroutine to hold for key press ***
5310 *
5320 PRINT: PRINT "Press any key to continue. "
5330 IF INKEY$="" THEN GOTO 5330
5340 PRINT: RETURN
5350 *
5400 * *** Subroutine to select an action option ***
5410 *
5420 PRINT: PRINT "Press the number of your choice """:
5430 A=""
5440 A=INKEY$: IF A="" THEN GOTO 5440
5450 J=VAL(A): IF (J 1) OR (J NI) THEN GOTO 5430
5460 PRINT A: RETURN
5470 *
5500 * *** Subroutine to reverse the order of the search ***
5510 *
5520 IS=1: J=3: GOSUB 3920
5530 RETURN
5540 *
5600 * *** Subroutine to check pointer loop closure ***
5610 *
5620 IF MO(3)=ME(3) THEN GOTO 5620
5630 *
5700 * *** Back search ***
5710 *
5720 IF PI<PI(NR) THEN ES=1: NE=M4
5730 RETURN
5740 *
5800 * *** Forward search ***
5810 *
5820 IF PL<RN(NR) THEN ES=1: ME=M5
5830 RETURN
5840 *
6000 * *** Data statements ***
6010 *
6020 DATA "Logo"," Scripsit Document File Search and List "
6030 DATA " by - A.F.Niessner ", " June 1983 ".EOT"
6040 DATA " Menu Items",S
6050 DATA "Run the Search with the following Options!:"
6060 DATA "Drive containing 'DOCUMENT/CTL' file." First one found "
6070 DATA "Search direction." Forward "
6080 DATA "Output to the Printer." No "
6090 DATA "Finished, return to BASIC!:"
6100 DATA "Description"
6110 DATA "This program searches the Scripsit file 'DOCUMENT/CTL' and lists"
6120 DATA "the documents in the Scripsit Directory. The search may be either"
6130 DATA "forward, oldest to newest, or backward, newest to oldest. The"
6140 DATA "document directory record numbers along with the forward and"
6150 DATA "backward pointers are listed to the video screen and optionally"
6160 DATA "to a printer. If the first search results in INCONSISTENT data,"
6170 DATA "a second search in the opposite direction is made automatically."
6180 DATA "The search may be terminated at any time by pressing any key."
6190 DATA "EOT"

```



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November 16, 1983

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The recent efforts of your staff in resolving the problems with your new UART board for the Model 16 will never be forgotten here. Please extend my personal thanks to Don Stanfield, Dave Krebs, Philip Hurrell, Tudor Apmadoc, David Williams, Ken Brookner, and Ron Light for the extra effort put forth during this trying period.

When the fix for the problem was finally obtained, the act of transmitting the corrected system files to me via UUCP was both a testimony to the power and value of the XENIX system and the customer service dedication of your staff.

My pleasure with the Model 16 with XENIX can hardly be expressed in words. I think that this system is head and shoulders above the competition. Speaking not only as an 'add-on' vendor, but also as a user, I hope that your marketing efforts continue to keep you at the forefront of the microcomputer industry.

Kindest personal regards,

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Bob Snapp

# REVIEW OF SL·MICRO

BY RICHARD JENSEN

*SL-MICRO is a statistical package that runs under CP/M-80, CP/M-86, PC-DOS and MS-DOS; it's ideal for the mainframe SPSS user who wants to exploit the convenience and low cost of the micro, while sacrificing only the less commonly used procedures in SPSS.*

**S**L-MICRO is a versatile, easy-to-use, general purpose statistical package. It has limitations that will trouble advanced researchers, but most users will find it quite satisfactory for the production of routine statistical analysis of small or large data sets.

SL-MICRO stands out because of its syntax. The command language is virtually an exact replica of batch-processed SPSS. Thus anyone who has spent long days in a computer center untangling the mysteries of format statements, RECODE, SELECT IF, and FREQUENCIES GENERAL will be right at home with SL-MICRO. Indeed, the SPSS manual will provide a much more thorough introduction to SL-MICRO than its own thin, but adequate, manual. The older the SPSS manual the better, for SL-MICRO resembles the SPSS of the early 1970s more than the enhanced versions

Richard Jensen  
1109 South Longwood Drive  
Bloomington, IN 47401

available today, such as SPSS-X. Furthermore, SL-MICRO is much friendlier than SPSS, primarily because microcomputers are operated in a much more friendly environment than big IBM mainframes.

SL-MICRO is peculiar among micro-computer packages in that it is not self-contained; it is necessary to have a text

**U**sers will find SL-MICRO quite satisfactory for the production of routine statistical analysis of small or large data sets.

editor to prepare the command file. SCRIPSIT can be used, but it is awkward because the SCRIPSIT document has to be converted to an ASCII file, then the TRSDOS ASCII file has to be converted to CP/M (by RSCPM or TRS2CPM or the equivalent instruction issued after the SCRIPSIT disk has been moved and a CP/M disk booted). I have a very convenient CP/M text editor called "The Final Word" which does a splendid job for SL-MICRO; most other CP/M word processors

should also work well. The CP/M editor ED perhaps could be used, but few non-programmers are familiar with its contorted structure. In any case, a rudimentary text editor should be included in the next version of SL-MICRO.

The finished command file, which resembles a deck of SPSS control cards, is executed by the CP/M command <SLM filename>. The output, including error messages, is diverted to a filename SLM.PRN, which can be viewed on the screen (by <TYPE SLM.PRN>), or routed to the printer (by control-P followed by <TYPE SLM.PRN>). This procedure allows the program to trap most errors and tells the user what has gone wrong. (But not always; the FREQUENCIES program hung up when an incorrect syntax was used.) The error messages are quite explicit ("Line 24 --No Left Paren"), enabling the user to easily correct the problem. The command file can be revised and used over and over again. Thus SL-MICRO differs from menu-driven programs which require the user to input all the choices each time a new variation is run, even if most of the choices are identical.

SL-MICRO does an especially nice job of formatting the output, which again closely resembles an SPSS printout. The cross-tabulation tables, for example, have neat labels. The familiar SPSS procedure of specifying VAR LABELS and VALUE LABELS is followed with good effect. In general, the

printouts are in camera-ready format for presentation or publication. Various options are also available to delete extraneous information (such as cell percentages) that might make the pages too crowded. Run name and comments are supported.

The most commonly used statistical procedures work well on SL-MICRO. FREQUENCIES and CONDESCRIP-TIVE provide summary statistics of nominal and continuous variables. CROSSTABS will provide two-way and three-way contingency tables, but not four-way. The only statistics provided include percentages every-which-way and chi square; highly useful summary statistics such as gamma, tau, C, and phi are, unfortunately, not computed.

PEARSON CORR provides a matrix of correlation coefficients, with valid Ns (using pairwise deletion of missing values) and an optional T score (the significance value of the T has to be looked up in a paper table). More useful is the last procedure, REGRES-SION. It generates forward stepwise multiple regression with one dependent and up to 19 independent variables. A useful ANOVA table is a by-product, but no residuals are calculated. The standard errors are given for the B coefficients, but not for the constant or the betas.

The program is written in CBASIC and is reasonably fast. Its capacity is large -- 32,600 cases can be handled, together with up to 200 variables in a single run. While the data must all fit into a single disk, the storage capacity of Model 12 and 16 disks is enormous (1.2 million bytes); a hard disk can be used. The precision for numerical data is a satisfactory 14 digits.

The hardest part of SL-MICRO, for those who have never used SPSS, will be the setup procedures. The command file structure includes optional and required commands. RUN NAME, PAGESIZE, COMMENT, PRINT BACK, OPTION, MISSING VALUES, VAR LABELS, and VALUE LABELS are optional; VARIABLE LIST, INPUT FORMAT, FACT FILE (i.e., filename of data set), the procedure commands, and FINISH are required. The order of the commands is fixed, and even the format of each line in the command file

is fixed. Thus the keywords (such as VALUE LABELS) must start in column one, and their parameters must start in column 16. Fortunately, an abundance of examples is provided in the SL-MICRO manual, and it includes sample data sets and sample command files.

The data to be used by SL-MICRO can be included at the end of the command file, or can be drawn from a disk file. The input format procedure assumes that variables are in the fixed format specified by the FORMAT statement. If they are not, then a CONVERT utility can be used to read a file that is in free-format and write a new file in fixed-format. SL-MICRO programs can access files created by dBase II, CONDOR, and other data base management programs.

A new version of SL-MICRO, expected in the first quarter, will include BREAKDOWN (a valuable procedure that calculates the means of all the subgroups designated by a nominal variable) and a data entry module. Future improvements are being

planned. Questionnaire Service Company plans to maintain SL-MICRO as a state-of-the-art statistical package.

SL-MICRO offers a reasonable range of statistical procedures at a moderate cost. It's ideal for the mainframe SPSS user who wants to exploit the convenience and low cost of the micro, while sacrificing only the less commonly used procedures in SPSS.

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# CONVERTING MODEL II BASIC PROGRAMS TO XENIX MBASIC

MBASIC for Model 16 XENIX systems is similar to Model II BASIC, but the differences can cause problems and confusion. The MBASIC manual covers most of the commands that have been changed, but there are some odd-ball variances that can really mess things up.

BY ANTHONY LAWRENCE

**I** imagine most of us don't bother to read the MBASIC manual at all. Who needs a manual to write BASIC? Besides, there is a concise section in the back that points out the differences in reserved words and that's all you really need to know, right?

Wrong. I have recently been involved in several conversion projects and have uncovered some unexpected differences and problems.

Two of the conversions I made were done because the users of the programs wanted more speed. Speed increases are possible, but a straight conversion without coding changes ends up running at the same speed as it did on the Model II or 12, or sometimes even slower. Part of the reason is BCD double precision routines. Accuracy has been increased, but you have to pay the piper somewhere.

Another reason is that the places where you are apt to be dissatisfied with speed involve I/O -- read from the disk, write to the disk, write to the screen. Guess who handles all I/O on your XENIX system? Why, it's your old friend the Z-80, the same guy who does it all when you are in Model II/12 mode. Why should you expect him to work any faster? You shouldn't, and actually, the overall time should probably be a little slower because now

the 68000 has to set up the Z-80 for what wants to be accomplished, and then let it do it.

However, speed isn't everything. More accurate math, long variable names, WHILE/WEND constructs, enormous file Logical Record Lengths, and Multi-user capability more than pay back the disappointment of no dramatic speed gains. I think MicroSoft and Tandy did a good job. Better than good, a great job.

Now that I have passed out the laurels, let's tear this thing apart and see what's wrong with it.

The conversion process starts with transferring your program from 4.x or "SAVE" media to XENIX using a program called "tx." Tx can be used to bring any 4.x file over, not just BASIC programs. You would expect (at least I did) that you would have to send an ASCII version of your program (one saved with the ,A option). In fact, you do not have to, and you probably don't want to. The reason is that you will end up having to do a lot more editing if you use the ASCII program. Since there will probably be a lot of editing needed, there is a program called "bp" to do some of it for you. However, bp works on normal encoded BASIC program files, not on ASCII files.

Use tx by popping your 4.x program disk in one of your floppy drives and typing something like this:

Tx has a number of options that specify whether the source is 4.x or SAVE media, whether you want the name converted to lower case, where you want it to go, and whether you want to convert carriage returns to line-feeds. All in all, a very useful and friendly little program. The example given above would transfer MYPROG/BAS to myprog.bas in whatever XENIX directory you happened to be in when you typed the command.

Now you have myprog.bas, which is the normal encoded version of your program and which is absolutely meaningless to MBASIC. To convert it to MBASIC, you need bp. Type:

