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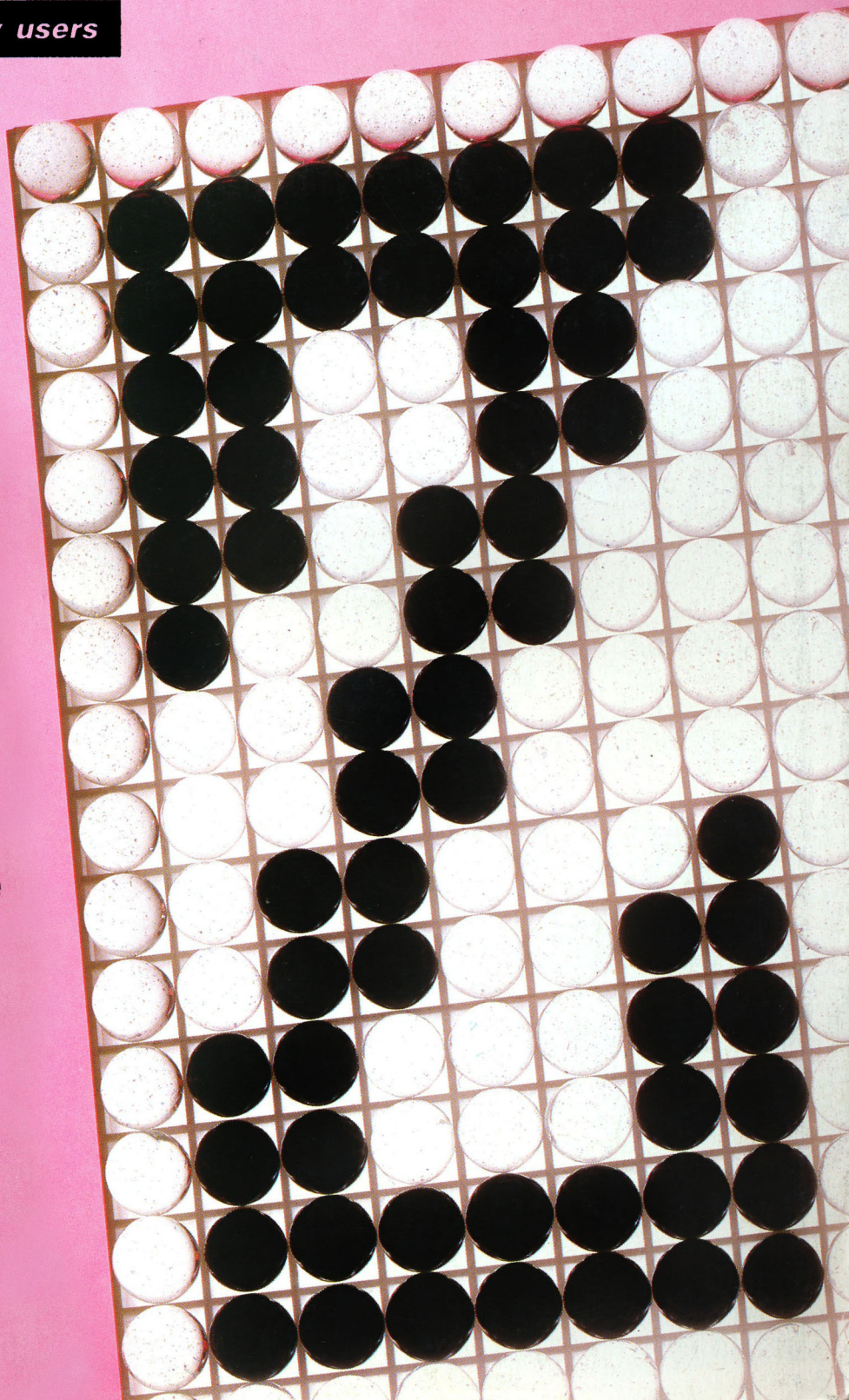

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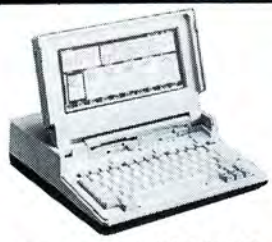

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Pizzazz

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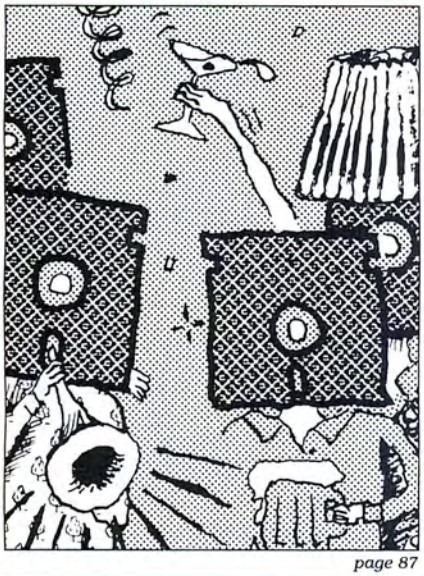

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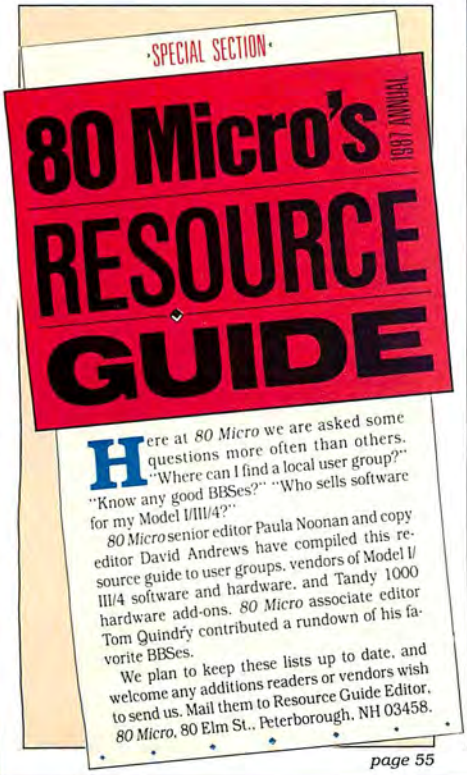

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55. ***80 Micro* Resource Guide** *by David Andrews, Paula Noonan, and Thomas Quindry*
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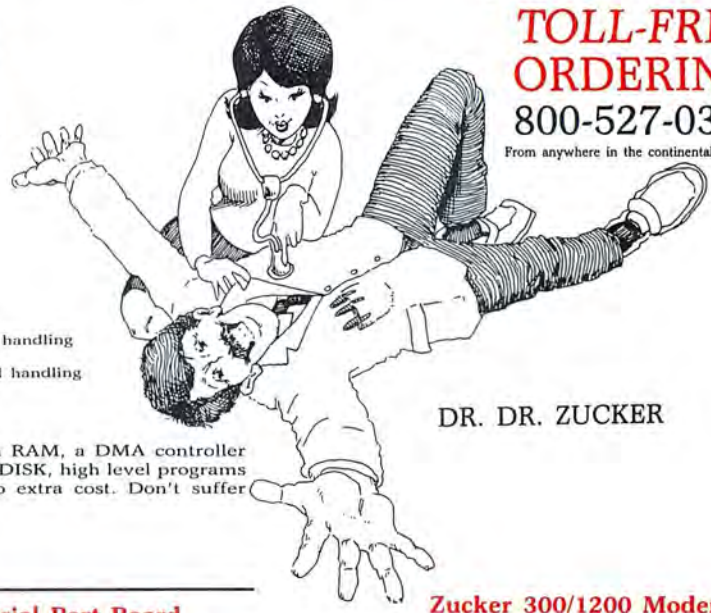

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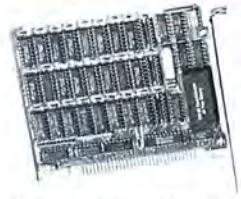

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Farewells

In case you missed my November Side Tracks, this is my last issue as editor of *80 Micro*. Starting next month, my time will be taken exclusively by *PC Resource*. Michael Nadeau, currently *80 Micro*'s executive editor, will be replacing me.

Some random thoughts on the eve of my departure:

Try as I might, I can't dredge up even a smidgen of sentimentalism over not having to deal with Tandy Corp. anymore. I'm going to miss those guys like I miss my last migraine.

Of course, I'm sure the feeling's mutual.

On the other hand, I will miss the misfits and rednecks that make up the rest of the Tandy market, even the one who recently told me I had my head up my ass because we forgot to mention his product in one of our columns. Those who have survived in this godforsaken market have every ounce of my respect. If you're new to Tandy computing, for pete's sake, buy your products from third-party companies; they deserve your dollars more than Tandy does.

Tandy's Turn

Speaking of dollars, that's all Tandy can credit to its longevity in the PC game. Sure, the company's learned a lot about marketing in the last couple of years, but it never would have gotten this far without the bucks all its other products brought in. Let's face it—if Apple had adopted the same marketing strategy for its computers, Jobs and Wozniak would be sweeping the floors in Armonk today.

Which reminds me of my favorite Side Tracks quote: "Tandy has as much of a chance of regaining its position in the marketplace as I do of becoming pope" (January 1986, p. 8). I haven't heard from the Vatican yet.

Despite Tandy's marketing ineptitude, the company has sold some good products. The TRS-80 Model 4 was one hell of a computer. So when's the Z8000 going to be ready?

And I still haven't found an MS-DOS word processor that I like as much as Model 4 Scripsit modified with Powersoft's Powerscript.

Let's not forget the Model 4P, the computer Tandy forgot it had made.

Which brings me to my second-least-favorite Side Tracks quote: "The 4P's features, along with Radio Shack's CP/M, should make it competitive in the transportable market" (January 1984, p. 6). I didn't realize at the time that Tandy had as much interest in promoting the 4P as it did in selling memberships to the Ku Klux Klan.

My least-favorite Side Tracks quote? "The 80186 has emerged as a chip to be reckoned with" (February 1984, p. 10). What drug was I on?

In case you forgot, the 80186 was the CPU in Tandy's first MS-DOS computer, the Model 2000. Talk about an ill-fated machine. Despite its noble failure, it did teach Tandy an important lesson: Don't try to be an innovator when your experience is in selling batteries for stuffed-animal radios.

Or, to quote from my January 1986 Side Tracks, "Tandy follows the beat of the loudest drummer in the band. . .. The company would rather let other manufacturers take the risks, and feed off their successes."

Which is, of course, a perfectly legitimate and very profitable way of doing business. For better or for worse, it's what'll take Tandy into the 1990s as one of the top four PC manufacturers in America.

But enough about Tandy. Time to reminisce a bit.

So Long *80*

Did you know that in 1982 *80 Micro* was the third-largest magazine in the country behind *Vogue* and *Byte*? The October issue had 255 ad pages. New owners of Tandy computers must have a hard time believing the Tandy market was once that big.

At one point that year, we produced a 518-page November issue and 594-page anniversary issue at the same time. That's 1,112 pages in one month, or about the same number of pages published in the first nine issues of 1987.

That was back when Wayne Green was still writing his editorials for *80*. Wayne wrote about everything from negative ions to apple sauce, with enough room left over for occasional harangues about Tandy's poor marketing and failure to support third-party vendors. Wayne's acerbic tongue has been matched by no one, including John Dvorak.

The *80 Micro* staff was ridiculously inexperienced back then. The average age was about 24. But the magazine has been blessed by a number of skilled editors. We have alumni at such publications as *Computerworld*, *Byte*, *Lotus*, *Network World*, *Publish!*, *Computers in Science*, and *Personal Computing*. We're older and wiser now, but the tradition of exceptional talent continues.

The same can be said of the many fine authors who have contributed to these pages. The first-rate articles by such writers as Hardin Brothers, Bruce Tonkin, John Harrell, Harry Bee, Craig Chaiken, David Goben, and Tom Quindry have made *80 Micro* what it is.

The Best for Last

A quality staff and quality authors. They wouldn't have been enough, though, without a quality readership. What I'll ultimately remember is the remarkable dedication you've shown this magazine.

For instance, there were the letters from readers who had switched to other systems and were apologizing for canceling their *80 Micro* subscriptions.

And the survey showing that 95 percent kept their issues.

And the many people at shows and user groups who treated *80 Micro*'s editors as if they were part of the family.

The letters, the phone calls, the personal contacts—all gave me a sense of how important *80 Micro* has been to many peoples' lives. It might only be computing, but it's computing with a whole lot of feeling. And I've felt privileged to have been able to help your computing be a bit more pleasurable and productive.

I've always contended that editors are not much more than custodians taking care of a building that is ultimately designed, built, and peopled by the readers. *80 Micro* has been a palace to work in.

Thanks for five and one-half fine years, and keep up the good work.■

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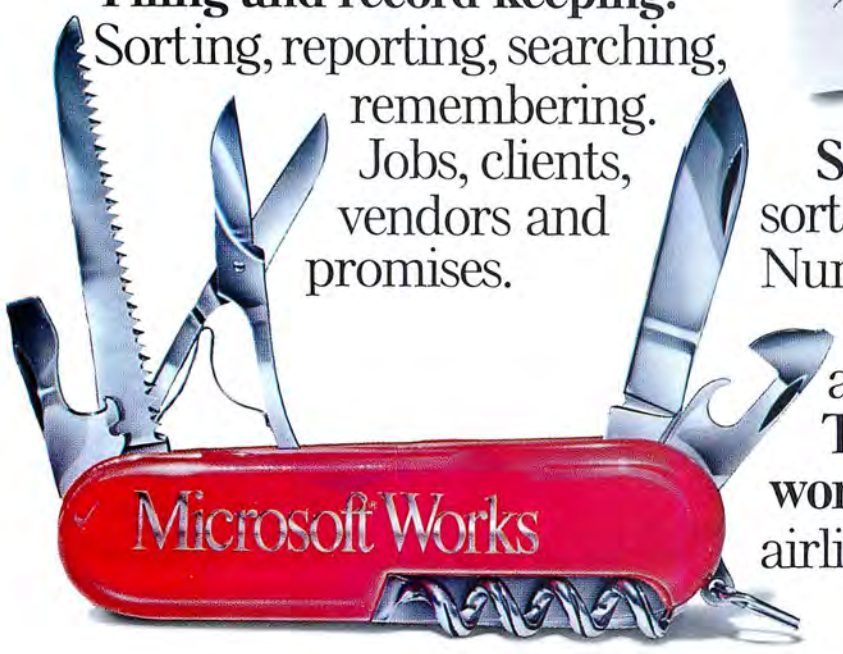

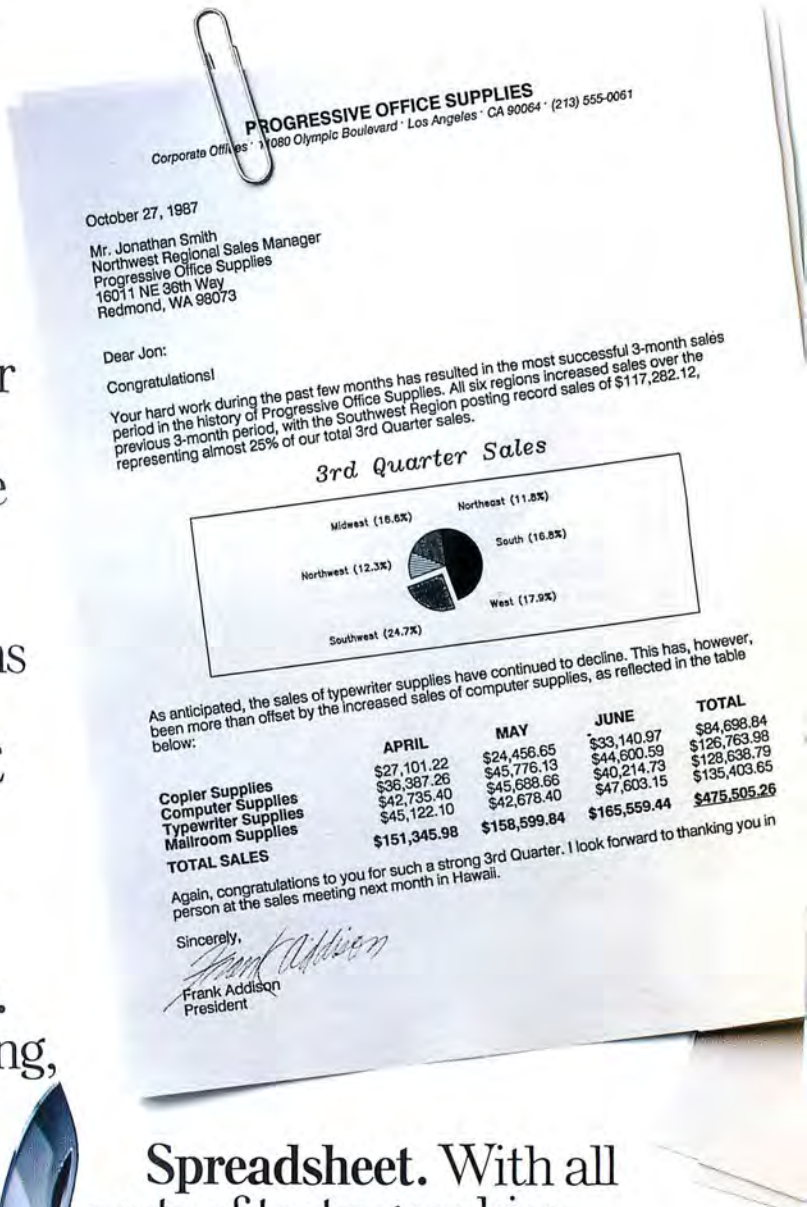

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3rd Quarter Sales

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	APRIL	MAY	JUNE	TOTAL
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Computer Supplies	$36,387.26	$45,776.13	$44,600.59	$126,763.98
Typewriter Supplies	$42,735.40	$45,688.66	$40,214.73	$128,638.79
Mailroom Supplies	$45,122.10	$42,678.40	$47,603.15	$135,403.65
TOTAL SALES	$151,345.98	$158,599.84	$165,559.44	$475,505.26

Again, congratulations to you for such a strong 3rd Quarter. I look forward to thanking you in person at the sales meeting next month in Hawaii.

Sincerely,

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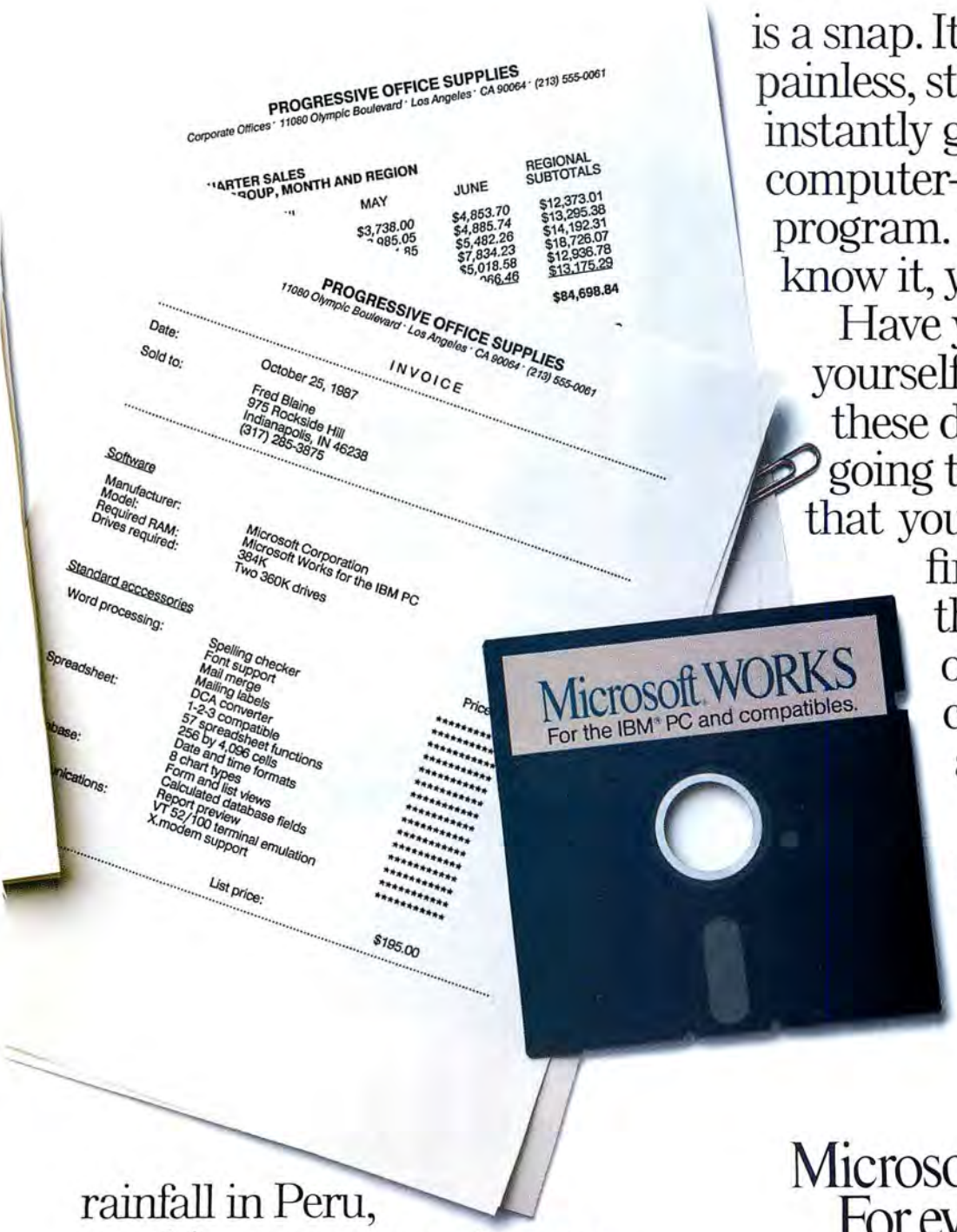

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Not So Revealing

Q. I found two inconveniences with Superscripsit when I updated to version 1.02.00 on my Model 4P that I want to fix:

•Version 1.01 displays the file name and extension in the lower left corner. It also displays the drive number if you type it in when calling to open a document. Version 1.02 displays the file name but not the extension or drive number.

•Version 1.02's Compress Document utility erases the data on the lines for author, operator, and comments in the Open Document Options portion of the document. I found these lines in version 1.01 helpful to leave little notes to recall the status of each document. (Gene Tozzi, New Rochelle, NY)

A. Model 4 Superscripsit 1.02.00 was dramatically reconfigured from earlier versions. It operates faster than the other versions, and its streamlining moved many routines around. Your two problems are well-concealed, pesky bugs. They are in an intricate web of code that shifts from system overlay to overlay. However, two simple 1-byte patches correct them.

The problem with the file-name extension and drive number is that version 1.02 purposefully hunts for the file-name delimiters to omit them. First, it checks for a slash, then a colon, and finally an underscore (from the line displayed when you type in the name). Changing the first test, for the slash, to an underscore, leaves the file name intact. The patch is:

```
PATCH SCR17/CTL (D02,9A=5F:F02,
9A=2F)
```

The Compress Document utility bug was a tough problem to solve. Instead of copying the entire data as did previous versions, version 1.02 only copies the file name, printer-driver name, and all format information up to, but not including, the author, operator, and comment blocks. To fix this, increase the length of the copy to include the desired additional data. The patch is:

```
PATCH SCR17/CTL (D04,65=D8:F04,
65=78)
```

Off the Beaten Path

Q. When I open a new document in Superscripsit, I must specify the drive or it defaults to drive zero. I want to have the option of setting the default drive. (Bernard Plotkin, Westbury, NY)

A. The unique nature of TRSDOS and similar DOSes is that they scan through all on-line drives for a file, instead of confining the scan to a default drive or individually selecting a drive to find the file, as CP/M and MS-DOS do. If you don't want to create files on the drive zero disk, place a tab over the disk's write-protect notch. Files are then created on the next higher drive.

Make sure files such as Move/CTL and Words/CTL are not on the write-protect disk, as Superscripsit often updates them.

Driving Out of Control

Q. In your answer to Albert E. Spaiches in July 1987 (see "Who's Driving," p. 12), you use too many control characters when you explain how to delete text with a Model III, Epson MX-80 printer, and Superscripsit 1.3. A single press of the control key at the beginning of the sequence should be enough. Shift-up arrow (↑) followed by control-X starts the block action sequence. After that, single letter entries of "E" (end of text), "B" (block action), "D" (delete), and "Y" (verify deletion) should work. The extra control-key presses disrupt the deletion process. (Don Morse, Valdosta, GA)

A. Oops. You're right about the excessive use of the control key. Control-X is the only control-key combination you should use.

Graphics Grapple

Q. I bought a Tandy 1000 SX via mail order. I prefer an amber screen, so the dealer sold me a Samsung monochrome monitor (model MD-I 252G), which requires the installation of a high-resolution graphics board. The dealer installed a Tandy Dual Display Graphics Adapter (catalog no. 25-3045). None of the Basic graphics commands seem to work. When I try to run the utilities disk that came with the graphics adapter manual, the screen goes blank, and I need to press the reset button. Every test I tried on the utilities program had the same result.

Do the graphics commands work only with a color monitor, or did the dealer install the wrong graphics board? I haven't worked with graphics commands before (my last computer was a Model 4), so I'm not sure if I'm doing something wrong or I have the wrong hardware or software. (Roger W. Roy, Southwick, MA)

A. Your adapter drives both monochrome and graphics displays. However, a color graphics monitor (usually one that advertises a 320 by 200 or a 640 by 200 resolution display) is required so you can take advantage of the graphics features of your display adapter. Your monochrome monitor displays only text, not graphics (except for the CHR$() blocks contained in the upper ASCII set).

The display driver in ROM checks for a color monitor; if you don't have one, it won't display graphics, and the computer locks. A good Basic graphics program prevents computer lockups with the line:

```
DEF SEG=0:IF (PEEK(&H410) AND
&H30)=&H30 THEN PRINT"GRAPHICS
NOT SUPPORTED!":END
```

If you want graphics, you need to purchase a color monitor. For information from one of our advertisers, circle the appropriate number on the Reader Service card and send it to *80 Micro*. Many of our advertisers sell color monitors for less than list price. You can contact them directly to verify that your display adapter supports the company's monitor.

Fool the Driver

Q. I use a Model III with a hard drive and LDOS 5.1.3. Can I use the printer spooler facility of LDOS with Superscripsit 1.2.0? Misosys representatives said Superscripsit sends data directly to the printer rather than porting it, and this prevents a device reroute. I'd like to buffer the output to my DMP 130 so I can go on to another project. I use the DMP130/CTL driver for Superscripsit.

Also, when I use Superscripsit 1.2.0 on my Model III, my system reboots if I try to print a document with headers or footers. It also reboots if I try to view or re-

Illustration by Maris Bishofs

edit a header/footer, and I can't print the document, which is locked. LDOS 5.1.3 gives me a "Sys error" message. I lost a 31-page business document because of this; I can look at it, but I can't print it. The problem doesn't occur in my other documents—it only affects the documents to which I tried to add headers/footers. (Andy Smith, Asheville, NC)

A. Modifying Model III Superscripsit for printer rerouting requires changes to only the printer drivers, which are the same for all other versions of Superscripsit (1.0–3.1). To modify any printer driver, you need to have a disk-monitor program, such as FED, which comes on LDOS 5.3. Radio Shack printer drivers test the printer port. Look for the hexadecimal (hex) byte sequence of DB F8. You can fool the driver into assuming a successful test, even when no printer is on line, by changing these 2 bytes to 3E 30.

The out-byte sequence is in bytes D3 F8. If a 00 byte follows these 2 bytes, change D3 F8 00 to CD 3B 00. If C9 follows the 2 bytes, change D3 F8 C9 to C3 3B 00. Some drivers use either of these sequences more than once. These changes divert printer output to the ROM's printer driver at hex address 003B. Model III DOSes, including your LDOS, can redirect this output. The LDOS patches for your DMP130/CTL driver are:

PATCH DMP130/CTL (D00,AF = C3 3B 00)
PATCH DMP130/CTL (D00,B4 = 3E 30)

A glitch in either the SCR16/CTL, SCR17/CTL, or SCRIPSIT/CMD program code might cause the header/footer problem. Recopy these three files from your master disk and try again. Or, perhaps your header/footers are too large.

A safer bet is to upgrade your word processor. You said that you have version 1.2.0. This tells me that you probably didn't mail in your software-registration card, which came with the package. The last version of 1.2 was 1.2.8. Customer Service Bulletin 1590-12 provides a free upgrade to registered users to version 1.3.0. The current version is 1.3.1. You can mail your inquiries to Computer Customer Service, 400 Atrium, One Tandy Center, Fort Worth, TX 76102, for update information. Include your name, full address, software version number, serial number if applicable, and software catalog number. If possible, provide a proof of purchase. If you are not registered, you can request to become so.

A Good Read

Q. When I use a Basic program under Newdos/80 version 2, can I read the disk name and print it on the hard copy of my accounts? I use a Model III and 4 (in III mode). (W.G. Kerr, Kilmacolm, Scotland)

A. You can with Program Listing 1, which is written in Basic and can be adapted for LDOS and TRSDOS/LS-DOS 6, by adding the system password when opening the DIR/SYS file.

The routine reads the first sector of the directory file, where the disk name and date are located. It places the disk name in N$ and the date in D$. Remove line 110 and transfer it to your own routines. This method takes advantage of the operating system's ability to read the directory. The directory sectors are stored on the disk in protected format. This results in a read error—thus the need for the On Error Goto instruction in line 90. An error will occur, but the system still reads in the sector. *Caution*: Never execute a Put command on the directory; it will write the sector in unprotected format.

No Cluster Size Reduction

Q. I own a 1000 HD with 640K RAM and two 10-megabyte (MB) hard disks, one internal and one external. In the August 1987 John's MS-DOS Column (see "Why Upgrade to DOS 3.2?" p. 95), John says that on his 20MB hard disk, the cluster size was quartered (from 8,192 bytes to 2,048 bytes). I booted with the DOS 3.2 system disk and copied the new backup to the main directory of drive C. Then I used the following DOS 3.2 command:

BACKUP C:\ A: /S (Backup drive C to drive A)

After I backed up the entire disk, I put the 3.2 system disk in drive A and entered the following commands:

FORMAT C:/S (Format drive C and put the system on it)
RESTORE A: C:/S (Restore backed-up files to drive C)

Using the Norton Utilities, I discovered I had a completely unfragmented disk, but the cluster size was still the same, 4,096 bytes! Did I forget something, or is the cluster size already at its minimum size for a 10MB hard disk? (Zachery Ives, Redwood Valley, CA)

A. The cluster size isn't reduced on the 10MB hard drive as it is on the larger ones.

Breaking and Sizing Windows

Q. I bought Borland's Turbo Basic 1.0 compiler, and I'm disappointed that I can't use the control-break on my 1000 EX to interrupt a running Turbo Basic program when keyboard break in the active window is turned on. In Turbo Basic, the scroll-lock key sizes and moves the window. My keyboard doesn't have a scroll-lock key. I tried the break key to size the window, but it won't work. How can I interrupt the program and resize the active window? (Michael Lewis, Coral Springs, FL)

A. Pressing control-hold and then any other key breaks a program. Use alternate-break for the missing scroll lock to size the windows.

Misaligned on the Big Screen

Q. Page 49 of the January 1985 *80 Micro* has an ad for DRV80, a utility that enables the use of an 80 by 24 screen display in Model III mode on a Model 4. I wrote to the supplier, The Logical Place, in Keyser, WV, to buy DRV80, but my letter was returned. Does anyone have such a utility? (Richard A. Stanford, Greenville, SC)

A. The *80 Micro* bulletin board has an excellent program in the Model I/III/4 Special Interest Group (SIG) called VID80X24/CMD. Philip Becker wrote it to do exactly what you want, and it operates under any Model III DOS. Be aware that most Model III programs are designed specifically for the 64 by 16 screen and look odd and misaligned on the bigger screen.

Take the Pedal Off the Metal

Q. I thank Jane Layman for submitting the Superscripsit 1.02.00 patch for DOS Commander, which appeared in the August issue of *80 Micro* (see p. 48). It is a terrific improvement to a good word-processing program. One minor glitch exists, however. When you enter the letter D to access the DOS command item of the menu, the letter reappears next to the "Command" query it gener-

Program Listing 1. A program for reading the disk name and printing it to a hard copy.

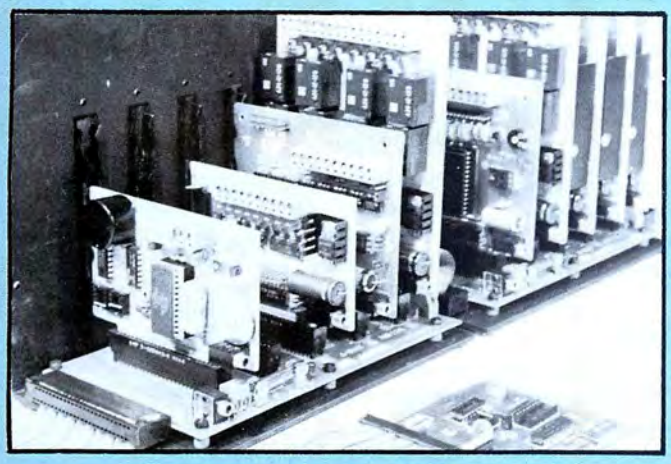
```
10 CLS:PRINT"NEWDOS80 2.0 Disk Name and Date Display Demo"
20 PRINT"August, 1987 -- D. Goben":PRINT
30 DR$="":LINE INPUT"Drive to test (0-3) ";DR$
40 IF DR$=""THEN END ELSE IF DR$<"0"OR DR$>"3"THEN 30 ELSE DR$=":"+DR$
41 'include the following line for LDOS/TRSDOS 6
45 'DR$=".SYSTEM"+DR$
50 ON ERROR GOTO 60:GOTO 80 'error trap for bad drive
60 PRINT"Illegal Drive":PRINT:RESUME 30
70 '********** DISK READ ROUTINE **********
80 OPEN"R",1,"DIR/SYS"+DR$:FIELD 1,208 AS N$,8 AS N$,8 AS D$
90 ON ERROR GOTO 100:GET 1,1:CLOSE 1:GOTO 110
100 RESUME NEXT
110 PRINT:PRINT"DISK NAME: "N$:PRINT"DISK DATE: "D$
120 '**************************************
130 PRINT:ON ERROR GOTO 0:GOTO 30
```

End

Circle 17 on Reader Service card.

The Amazing A-BUS

NEW



An A-BUS system with two Motherboards
A-BUS adapter (IBM) in foreground

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Includes eight industrial relays, (3 amp contacts, SPST) individually controlled and latched. 8 LED's show status. Easy to use (OUT or POKE in BASIC). Card address is jumper selectable.

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Same features as above, but uses 8 Reed Relays to switch low level signals (20mA max). Use as a channel selector, solid state relay driver, etc.

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This analog to digital converter is accurate to .025%. Input range is −4V to +4V. Resolution: 1 millivolt. The on board amplifier boosts signals up to 50 times to read microvolts. Conversion time is 130ms. Ideal for thermocouple, strain gauge, etc. 1 channel. (Expand to 8 channels using the RE-156 card).

Digital Input Card — IN-141: $59

The eight inputs are optically isolated, so it's safe and easy to connect any "on/off" devices, such as switches, thermostats, alarm loops, etc. to your computer. To read the eight inputs, simply use BASIC INP (or PEEK).

24 Line TTL I/O — DG-148: $65

Connect 24 input or output signals (switches or any TTL device) to your computer. The card can be set for: input, latched output, strobed output, strobed input, and/or bidirectional strobed I/O. Uses the 8255A chip.

Clock with Alarm — CL-144: $89

Powerful clock/calendar with: battery backup for Time, Date and Alarm setting (time and date); built in alarm relay, led and buzzer; timing to 1/100 second. Easy to use decimal format. Lithium battery included.

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Each tone is converted into a number which is stored on the board. Simply read the number with INP or POKE. Use for remote control projects, etc.

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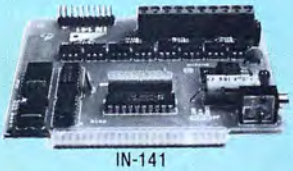
3½ by 4½ in. with power and ground bus. Fits up to 10 I.C.s

ST-143

CL-144

RE-140



IN-141

AD-142

Smart Stepper Controller — SC-149: $299

World's finest stepper controller. On board microprocessor controls 4 motors simultaneously. Incredibly, it accepts plain English commands like "Move arm 10.2 inches left". Many complex sequences can be defined as "macros" and stored in the on board memory. For each axis, you can control: coordinate (relative or absolute), ramping, speed, step type (half, full, wave), scale factor, units, holding power, etc. Many inputs: 8 limit & "wait until" switches, panic button, etc. On the fly reporting of position, speed, etc. On board drivers (350mA) for small steppers (MO-103). Send for SC-149 flyer.

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TRS-80 Mod 3,4,4 D. Fits 50 pin bus. (With hard disk, use Y-cable).	AR-132...$49
TRS-80 Model 4P. Includes extra cable. (50 pin bus is recessed).	AR-137...$62
TRS-80 Model I. Plugs into 40 pin I/O bus on KB or E/I.	AR-131...$39
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ates. You must delete it to enter any command that doesn't begin with the letter D. Could someone correct this minor flaw? A patch for Scripsit Pro would be more valuable. (Jacob Nachmias, Philadelphia, PA)

A. I think the extra "D" appears because you hold the key down too long. Have you tried just tapping the key selection? The Superscripsit menu keyboard-input routine acts on any keypress immediately; sometimes, due to its need to load an overlay file, it might take more time for the screen to change. The keyboard driver, which runs off the interrupt structure of the computer (this gives it its "type-ahead" capability) will still read the keyboard. If you press a key and hold it down, the driver will read it. Although Scripsit only needs one character, it will hold whatever follows in the keyboard buffer for the next time that it needs keyboard data, which will be the new DOS command prompt.

Scripsit Pro is more complex than Superscripsit. It uses indexing and relative offsets to point to data and routines. I located the addresses that need to be modified, but I don't know where to return to once DOS command input is exited via the break key. Can anyone help?

Drawing a Blank

Q. I use MS-DOS 2.11.22 with my Tandy 1000. I have two drives and 640K memory, a DMP 200 and a CGP 200 printer, and a CM-2 monitor. When I try to get graphics printouts from such software as Printshop or Custom Character Generator (June 1987, p. 58), I only get blank sheets of paper.

Should I add to my equipment to correct this problem, or must I replace printers? (William E. Yochem, Anaheim, CA)

A. Load Graphics.COM at the DOS prompt by typing Graphics and pressing the enter key. Graphics.COM should be on your system disk. Go into your program, and when the picture you want to print is on screen, press shift-print.

New Chips, No Fix

Q. Can the Tandy 1000 use the newer Enhanced Graphics Adapter (EGA)? I heard that you can't manually disable the color-graphics adapter (CGA) of the 1000.

If true, can I turn the CGA off permanently by cutting a few wires or something? If not, do any EGAs work with my CGA? (Clive Liu, Anaheim, CA)

A. On pre-SX 1000s, I don't know of any fixes (cuts, for instance) to disable the CGA. You must replace the existing chips on the motherboard with custom chips. The chips should soon be available from Matthew Electronics (386 Avenida de la Vereda, Ojai, CA 93923).

No Fix, New Chips, Part II

Q. I purchased a Tandy memory expansion board with my Tandy 1000. I have total memory of 384K. Can I expand this to 512K or 640K without using another expansion slot? I have an internal modem in one slot and plan to buy a hard card for my last slot. (Michael Sheehan, Eugene, OR)

A. If you have an old card with 64K chips, I'm afraid you are out of luck. You must totally replace your memory expansion board with a new one containing the DMA (Direct Memory Access) chip and 256K chips.

Your Time Will Come

Q. Pages B-29 (On Timer) and B-49 (Timer) in the *Tandy 1000 SX Quick Reference* describe a useful routine, but the 1000 and the 1000 SX won't do the interrupt. A similar routine, On Time$, works perfectly on the Model 100. I used Program Listing 2. Can you tell me how to get this interrupt to work? (H.E. Widing, El Paso, TX)

A. On page B-49, the quick reference states that Timer "returns the number of seconds since midnight or since the last system reset." It takes many seconds to reset, get into Basic, load your file, and run it. The parameter X for Timer tells it how many seconds should pass while the rest of the program runs before it interrupts. Setting the parameter to the number of seconds already passed (+10 in line 10) gives you a long wait. In line 10, make X = 10 and retry the program. Add the following line for a better attention getter:

105 SOUND 10,10

Program Listing 2. Timex.BAS.

```
10 CLS: X=INT(TIMER+10)
20 ON TIMER (X) GOSUB 100
30 TIMER ON
40 PRINT TIMER"    "X
50 GOTO 40
100 PRINT "If you see this,it worked."
110 FOR K=1 TO 5000:NEXT
120 RETURN 10
```

End

Drive Faster with This Six Pack

Q. Will an NEC 8MHz V20 processor make a 1000 SX faster? If I get a Master/Chassis (New Products, March 1987, p. 121), can I use AST's Six Pack or Intel's Above Board with it? Also, what is the difference between an 8087-2 chip and an 8087-3? (James E. White, New York, NY)

A. The NEC 8MHz V20 processor should make your Tandy 1000 SX 5–10 percent faster. According to Matthew Electronics, maker of Master/Chassis, you can use AST's Six Pack, but they don't know about Intel's Above Board. The 8087 chips (8087, 8087-1, 8087-2) are math coprocessors made by Intel. The 8087-3 doesn't exist. The main differences are in speed. The 8087-1 is the fastest.

READERS RESPOND

More Efficient, and Effective

Daniel J. Tynan of Charles City, IA, responds to Eric Norton's question about scrolling additional Basic lines without continuously pressing the F1 key and entering line numbers (see "Not Efficient, but Effective," September 1987, p. 11). Put the cursor on a Basic line on screen. Press control-Y to list the next line or control-X to list the previous line.

SEEKING HELP

►Walter J. Steiges (P.O. Box 747, Etowah, NC 28729) wants an instruction book and startup and initialization disks for a Microdesign Pro Series Model 10B1 for the Model III or 4.

►Arthur Pittard (36 Hubert St., Fairfield 2165, N.S.W., Australia) says two friends are "in a bother" with Tandy's Astrology. He requests a debug for the Astrology program that refers to the fault of getting various times from Greenwich Mean Time to local time.

►Ed Geiser (522 S. Downing Lane, Tucson, AZ 85711) wants information or a service manual for a Discus 8-inch drive. According to the cabinet label, it's manufactured by Morrow Designs. The chassis is a Shugart Model 801.

Ed has two of them and is trying to determine the pin-out on the 50-pin edge connector and the circuit board jumper configuration so he can use them as drives 2, 3, or 4 on a Model III or 4.

►Dave VonDielingen (Trinity School, 4900 McCain Road, Jackson, MI 49201) is looking for the Model III cassette version of Electric Pencil.

►Willie C. Ellis (2756 Kausman St., San Diego, CA 92139) has a Cipher Data Model 5210 floppy tape backup system. He wants to use it with his 1000 to back up his Zuckerboard 20MB Hard Card. His 1000 is an early model, and he has one expansion slot that he could use to interface to the tape drive, but *nothing* he tried has succeeded.

He says Cipher makes a card (catalog no. 962536-001) for use with Xerox computers. He tried this card with his Tandy, but none of the 45 possible jumper-bar combinations seem to work with his 1000.

►Skip Stitham (P.O. Box 127, Newport, ME 04953) wants to talk to someone experienced in using mail merge with Wordstar 3.31P.■

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Santa Holds Answer To Tandy Profits

Tandyland

While the rest of us this Christmas may be dreaming of sugarplums, the folks at Tandy are imagining sweet sales records.

The holiday shopping season is crucial to the year's profits at Radio Shack stores, and as in past years, computers are expected to help deck Tandy's halls with boughs of green—and I don't mean holly. Christmas sales amount to about 30 percent of Tandy's annual income from computers.

But this year a little more is riding on the line than the general ledger. Tandy's computer sales in 1987 could indicate the future of its non-MS-DOS line.

If MS-DOS systems outsell Color Computers at Christmas time, it could signal the end of Tandy's low-end computers.

Previously, Tandy's big Christmas seller was the Color Computer—a decent "family" computer, not too expensive and with lots of games available for it once the family gives up the pretense it was bought to help the kids get into Harvard.

This year, however, the Color Computer faces new competition from Tandy's own MS-DOS line of PCs. In the past, price and image have largely defined the gap between the home and office markets for personal computers. With even the most inexpensive IBM clones a year ago selling for close to $2,000, it wasn't hard for parents to decide whether to get their children an MS-DOS computer or a Commodore, Atari, or low-end Tandy computer costing a few hundred dollars.

But now, bare-bones clones for $500–$600 are not uncommon. Although Tandy's new PCs include a few pricey numbers themselves, such as the Tandy 4000 at $2,599 (still not bad for an 80386 machine), the Tandy line now has three PCs for less than $1,000 sans monitor: the 1000 SX for $849, the 1000 HX for $699, and the 1000 EX for $599.

The Color Computer is still less expensive at $200, and the Color Computer 2 at $100 is cheap enough that even if it winds up in the back of the closet, no one minds.

Is a few hundred dollars enough to keep a right-thinking parent from buying a computer that is also a serious machine that he or she can appropriate from the kids occasionally to run a Lotus spreadsheet from work?

Ed Juge, director of market planning for Tandy, thinks it is.

"The fact remains there is a price differential," Juge says. "A lot of people get hung up on IBM compatibility, but as a general rule, they'll wind up buying a Color Computer for a lower entry-level cost and then add to it as finances permit.

"There's still a good market for the Color Computer. It's got it's own little niche like the Apple II," he says.

In addition to the market for families that want a computer mostly for games and just to say they have a computer for the youngsters, Juge points out that Tandy's non-MS-DOS computers are also popular with hobbyists.

"They're not that turned on by PC compatibility," he says. "Compatibility's kind of a security blanket for people who don't know anything about computers or programming and don't want to learn."

An enterprising hobbyist can rig a Color Computer so that it performs multitasking and can be used by more than one person at a time with 8–10 windows on the screens, functions that are still uncommon on MS-DOS machines, Juge says.

Still, the temptation to have the biggest and grandest your pocketbook can afford might hold sway this Christmas. For many family buyers, getting an MS-DOS computer from Tandy when a perfectly good Color Computer is sitting in the next aisle could be like buying a Corvette to go to the grocery store. But how many of us would have bought a Corvette if it were only slightly more expensive than a Camaro? (And if a Radio Shack salesperson thinks there's half a chance to swing a sale to a more expensive computer, which model do you think will get pushed?)

The point of all this speculation is that the sales of Tandy computers could make a decisive turn this Christmas. If sales of Color Computers, which have always increased each holiday season compared to the previous one, suffer at the same time the MS-DOS line booms, it could signal the beginning of the end of Tandy's low-end computers.

If it doesn't happen this Christmas, it will sooner or later. As prices continue to fall on MS-DOS systems, the distinction between home and work computers will continue to blur.

Update

Dell Computer Corporation—the Austin-based manufacturer of PC's Limited computers that hired away Tandy's Business Products Division Chief Graham Beachum earlier this year—has put its brand on some more Tandy executives.

Mark Yamagata, Tandy's senior director of computer products, and Ed Kagle, manager of large accounts marketing, have followed Beachum from Fort Worth to Austin.

The folks back at Tandy suspect that Dell, a private company in a good position to go public, probably offered the "renegades" stock options that could pay off big if a public offering is made.

But at least with Yamagata, there might have been something more. A fairly high-profile executive in a company that's usually taciturn, Yamagata had been with Tandy for more than 15 years but was never made a vice-president.

The latest acquisitions indicate that Dell is positioning itself to enter direct sales to major businesses, a field in which Tandy itself is still trying to get a grasp on.

You might have thought that vaporware—software products that are announced months before they're on the market—was something like UFOs. It's always someone else who's actually been in contact with them. No one ever seems to have hard evidence that they exist.

A close encounter of the third kind exists in the *1988 Tandy Computer Catalog & Software Reference Guide*. Page 112 has a full description of Excel for MS-DOS computers. It's a program from Microsoft that has been a more-or-less open secret although, at the time the catalog was released, Microsoft had not officially announced it. (This is actually a case of etherware, a rarified form of vaporware in which the product not only is not ready for distribution but is not even acknowledged officially no matter how many people in the industry know about it.)

Excel is the leading electronic spreadsheet for the Macintosh, and the assumption has been that Microsoft would convert it for MS-DOS computers in yet another company's attempt to dislodge Lotus's 1-2-3 as the long-reigning king of the field. When Tandy published its catalog, it was the first time something approaching official information about Excel for MS-DOS has appeared.

The description praises the program's superior graphics, sideways printing, "annual report quality" output, auditing and notation tools, and macro recorder. The price is listed as $495, and it's noted that Windows 2.0 is required. According to the catalog, the release date was set for Oct. 30.

The catalog was prepared months in advance when presumably Tandy thought Excel would be announced by the time the catalog was distributed. Microsoft was silent on the subject but was reportedly unhappy with Tandy. Lotus Corp., if it hadn't found out this information on its own, undoubtedly thought the catalog made for fascinating reading.

It almost makes the whole notion of industrial espionage pointless, doesn't it?

Micro Trends

Shareware—software that can be freely distributed and that you pay for only if you decide to use it—has always been an important behind-the-scenes alternative to the more conventionally distributed commercial software.

The reasons are obvious. Usually the prices—or registration fees, as they're called—are low. You can find a decent word processor, data-base manager, spreadsheet, or utility program for anywhere from $10 to $75, with many fees less than $35. And you can pick up the programs from the libraries supported by user groups or electronic bulletin boards and use them for free to see if you like them before paying a thing. Try calling Lotus or Ashton-Tate, and see if they'll let you do the same.

But one reason people will pay Lotus's and Ashton-Tate's higher prices is support. Support for shareware is sometimes quite good, with printed manuals and even seven-day-a-week telephone technical support for a few products. But sometimes support is non-existent.

One program called Ultra Utilities is a good example. It lets you manipulate disk files to restore data that has been accidentally erased. You can also use it to bust some copy-protection schemes. Several people liked Ultra Utilities enough to send in the $10 registration fee that supposedly entitled them to a newsletter.

After a few months without the newsletter, one of the users contacted the company and was told that the person who wrote the program had died. Since he never documented his work, the secrets of Ultra Utilities went to the grave with him, and his associates did not feel they could support it. The user's fee was returned, but it points out a major flaw in alternative software.

But now, shareware authors are trying to remedy that flaw with the creation of the Association of Software Professionals. It is chaired by two of the most successful shareware producers, Jim Button and Bob Wallace, who wrote PC-File and PC-Calc, and PC-Write, respectively. These programs are the big three of alternative software. One of the association's purposes is to give tips to other shareware authors on writing and marketing successful software.

"A lot of programmers think they can write a program, and then just sit back and wait for the money to roll in," says Button. "But there's so much other work to be done . . . . It takes a good six months at least for the shareware to really get out and get distributed. Sometimes during those months the author gets discouraged and stops supporting it." Some of the suggestions the association plans to have for programmers will also help users.

"At some point we're going to be setting standards: If someone sends you money, you will do such and such," Button says. "And we're considering getting the authors to put the source code on file with the association so that the association could continue to support the program if the author stops." Or dies.

Right now, the association is still in a formative stage, but during the next year it should start getting its act together. If all the association's plans come together, shareware, already the best deal in computing, should get even better.

What with corporate raids and premature catalog entries, you might think Texas sometimes gets on the weird side of computing. This next item will do nothing to change that notion.

Two new ways of using computers in the Lone Star State deserve to have a category created just for them. In addition to shareware and vaporware, we now have excessware—ways of using computers that carry the machine's capabilities above and beyond the call of practicality.

One is EZ Shopper, a program being distributed by H.E.B. supermarkets in South Texas. You buy one from the store where you ordinarily shop. It costs $1.95 (at least the price is right) in either MS-DOS or Apple versions. When you get it home, the program lets you create shopping lists by writing in the items you need to buy or by selecting them from menus. It also keeps track of your discount coupons.

When you're done, EZ Shopper prints out a shopping list organized by aisle and can even include a map of the store.

In East Texas, Access Houston, that city's public-access cable facility, is now offering its program listings on Linx, an electronic bulletin board. Want to find out what's on the channel at 9 p.m.? Just fire up your computer, load your communications software, call Linx (hope you make connection right away), and search the listings. By the time you get back in front of the TV with the information, the show will be half over.

Now is this why you've sunk a few grand into your computer system?■

Ron White can be contacted by writing 80 Micro or through MCI Mail (329-1704), Compuserve (73240,2404), or Genie (XMG12136).

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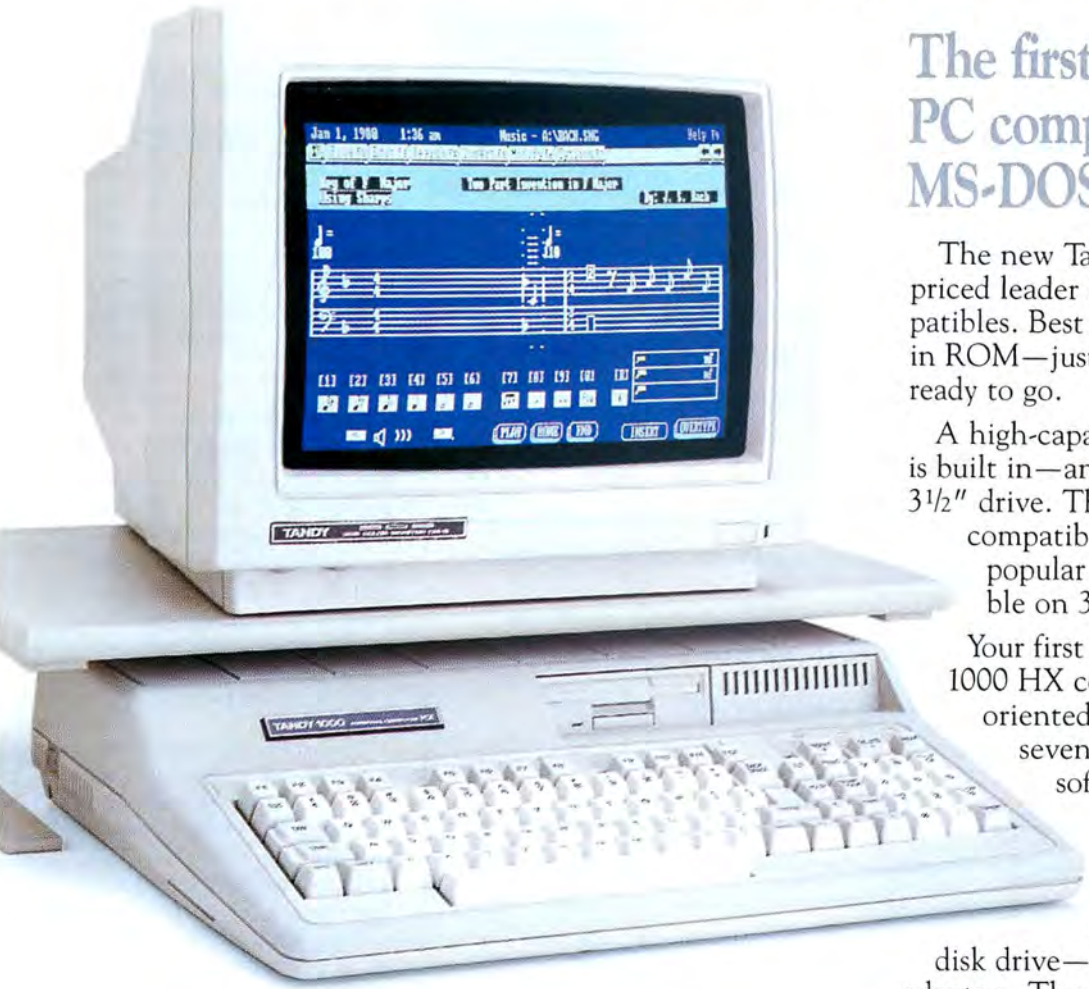

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High Five

I discovered a way to save more than the five report formats that Profile III+ allows on the Model III.

First create the four formats you will use most often and save them permanently as formats 1 through 4. Next, create a report format in format 5 and then exit the program to TRSDOS Ready. Use the Rename command to change the file name that holds format 5 to any name that is handy. For example, type RENAME FILENAME/PR5 SALESRPT/PR5 to store the format in a file called SALESRPT/PR5. You can then create additional formats under the original file name and rename the new formats under a variety of file names. Disk space is the only limit of the number of formats you can save.

To use a format, use the Copy command at TRSDOS Ready to copy the file back into Filename/PR5. For example, type COPY SALESRPT/PR5 FILENAME/PR5, complete the copying, and print using format 5.

Andrew J. Wheeler
Butner, NC

Program Listing 1. A program to evaluate null and invalid inputs. See p. 94 for using checksums in Listings 1, 2, 3, 4, and 7.

```
7722 | 150 REM Listing 1. Demonstration of avoidance of problems with INSTR() i
       n menu selector.
9775 | 190 X$=CHR$(0)+"ABCabc": REM A,B, and C are the valid entries; a, b, and
        c are allowed and CHR$(0) is not a keyboard character
 728 | 191 INPUT I$
3367 | 193 ON INSTR(X$, I$)+1 GOTO 191, 191, 210, 220, 230, 210, 220, 230
1313 | 210 PRINT 210:GOTO 191
1315 | 220 PRINT 220:GOTO 191
1317 | 230 PRINT 230:GOTO 191
```

End

Program Listing 2. A program that rejects null entries and entries exceeding one character.

```
8827 | 250 REM Listing 2. Demonstration of shorter alternative that rejects bot
       h null and long strings.
6429 | 290 X$=CHR$(0)+"ABCabc": REM A,B, and C are the valid entries; a,b, and
        c are allowed.
2133 | 291 INPUT I$:IF LEN(I$) <> 1 THEN 291
2920 | 293 ON INSTR(X$,I$)+1 GOTO 291,310,320,330,310,320,330
1316 | 310 PRINT 310:GOTO 291
1318 | 320 PRINT 320:GOTO 291
1320 | 330 PRINT 330:GOTO 291
```

End

Program Listing 3. A program for one-character inputs.

```
8110 | 350 REM Listing 3. Demonstration of INPUT$() alternative that rejects nu
       ll and long strings.
6398 | 390 X$=CHR$(0)+"ABCabc":REM A,B, and C are the valid entries; a,b, and c
        are allowed.
 925 | 391 I$=INPUT$(1)
2927 | 392 ON INSTR(X$,I$)+1 GOTO 391,410,420,430,410,420,430
1319 | 410 PRINT 410:GOTO 391
1321 | 420 PRINT 420:GOTO 391
1323 | 430 PRINT 430:GOTO 391
```

End

Program Listing 4. A program for inputs of variable length.

```
12603 | 550 REM Listing 4. Demonstration of menu selector for variable length in
        puts. All inputs of wrong length or invalid content are rejected.
 9245 | 560 DEF FNUC$(X$)=CHR$(ASC(X$)+32*(ASC(X$)>96 AND ASC(X$)<123)): REM Upp
       er-case a letter; leave any other character unchanged.
 4067 | 570 X$=CHR$(0):REM CHR$(0) is not a keyboard character
 7214 | 580 X$=X$+"RED"+X$+"BLUE"+X$:CLS:REM RED and BLUE are the valid entries,
        now case-insensitive
 8658 | 600 INPUT I$:I$=CHR$(0)+I$+CHR$(0):REM I$, forced to non-zero length, ca
       n be handled without error by MID$() in 900
 3433 | 610 GOSUB 900:ON INSTR(X$,I$)+1 GOTO 600,1000,600,600,600,2000
 6258 | 900 FOR I=1 TO LEN(I$):MID$(I$,I,1)=FNUC$(MID$(I$,I,1)):NEXT I:RETURN:RE
       M Upper-case a string
 1400 | 1000 PRINT 1000:GOTO 600
 1402 | 2000 PRINT 2000:GOTO 600
```

End

Mouse on the Move

If you own a Tandy 1000 and a TRS-80 Color Mouse, you can use the mouse with Quick Basic. Copy the Joy.SYS file from the Personal Deskmate disk to your boot-up disk. On the same disk, make or change the Config.SYS file to include the following statement:

DEVICE=JOY.SYS

Reboot your computer. Now when you start Quick Basic, you will see an inverse square block on the screen. The block is the mouse pointer, and you can use the pointer as described in the Quick Basic manual. The Color Mouse also works very well with Personal Deskmate.

Dion Carpenter
Lewistown, ID

Menu Input With INSTR( )

What value is returned by INSTR(X$, " ")? If LEN(X$) = 0, then the INSTR() function returns zero; otherwise it returns 1. Therefore, you have to be careful when you use a construct, often used for menu inputs, such as:

ON INSTR(X$, I$) GOTO 100, 2000, etc.

Program Listing 1 offers you a solution. When you enter a null input, the program evaluates INSTR() to 1 and an invalid input to zero. The 191s in line 193 cover these two cases.

Program Listing 2 shows an improvement. It rejects both null entries and entries exceeding one character.

If you want only one-character inputs, Input$( ) is better, as in Program Listing 3. Again, null and long strings are rejected.

What if some choices are longer than one character and not all of equal length? Program Listing 4 provides you full protection from invalid entries. It also contains a function and a subroutine so that choices are not case-sensitive.

Robert M. Doerr
Rolla, MO

Illustrations by Chris Reed

Smooth Lines

Robert Hood's "Informative Lines" (Reader Forum, June 1987, p. 23) helped me understand how Basic handles program lines on the Model III. I changed one line to make the program run smoother.

Substitute the existing line 65040 with the following:

```
65040 BA=D1:PRINT"Start address for line";LN;"is ";BA:IF BA>32767 THEN BA=BA-65536
```

I also found that if the line you are examining contains a space, the program prints a space, but you might not see it because Basic adds spaces when you print numbers. If you want to print only the Peeks and not worry whether the character is alphanumeric, change line 65090 to:

```
65090 FOR J=BA+4 TO BB-1
```

Doug Gibson
Rochester, NY

Down in the Dumps

Model 4 TRSDOS doesn't allow memory-to-disk dumps from addresses below 3000 hexadecimal (hex). This makes it difficult when you want to look at system information such as drive-code tables or device-control blocks.

The following patch slightly modifies the Dump command so that the check for the bottom address is skipped. (Be sure to make a backup copy of DOS first.)

For LS-DOS 6.3:

```
PATCH SYS7/SYS.LSIDOS (D13,D8=00,00,00:F13,D8=D2,66,25)
```

For TRSDOS 6.2:

```
PATCH SYS7/SYS.LSIDOS (D13,80=00,00,00:F13,80=D2,66,25)
```

Marc A. Barrot
Boulogne, France

Reader Forum is looking for your words of wisdom. Send your patches, solutions, or advice in regard to Tandy microcomputing to Reader Forum, c/o 80 Micro, 80 Elm St., Peterborough, NH 03458. We pay $10 for each item that we use. All Reader Forum submissions should be no more than one typed, double-spaced page in length.

Two Flashers

The two one-line programs in Program Listings 5 and 6 provide a flashing on-screen prompt for a one-key input on the Model 4.

Listing 5, which uses Print@ statements, is for a menu selection with less than 10 choices. The program converts the variable X$ to another variable following the prompt statement with a "n=VAL(X$)" statement. You can use Listing 6 with programs that produce a list of data items on the screen where the program pauses to let you read it.

You could use any prompt statement. The only conversion necessary is that the first figure in the String$( ) statement should be the number of letters and spaces in the prompt.

Walter R. Olsen
Secane, PA

Program Listing 5. A flashing prompt for menu selection under 10 choices.

```
1000 X$="":PRINT CHR$(15):WHILE X$="":PRINT@ 990,"SELECT OPERATING MODE";:FOR T=
1 TO 450:NEXT:PRINT@ 990,STRING$(21,32);:FOR T=1 TO 300:NEXT:X$=INKEY$:WEND:PRIN
T CHR$(14)
```

End

Program Listing 6. A flashing prompt for programs with a list of data items.

```
1000 X$="":PRINT CHR$(15):WHILE X$="":PRINT "Press any key to continue";:FOR T=1
 TO 450:NEXT:PRINT STRING$(25,8);:FOR T=1 TO 300:NEXT:X$=INKEY$:WEND:PRINT CHR$(
14)
```

End

A Helping Hand

I needed to input many data items for generating machine-code files from a Basic program, so I wrote Data Line Generator (see Program Listing 7), which runs on the Models III and 4 and the Tandy 1000. I designed it for data lines with a consistent number of items.

Normally you would have to insert the commas between items manually, but this program inserts them for you as you enter the data items from the keypad. The program sets the line number of your choice and the Data keyword in each line. It saves each line to disk as it is produced.

The program produces a series of Data statements in an ASCII file on disk that you can load as a Basic program or merge with the driver portion of the program you are entering. You can check the Data statements with *80 Micro*'s Checksum program.

Lionel P. Tercier
Bonnyville, Alberta

Program Listing 7. Data Line Generator.

```
2235 | 5 REM 1987 -- Lionel P. Tercier
2278 | 10 REM DATA LINE GENERATOR PROGRAM
     | 11 ' Program to facilitate entry of numeric data lines
     | 12 ' as used in generating machine files from a Basic program
     | 13 ' Variable names used are compatible with Model 3,4 and 1000 basics
     | 14 ' Program is designed for data lines with consistent number of items
1545 | 20 REM OPEN OUTPUT FILE
 812 | 30 CLS:PRINT
2621 | 40 INPUT"WHAT NAME FOR THE DATA FILE";FI$
 969 | 50 OPEN "O",#1,FI$
2863 | 60 INPUT"WHAT IS STARTING LINE NUMBER";SLN
2667 | 70 INPUT"WHAT IS ENDING LINE NUMBER";ELN
2582 | 80 INPUT"WHAT IS LINE INCREMENT";LNSEP
2707 | 90 INPUT"HOW MANY DATA ITEMS PER LINE";DI
2074 | 100 FOR X= SLN TO ELN STEP LNSEP
1435 | 110  OP$=STR$(X)+" DATA ":'Set up line number and DATA key word
1105 | 120   FOR Y= 1 TO DI
1712 | 130     INPUT"DATA ITEM -";Y$:'get data item either string or numeric
1761 | 140     IF Y < DI THEN Y$=Y$+", ":'add comma to separate data statements
 987 | 150     OP$=OP$+Y$:'add item to current line
 687 | 160   NEXT Y
 898 | 170  PRINT OP$:'display line generated
1091 | 180  PRINT #1 , OP$:'write line generated to disk
 625 | 190 NEXT X
 552 | 200 CLOSE
6125 | 210 PRINT:PRINT"Your program data lines have been saved in ASCII format.
4877 | 220 PRINT"You can merge them into the target program or"
5652 | 230 PRINT"load them into your program editor for further work."
5372 | 240 PRINT"The output from this program should be readable by
4979 | 250 PRINT"and compatible with the CHEKSUM.BAS used by 80-MICRO.
 399 | 260 END
```

End

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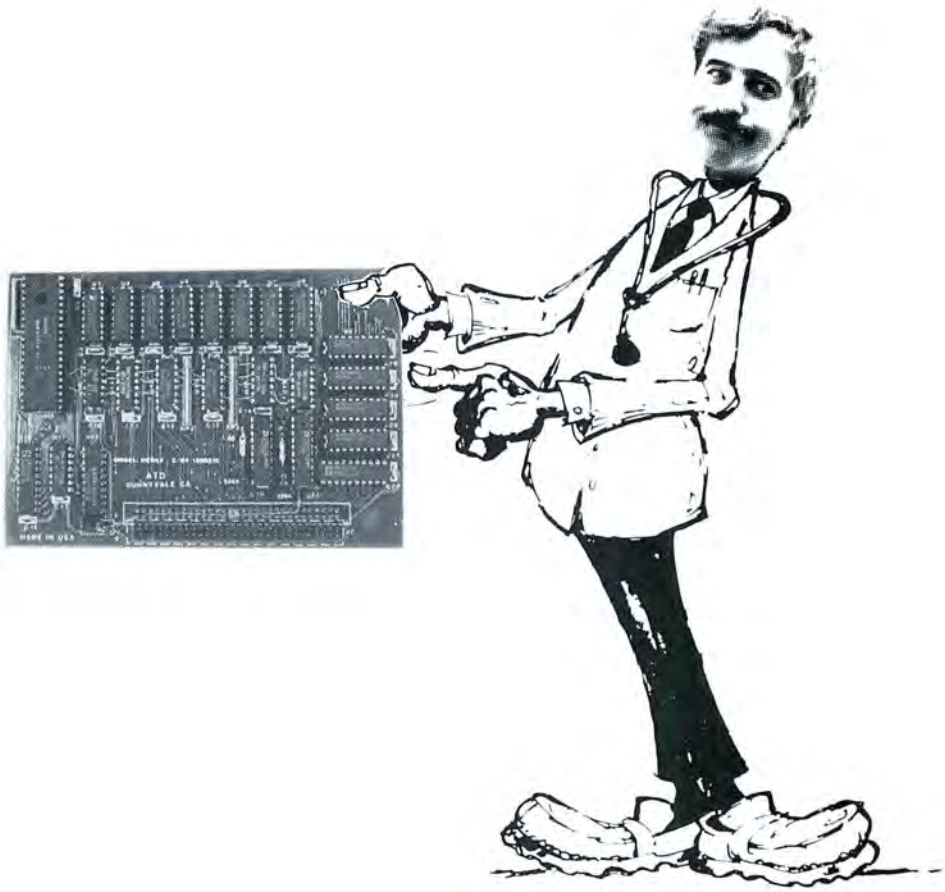

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As Time Goes By

Don Riggin (Elgin, IL) wrote to remind me that I should occasionally explain what goes on in this column, if only to forewarn newcomers about this monthly madness.

Programming in any language involves at least two skills. First, you need enough fluency in the language to craft efficient code that clearly expresses a program and what it intends to accomplish. That's the part you have to practice after school. Second, you need to learn problem solving—figuring out how to describe a task in a language with a vocabulary of a hundred-odd words (some more odd than others). That's the fun part, and that's what Fine Lines is about.

Many programming problems have already been solved. If you learn to write clear, structured code, you'll get most jobs done. Fortunately, a few puzzles remain for us to solve, and other solutions are worth improving. I always encourage good programming practices (publicly), but I do not insist on them in your Fine Lines solutions. I do insist that you have fun with the puzzles. And if the Master of Programs will one day punish you for breaking a rule occasionally, believe me, owning and wearing an *80 Micro* T-shirt is worth it.

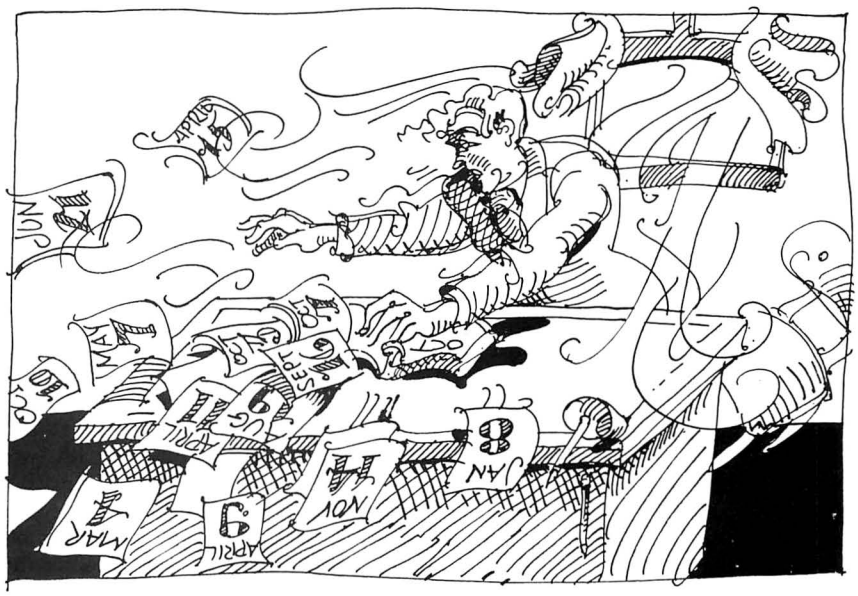


Illustration by Yvonne Buchanan

Eye of the Beholder

A key element of problem solving is the ability to look at things from odd, unfamiliar, and sometimes uncomfortable angles. Your Fine Lines entries each month prove, again and again, how many ways you can find to achieve similar results. When you write a program, it's especially helpful to see a problem from the computer's point of view—if you'll allow that it has one.

In September, I proposed a list of dates in an array called D$ that I wanted to put into chronological order. Whenever you sort a list, you must first consider the data: What form is it in? And in what form do you need it to sort it?

Most of us are used to seeing dates in month-day-year order, such as August 6, 1945. Furthermore, we are all comfortable with expressing dates numerically, as in 8/6/45. To make it easy for computer programs, data files usually have rigid formats to ensure uniformity. So, we see prompts that demand us to enter dates as 08/06/45 and accept no substitutes.

To avoid chaos, the data in my list, D$, is in the form mm-dd-yyyy (08-06-1945). I modified your solutions to use that format so that the examples would be consistent. I chose the four-digit date because you don't have to look too far into the future to see the 21st century coming. That's going to render useless many standard date-handling routines. You can remodify the examples to work with your favorite format.

To sort dates, as all your solutions demonstrate, you must consider the year first, then the month and day. You could write a program to deal with the dates in their original format. However, you have a list of them, which you have to sort. Given the nature of sort routines, it's probably best to put the dates in a different form. Routines that leave them written for human eyes to recognize have to ask lots of questions: If year 1 is greater than year 2, then swap, or else if year 1 equals year 2 then if month 1 is greater then month 2 then swap, or else if month 1 equals, and so on.

I'm not saying that's wrong. My rule of thumb says, "If it works, get on with it." But you and your computer don't have to work that hard.

Timely Conversions

If you agree to rewrite the data, you also have to decide when to do it. You can put the dates in year-month-day order, sort them, and put them back in their original form. Or, you can have the sort routine rework the dates as it goes. The second choice seems to have fewer steps; in fact it has more. Sort routines compare the same items many times. The more disorderly the list, the more it's handled. The first choice is most often more efficient.

Your most popular solution to the problem was to rewrite the list, leaving it in the same array, before sorting it:

```
FOR I=1 TO S%: D$(I)=RIGHT$(D$(I),4)+
  LEFT$(D(I),6): NEXT
```

This method has a lot going for it. The reworked date is "194508-06-". Since it retains all the characters of the original string, you just reverse the procedure to return to where you started.

Some of you built a second list and left the original data intact. This approach also has merit. In a second array you're free to represent the dates with any symbolism that suits you. Then, you might store them in the new form, or build an index and leave the list in its original order.

You can argue in favor of either approach and a few more. The best one is the one that enhances the particular application you're working on. Your solutions this month show a number of ways to restate dates in sortable form, some suitable for storage.

Most of you did as I suggested and looked up a standard sort. That's what programmer's references and program-

ming libraries are for. Since the sort isn't the issue, I won't even show you one. Instead I'll illustrate the various ways you chose to represent dates for sorting. Keep the ideas in your tool kit, and plug them into your routines as you need them.

One thing to keep in mind is that you don't have to add spaces or characters to the rewritten dates or otherwise maintain their legibility, especially if the new form is temporary and won't be displayed. The reformed date doesn't need to have separating characters at all. Stephen Pryor's (Beale AFB, CA) method turns the sample date into "19450806", which is also two characters shorter:

```
D$(I) = RIGHT$(D$(I),4) + LEFT$(D$(I),2) +
  MID$(D$(I),4,2)
```

Roger Creasy (Marshall, TX) demonstrates a property of Mid$ that's worth remembering. When you omit the third parameter (the length), the function returns everything to the right of the position you indicate with the second parameter. In this application, Mid$ picks up the year whether it's two or four digits long. Roger's method renders the date as "194508-06":

```
D$(I) = MID$(D$(I),7) + LEFT$(D$(I),5)
```

Unlike the example in the loop above, both Stephen's and Roger's methods require that you put the separating characters back if you return the dates to their original form. The method suggested by Bill Mincher (Augusta, ME) performs the least string surgery and puts the date in a form that's easiest to return to its original condition. He uses one function to nail the year to the front of the string:

```
D$(I) = MID$(D$(I),7) + D$(I)
```

The string becomes "194508-06-1945". Having the year on both ends doesn't affect the sort, though it creates longer strings. You get the original back with one Right$ function:

```
D$(I) = RIGHT$(D$(I),10)
```

If you intend to store the dates in symbolic form and space is a major factor, Robert Yankowitz (New Bedford, MA) has a way to reduce the whole thing to a 4-byte string. The reconstructed string is meaningless to display and more difficult to recover from, but it needs 60 percent less storage space. If the year were expressed as only two digits, you could get the date into 3 bytes with this method:

```
D$(I) = CHR$(VAL(MID$(D$(I),7,2))) +
  CHR$(VAL(MID$(D$(I),9))) +
  CHR$(VAL(LEFT$(D$(I),2))) +
  CHR$(VAL(MID$(D$(I),4,2)))
```

Several of your solutions stored the dates in numeric variables, which relieves Basic of cleaning up the string pool (garbage collection) as your routine does its worst to a bunch of strings. Unfortunately, when the year is four digits long, the number you get most easily has eight digits, a double-precision number that needs 8 bytes to store, and Basic handles it clumsily. It's not an attractive option. You could devise a scheme to limit the range of values your conversion produces, but it would take a great deal of trouble. If you're working with two-digit years, however, David Smith's (Bellevue, WA) way of producing a 4-byte, single-precision value is worth noting. For instance, 08/06/45 becomes the value 450,806:

A key element of problem solving is the ability to look at things from odd,. . . unfamiliar angles.

```
D(I) = VAL(RIGHT$(D$(I),2) + LEFT$(D$(I),2)
  + MID$(D$(I),4,2))
```

Mark Gustitis (Media, PA) suggested another way to avoid garbage collection. Instead of assigning the new string contents with an equals sign (=) and the silent Let statement, use LSet. While LSet and RSet are associated with filling fields for random access files, you can use them for any string assignment. The advantage, according to Mark, is that the statements force Basic to use the same storage locations for the strings. Be aware that the new string must be the same length or shorter.

This month, you set a record for the number of entries you sent in. I wish I could acknowledge every one of them. Thank you. Without you I'd have to make up all this stuff.

Swap Shop

The second challenge from September was sneaky. I gave in to a mischievous impulse. Lawrence Kesteloot's subroutine used two arrays, named A$ and B$, and he dumped the contents of B$ array into A$ array with the time-tested method of a loop:

```
FOR T = 1 TO S%:A$(T) = B$(T):NEXT T
```

I bragged I could make the swap without a loop by using two Basic statements.

Richard Snow (Vallejo, CA) got my trickery just right:

```
POKE VARPTR(B$(0)) - 8,ASC("A"):POKE
  VARPTR(A$(0)) - 8,ASC("B")
```

It works by getting into the variable lookup table with the VARPTR function and changing the names of the variables, which are 8 bytes lower than where VARPTR points.

However, Jerry Engelbach (New York, NY) points out that the solution works only under the special conditions of the example. Both array variables must have one-character names. Also, you have to be sure which of two variables comes first in the table. If you change the name of the first one first, Basic will never find the second one.

Now that you know the method, can you write a general subroutine to swap the contents of any two arrays without having to loop through them?

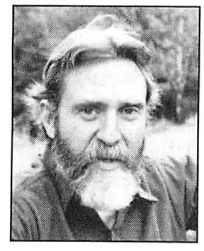
Mirror Image

I recently saw two programs with routines that depended on putting a list in reverse order. The inefficiency of those routines struck me. I'm sure you can do better. Take a list of strings in L$ array, S% elements long, and put the last one first, the next to last second, and so on until the first becomes last. When you're through, the reversed list will replace the original list in L$ array. Start your subroutine at line 1000. You won't know on entry the exact value of S%.

When you've got that down, apply the same principle to an individual variable, W$, containing a string of any length. Begin this subroutine at line 2000. When it returns, the contents of W$ will be backwards. In other words, if W$ contained "ROTOR" going in, it will hold "ROTOR" coming out. See?

The rules:

1. Write your program(s) or routine(s) in GW-Basic.
2. Your solution(s) to this month's poser(s) must reach us by December 15, 1987, to be considered for the March 1988 issue and a T-shirt if we use it.
3. Employees of CW Communications already have T-shirts and are not eligible.
4. Send your solutions, comments, criticism, suggestions, and T-shirt size to: *80 Micro*, Fine Lines, 80 Elm St., Peterborough, NH 03458. We cannot return entries.■

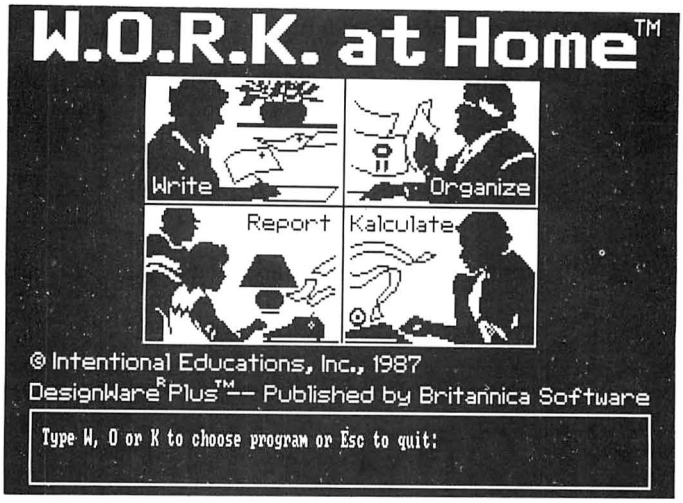


Harry Bee is a freelance writer, programmer, puzzle creator, and dreamer. You can contact him at P.O. Box 567, Cornish, ME 04020, or on Compuserve (74076, 3461).