```
bp myprog.bas>myprog.mbas
```

You may see a series of messages, such as "MBASIC does not support SYSTEM" and others like it, and it is quite likely that you will get "Line is over 251 characters."

"Wait a minute," you protest, "none of my lines is even close to 251 characters. My XENIX system must be broken!"

It isn't, and your lines are now a lot bigger than they used to be. The reason is that MBASIC requires spaces between most key words. The bp program, being of limited intelligence, satisfies MBASIC's needs by inserting a space in front of EVERYTHING it sees. For example, you might have had a program line that read:

Anthony Lawrence  
BackUp-80  
37 Harold Street  
Sharon, MA 02067

```
tx :0 -cyp MYPROG/BAS
```

```
100 A$=B$+" "+C$
```

The lack of spaces is perfectly OK in Model II BASIC and is actually perfectly fine in MBASIC, but bp errs on the side of caution, and you end up with:

```
100 A$ = B$ + " " + C$
```

You can see how your program expands rather quickly.

Now that bp has done its magic, you have myprog.mbas in your directory. It is an ASCII version of your program with a lot of extra spaces put in. Some of the spaces are very necessary, and a lot of them just take up, well ... space.

The next step of your conversion is to edit myprog.bas to clean up some of the obvious problems. You won't be able to use the MBASIC line editor yet because you can't load myprog.bas. It has lines that are too long, remember? So what you use is either "ed" (my buddy ed -- great at fixing BASIC programs! No, XENIX ed, the file ed-itor) or, if you have purchased the XENIX development system, you can use "vi."

I am not going to attempt to teach editing commands here. The XENIX manuals cover the subject very well (though vi can be a little confusing).

The first order of business is to modify or delete unsupported keywords. DEFUSR and USR may be real problems for you. If the machine language routine is a sort, you are in luck because XENIX has a sort command in its operating system. Otherwise, you either program around it or learn 68000 code. The SYSTEM command is fairly simple. Do a global substitution of SHELL for SYSTEM for now, and straighten out the loose ends later. The matter of excess spaces requires either knowing what you can get away with or splitting of lines. Split the lines until you are more familiar with MBASIC's quirks. All done? Don't forget to write the file back out of the editor before you quit.

Now is the time to load MBASIC and see where the real problems are. If your original program was of any real size at all, give MBASIC plenty of memory to work with. Remember, those extra spaces have made myprog.mbas a lot bigger than it was before. So as a starting point, type:

```
mbasic -m 50000
```

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That gives 50000 bytes for MBASIC to play in. RUN "myprog.mbas" and don't be surprised if it doesn't work. Here are the places to start looking for problems:

**Logical Record Length:** You have assumed, and the manual even tells you, that the default LRL for a random access file is 256 bytes. The manual lies. If you say

```
100 OPEN "R",1,"MYDATA"  
110 FIELD 1, 128 AS A$,128 AS B$
```

the MYDATA file will be opened with a LRL of 128. MBASIC doesn't know or care how the data was originally written, so the open statement perceives no error. However, your field statement will bomb with an overflow error. Therefore, you must:

```
100 OPEN "R",1,"MYDATA",256
```

MBASIC's cavalier attitude toward record lengths can be very helpful. Nothing prevents you from opening that file with a length of 1024 and getting 4 records at a time. You do need to know what you are up to, so be careful if you don't really understand LRLs.

**LOF:** Here's one that can really get you into trouble.