Doesn't W.O.R.K.

by Eric Grevstad

W.O.R.K. at Home runs on the Tandy 1000/1200/3000 (128K). Designware Plus, 185 Berry St., San Francisco, CA 94107, 415-546-1866. $59.95.



W.O.R.K. offers four affordable high-memory programs.

What would you say if I asked you, "What kind of program works on 128K one-disk systems, costs under $60, is copy-protected, and can't be installed on a hard disk?" Chances are, you'd say "A computer game"—and that, unfortunately, describes W.O.R.K. at Home. Designware deserves credit for bucking today's trend toward high-cost, high-memory programs and for trying to offer families or beginners a simple, affordable word processor, spreadsheet, and data base. But W.O.R.K. at Home, despite a few nice design touches, literally doesn't work.

The program's initials stand for Write, Organize, Report, and Kalculate, referring to its Writer, Filer, and Spreadsheet modules. "Report" refers to the ability to insert a data-base or spreadsheet file from disk into a word-processing document. That's the extent of the trio's integration; Writer, Filer, and Spreadsheet are separate programs chosen from a main menu, with no clipboard or window transfer among them.

The package comes with a program disk, a tutorial disk whose lessons stop after a couple of commands, a slim manual that covers the MS-DOS, Apple II, and Commodore 64 versions of the program, and a book of sample exercises that illustrate most functions. As I said, you can't install the program on a hard disk or copy DOS to the master disk; you must boot your system to the A> prompt, then insert the master disk. Each module prompts you to insert a formatted data disk when saving your work on a one-drive system (you can't format disks from within the program).

Writer

The Writer is a simple word processor. Like the other W.O.R.K. modules, it has a tidy command structure: The F1 key pulls down a menu of single-key commands such as C for Copy or F for Find. These are easy to follow—the Delete command, for example, prompts you to delete (A)ll or (P)art of your text and then highlight an area for the latter—and an Undo function catches mistakes. Since what you see in Writer is not what you get (inverse-video C, L, or 2 markers indicate centered lines, indented left margins, or double spacing), a View command shows you a split screen of text and a graphic representation of the printed page.

Everything else about Writer is sluggish, awkward, or both. Tabs are fixed at five spaces. Replacements must be confirmed one at a time. There is no overwrite cursor, only an insert mode.

Cursor movement commands are scarce, and page up and page down don't work (you use control-V and control-F, respectively). The Print menu lets you set margins and spacing, but you won't find headers, footers, justified text, or a chance to specify codes for your printer, only generic underlining (characters underlined individually) and boldface (characters printed three times).

Organize

The Filer allows up to 360 records with 20 fields apiece (more than enough), each field containing up to 33 characters of data (not enough). It's a minimal, flat-file data base, saving each record to disk as you enter it and giving you the opportunity to rename fields and edit data afterward.

You can sort on any field in ascending or descending order (Filer saves the rearranged data base to disk after every sort); search for matches on one or multiple fields; sort, browse, or edit only those records found in a search, or return to working with all records in the data base. I don't like its skimpy field lengths or bland screen layout (a list of numbered fields), but Filer is probably the most successful of the W.O.R.K. at Home trio.

Kalculate

Filer certainly compares favorably to the spreadsheet. The latter's 26-column, 99-row size and its column-width and decimal-format choices are suitable for home-budget uses, as are its admittedly limited built-in functions—sum, average, and the math functions sine, cosine, tangent, and square root.

With no cursor pointing, you must write cells' column and row addresses in formulas, but I found the conventional shorthand (A6) works as well as the program's comma-separated style (A,6). In one good feature, W.O.R.K. Spreadsheet lets you enter titles in the frame outside the cell area, above row 1 and beside column A, and refer to them in formulas (so cell C,10 can be expressed as Sales, Other).

But for anything other than simple paper-route or checkbook totals, Spreadsheet is a disaster. I wondered why the program had manual and not automatic recalculation (the documentation quaintly compares pressing the equals key to pulling the handle on an antique adding machine), until I found that recalculating a complex but small (50 cells) worksheet took a minute and 20 seconds.

Worse, for a few cells in all but the simplest worksheets I created, the program simply gave up, copying cell values instead of using them in equations. The formula SUM(D1:D6) yielded the value D6. Adding A3 + SQRT(A3) produced A3.

Report

The Report or integration feature uses the Filer and Spreadsheet's copy-for-Writer function to save a data base or worksheet in ASCII format for insertion into a Writer document. Spreadsheet importation works nicely, fitting only a few columns across a page but automati-

cally adding hyphens to underline column titles and colons after row labels. Data bases arrive as clumsy lists of lines, including field names, requiring massive editing and reformatting.

Summary

W.O.R.K. at Home benefits from some good ideas—features like the spreadsheet titles or page preview—and I didn't even mind its copy protection much (there's no disk access once a module is loaded). But it's too short on features to give a good introduction to word processing or data-base management, and it's the first spreadsheet I've seen that can't add. Tandy owners are much better off with Deskmate, and other users would be happier with the capable, well-integrated PFS:First Choice.■

Direct Connection

by Harry Bee

PEP runs on the Tandy 1000/1200/3000 and requires 192K RAM (256K recommended), an RS-232 serial port, and one disk drive. Intelpro, 13 Saratoga Drive, Kirkland, Quebec, Canada, H9H 3J9, 514-694-6862. $59.95 (U.S.).

PEP, as a title, is a failure. It's catchy enough, but it doesn't tell you anything, and what you might infer from it could be wrong. It's an acronym for Printer Emulation Package, but PEP won't make your DMP 200 emulate an Epson, as you might guess.

PEP is a file-transfer utility. It lets you port files of any type from almost any computer (VAX mainframe or Model 100, to establish a range) to your MS-DOS machine. It combines the receiving end of a good terminal-emulation package with added features particularly suited to transferring files, and diagnostic tools to assist with its installation.

The title is meant to mean that, with PEP aboard, your computer looks like a (serial) printer to another computer. Inappropriate title aside, once you get your computer connected to the source computer, PEP works well indeed.

First, however, you have to connect the two computers. That task can be the easiest thing in the world, or the most difficult.

The demands on your MS-DOS computer are minimal. The hard part is the serial port. The source computer needs a serial port, too. You can get by with a

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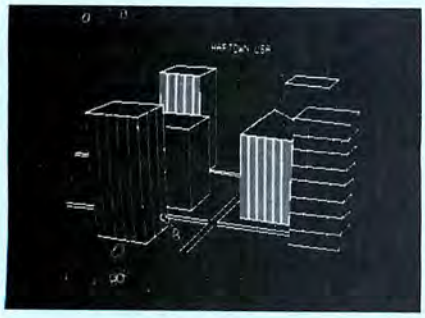
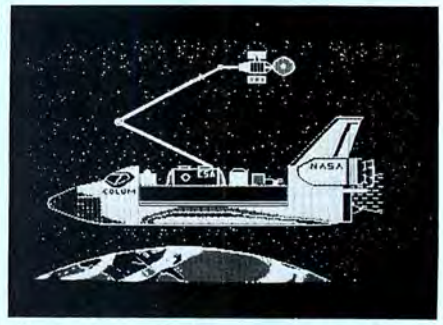


Superior Hardware. The Grafyx Solution provides 153,600 pixel elements which are arranged in a 640 × 240 or on the Model III a 512 × 192 matrix. Hundreds of new business, personal, engineering, and educational applications are now possible. The hi-res display can be shown on top of the standard display containing text, special characters, and block graphics. This simplifies program debugging, text labeling, and upgrading current programs to use graphics. The Grafyx Solution fits completely within any tape or disk based Model 4, 4D, 4P, or III. Installation is easy with the plug-in, clip-on Grafyx Solution board.

Superior Basic. Over 20 commands are added to the Basic language. These commands will set, clear or complement points, lines, boxes, circles, ellipses, or arcs. The hi-res screen can be printed on any of 30 popular printers or saved or loaded to disk without leaving Basic. Areas may be filled in with any of 256 patterns. Sections of the screen may be saved and then put back using any of five logical functions. Labels can be printed in any direction. The viewing area can be changed. The entire screen can be complemented or cleared. Graphics Basic provides dot densities of 640 × 240, 320 × 240, 160 × 240, and 160 × 120, all of which can be used in the same display.



Superior Software. The board comes with over 40 programs and files which make it easier to use, serve as practical applications, demonstrate its capabilities, and serve as programming examples. The software works with TRSDOS 1.3, 6.1.2, 6.2; DOSPLUS 3.4, 3.5, 4; LDOS; and Newdos80. The Grafyx Solution is also supported by over 20 optional applications programs: Draw, Bizgraph, xT.CAD, 3D-Plot, Mathplot, Surface Plot, Chess, Slideshow, etc.

The Grafyx Solution package is shipped complete for $199.95 (reduced from $299.95). The manual only is $12. Payment may be by check, Visa/MC, or COD. Domestic shipping is free on pre-paid orders. Texas residents add 6⅛% tax.

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parallel port at the source, if you invest in a parallel-to-serial converter.

Then you need a null-modem cable or adapter, and that's not as simple as it sounds. Hardware interfaces never are. The basic difficulty is that a standard null modem is a fiction. So is a standard connector. And if RS-232 is supposed to define a standard way to wire a serial communications port, few people ever read the specification.

Finally, once the computers are physically connected, you need software for the source computer to transmit your files. That can be as simple as a word processor with a serial-printer driver. More likely you'll want a competent communications program.

Help and a Roadmap

If the potential obstacles don't frighten you, Intelpro goes to great lengths to guide you around them. The manual describes the serial connection and all its possible variations in such detail that even a hardware dolt like me can understand it. To complete a near ideal interface, I had to modify an off-the-shelf cable. Wasn't I surprised when it worked!

The PEP package also includes software to assist you. A program called BOB validates your computer's serial port, verifies the connections you've made to the source computer, and reports on the signals exchanged. This software breakout box is a valuable analytical tool in its own right.

PEP is forgiving and works well under far less than ideal conditions. Of the RS-232 interface's nine or 10 standard signals (depending on whom you believe), PEP needs only five to be fully functional—four if they're the right ones. Further, two options let the program work even with no control signals at all.

Help doesn't stop with the physical interface. Before you run PEP itself, two programs check your computer for conflicts with the way PEP does things. Another lets you examine transferred files. And PEP's on-screen directions make operating the program obvious. Still, the manual contains a good tutorial and outlines a painstaking procedure to make sure you're getting the most accurate file transfer possible.

Look, Ma, No Hands

PEP operates in two phases. In phase 1, following the prompts, you select a baud rate up to 9,600, word length, parity, and stop bits to match the incoming signal. You route the incoming data to your monitor, printer, disk drive, or any combination of them. You instruct PEP to accept the data as is, for binary files, or to massage certain text files by adding line feeds.

Then you switch to phase 2 where PEP receives files from the source computer and disposes them according to the way you set it up. You can freely switch back and forth between phases to reset PEP for different kinds of files and ways of sending them.

If you're thinking you could import files this way with any communications software, you can, but not nearly as well. First, PEP receives and correctly interprets files transmitted without fussing over protocol, or even the lack of it. Then, when you switch to phase 2, PEP is automatic. You can sit at your source computer and send files to MS-DOS all day long.

PEP doesn't rely on end-of-file (EOF) codes, or any codes at all. Instead it recognizes a pause of at least five seconds to distinguish one file from the next. If you have an erratic or poorly behaved connection, you can increase the delay PEP looks for and avoid fragmenting your files. When PEP detects a long enough pause, it closes the current file and waits. If another signal comes, it opens the next file. It names all files Remote, and sequences their extensions from 001 through 999. (You can't change the file name or vary the extension sequence, and every time you run PEP it starts numbering again at 001.) If your sending program has a script language that includes a Wait command, you can automate the entire file-transfer process.

Conclusion

I transmitted nearly 100 files of all types from my Model III and Model 4, and a couple from a TI99/4, under varied conditions, without a significant error, and certainly without an uncorrectable one. The closest I came to a problem was while using a word processor to "print" from my Model III. Before starting to print, the program sent a string of characters, then paused long enough to indicate the end of a file. On the Tandy 1000 side, PEP wrote several extra files that I had to delete. However, that was not a disaster. In another session, I sent 25 files, one after the other, while reading to my daughter.

Making the physical connection between computers can present problems, but as flexible as PEP is, it's hard to imagine one that's insurmountable. Once the connection is made, the program couldn't be easier to run, although I'd wish for more control over file names, perhaps, or that PEP would sense a nearly full floppy disk. If you're looking for a way to salvage data from an incompatible computer for which no software solution exists, or from a compatible portable, PEP is a good answer. ■

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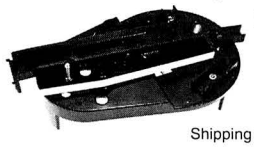

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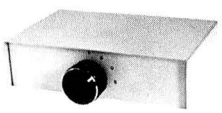

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Riding on the Freeway

by David A. Williams

Freeway runs on the Tandy 1000/1200/3000. Kortec Inc., 505 Hamilton Ave., Palo Alto, CA 94301, 800-327-0310. The standard version requires 256K and sells for $24.95; Freeway Advanced requires 384K and sells for $89.95.

Freeway is billed as a communications software package that is automated and easy to use. In general, the program lives up to that billing. However, its command language is arcane and poorly explained, and Freeway is too leisurely in performing some tasks.

The program comes in two versions: standard and advanced. The two are identical, but the advanced version includes the command language and a few other extras. If you buy the standard version and later decide to upgrade to the advanced version, you can do so for the difference in price.

Cruise Control

The Autopilot is perhaps Freeway's most distinctive feature. It will log onto a host computer and, in some cases, conduct the entire session automatically. To set up an Autopilot sequence, you select the teach mode, then log onto a host and conduct your session manually. You can end the teach mode at any point. Autopilot remembers every keystroke and the point at which you typed it.

The next time you dial that host, Autopilot takes over up to the point where it stopped learning. If something goes wrong, you can disable the Autopilot and continue manually, but the Autopilot can't branch to an alternative response. You need the command language for that.

You'd better type fast when setting up the Autopilot; it remembers the delays between keystrokes and faithfully reproduces them, too. It shouldn't be that way; a short, fixed delay between receiving the cue and sending the response would be sufficient to avoid any timing problems.

Freeway is completely menu-driven; the advanced version also offers a command-line mode. The menu entries are almost self-explanatory, but ample on-line help is available if you have a problem.

A short, introductory session in the manual walks you through the process of dialing a number from the Phonebook, creating a Phonebook entry, and teaching the Autopilot. Freeway has nine Phonebooks, each capable of storing 12 host numbers, along with communications parameters and other information about each host.

Freeway's built-in page editor gives you an alternative to the poor on-line editing capability found on most BBSes and on-line services. You can use the page editor on- or off-line to compose short messages. When you're finished writing, a couple of keystrokes will send the message out.

Freeway has several appealing features, but. . . is sub-standard.

A line editor provides a similar function. When invoked, it displays the last 10 commands you sent to the host. You can select one, edit it if necessary, and resend it. This could save time if you are entering the long commands required for an on-line search.

Freeway has two ways to capture text in a disk file. An entry in the Phonebook turns on a log file to record the entire session but allows no way to start or stop recording in mid-session. The second method lets you identify and send text to another file that you can toggle on and off. Both methods slow down text reception by almost a factor of two, a performance degradation not shared by most other communications programs.

Freeway supports several file transfer protocols, including ASCII, Xmodem, Ymodem, and Kermit. I had no trouble with Xmodem and Ymodem, but I was unable to get Kermit to work, although my usual communications program has no trouble with it.

The command language, an extension of that used by Crosstalk, has many powerful commands, but they are more complex and less intuitive than those of other communications programs I've worked with. This shouldn't be a problem, but the manual's explanations are skimpy. The distribution disk contains a script file that sets up Freeway to operate as a simple bulletin board. This illustrates the language's power, but the lack of comments limits the file's tutorial value.

Summary

Freeway has several appealing features, but its overall performance is substandard. The Autopilot function would benefit by being faster, but my main complaint is the severe performance penalty imposed by the text-capture function. If you need a command language, you might consider Freeway Advanced, but several shareware programs, notably Procomm, are less expensive and easier to use. ■

First Publisher

by Ron White

PFS:First Publisher runs on the Tandy 1000/1200/3000 and requires 512K; a CGA, Hercules, or EGA graphics adapter; and two floppy drives. Software Publishing Corp., 1901 Landings Drive, Mountain View, CA 94039-7210, 415-962-9002. $99.

Analysts have been predicting for nearly two years now that desktop publishing will be *the* new hot software market. What the pundits forget is that publishing programs— such as Pagemaker and Ventura Publishing—are running in the $800 range. Add a couple of grand for a laser printer, and desktop publishing has priced itself out of the reach of many small businesses, not to mention individual computer users.

PFS:First Publisher is not the complete answer to the need for everyman's desktop publishing program, but it comes close. At $99, it's affordable. Since it works with dot-matrix printers as well as laser printers, it doesn't require an investment in more hardware. And it's simple enough that you can use most of its features after spending a day reading the manual and playing with the program. After that, the learning curve may reach a plateau while you adjust to some of First Publisher's idiosyncrasies.

Page Makeup

First Publisher is best when used with a mouse, but it isn't necessary. With an EGA, First Publisher will display all of an 8½- by 11-inch page. A Hercules adapter will display half a page, and a CGA will show one-fourth of a page.

Pull-down menus let you bring in text or graphics to change type fonts and size, cut and paste, resize, or otherwise rearrange elements on the page. An icon-based menu on the right side of the screen provides elementary drawing tools for creating boxes, lines, and freehand drawings.

You can format a page for the number of columns, spacing between columns, margins, and default spacing between lines of type. The program also provides sample formats for a newsletter, advertising leaflet, menu, and other typical uses for desktop publishing, which you can adapt for your own publications. Individual elements of the format can be altered. For example, one line of type that ordinarily extends over only a single column can be stretched across the entire width of a page so that it can contain a headline.

The package includes a basic supply of art work illustrating subjects such as business, holidays, and leisure activities. More disks of graphics and type fonts are available separately. In addition, First Publisher will accept art created with several popular drawing programs, and it comes with a memory-resident program that can capture screen images created by software otherwise incompatible with First Publisher.

First Publisher works with dot-matrix. . .as well as laser printers.

You can type the text for your print job directly into First Publisher, but you give up some of the amenities of word processors, such as spelling checkers and dual screens. A better way is to type your text using your word processor and save it in an ASCII file, which First Publisher can read. If you use PFS:Write, a word processor from the company that sells First Publisher, then the imported text will retain any boldfacing or italicizing it had as a word-processing document.

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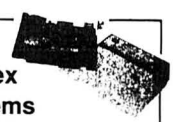
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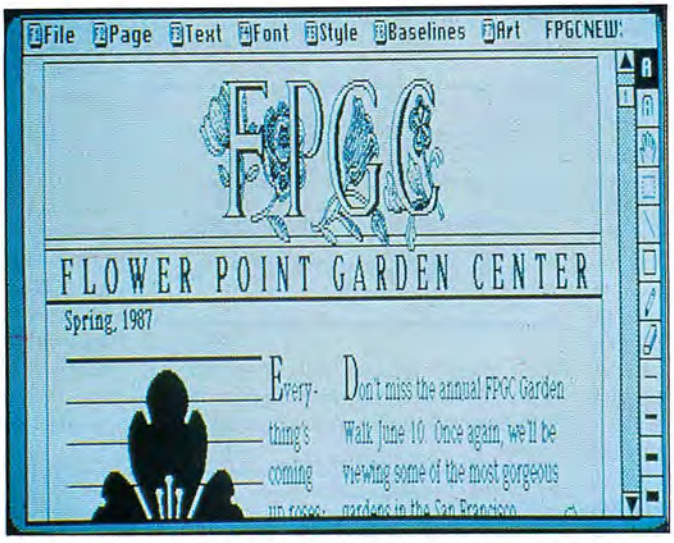
Pros and a Couple Of Cons

Creating a layout with First Publisher requires some planning, such as deciding where to place blocks of type and illustrations, and the best sizes for body type and headlines. You're not locked into a design once you start filling up the page; in fact, First Publisher is versatile enough and fast enough, even working with multipage documents, to encourage experimentation. By the same token, it's easy to let things get out of hand.

For instance, if you've just written a headline in 36-point type—about a half-inch tall—and call in a text file that contains the main body of a story without changing to smaller type, First Publisher will flood page upon page with the larger type. The program needs an undo feature; it's best to save your work frequently so you can backtrack to a previous version if things go awry.

Outside of the lack of a convenient way to undo mistakes, my only other serious complaint was that I was never able to use zero-based columns successfully. This feature lets you use, for example, two columns at the top of a page and three columns at the bottom. On the nuisance complaint level, a ruler that can be displayed at the top of the screen to help place elements on the page is off by 1/16 for each inch (although a similar vertical ruler is accurate).



Pull-down menus let you bring in text or graphics to cut and paste, resize, or otherwise rearrange elements on the page.

Those limitations and nuisances aside, the final results are often stunning for hard copy from an inexpensive dot-matrix printer. First Publisher uses a smoothing algorithm that reduces the jagged edges typical of most dot-matrix printers. The results, particularly the graphics, were close to those of a laser printer producing 300 dots per inch.

Conclusion

First Publisher is not the perfect program for all occasions. Jobs calling for fine points of printing, such as fine adjustments of type size or spacing between letters, still require the big-boy programs. But if your needs are this side of professional—if you want to produce attractive, eye-catching documents combining text and graphics with a minimum of bother and expense—First Publisher will do the job. ■

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Cooking with the Baker's Dozen

by Ron White

Baker's Dozen runs on the Tandy 1000/1200/3000 and requires two floppy drives or one floppy and one hard drive and 256K to run the disk utilities and mini-spreadsheet; all other programs have minimal memory requirements. Some programs require displays that are closely hardware compatible with the IBM standards. Buttonware Inc., P.O. Box 5786, Bellevue, WA 98006, 800-528-8866. $59.95.

MS-DOS's shortcomings provide many opportunities for others to come up with improvements. Buttonware, for one, has claimed 14 such opportunities in its Baker's Dozen, a collection of utilities, some of which are simple—but indispensible when you need them. Others are unique or only approximated by more expensive software sold through commercial routes.

File Recovery and More

The most impressive of the group is Diskutil, an excellent shareware response to the Norton Utilities. Diskutil lets you manipulate disk files and has some handy features for selecting and sorting groups of files; you can then perform operations such as erase and copy to the group en masse.

The only advantage over performing those operations from the DOS prompt using the asterisk (*) and question mark (?) wild cards is that you can group files from several different subdirectories. You could, for example, erase every file that has the extension .BAK in all of a hard disk's subdirectories.

Diskutil is perhaps most valuable for its ability to restore a file that you've accidentally erased. Diskutil worked in every test I ran on a hard disk. Naturally, it can't recover a file intact if the file-allocation table (FAT) has already assigned its first cluster of data to a new file. However, if you haven't overwritten the deleted file with a new one, Diskutil can save the day. Restoring a file is slightly simpler than with Norton Utilities. However, if the first cluster has been assigned to another file, salvaging what you can is tedious and underdocumented in the Baker's Dozen manual.

Baker's Dozen also shares Norton Utilities Advanced Edition's ability to inspect and modify the FAT, which contains the basic road map to an entire disk. Therefore, use this function with extreme care; a wrong move here could cause you serious problems.

Other Diskutil features are more useful for everyday operations. These include routines to change file attributes, rename a directory, remove a directory and all its files with a single command, change the date and time stamp on a file, and change a disk's volume ID.

The other major Baker's Dozen program is Button-Calc, a mini spreadsheet comprising one screen of six columns by 20 rows. For its small size, Button-Calc supports a host of features usually found in full-fledged spreadsheets, including formulas, trigonometry and business functions, time and date calculations, named ranges, and the ability to import and export data. It lacks macro, database, and graphing capabilities, but, otherwise, you can do nearly anything with it that you can do with other spreadsheets. You just can't do them with a large number of entries.

Assorted Utilities

While MS-DOS's sort program is limited to files no bigger than 64K and can

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sort only on a single field, the program in Baker's Dozen will sort by four fields in ascending or descending order, and it can handle any size file that fits in your computer's memory.

The DOS file-comparison utility provides so little information on the differences between two files that it's hard to imagine it gets much use. The Baker's Dozen comparison program, on the other hand, gives detailed information on the differences between the files and tells where the differences are located and where text in one file appears in a different location in another file.

One of Baker's Dozen's two memory-resident programs is a calendar. It can be customized through a text data file to include special dates and has functions to display some Christian, Jewish, and Chinese holidays. You cannot enter appointments on the fly, as you can with many other memory-resident calendars.

The remaining programs in the collection are less elaborate but do odd jobs that would be difficult or impossible using MS-DOS alone. They include routines to print a file (such as output from a spreadsheet) sideways on an Epson or compatible printer; locate a file anywhere on a disk or in a subdirectory; find files that contain specific text; swap COM and LPT ports; remove a subdirectory; capture printer output, including print-screen output (the other memory-resident program) to a disk file; and determine the hex, decimal, or scan-code values of keystrokes.

You can run any of the programs from the DOS prompt, from a batch file, or from Baker's Dozen's own menu. The menu can also be adapted to include application programs and prompts of your own choice. The menu, in fact, could be stripped of all its Baker's Dozen utilities and converted into a front-end menu for a hard-disk system, something the manual doesn't go into.

Conclusion

Baker's Dozen is a motley collection including functions some computer users will never need. But, like any good assortment, it contains something for everyone.

Baker's Dozen was released as shareware during the summer. By late 1987, it should be available through electronic bulletin boards and user's groups. Under the shareware concept, anyone who uses the program is expected to pay its registration fee. Paying the fee entitles you to a printed manual that is more extensive than the on-disk documentation (and essential to understanding how to manipulate the FAT), and to technical support and updates. If you don't already have the Norton Utilities or some other good unerase program, Baker's Dozen's Diskutil is by itself worth the fee. ■

A Bit of a Pinch

by Thomas Krehbiel

PC-Type + runs on the Tandy 1000/1200/3000 and requires MS-DOS 2.0 or later, 256K, and one disk drive. Buttonware Inc., P.O. Box 5786, Bellevue, WA 98006, 206-454-0479, 800-528-8866 (orders only). $69.95.

Software is a little like bedroom slippers. Utility is the given; comfort is the goal. A breaking-in period is part of the process, of course, and it's a big disappointment if you discover pinches and rubs that won't go away.

That's just what I found with Buttonware's shareware word processor, PC-Type +. It does the basic job, offers some special features and functions, and has a well-conceived menu and command structure, but it doesn't feel good.

First Impressions

The first pinches came from PC-Type's incompatibilities with my Tandy 1000's non-standard keyboard. The control-backslash (\) and control-tilde (~) commands that should abort printing and split the line at the cursor, respectively, don't work at all.

I did uncover a way to work around the missing control-~. One of PC-Type's predefined keystroke macros offers a split/shift function. As long as you don't replace this macro with one of your own, you can invoke a line-split with control-1. However, the only way I could abort printing was to take the printer off-line and wait for the error message.

It's also not very graceful to have to delete a word letter by letter, but that's the only way PC-Type will do it. PC-Type can't count words, either. It will tell me what line of what page the cursor is on (assuming a single-spaced printout), but that's not really good enough.

Printer support is generally good. PC-Type comes with configuration files for nine printers. If none fits your printer, PC-Type has screens available that let you define your own configuration file with up to 12 escape codes.

You embed printer codes in your text using one of PC-Type's handy pop-up menus. Code entry was easy, but I had some difficulty keeping track of codes once they were part of the text. PC-Type uses color changes to show embedded codes, but on my amber monochrome monitor this often meant that a letter would simply disappear or fade. PC-Type shows a list of active attributes on a message line at the bottom of the screen, but that doesn't help the appearance of the text. Of course, this system works better with a color monitor.

The screen layout provides another rub. PC-Type puts a frame around the

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text area, which adds clutter to the screen and reduces the maximum displayable characters per line to 78.

Then there's the reformatting business. PC-Type does it by paragraphs but uses a blank line rather than the usual carriage return to indicate the end of a paragraph. Without the blank lines, you're going to get a nicely blocked one-paragraph document when you hit control-R.

PC-Type's solution is as bad as the problem: You must insert special paragraph marker lines. You get one of these lines by pressing F8 (miscellaneous options), F7 (special lines), then F7 (paragraph marker) again. That's a lot of typing for something that other word processors handle with a press of the enter key.

Some Fancy Features

The pop-up menu structure is excellent, and the commands are as mnemonic as anyone could wish. For example, control-B marks blocks, control-I inserts a line above the cursor, alternate-I inserts a line below the cursor, and alternate-M moves a marked area. A command line at the bottom of the screen provides access to DOS commands, detailed help, searches, and more.

One powerful feature lets you create charts and diagrams with a few simple commands. All you have to do to throw a box on the screen is choose the graphics characters you want and locate two diagonally opposite corners. The program takes care of the rest. To subdivide the box, just indicate where you want the horizontal and vertical lines. PC-Type draws them in, and supplies the correct characters at every intersection.

PC-Type's ability to mark and move text is unparalleled in my experience. Using just a few keystrokes, you can move any marked area in your document to any other spot you'd like. When you combine this with the box- and line-drawing capabilities, you'll find that PC-Type can do layout work that comes close to desktop publishing.

You can create columns, sort them, and add and align columns of numbers. All of this happens with little fuss, once you get accustomed to a few commands.

PC-Type can have as many as 10 file-editing buffers active at once, and you can switch from one to another with just a keystroke or two. There's no split-screen option for viewing two or more files at once, but it is easy to change from one file to another and move text from one file to another.

The detailed, 300-page manual's reference section tells how to handle anything PC-Type can do. In addition, there's a whole disk full of on-line help.

A third disk holds the Fault Finder spelling checker that lets you watch as it scans your document. A mail-merge feature has the special ability to use PC-File information in addition to comma-delimited data and direct keyboard input.

The Last Word

PC-Type+ is a competent word processor with special layout capabilities that approach costly desktop-publishing systems. But some of its basics don't work as smoothly as the extras, and it has a couple of problems with the Tandy 1000 keyboard.

The best thing about PC-Type is its shareware distribution method. You can test the comfort of the package for yourself at little or no cost. Although you won't have the detailed manual to work with, the files on the help disk should serve well enough for trial purposes. If you find PC-Type fits you better than it does me, you can then send in your purchase fee to get the full printed documentation and access to a year of technical support.■

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Move Over, Peter Norton

PC Tools 3.20 runs on the Tandy 1000/1200/3000, requires 256K (64K or more in resident mode), and includes both 5¼- and 3½-inch disks. Central Point Software Inc., 9700 S.W. Capitol Highway, Suite 100, Portland, OR 97219, 503-244-5782. $39.95.

Frankly, as an Advanced Edition Norton Utilities owner, I thought I'd be slumming when I tried PC Tools. Not only do Central Point Software's disk utilities cost $39.95 instead of $150, but they're squeezed into a memory-resident program instead of a bulky bundle of separate routines. (The package does access the disk frequently, but EMS memory or a RAM disk can speed things up.)

As for my loyalty to Peter Norton, that lasted about an hour. Popping up over your favorite application, PC Tools can copy, delete, or sort files or move them between directories; "prune and graft" whole directories onto each other; edit files in hexadecimal or ASCII format; copy disks or format data disks; and duplicate popular Norton functions from the system-information screen to the disk space allocation map—not to mention its ability to recover erased files or directories.

Version 3.20 adds some non-resident programs, including high-speed replacements for the Backup and Restore commands, a compress program that rejoins your fragmented disk files, and a hard-disk unformatter that promises to undo the disaster of an accidental Format C: if you've run the safety program that stores a backup copy of the file-allocation table and root directory. A teaser file on the disk promises you disk caching, a text editor, and easier, more bulletproof recovery and unformat routines for future upgrades.

I recommend PC Tools as a convenient, powerful software bargain.

I found a few things to complain about. While its single-key file selection and command menus are a breeze to use, PC Tools sometimes requires you to steer through a number of keystrokes or program layers. The manual should tell you to specify a directory sorting order before running the file-unfragment program; skipping that step, I crashed my system repeatedly before I guessed what I was doing wrong.

But PC Tools generally worked like a charm (even if it did take 74K instead of the advertised 64K to manage my 10-megabyte hard disk without "Not enough memory" messages), and I recommend it as a convenient, powerful software bargain. If you're at the DOS prompt and want specific answers to inquiries—"What's the total size of the EXE files in my Dbase directory?" — Norton's separate programs and parameters give faster service and functions for more expert hard-disk hackers. But as an all-purpose accessory available from within applications, PC Tools is the only disk utility most users will ever need.■

—Eric Grevstad

Q for Quick

Q-DOS II runs on the Tandy 1000/1200/3000 and requires 256K and a hard-disk drive. Gazelle Systems, 42 N. University Ave., Suite 10, Provo, UT 84601, 800-233-0383. $69.95.

Q-DOS II, an upgrade to Gazelle Systems' Q-DOS (see the review in *80 Micro*, March 1987, p. 102), is accurately advertised as a "blazingly fast hard-disk file manager." Besides that, this memory-resident utility offers powerful functions, simple commands, high-quality design, and includes a text editor.

When resident, Q-DOS II performs the most common hard-disk-management functions from MS-DOS; its main screen stays in the foreground until you access an application, at which time it drops out of the way. The efficiently designed main screen displays file and directory names, a function-key menu, the active path, and information about files in the current directory (as well as files tagged for mass operation). A command menu includes options to tag, view, copy, move, erase, rename, and print files.

Everything about Q-DOS II is simple and neat, including its concise, well packaged documentation. Although the manual has no index, the program contains an on-line index to Q-DOS II's help file. Two keystrokes will call up the index, then another keystroke selects help information on the subject in question.

The directory command displays the structure of disk directories in a tree diagram. Move the cursor along this visual tree to select a directory name, and press enter to display the corresponding directory file names on the main screen. You can then select individual file or directory names from this list. Press the period key continuously when the cursor bar is over a directory name to reach the root of the directory tree.

The utility now gives you the option of erasing all files that match any search specification. Because Q-DOS II always remembers the contents of two directories, comparing two floppy disks is as easy as toggling a function key. Q-DOS's find, attribute, and print directives are also enhanced in the new version.

Q-DOS II allows more flexibility in configuring features. For example, you can now set default sort and search specifications, specify the path to the help file, and toggle the auto disk-logging feature on and off.

Perhaps the most important feature added to this upgrade is a simplistic but effective file editor. It is limited to 60K files that can be revised in either hexadecimal or ASCII display mode. In addition to normal edit functions, it has find/replace text features and an in-memory buffer (4,000-character limit) that lets you insert or copy buffer text repeatedly. Although you can use the editor as a stand-alone program, it is designed to be called from within Q-DOS II. If you don't like the editor, you can customize the access key to call your favorite word processor instead.

Q-DOS II's speed and easy commands make it possible for you to locate any file within the hard-disk directories in about three seconds. If it finds the file name, you can jump directly to its directory if you want.

One great advantage to using Q-DOS II lies in its ability to perform mass operations on groups of files. You move the cursor bar to select the files you want to tag for mass copy, erase, rename, print, attribute, or move operations. There are one-stroke mass tag operations, as well as a convenient invert parameter that reverses the tagged status of individual files.

Before going ahead with a mass copy, you can use the space command to determine how much room is available on the destination disk. Compare available room with the total size of your tagged files—displayed on the Q-DOS screen—and you can be assured of a complete transfer.

You can use the function keys for major operations such as changing the default disk drive, moving to selected directories, modifying default search and sort specifications, displaying status information, or invoking the Q-DOS editor. Of course, you can also access the MS-DOS command line.

Q-DOS II is a joy to use. Hard disk users are sure to find it an indispensable utility well worth the price.■

—G. Bruce Libengood

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If you don't like the way that some of the text characters appear on your graphics monitor, consider changing them to suit your taste. You can greatly enhance an abundance of MS-DOS applications programs—including your own—by adding complementary text characters or special graphics displays. Possible applications are foreign languages, complex mathematical symbols, and intricate cartoon elements for animation sequences.

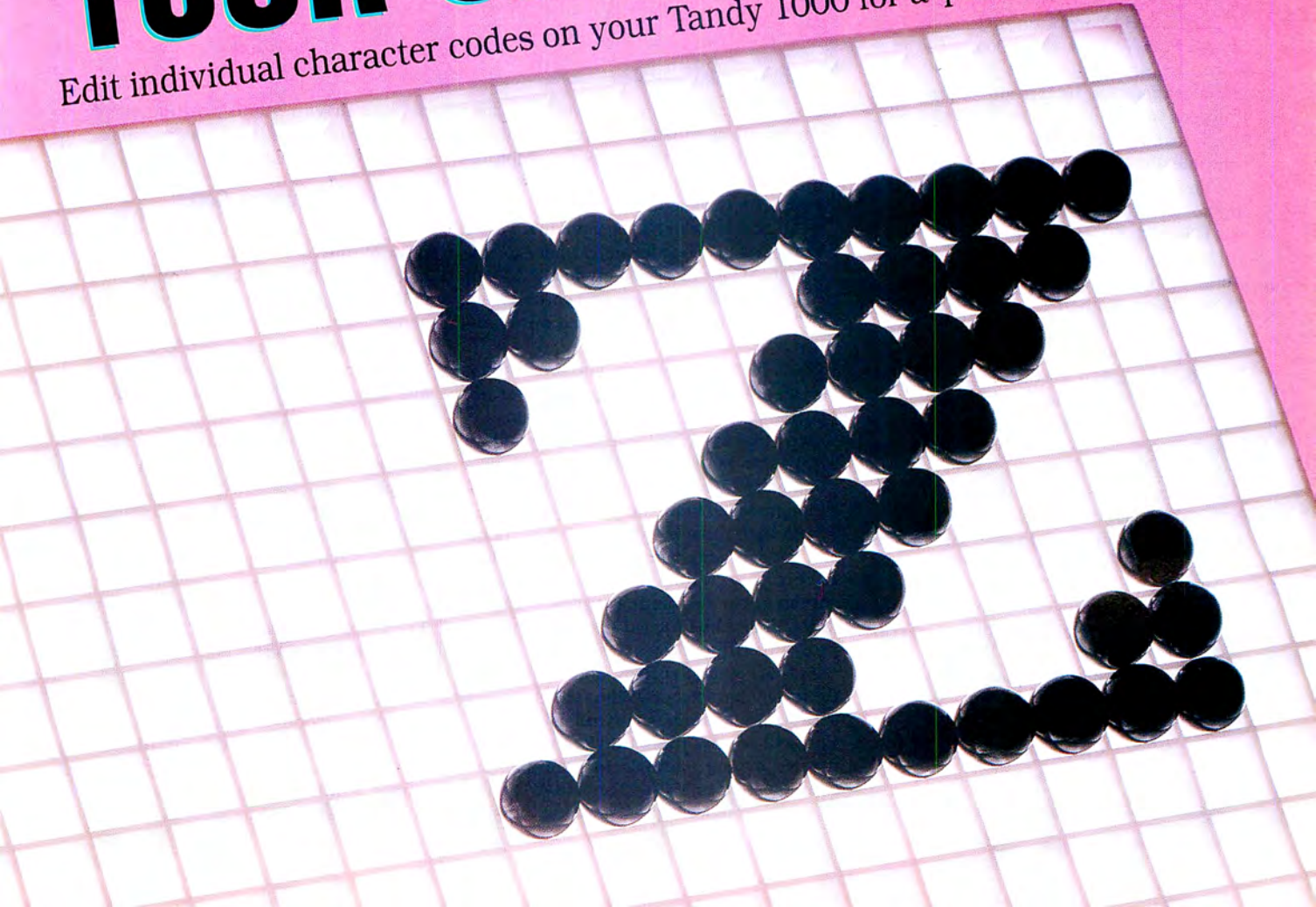
BY DAVID GOBEN

Photo by Larry Dunn

aZz

YOUR CHARACTERS

Edit individual character codes on your Tandy 1000 for a personalized set.

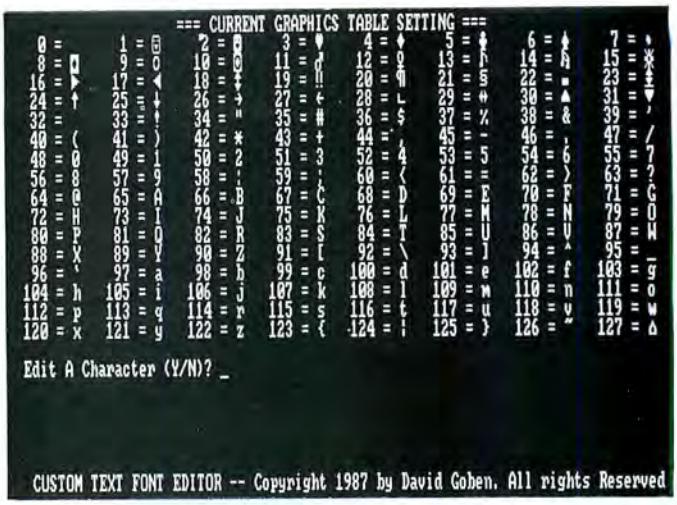


Character Editing Made Easy

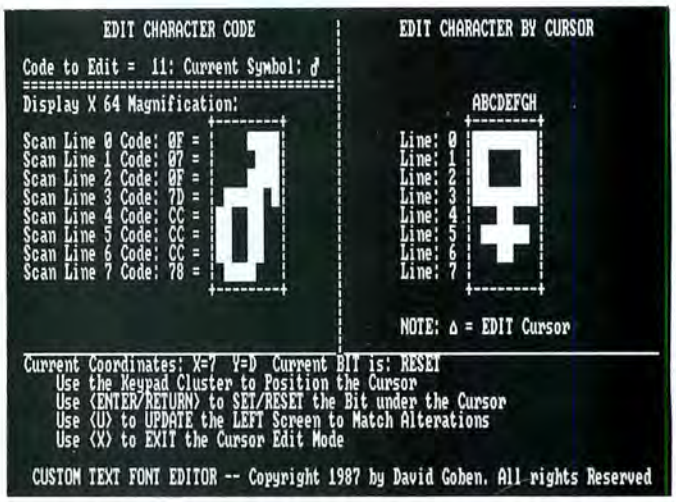
Program Listing 1, CTFEDIT.BAS, is my Custom Text Font Editor. This Basic program lets you create customized character tables that you can store on disk either in COM file format, which you can load directly to memory from the system prompt, or as a block dump. I included a block dump option since some word processors, such as Homeword Plus and Word, use customized character tables stored in this format as a part of their system environment.

CTFEDIT requires that you have resident in the computer's memory a table containing the upper character set (such as GRAFTABL.COM); CTFEDIT uses this table for modifications. If a table is not resident, the program will abort.

After typing CTFEDIT.BAS into Basic and saving it to disk, temporarily add the lines in Program Listing 2 and run it. This creates a GRAFTABL.COM file that you can load to use CTFEDIT. Because CTFEDIT uses these lines to create the file, you should ensure that you typed in lines 50–200 and 530–710 correctly. It will be difficult to check the rest of your program for typographical errors until you have the GRAFTABL file properly installed on disk.



There is an upper and lower table, each offering 127 characters.



These biological symbols have been magnified 64 times so that you can edit them.

Operating CTFEDIT

To use CTFEDIT, you must first install GRAFTABL.COM from the system level by entering GRAFTABL. Next, with Basic and CTFEDIT.BAS resident on disk, enter BASIC CTFEDIT. After Basic loads the program, the screen goes into the 40 by 25 graphics mode for the introductory screen. If all goes well, it prompts you to press the L key to load a block file or any other key to continue. Press the spacebar.

A new prompt asks if you want to edit the low set (ASCII codes zero–127) or the high set (128–255). Select "L" for low.

The program saves the original codes stored in the high table to an array for later reinstallation. It then loads the zero–127 character set into the area where the high table was stored. Once the table is reconfigured, the screen goes to the 80 by 25 graphics mode and displays the 128 character codes, showing the ASCII value for each followed by its currently defined characteristics.

The program first asks if you want to edit a character. For now, answer "N" for no. Then it asks if you want to save this data to disk. Answer "Y" for yes. Give the file a name such as LOTABL. All single key prompts (those questions with a single underscore character following them) do not require the enter key. Multiple key prompts (those with a row of periods following them), such as the filespec prompt, require that you press the enter key to terminate a typed entry.

You are next asked if you want to save the file in COM or block format. Enter "C" for COM or "B" for block. If you do not add an extension to the file name and you selected "C," a COM extension is added automatically.

If the file already exists, you are asked if you want to overwrite it. If you answer no, you are prompted to save the file again.

After you save the file to disk, if you had a low-table character set installed, the program asks if you want the current configuration installed in memory.

The high table is reinstalled into memory, and you are prompted to press any key to continue. When you press a key, the screen zero text mode returns with the function-key line turned back on, and the program terminates.

At this point enter RUN, and again select the lower character set. When the character set appears, examine the symbols carefully. You will see symbols that are not documented in your manuals, for example, the characters for codes 7–13 and 28–31. They all have graphics representations, but the display driver, when printing the ASCII codes, interprets them as special feature characters and uses them differently.

Modifying Character Codes

To modify characters, answer yes to the prompt that asks if you want to edit a character. Answer the code prompt with "1" to edit the face. When you press enter, the screen clears and then displays in the upper left corner the character code to be edited, its current display characteristics, and below that an expanded version, magnified 64 times.

You are asked if you want to edit this character. If you answer yes, you are given the choice to clear the slate, duplicate another character over it, or begin editing the current character "as is." The Clear Slate option is handy if you want to create a totally new character, where the current codes are not essential to the new format. The Duplicate function is useful if you are going to create a set of characters that have subtle differences, such as cells that will be used in an animation sequence. Select "E" to begin work on the current code.

You can edit an individual character two ways: by scan line or with a "live" cursor. Editing by scan line lets you work on an individual line within the cell. On

System Requirements

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the left of the magnified character, the scan lines are numbered zero–7. Pressing the S key gives a prompt for which scan line you want to edit. Pressing zero displays the current format for scan line zero in the lower portion of the screen; a dash (-) represents a reset (off) bit, and a graphics block represents a set (on) bit. Pressing the dash key or the spacebar sends a reset bit to the edit line. Pressing the X key causes a bit to be set. Pressing the backspace key backs up the pointer, in case you made a mistake.

If you are satisfied with the edit or want to abort, press enter. You are asked if you want to use this data in the character cell. If you answer yes and you had typed a different format into the line, the actual character displayed at the top of the screen, as well as the magnified display, changes shape to reflect the alteration.

You are again asked to edit by scan line or live cursor. Press "L" for live cursor. An "Edit by cursor" display fills the upper right of the screen. Below this box, you are told which character represents the cursor, and the bottom half of the screen displays an options menu. The edit cursor blinks in the upper left corner of the edit box. Use the arrow keys to move the cursor.

Pressing enter causes the character under the blinking cursor to be toggled to its opposite state, from on to off, or from off to on.

Pressing the U key at any time updates the upper left screen, reflecting your current changes. Try rounding the edges of the face or squaring them off.

When you finish editing, press the X key to exit the edit by cursor mode. If you changed the state of any bits since the last update, you are asked if you want to update the left screen for the latest changes.

When you are prompted again for editing by scan line or by live cursor, press enter. The program asks if you want to install this character into the current graphics table. Answering "N" resets the character to its original state. Pressing "Y" leaves the current form intact.

You can go on to edit another character from this level without returning to the main display screen, which shows all 128 characters. If you type Y, you can enter the new code. Typing N returns you to the main display, where you can gloat over your progress.

Additional Operation Notes

During most prompts, pressing enter returns you to a previous level.

You can type commands in lower- or uppercase.

When you load a block file, you are asked if you want the table to be referenced as a low or a high table. A low table consists of ASCII codes zero–127, and a high table consists of codes 128–255. If you later save the edited data to a COM

Program Listing 1. *Custom Text Font Editor, a program to create customized character tables. See page 94 for information on using checksums.*

```
      | 10 ' CTFEDIT/BAS -- CUSTOM TEXT FONT EDITOR -- VERSION 02/15/87
      | 20 ' COPYRIGHT (C) 1987 BY DAVID GOBEN. ALL RIGHTS RESERVED
      | 30 '
 2163 | 40 KEY OFF:SCREEN 1:CLS:GOSUB 1720
 3983 | 50 TROFF:CLEAR:DEFINT W-Z:DIM CD$(127):L$="+--------+":PD$=".":SP$=" "
 3402 | 60 DIM YZ(5):YZ(0)=8:YZ(1)=8:FOR X=2 TO 5:YZ(X)=-1:NEXT
 1031 | 70 HIGHSEG=&HF000 '*****  Segment address for chars 0-127
 1015 | 80 HIGHOS=&HFA6E  '*****  offset in segment for chars 0-127
  788 | 90 LOCHR=&H44     'INT vector for characters 0-127
  833 | 100 HICHR=&H1F    'INT vector for characters 128-255
 3761 | 110 IF HIGHSEG<0 THEN HIGH=HIGHSEG+65536! ELSE HIGH=HIGHSEG
 2031 | 120 LOCHR=LOCHR*4:HICHR=HICHR*4
 7622 | 130 LOCATE 22,1:DEF SEG=0:OFFSET=HICHR:TABLE=PEEK(OFFSET)+256*PEEK(OFFSE
          T+1):SEGMENT=PEEK(OFFSET+2)+256*PEEK(OFFSET+3)
 7368 | 140 IF TABLE<>0 AND HIGH<>SEGMENT THEN 220 ELSE PRINT"UPPER CHARACTER TA
          BLE NOT INSTALLED!!!":SOUND 2000,20:GOTO 190
 6285 | 150 IF BLKLD THEN 180 ELSE IF HIGHSEG=HIGH AND TBL>0 THEN 170 ELSE IF TB
          L THEN A$="0-127"ELSE A$="128-255"
 5723 | 160 PRINT"Install Above Codes "A$" into Memory";:GOSUB 680:PRINT:IF A TH
          EN 200
 1820 | 170 IF EDT=0 AND TBL=0 THEN 190
10123 | 180 PRINT"Restoring 128-255 Data Elements ";:DEF SEG=SEGMENT:FOR X=0 TO
          127:PRINT".";:A=TABLE+X*8:FOR Y=0 TO 7:POKE A+Y,ASC(MID$(CD$(X),Y+1,
          1)):NEXT Y,X
 7337 | 190 PRINT"*** PRESS ANY KEY TO CONTINUE ***";:WHILE INKEY$<>"":WEND:GOSU
          B 1310:DEF SEG:WIDTH 80:SCREEN 0:KEY ON:END
 5107 | 200 IF TBL=0 THEN 190 ELSE GOSUB 700:PRINT"Moving Chars 0-127 to Memory
          ";
 9662 | 210 FOR X=0 TO 127:PRINT PD$;:A=TABLE+X*8:B=HIGHOS+X*8:FOR Y=0 TO 7:DEF
          SEG=SEGMENT:C=PEEK(A+Y):DEF SEG=HIGHSEG:POKE B+Y,C:NEXT Y,X:GOSUB 70
          0:GOTO 180
14749 | 220 LOCATE 23,6:PRINT"Press 'L' to LOAD a BLOCK File,";:LOCATE 24,6:PRIN
          T"Press Any Other Key To Continue";:WHILE INKEY$<>"":WEND:GOSUB 1310
          :SCRN=0:IF A$="L"THEN BLKLD=1:CLS:PRINT"LOAD A BLOCK FILE":GOTO 330
          ELSE 290
 4792 | 230 ON ERROR GOTO 0:PRINT"BLOCK File to Load: ";:GOSUB 790:FILESPEC$=A$
 7687 | 240 IF FILESPEC$=""THEN PRINT"Aborting BLOCK LOAD":RUN 50 ELSE ON ERROR
          GOTO 250:OPEN"I",1,FILESPEC$:CLOSE 1:GOTO 260
 6451 | 250 PRINT"File Not Found!":PRINT"Press <ENTER/RETURN> to EXIT, or type i
          n";:RESUME 230
12410 | 260 ON ERROR GOTO 0:OPEN"R",1,FILESPEC$,1:IF LOF(1)<>1024 THEN 280 ELSE
          FIELD 1,1 AS A$:DEF SEG=SEGMENT:FOR X=0 TO 127:A=TABLE+X*8:FOR Y=0 T
          O 7:GET 1:POKE A+Y,ASC(A$):NEXT Y:PRINT PD$;:NEXT X:CLOSE 1
 9362 | 270 PRINT"Use BLOCK Data As LOW Chars (0-127) or  HIGH (128-255) (L/H)?
          ";:GOSUB 1300:IF A$="L"THEN TBL=128:RETURN ELSE IF A$="H"THEN RETURN
           ELSE 270
 4909 | 280 PRINT:PRINT"'"FILESPEC$"' LENGTH NOT 1024 BYTES!":CLOSE 1:BLKLD=0:GO
          TO 220
10976 | 290 IM=0:CLS:PRINT"Edit LOW Characters (Codes 0-127) or":PRINT"HIGH Char
          acters (128-255) (L/H)? ";:GOSUB 1300:IF A$="L"THEN TBL=128 ELSE IF
          A$<>"H"THEN BEEP:GOTO 290
 2581 | 300 IF HIGHOS<0 THEN HIGHOS=HIGHOS+65536!
 2765 | 310 IF HIGHSEG<0 THEN HIGHSEG=HIGHSEG+65536!
 9083 | 320 DEF SEG=0:A=PEEK(LOCHR)+256*PEEK(LOCHR+1):B=PEEK(LOCHR+2)+256*PEEK(L
          OCHR+3):IF B THEN IF B=>61440! THEN IM=1 ELSE HIGHSEG=B:HIGHOS=A ELS
          E IM=1
 4981 | 330 PRINT:PRINT:PRINT"Storing Original Codes For Chars 128-255";
 7731 | 340 DEF SEG=SEGMENT:FOR X=0 TO 127:PRINT PD$;:A=TABLE+X*8:FOR Y=0 TO 7:C
          D$(X)=CD$(X)+CHR$(PEEK(A+Y)):NEXT Y,X:PRINT:PRINT
 6979 | 350 IF BLKLD THEN PRINT:GOSUB 230:GOTO 370 ELSE IF TBL=0 THEN 370 ELSE P
          RINT"GATHERING CODES FOR CHARS 0-127 ";
 8487 | 360 FOR X=0 TO 127:PRINT PD$;:A=HIGHOS+X*8:B=TABLE+X*8:FOR Y=0 TO 7:DEF
          SEG=HIGHSEG:C=PEEK(A+Y):DEF SEG=SEGMENT:POKE B+Y,C:NEXT Y,X
 9437 | 370 GOSUB 380:SCREEN 2:LOCATE 25,2:PRINT"CUSTOM TEXT FONT EDITOR -- Copy
          right 1987 by David Goben. All rights Reserved";:GOTO 390
 7592 | 380 DEF SEG=SEGMENT:A$="":X=TABLE+1008:FOR Y=0 TO 15:A$=A$+CHR$(PEEK(X+Y
          )):NEXT Y:C254$=LEFT$(A$,8):C255$=RIGHT$(A$,8):RETURN
 8409 | 390 IF SCRN THEN 410 ELSE SCRN=1:LOCATE 1,1:VIEW SCREEN (0,0)-(639,191):
          CLS:VIEW:PRINT TAB(20)"=== CURRENT GRAPHICS TABLE SETTING ==="
 7002 | 400 FOR X=0 TO 127:PRINT USING"### = ";X+128-TBL;:CODE=X+128:GOSUB 770:P
          RINT SPACE$(3);:NEXT X:CURSORX=CSRLIN+1
 4207 | 410 GOSUB 700:PRINT"Edit A Character";:GOSUB 680:IF A THEN 710
 9032 | 420 GOSUB 700:PRINT"Save Current Character Set To Disk";:GOSUB 680:PRINT
          :IF A THEN 440 ELSE IF TBL=0 THEN 150 ELSE IF IM=0 THEN 150
 6642 | 430 GOSUB 700:PRINT"Chars 0-127 Only In ROM. Are you Sure";:GOSUB 680:PR
          INT:IF A THEN 150 ELSE 420
 8128 | 440 GOSUB 700:WHILE INKEY$<>"":WEND:PRINT"FILESPEC For File to Save Tabl
          e: ";:GOSUB 790:IF A$=""THEN 420 ELSE FILESPEC$=A$
10563 | 450 GOSUB 700:PRINT"Save <"FILESPEC$"> as a .COM File or as a BLOCK Dump
           (C/B)? ";:GOSUB 1300:COMFILE=0:IF A$="C"THEN COMFILE=1:EXT$=".com"
          ELSE IF A$<>"B"THEN 450
 5074 | 460 IF COMFILE THEN X=INSTR(FILESPEC$,"."):IF X=0 THEN FILESPEC$=FILESPE
          C$+EXT$
 4096 | 470 PRINT:ON ERROR GOTO 480:OPEN"I",1,FILESPEC$:CLOSE 1:GOTO 490
  835 | 480 RESUME 510
 6696 | 490 GOSUB 700:PRINT"<"FILESPEC$"> ALREADY EXISTS! Do you wish to OVER-WR
          ITE it";:GOSUB 680:PRINT
 1047 | 500 IF A=0 THEN 420
12028 | 510 ON ERROR GOTO 0:OPEN"R",1,FILESPEC$,1:FIELD 1,1 AS B$:PRINT"Saving <
          "FILESPEC$">, Please Wait...The Drive May Stop and Start.":DN=0:REST
          ORE 610:IF COMFILE THEN GOSUB 600
 2180 | 520 DEF SEG=SEGMENT:FOR X=0 TO 1023
 8405 | 530 LSET B$=CHR$(PEEK(TABLE+X)):PUT 1:NEXT X:IF COMFILE=0 THEN 570 ELSE
          LSET B$=CHR$(&HBB):PUT 1:B=0:IF TBL THEN A=LOCHR ELSE A=HICHR
 2302 | 540 IF A>255 THEN B=B+1:A=A-256:GOTO 540
 5844 | 550 LSET B$=CHR$(A):PUT 1:LSET B$=CHR$(B):PUT 1:GOSUB 600:IF TBL THEN A=
          LOCHR/4 ELSE A=HICHR/4
13301 | 560 LSET B$=CHR$(A):PUT 1:GOSUB 600:C$=CHR$(13)+CHR$(10)+"$":A$="Charact
```

Listing 1 continued

Listing 1 continued

```
            er Set Installed"+C$+"Character Set Overlaid"+C$+"New $Lower $Upper
            $":FOR X=1 TO LEN(A$):LSET B$=MID$(A$,X,1):PUT 1:NEXT X
 4808 | 570 CLOSE 1:PRINT FILESPEC$" is SUCCESSFULLY Saved to Disk":GOTO 150
 3886 | 580 GOSUB 590:IF DN THEN RETURN ELSE LSET B$=C$:PUT 1:RETURN
 4451 | 590 READ C$:IF C$="END"THEN DN=1:RETURN ELSE C$=CHR$(VAL("&H"+C$)):RETUR
            N
 2914 | 600 GOSUB 580:IF DN=0 THEN 600 ELSE DN=0:RETURN
 1166 | 610 DATA E9,00,04,END
 4052 | 620 DATA 2B,C0,8E,D8,8B,07,3D,60,00,8C,C8,BA,76,04,75,07,BA,90,04,43,43,
            8B,07
 4075 | 630 DATA 52,8E,C0,BF,60,00,8C,C8,8E,D8,BE,03,00,81,C6,00,01,B9,00,02,F3,
            A5,BA
 2131 | 640 DATA 60,00,8C,C0,8E,D8,B4,25,B0,END
 4099 | 650 DATA 50,CD,21,8C,C8,05,10,00,8E,D8,BA,A9,04,B4,09,CD,21,58,BA,B5,04,
            3C,1F
 4131 | 660 DATA 74,03,BA,AE,04,B4,09,CD,21,5A,B4,09,CD,21,8C,C0,8C,C9,3B,C1,74,
            02,CD
 2244 | 670 DATA 20,CC,03,04,81,C2,00,01,CD,27,END
 2573 | 680 WHILE INKEY$<>"":WEND:PRINT" (Y/N)? ";
 5562 | 690 GOSUB 1300:A=0:IF A$="Y"THEN A=1:RETURN ELSE IF A$<>"N"THEN BEEP:GOT
            O 690 ELSE RETURN
 4207 | 700 VIEW SCREEN (0,144)-(639,191):CLS:VIEW:LOCATE CURSORX,1:RETURN
 9011 | 710 GOSUB 700:WHILE INKEY$<>"":WEND:PRINT"Which Character Code (Press <E
            NTER/RETURN> to Abort)";:GOSUB 800:IF LEN(A$)=0 THEN 370
 7513 | 720 A=VAL(A$):IF A<(128-TBL) OR A>(255-TBL) THEN BEEP:GOTO 710 ELSE CODE
            =A:GOSUB 700:CODE=CODE+TBL:DFT$=STRING$(8,0):UPD=0
13363 | 730 CODEADR=(CODE-128)*8+TABLE:GRAF$="":DEF SEG=SEGMENT:FOR Y=0 TO 7:GRA
            F$=GRAF$+CHR$(PEEK(CODEADR+Y)):NEXT Y:IF SCRN THEN LOCATE 1,1:VIEW S
            CREEN (0,0)-(639,191):CLS:VIEW ELSE VIEW SCREEN (191,47)-(255,111):C
            LS:VIEW
 1170 | 740 SCRN=0:GOTO 890
 3123 | 750 LOCATE 1,11:PRINT"EDIT CHARACTER CODE":PRINT
 5180 | 760 PRINT USING"Code to Edit = ###: Current Symbol: ";CODE-TBL;:GOTO 860
 2940 | 770 IF CODE<>255 THEN PRINT CHR$(CODE);:RETURN
 9894 | 780 DEF SEG=SEGMENT:B=TABLE+1008:FOR Y=0 TO 7:POKE B+Y,ASC(MID$(C255$,Y+
            1,1)):NEXT Y:PRINT CHR$(254);:FOR Y=0 TO 7:POKE B+Y,ASC(MID$(C254$,Y
            +1,1)):NEXT Y:RETURN
 1482 | 790 NUM=0:MX=14:GOTO 810 'get up to 14 characters
  869 | 800 NUM=1:MX=3 'get up to 3 digits
 5377 | 810 T=0:A$="":CD=POS(0)+2:PRINT "? _"STRING$(MX-1,PD$);:LOCATE,CD:WHILE
            INKEY$<>"":WEND
12636 | 820 B$=INKEY$:IF B$=""THEN 820 ELSE IF B$=CHR$(13)THEN GOSUB 850:PRINT:R
            ETURN ELSE IF B$=CHR$(8)THEN 840 ELSE IF NUM THEN IF B$<"0"OR B$>"9"
            THEN BEEP:GOTO 820 ELSE 830 ELSE IF B$<"1"OR B$>"z"THEN BEEP:GOTO 82
            0
 5200 | 830 IF T=MX THEN BEEP:GOTO 820 ELSE A$=A$+B$:T=T+1:PRINT B$"_";:LOCATE,C
            D+T:GOTO 820
 6514 | 840 IF T=0 THEN 820 ELSE GOSUB 850:T=T-1:A$=LEFT$(A$,LEN(A$)-1):LOCATE,C
            D+T:PRINT"_";:LOCATE,CD+T:GOTO 820
 3604 | 850 IF T=MX THEN PRINT" ";:RETURN ELSE PRINT".";:RETURN
 2575 | 860 GOSUB 770:PRINT:PRINT STRING$(39,"=") 'display current char.
 8616 | 870 PRINT"Display X 64 Magnification:":PRINT TAB(24);L$:X=CODEADR:C$=" "
            :FOR Y=0 TO 7:B=PEEK(X+Y):B$=HEX$(B):IF B<16 THEN B$="0"+B$
 3358 | 880 GOSUB 1230:NEXT Y:PRINT TAB(24);L$;:UPD=1:RETURN
 1442 | 890 GOSUB 1280:GOSUB 750
 4737 | 900 GOSUB 700:PRINT"Edit this Character";:GOSUB 680:IF A=0 THEN 1010
 5827 | 910 GOSUB 700:OPT$="D/E":IF GRAF$<>STRING$(8,0)THEN OPT$="C/D/E":PRINT"C
            LEAR Char Slate, ";
10273 | 920 PRINT"DUPLICATE from Another Char, or EDIT Char As-Is ("OPT$")? ";:G
            OSUB 1300:IF A$=CHR$(13)THEN 900 ELSE IF INSTR(OPT$,A$)=0 OR A$="/"T
            HEN BEEP:GOTO 910
 2487 | 930 IF A$="C"THEN 970 ELSE IF A$="E"THEN 990
 8048 | 940 GOSUB 700:PRINT"Duplicate Which Character ("MID$(STR$(128-TBL),2)"-"
            MID$(STR$(255-TBL),2)")";:GOSUB 800:IF A$=""THEN 910
 3629 | 950 A=VAL(A$):IF A<(128-TBL) OR A>(255-TBL)THEN BEEP:GOTO 940
 6971 | 960 GOSUB 700:ADR=(A-128+TBL)*8+TABLE:DEF SEG=SEGMENT:FOR Y=0 TO 7:POKE
            CODEADR+Y,PEEK(ADR+Y):NEXT Y:GOTO 980
 2763 | 970 GOSUB 700:FOR Y=0 TO 7:POKE X+Y,0:NEXT Y
 3368 | 980 IF CODE>253 THEN GOSUB 380:GOSUB 750 ELSE GOSUB 750
 7064 | 990 GOSUB 700:PRINT"Edit Char by SCAN LINE,'LIVE' CURSOR, or press <ENTE
            R/RETURN> to Quit (S/L)? ";
 6262 | 1000 GOSUB 1300:IF A$=CHR$(13)THEN 1040 ELSE IF A$="S"THEN 1030 ELSE IF
            A$<>"L"THEN BEEP:GOTO 1000 ELSE 1350
 6837 | 1010 GOSUB 700:PRINT"Edit Another Character From This Level";:GOSUB 680:
            IF A THEN 710 ELSE 390
      | 1020 'EDIT CODE
11160 | 1030 GOSUB 700:PRINT"Edit Which Scan Line (0-7, or press <ENTER/RETURN>
            to Exit) ";:GOSUB 1300:IF A$=CHR$(13)THEN 990 ELSE IF A$<"0"OR A$>"
            7"THEN BEEP:GOTO 1030 ELSE 1060
10148 | 1040 GOSUB 700:PRINT"Install This Character into the Graphics Table";:GO
            SUB 680:IF A THEN EDT=A:IF CODE>253 THEN GOSUB 380:GOTO 1010 ELSE 1
            010
 5663 | 1050 GOSUB 700:FOR Y=0 TO 7:POKE CODEADR+Y,ASC(MID$(GRAF$,Y+1,1)):NEXT Y
            :GOSUB 750:GOTO 1010
 2922 | 1060 A=VAL(A$):IF A<0 OR A>7 THEN 1030 ELSE SCAN=A
 1492 | 1070 B=PEEK(X+SCAN):C$="-" 'get scan line and set "blank" character
 5027 | 1080 GOSUB 700:PRINT MID$(STR$(SCAN),2)"'S Current Format==>>  ";:GOSUB
            1240
 5661 | 1090 LOCATE CURSORX,33:PRINT"   <<==  NOTE: '-' = RESET BIT, '";:GOSUB 1
            270:PRINT"' = SET BIT"
 8090 | 1100 T=0:D$=STRING$(8,"+"):PRINT"Enter NEW Format====>>  ";:CX=CSRLIN:CY
            =POS(0):GOSUB 1180:PRINT:PRINT:PRINT:PRINT"Use '-' or <SPACE> to RE
 3872 | 1110 LOCATE CX,CY:GOSUB 1180:LOCATE CX+1,CY+T:PRINT CHR$(127);
 1607 | 1120 WHILE INKEY$<>"":WEND
 4492 | 1130 A$=INKEY$:IF A$=""THEN 1130 ELSE IF A$="x" OR A$="X"THEN A$="X":GOT
            O 1170
 2512 | 1140 IF A$="-" OR A$=SP$ THEN A$="-":GOTO 1170
 3221 | 1150 IF A$=CHR$(13)THEN 1200 ELSE IF A$<>CHR$(8)THEN 1130
 5054 | 1160 IF T=0 THEN 1130 ELSE LOCATE CX+1,CY+T:PRINT" ";:MID$(D$,T,1)="+":T
            =T-1:GOTO 1110
 5180 | 1170 LOCATE CX+1,CY+T:PRINT SP$;:IF T=8 THEN 1110 ELSE T=T+1:MID$(D$,T,1
            )=A$:GOTO 1110
```

Listing 1 continued

file, the high- or low-table format you selected during initial file loading will be used to determine where to load the file. To use the character COM files you have created, enter the file name at the DOS prompt.

If you have the Homeword word-processing program and want to use your new character sets with it, you can load the lower set into memory, but *do not* install the upper set. A fluke in Homeword overwrites your pointer in INT 1F hexadecimal (hex) to its own table, and, rather than reinstalling it upon exit, it leaves the vector completely blank. Therefore, to use your new upper set, rename Homeword's CHARSET.HW file, and save your desired upper set as CHARSET.HW in block format. This way you can use your entire set with the word processor.

Finally, it is important to remember that these new characters are *only* displayed when you are in one of the graphics/text modes (screen 1 or screen 2 in Basic). Since the standard non-graphics text screen (screen zero) uses the character generator ROM, your new character set appears to be turned off when you are in a non-graphics mode.

DOS-Level Screen Mode Changes

Since you can only access the customized character codes in one of the graphics/text modes, you might want to activate them from the DOS level. You can follow the Debug editing session outlined in the Figure. Note that "xxxx" represents the segment address, which can vary among machine configurations. You can produce ^C by holding down the control key and pressing "C." This session produces four COM files named MODEBW.COM, MODECO.COM, MODE320.COM, and

```
A>debug
-a
xxxx:0100 mov ax,2
xxxx:0103 int 10
xxxx:0105 mov ax,4c00
xxxx:0108 int 21
xxxx:010a ^C
-rcx
CX 0000
:a
-nmodebw.com
-w
Writing 000A bytes
-a100
xxxx:0100 mov ax,3
xxxx:0103 ^C
-nmodeco.com
-w
Writing 000A bytes
-a100
xxxx:0100 mov ax,4
xxxx:0103 ^C
-nmode320.com
-w
Writing 000A bytes
-a100
xxxx:0100 mov ax,6
xxxx:0103 ^C
-nmode640.com
-w
Writing 000A bytes
-q
A>
```

Figure. *A sample Debug editing session.*

Inside the Character Sets

The Tandy 1000 series lets you modify the upper and lower character sets—all codes from zero to 255. A pointer at the bottom of memory, INT 1F hex, points to the character table for the upper ASCII set values 128–255. The address of the lower table's character set is FFA6E hex, near the top of the computer's memory.

When your computer is in its standard text screen mode (the default video mode with an 80- by 25-character display), a character generator ROM chip displays the text characters. But when you are in the graphics mode, the display routine approaches each display character as though it were a graphics block to be sent to the screen. This involves sending the bit patterns for each individual scan-line segment assigned to the character position out through the video circuitry. (A scan line is one among the hundreds of horizontal rows of dots; on these rows, the dots are individually on or off to create what you see on the display.)

The graphics display driver operates on these ASCII characters as though each text cell were set up on an 8 by 8 grid, where each of the possible 64 positions within the grid represents an individual dot on the monitor. Each scan-line segment for each character is therefore 8 bits, or 1 byte long. Thus, it takes 8 bytes to hold the 64 dots that represent a single text character on the screen. The display driver must send each of these 8 bytes one at a time through the video circuit to display a single recognizable text character. For this reason, the text display slows down when you operate from within the graphics modes.

The Debug utility helps you understand exactly how a graphics mode text character is designed. From the system prompt enter DEBUG. After the dash (-) prompt, type DF000:FA6E and press enter. The "D" tells Debug to display memory segment F000, offset address FA6E, which is the absolute address FFA6E. Figure 1 is a sample display.

```
C:\>debug
-df000:fa6e
F000:FA60                                                 00 00
F000:FA70  00 00 00 00 00 00 7E 81-A5 81 BD 99 81 7E 7E FF   ......~......~~.
F000:FA80  DB FF C3 E7 FF 7E 36 7F-7F 7F 3E 1C 08 00 08 1C   .....~6...>.....
F000:FA90  3E 7F 3E 1C 08 00 1C 3E-1C 7F 7F 3E 1C 3E 08 08   >.>....>...>.>..
F000:FAA0  1C 3E 7F 3E 1C 3E 00 00-18 3C 3C 18 00 00 FF FF   .>.>.>...<<.....
F000:FAB0  E7 C3 C3 E7 FF FF 00 3C-66 42 42 66 3C 00 FF C3   .......<fBBf<...
F000:FAC0  99 BD BD 99 C3 FF 0F 07-0F 7D CC CC CC 78 3C 66   .........}...x<f
F000:FAD0  66 66 3C 18 7E 18 30 3C-33 31 31 70 70 00 60 78   ff<.~.0<3llpp.`x
F000:FAE0  66 73 6F E3 E7 07 99 5A-3C E7 E7 3C 5A 99         fso....Z<..<Z.
-
```

Figure 1. *A portion of the graphics mode text character table.*

```
Bit name | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
---------|---|---|---|---|---|---|---|---|
Bit value|128| 64| 32| 16| 8 | 4 | 2 | 1 |Relative Scan line
-------------------------------------------------------------
         |x_______________________________x|---> Scan line 0
         |_____x_____________________x_____|---> Scan line 1
         |_________x_____________x_________|---> Scan line 2
         |_____________x___x_______________|---> Scan line 3
         |_____________x___x_______________|---> Scan line 4
         |_________x_____________x_________|---> Scan line 5
         |_____x_____________________x_____|---> Scan line 6
         |x_______________________________x|---> Scan line 7
```

Figure 2. *A breakdown of a video cell by scan code and bit position.*

```
Bit positions = 7 6 5 4 3 2 1 0  X=ON, .=OFF
-----------------------------------------
Scan Line 0   = 0 1 1 1 1 1 1 0  = .XXXXXX.
Scan Line 1   = 1 0 0 0 0 0 0 0  = X......X
Scan Line 2   = 1 0 1 0 0 1 0 1  = X.X..X.X
Scan Line 3   = 1 0 0 0 0 0 0 0  = X......X
Scan Line 4   = 1 0 1 1 1 1 0 1  = X.XXXX.X
Scan Line 5   = 1 0 0 1 1 0 0 1  = X..XX..X
Scan Line 6   = 1 0 0 0 0 0 0 1  = X......X
Scan Line 7   = 0 1 1 1 1 1 1 0  = .XXXXXX.
-----------------------------------------
```

Figure 3. *A breakdown of bits for ASCII code 1, the face.*

Program Listing. *A program to decode the on/off bits for hex values.*

```
2237 | 10 INPUT"ENTER HEXT BYTE VALUE";A$
2066 | 15 PRINT"BIT--76543210":PRINT"          ";
3008 | 20 A=VAL("&H"+A$) AND 255:FOR X=7 TO 0 STEP -1:B=2^X
2791 | 30 IF B<=A THEN PRINT"1";:A=A-B ELSE PRINT"0";
1981 | 40 NEXT X:PRINT:PRINT:GOTO 10
```

End

This 128-byte representative portion of the 1,024-byte table shows the bit patterns for ASCII codes zero–15, where 8 consecutive bytes are set aside for each individual character. The first 8 bytes are all zeros, which indicates that all dots in this "cell" are turned off. The character is a blank on the graphics screen. ASCII code 1, the face character, is represented by the next 8 bytes, which in this case is the code sequence 7E 81 A5 81 BD 99 81 7E.

Each byte represents a scan line, or a row of dots, in which each bit in the byte tells the video circuits if an individual dot is on or off. These 8 bits are arranged from left to right, from bit 7 down to bit zero. You can compute the value of each set bit by taking the value of 2 to the power of the bit position. From Basic you can use the formula 2^X, where "X" is a value from zero to 7. Figure 2 shows how this breakdown is applied to the video cell.

Look at the block of bit patterns for the first scan line for ASCII code 1. The first pattern, scan line zero, is represented by the hex value 7E; 7E in decimal is 126. (You can get this quickly from Basic by entering PRINT &H7E.) Starting from the bit 7 position on the scan line, you cannot subtract 128 from it because 126 is below that value, so bit 7 is off. You can subtract 64, so bit 6 is on. Subtracting 64 from 126 gives a remainder of 62. You can subtract 32 from 62, and so bit 5 is on; 62 less 32 is 30. You can subtract 16 from 30, so bit 4 is on. You can subtract 8 from the remainder of 14, which indicates that bit 3 is on. You can subtract 4 from the remainder of 6, so bit 2 is on. Subtracting 2 from the remainder of 2 means bit 1 is on. Since nothing is left over, bit zero is off. From this process, you have learned that bits 6, 5, 4, 3, 2, and 1 are turned on, and bits 7 and zero are off.

The Program Listing does the work for you. Load it into Basic and run it. Answer the prompt with a hex byte value, such as 7E, and it decodes the on/off (1/zero) format immediately.

The results computed for 7E hex give the bit pattern 01111110, where the zeros represent pixels that are turned off, and the 1's are pixels that are turned on. Breaking down the next hex byte, 81, results in the on/off sequence of 10000001, A5 results in 10100101, and so on, through scan line 7. If you put scan line zero on top, scan line 1 immediately below it, line 2 below that, and so forth, you get the results shown in Figure 3. If you examine the "X" and period representation to the right of the figure from a distance, you will discern the face that ASCII code 1 represents.

By altering the states of the set and reset bits pattern, you can create anything you want. Most alphabetic characters do not use scan line 7, the bottom line; by setting all the bits in that line you can effectively underline the character. You can create inverse video by inverting the values of all the bits in the cell, changing 1's to zeros, and zeros to 1's. Other special effects, such as strikethrough, can be accomplished by setting specific bits within each scan line's pattern. ■

Using the custom text font editor, *you* can define a table to support the language's non-English characters.

MODE640.COM.

MODEBW sets the screen to its default 80 by 25 black-and-white mode. MODECO sets it to the color mode. MODE320 sets it to the 320 by 200 graphics mode, and MODE640 sets it to the 640 by 200 graphics mode. The cursor is turned off in the last two modes.

Suggested Applications

If you also own an 8-bit computer, such as a TRS-80, Apple, or Commodore, you might want to convert several graphics programs over to GW-Basic on your MS-DOS system. To re-create the 8-bit machine's standard graphics cells, you could redefine the special character set to reflect the graphics set for those computers, such as codes 128–191 for the TRS-80 computers.

Special character elements can cut down the complicated Basic-level cell construction required for complex graphics patterns. With several Print CHR$(x) statements, you can put a multi-cell figure on the screen and capture it using the graphics Get statement. You can later superimpose it over any desired screen location using the faster and more versatile Put statement with its numerous special effects subcommands. Thus, Basic programmers looking for high-speed animated graphics can define a set to support the required pixels and provide the COM file table with their program for installation by those who use the program.

If you are a foreign-language student, you can define a table to support the language's non-English characters.

Mathematicians can format a table to support a complete selection of the specialized symbols for properly presenting equational models.

Educators could create special graphics to set up driver's education demonstration animations, physics or geometric models, entertaining rewards for correct answers, musical notation editors, and electrical circuit design editors—anything that you could enhance with special graphics.■

David Goben is a programming consultant who specializes in troubleshooting programs and writing utilities. You can write to him at 67 Highland Road, Mansfield Center, CT 06250.