```
200 IF X=LOF(1) THEN GO TO 500
```

The problem relates to the LRL as mentioned above. What LOF means to MBASIC is the total number of bytes in a file. What you meant was the number of records. If you and MBASIC are going to work this thing out, you have to divide LOF (1) by the LRL of the file. If you opened it as 256, use:

```
200 IF X = LOF(1)/256 THEN GO TO 500
```

**MOD:** This one had me tearing my hair and banging the walls. It is very sneaky and very nasty. If you don't already know, the MOD function in BASIC performs modulo arithmetic. That is 15 MOD 10 equals 5 (the remainder after dividing 15 by 10). Also, 1001 MOD 10 is 1. Model II BASIC and MBASIC agree to this point.

Model II BASIC says, "-1001 MOD 10 is -1." I can agree with that, but MBASIC doesn't. MBASIC says the result is 6. Six? Oh, it gets worse. -2004 MOD 10 is 535, according to MBASIC.

I am sure you can imagine the havoc this wreaks with a program that is unfortunate enough to have negative conditions on MOD functions. Can you also imagine how long it takes to find this problem if you are not aware of it?

The solution is to use something like:

```
500 X=SGN(Y)*(ABS(Y) MOD 10)
```

which will calculate -1001 to the correct -1 value.

**FOR WITHOUT NEXT:** I thought I was seeing things at first, and then I thought Microsoft had goofed. Look again, the message is not your every day NEXT WITHOUT FOR.

I am not real clear on this, but apparently MBASIC does a forward scan on every FOR statement looking for the terminating NEXT. This sounds more compiler-like than interpreter, but it does the scan just the same. You are probably thinking that this is not a problem, and I agree. However, BASIC programmers do write some strange code, and it is possible to get MBASIC confused.

The following example of code is not good programming, but it works on oldfashioned TRSDOS BASIC:

```
100 IF X=-1 THEN FOR P=L TO H :ELSE FOR J= H TO L  
110 ---MISC PROCESSING AND PRINTING  
120 --- ""  
130 IF IX=-1 THEN NEXT P : ELSE NEXT J
```

MBASIC doesn't like this sequence. For some reason it sees the J loop even when X is -1, but doesn't see the NEXT J. Therefore, FOR WITHOUT NEXT error. Don't ask me. I don't understand it; I just programmed around it.

In conclusion, you can convert your Model II BASIC programs to XENIX, but there are some glitches to be aware of. I have not even mentioned the implications of a multi-user environment, nor taken up the somewhat annoying

line printer problems. There are also some other strange things I have encountered but couldn't get repeatable results. I assume that these were either my imagination or hardware flukes. ■

## TCBUG ANNOUNCES DATES FOR SECOND ANNUAL CONFERENCE

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Pre-registrations are now being accepted for the TCBUG Conference. Early registration fee for two and one-half days, including two luncheons and a reception, is \$90 for members of the Users Group and \$120 for non-members. Registration at the door will be \$100 for members and \$140 for non-members. Room reservations may be made by contacting the Americana Hotel at 817/870-1000. Special room rates are available.

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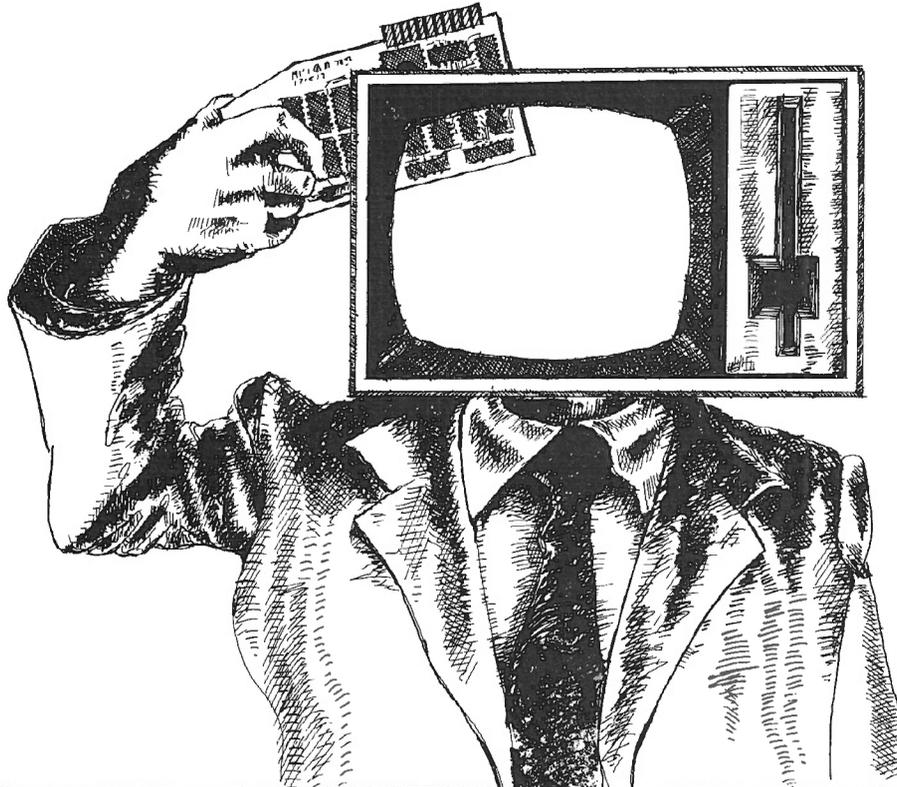
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ON THE MODEL II

# BANK SWITCHING



BY JERRY LIPPEY

*The following remarks apply to the TRS-80 Model II running under TRSDOS 2.0a. They are relevant to those who have one or more extra 64K memory boards installed; perhaps, as in my case, to run larger VisiCalc sheets. It is assumed that the reader is familiar with Z-80 machine language, with TRSDOS commands, and with a fair sample of programmers' jargon.*

**T**he Model II is configured to switch among up to 15 banks of upper 32K memory (addresses 8000H through FFFF) -- even though slots in the mother board are provided for a maximum of only nine banks. The first memory board contains the lower 32K of memory ("low memory") and bank #1; each additional 64K board represents two more banks. Jumpers installed on the boards determine the numbers assigned to the switchable banks ("high memory").

A bank is switched in by sending port FF a low-order nibble equal to the number of the new bank. A zero in this location removes high memory altogether. The high-order nibble of port FF controls other things; unless you intend to change them, leave that nibble as you find it. The current status of

port FF is maintained in byte 55H. The number of the bank currently in use is stored in byte 54H as well; since its high-order nibble is zero, this is a more convenient byte to test if you need to know which bank is present. When TRSDOS boots, it switches in bank #1 and sets byte 4F to the number of banks installed.

A region at the top of high memory can be protected from programs that respect it. The lowest address of this area, known as TOP, applies to all banks and is stored in bytes 52H and 53H (LSB first). TOP is initialized to F000, but you may modify it at any time.

The top of high memory is used by TRSDOS for the Library Commands DO, DEBUG, SETCOM, SPOOL, and HOST. TRSDOS knows when a function is turned on but does not keep track of whether or not the proper bank is switched in. In other words, when a function is active, TRSDOS always assumes that the appropriate high memory routines are accessible. So far, I have had no difficulty loading multiple banks and later exercising the associated function when any of these banks is switched in. To load the banks, TRSDOS needs to be fooled by turning off the function before loading another bank. After the new bank is switched in, it is loaded by turning the function on again.

# BANK SWITCHING

## Bank Switching Program

This is the routine I use for switching memory banks:

1	0284 5E	LD	E, (HL)
2	0285 23	INC	HL
3	0286 56	LD	D, (HL)
4	0287 EB	EX	DE, HL
5	0288 4E	LD	C, (HL)
6	0289 23	INC	HL
7	028A 23	INC	HL
8	028B 5E	LD	E, (HL)
9	028C 23	INC	HL
10	028D 56	LD	D, (HL)
11	028E 0601	LD	B, 1
12	0290 3E1F	LD	A, 31
13	0292 CF	RST	8
14	0293 3A5500	LD	A, (55H)
15	0296 E6F0	AND	F0H
16	0298 B1	OR	C
17	0299 325500	LD	(55H), A
18	029C D3FF	OUT	(0FFH), A
19	029E 79	LD	A, C
20	029F 325400	LD	(54H), A
21	02A2 0600	LD	B, 0
22	02A4 3E1F	LD	A, 31
23	02A6 CF	RST	8
24	02A7 7A	LD	A, D
25	02A8 B3	OR	E
26	02A9 C8	RET	Z
27	02AA EB	EX	DE, HL
28	02AB E9	JP	(HL)

## Comments On The Program Listing

### Lines Description

- 1-4 Address of parameters to HL (for BASIC only)
- 5 Bank number to C
- 6-10 Branch address to DE
- 11-13 Disable Break and Timer routines (SVC 31)\*
- 14-18 Switch to new bank & store value of port in 55H
- 19-20 Save bank number in 54H
- 21-23 Enable Break and Timer routines (SVC 31)\*
- 24-26 RET if branch address is zero
- 27-28 Otherwise, branch to this address

\* SVC 31 turns off and on most of the processing for the non-maskable interrupt, which occurs every 1/30 second.

### Program Location

The program is relocatable. As shown, I chose to tuck it into TRSDOS at locations 284H through 2AB. This is in the table of SVC addresses, beginning at SVC 102. If you have home-made SVCs or other things here, you will know it --because you put them there.

The unused SVC address space extends from 284H through 2B7. My switching program occupies 40 of these 52 bytes, leaving 12 for other uses. If you do not need the serial ports (selected with SETCOM), 12 additional bytes are available in 278H through 283H. Free memory below 2800H can be valuable, as will become apparent.

The switching program can be loaded when you are ready to change banks, but it must, of course, reside in lower

memory. Avoid locations 2800H through 2FFF if you leave it in memory because TRSDOS uses this region for 16 of its Library Commands (ANALYZE, APPEND, BUILD, COPY, CREATE, DUMP, ERROR, HELP, KILL, LIST, MOVE, PRINT, PURGE, RECEIVE, SETCOM, VERIFY). If you want to load the routine below 2800H using TRSDOS commands, you will first need to have applied the equivalent of

Bob Snapp's Patches #4 and #5. If you want to leave it below 2800H, you may as well PATCH the bytes into SYSRES/SYS; it will then arrive with TRSDOS when you boot.

### Calling Sequence

The normal entrance to my program is at the LD C, (HL) in location 288H. (I've included the first four instructions in case you wish to switch banks from BASIC; this procedure is discussed below.) You may enter with either a CALL or a JP. Use a CALL if you want to place the contents of the program counter on the stack; otherwise, use a JP.

Before the CALL or JP, you must load HL with the address of a pair of parameters which consists of (1) the number of the bank that you wish to switch in and (2) the address of the instruction that should be executed after the bank switch.

This data is stored in four bytes as follows: HL points to the byte containing the bank number. Make certain that it does

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# BANK SWITCHING

not exceed 15 (the program does no checking for errors; you would be placing garbage bits in important positions of port FF). The next byte is immaterial. The following two bytes contain the address of the instruction to be executed after switching (LSB first). If you want the next instruction address to be picked off the stack (i.e., execution of a RET), then set this to zero.

Summary of calling sequence:

Set (HL) → 0NXX JJJJ  
where 0N = Number of the bank to be switched in (00 to 0F).  
XX = Anything.  
JJJJ = Address of the next instruction after switching banks (LSB first). JJJJ = 0000 means RET after switching.  
CALL or JP 288H

The following example is a CALL from low memory which switches in bank #2 (perhaps it contains data) and then immediately continues with the next instruction:

```
LD HL,PAR
CALL 288H
      .
      .
      .
PAR DEFW 2
   DEFW 0
```

Here is a pair of calling sequences that will exit a program in bank #1 to execute another program at 8000H in bank #2 and then continue the original program:

```
In bank #1: LD HL,PAR1
             CALL 288H
      .
      .
      .
PAR1 DEFW 2
     DEFW 8000H

In bank #2: (Instruction at 8000H executed first)
      .
      .
      .
LD HL,PAR2
JP 288H
PAR2 DEFW1
     DEFW0
```

Note that the switching routine saves no registers. You can use low memory to pass information between programs in different banks. If you want to modify the program to save registers using the Z-80 stack, you may begin to worry about what happens when the stack is in high memory during the switch. That is a legitimate concern. But, as we shall see, you need to worry about this anyway.

## Managing The Stack

If in the past you have not paid much attention to where the stack is located, now is the time to start. Because of the peculiarity described below, it is safest to keep the stack in low memory. If you should relocate the stack after switching banks and wish to use the old stack to return (as in the last sequence above), do not forget to reset the stack pointer before returning.

A potential problem to keep in mind: Both before and after the bank switch, the switching program does one PUSH-POP (in SVC 31). If the stack is in high memory, this can lead to disaster. Because you may sometimes be stuck with such a situation, I shall discuss it in more detail.

Suppose we are switching in an auxiliary bank with the stack pointer aimed at high memory. Just after the switch, the PUSH-POP will destroy the two bytes below that location in the new bank. Similarly, if we have just reset the pointer to high memory in anticipation of returning a bank to a program that had its stack there, the PUSH-POP, before switching, will write two bytes into the bank which is departing.

If you have low memory available, this problem can be solved by relocating the stack. If you must frequently deal with stacks in high memory, you may wish to modify the switching routine to temporarily move the stack to low memory. You might, instead, revise the offending SVC, but I am reluctant to do so.

A tolerable compromise becomes available when you can depend on the stack's location remaining constant. Suppose you have an alternate-bank routine that is always switched in by a program having its stack in the same place in high memory. Since you know in advance the approximate stack location, you can simply program around the affected area. Better yet, leave the stack pointer alone, and designate it as the beginning of the stack in the new bank. This procedure eliminates the need for any low memory for your stack. As a bonus, the pointer will be correctly set when you return to the calling program (be sure to empty your new stack first).

## Switching Banks From BASIC

RSBASIC hogs so much memory that the temptation to put unused banks to work is hard to resist. Accordingly, I have made provisions for this in my switching routine. On the other hand, BASIC does not cooperate very well.

The program to be executed must be in the new bank and must have been loaded prior to loading BASIC. A switch to it may be accomplished as follows:

```
DEFUSR = &H284
Z%(0) = M: Z%(1) = KKKK
Z%(0) = USR(VARPTR(Z%(0)))
```

where M = Number of the bank to be switched in (1-15). Remember, the switching routine does not check this number.

KKKK = Address of first instruction to be executed in new bank (8000 hex to FFFF).

# BANK SWITCHING

To return to BASIC, use the "JP 288H with RET" form of the calling sequence.

Here is an example of branching to a program at 8000H in bank #2:

```
DEFUSR = &H284  
Z%(0) = 2: Z%(1) = &H8000  
Z%(0) = USR(VARPTR(Z%(0)))
```

If BASIC were using bank #1, the last machine language example above will return to your BASIC program.

Note these two important facts: (1) This scheme does not enable you to pass parameters between your programs, and (2) the stack poses a problem.

If you insist upon access to another bank from a serious BASIC program, here are a few tips that may help. BASIC controls essentially all memory between 2800H and whatever you have informed BASIC is the bottom of protected memory; if you have not specified, then it is TOP. Unless you are aware of a dependable low-memory hole in BASIC's territory, you will need to locate the switching routine below 2800H.

For passing parameters, it is easiest to use machine language in protected memory above BASIC. Before a bank switch, parameters can be tucked away somewhere in low memory,

say alongside the switching routine. Use USRs to reach your programs in protected memory and to pass the data in and out of BASIC.

(Here is a challenge to you floating point buffs: You can forget about protected programs and more USRs to pass parameters if you do the following: use a floating point variable instead of a VARPTR in the USR that calls for changing banks. The three bank-switching bytes plus several others can all be passed out of BASIC as a single double precision number. The same variable can be used to return data to your BASIC program via that USR. Because BASIC stores its USR argument in low memory, these bytes are accessible to programs in any bank. The easy part is rearranging the bank switching program to look after the HL register. The challenge is to encipher and decipher the normalized floating point numbers. Good luck!)

BASIC's stack is just below its string space (established with CLEAR), whose top is at the memory protection boundary described above; so it is ordinarily in the bank that is switched out. Fortunately, the area of memory in which the stack resides can be easily located within a few dozen bytes, and unless the string space or protection address is changed, the stack will remain in that vicinity. Consequently, you can leave the stack pointer alone and program around your stack in the alternate bank, as outlined earlier. Your program can then be safely used by all BASIC programs having this stack area. ■

# MODEL-16 FORTRAN-77

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# A LOOK AT VERITAS

## dual processor option

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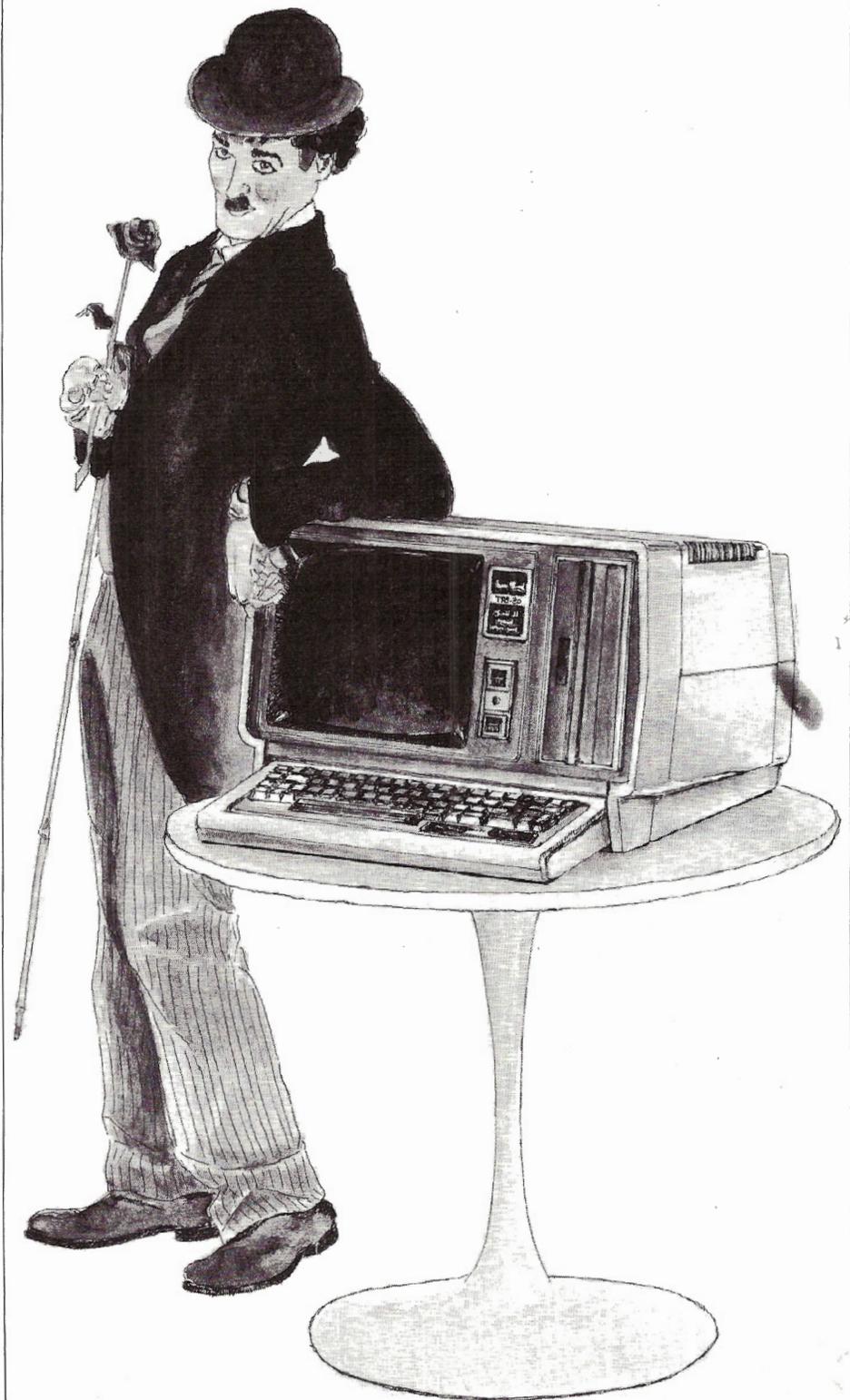
BY R.P. VANNATTA

**T**ime flies, it seems! Just about every time I think that I have a handle on what is going on in the computer world, a curve ball comes rolling in.

A couple years back, IBM produced a small computer they dubbed the PC. Cynical journalists (like myself) immediately dismissed it as a loser. After all, it had to be plugged together in a stack of pieces like a Radio Shack Model I and used an oddball processor called the Intel 8088. Similarly, everyone knew that real micro computers used 8" floppies and toys used 5.25" floppies. On top of all that, it seemed to be priced a bit above the competition. Certainly, this amounted to a surefire formula for failure.

About the same time, the Radio Shack Model 16 came on the market. It had enough disk space to run most programs and would not only run conventional 8-bit programs, but would also run programs on a vastly more powerful MC68000. Certainly this product would stampede the world.

Robert P. VanNatta  
222 South First Street  
St. Helens, OR 97051



Well, maybe! Radio Shack has just released the Model 2000 with its 5.25" drives and a 80186 processor. (This is a state-of-the-art upgrade from the 8088.) Meanwhile, back at the farm, Veritas Technology, Inc. has developed a plug-in board for the Model II/12/16 with, guess what...a 8088 processor.

Little did I think when I ordered my Model 16 almost two years ago that I would be retrofitting it with an 8088 board before I managed to acquire a single program suitable for use on the 68000 side of the machine. Oh, yes, I have evaluated CP/M-68k and I know that TRISOFT has a BASIC available for CP/M-68k, but that BASIC hasn't made it my way yet. And, of course, there is XENIX. It needs a hard disk which I don't have.

Announcements of the Veritas board have been appearing periodically for about a year in *two/sixteen*. Like many computer products, however, Veritas has found it easier to distribute press releases than to deliver the goods. Their manuals bear a January 1983 printing date, and the board I got in November 1983 was still a BETA test board.

Physically, the Veritas board is a large board (cut to the same shape as the Model 16a MC68000 boards). This means that it fits very nicely into the card cage of a Model II or Model 16a, but less elegantly in the model 12.

The particular board I received contains 256k of memory, a 8088 processor, and the necessary supporting chips.

The board contains an empty socket for the 8087 math co-processor, but the board I got was not so equipped. To my notion, this absence is just as well. The 8087 is a specially-designed chip which is intended to make math operations execute very quickly. It is my impression (not first hand) that it does

this very well, but to some extent at the expense of other operations. The more serious problem, however, is that there is simply very little general purpose software which supports the 8087.

#### Installing The Veritas Board

Installation of the Veritas Board, which is dubbed the Dual Processor Option (Veritas Technology, Inc. claims a trademark on the name) is very easy.

Essentially, you take the lid off your Model II/16, remove the hold-down bracket on the back of the card cage, stick the board in the first empty slot, and then put everything back together. On the Model 12, you simply take the back cover off and stick the board in (after removing the hold-down brackets).

#### Using The DPO

Use of the DPO is about as simple as the installation. I got CP/M-86 with my board. You use it like you would any other computer. You simply put the CP/M-86 disk in the drive and slam the door, and, in due course, it boots. In this sense, it works more like CP/M-80 than CP/M-

68k. Unlike CP/M-68k, the DPO does not require you to use CP/M-80. It is a complete stand-alone system. It is a bit amazing, but it is this simple. If you cold boot with a CP/M-86 disk, the machine will boot on the DPO, and if you cold boot with any of the traditional operating systems, they will still work like they always did.

#### What Is CP/M-86

I won't undertake a long description of CP/M-86 except to say that if you can use CP/M-80, you should become comfortable with CP/M-86 in about 5 minutes. The only criticism I have of the version that came to me is that it is very spartan. It does not have a great bag of "extra utilities." I assume they will get around to writing some of these in due course, but, at the moment, for example, if you need to

If you can use CP/M-80, you should become comfortable with CP/M-86 in about five minutes.

# XENIX Utilities

## spoolutil

### SPOOL MANAGEMENT UTILITY PROGRAM

*Easy to use menu driven program which allows you to manipulate the reports waiting for printing in the spool queue.*

*Easy to use menu driven program which allows you to manipulate the reports waiting for printing in the spool queue.*

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- view a spooled report on the screen prior to printing
- cancel printing of unnecessary reports
- print extra copies of a report (without rerunning the program)