Listing 1 continued

```
 3977 | 1180 FOR Y=1 TO 8:IF MID$(D$,Y,1)="X"THEN GOSUB 1270 ELSE PRINT"-";
 1213 | 1190 NEXT Y:RETURN
 4060 | 1200 LOCATE CX+1,CY+T:PRINT SP$;:IF T<8 THEN D$=D$+STRING$(8-T,"-")
15389 | 1210 GOSUB 700:PRINT"You Have Selected ==>> ";:GOSUB 1180:PRINT" <<== Fo
              r Scan Line #"STR$(SCAN)". Use This";:GOSUB 680:IF A=0 THEN 1030 EL
              SE GOSUB 700:PRINT"Updating Character":FOR Y=1 TO 8:C=0:A$=MID$(D$,
              Y,1):IF A$="X"THEN C=1
 3671 | 1220 B=B+B+C:NEXT Y:POKE CODEADR+SCAN,B:GOSUB 750:GOTO 990
 8211 | 1230 IF UPD=1 AND MID$(DFT$,Y+1,1)=CHR$(B)THEN PRINT:RETURN ELSE MID$(DF
              T$,Y+1,1)=CHR$(B):PRINT"Scan Line"Y"Code: "B$" = "CHR$(124);
 4242 | 1240 FOR Z=0 TO 7:B=B+B:IF B>255 THEN B=B-256:GOSUB 1270 ELSE PRINT C$;
 2187 | 1250 NEXT Z:PRINT CHR$(124):RETURN
 2351 | 1260 IF C1$<>"X"THEN PRINT C1$;:RETURN 'Put BLOCK char,blank,cursor
 4142 | 1270 PUT ((POS(0)-1)*8,(CSRLIN-1)*8),YZ,PSET:LOCATE,POS(0)+1:RETURN
 3739 | 1280 FOR LIN=1 TO 18:LOCATE LIN,40:PRINT CHR$(124);:NEXT LIN
 3448 | 1290 LOCATE CURSORX-1,1:PRINT STRING$(39,"_");:RETURN
 8096 | 1300 WHILE INKEY$<>"":WEND:CB=POS(0):PRINT"_ ";:LOCATE,CB:GOSUB 1310:IF
              A$=CHR$(13)THEN RETURN ELSE PRINT A$;:LOCATE,CB:RETURN
 1806 | 1310 A$=INKEY$:IF A$=""THEN 1310
 4034 | 1320 IF A$<"a"OR A$>"z"THEN RETURN ELSE A$=CHR$(ASC(A$)-32):RETURN
 3051 | 1330 VIEW SCREEN (320,0)-(631,143):CLS:VIEW:RETURN
 2070 | 1340 LOCATE CX,48:CX=CX+1:RETURN
 5001 | 1350 GOSUB 700:GOSUB 1330:LOCATE CURSORX-1,41:PRINT STRING$(39,"_");:CX=
              1:C$=SP$
 4897 | 1360 GOSUB 1340:PRINT"EDIT CHARACTER BY CURSOR":FOR X=1 TO 3:GOSUB 1340:
              NEXT
 5005 | 1370 GOSUB 1340:PRINT SPACE$(9);:CZ=CSRLIN+2:CA=POS(0):PRINT"ABCDEFGH":E
              NTER=0
11434 | 1380 GOSUB 1340:PRINT SPACE$(8);L$;:ED$="":FOR Y=0 TO 7:GOSUB 1340:PRINT
              "Line:"STR$(Y);SP$;CHR$(124);:B=PEEK(CODEADR+Y):ED$=ED$+CHR$(B):GOS
              UB 1240:NEXT Y:GOSUB 1340:PRINT SPACE$(8);L$;
 5373 | 1390 GOSUB 1340:GOSUB 1340:PRINT"NOTE: "CHR$(127)" = EDIT Cursor":GOSUB
              1400:GOTO 1430
 1251 | 1400 GOSUB 700:PRINT
16287 | 1410 PRINT TAB(5)"Use the Keypad Cluster to Position the Cursor":PRINT T
              AB(5)"Use <ENTER/RETURN> to SET/RESET the Bit under the Cursor":PRI
              NT TAB(5)"Use <U> to UPDATE the LEFT Screen to Match Alterations"
 4688 | 1420 PRINT TAB(5)"Use <X> to EXIT the Cursor Edit Mode";:RETURN
 2409 | 1430 X$="01234567":Y$="HGFEDCBA":XC=0:YC=7
 8823 | 1440 LOCATE CURSORX,1:PRINT"Current Coordinates: X="MID$(X$,XC+1,1)"  Y=
              "MID$(Y$,YC+1,1)"  Current BIT is: ";:GOSUB 1450:GOTO 1460
 3366 | 1450 B2=ASC(MID$(ED$,XC+1,1)):B3=2^YC:B=B2 AND B3:RETURN
 2789 | 1460 IF B THEN PRINT"SET  "ELSE PRINT"RESET"
 4013 | 1470 LOCATE CZ+XC,CA+7-YC:PRINT CHR$(127);:WHILE INKEY$<>"":WEND
 2490 | 1480 T1$="78946123U"+CHR$(13):T2$="GHIKMOPQ"
 4858 | 1490 WHILE INKEY$<>"":WEND:CNT=10:C$=CHR$(127):GOSUB 1450:C1$=" ":IF B T
              HEN C1$="X"
 8470 | 1500 A$=INKEY$:IF LEN(A$) THEN 1510 ELSE CNT=CNT-1:IF CNT THEN 1500 ELSE
               LOCATE CZ+XC,CA+7-YC:GOSUB 1260:A$=C$:C$=C1$:C1$=A$:CNT=10:GOTO 15
              00
 3894 | 1510 GOSUB 1320:GOSUB 1580:IF LEN(A$)=1 THEN 1530 ELSE A$=MID$(A$,2)
 3565 | 1520 IF INSTR(T2$,A$)=0 THEN SOUND 3000,2:GOTO 1490 ELSE 1540
 3624 | 1530 IF INSTR(T1$,A$)=0 AND A$<>"X"THEN SOUND 3000,2:GOTO 1490
 8267 | 1540 IF A$="X"THEN 1690 ELSE ON INSTR(T1$+T2$,A$) GOSUB 1600,1560,1550,1
              610,1630,1640,1650,1620,1670,1710,1600,1560,1550,1610,1630,1640,165
              0,1620:GOTO 1440
  853 | 1550 GOSUB 1630
 3908 | 1560 IF XC=0 THEN BEEP:RETURN ELSE GOSUB 1580:XC=XC-1:RETURN
      | 1570 'RESET CHARACTER AT CURSOR TO SET/RESET ATTRIBUTE
 4417 | 1580 LOCATE CZ+XC,CA+7-YC:GOSUB 1450:IF B THEN GOSUB 1270 ELSE PRINT" ";
  719 | 1590 RETURN
  851 | 1600 GOSUB 1560
 3912 | 1610 IF YC=7 THEN BEEP:RETURN ELSE GOSUB 1580:YC=YC+1:RETURN
  853 | 1620 GOSUB 1650
 3909 | 1630 IF YC=0 THEN BEEP:RETURN ELSE GOSUB 1580:YC=YC-1:RETURN
  851 | 1640 GOSUB 1610
 3913 | 1650 IF XC=7 THEN BEEP:RETURN ELSE GOSUB 1580:XC=XC+1:RETURN
 1918 | 1660 GOSUB 1580:XC=XC+1:RETURN
 1461 | 1670 GOSUB 1680:GOTO 1400
10561 | 1680 ENTER=0:GOSUB 1580:GOSUB 700:PRINT"Updating Character":FOR Y=0 TO 7
              :POKE CODEADR+Y,ASC(MID$(ED$,Y+1,1)):NEXT Y:IF CODE>253 THEN GOSUB
              380:GOTO 750 ELSE 750
12160 | 1690 IF ENTER=0 THEN GOSUB 1330:GOTO 990 ELSE GOSUB 700:PRINT"Character
              Has Been Altered Since Last Update. Update Character";:GOSUB 680:IF
               A=0 THEN GOSUB 1330:GOTO 990
 2093 | 1700 GOSUB 1680:GOSUB 1330:GOTO 990
 4085 | 1710 ENTER=1:GOSUB 1450:B=B2 XOR B3:MID$(ED$,XC+1,1)=CHR$(B):RETURN
13601 | 1720 PRINT TAB(9)"CUSTOM TEXT FONT EDITOR":PRINT TAB(6)"Copyright 1987 b
              y David Goben":LOCATE 6,16:PRINT"REQUIRES:":PRINT TAB(7)"640 X 200
              GRAPHICS ADAPTER,":PRINT TAB(7)"256K and MS-DOS 2 or higher"
11579 | 1730 LINE (0,79)-(319,151),7,B:DEFINT A-Z:C$=" ":CX=12:CY=3:DIM YZ(9):YZ
              (0)=16:YZ(1)=8:FOR X=2 TO 9:YZ(X)=-1:NEXT:RESTORE 1770:GOSUB 1740:L
              OCATE 15,CY:GOSUB 1270:GOSUB 1270:GOSUB 1270:CY=CY+5
 6817 | 1740 FOR Y=0 TO 1:FOR W=0 TO 6:LOCATE CX+W,CY:READ A$:B=VAL("&H"+A$):GOS
              UB 1750:NEXT W:CY=CY+8:NEXT Y:RETURN
 4248 | 1750 FOR Z=0 TO 7:B=B+B:IF B>255 THEN B=B-256:GOSUB 1270 ELSE PRINT C$;
 1217 | 1760 NEXT Z:RETURN
 2791 | 1770 DATA 30,78,CC,CC,FC,CC,CC,00,00,78,0C,7C,CC,76
 2746 | 1780 DATA FE,C6,8C,18,32,66,FE,00,00,FC,98,30,64,FC
```

End

Program Listing 2. *Temporary lines to create a GRAFTABL.COM file.*

```
  866 | 35 CLS:GOTO 50
 2953 | 132 IF TABLE=0 THEN SEGMENT=0:TABLE=&H7D:NUM=1
 3016 | 134 COMFILE=1:FILESPEC$="GRAFTABL.COM":GOTO 510
  686 | 155 GOTO 190
 1254 | 525 TABLE=TABLE-NUM
```

End

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›SPECIAL SECTION‹

80 Micro's RESOURCE GUIDE

1987 ANNUAL

Here at *80 Micro* we are asked some questions more often than others. "Where can I find a local user group?" "Know any good BBSes?" "Who sells software for my Model I/III/4?"

80 Micro senior editor Paula Noonan and copy editor David Andrews have compiled this resource guide to user groups, vendors of Model I/III/4 software and hardware, and Tandy 1000 hardware add-ons. *80 Micro* associate editor Thomas Quindry contributed a rundown of his favorite BBSes.

Our lists are not complete. Our intention is to provide a source of "best-bets." User groups and BBSes come and go. We have verified the ones listed here as late as the end of September. The prices on the 1000 add-on list are current, too, as is the list of Model I/III/4 vendors.

We plan to keep these lists up to date, and welcome any additions readers or vendors wish to send us. Mail them to Resource Guide Editor, *80 Micro,* 80 Elm St., Peterborough, NH 03458.

USER GROUPS

NORTHEAST

Monadnock PC Users Group

P.O. Box 34, Keene, NH 03431. Contact Jim Stewart, 603-352-5212.

Not Tandy specific. MS-DOS with Tandy 1000/2000 and other compatibles. Affiliated with Boston Computer Society. Dues: $5/year. 60 members. Club's age: 3 years. No newsletter but access to BBS (603-924-7724, 300/1,200/2,400 baud, 8-bit words, 1 stop bit, no parity).

Tandy Computer Club

P.O. Box 428, Westbrook, ME 04092. Contact Del Cargill, 207-854-2862.

Tandy specific, TRSDOS with Models I/III/4, MS-DOS with 1000/3000. Dues: $15/year. 35 members. Club's age: 8 years. No newsletter, but a BBS is in the works.

Computer Users Group of Central Connecticut

P.O. Box 1575, Hartford, CT 06144. Contact Keith Carriere, 203-646-2842.

Primarily Tandy with some MS-DOS compatibles. All TRSDOS and MS-DOS machines, including laptops. Dues: $10/year. 25 members. Club's age: 6 years. No newsletter, no BBS.

Fairfield County Computer Users Group Inc.

10 Richlee Road, Norwalk, CT 06851-6017. Contact Alan Abrahamson, 203-866-7883 or 866-2670.

Not Tandy specific. I/III/4, 1000/3000/4000, and other IBM clones. Dues: $30/year. 120 members. Club's age: 8 years. Newsletter and BBS (203-846-6728, 300/1,200 baud, 1 stop bit, no parity).

Brookdale Users Group

22 Alexander Ave., Freehold, NJ 07728. Contact Fred Kagel, 201-577-0606.

Not Tandy specific. I/III/4, Color Computer, 1000, MS-DOS compatibles, and CP/M machines. Software library with 600 volumes. Dues: $12/year per family. 70 members. Club's age: 10 years. Newsletter and BBS (201-613-4055, 300/1,200/2,400 baud, 8-bit words, 1 stop bit, no parity, operating 24 hours a day).

Metro Tandy User Group

310 W. 106th St., 15D, New York, NY 10025. Contact G.F. Mueden, 212-222-8751.

Not Tandy specific. I/III/4 and 1000. Mostly business oriented. Dues: $10/year. 30 members. Club's age: 8 years. Occasional newsletter, no BBS.

Long Island Computer Association Inc.

Box 71, Hicksville, NY 11802. Contact Al Levy, 516-293-8368.

Not Tandy specific. All kinds of machines. Dues: $12/year. 1,500 members. Club's age: 11 years. Newsletter and BBS (516-561-6590, 9,600 baud).

Plattsburgh PC-DOS User Group

246 Margret St., Plattsburgh, NY 12903. Contact Howard Giskin, 518-562-0000.

Not Tandy specific. Most members own a 1000. MS-DOS and IBM machines. Dues: $25/year. 23 members. Club's age: 2 years. Newsletter and BBS (518-562-2222, 300/1,200/2,400 baud, 8-bit words, 1 stop bit, no parity).

Western New York Tandy Users Group

80 Lockwood Ave., Buffalo, NY 14220. Contact James Krywalski, 716-826-5687.

Not Tandy specific. Dues: $12/year. 80 members. Club's age: 7 years. Newsletter and BBS (716-633-7549, 300/1,200 baud, 8-bit words, 1 stop bit, no parity).

Erie Tandy Users Group

P.O. Box 8558, Erie, PA 16505.

Not Tandy specific. All machines, including MS-DOS. Dues: $10/year per family. 75 families. Club's age: 5 years. Newsletter and private BBS with optional parameters.

Tandy 1000 User's Group

648 Lafayette Ave., Palmerton, PA 18071. Contact Scott Voth, 215-826-6143 after 5:30 p.m.

Hardware, commercial, and public-domain software, and problem solving for novices. 1000. Dues: None. 15 members. Club's age: 2 years. Newsletter.

Tandy User Group—Delaware County

543 Marietta Ave., Swarthmore, PA 19081. Contact Bob Stewart, 215-543-5469.

BBSes

by Thomas Quindry

Electronic bulletin board systems (BBSes) are becoming increasingly popular with home computerists. You can find public-domain and shareware software, technical support, and discuss the issues of the day.

BBSes are more concentrated on the East Coast in the major cities than in the rest of the country. Cities like Philadelphia, PA, and Washington, DC, have many boards within local dialing distances, while BBSes are more spread out in the Midwest and West. With clear telephone service, high-speed modems, and good communications programs and protocols, calling BBS boards even from long distance is practical and somewhat affordable. But you can cut the cost of calling long distance a number of ways.

PC-Pursuit

One option is PC-Pursuit, a subscriber phone service from GTE Telenet in Reston, VA. For a monthly fee of about $25, you can make unlimited data calls during evenings (6 p.m. to 6 a.m.) and weekends to selected major metropolitan areas. You can make any local call within these cities as long as it is through a computer and modem and not voice.

You have to decide whether this service will pay for itself or not. Even those who like the service talk about its problems. When downloading a file, PC-Pursuit results in a noticeable slowdown in the speed of transmissions.

Other Costs

Once you connect with a BBS, your costs don't end. Some system operators, or sysops, charge a nominal fee to download public-domain and shareware files. If you just want to read and leave messages, there is usually no fee. Fees range from $10 to $40 per year, with an average of $25, which is inexpensive compared to the professional database services.

The user fee usually pays for increased hard-disk file storage, updated equipment, and perhaps an extra phone line. No one gets rich running a BBS.

What to Expect When Calling

Your communications protocols must match those of the bulletin board. Typically you can call a BBS at 8-bit words, no parity, and 1 stop bit (8-N-1). A baud rate of 1,200 bits per second (bps) is usually supported by all boards; 300 bps is becoming less in favor, and 2,400, 9,600, and 19,200 are sometimes supported.

When you call with your TRSDOS computer, you might experience extraneous characters in the opening screen display from the BBS. If your communications program has a graphics mode, turn it off. You might also have to contend with screen formats that are designed for 80 characters across.

When you first call a bulletin board you are expected to register. Most sysops want your full name, address, and phone number. Many sysops will call you for verification, so be prepared to accept a collect call if the bulletin board is not local. Some sysops require a mail-in registration.

Downloading

Once you gain full access to a bulletin board, you can read the various messages, respond to them, and download and upload public-domain and shareware files. Downloading requires some basic knowledge. Except for ASCII (text) file transfers, some form of handshaking must take place to transfer a file in an error-free manner. X-modem, X-modem CRC, and Y-modem protocols are most popular. These protocols verify that the file transfer is complete and accurate.

Tandy specific. I/III/4/4P, Color Computer 2 and 3, 100, 1000, and 1000 SX. Dues: $15/year, $30 per family, $7.50 for high school students. 60 members. Club's age: 6 years. Newsletter, no BBS.

Philadelphia Area Computer Society

c/o La Salle University, Philadelphia, PA 19141. Contact Dr. Stephen Longo, 215-951-1255.

Tandy specific. Dues: $18/year. 1,400 members. Club's age: 11 years. Newsletter and BBS (215-951-1863/64/65/66).

TRS "134" Computer Group

P.O. Box 2711, White Flint Mall, Kensington, MD 20895-0824. Contact Paul Shapiro.

Tandy specific. I/III/4. Dues: None. 15 members. Club's age: 1 1/2 years. Newsletter ($8 for 10 issues), no BBS.

SOUTHEAST

Valley MS-DOS User Group

Route 1, Box 133, Fort Defiance, VA 24437. Contact Bob Muller, 703-363-5799.

Not Tandy specific. Dues: $1 at press time. 13 members. Club's age: 7 months. Newsletter, no BBS.

TRS-80 Users Group of Charlotte

2116 Tyvola Road, Charlotte, NC 28210. Contact Horace Lutz, 704-525-4952.

Tandy specific covering all machines. Emphasis on education. Dues: $12/year. 50 members. Club's age: 6 years. Newsletter, no BBS.

USER GROUPS continued

To download a file, you must tell the bulletin board that you want to download and with which protocol. You must also follow through and command your own communications program to download.

Most programs are put on BBSes in an archival format. This format packs many files within one large file so all programs of a set are self-contained. For MS-DOS, they also employ a compression technique to save space. These files usually end with the extension ARC. After you get these files, you must "unarc" them to use them. Two shareware programs are ARC520.COM and PKX35A35.EXE. In TRSDOS, archiving is less common. For further information on downloading files, archiving, and BBS etiquette, see the Public Works columns for July (p. 89) and August (p. 98) 1987.

Bulletin Boards

I describe the following BBSes because they support the computers of interest to *80 Micro* readers. All use 8-bit words, no parity, and 1 stop bit at the specified baud rates.

The Tech Connect

Sysop: Tiff Reardon
Phone: 703-430-0091, 24 hours

BBSes continued

TANDY 1000 SERIES ADD-ON BOARDS

MEMORY AND MULTIFUNCTION BOARDS

Zuckerboard Memory Expansion
$149 (512K), $109 (256K).
Advanced Transducer Devices (ATD), 235 Santa Ana Court, Sunnyvale, CA 94086, 408-720-1942.

Zuckerboard Memory Expansion (1000 EX)
$149 (384K).
ATD (see address above).

Zuckerboard Secondary Memory Expansion
$125 (384K), $109 (256K).
ATD (see address above).

Zuckerboard Multifunction Board
$279 (512K) with serial port and clock.
ATD (see address above).

Zuckerboard Memory Expansion (1000 SX)
$109 (256K).
ATD (see address above).

Zuckerboard Multifunction Board (1000 SX)
$199 (256K), with serial port and clock.
ATD (see address above).

Zuckerboard Clock/Calendar board
$59 (with software, for 1000 and 1000 SX).
ATD (see address above).

Bocaram/XT (see Express Checkouts, August 1987, p. 44)
$575 (2MB), $345 (1MB), $245 (256K expansion card), $195 (unpopulated), and $245 (1MB add-on card to bring board up to 2MB maximum).
Boca Research Inc., 6401 Congress Ave., Boca Raton, FL 33487, 305-997-6227.

Maxi Magic EMS board (1000 SX only)
$199 (unpopulated), expandable to 2MB.
Everex, 48431 Milmont Drive, Fremont, GA 94538, 415-498-1111.

Memory Only (for the 1000/1000A)
$195 (512K), $139 (unpopulated).
Hard Drive Specialist (HDS), 16208 Hickory Knoll, Houston, TX 77059,
800-231-6671 or 713-480-6000.

Tanpak multifunction board (for 1000/1000A)
$259 (512K), $219 (256K), $179 (unpopulated). RS-232 serial port, clock/calendar, DMA, printer spooler, memory disk, and a Plus expansion port included.
HDS (see address above).

Tanpak SX (for the 1000 SX)
$129 (unpopulated). All features of the Tanpak but without memory and DMA features.
HDS (see address above).

RS-232 Clock/Calendar Plus card
$129, $59 for RS-232 Serial Plus card, $59 for Clock/Calendar Plus card.
HDS (see address above).

Master/One board (1000A/1000 SX)
$455 (1 MB), $335 (512K) includes EMS emulation software, print spooler, clock, and RAM-disk software.
Matthew Electronics, 386 Avenida de la Vereda, Ojai, CA 93023, 800-543-2233; in CA, 805-646-7790.

EMS5150 2MB board
$509.60 (2MB) includes EMS driver, RAM disk, printer spooler, and memory test. Also available for $229.95 is a 2MB Plus module. $229.95 (256K).
Micro Mainframe, 322 E. Bidwell, Folsom, CA 95630, 916-985-7501.

Dual RS-232 and Clock
$92.95, $85.95 (Dual RS-232), and $55.95 (Single RS-232).
Micro Mainframe (see address above).

4N1 multifunction board
$229.95 (512K) and $149.95 (unpopulated).
Micro Mainframe (see address above).

Dual RS-232 and Clock
$92.95, $85.95 (Dual RS-232), and $55.95 (Single RS-232).
Micro Mainframe (see address above).

4N1 multifunction board
$229.95 (512K) and $149.95 (unpopulated).
Micro Mainframe (see address above).

1000 EX Memory Board
$99.95 for 128K, two additional Plus connectors, a DMA circuit, and sockets for additional 256K of memory. Connector to add battery-backed clock/calendar board, which sells for $45.95.
Micro Mainframe (see address above).

Maxit
$195 (224K for memory-resident programs only).
Osborne/McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710, 415-548-2805.

RS-232 Clock/Calendar Plus option board
$129.
Southwestern Digital, 17333 El Camino Real, Houston, TX 77058, 713-480-3296.

TANDY 1000 ADD-ONS continued

USER GROUPS

continued

TRS-80 User's Group of Atlanta

1294 Nerine Circle, Dunwoody, GA 30338. Contact D.E. Golden, 404-394-6480.

Tandy specific. I/III/4, 1000, and 100. Talks by Radio Shack on MS-DOS. Dues: $20/year. 60 members. Club's age: 8 years. Newsletter and BBS (404-995-0144, 300/1,200 baud, 8-bit words, 1 stop bit, no parity).

Valley Hackers

409 Chamlee Drive, Fort Valley, GA 31030. Contact J.C. Shy, 912-825-1971.

Primarily Tandy equipment. 1000/1200 HD/3000. Networking, shareware, and interoperability between PCs nationwide. Dues: None. 41 members. Club's age: 3 years. Newsletter and private BBS.

Midstate Computer People Unite

Box 442, Hawkinsville, GA 31036. Contact Shelly J. Berryhill, 912-783-4017, x51 (days), or 912-783-1567 (nights).

Mostly Tandy, exclusively MS-DOS, with a quarterly disk series of public-domain software. Dues:$20/year. 15 members. Club's age: 1 year. Newsletter, possibly a BBS.

Alachua County Computer User Group

712 N.W. 95th Terrace, Gainesville, FL 32607. Contact Mitchell E. Sapp, 904-332-2065.

Not Tandy specific. Basic and DOS programming classes. Dues: $20/year. 60 members. Club's age: 2 years. Newsletter and BBS (904-371-1146, 7-bit words, 1 stop bit, even parity).

Tandy MS-DOS Users Group

1812 Second St., Indian Rocks Beach, FL 34635. Contact Charles Wolff, 813-593-0316.

Tandy specific. 1000/1000 EX, SX, TX/2000/1200/3000. Dues: $15/year. 70 members. Club's age: 1 year. Newsletter, and a BBS is in the works.

MIDWEST

Cincinnati Tandy Users Group

P.O. Box 399145, Cincinnati, OH 45239. Contact R.A. White, 513-829-8510.

Tandy specific supporting all machines. Dues: $20/year. 175 members. Club's age: 8 years. Newsletter and BBS (513-474-2985, 300/1,200/2,400 baud, 8-bit words, even parity).

The Northeast Computer Club

P.O. Box 50252, Indianapolis, IN 46250. Contact Oswald Cooper, 317-849-3120.

Not Tandy specific. Dues: $15/year. 50 members. Club's age: 7 years. Newsletter and two BBSes: 317-841-7072 (free) and 317-782-3220 (subscription). Both use 300/1,200/2,400 baud, 8-bit words, 1 stop bit, no parity, and operate 24 hours a day.

Dearborn TRS-80/Tandy Users Group

P.O. Box 1942, Dearborn, MI, 48121. Contact Doug Schilbe, 313-332-9696 (7 a.m. to 3 p.m.) or 313-261-8027 (evenings).

Tandy specific. I/III/4, Color Computer, 1000/3000, and Model 100. Dues: $12/year. 60 members. Club's age: 9 years. Newsletter and BBS (313-459-8375, 300/1,200 baud, 7-bit words, 1 stop bit, even parity).

Personal Computers of Battle Creek

2018 W. Territorial Road, Battle Creek, MI 49017. Contact Dick Jung, 616-963-0246.

Not Tandy specific. MS-DOS, tutorials in Basic, and software library. Dues: $15/year. 124 members. Club's age: 2 years. Newsletter, no BBS.

Twin Cities Tandy Users Group

1836 Jefferson, St. Paul, MN 55105. Contact Duane Stabler, 612-894-7282.

Not Tandy specific. I/II/III/4, Models 12/16, Model 100, Tandy 102, MS-DOS, and clones. Dues: $15/year. 150 members. Club's age: 7 years. Newsletter and BBSes. (United BBS, 612-731-1063, 7-bit words, 1 stop bit, even parity. Call Marian for access to United at 738-2928. This BBS is for Models I/III/4/100. American Data Terminals at 456-9450, 8-bit words, 1 stop bit, no parity, is for same machines as United, plus 102 and MS-DOS. The TCTUG portion is private to paid members.)

Tandy SIG of Chicago Area Computer Hobbyists' Exchange

6720 Palma Lane, Morton Grove, IL 60053. Contact George Matyaszek, 312-622-5969.

Tandy specific. I/III/4, 1000/1200. Dues: $5/year. 75 members. Club's age: 10 years. Newsletter and BBS (312-622-4442, 300/1,200 baud, 8-bit words, 1 stop bit, no parity).

BBSes

continued

Modem speeds: 300/1,200/2,400
Specialties: MS-DOS, Models I/III/4, CP/M
BBS software: PC Board
Location: Great Falls, VA
Registration: Mail-in form
Fees: $15 for 6 months, $25 per year, and free options

The Tech Connect has a good selection of public-domain and shareware programs. It groups files into 16 directories for MS-DOS. CP/M and TRSDOS sections have their own sets of directories for programs, with 150–200 files for each. Many utilities and business programs are available. You can easily get help with your computer problems.

Instead of paying the user-support access fee you can trade your public-domain and shareware programs forree access to download programs. The amount you can download depends on your upload/download ratio.

Sterling Exchange

Sysop: Jim Rhodes
Phone: 703-435-0836, 24 hours
Modem speeds: 1,200/2,400
Specialties: MS-DOS, programming, aviation, leisure
BBS software: PC Board
Location: Sterling, VA
Registration: Mail-in form
Fees: $25 and free options

The Sterling Exchange has a good following of highly technical users and programmers, as well as novices. It offers free access for those wanting to maintain a liberal upload/download ratio of public-domain and shareware programs, or you can pay the one-time $25 user-support fee, which gives you 60 minutes per day of download privileges and access to the less-used private phone line. Files are categorized into 15 directories. Included are a good selection of graphics programs, programming aids, aviation aids, hard-disk and DOS utilities, language utilities, word processors, business programs, and games.

Tandy Hotline

Sysop: Bob Cook
Phone: 804-358-5824, 24 hours
Modem speeds: 300/1,200/2,400
Specialties: MS-DOS, TRSDOS, most Tandy computers
BBS software: Collie
Location: Richmond, VA
Registration: Phone-in
Fees: None

The Tandy Hotline is supported by the manager of the Radio Shack Training/Support Center in Richmond, VA, and is the host BBS for the Richmond Tandy Users Group. The system is part of the Fido Bulletin Board System.

You will find conferences and files to download for the TRS-80 I/III/4, II/12/16/6000, Tandy 1000/1200/2000/3000, Color Computer, 100/200/600, and the MC-10. You normally get 15 minutes on the first call, and 60 minutes on the second call. Other limits are two hours per day and five-to-one download/upload ratio calculated in bytes.

The Byteline BBS

Sysop: Chuck Ober
Phone: 317-782-3220, 24 hours
Modem speeds: 300/1,200
Specialties: MS-DOS, TRSDOS, CP/M, Color Computer, Model 100
BBS software: TBBS
Location: Indianapolis, IN
Registration: Phone-in
Fees: $15

The Byteline BBS is host to the Tandy Users

Tandy Business Users Group

3329 B. Beacon, #50, North Chicago, IL 60064. Contact Linda Hapner, 312-689-2325.

Tandy specific for all machines. Dues: $35/year. 115 members. Club's age: 5 years. Newsletter, no BBS.

St. Louis Area TRS-80 Users Group

119 Old State Road, Ellisville, MO 63021. Contact Bill Schaper, 314-843-0560.

Tandy specific, but all users welcome. Product reviews, help in programming, software library. Dues: $12/year. 28 members. Club's age: 7 years. Newsletter and BBS (314-843-0001, 8-bit words, 1 stop bit, no parity).

KC South Computer Club

2419 Queen Ridge Drive, Independence, MO 64055. Contact Bob Lazere, 816-444-9911.

Tandy specific. I/III/4, all MS-DOS machines. Dues: $15/year. 30 members. Club's age: 8 years. Newsletter, no BBS.

Kansas City TRS-80 Users Group

300 N.W. 83rd St., Kansas City, MO 64118. Contact Mary Youngblood, 816-436-1071.

Tandy specific. I/III/4/4P, and maybe other machines. Dues: $15/year. 32 members. Club's age: 10 years. Newsletter, no BBS.

Omaha Area Tandy Users Group

7318 S. 33rd St., Omaha, NE 68147. Contact Dan Shelby, 402-291-6520 (days) or 402-734-2599 (evenings).

USER GROUPS continued

Group as well as an NEC computer club. Of significance is the on-line 600-megabyte CD-ROM with the optical disk of all public-domain and shareware MS-DOS offerings from PC-SIG. It has a good selection of files and several conferences where you can get advice about your specific computer. The registration fee is waived if you are a member of either of the previously mentioned computer clubs.

The Chicago Syslink

Sysop: George Matyaszek
Phone: 401-272-1138, 24 hours
Modem speeds: 1,200
Specialties: MS-DOS, TRSDOS, CP/M
BBS software: Syslink
Location: Chicago, IL
Registration: Phone-in
Fees: $20

The Chicago Syslink maintains a 1,300-file library (with a library of 3,000 available from a national network of Syslinks). Access to chat is free. The Chicago Syslink provides "Aviation Monthly," an on-line newsletter and shopper for pilots. Bruce Tonkin, a writer for *80 Micro*, writes a monthly column for the Syslink.

BBSes continued

TANDY 1000 ADD-ONS

continued

Clock/Calendar Plus option board
$59.
Southwestern Digital (see address above).

RS-232 Plus option board
$59.
Southwestern Digital (see address above).

Memory Plus Expansion Adapter (1000 EX/HX)
$129.95 for 128K, a DMA circuit, two additional plus connectors, and sockets for an additional 256K of memory.
Tandy Corp., One Tandy Center, Fort Worth, TX 76102, 817-390-3011.

128K RAM Upgrade Kit
$99.95.
Tandy Corp. (see address above).

Plus RS-232 Option Card
$79.95.
Tandy Corp. (see address above).

Turner Hall Card
$75 for 256K.
Turner Hall Publishing, 10201 Torre Ave., Cupertino, CA 95014, 800-556-1234; in CA, 800-441-2345.

SPEEDUP BOARDS

PC-Sprint (1000/1000A)
$99.95.
Exec-PC Inc., P.O. Box 11268, Shorewood, WI 11268, 414-242-2173.

Fast88
$149, $20 extra for the V20 option.
Microspeed Inc., 5307 Randall Place, Freemont, CA 94538, 415-490-1403.

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286 Express
$595.
PC Technologies Inc., 704 Airport Blvd., P.O. Box 2090, Ann Arbor, MI 48106, 800-821-3086; in MI, 313-996-9690.

INTERNAL MODEMS

Internal Modem
$129 for 1,200 baud (1000 and 1000 SX).
ATD (see address p. 57).

EV-920 300/1,200 baud Internal Modem
$249.
Everex Systems Inc. (see address p. 57).

Sidedialer
$59.95.
Quadtel, 3176 Pullman, Suite 124, Costa Mesa, CA 92626.

Plus 300 baud PC Modem
$99.95.
Tandy Corp. (see address above).

Plus 1,200 baud PC Modem
$199.95.
Tandy Corp. (see address above).

INTERNAL HARD-DISK CARDS

Hard Disk Cards (for 1000 and 1000 SX)
$599 for each card.
ATD (see address p. 57).

20-Megabyte Hard Drive card
$499 with shipping.
Aerocomp, 2544 W. Commerce St., Dallas, TX 75212, 800-527-0347.

40-Megabyte Internal Hard Drive
$575 (40MB), $349 (20MB internal), and $329 (10MB internal). One year parts and labor.
Bi-Tech, 10 Carlough Road, Bohemia, NY 11716-2996, 800-645-1165.

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45 Meg Hard Card (1000/1000A/1000 SX)
$899. Requires a memory board with DMA compatible to the 1000. $699 (30MB), $499 (20MB).
HDS (see address p. 57).

60 Meg Internal Hard Drive
$1,199. $879 (45MB), $679 (30MB), $479 (20MB).
HDS (see address p. 57).

20-Megabyte Internal Hard Drive
$369.95 includes 15 months parts and labor.
Micro Smart, 200 Homer Ave., Ashland, MA 01721, 800-343-8841.

Internal 20-Megabyte Disk Cartridge System (DCS)
$1,799 (20MB, 5¼-inch Internal DCS), $999 (secondary 20-MB DCS). $99.95 (5¼-inch 20-MB cartridge).
Tandy Corp. (see address above).

20-Megabyte Hard Disk Card
$799. Mounts in a 10-inch card slot on 1000 or 3000.
Tandy Corp. (see address above).

Internal 40-Megabyte Hard Disk Kit
$1,399. Requires hard disk controller.
Tandy Corp. (see address above).

Internal 20-Megabyte Hard Disk Kit
$599.
Tandy Corp. (see address above).

Hard Disk Controller Board
$299.95 includes cable for 10-, 20-, and 35-MB hard disks.
Tandy Corp. (see address above).■

USER GROUPS

continued

Primarily Tandy, supporting all machines. Dues: $12/year. 160 members. Club's age: 9 years. Newsletter and BBS (402-553-2432, 300/1,200 baud, 8-bit words, no parity, 24 hours a day).

Laptop Users of Texas

Contact Ed Howdershelt at P.O. Box 530861, Grand Prairie, TX 75053-0861, or leave message on BBS.

Primarily Tandy. Model 100, Tandy 200, and other laptops. Dues: None. 18 hardcore members and six others. Club's age: 6 months. On-line newsletter and BBS (214-234-4952, 300/1,200/2,400 baud, 8-bit words, 1 stop bit, no parity).

Tyler Computer Club

4928 Richmond Road, Tyler, TX 75703. Contact Marionetta Smith, 214-561-6136.

Not Tandy specific. MS-DOS, TRSDOS, CP/M, and Color Computer. Dues: $20/year. 133 members. Club's age: 15 years. Newsletter, no BBS.

Mid-Cities TRS-80 Users Group

P.O. Box 171566, Arlington, TX 76003. Contact Bob Zwick, 214-435-8101.

Not Tandy specific. I/III/4, 1000/2000, and MS-DOS compatibles. Dues: None. 65 members. Club's age: 9 years. Newsletter, no BBS.

TRS-80 Users Group

Contact Pat Coyne at 920 Doral Drive, Fort Worth, TX 76112.

Not Tandy specific. I/II/III/4, 1000/2000, clones, and Model 100. Dues: None. 60 members. Club's age: 9 years. No newsletter, no BBS.

WESTCOAST

Tandy 1000 User Group

4014 Centralia St., Lakewood, CA 90712. Contact Dick Sherwood, 213-421-4014.

Tandy specific. 1000/1200/2000/3000/6000. Dues: $15/year. 58 members. Club's age: 1 year. Newsletter and BBS (213-437-1410, 8-bit words, 1 stop bit, no parity).

San Gabriel Valley Tandy User's Group

837 E. Alosta Ave., Glendora, CA 91740. Contact Mark Speer, 818-841-2119.

Tandy specific. I/III/4, but open to all computers. Goal is evolving against an MS-DOS world. Dues: $20/year. 60 members. Club's age: 9 years. Newsletter, no BBS.

Nevada User Group for Electronic Telecommunications

3990 Las Vegas Blvd. North, Space #245, Las Vegas, NV 89115. Contact Larry Wuertzer, 702-644-8652.

Recognizes all computers. Dues: None (contribution basis only). 23 members. Club's age: 1 year. BBS (702-643-8622, 300 baud, 8-bit words, 1 stop bit, no parity).

Capital City Gateway

Contact Charles Doughty at Box 60511, Sacramento, CA 95860 or on BBS.

Mostly Tandy, all MS-DOS Tandy systems. Telecommunications is first priority. Dues: $20/year. 240 members. Club's age: 3 years. Quarterly newsletter, BBS (916-381-8788, 1,200/2,400/9,600 baud, 8-bit words, 1 stop bit, no parity).

Denver Area TRS-80/Tandy Association

1799-D S. Lee St., Lakewood, CO 80226. Contact Norman Rowe, 303-355-6129, or Frank Berndt, 303-989-6068.

Not Tandy specific. III/4, 1000, Model 100, Tandy 200, and more. Dues: $12/year. 30 members. Club's age: 5 years. No newsletter, but a BBS (303-690-9423, 8-bit words, 1 stop bit, no parity).

San Mateo Users Group

193 Del Prado Drive, Daly City, CA 94015. Call 415-992-1783 for more information.

Tandy specific, all machines. Dues: $24/year, $20 initiation fee. 20 members. Club's age: 2 years. Newsletter and BBS (415-674-7684).

Byte Bandits of America—TRS-80's

780 Manx Ave., Campbell, CA 95008. Contact R.W. Brown, 408-379-2774.

Tandy specific. I/III/4/4P, Models 12/16. Dues: $25/year. 350 members. Club's age: 5 years. Newsletter and BBS (408-374-3974, assume standard parameters).

Valley TRS-80 Hackers' Group

Box 9747, North Hollywood, CA 91609. Contact Eric Bagai, 818-982-0467.

Tandy specific. I/III/4, and LNW. Dues: $12/

BBSes

continued

The Exclusive-80 BBS

Sysops: Brian Driscoll and Bob Griggs
Phone: 215-739-9512, 24 hours
Modem speeds: 300/1,200/2,400
Specialties: MS-DOS, TRSDOS, CP/M, Model 100/200
BBS software: TBBS
Location: Philadelphia, PA
Registration: Phone-in
Fees: Donation requested

The Exclusive-80 supports the Tandy 1000/1200/3000, TRS-80 I/III/4/4P, Color Computer, Model 100/200, MS-DOS and compatibles, and some CP/M computers. It has message conferences and download files plus a gamers conference with downloads. Selections include general utilities, graphics programs, computer language programs, games, text and screen editors, and files for data-base and spreadsheet programs.

Camelot

Sysop: Lance G. Hegamin
Phone: 213-204-6158, 24 hours
Modem speeds: 300/1,200/2,400
Specialties: MS-DOS, Tandy support
BBS software: PC Board
Location: Culver City, CA
Registration: Phone-in
Fees: Free

Camelot is intended primarily to support the MS-/PC-DOS community, with an emphasis on MS-DOS Tandy users. On request, the co-sysop for the PC-SIG conference, Ray Siminas, makes programs available from the entire PC-SIG library for downloading. Files include business programs, instructional and informational text files, and several types of utility programs.

The Decibel Group

Sysop: Tom Brady
Phone: 404-288-6858, 24 hours
Modem speeds: 300/1,200/2,400/9,600
Specialties: MS-DOS, CP/M
BBS software: TCOMM
Location: Decatur, GA
Registration: Phone-in
Fees: Free

Decibel is a long-standing BBS that supports CP/M in addition to MS-DOS. One of the special-interest conferences on the board is dedicated to ham radio.

Seattle's Downspout

Sysop: Norm Gregory
Phone: 206-325-1325, 24 hours
Modem speeds: 1,200/2,400
Speciality: CP/M
BBS software: ZCPR3 Remote Access System
Location: Seattle, WA
Registration: On-line
Fees: $32

With 1,800 files on line, Seattle's Downspout has to be one of the bigger sources for CP/M software. Be sure to look at Norm's "best" programs.