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- remove users, files and directories
- establish group codes for more versatile file protection
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  - who is on the system
  - who is authorized to use the system
  - how much disk space is available
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change the I/O byte, you will use the STAT command. STAT LST:=UL1: will set the I/O byte to serial port B, so you can use a serial printer out of that port. This is, of course, the Digital Research documented method of changing the I/O byte on CP/M-80 as well, but who does it that way?

Support is provided for up to four floppy disks and four 8-megabyte hard drives. At the moment, the newer 12 and 15-megabyte hard drives are not supported.

#### Terminal Characteristics

The terminal is configured to emulate a DEC VT-52 display. I am at a dead loss to know why Veritas picked the DEC VT-52 as an emulation model, but I must say the choice is not all bad. It takes three pages of their 23-page manual just to list all the escape codes that control the terminal.

Specifically, there are 26 escape codes for managing the display, and five control codes (Pickles and Trout lists 24 total).

#### Does It Work?

Veritas warned me before they delivered the board that it would not work properly on the Model 12. They weren't kidding. It seems that the Shack made a few subtle changes in the buss between the Model II and the Model 12. They haven't bothered to tell anyone what those changes were or why they made them, so folks like Veritas simply have to discover them the hard way. Thanks to the insensitivity of those who like to change things for obscure reasons, the DPO will only run a few minutes in the Model 12 before it "locks up." In the Model II and the Model 16a, it works fine, but not in the 12.

According to Veritas, it is their failure to get the DPO working in the Model 12 that accounts for the fact that it is still in the BETA test routine. When I last spoke with them, they were working frantically trying to solve the Model 12 mystery and were hopeful the task would be accomplished "real soon now."

I have some reason to believe that the true goal of Veritas is to produce a board with an implementation of MS-DOS which is reasonably compatible

with the Tandy 2000. To date no MS-DOS is to be seen, but the idea is obvious and all of us who have II/12/16 computers ought to hope that they are very successful in the endeavor. With the advent of the Tandy 2000 which supports MS-DOS, the editorial predictions of *two/sixteen* of the last two years have almost come true in one blast. There probably will never be another major software product written for TRSDOS.

Similarly, it is doubtful if there will be many exciting new products developed for CP/M-80. Software writers are

Our Model II/12/16 computers are going to be worth a whole lot more if they have an upgrade path to the current state-of-the-art software.

working on exciting MS-DOS programs. Only when they get MS-DOS versions running, do they look to see if it is feasible to transport the product to other operating systems (usually CP/M-86 and CP/M-80 in that order). The usual answer is that the product is too large to fit in a mere 64k Z-80 system, and that is the end of it.

What I am trying to politely say is that our Model II/12/16 computers are going to be worth a whole lot more if they have an upgrade path to the current state-of-the-art software.

Radio Shack has sent a memorandum to their dealers advising them that the advent of the Tandy 2000 does not signal an end to the Model 12. They say that the market direction of the two computers is different. The Model 12 with its expansion path toward the Model 16 and multi-user software is intended for accounting and general business applications. Tandy 2000 is positioned to compete directly against the IBM PC. As such, it is aimed at those who have 2700 bucks in their

pocket and want a computer, but don't know quite what they are going to do with it.

#### Performance

You have probably all been holding your breath for me to tell you how fast or slow the DPO board operates. The answer is that I don't really know. When the DPO board arrived, my desk drawer did not have much of a selection of CP/M-86 software in it, since I had never before had a CP/M-86 computer. My first thought was to try renting something for a test. I called United Computer Corp., who always has an expensive-looking ad in nearly every computer magazine that I read. When I told them I was looking for something for CP/M-86, they just laughed. It took a couple more phone calls before I found a mail order house that even stocked software for CP/M-86. I finally selected Personal BASIC from Digital Research as something I could afford which would make a reasonable test bed for checking out the DPO board.

Personal BASIC or PBASIC is supposed to be a MBASIC look-alike for CP/M-86. It was developed by Digital Research as part of their effort to get some acceptance for CP/M-86. For the most part, rather than evaluate the DPO, I simply convinced myself that PBASIC is a real mutt.

For example, I checked out the execution time for 10000 iterations of an empty FOR-NEXT loop in various languages. Some of the results were as follows:

DPO + PBASIC	11.63 sec.
Tandy 2000 + MBASIC	3.84 sec.
TRSDOS + MBASIC	11.00 sec.
CP/M-80 + MBASIC	5.21 sec.
CP/M-80 + CB-80	0.20 sec.

Even though the DPO came in dead last in this test, I am convinced that the fault lies in PBASIC, not the DPO. It is going to take more time than I have had, and a lot of work, to form a serious conclusion about overall performance. In reality, however, I think that this is a phony issue. It has long been generally reported that 8088-based computers usually, at least superficially, seem to perform comparably with Z-80 computers, and

there is nothing I have seen that indicates the DPO does anything other than make your II/16 into a credible CP/M-86 based computer.

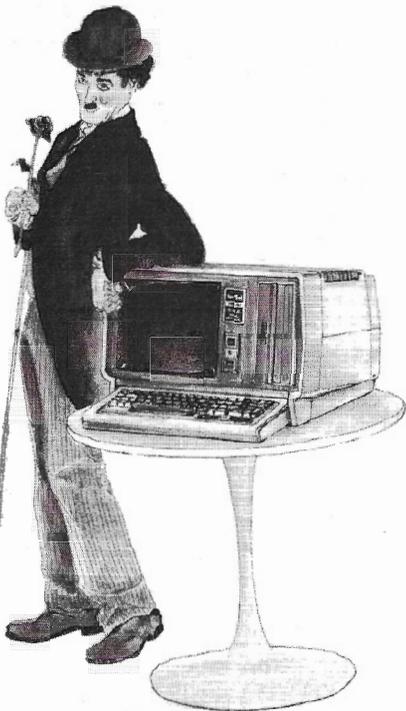
You should not think of the DPO board in terms of replacing a 4-cylinder engine with a V-8. Rather, you should think of it in terms of putting a Ford engine in a Chevrolet.

#### Conclusions

This is a quick first look at a very exciting product! It is not formally released yet (*due to lag time between writing and publishing, the DPO may well be formally on the market by the time you see this-Ed.*) because of the Model 12 problem; but when it comes, it should be well worth your consideration if you feel a need to get into the CP/M-86 software field.

The relatively low cost of the Model II (as compared to a CompuPro, etc.) has made it quite a popular machine for software development and the like. I hardly see much purpose in buying a DPO board just to run a CP/M-86 General Ledger, but if you like to be very trendy, or are a software developer, the DPO is a pretty clever product.

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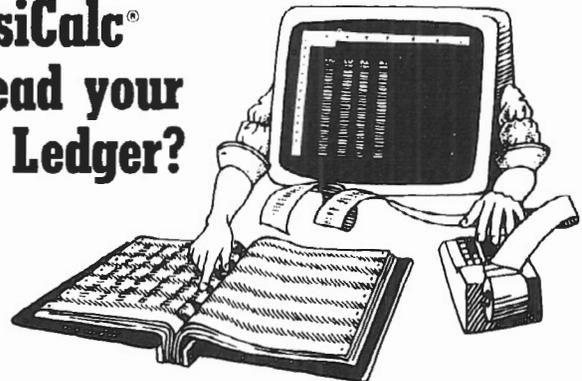
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# THE CP/M WORKSHOP

Making the transition from TRSDOS to CP/M doesn't have to be difficult or painful -- if you have The CP/M Workshop to get you started and help you over the rough spots.

BY MARK BENNETT

**R**ecent events have made it necessary for me to learn and use CP/M, which necessity I was approaching with a certain sense of dread. But when you gotta, you gotta. *Advanced Computing* came to my rescue by allowing me to review a new program called The CP/M Workshop, a tutoring program for new CP/M users. How could I refuse?

## Setting Up the Workshop

First, The CP/M Workshop is disk based. The entire manual, including appendices, is 17 pages long. It tells how to insert your CP/M system disk, insert the Workshop disk in Drive B (CP/M uses letters A-D to designate drives), and hit <CTRL><C> to initialize the new disk. CP/M uses the drive letter to show which drive the computer is looking at. So, you see "A" followed by the cursor.

At the A> prompt, type B:<ENTER> to switch to the drive with the Workshop in it, then type SETUP <ENTER>. You will be asked some pretty technical questions.