Checkpoint Computer System

Sysop: Bob Bailey
Phone: (619) 442-3595; 5 p.m. to 8 a.m. six days, 24 hours Sunday
Modem speeds: 1,200/2,400/9,600/19,200
Specialty: MS-DOS
BBS software: PC Board
Location: El Cajon, CA
Registration: Phone-in with voice verification by collect call
Fees: Free

Checkpoint is a charter member of the San Diego Sysop Association (SDSA). The Checkpoint BBS is specifically geared to helping the new user with telecomputing. The board offers conferences

year. 47 members. Club's age: 4 years. No newsletter, no BBS.

TRS-Nyblers

2700 Otis Drive, Alameda, CA 94501. Contact Bruce, 415-846-3575 or Bud, 415-351-4112.

Not Tandy specific. All Tandy machines. Dues: $2/month (6-month minimum) plus $10 initiation fee. 120 members. Club's age: 9 years. Newsletter and BBS (415-352-8442, 7-bit words, 1 stop bit, no parity).

Computron Research Institute

P.O. Box 370, Clackamas, OR 97015. Contact Tom Bair, 503-668-3986.

Tandy specific, I/III/4, 1000, and Color Computer. Dues: $20/year. 200 members. Club's age: 3 years. Newsletter and BBS (503-668-8397, 300/1,200 baud, 7-bit words, full duplex).

Portland Area TRS-80 Users Group

3714 S.E. Haig St., Portland, OR 97202. Contact PAUG BBS, 503-236-0281 (Steve Overton, sysop).

Education regarding TRS-80 computers and peripherals. Dues: $18/year. 100 members. Club's age: 8 years. Newsletter and BBS (503-236-0281, 300/1,200 baud).

Orange County TRS-80 Users Group

P.O. Box 8074, Orange, CA 92664. Contact Dave Bozarth, 714-538-5921.

Tandy specific. All machines, mostly I/III/4. Dues: new members, $20/year, renewal, $15/year. 90 members. Club's age: 9 years. Newsletter and

USER GROUPS continued

for the EGA and desktop publishing. Files for downloading include printer, screen, disk, and file utilities, spreadsheet, finance and data-base programs, graphics programs, and games.

Sparta

Sysop: Richard Driggers
Phone: 201-729-7056, 24 hours
Modem speeds: 1,200/2,400
Specialties: MS-DOS, hard-disk utilities
BBS software: PC Board
Location: Sparta, NJ
Registration: Phone-in
Fees: Free, $25 and $50 options

Sparta is an open-system BBS that offers three phone lines with up to 9,600 bps on the second and third lines. As a supporting user you get extra privileges that free you from maintaining an upload/download ratio. The $50 fee gets you exclusive access to the subscription-only line. Sparta has an assortment of files for downloading in over 20 categories. Of special note is the conference and expertise on hard disks.

Lakes Region BBS

Sysop: John Hodal
Phone: 312-872-8086, 24 hours

BBSes continued

TRSDOS Vendors

A

Donald W. Ady
56 Oak Ridge Ave.
Summit, NJ 07901
201-277-3365
software (Low Vision Editor)

Aerocomp
2544 W. Commerce St.
P.O. Box 223957
Dallas, TX 75212
214-637-5400 (information)
214-638-8886 (service)
800-527-0347 (orders)
800-442-1310 (orders, in Texas)
drives, power supplies, controllers

AISE
11799-D S. Lee St.
Lakewood, CO 80226
303-989-6068
software (ICLE)

Alpha Products
242-E West Ave.
Darien, CT 06820
203-656-1806 (information)
800-221-0916 (orders)
203-348-9436 (orders, in Connecticut)
cards, adapters

Anitek Software Products
P.O. Box 361136
Melbourne, FL 32936
305-259-9397
software (LeScript), expansion boards

B

B. Erickson Software
P.O. Box 11099
Chicago, IL 60611-0099
312-276-9712
software (Title)

B&G Microsystems
1733 Eastern S.E.
Grand Rapids, MI 49507
800-854-8544
800-422-4227, in Michigan
ABasic

Blue Ridge Software
230 Chesterfield Road
Lynchburg, VA 24502
804-239-0574
software (Profix IV)

C

Clay Watts Software
68C North Loop
Cedar Hill, TX 75104
214-291-1171
software (Proaid 4 +)

Compuserve
5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, OH 43220
800-848-8199
614-457-0802
electronic forums

Contract Services Associates
507 Lead St.
Kingman, AZ 86401
602-753-1133
software (PC-Tax)

Cornucopia Software Inc.
Box 6111
Albany, CA 94706
415-524-8098
software (Electric Webster)

CTL Software
115 Bixby Drive
Milpitas, CA 95035
408-263-1623
software (Handwriting Analyzer)

D

Data Cover/Z Systems Inc.
1985 Northfield
Rochester, MI 48063
313-853-6969
software (Nibble Theory)

Diskcount Data
2701-C W. 15th
Suite 612
Plano, TX 75075
214-680-8268
software (operating systems, utilities, games, graphics,
education)

E

Educational Micro Systems Inc.
P.O. Box 471
Chester, NJ 07930
800-922-0786
201-879-5982
software (Hypercross, PC Cross-Zap)

Electronic Repair Service
118½ N. Dallas Highway
Waxahachie, TX 75165
214-937-7017
hardware (V80-CPU)

EZWare Corp.
29 Bala Ave.
Bala Cynwyd, PA 19004
800-543-1040
215-667-4064, in Pennsylvania
software (EZTax-Prep, EZTax-Plan)

TRSDOS Vendors continued

BBSes

continued

Modem speeds: 1,200/2,400/9,600
Specialty: MS-DOS
BBS software: PC Board
Location: Chicago, IL
Registration: Phone-in
Fees: Free

The Lakes Region BBS has conferences for beginning and advanced programmers and for members of the Radio Communications Monitoring Association (RCMA). You must maintain an upload/download ratio for access. Files range from utilities and graphics to programming aids, and business and word-processing applications.

File Cabinet

Sysops: Dan and Marj Bair
Phone: 215-678-9334, 24 hours
Modem speeds: 1,200/2,400
Specialty: MS-DOS
BBS software: RBBS
Location: Reading, PA
Registration: Phone-in with voice verification by collect call
Fees: Free

The File Cabinet BBS has over 5,900 programs on file. This system has five computers, all with phone lines, slaved to a master computer. This is a good board, but sifting through the downloading selections can take a long time. Files are only organized by the date they were obtained. Information about Trojan horses (programs altered or written to destroy your computer data) is prominent.

Just TRS-80

Ed. note: Pat Anderson wrote from Fall City, WA, about his BBS for TRS-80s. You can call the board at 206-222-6224 at 300 or 1,200 baud.■

USER GROUPS

continued

BBS (714-639-3566, 300/1,200 baud).

TRS-80 User Group, Marinette Recreation

9860 Union Hills Drive, Sun City, AZ 85373. Contact Jack Buckingham, 602-972-4423.

Tandy specific. I/III/4P/4D. Dues: None. 56 members. Club's age: 5 years. No newsletter, no BBS.

INTERNATIONAL

Calgary Hyperion User's Group

3411 33rd St. S.E., Calgary, Alberta T2B0V9. Contact David Tansey, 403-273-7740 (home) or 297-2350 (work).

Not Tandy specific. MS-DOS emphasis, 1000. 39 members. Club's age: 6 years. Newsletter, no BBS.

Tec-Voc Computer Systems

115 Campbell St., Winnipeg, Manitoba R3N1B3. Contact Henry Yau, 204-786-1401.

Tandy specific. III/4, Color Computer, and 1000/1200. Dues: None. 200 members. Club's age: 4 years. No newsletter but BBS (204-885-7921, 8-bit words, 1 stop bit, no parity).

TRS-80 Users Group of Hamilton Area

Contact Norman Freidin at 2129 Larabee Court, Burlington, Ontario L7P3S3.

Exclusively Tandy. Dues: $5/year. 20 members. Club's age: 2 years. No newsletter, local BBS (parameters N/A).

The Hobart Users' Group

Box 1271N, Hobart, Tasmania 7001, Australia. Contact Byron Combes, 723744, or Andrew Marshall, 343649.

Not Tandy specific. I/III/4/4P, and MS-DOS machines. Dues: $20 (American). Membership numbers N/A. Club's age: 3 years. Newsletter, no BBS.

National Amstrad Tandy and General User Group

Oakfield Lodge, Broad Lane, Ram Hill, Coalpit Heath, Bristol, England BS17 2TY. Contact Roger Storrs, (0454) 772920.

Primarily Tandy. I/III/4, 1000, Models 2/100, and MS-DOS machines. Dues: None. Club's age: 8 years. Newsletter. BBS information N/A.■

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continued

G

Gamco Industries Inc.
Box 1911
Big Spring, TX 79721
800-351-1404
915-267-6327
software (Word Problems, Chance It!, Test Generator, Main Idea Gold Rush)

GE Information Services
401 N. Washington St.
Rockville, MD 20850
301-294-5692
800-638-9636
electronic forums

Gooth Software
931 S. Bemiston
St. Louis, MO 63105
314-727-2229
software (tax programs)

Gray Fox Enterprises
P.O. Box 8092
Belleville, IL 62222
618-234-3332
software (Wild Adventure)

H

Hard Drive Specialist
16208 Hickory Knoll
Houston, TX 77059
800-231-6671 (orders)
713-480-6000 (orders)
boards, drives

H.I. Tech Inc.
P.O. Box 25404
Houston, TX 77265
713-682-7317
boards (XLR8er)

Howe Software
64 Windmill Road
Armonk, NY 10504-2832
914-661-2207
914-273-3998 (information)
800-428-7825 x169 (orders)
800-428-7824 x169 (orders, in California)
software (word processor, communications, business)

Hypersoft
P.O. Box 5155
Raleigh, NC 27609
919-847-4779 (orders)
919-846-1637 (support)
software (Hypercross 3.0, Hyperzap)

H & E Computronics Inc.
50 N. Pascack Road
Spring Valley, NY 10977
914-425-1535
800-431-2818 (orders)
800-331-0362 (orders, in New York)
software (Versa series)

J

J & M Systems
15100-A Central S.E.
Albuquerque, NM 87123
505-292-4182
software (Memory Minder)

Jameco Electronics
1355 Shoreway Road
Belmont, CA 94002
415-592-8121
415-592-8097 (orders)
hardware, peripherals

K

Kenmore Computer Technologies
P.O. Box 635
Kenmore, NY 14217
716-877-0617
boards (Ztime1)

Knewco Inc.
P.O. Box 25329

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Wilmington, DE 19899
software (FULSCR)

KSoft
318 Lakeside Drive
Brandon, MS 39042
601-992-2239
software (Superlog)

L

Logical Systems Inc.
P.O. Box 55235
Grand Junction, CO 81505
303-243-7070
LS-DOS 6.3

Lyons Products
P.O. Box 272
Titusville, PA 16354
814-827-9892
software (Omniscroll III/4)

M

Marathon Software
P.O. Box 1349
641 Fort Worth St.
Jacksonville, TX 75766
214-586-8212
800-722-2277
software (Pik'em)

Microdex Corp.
1212 N. Sawtelle
Tucson, AZ 85716
602-326-3502
software (Cash Professional, XT.CAD)

Microgroup
P.O. Box 65
Bend, OR 97709
503-382-8048
CP/M software (Spellsys)

Micro-Labs Inc.
7309 Campbell Road
Dallas, TX 75248
214-702-8654
software (Grafyx Solution, Pro-Draw, Fractals, Life Experimenter & Super Spiro-Graph)

Miller Microcomputer Services
61 Lake Shore Road
Natick, MA 01760
617-653-6136
software (MMSForth)

Misosys Inc.
P.O. Box 239
Sterling, VA 22170-0239
703-450-4181
800-647-6797 (orders)
software (Pro-Wam, LDOS 5.3 Upgrade Kit, Gobbling Box, Pro MC-Compiler, Pro-Hartforth, Enhcomp Basic Compiler 2.5)

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2544 W. Commerce St.
P.O. Box 224767
Dallas, TX 75222-4767
214-631-7900
214-634-3336 (service)
800-527-0347 (orders)
software (CP/M and TRSDOS), hardware

P

Poor Man Software
3721 Starr King Circle
Palo Alto, CA 94306
415-493-3735
CP/M software (Write-Hand-Man)

Portable Software Inc.
P.O. Box 394
Nottingham, PA 19362
215-932-5395
software (Golf)

Powersoft
17060 Dallas Parkway
Suite 114
Dallas, TX 75248
214-733-4475
software (TRSCross)

Professor Jones/Frogg House
1940 W. State St.
Boise, ID 83702
208-342-2939
software (Professional Handicapping Systems)

Program Customizing
245 Richelieu
McMasterville, Quebec J3G1T7
LeScript modifications

Prosoft
P.O. Box 560
North Hollywood, CA 91603
818-764-3131
software (Allwrite, Dotwriter)

R

Research Design Associates
P.O. Box 848
Stony Brook, NY 11790
516-928-5700
software (Proteus, Model III)

Rockware Data Corporation
P.O. Box 866307
Plano, TX 75086
214-596-0588
software (Supertax, Pension Master)

RSI Software
P.O. Box 6094
Deltona, FL 32728
305-574-6469
software (Memcheck)

S

Seatronics
distributor: Sylvester Technologies
11803 Grant Road
Suite 203
Cypress, TX 77429
713-251-5700
boards (8 MHz Super Speed Up, 512K or 1MB Memory Board)

Softrends
26111 Brush Ave.
Euclid, OH 44132
216-289-2002
software (Xport)

The Source
1616 Anderson Road
McLean, VA 22102
703-734-7500
800-336-3330 (support)
703-734-7540 (support in Virginia and Washington, DC)
electronics forums

Spectre Technologies Inc.
22458 Ventura Blvd.
Suite E
Woodland Hills, CA 91364
800-628-2828 (orders)
818-716-1655 (information)
software (Rembrandt Complete Business Graphics Toolkit, Long and Loud, Twist and Shout)

Success Management Systems Inc.
P.O. Box 6120
Harrisburg, PA 17112
717-652-1732
800-628-2828 (orders)
Print-Commander

T

TCI
17733 205th Ave. N.E.
Woodinville, WA 98072
206-788-9732
CP/M software (Express 2.0)

Teletrends Corp.
P.O. Box 2198
Garden Grove, CA 92642
714-554-7401
cards (TT512P Modem, for Model 4P)

Try-O-Byte
1008 Alton Circle
Florence, NC 29501
803-662-9500
software (Try-O-Tax)■

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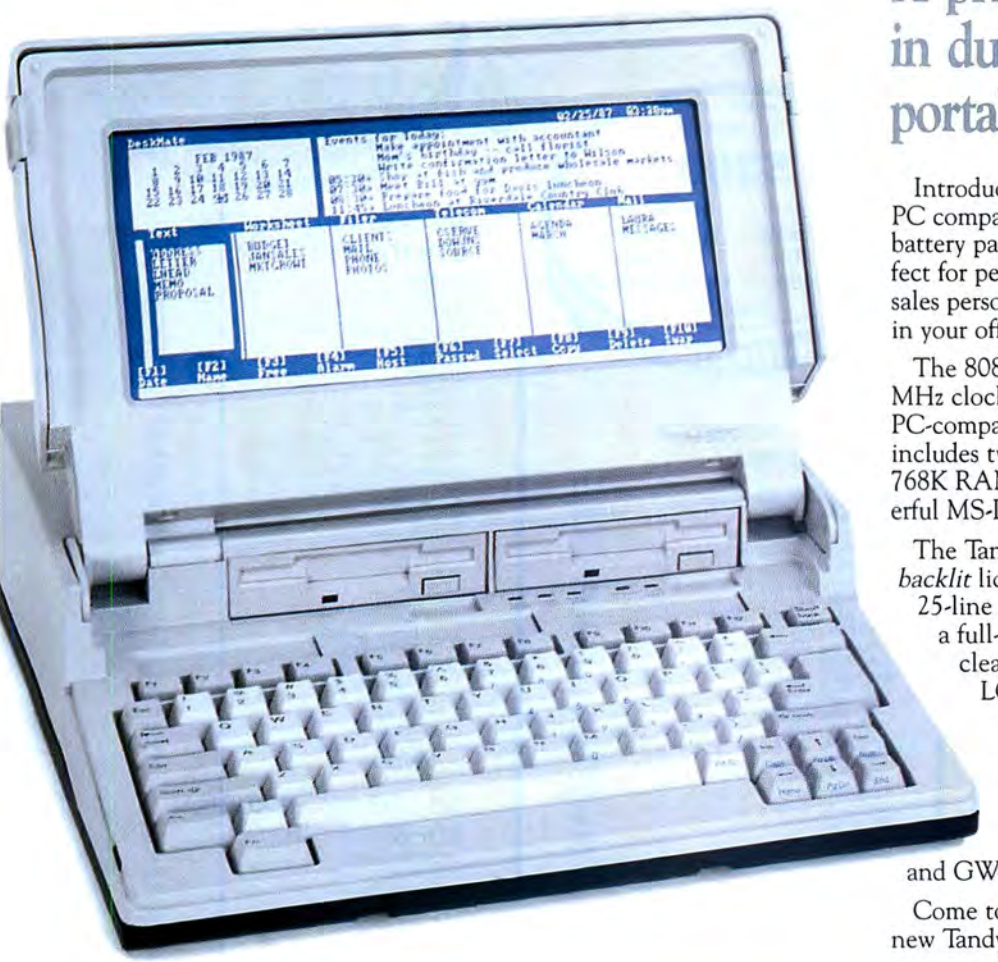

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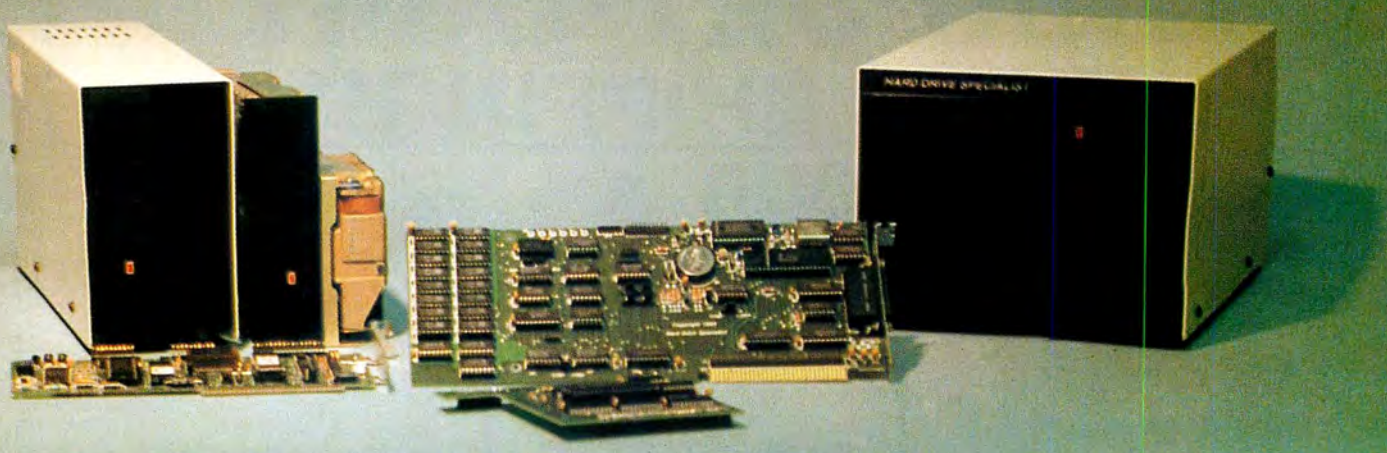

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Avoid labeling your disks by hand with these programs.

Disk-indexing programs can help you find that one important utility program, but you need to label your disks to make the indexing program worthwhile. Making labels is not my favorite chore; I own more than 300 disks, and the initial task seemed overwhelming. I could have labeled the disks by hand, but this wouldn't be neat or nearly as fun as writing EZLabel. My programs print disk labels for your Tandy 1000 or Model 4.

Reading the MS-DOS Directory

In MS-DOS you can't read the directory as a file under Basic. I decided to use a program contained on everyone's DOS disk, the program CHKDSK. EXE, and the DOS command VER. EZLabel (see Program Listing 1) uses this program in lines 1120 and 1130 with the Shell command. The output goes to the DIR.LST and VER.LST files, which you can read as files from Basic. Using the /V after CHKDSK creates a list containing the label name of the disk, all the file names, and the amount of space (measured in bytes) available on the disk. I could have written the directory to DIR.LST, but you obtain only a partial list of the disk files if some of the files are under a subdirectory.

Lines 335–435 extract the information from the file DIR.LST. I make assumptions about the density and sides based on the amount of available space; see lines 420–433. In line 345, a system disk is declared if the file IO.SYS (MS-DOS) or IBMBIO.COM (PC-DOS) is present on the disk. The program chooses the DOS version in lines 1170–1185 using the file VER.LST. In line 380, I display file names with the extensions COM, EXE, and BAS. You can change this line to fit your needs.

Running the Program

Start the program by running EZINIT.BAS (see Program Listing 2) on your Tandy 1000. Model 4 users only need to run Program Listing 3. EZINIT

System Requirements

Tandy 1000 or Model 4
64K RAM
Basic
Printer
Available on The Disk Series

```
 #  104
MS-DOS 3.20 DATA DSDD
SIMON   BAS  SIMON   EXE  BOWL    EXE  BOWL    BAS
SELECTORBAS  BASLINK BAS  LIST1   COM  LIST2   COM
LIST3   COM  LIST4   COM  LIST5   COM  CHECKSUMBAS

 #  200
MS-DOS 3.20 SYSTEM DSDD
COMMAND COM  PW      EXE  PSI     EXE  SPOOLI  COM
PFCONFIGCOM  DISKCOPYCOM  PF      EXE  PP      EXE
PS      EXE  KWIKPLOTBAS  GOBEN   BAS  TEST    BAS

CC-PROGR #  300
MS-DOS 3.20 DATA DSDD
TWMENU  EXE  PSI     EXE  WS      COM  DESK    EXE
DMPLUS  COM  TWTEXT  EXE  SETPRN2 BAS  SETPRN1 BAS
TWCALENDEXE  STOCTRACBAS  TESTGEN BAS  EZEDIT  BAS

CC-PROGR #  301
MS-DOS 3.20 DATA DSDD
STOCTRACBAS  TESTGEN BAS  EZEDIT  BAS  LABELER BAS
MDENTRY BAS  FAKEOUT BAS  CALMAKERBAS  CHECKER BAS
CWD     COM  CHEKBOOKBAS  TEETEST BAS  MDRANDOMBAS

 #  303
MS-DOS 3.20 DATA DSDD
PROJMINDBAS  DICTION BAS  GRAPHER BAS  SCREEN  COM
SORTER  BAS  CPS     BAS  TRADER  BAS  MAIN    BAS
GENETICSBAS  LOAN    BAS  MICROTABBAS  LOGRTHM BAS
```

Figure 1. If you set your printer for condensed mode, EZLabel lets you write four file names with extensions on each of the last three lines.

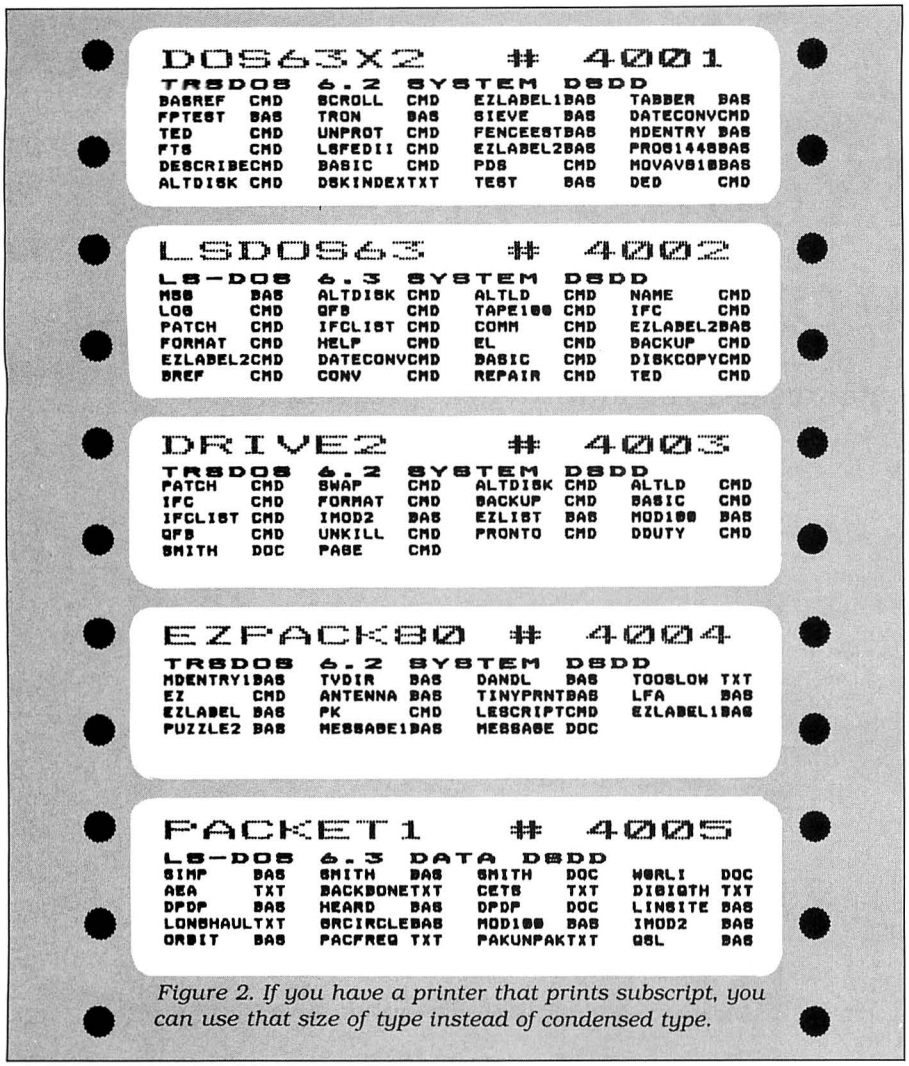

Figure 2. If you have a printer that prints subscript, you can use that size of type instead of condensed type.

Program Listing 1. EZLabel. See p. 94 for information on how to use checksums.

```
2520 | 10 REM ********** MS-DOS VERSION ***************
 999 | 20 REM FILE NAME 'EZLABEL.BAS' VER 2.2  05/10/87
 359 | 30 REM 'EZ DISK LABEL MAKER' BY WILLIAM MCMULLAN
2140 | 40 REM RT 6 BOX 1 BASTROP,  LA. 71220
2115 | 50 REM ****************************************
 493 | 60 CLEAR
 623 | 65 KEY OFF
 511 | 90 CLOSE
1258 | 100 CL$=STRING$(76," ")
3993 | 110 LARGE$=CHR$(27)+CHR$(14):     REM EPSON LARGE$=CHR$(27)+"W"+CHR$(1)
4150 | 120 NORMAL$=CHR$(27)+CHR$(15):    REM EPSON NORMAL$=CHR$(27)+"W"+CHR$(0)
3825 | 130 CONDENSED$=CHR$(27)+CHR$(20): REM EPSON CONDENSED$=CHR$(15)
3737 | 140 STANDARD$=CHR$(27)+CHR$(19):  REM EPSON STANDARD$=CHR$(18)
2419 | 160 DIM F$(300),E$(300),TAG(300),P$(50),DA$(300)
 761 | 170 GOSUB 980
5033 | 180 B=1:CLS:GOSUB 980:LOCATE 13,26:PRINT "NO. OF LINES ON LABEL  < >";:L
       OCATE 13,50
3033 | 190 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 190
1839 | 200 NL$=DUMMY$:PRINT DUMMY$;
1514 | 210 NL=VAL(NL$)-2:NR=NL*4
 794 | 220 GOSUB 1230
1042 | 230 CLS:GOSUB 980
4359 | 240 LOCATE 13,19:PRINT "PLACE DISK ON DRIVE :A, PRESS SPACE BAR";:D1=1
2874 | 250 LOCATE 22,30:PRINT "Press 'Q' TO Quit";
3029 | 260 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 260
2844 | 280 ON 1+INSTR(" Qq",DUMMY$) GOTO 260,300,285,285
 838 | 285 CLOSE:END
4635 | 300 FOR XX=0 TO T:P$(XX)="":TAG(XX)=0:DA$(XX)="    ":F$(XX)="":E$(XX)="":
       NEXT XX
6232 | 310 DN$="":JJ=0:J=0:MAX=0:TT=0:T=0:Y=0:Z=0:D9$="":D8$="":D7$="":D6$="":D
       5$="":D4$="":D3$="":D2$="":D1$="":D0$="":W=0
3267 | 320 CLS:GOSUB 980:LOCATE 13,31:PRINT "READING DISK";
 793 | 330 GOSUB 1110
1251 | 335 LINE INPUT #2,FE$
3209 | 338 IF LEFT$(FE$,6)="Volume" THEN NAM$=MID$(FE$,8,8)
1247 | 340 LINE INPUT #2,FE$
6931 | 345 IF D1 THEN IF INSTR(FE$,"IO.SYS") OR INSTR(FE$,"IBMBIO.COM") THEN D1
```

Listing 1 continued

prompts you for a number, writes the first serial number to disk, and starts the larger program, EZLabel.BAS. Unless you change the program disk, you don't need to run EZINIT again, since the last serial number you use is written to disk.

EZLabel prompts you for the number of lines that you want on the label. The standard label allows five lines. Next, it lets you set up the printer by printing rows of X's. You can repeat the process as many times as necessary to get the labels in correct position on the printer. You won't be prompted for these entries again, unless you rerun the program.

With subscript you can get 24 file names, eight lines, on a standard label.

Next it prompts you to place a disk in drive A (or drive 1 on the Model 4). Assign the drive you want to use in lines 1120 and 1130. I use a hard disk, so my program disk is C. The disk I want to label is in drive A. If you use two floppies, I suggest that you change C to A and A to B. Now put the disk you want to label in the indicated drive, close the door, and press the spacebar.

The file LASTNR.DAT (LASTNR/DAT on the 4) is read, and you are asked if you want to continue the series of labels. If you choose not to continue, a new series starts.

At this point the directory is read, the files display on the screen, and you can tag the ones that you want to appear on the disk label by pressing the T key. Use the plus (+) and the minus (–) keys (up and down arrows on the 4) to scroll up and down. If you set the printer for condensed mode, the program lets you write four file names with extensions on each of the last three lines. (See Figure 1.) The first two lines are for disk name, number, and DOS. Thus, for five-line labels you can tag 12 files.

If you tag 12 files and decide that you want to tag a different file, you must untag one file by using the U key to tag another. The screen displays the number of files you can tag in the lower left corner and the total number of files you've tagged in the lower right corner. When you finish selecting files, you can print the label or quit.

After you print the label, you are prompted to place your next disk in the previously chosen drive. After pressing the spacebar you get the next disk number, and the cycle continues.

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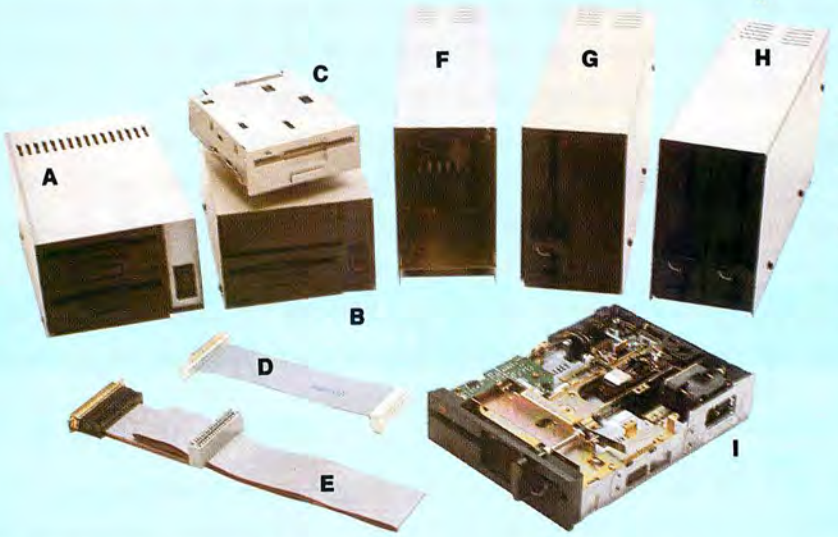

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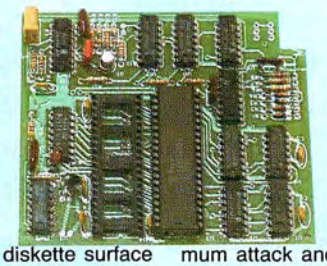

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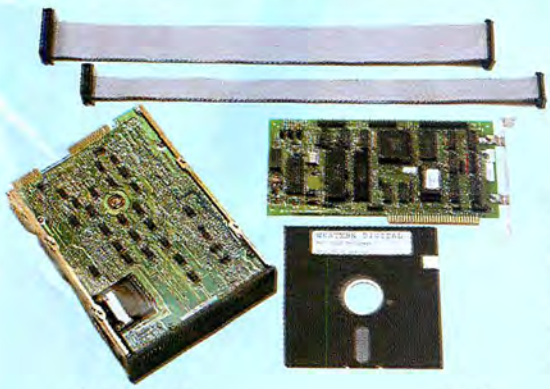

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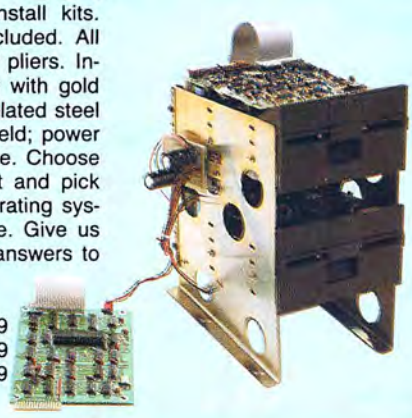

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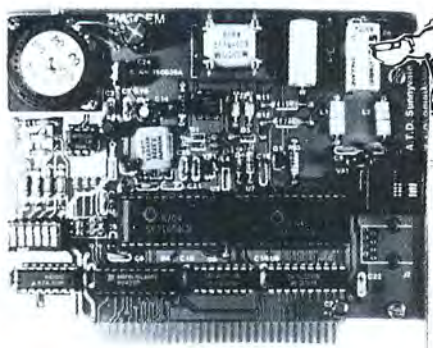

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Listing 1 continued

```
          =0:DISK$="SYSTEM" ELSE DISK$="DATA":D1=1
1891 | 350 IF LEFT$(FE$,6)="          " THEN 380
2300 | 360 IF LEFT$(FE$,3)="   " THEN 420 ELSE 340
6707 | 380 IF RIGHT$(FE$,3)="COM" OR RIGHT$(FE$,3)="EXE" OR RIGHT$(FE$,3)="BAS"
        THEN E$(T)=RIGHT$(FE$,3):GOTO 390 ELSE 340
2514 | 390 F$(T)=RIGHT$(FE$,12):F$(T)=LEFT$(F$(T),8)
2719 | 400 P1=INSTR(F$(T),"\"):IF P1 THEN 410 ELSE 415
2195 | 410 F$(T)=RIGHT$(F$(T),8-(P1)):GOTO 415
3596 | 415 LL=LEN(F$(T)):F$(T)=F$(T)+STRING$(8-LL," "):T=T+1:GOTO 340
1412 | 420 DD!=VAL(LEFT$(FE$,9))
2531 | 430 IF DD!>700000! THEN SID$="QUAD":GOTO 435
2521 | 431 IF DD!>350000! THEN SID$="DSDD":GOTO 435
2535 | 432 IF DD!>150000! THEN SID$="SSDD":GOTO 435
 892 | 433 SID$="SSSD"
 943 | 435 CLOSE:T=T-1
 761 | 480 GOSUB 760
 803 | 490 GOSUB 1320
3038 | 600 REM ********* SET UP TO PRINT LABELS ***************
1042 | 610 FOR XX=0 TO T
3331 | 620 IF TAG(XX) THEN P$(J)=P$(J)+F$(XX)+E$(XX)+"   ":JJ=JJ+1
1604 | 630 IF JJ=4 THEN JJ=0:J=J+1
 713 | 640 NEXT XX
2803 | 650 REM ************* PRINT LABELS *********************
1747 | 660 LPRINT LARGE$;NAM$;" #"DN
3297 | 670 LPRINT CONDENSED$;DOS$;" ";DISK$;" ";SID$;NORMAL$
1119 | 680 FOR XX=0 TO NL
1069 | 690 LPRINT P$(XX)
 710 | 700 NEXT XX
1377 | 710 LPRINT STANDARD$;
1606 | 720 OPEN "O",1,"LASTNR.DAT"
 923 | 730 WRITE #1,DN$
 561 | 740 CLOSE
 682 | 750 GOTO 230
2376 | 760 REM ***************** MENU *********************
 809 | 770 GOSUB 1190
1275 | 780 ADV=1:DN=VAL(DN$)
3413 | 790 IF ADV THEN LOCATE 13,26:PRINT "      DISK NO.  <"DN">";
5818 | 800 IF ADV THEN LOCATE 14,14:PRINT "DO YOU WANT TO CONTINUE SERIES <Y>/<
        N>.....< >";:GOTO 830
2901 | 810 LOCATE 13,26:PRINT "ENTER DISK NO.  < .... >";
4532 | 820 LOCATE 14,13:PRINT "DO YOUR WANT A SERIES OF NUMBERS <Y>/<N>... < >"
        ;
1823 | 830 LOCATE 13,44:PRINT "";:P=43
1104 | 840 IF ADV THEN 920
 500 | 850 DN$=""
3110 | 860 DUMMY$="":WHILE DUMMY$="":DUMMY$=INKEY$:WEND
9807 | 870 IF DUMMY$=CHR$(8) THEN IF LEN(DN$)=0 THEN 860 ELSE P=POS(X)-1:LOCATE
         13,P:PRINT ".";:LOCATE 13,P:PRINT "";:DN$=LEFT$(DN$,LEN(DN$)-1):GOT
        O 860 : REM BACKSPACE
3100 | 880 IF DUMMY$=CHR$(13) THEN 910 ELSE PRINT DUMMY$;
2446 | 890 DN$=DN$+DUMMY$:IF LEN(DN$)=4 THEN 910
 688 | 900 GOTO 860
 883 | 910 DN=VAL(DN$)
 913 | 920 LOCATE 14,58
3037 | 930 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 930
3662 | 940 ON 1+INSTR(" YyNnQq",DUMMY$) GOTO 930,930,950,950,960,960
2035 | 950 ADV=1:PRINT DUMMY$;:RETURN
3317 | 960 IF ADV THEN 970 ELSE ADV=0:PRINT DUMMY$;:RETURN
1076 | 970 ADV=0:GOTO 810
2341 | 980 REM ***************** INTRO ******************
1309 | 990 K3$=STRING$(80,219)
1831 | 1000 CLS:LOCATE 1,1:PRINT K3$;
5148 | 1010 FOR MM=1 TO 24:LOCATE MM,1:PRINT CHR$(219);:LOCATE MM,80:PRINT CHR$
        (219);:NEXT
2748 | 1020 LOCATE 24,1:PRINT K3$;:IF B THEN RETURN
2332 | 1030 LOCATE 5,29:PRINT STRING$(21,223);
2606 | 1040 LOCATE 6,29:PRINT "D I S K   L A B E L S";
2336 | 1050 LOCATE 7,29:PRINT STRING$(21,223);
3795 | 1060 LOCATE 12,18:PRINT "A U T O - L A B E L I N G   F O R  D I S K";
2410 | 1070 LOCATE 17,32:PRINT "S O F T W A R E";
3502 | 1080 LOCATE 20,27:PRINT "WRITTEN BY WILLIAM MCMULLAN";
2069 | 1090 FOR MM=1 TO 5000:NEXT MM:MM=0
 706 | 1100 RETURN
1974 | 1110 REM ******** OPEN FILES *********
2195 | 1120 SHELL "CHKDSK A:/V > C:DIR.LST"
1874 | 1130 SHELL "VER A: > C:VER.LST"
1427 | 1140 OPEN "I",2,"DIR.LST"
1441 | 1150 OPEN "I",1,"VER.LST"
1552 | 1160 LINE INPUT #1,DUMMY$
1900 | 1170 LINE INPUT #1,DOS$:CLOSE 1
3485 | 1180 P1=INSTR(DOS$," "):P2=INSTR(P1+1,DOS$," "):L=LEN(DOS$)
2761 | 1185 DOS$=LEFT$(DOS$,P1-1)+" "+RIGHT$(DOS$,L-P2)
1650 | 1190 OPEN "I",1,"LASTNR.DAT"
 969 | 1200 INPUT #1,DN$
1419 | 1210 DN$=STR$(VAL(DN$)+1)
1222 | 1220 CLOSE 1:RETURN
2407 | 1230 REM ********* SET UP PRINTER ***********
3388 | 1240 LOCATE 13,26:PRINT "   SET UP PRINTER <Y>/<N>       ";
3125 | 1250 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 1250
3407 | 1260 IF DUMMY$="Y" OR DUMMY$="y" THEN 1270  ELSE RETURN
1409 | 1270 FOR M=1 TO VAL(NL$)
1629 | 1280 LPRINT STRING$(32,"X")
 664 | 1290 NEXT M
 701 | 1300 LPRINT
1926 | 1310 B=1:CLS:GOSUB 980:GOTO 1240
2227 | 1320 REM *********** TAG FILES **************
 457 | 1330 CLS
2326 | 1340 LOCATE 3,20:PRINT STRING$(40,223);
3604 | 1350 LOCATE 4,27:PRINT "<PLUS KEY> = Next Filename";
4124 | 1360 LOCATE 5,27:PRINT "<MINUS KEY> = Previous Filename";
2555 | 1370 LOCATE 6,27:PRINT "<T> = Tag File";
2785 | 1380 LOCATE 7,27:PRINT "<U> = Untag File";
```

Listing 1 continued

I wrote the program for the Radio Shack DMP 400 printer. If you have a different printer, you might need to change the printer codes in lines 100–140 for Listing 1 or lines 90–140 in Listing 3. Notice in Listings 1 and 3 that I include the Epson printer codes as remark statements.