The first screen scrolls up, explaining that you need to customize the program to your computer. At the bottom of every screen, and as a consistent feature throughout the Workshop, is the instruction to tap the <SPACEBAR> on your keyboard to

advance the program. This gives you plenty of time to read the information presented.

Also, in the SETUP program, you have the ability to call a help screen simply by hitting the "?" key. I did that at the first setup screen and received a simplified explanation of what the SETUP program hoped to achieve and advice to call the store from which I purchased my computer if I have trouble. Also, the help screen provides the opportunity to enter all SETUP specifications from a command line, but if you know how to do that, you won't need this program.

The second screen gives a menu of "popular" terminals. Twenty-one terminals. It doesn't include Tandy, but it does include such biggies as GTC, INFOTON and KIMTRON. How many installations of CP/M do you suppose there are on Models II/12/16 worldwide compared, for instance, to KIMTRON? Additional blank spots are provided on the menu to enter other terminals, and if Tandy were included, all this custom installation garbage could be avoided. But no such luck. So, on this menu, press "Z" (none of the above).

A "None of the Above" response puts you in the custom installation routine where you are asked seven questions, which must be answered in hexadecimal form. If you make a mistake after any entry, you have the opportunity to press <R> instead of the <SPACEBAR> to re-enter the code. The program runs a screen test to make

sure all the codes you just entered do the right thing.

After that, you have the opportunity to enter codes to clear the screen instead of having everything scroll off. I looked at the list of Character Codes in Appendix B of the TRSDOS manual and found that hex code 1B is supposed to clear the screen and home the cursor, so I went ahead with the screen clear entry routine. I entered 1B, then 00. The program ran a test to see if it worked. It didn't. So I tried to re-enter using hex codes 14 (home cursor) and 17 (clear below), ran the test again, and it still didn't work. So, I gave up.

After the aborted screen clear attempt, the program gives you the opportunity of saving your changes or quitting. Of course you should save them, and the program quickly writes to the disk, then returns you to the prompt B\*..

## Running the Workshop

At B>, type TEACH <ENTER>. This sends you automatically into Lesson A, which summarizes what you've done so far (nothing). About all you have to do after this is hit the <SPACEBAR> and read what comes up on the screen. The program progresses sequentially from Lesson A to Lesson P.

You'll probably find exactly what I found; it's really kind of boring. Somehow operating systems can't be described or explained in an interesting way.

The CP/M Workshop tries valiantly to overcome this fact by using some simple animation to illustrate a computer

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system, some clever writing, and examples that are well designed for their task. But explaining even the simple ways to use PIP and STAT, and there are apparently many ways to use them, just isn't the same as learning by doing.

Anyway, you will find the following commands covered:

**ERA** Same as TRSDOS KILL  
**REN** Same as TRSDOS RENAME  
**DIR** Same as TRSDOS DIR  
**TYPE** Similar to TRSDOS DUAL  
**STAT** Similar to TRSDOS FREE and ANALYZE  
**PIP** Similar to TRSDOS DUMP, DUAL, LIST, COPY, FORMAT, BACKUP, MOVE and PRINT

It also gives thumbnail sketches of expanded functions for these commands which are easy to review, once you know where they are located within the program. Some of the modules deal with how to enter commands, control codes, naming disk files and devices, and choosing file names.

The CP/M Workshop lets you go back into any of the sixteen modules and exit from them to the main menu at any time, just by hitting "I", so you can study and review at your own pace.

One of the important things I learned is that in a command line, CP/M reverses the sequence for filenames or drive designations. For example, under TRSDOS you would enter RENAME OLDFILE/BAS TO NEWFILE/BAS. Under CP/M it would be REN NEWFILE/BAS =OLDFILE/BAS. Logically this format is similar to BASIC, but it doesn't seem logical after using TRSDOS.

At the end of the lesson part of the program is a self test which you can use to review your progress. I could give you the answers, but that would be cheating. I scored high enough on the test to qualify as a "systems analyst" according to Datascan.

This program touches on only the bare minimum of things you will need to get started with CP/M, but that is the stated objective of the program's writers. You will probably need to refer to the CP/M manual within a few

days of starting, even after using this program. It's just not extensive enough, even if you have one or two applications and only turn the computer on to use them.

#### The Bottom Line

My advice for The CP/M Workshop is this; buy it only if you have no other convenient source of help, and don't mind the cost. It does have basic information that comes in a handy form for review, and it probably won't go out of date for a couple more years. Just by using the program you will get some fundamental knowledge of how other programs work, and sometimes that can teach you a lot.

To Datascan's disadvantage, I used Pickles & Trout CP/M Version 2.2m for this review. If you didn't read Vannatta's review in the November-December issue of *two/sixteen*, you may not know that P&T has a program called MENU.COM on this version that does just about everything automatically that The CP/M Workshop teaches you to do manually. You

don't even have to know there is a program called PIP in order to make a backup, just that you need to type MENU <ENTER>; after that it's easy. I even used the MENU to change the step rate on my thinline disk drives and it only took a couple of minutes! It comes with a pretty good manual which isn't always easy to understand, but is well organized and extensive.

It is money better spent, in my opinion, to buy a new version of P&T CP/M 2.2m than The CP/M Workshop.

The CP/M Workshop is available from:  
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# MBASIC SPOOLING IN TRS-XENIX

BY JOE A. SANCHEZ

**T**he spooling in MBASIC running under TRS-XENIX can sometimes be a real wait. True, most of our processing time was cut by more than 50 percent by using XENIX instead of TRSDOS. But we lost this processing time savings by using spooling as the MBASIC manual recommends.

I have found that opening a file for output under any filename, then doing a Shell "lpr <filename>" instead of opening it for output as "LTP1:" as the manual recommends, will save you over 80 percent of your time, as well as computer time!

In a timed spooling test, running the same report in both cases, I did a four page report. In the first test, I opened the output file under "LPT1:". It took 5 minutes 51 seconds to spool. In the second test, I opened the output file under any other file name (I used ENGINEERING). It took only 58 seconds to spool. I saved almost five minutes!

Everyone here is more than pleased with the cut processing time of XENIX MBASIC and even more pleased with less spooling time.

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# USING A SERIAL PRINTER WITH TRS-XENIX

BY RICHARD S. BILANCIA

**W**ant to use a serial printer with TRS-XENIX, but don't know how? Here is a solution that works. However, it's not quite as easy as using a parallel printer.

Assuming that your serial printer is plugged into serial channel B, as it would be if you were using TRSDOS, simply follow these instructions:

1.) Open your printer and be sure the appropriate switches are set to receive using these protocols:

- a.) 8 bit words
- b.) No parity
- c.) 1 stop bit
- d.) 9600 baud

2.) Turn the printer on.

3.) Enter the following commands as the TRS-XENIX root:

```
disable tty02  
cu -wait -s 9600 -1 /dev/tty02 -a /dev/null -nh
```

4.) After the "Connected" message is displayed, simply type the following:

```
~<file
```

where "file" represents either a filename or the full pathname of the file to be printed.

5.) When you are finished printing and wish to return to the shell, just type:

```
~
```

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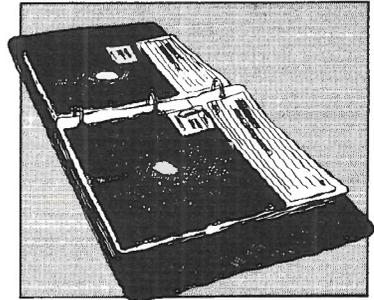
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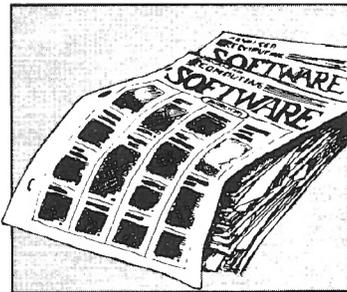
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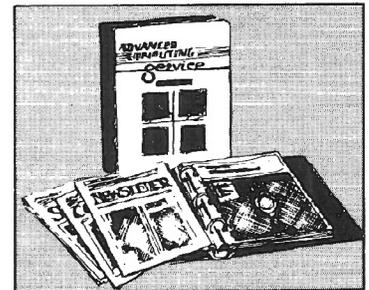
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