If you have a printer that prints subscript, you can use that size of type instead of condensed type. For the Epson use:

```
130 CONDENSED$ = CHR$(15) + CHR$(27) +
  "SO" + CHR$(27) + "A" + CHR$(6)
140 STANDARD$ = CHR$(18) + CHR$(27) + "T"
  + CHR$(27) + "A" + CHR$(12)
```

You might need to wear your bifocals, but you can get 24 file names on a standard label. The label will contain eight lines. (See Figure 2.)

The Model 4 Version

When you run Listing 3, EZLabel/BAS, the initialization is done in the beginning of the program. The program reads the DIR/SYS file on the Model 4 disk and collects all the necessary information for the label: the number of sides, density, DOS format, whether it is a system or a data disk, the name of the disk, and the file names.

In the following demonstration listing, notice how the disk-labeling program gets the directory to complete the label:

```
10 OPEN "R",1,"DIR/SYS:1",32
20 FIELD 1,1 AS A$,4 AS B$,8 AS F$,3 AS E$,16
   AS C$
30 FOR X = 16 TO LOF(1)
40 GET 1,X
50 IF A$ = CHR$(0) THEN 80 ELSE 70
60 PRINT F$;"/";E$
70 NEXT
80 CLOSE
```

The directory opens as a direct-access file with a record length of 32. The list of file names starts at record number 16. String variable F$ represents the file name, and E$ represents the extension. String variables B$ and C$ in this case are dummies that aren't used. In line 50, A$ is checked to see if it is a null character. If it is, there is either no file or a closed file at the location being read and the next file position is examined.

You can change line 540 in Listing 3 to select the files that you want to display. Line 540 checks the extensions, and only those of interest are kept. I chose to display CMD, BAS, TXT, and DOC files.

After the printer is set up, you are prompted to put your disk in drive 1. If you prefer a different drive, press the number that you want, and the number changes on the screen. Place the disk you want to label in the drive, close the door, and press the spacebar. ■

William McMullan is a self-employed electronics technician, a ham-radio operator, and a computer hacker. You can write him at Route 6, Box 1, Bastrop, LA 71220.

Listing 1 continued

```
2892 | 1390 LOCATE 8,27:PRINT "<P> = Print Label";
2268 | 1400 LOCATE 9,27:PRINT "<Q> = Quit";
2330 | 1410 LOCATE 10,9:PRINT STRING$(62,220);
5716 | 1420 LOCATE 11,28:PRINT "TAG";:LOCATE 11,34:PRINT "Filename";:LOCATE 11,
       44:PRINT "Ext.";
5773 | 1430 LOCATE 12,28:PRINT "  ___ ";:LOCATE 12,34:PRINT "  ________ ";:LOCATE 12,
       44:PRINT "  ___ ";
1204 | 1440 IF W>T THEN W=0
1235 | 1450 IF W<0  THEN W=T
2660 | 1460 IF TAG(W) THEN DA$(W)="*   " ELSE DA$(W)="    "
 851 | 1470 GOSUB 1600
5046 | 1480 LOCATE 22,11:PRINT "TAG ";NR;" FILES";:LOCATE 22,51:PRINT "FILES TA
       GGED ";TT;
2342 | 1490 LOCATE 23,9:PRINT STRING$(62,220);
2460 | 1500 QU$="":WHILE QU$="":QU$=INKEY$:WEND
2202 | 1510 IF TT=NR THEN MAX=1 ELSE MAX=0
5398 | 1520 ON 1+INSTR(" +TtUu-PpQq",QU$) GOTO 1560,1500,1580,1530,1530,1540,15
       40,1550,600,600,1570,1570
4895 | 1530 IF MAX=0 THEN IF TAG(W) THEN 1580 ELSE TAG(W)=1:TT=TT+1:DA$(W)="*
       ":GOTO 1580
3439 | 1540 IF TAG(W) THEN TAG(W)=0:TT=TT-1:DA$(W)="   ":GOTO 1580
1169 | 1550 W=W-1:GOTO 1450
 884 | 1560 CLOSE:END
 569 | 1570 QU$=""
1170 | 1590 W=W+1:GOTO 1440
2294 | 1600 REM ***** GET READY TO SCROLL *****
2463 | 1610 W4=W-4:IF W4 < 0 THEN W4=(T+1)-ABS(W4)
2459 | 1620 W3=W-3:IF W3 < 0 THEN W3=(T+1)-ABS(W3)
2455 | 1630 W2=W-2:IF W2 < 0 THEN W2=(T+1)-ABS(W2)
2451 | 1640 W1=W-1:IF W1 < 0 THEN W1=(T+1)-ABS(W1)
 519 | 1650 W0=W
2210 | 1660 W5=W+1:IF W5 > T THEN W5=W5-(T+1)
2216 | 1670 W6=W+2:IF W6 > T THEN W6=W6-(T+1)
2222 | 1680 W7=W+3:IF W7 > T THEN W7=W7-(T+1)
2228 | 1690 W8=W+4:IF W8 > T THEN W8=W8-(T+1)
1691 | 1700 REM ******** SCROLL ********
5285 | 1710 LOCATE  13,29:PRINT DA$(W4);:LOCATE  13,34:PRINT F$(W4);:LOCATE  13
       ,44:PRINT E$(W4);
5286 | 1720 LOCATE  14,29:PRINT DA$(W3);:LOCATE  14,34:PRINT F$(W3);:LOCATE  14
       ,44:PRINT E$(W3);
5287 | 1730 LOCATE  15,29:PRINT DA$(W2);:LOCATE  15,34:PRINT F$(W2);:LOCATE  15
       ,44:PRINT E$(W2);
5288 | 1740 LOCATE  16,29:PRINT DA$(W1);:LOCATE  16,34:PRINT F$(W1);:LOCATE  16
       ,44:PRINT E$(W1);
8360 | 1750 LOCATE  17,26:PRINT ">";:LOCATE  17,29:PRINT DA$(W0);:LOCATE  17,3
       4:PRINT F$(W0);:LOCATE  17,44:PRINT E$(W0);:LOCATE  17,47:PRINT "<-
       ";
5308 | 1760 LOCATE  18,29:PRINT DA$(W5);:LOCATE  18,34:PRINT F$(W5);:LOCATE  18
       ,44:PRINT E$(W5);
5315 | 1770 LOCATE  19,29:PRINT DA$(W6);:LOCATE  19,34:PRINT F$(W6);:LOCATE  19
       ,44:PRINT E$(W6);
5295 | 1780 LOCATE  20,29:PRINT DA$(W7);:LOCATE  20,34:PRINT F$(W7);:LOCATE  20
       ,44:PRINT E$(W7);
5302 | 1790 LOCATE  21,29:PRINT DA$(W8);:LOCATE  21,34:PRINT F$(W8);:LOCATE  21
       ,44:PRINT E$(W8);
 730 | 1799 RETURN
 474 | 9998 END
1434 | 9999 SAVE "EZLABEL.BAS"
```

End

Program Listing 2. EZINIT.BAS.

```
3141 | 10 REM ***** INITIALIZES THE LABELING PROGRAM *****
2655 | 20 CLS:PRINT "ENTER THE DISK NUMBER YOU"
2581 | 30 INPUT "WOULD LIKE TO BEGIN WITH.";A$
2021 | 40 A=VAL(A$):A=A-1:IF A < 0 THEN A=0
 726 | 50 A$=STR$(A)
2703 | 60 OPEN "O",1,"LASTNR.DAT":PRINT #1,A$:CLOSE
1251 | 70 RUN "EZLABEL.BAS"
```

End

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Program Listing 3. The Model 4 version of EZLabel.

```
 2435 | 10 REM ************ MOD 4 VERSION **************
 2515 | 50 REM ********** EZLABEL/BAS VER 1.2 **********
 4941 | 60 CLEAR:DEFINT A-Z:OPEN "O",1,"LASTNR/DAT:0":A=LOF(1):IF A=0 THEN PRIN
        T #1,"0000"
 5363 | 90 CLOSE:CL$=STRING$(76," "):LARGE$=CHR$(27)+CHR$(14):REM EPSON LARGE$=
        CHR$(27)+"W"+CHR$(1)
 4022 | 120 NORMAL$=CHR$(27)+CHR$(15):REM EPSON NORMAL$=CHR$(27)+"W"+CHR$(0)
 3793 | 130 CONDENSED$=CHR$(27)+CHR$(20):REM EPSON CONDENSED$=CHR$(15)
 3673 | 140 STANDARD$=CHR$(27)+CHR$(19):REM EPSON STANDARD$=CHR$(18)
 8318 | 150 DR$="1":DIM F$(300),E$(300),TAG(300),P$(50),DA$(300):GOSUB 980:B=1:
        CLS:GOSUB 980:PRINT @(12,25),"NO. OF LINES ON LABEL  < >";:PRINT @(
        12,49),"";
 3033 | 190 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 190
 3904 | 200 NL$=DUMMY$:PRINT DUMMY$;:NL=VAL(NL$)-2:NR=NL*4:GOSUB 1230
 4629 | 230 CLS:GOSUB 980:PRINT @(11,19),"PRESS NUMBER OF DRIVE TO CHANGE DRIVE
        ";
 5523 | 240 PRINT @(12,18),"PLACE DISK ON DRIVE :";DR$;", PRESS SPACE BAR";:PRI
        NT @(21,29),"Press 'Q' TO Quit";
 3029 | 260 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 260
 2915 | 270 IF DUMMY$="Q" OR DUMMY$="q" THEN CLOSE:END
 2325 | 280 IF DUMMY$<"0" OR DUMMY$>"7" THEN 300
 1419 | 290 DR$=DUMMY$:GOTO 240
11354 | 300 FOR XX=0 TO T:P$(XX)="":TAG(XX)=0:DA$(XX)=" ":F$(XX)="":E$(XX)="":N
        EXT XX:DN$="":JJ=0:J=0:MAX=0:TT=0:T=0:Y=0:Z=0:D9$="":D8$="":D7$="":
        D6$="":D5$="":D4$="":D3$="":D2$="":D1$="":D0$="":W=0:GOSUB 1150
10312 | 330 CLS:GOSUB 980:PRINT @(12,30),"READING DISK";:GET 2,7:NN1$=NN$:DD1$=
        DD$:TT1$=TT$:SS1$=SS$:NAM$=NN1$:SY=ASC(SS1$):IF 128 AND SY THEN DIS
        K$="DATA" ELSE DISK$="SYSTEM"
 3349 | 390 IF 64 AND SY THEN DENSITY$="DD" ELSE DENSITY$="SD"
 2864 | 400 IF 32 AND SY THEN SIDE$="DS" ELSE SIDE$="SS"
 2893 | 410 DS=ASC(DD1$):IF DS=99 THEN DOS$="TRSDOS 6.3"
 2106 | 430 IF DS=98 THEN DOS$="TRSDOS 6.2"
 2105 | 440 IF DS=97 THEN DOS$="TRSDOS 6.1"
 2174 | 450 IF DS=81 THEN DOS$="LSDOS 5.1.x"
 4059 | 460 TR=35+ASC(TT1$):SID$=SIDE$+DENSITY$:IF TR>43 THEN SID$="QUAD"
 6993 | 490 GOSUB 760:CLS:GOSUB 980:PRINT @(12,30),"READING DISK";:GOSUB 1110:F
        OR X=16 TO 288:GET 1,X:IF A$=CHR$(0) THEN 570
 3905 | 540 IF E$="BAS" OR E$="CMD" OR E$="DOC" OR E$="TXT" THEN 550 ELSE 570
 3469 | 550 A1$=A$:B1$=B$:F1$=F$:E1$=E$:C1$=C$:F$(T)=F1$:E$(T)=E1$:T=T+1
 1992 | 570 NEXT:T=T-1:CLOSE:GOSUB 1320
 3038 | 600 REM ********* SET UP TO PRINT LABELS ***************
 4247 | 610 FOR XX=0 TO T:IF TAG(XX) THEN P$(J)=P$(J)+F$(XX)+E$(XX)+"   ":JJ=JJ
        +1
 1604 | 630 IF JJ=4 THEN JJ=0:J=J+1
 3387 | 640 NEXT XX:REM ************ PRINT LABELS *********************
12037 | 660 LPRINT LARGE$;NAM$;" #"DN:LPRINT CONDENSED$;DOS$;" ";DISK$;" ";SID$
        ;NORMAL$:FOR XX=0 TO NL:LPRINT P$(XX):NEXT XX:LPRINT STANDARD$;:OPE
        N "O",1,"LASTNR/DAT:0":WRITE #1,DN$:CLOSE:GOTO 230
 2376 | 760 REM *************** MENU *********************
 4887 | 770 GOSUB 1190:ADV=1:DN=VAL(DN$):IF ADV THEN PRINT @(12,25),"      DISK
         NO.  <"DN">";
 5475 | 800 IF ADV THEN PRINT @(13,13),"DO YOU WANT TO CONTINUE SERIES <Y>/<N>.
        ....< >";:GOTO 830
 6619 | 810 PRINT @(12,25),"ENTER DISK NO.  < .... >";:PRINT @(13,12),"DO YOUR
        WANT A SERIES OF NUMBERS <Y>/<N>... < >";
 2454 | 830 PRINT @(12,43),"";:P=43:IF ADV THEN 920
  500 | 850 DN$=""
12037 | 860 DUMMY$="":WHILE DUMMY$="":DUMMY$=INKEY$:WEND:IF DUMMY$=CHR$(8) THEN
         IF LEN(DN$)=0 THEN 860 ELSE P=POS(X)-2:PRINT @(12,P),".";:PRINT @(
        12,P),"";:DN$=LEFT$(DN$,LEN(DN$)-1):GOTO 860:REM BACKSPACE
 3100 | 880 IF DUMMY$=CHR$(13) THEN 910 ELSE PRINT DUMMY$;
 2446 | 890 DN$=DN$+DUMMY$:IF LEN(DN$)=4 THEN 910
  688 | 900 GOTO 860
  883 | 910 DN=VAL(DN$)
 1184 | 920 PRINT @(13,57),"";
 3037 | 930 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 930
 3662 | 940 ON 1+INSTR(" YyNnQq",DUMMY$) GOTO 930,930,950,950,960,960
 2035 | 950 ADV=1:PRINT DUMMY$;:RETURN
 3317 | 960 IF ADV THEN 970 ELSE ADV=0:PRINT DUMMY$;:RETURN
```

Listing 3 continued

Listing 3 continued

```
 1076 | 970 ADV=0:GOTO 810
 2341 | 980 REM *************** INTRO ******************
 9161 | 990 K3$=STRING$(80,131):CLS:PRINT @(1,0),K3$;:FOR MM=1 TO 22:PRINT @(MM
        ,0),CHR$(191);:PRINT @(MM,79),CHR$(191);:NEXT:PRINT @(23,0),K3$;:IF
        B THEN RETURN
11070 | 1030 PRINT @(4,28),STRING$(21,131);:PRINT @(5,28),"D I S K   L A B E L
        S";:PRINT @(6,28),STRING$(21,140);:PRINT @(11,17),"A U T O - L A B
         E L I N G   F O R   D I S K";:PRINT @(16,31),"S O F T W A R E";
 5599 | 1080 PRINT @(19,26),"WRITTEN BY WILLIAM MCMULLAN";:FOR MM=1 TO 5000:NEX
        T MM:MM=0:RETURN
 2605 | 1110 REM ******** OPEN FILES AND FIELD *********
 4398 | 1120 OPEN "R",1,DIR$,32:FIELD 1,1 AS A$,4 AS B$,8 AS F$,3 AS E$,16 AS C
        $:RETURN
 7092 | 1150 DIR$="DIR/SYS:"+DR$:OPEN "R",2,DIR$,32:FIELD 2,11 AS AX$,1 AS DD$,
        1 AS TT$,1 AS SS$,2 AS BX$,8 AS NN$,8 AS CX$:RETURN
 4857 | 1190 OPEN "I",1,"LASTNR/DAT:0":INPUT #1,DN$:DN$=STR$(VAL(DN$)+1):CLOSE
        1:RETURN
 2407 | 1230 REM ********* SET UP PRINTER ***********
 3045 | 1240 PRINT @(12,25),"   SET UP PRINTER <Y>/<N>       ";
 3125 | 1250 DUMMY$="":DUMMY$=INKEY$:IF DUMMY$="" THEN 1250
 3375 | 1260 IF DUMMY$="Y" OR DUMMY$="y" THEN 1270 ELSE RETURN
 5633 | 1270 FOR M=1 TO VAL(NL$):LPRINT STRING$(32,"X"):NEXT M:LPRINT:B=1:CLS:G
        OSUB 980:GOTO 1240
 2227 | 1320 REM *********** TAG FILES **************
15778 | 1330 CLS:PRINT @(2,19),STRING$(40,131);:PRINT @(3,26),"<DOWN ARROW> = N
        ext Filename";:PRINT @(4,26),"< UP ARROW > = Previous Filename";:P
        RINT @(5,26),"<T> = Tag File";:PRINT @(6,26),"<U> = Untag File";:P
        RINT @(7,26),"<P> = Print Label";
12786 | 1400 PRINT @(8,26),"<Q> = Quit";:PRINT @(9,8),STRING$(62,131);:PRINT @(
        10,27),"TAG";:PRINT @(10,33),"Filename";:PRINT @(10,43),"Ext.";:PR
        INT @(11,27),"___";:PRINT @(11,33),"________";:PRINT @(11,43),"___
 1204 | 1440 IF W>T THEN W=0
 1203 | 1450 IF W<0 THEN W=T
 2660 | 1460 IF TAG(W) THEN DA$(W)="*  " ELSE DA$(W)="   "
 6852 | 1470 GOSUB 1600:PRINT @(21,10),"TAG ";NR;" FILES";:PRINT @(21,50),"FILE
        S TAGGED ";TT;:PRINT @(22,8),STRING$(62,131);
 4489 | 1500 QU$="":WHILE QU$="":QU$=INKEY$:WEND:IF TT=NR THEN MAX=1 ELSE MAX=0
 1683 | 1515 IF QU$=CHR$(11) THEN 1580
 1681 | 1517 IF QU$=CHR$(10) THEN 1550
 4813 | 1520 ON 1+INSTR(" TtUuPpQq",QU$) GOTO 1500,1500,1530,1530,1540,1540,600
        ,600,1570,1570
 4895 | 1530 IF MAX=0 THEN IF TAG(W) THEN 1580 ELSE TAG(W)=1:TT=TT+1:DA$(W)="*
         ":GOTO 1580
 3439 | 1540 IF TAG(W) THEN TAG(W)=0:TT=TT-1:DA$(W)="   ":GOTO 1580
 1169 | 1550 W=W-1:GOTO 1450
  884 | 1570 CLOSE:END
 1558 | 1580 QU$="":W=W+1:GOTO 1440
 2294 | 1600 REM ***** GET READY TO SCROLL *****
 2399 | 1610 W4=W-4:IF W4<0 THEN W4=(T+1)-ABS(W4)
 2395 | 1620 W3=W-3:IF W3<0 THEN W3=(T+1)-ABS(W3)
 2391 | 1630 W2=W-2:IF W2<0 THEN W2=(T+1)-ABS(W2)
 2387 | 1640 W1=W-1:IF W1<0 THEN W1=(T+1)-ABS(W1)
 2486 | 1650 W0=W:W5=W+1:IF W5>T THEN W5=W5-(T+1)
 2152 | 1670 W6=W+2:IF W6>T THEN W6=W6-(T+1)
 2158 | 1680 W7=W+3:IF W7>T THEN W7=W7-(T+1)
 2164 | 1690 W8=W+4:IF W8>T THEN W8=W8-(T+1)
 1691 | 1700 REM ******* SCROLL *********
12130 | 1710 PRINT @(12,28),DA$(W4);:PRINT @(12,33),F$(W4);:PRINT @(12,43),E$(W
        4);:PRINT @(13,28),DA$(W3);:PRINT @(13,33),F$(W3);:PRINT @(13,43),
        E$(W3);:PRINT @(14,28),DA$(W2);:PRINT @(14,33),F$(W2);:PRINT @(14,
        43),E$(W2);
10469 | 1740 PRINT @(15,28),DA$(W1);:PRINT @(15,33),F$(W1);:PRINT @(15,43),E$(W
        1);:PRINT @(16,25),"->";:PRINT @(16,28),DA$(W0);:PRINT @(16,33),F$
        (W0);:PRINT @(16,43),E$(W0);:PRINT @(16,46),"<-";
12207 | 1760 PRINT @(17,28),DA$(W5);:PRINT @(17,33),F$(W5);:PRINT @(17,43),E$(W
        5);:PRINT @(18,28),DA$(W6);:PRINT @(18,33),F$(W6);:PRINT @(18,43),
        E$(W6);:PRINT @(19,28),DA$(W7);:PRINT @(19,33),F$(W7);:PRINT @(19,
        43),E$(W7);
 4715 | 1790 PRINT @(20,28),DA$(W8);:PRINT @(20,33),F$(W8);:PRINT @(20,43),E$(W
        8);:RETURN
```

End

A Real Bargain

It is difficult to sit in Washington at the end of the summer and think of Christmas, but, by the time this is published, not many shopping days will be left. In this month's column, I will look at a few items that would brighten anyone's stocking.

Borland Does It Again

Borland International is anathema to most software publishers because it originates tremendous software products that are dirt cheap. Several years ago, Borland rocked the software industry with the introduction of Turbo Pascal. How could an industrial-grade compiler run so fast, be so inexpensive, and take up so little space on your disk? Turbo Pascal has enjoyed enormous popularity and has created one of the largest "cults" in the software industry.

The microcomputer world badly needed Turbo Pascal. Unless you wanted to spend several hundred dollars for a compiler with a poor user interface, interpretive Basic or assembly language was your only alternative. Overnight, Turbo Pascal changed the programming environment, and Borland appears to be doing it again with Turbo C.

Turbo C is a robust compiler by any standards. Most important, Turbo C fully supports the original implementation published by Kernighan and Ritchie, as well as most of the features contained in the proposed American National Standards Institute (ANSI) standard. As it did for Turbo Pascal, Borland has added many significant enhancements that surpass these standards. Turbo C is one of the most flexible languages I have used other than Turbo Pascal.

Turbo C is a Winner

Compared to other low-cost C implementations, Turbo C is a winner. It can produce industrial-strength programs. The development environment is worlds ahead of any other compiler with this much power. It contains a full editor, project Make utility, compiler, and facilities for linking your modules into an executable program file. Borland provides full support for all possible Intel family memory models and for the math coprocessor (if available).

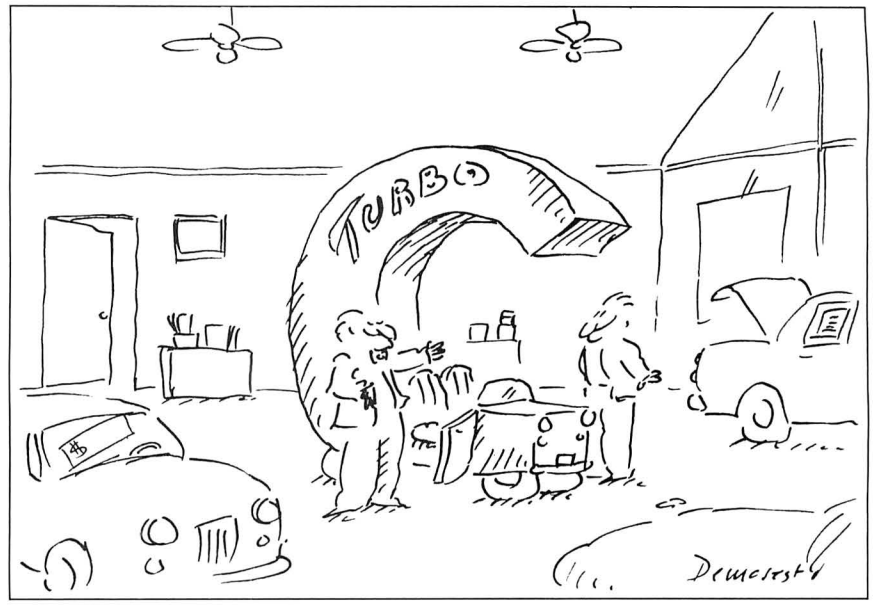


Illustration by Chris Demarest

Simple pull-down menus allow full control of all compiler options, including sophisticated code-generation selections and memory models. If the compiler detects errors, simple keystrokes step you through the source code and point out the exact location. You can control the compiler's error checking and reporting using simple menu selections, and, combined with the interactive error identification, this can be a powerful aid for program development. With all error-reporting options turned on, this feature is as good as any lint facility that you can find on the market.

For the more traditional C programmer, Turbo C provides a command-line compiler that will compile your program and automatically invoke the linker. This version of the compiler will accept multiple source files on one command line, and you can also include previously compiled object modules or libraries. Turbo C compiles the source files and automatically links the remaining files with the newly compiled object modules into an executable program. Borland includes several other utilities that increase your productivity.

Well-Written Documentation

The documentation exemplifies Borland's product line. It is well written, thoughtfully organized, and complete. The introduction to C and the chapters organized for the converted Pascal programmer are outstanding. The reference section is the best I have used. For $99.95, you can't go wrong—and for those who like to bargain hunt I have seen Turbo C discounted as low as $65.

Pixels, Pixels, and More Pixels

Are you as confused about the current status of video equipment as I am? Everywhere you turn, someone has a new Farkle-Zarp video board that claims extraordinary features. Many users have not considered this option because of the initial high costs. However, the current market has driven prices down to a reasonable level, and I have added an enhanced monitor and video card to my shopping list. I think I have a solution for everyone here, but I'll examine some of the terms first.

The standard low-resolution color system that comes on the IBM computers and compatibles is the Color Graphics Adapter (CGA) and monitor. This monitor can generate graphics in four colors at a resolution of 320 pixels horizontally by 200 pixels vertically. A medium-resolution mode exists with 640 by 200 pixels, but it is limited to two colors (background and foreground).

Another characteristic of these systems is that text reproduction is terrible, even on the highest-quality monitors. Characters are formed using a matrix of dots. The CGA's maximum resolution generates 25 lines of 80 characters using a character matrix of 8 by 8 dots. If you have one of these adapters, look at your screen and you will note that the characters are not well formed, and adjacent lines actually touch (i.e., descenders on characters such as "y" and "p" touch the tops of uppercase characters on the line below).

When IBM introduced the Enhanced Graphics Adapter (EGA) and monitor, visual displays for personal computers took a quantum leap.

This display adapter mimicked all the previous video modes with some significant advances. Because of the additional vertical resolution, characters now use an 8- by 14-dot matrix and are much better defined than with the older CGA. Full-screen text displays are much clearer because the larger character box allows for vertical separation between the text lines.

The biggest advantage of the EGA is the more flexible graphics support. The EGA provides graphics support modes with a maximum resolution of 640 pixels by 350 pixels. You can generate graphics using any one of 16 colors selected from a palette of 64. The EGA supports many other functions, such as alternative character sets and limited graphics primitives. All in all, this is a good alternative for a graphics system.

These. . . improvements will give you many hours of enjoyment.

A Video Standard

While IBM introduced the EGA, it certainly has not been responsible for its acceptance as a new video standard. The full-size IBM adapter card takes up a lot of real estate. The Chips and Technologies Chipset is largely responsible for the reduction in size and cost of a cloned EGA adapter. Many companies have used this chip set to provide a fully compatible EGA, and many have significant advances such as graphics resolutions as high as 800 by 560.

The current rage centers around IBM's introduction of the new graphics standard (Video Graphics Array) for the Personal System/2. The maximum resolution for this adapter is 640 by 480 pixels in 16 colors. The VGA also has a 320 by 200 resolution mode similar to the older CGA. Unlike the CGA, this adapter can generate any of 256 colors selected from a palette of up to 262,144. It has improved text capabilities over the EGA because it uses an 8- by 16-dot matrix for each character.

The monitors are substantially different. The monitors for the CGA and EGA use discrete digital signal levels. The newer monitors for the VGA are analog and account for the extraordinarily large number of colors available. The progression of increased capabilities in the graphics adapters is closely matched with a progression in price for suitable monitors. The analog monitors with high scanning rates capable of supporting the VGA-style graphics are tops on the list in price.

So what's in it for you? Tandy 1000 SX and 1000 TX owners, as well as those who have the Tandy 3000 and 4000, have a wide variety of monitors and adapters available. The Tandy adapter listed in the Table is an excellent choice for the 3000 and 4000 systems, but you need a short adapter card for the 1000 series computers. You can shop around and select one of the newer EGA cards that supports VGA capabilities and one of the multiscanning monitors for an exceptional graphics system, but EGA systems are an excellent lower-cost alternative. Expect to spend about $1,000 for this addition to your computer, depending on your selection, but you will find it worth it.

Owners of Tandy 1000s (pre-SX) should not despair. I have it on good faith from Hardin Brothers that Matthew Electronics has adapted a Chips and Technologies EGA card specifically for the 1000 and 1000A. This card should be available by the time this is published and will cost under $300 (see the Table for contact information). This is quite a present for the stalwart Tandy 1000 owner.

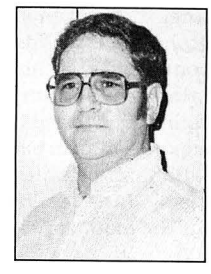
Conclusion

These two ideas for improvements will give you many hours of enjoyment.

I am sad to note that this marks the end of John's MS-DOS Column. This is my last regular column in *80 Micro*, but it is not the end of MS-DOS coverage. I have enjoyed this forum and your communications. I encourage each of you to continue writing and providing your support.■

Enhanced Graphics Monitor (EGM-1) 25-4035, $699 Enhanced Graphics Adapter 25-4037, $299.95 See the *1988 Tandy Computer Catalog & Software Reference Guide*
Tandy 1000/1000A Enhanced Graphics Adapter, under $300 Matthew Electronics 386 Avenida de la Vereda Ojai, CA 95023 805-646-7790
Turbo C Compiler, $99.95 Borland International 4585 Scotts Valley Drive Scotts Valley, CA 95066 408-438-8400

Table. Products mentioned in this column.



John B. Harrell III is a naval electronic warfare systems analyst. He programs in Pascal, C, and assembly language. Write to him c/o 80 Micro, *80 Elm St., Peterborough, NH 03458.*

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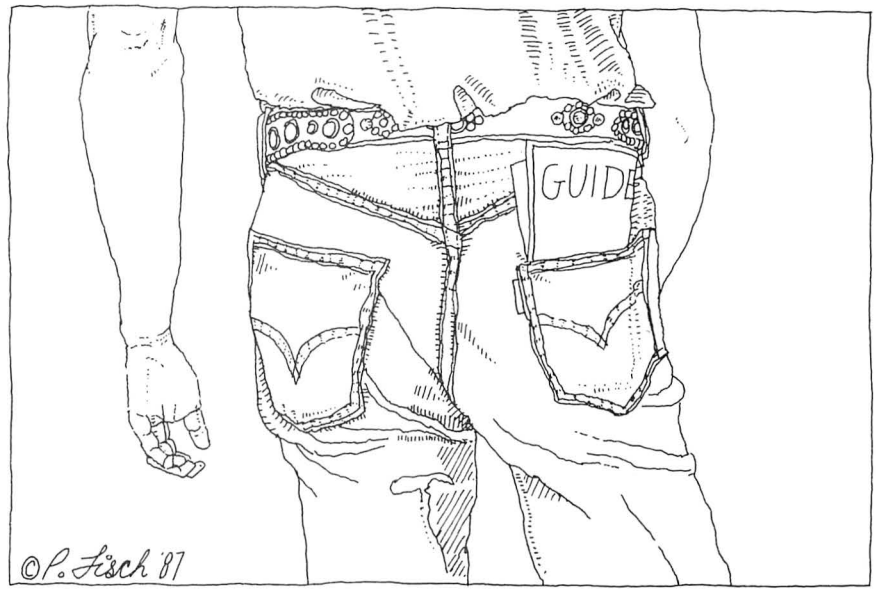
Ready References

Good reference books are something that no computer owner should be without. Hundreds appear in the bookstores each year, mostly proving science-fiction writer Theodore Sturgeon's theorem that "99 percent of everything is crap."

Superior references do exist, even ones specific to the Tandy 1000. I have three to recommend: *MS-DOS Advanced Applications*, by David A. Lien and Lewis Rosenfelder (Compusoft Publishing, 1986, available through Tandy, catalog no. 25-1507, $14.95), *PC-DOS/MS-DOS*, by Alan M. Boyd (Bantam Computer Books, 1985, $18.95), and *Learning Basic for Tandy Computers*, by David A. Lien (Compusoft Publishing, 1986, available through Tandy, catalog no. 25-1500, $19.95).



Not So Advanced

Don't be put off by the title of Lien and Rosenfelder's book. Tandy tends to be conservative with the books it commissions, bringing along readers slowly. I find it an excellent step-by-step guide to using Tandy's version of MS-DOS. It is advanced only in comparison to the manual that comes with the 1000.

MS-DOS Advanced Applications speaks directly to its readers in terms everyone can understand and includes many examples. This style is a trademark of author Lien, who wrote the original manual for the TRS-80 Model I. Rosenfelder is no slouch, either; he is one of the few authors who can describe technical topics to a novice audience with both clarity and authority.

Following the book chapter by chapter will teach you a good deal about MS-DOS, but its real value is as a reference. I often consult it when I'm unsure how to use an MS-DOS command or utility. A quick peek at its well-planned index tells me where to find my answer.

Lien and Rosenfelder don't tell you all about DOS. Their book lays out only basic ground rules. If you want to learn more about, say, batch files or file redirection, you'll need another reference. This is where Boyd's *PC-DOS/MS-DOS* comes in.

A Broader View

PC-DOS/MS-DOS covers much of the same material that *MS-DOS Advanced Applications* does. However, it differs in the author's approach and thoroughness. Boyd uses fewer examples but includes more background. His prose is not as elegant as Lien's or Rosenfelder's, yet he manages to describe the DOS functions in an efficient, unintimidating manner.

Boyd works for Microsoft Corp., the developer of MS-DOS. Therefore, he writes with authority and detail. Lien and Rosenfelder get you started, but *PC-DOS/MS-DOS* tells you how far you can go with DOS. It is by no means the definitive text on MS-DOS, but it is all most people will need.

What About Basic?

Knowing how to program is not essential, but it comes in handy. I don't write my own programs, but I know my way around Basic because I sometimes like to modify someone else's software. In any case, it can't hurt to have a good Basic reference nearby.

Learning Basic for Tandy Computers is good enough to teach you Basic programming by itself. Lien forces you to the keyboard with example after example. In fact, it's hard to find more than two consecutive paragraphs in the book. Even the examples are broken up by cartoons (which, I suppose, some of you will find corny).

As a reference, *Learning Basic for Tandy Computers* tells you what error messages mean, provides a chart of ASCII characters, and lists all reserved words. As a bonus, Lien includes a number of simple Basic programs such as a Dow Jones industrial average forecaster, games, and a 12-hour clock.

Learning Basic is a must if you have an interest in Basic programming. It makes Basic look simple and interesting. I'll even bet that most of you with no desire to program will be drawn in by Lien's approach.

Sneak Previews

I've come across a program for you cinema fans—or maybe not. The CMT Personal Movie Database lists over 2,000 movies that you can index by year made, title, category, actors, or rating. Its advantages over the paperback movie guides include the ability to find and print all movies that meet certain criteria and a notepad for you to comment on each movie (up to 16K).

I would prefer the book versions, but then I don't count cinema among my hobbies. Film aficionados will enjoy Personal Movie Database. It makes efficient use of windows; you just move the cursor to a function and press the enter key. The program requires 256K of memory, two floppy drives or one floppy and a hard drive, and a color or monochrome monitor. It comes on two disks and is not

Illustration by Paul Fisch

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when looking over the field this little "Help" message may be useful.

HOW TO READ A TAX SYSTEM AD

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We have had our system tested by this giant CPA firm and they just love it.	It hasn't been in use in the field to any extent yet and we are trying to get around this with double-talk.
Our system is 99% pure.	(Pure what?)
Don't believe what you read in tax system ads.	We have found out that most tax systems advertised go bust in a year or two but we are sure we'll make it.

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LET'S TALK PERFORMANCE:

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LET'S TALK FEATURES:

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Meanwhile, Back in 1066

It seems like everyone wanted a piece of England in medieval times. Saxons, Normans, Danes, Vikings, and various denominations of Celts each laid claim to all or part of it at one time or another. And now you can, too, with Mindscape's Defender of the Crown.

Mindscape calls this game an interactive movie, but its only movie-like aspects are the excessively long list of credits (though the program mercifully allows you to bypass it) and the packaging. It sports superb graphics, though I didn't like the red and green color scheme. The music is passable, and you can turn it off once the credits finish.

You play Defender of the Crown at several levels. You are a Saxon knight who competes against two other Saxon and three Norman knights for territory. The more territory you own, the more revenue you generate, and the more army, knights, and armament you can afford. If you don't feel like conquering land, you can host a joust, raid a castle, pass, or buy a home army. Jousting and raiding require arcade-like skill at the keyboard or joystick. To joust you must point your lance at a knight galloping toward you on his steed, and winning brings you fame or land. Raiding tests your skill with a sword; you get gold from a successful raid.

I enjoyed Defender of the Crown for a couple weeks, but now it bores me.

Winning land by conquest requires superior numbers and a little luck. You have the advantage of outside help from none other than Robin Hood, but only three times. Taking a castle requires a catapult and skill at using it.

I was at first impressed by Defender of the Crown. It seemed challenging, and it offered a lot of variety for one game. However, I soon found the proper strategy and mastered the use of the catapult. Jousting and raiding are fun, but not necessary to win the game.

I won't reveal how to win, but once you know, the challenge is gone. I will tell you that the key is knowing how to use the catapult. Defender of the Crown would benefit from a multiplayer option, which would prevent the game from becoming predictable.

I give Defender of the Crown a lukewarm recommendation. I enjoyed it greatly for a couple of weeks, but now it bores me. The game requires 256K of memory and one disk drive, and it is copy protected. It costs $39.95 from Mindscape Inc., 3444 Dundee Road, Northbrook, IL 60062, 312-480-7667.■

Michael E. Nadeau is 80 Micro's executive editor. He has been editing computer magazines for six years, using Tandy equipment all the while. Write to him c/o 80 Micro, 80 Elm St., Peterborough, NH 03458.

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Not all programs will run on your system. Some Model III programs, for instance, will run on the Model 4 in the Model III mode, but not in the Model 4 mode. You should check the system requirements box that accompanies the article to find out what system configuration individual programs require.

If you have any questions about the programs, call Keith Johnson at 603-924-9471. Yearly disk subscriptions to The *80 Micro* Disk Series are $149.95. Individual loaders are available on disk for $17.95, including postage. To place a subscription order, or to ask questions about your subscription, please call us toll free at 1-800-258-5473 24-hours a day. Or, you can write to The *80 Micro* Disk Series, 80 Elm St., Peterborough, NH 03458.

Let Your Printer Do the Labeling
Article: Label Your Disks. . .Automatically (p. 69).
System: Model 4/4P, 64K RAM, printer.
Now you don't need to label your disks by hand.
Language: Basic.
Filespec: EZLABEL/BAS.

Bonus Program, Putting on the Squeeze
System: Model 4/4P/4D, TRSDOS/LS-DOS 6.
Remove remarks and extra spaces and linefeeds (except within quoted strings and optionally saved remarks) from any Model 4 Basic program.
Language: Assembly.
Filespecs: PACK4/TXT, PACK4/CMD, PACK4/SRC.

Bonus Program, Removing SYSRES Files
System: Model 4/4P/4D, 64K RAM, TRSDOS/LS-DOS 6.
Remove your SYSRES files without rebooting your system.
Language: Assembly.
Filespecs: RMVRES/TXT, RMVRES/CMD, RMVRES/SRC.

In Search of Lost Sectors
Article: The Next Step (p. 89).
System: Model 4/4P/4D, LS-DOS 6.3, 128K RAM.
When you think you've lost a document, don't despair. Use this article to recover the lost sectors.
Language: Basic.
Filespecs: RECOVER/ASM, RECOVER/CMD, MACLIB/ASM.

BAS = Basic; ASM, SRC = source code; CMD = object code; TXT = text file
See page 6 for details on the quarterly disk series for the Tandy 1000/1200/3000.

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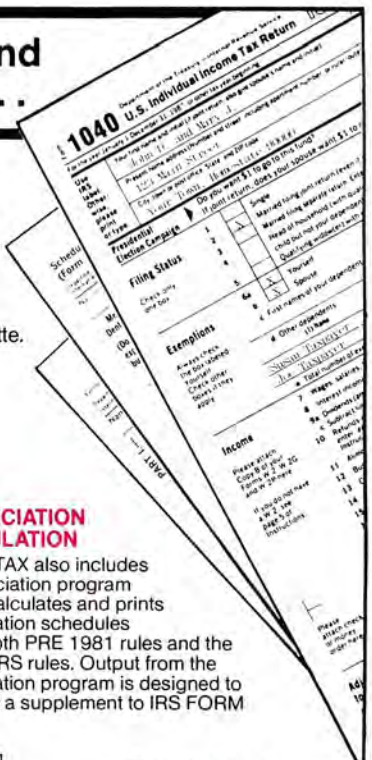

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FOR RETURN PREPARATION
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FOR DEPRECIATION CALCULATION
SUPERTAX also includes a depreciation program which calculates and prints depreciation schedules using both PRE 1981 rules and the new ACRS rules. Output from the depreciation program is designed to serve as a supplement to IRS FORM 4562.

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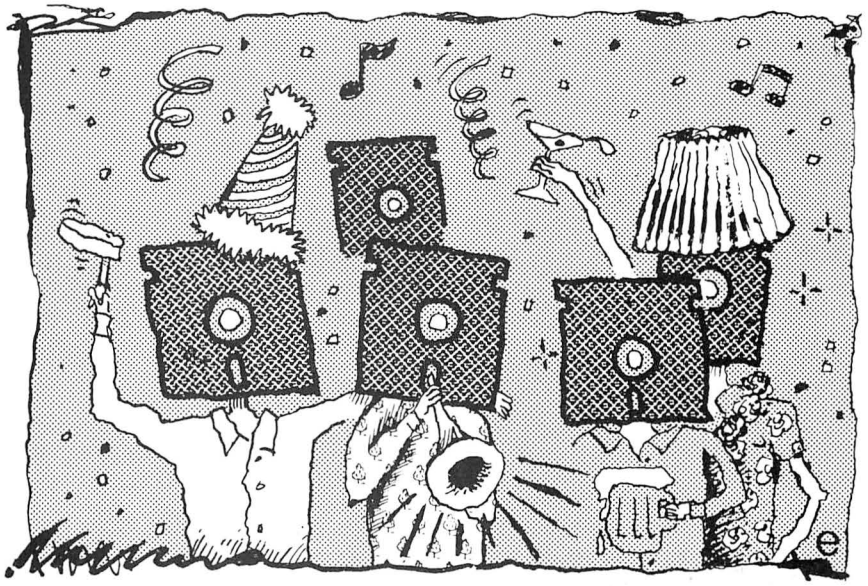


Illustration by Bob Eckstein

Although I'm preparing for this Christmas column in mid-September, it isn't hard to get into the Christmas mood as I describe this month's software. All the programs are for MS-DOS and run on PCs and compatibles, including the Tandy 1000. I tested the graphics programs on a Tandy 1000A color monitor with 640- by 200-pixel resolution. They do require a color graphics adapter (CGA). If you have a color monitor, you have a CGA.

Jingle

Ben Diaz Jr. created Jingle using a commercial program called Jingledisk. Jingledisk sells for $9.95 (High Tech Expressions, 2699 S. Bayshore Drive, Miami, FL 33133, 305-854-2318). Ben got High Tech's permission to put this "greeting card" in the public domain. Jingle is supposed to work on IBM PC and AT compatibles.

After you load Jingle, you get animated graphics with accompanying Christmas music. Among several impressive Christmas scenes are a train going around a track under the Christmas tree and next to a blazing fire. There is also the traditional march of the wooden soldiers. Both children and adults will enjoy this program.

Christmas Music

If you have ever heard Pianoman generate music, you understand the power of your computer's sound-generating capabilities. Xmas-PC and Xmas-AT are two sets of Christmas music that a Pianoman user, Leti Romito, keyed in. Each set of music is the same except for clock-speed timing. One set is for regular PC computers with a clock speed of 4.77 megahertz (MHz). The other set is for AT-style and other computers, such as the Tandy 1000 SX, that use higher clock speeds. The music includes 16 selections from "Adeste Fideles" to "Frosty the Snowman." Each musical selection is a stand-alone program that you run just by keying in the name.

Although these programs use only one voice, rather than the three that are available on the Tandy 1000 and the PCjr, you would never know it. The author of Pianoman has made it possible to create and edit music that switches rapidly enough between notes to give the illusion of polyphony.

Pianoman

Pianoman is an excellent shareware program by Neil J. Rubenking. If you like the program and use it, he requests a donation of $25. (See the Table for the address.) It is worth much more. Pianoman lets you play the keyboard of your computer like a piano or, since keys are in two banks, more like an organ. You can edit your music with a variety of commands, much like a word processor. You can move, insert, and delete notes, and make global changes. You can also change the tempo, octave, or staccato values in your tune. You can save files and retrieve them for further editing. Several help screens guide you through the process. Neil suggests that you have 256K of memory for Pianoman. With 256K, you can keep 30,000 notes in memory. If you want longer tunes, you can append them to a file in sections.

You can play a tune or part of it while in Pianoman, and a conversion utility called Player Piano makes your tune a self-running program. Player Piano offers four other options: You can create an external procedure for Turbo Pascal programs, create a file in BLoad format for Basic programs, create a Superkey macro, and combine two to four tunes to create one "polyphonic" tune. The self-running program is automatically set to your computer's clock speed. If you have an AT and try to play a tune created on a PC, the song will play fast. A timing utility will let you change the timing of particular songs to a different value for other computers. The default is the value needed for your own computer.

The author of Pianoman has created a large number of sample pieces that are worth the program's cost, even if you never create your own tunes. Examples that I like best are Monty Python's Theme, "Theme from the Entertainer," "Maple Leaf Rag," the "William Tell Overture," and "Chaconne" from the Partita No. 2 in D-Minor for Unaccompanied Violin. These are no small tunes. Some run as long as five minutes or more.

Drain

Drain is a cute program that you can put in your Autoexec batch file for an unsuspecting user. After you load it, Drain displays a cursor on the screen as if you are ready to begin using your computer. When you press any key, a "System error" message begins flashing on

your screen. You are told that water has been detected in drive A and that the computer is about to extract it. Drive A starts spinning, and your speaker emits a high-pitched whine that simulates a spin-dry cycle. After a few seconds, Drain tells you that everything is okay again and restores normal operation. The program is harmless but will definitely add a giggle to your day.

Max Headroom

Max Headroom is a short talking graphics program that displays a picture of Max and tells you to "Catch the Wave, Coke." It also informs you that "Pepsi Drinkers are DWEEBS!"

Speech

You can create your own talking computer. Speech is a program written by Andy McGuire to generate speech on a PC. When you run it, it stays resident in your computer for use by other programs. With it is a Basic program called Talkdemo to demonstrate how to use the Speech function from Basic. Speech supports 36 phonemes and gives you rules for how to use them. The phonemes are generated by one- or two-character codes and are listed in a documentation file. It's not as easy as spelling out a word, but trial and error will eventually get you there if you are patient.

A short driver program called Say, written by Thom Henderson, passes its command-line arguments to the Speech function, thus letting batch files generate speech. To use Say, you enter the program name and the text you want your computer to say using the phoneme rules. For example, to say "This is a test," you would enter the following command from DOS:

```
SAY tz-ih-s ih-z ah t-eh-s-t-t
```

The documentation defines a large number of words for you. For example, zero is z-ee-r-oh and December is d-ee-s-eh-m-b-uh-r. You can generate a large v-oh-k-ae-b-y-oo-l-ae-r-ee for your own use.

Talktime, by John Halloran, also uses the Speech program for talking. This program can give you the time every minute and even chimes on the hour.

When you load Speech, the program checks to see if it is already loaded. It will not load itself a second time. Unfortunately, depending on your other resident software and the configuration of your Tandy 1000, Speech might erroneously tell you that it is already loaded, and then it will not load. A 1-byte change to the program to eliminate error checking fixes the problem; I have made the change in the program and renamed it T1kspeak. T1kspeak is for use only if you cannot run the Speech program on your computer.

Pianoman
Neil J. Rubenking
300 Page St.
San Francisco, CA 94102
$25 asked for user support

WSSindex
Robert W. Babcock
WSS division of DDC
4 Reeves Road
Bedford, MA 01730
$25 asked for user support

Table. User-supported software discussed this month.

Yigart

Yigart is a graphics demonstration by Yig. This program displays continuously changing geometric shapes in color on your screen. Several interesting pattern types appear in constant motion. The program runs as long as you want it to. Just hit any key to end it.

WSSindex

The only useful program (other than for entertainment) this month is WSSindex, written by Robert W. Babcock. This is a shareware program that has been around for a while but has now evolved into a fancy program for cataloging files stored on your floppy or hard disks. If you try it and like it, I urge you to send $25 to the author as a donation (see the Table). Without financial encouragement, this program would never have evolved as it has. The latest version is 3.2.

WSSindex creates a data base that allows optional comments and categories describing each file. It tells you what programs you have and what disk and subdirectory they are in. You can print the information to screen, printer, or disk file using various sorting options, including a wild card to pick out files that match certain specifiers. You even have the option of cataloging those program names that are included in an archived file. Another utility custom-prints the data base in an enhanced way.

The author also includes an unrelated file called CP2 with WSSindex. This public-domain cut-and-paste utility copies text from the computer screen and saves it until you paste it somewhere else. I described CP2 in a previous column (June 1987, p. 96).

Using WSSindex is easy. Just put your disk in the drive and read it with the program. WSSindex automatically generates the data base. An included utility imports file descriptions from any ASCII text file into the data base. The file descriptions will follow the same program names found in the data base. If the program finds no match, it discards the description. Bulletin boards have public-domain file lists with descriptions of everything stored on the bulletin board for downloading. You can just download the file list and use the utility to transfer those descriptions for the files you have.

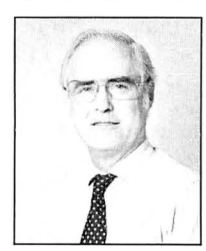
I find WSSindex useful for keeping track of files, including what programs are in archived files on my hard disk. I keep a special data base of my hard-disk programs right on the hard disk. If I have to search for a program that might be in an archived file, I run WSSindex and search for the program name. It is faster than other utilities that search the hard disk itself.

Thatsall

Since this is my last Public Works column, Thatsall is my parting shot. This program starts out with an expanding red circle in the middle of the screen to the Porky Pig theme from Looney Tunes. At the end, in script, the words "That's All Folks!" appear. A former supervisor of mine liked this program. He ran it on his computer as he ran out the door after resigning to take another job. I've enjoyed writing Public Works, but all good things must end. Thank you for being a good audience. I will continue to review public-domain and shareware programs as part of *80 Micro*'s regular reviews.

All programs I've discussed will be on the *80 Micro* BBS for a period of time. As a convenience, you can order the programs from me for $6 per disk. The Pianoman disk contains all the Pianoman programs except the Christmas music. The WSSindex disk also has the two files created by Pianoman called Xmas-PC and Xmas-AT. These two Christmas programs are also on the Christmas Music disk, which has the rest of the programs discussed this month.

Please send a pre-addressed mailing label with your order to speed delivery. If you have any comments or questions and request a reply, please include a self-addressed stamped envelope so I can answer you separately. I can still provide programs from previous issues for the prices specified in the columns. You must order Wordplan and Deskteam, from the October and November columns, from the author or a public-domain disk distributor.■



Thomas Quindry has written for 80 Micro *since 1980. Write Tom at 6237 Windward Drive, Burke, VA 22015. Enclose a stamped, self-addressed envelope for a reply.*

Photo by Richard Quindry

In Search of Lost Sectors

I created the original version of this month's program out of sheer panic. Working on deadline late one night, I saved a 3,000-word article and started another project. I wrote 200 words, saved the second file, and went to bed.

The next morning I discovered that I saved the second file with the same name as the first without printing or backing up the long article—I thought the 3,000 words were gone forever.

When my stomach stopped sinking, I realized that most of the long article was still on disk, although my word processor couldn't find it. If I could recover the individual sectors that held the long article, I would only need to rewrite about 200 words. I found the sectors with LS-FED II, a sector editor from Misosys, but I couldn't collect and put them in a new file.

If I'd been working with a floppy disk, I might have used Super Utility, but the sectors were on a Diskdisk, and I didn't have a utility to rescue them.

If you use a hard disk and aren't familiar with Diskdisk, you aren't getting the full potential from your Model 4. Using Diskdisk, you can create any number of logical drives on a physical hard disk and assign them when needed to the available drive slots. Diskdisk lets you specify how you want to format each subdisk; you can create disks with a granule size of one sector to minimize wasted hard-drive space. Diskdisk is the best product I know for circumventing LS-DOS's restriction of 256 directory slots, which is hardly enough on a large hard drive.

That morning I wrote a utility to read the lost sectors and save them to a file on another drive. I rewrote the beginning of the long article, printed it, and sent it to my editors.

A friend later made the same mistake, and I altered my short program to save more sectors. My patchwork utility gradually evolved into a usable program. It isn't completely finished, but it works, and it demonstrates some interesting

System Requirements

Model 4/4P/4D
128K RAM
LS-DOS 6.3
Editor/assembler,
(Pro-Create 4.3a or MRAS)
Available on The Disk Series

Program Listing 1. A sector recovery program to select sectors from any drive and save them as a new file on another drive.

```
00100 ;-------------------------------------------------------------
00110 ;   Sector Recovery Program  for LS-DOS 6.3
00120 ;
00130 ;   This program lets the user select sectors from any drive
00140 ;   and then save them as a new file on another drive.
00150 ;-------------------------------------------------------------
00160 *LIST OFF
00170 *GET MACLIB/ASM
00180 *LIST ON
00190 ;
00200         ORG     3000H
00210 BEGIN   @@CLS                   ;Clear the screen
00220         @@DSPLY SIGNON$         ;Say hello
00230         @@CKBRKC                ;User wants out?
00240         JR      Z,START         ;No -- go
00250 EXIT    @@EXIT                  ;Yes -- leave
00260 ;
00270 START   LD      SP,STACK        ;Move to our stack
00280         CALL    DRIVE           ;Get drive number & check it
00290         CALL    MAKLIST         ;Make list of sectors to save
00300         LD      A,(SECLIST)     ;Get first item in list
00310         INC     A               ;Was it -1 ?
00320         JR      Z,EXIT          ;Yes -- leave
00330         CALL    SAVLIST         ;  else save the sectors
00340         JR      EXIT            ;  and then leave
00350 ;----------
00360 ;  Get drive number from user and verify it.
00370 ;  Then get maximum cylinders & sectors.
00380 ;-----------
00390 DRIVE:
00400         @@DSPLY DRIVE?$         ;Display prompt
00410         @@KEY                   ;Get 1-key input
00420         SUB     '0'             ;Change ASCII to binary
00430         LD      (DRV$),A        ;Then save it
00440         JR      C,BAD_DRIVE     ;Go if < 0
00450         CP      8               ;Too high?
00460         JR      C,GET_DCT       ;Go if okay
00470 BAD_DRIVE:
00480         @@DSPLY BAD_DRIVE$      ;Display error
00490         JR      DRIVE           ;And loop back
00500 GET_DCT:
00510         @@CKDRV (DRV$)          ;Is drive available?
00520         JR      NZ,BAD_DRIVE    ;No -- leave
00530         @@GTDCT (DRV$)          ;Else get DCT pointer
00540         LD      A,(IY+7)        ;Get configuration byte
00550         AND     1FH             ;Mask off top 3 bits
00560         LD      (MAXSEC),A      ;Save sectors per cylinder
00570         @@HEX8  A,MAXSEC$       ;Convert to ASCII
00580         LD      A,(IY+6)        ;Get max cylinder count
00590         LD      (MAXCYL),A      ;Then save top cylinder #
00600         @@HEX8  A,MAXCYL$       ;Convert to ASCII
```

Listing 1 continued

Illustration by Hal Mayforth

Listing 1 continued

```
00610           @@DSPLY MAX$            ;Display the maximums
00620           @@KEY                   ;And wait for a keystroke
00630           RET
00640 ;----------
00650 ;  Read sectors as long as user wants, adding requested
00660 ;  sectors to recovery list.  Return when user requests
00670 ;  file service.
00680 ;----------
00690 MAKLIST:
00700           LD      IY,CURSEC       ;IY ==> current sector & cylinder
00710           LD      IX,MAXSEC       ;IX ==> maximum sector & cylinder
00720 MAK1      LD      E,(IY)          ;Get sector
00730           LD      D,(IY+1)        ;  and cylinder
00740           CALL    RDSEC           ;Read and display the sector
00750           @@DSPLY SECPRMT$        ;Display options
00760 MAK2      @@KEY                   ;Get response
00770           AND     0DFH            ;Force to uppercase
00780           CP      'F'             ;File services?
00790           RET     Z               ;Yes -- return for file services
00800           CP      'Q'             ;Wants to quit?
00810           JP      Z,EXIT          ;Yes -- leave
00820           CP      'N'             ;Next sector?
00830           JR      NZ,MAK3         ;No -- go
00840 ;----------
00850 ;  Move to next sector
00860 ;----------
00870 MAK2A     INC     (IY)            ;Increment sector #
00880           LD      A,(IY)          ;Now get it to test
00890           CP      (IX)            ;Over the top?
00900           JR      Z,MAK1          ;Last sector -- okay
00910           JR      C,MAK1          ;Less than last -- okay
00920           LD      (IY),0          ;Else go to sector 0
00930           INC     (IY+1)          ;But go to next cylinder
00940           LD      A,(IY+1)        ;Get it for testing
00950           CP      (IX+1)          ;Over the top?
00960           JR      Z,MAK1          ;Last cylinder -- okay
00970           JR      C,MAK1          ;Less than last -- okay
00980           DEC     (IY+1)          ;Else back to the last
00990           LD      A,(IX)          ;Get max. sector
01000           LD      (IY),A          ;And display highest sector
01010           JR      MAK1            ;And loop back
01020 MAK3      CP      'P'             ;Previous sector?
01030           JR      NZ,MAK4         ;No -- go
01040 ;----------
01050 ;  Move to previous sector
01060 ;----------
01070           DEC     (IY)            ;Decrement current sector
01080           JP      P,MAK1          ;Okay -- loop back
01090           DEC     (IY+1)          ;Decrement cylinder #
01100           JP      M,MAK3A         ;Too low -- go
01110           LD      A,(IX)          ;If cylinder okay, get max sector
01120           LD      (IY),A          ;And save for next time
01130           JR      MAK1            ;And loop back
01140 MAK3A     XOR     A               ;Make A = 0
01150           LD      (IY),A          ;Set sector 0
01160           LD      (IY+1),A        ;  and cylinder 0
01170           JR      MAK1            ;Now loop back
01180 MAK4      CP      'A'             ;Absolute track & sector?
01190           JP      NZ,MAK5         ;No -- go
01200 ;----------
01210 ;  Move to absolute track & sector
01220 ;----------
01230 MAK4A     LD      HL,21<8         ;Cursor to 21,0
01240           @@VDCTL 3               ;Set cursor
01250           @@DSP   1FH             ;Erase to end of screen
01260           @@DSPLY CYLNDR?$        ;Ask for cylinder
01270           @@KEYIN ANSBUF,2        ;Get response
01280           JR      C,MAK4A         ;Try again if <Break>
01290           CALL    HEXBIN          ;Convert to binary
01300           JR      C,MAK4A         ;Try again if error
01310           LD      (IY+1),C        ;Save the cylinder number
01320           LD      A,C             ;Get it for test
01330           CP      (IX+1)          ;Compare against maximum
01340           JR      Z,MAK4B         ;Is maximum -- okay
01350           JR      NC,MAK4A        ;Too large -- try again
01360 MAK4B     LD      HL,22<8         ;Cursor to 22,0
01370           @@VDCTL 3               ;Set cursor
01380           @@DSP   1FH             ;Erase to end of screen
01390           @@DSPLY SECTOR?$        ;Ask for sector
01400           @@KEYIN ANSBUF,2        ;Get response
01410           JR      C,MAK4B         ;Try again if <Break>
01420           CALL    HEXBIN          ;Convert to binary
01430           JR      C,MAK4B         ;Try again if error
01440           LD      (IY),A          ;Save as current cylinder
01450           CP      (IX)            ;Compare to maximum sector
01460           JP      Z,MAK1          ;Loop back if equal
01470           JP      C,MAK1          ;Or if lower
01480           JR      MAK4B           ;Else try again
01490 MAK5      CP      'M'             ;Want to add sector to list?
01500           JR      NZ,MAK6         ;No -- go
01510 ;----------
01520 ;  Add this sector to list of
01530 ;  sectors that will be saved
01540 ;----------
01550           PUSH    IX              ;Save IX
01560           LD      IX,(SAVPTR)     ;Get pointer to next position in table
01570           LD      A,(IY)          ;Get current sector
01580           LD      (IX),A          ;  and save it
01590           LD      A,(IY+1)        ;Get current track
```

Listing 1 continued

programming techniques. If you find yourself in my predicament, the program might save you from plenty of unnecessary work.

When TRSDOS/LS-DOS saves a new version of an already existing file, it writes over the old file and sets a new end-of-file value in the directory. If the second version of the file is longer than the first, new sectors are allocated at the end of the file. If the first version is longer, the sectors that it once occupied are marked as unused in the granule allocation table (GAT) in the first sector of the directory.

Deleting a file involves a similar process. In the directory entry for the file, 1 bit changes to show that the file no longer exists, and the granules originally allocated to the file are marked as unused in the GAT. The hash code for the file is removed from the hash index table (HIT) in the second sector of the directory.

In both cases, nothing is erased from the disk. With a disk editor and patience, you can find the file and read it directly from the disk. If you want to erase a file so that the data cannot be read at all, you should obliterate the directory entry and overwrite with new information. For total security, you should overwrite each sector several times with different bit patterns. Government regulations specify how to erase a file to maintain security.

This month's program doesn't use the directory. It lets you look through a disk until you find the sectors you want to reclaim, creates a list of sectors to save, and writes them to a new file. The program doesn't enforce it, but the new file should be on a different drive to avoid overwriting sectors you want to recover.

Program Listing 1 contains the body of the program. It uses macro commands that are in Program Listing 2. If you have started your own library of macros from past Next Step articles, you shouldn't have to type Listing 2 at all.

Drive Information

Listing 1 prints a sign-on message and then checks if you pressed the break key to abort the program. If not, it relocates the stack into the program area. Listing 1 uses a lot of stack space; it is safer in all but the smallest programs to move the stack to a new location so it won't overrun part of the operating system. If you use the @Exit, @Abort, or @Error SVCs (supervisory calls) to end a program, LS-DOS restores the original stack for you as your program ends.

The main outline of the program begins at the label Start and ends eight lines later. The program actually consists of three subroutines. The first gets a drive number from you and gathers information about that drive from the DOS; the second subroutine lets you define a list of

sectors to be saved; the third subroutine copies those sectors to a new file.

The first subroutine, which begins with the label Drive, asks you which drive to search. If the response is between zero and 7, the only legitimate drive numbers on a Model 4, the program uses the @CKDRV SVC to see if that drive is defined and whether it has a disk mounted. If you gave an improper response or if the requested drive is not ready, the program loops back to ask for a new drive number.

Once it knows the drive is part of the system, the program determines the size of that drive. The @GTDCT SVC loads the IY register with the address of the drive-control table (DCT) for the requested drive. The DCT, a complex data structure, contains a wealth of information about each drive. (See "Inside Information," June 1986, p. 106, for a complete discussion of the DCT.)

In this program, you need to know how many cylinders or tracks the drive contains and how many sectors are in each track. The lowest 5 bits of byte 7 of the DCT contain the number of sectors. The sixth byte of the DCT holds the number of cylinders.

At this point you encounter an interesting wrinkle; the number of cylinders shown in the DCT might not equal the number of physical cylinders on a large-capacity hard drive. A single-bit flag in the DCT tells the system that each logical cylinder is mapped onto two physical sectors, but this program is only concerned about logical cylinders, sectors, and drives, and it needn't concern itself with the disk drive's physical characteristics.

One potential problem in reading the drive parameters from the DCT, according to some Compuserve users, is that the hard-disk drivers from several third-party suppliers do not correctly maintain the DCT for their drives. If this is true, many utility programs won't work with those hard drives. If you have such a system, you could examine the DCTs carefully to ensure that all the values are correct.

Listing 1's next section is the most interesting part. Starting at the label MAKLIST, the program displays each sector in a format similar to Debug's, presents a menu of options, and waits for your single-letter response.

If you type "F" for file services, the Maklist subroutine ends and control returns to the top of the program. If you want to quit the program, type "Q" and the @Exit SVC returns you to LS-DOS.

When you type "N" or "P", the next or previous sector is displayed. The program keeps track of the maximum cylinder and sector numbers and the current numbers. Throughout the MAKLIST routine, the IX register points to the maximum values

Listing 1 continued

```
01600          LD      (IX+1),A        ;  and save it
01610          INC     IX              ;Bump to next location
01620          INC     IX
01630          LD      (SAVPTR),IX     ;Save this value
01640          LD      A,-1            ;Mark new end to list
01650          LD      (IX),A          ;  with two bytes
01660          LD      (IX+1),A        ;  of ØFFh
01670          @@DSPLY MARKED$         ;Report that it is marked
01680          POP     IX              ;Recover pointer
01690          @@KEY                   ;Wait for keystroke
01700          JP      MAK2A           ;Increment to next sector
01710 MAK6     CP      'R'             ;Review sector/cylinder list?
01720          JP      NZ,MAK2         ;No -- get next command
01730 ;----------
01740 ;  Display list of sectors marked to be saved
01750 ;----------
01760          @@CLS                   ;Clear the screen
01770          PUSH    IX              ;Save pointer
01780          LD      IX,SECLIST      ;IX ==> list of sectors
01790 MAK6A    LD      B,11            ;Count # of conversions
01800          CALL    CLRLIN          ;Clear the line buffer, HL==> buffer
01810 MAK6B    LD      A,(IX+1)        ;Get cylinder
01820          CP      ØFFH            ;End of list?
01830          JR      Z,MAK6C         ;Yes -- we're done
01840          @@HEX8  A               ;Convert A to hex/ASCII
01850          LD      (HL),'-'        ;Separate from sector
01860          INC     HL              ;Move to next space
01870          @@HEX8  (IX)            ;Convert it
01880          INC     HL              ;Bump pointer
01890          INC     HL
01900          INC     IX              ;Move pointer to next
01910          INC     IX              ;  in list
01920          DJNZ    MAK6B           ;Repeat until line is full or done
01930          @@DSPLY LINBUF          ;Display the line
01940          JR      MAK6A           ;Do another
01950 MAK6C    @@DSPLY LINBUF          ;Display the line
01960          POP     IX              ;Clear the stack
01970          @@KEY                   ;Wait for keystroke
01980          JP      MAK1            ;Do display again
01990 ;----------
02000 ;  Save the list of sectors as a new
02010 ;  file.  Note that the file should be on a
02020 ;  different drive, but no check is performed
02030 ;----------
02040 SAVLIST:
02050          @@CLS                   ;Clear the screen
02060          @@DSPLY OUTFIL?$        ;Ask for file name
02070          @@KEYIN ANSBUF,15       ;Get name from user
02080          RET     C               ;Return if <Break>
02090          @@FSPEC HL,FCB          ;Test file name
02100          JR      Z,SAV1          ;Go if okay
02110          @@DSPLY BADFIL$         ;Else report error
02120          JR      SAVLIST         ;And start again
02130 SAV1:
02140          @@DSPLY FILPRMT$        ;New file or append?
02150          @@KEY                   ;One key input
02160          AND     ØDFH            ;Convert to upper case
02170          CP      'A'             ;Append to existing file?
02180          JR      Z,SAV2          ;Yes -- go
02190          CP      'N'             ;Open as new file?
02200          JR      NZ,SAV1         ;No -- get response again
02210 ;----------
02220 ;  Open as a new file
02230 ;----------
02240          @@INIT  SECBUF          ;Open using @INIT
02250          JR      SAV3            ;Jump ahead
02260 ;----------
02270 ;  Open existing file & position to end for append
02280 ;----------
02290 SAV2:
02300          @@OPEN  SECBUF          ;Open the file
02310          @@PEOF                  ;Get to the end
02320 ;----------
02330 ;  Get cylinder/sector pairs until the list is done
02340 ;  Read the sector and then save to the file
02350 ;----------
02360 SAV3:
02370          LD      IY,SECLIST      ;IY ==> data list
02380 SAV4     PUSH    DE              ;Save DCB pointer
02390          LD      A,(IY)          ;Get sector
02400          LD      D,(IY+1)        ;and cylinder
02410          INC     A               ;At end of list?
02420          JR      Z,SAV5          ;Yes -- go
02430          DEC     A               ;Else restore value
02440          LD      E,A             ;DE = cylinder/sector
02450          CALL    RDSEC           ;Read the sector
02460          POP     DE              ;Recover DCB pointer
02470          @@WRITE                 ;Write to new file
02480          INC     IY              ;Move to next pair
02490          INC     IY
02500          JR      SAV4            ;And do it again
02510 ;----------
02520 ;  Close the file and return
02530 ;----------
02540 SAV5     POP     DE              ;Get DCB pointer
02550          @@CLOSE                 ;Close the file
02560          RET
02570 ;----------
02580 ;  CLRLIN -- Clear the line buffer and position HL to the beginning of it
```

Listing 1 continued

Listing 1 continued

```
02590 ;  Uses HL & AF
02600 ;----------
02610 CLRLIN:
02620          PUSH    BC              ;Save for counting
02630          LD      B,79            ;Bytes to clear
02640          LD      HL,LINBUF       ;HL ==> beginning of line
02650 CLR1     LD      (HL),' '        ;Clear first place
02660          INC     HL              ;Point to next
02670          DJNZ    CLR1            ;Do them all
02680          LD      (HL),CR         ;Carriage return at end
02690          LD      HL,LINBUF       ;HL==> back to beginning
02700          POP     BC              ;Clear stack
02710          RET
02720 ;----------
02730 ;  Hexbin -- Takes 2-byte ASCII/hex string at (HL) and returns
02740 ;    value in C.  Carry flag set if either digit not hex.
02750 ;  Uses C, AF
02760 ;----------
02770 HEXBIN:
02780          LD      C,0             ;C is accumulator
02790          CALL    HEXA            ;Convert first
02800          RET     C               ;Return if error
02810          RLA                     ;Multiply by 16
02820          RLA
02830          RLA
02840          RLA
02850          LD      C,A             ;Save value
02860          INC     HL              ;Point to next
02870          CALL    HEXA            ;Convert 2nd digit
02880          DEC     HL              ;Restore HL
02890          RET     C               ;Return if error
02900          ADD     A,C             ;Add result
02910          LD      C,A             ;Put in C
02920          RET
02930 HEXA:
02940          LD      A,(HL)          ;Get character
02950          CP      'a'             ;Is it lowercase?
02960          JR      C,HEXB          ;No -- go
02970          AND     0DFH            ;Else force to uppercase
02980 HEXB     SUB     '0'             ;Adjust for decimal
02990          RET     C               ;Return if error
03000          CP      10              ;Above 9?
03010          CCF                     ;Flip flag
03020          RET     NC              ;No -- return
03030          SUB     7               ;Adjust for hex
03040          CP      10H             ;Above 0F hex?
03050          CCF                     ;Flip flag
03060          RET
03070 ;----------
03080 ;  Read a sector and display in both hex and ASCII form
03090 ;  Cylinder/sector in DE
03100 ;----------
03110          DEFINE  @RDSEC,31H
03120          DEFINE  @ERROR,1AH
03130 RDSEC:
03140          RPUSH   AF,BC,DE,HL,IX
03150          @@CLS
03160          LD      HL,SECBUF       ;HL ==> sector buffer
03170          LD      A,(DRV$)        ;Get drive #
03180          LD      C,A             ;  into C
03190          SVC     @RDSEC          ;Read the sector
03200          JR      Z,RD1           ;No error -- go
03210          CP      6               ;Directory sector?
03220          JR      Z,RD1           ;Yes -- ignore error
03230          OR      80H             ;Set bit 7
03240          SVC     @ERROR,A        ;Display the error
03250 RD_OUT   RPOP    IX,HL,DE,BC,AF  ;Clear the stack
03260          RET
03270 ;----------
03280 ;  Display the buffer in Hex and ASCII
03290 ;----------
03300 RD1:
03310          LD      IX,SECBUF       ;IX ==> data
03320          LD      B,16            ;B counts lines displayed
03330 RD2      CALL    ONELINE         ;Display one line
03340          DJNZ    RD2             ;Do 16 lines
03350          LD      HL,SECNUM       ;HL==> space for sector number
03360          @@HEX8  (IY)            ;Convert it
03370          LD      HL,CYLNUM       ;Now the same for the cylinder
03380          @@HEX8  (IY+1)
03390          @@DSPLY SEC$            ;Display whole string
03400          JR      RD_OUT          ;Then leave
03410 ;----------
03420 ;  Display 16 bytes at (IX) as a line
03430 ;  Updates IX, uses HL, AF
03440 ;----------
03450 ONELINE:
03460          PUSH    BC              ;Save line counter
03470          CALL    CLRLIN          ;Clear the line buffer
03480          LD      B,16            ;16 bytes in a line
03490          PUSH    IX              ;Save data pointer
03500 ONEA     @@HEX8  (IX)            ;Convert byte there
03510          INC     HL              ;Skip the space
03520          INC     IX              ;Point to next byte to convert
03530          DJNZ    ONEA            ;Do for 16 bytes
03540          LD      BC,7            ;Spaces to skip
03550          ADD     HL,BC           ;HL ==> ASCII area
03560          POP     IX              ;Back to beginning of row
```

Listing 1 continued

and the IY register points to the current values of the cylinder and sector. When you ask to increment or decrement the sector number, the program must determine if it should also change the cylinder number. The code beginning at MAK2 and MAK3 performs those comparisons and adjustments. The program must ensure that it never asks LS-DOS to read a sector that doesn't exist.

You can also jump to a specific cylinder and sector. Beginning at the label MAK4, the program prompts for values of each, changes those values from ASCII to binary, and, if the requested cylinder exists, displays the new sector. A weakness of the program is that it requires you to enter the cylinder and sector values as two-digit hexadecimal (hex) numbers. For values below 10 hex, you must type a leading zero.

When you find a sector to save, the routine beginning at MAK5 adds its cylinder and sector values to a table stored in memory. Each entry in the table consists of a 1-byte sector number followed by a 1-byte cylinder number. The first unused entry in the table is always marked as 2 bytes of 0FF hex. The label SAVPTR contains a pointer to the first unused entry position.

When it is time to store a new value, the value at SAVPTR is loaded into IX and the new sector and cylinder numbers are stored at IX + 0 and IX + 1. Then IX increments to the next table position, 2 bytes of 0FF hex are written there, and the value of IX is stored back in SAVPTR.

This technique makes several parts of the program easier to write. The beginning of the list is always known, since it is associated with an absolute label in the program. The end of the table's address is stored at SAVPTR so you can quickly add new entries. The table terminates with a specific byte pair; a later program section can read through the table and use that byte pair to know when it reaches the end.

The program doesn't check that you aren't asking to save the same sector more than once. You could scan the entire table each time you designate a new sector number to be saved to ensure that you haven't already added that sector to the table.

The table is the last data structure in the program and can grow to any size. The program doesn't ensure that it stays below the High$ memory limit. But even if High$ is as low as 8000 hex, you can make more than 9,000 entries in the table. I doubt anyone would use this program to recover a 9,000-sector file from disk.

The last section of the MAKLIST routine displays the current contents of the sector table so you can see the sectors you selected. Each entry in the table shows as

How to Use *80 Micro* Program Listings.

Basic Program Listings in *80 Micro* include a checksum value at the beginning of each line. This value is the sum of the ASCII values of all characters and spaces in the line, excluding remarks. You can use these values to test the accuracy of your typing.

- Type in the program code exactly as listed, omitting the indentations (when program lines continue to a second or third magazine line). Do not type the checksum values at the beginning of each line or the vertical bar (|).
- Save the program in ASCII format with the command SAVE "file name",A.
- Load and run Checksum (see Program Listing; Model 4 changes are below). The program prompts you for the name of the file to be verified and gives you the option of sending the checksum values and program lines to the printer or to the screen.

When printing to the screen, Checksum lists 22 lines and then waits for you to press the enter key. You can change the number of lines displayed in line 190.

- Compare the checksum values with the checksums shown in the listing. Correct errors in lines having checksum values that don't match.

To modify Checksum for the Model 4, make the following changes. Omit line 45. Replace lines 100 and 110 with the lines in the Figure. Replace all occurrences of PRINT#2, with PRINT.

—Beverly Woodbury,
Technical Editor

Program Listing. Checksum for MS-DOS.

```
     | 10 'CHECKSUM/BAS revised  --  08/87
  3504 | 20 CLS:PRINT "PRINT PROGRAM LISTING WITH CHECKSUMS"
  4218 | 30 PRINT:PRINT:PRINT "Basic program must be in ASCII."
  4015 | 40 PRINT:PRINT:INPUT "Enter name of File to PRINT";F$
  2273 | 45 IF INSTR(F$,".")=0 THEN F$=F$+".bas"
  3061 | 50 PRINT:PRINT:PRINT "List program to:"
  3124 | 60 PRINT TAB(20) "<P>rinter or <S>creen  ?";
  3098 | 70 K$=INKEY$:IF K$="" OR INSTR("PpSs",K$)=0 THEN 70
  2441 | 80 PRINT K$:IF K$="P" OR K$="p" THEN PN=1
  3653 | 90 PRINT:B$=CHR$(34):ES=CHR$(32)+CHR$(124)+CHR$(32):OPEN "I",1,F$
  5529 | 100 IF PN THEN OPEN "LPT1:" FOR OUTPUT AS 2:GOSUB 480:ELSE OPEN "SCRN:"
         FOR OUTPUT AS 2
  3991 | 110 IF EOF(1) THEN CLOSE:IF PN THEN LPRINT CHR$(12):END ELSE END
   693 | 120 X=0:CS=0
  3361 | 130 LINE INPUT #1, L$: A=VARPTR(L$):GOSUB 310:Q=PEEK(A)
  3110 | 140 LS=PEEK(A+1):MS=PEEK(A+2):A=MS*256+LS:GOSUB 310
  2034 | 150 IF INSTR(L$,"'") THEN GOSUB 330
  2944 | 160 FOR K=1 TO Q:P=PEEK(A):A=A+1:CS=CS+P:NEXT K
  1619 | 170 N=VAL(LEFT$(L$,5)):L=L+1
  3301 | 180 IF PN THEN IF L>58 THEN GOSUB 470:GOTO 200 ELSE 200
  1854 | 190 IF L>22 THEN L=0:INPUT XY$
  1463 | 200 IF Q>72 THEN GOTO 240
  1126 | 210 IF CS=0 THEN 110
  3016 | 220 IF X=2 OR X=3 THEN PRINT#2, "     ";E$;L$:GOTO 110
  3430 | 230 PRINT#2, USING "#####";CS;:PRINT#2, E$;L$:CS=0:GOTO 110
  2005 | 240 NL=LEN(STR$(N)):S1=NL+8:S=NL
  2986 | 250 L=L+1:IF X=3 THEN PRINT#2, "     ";E$;MID$(L$,1,72)
  3507 | 260 L=L+1:PRINT#2, USING "#####";CS;:PRINT#2, E$;MID$(L$,1,72)
  2540 | 270 PRINT#2, STRING$(S1," ");MID$(L$,73,72-S)
  4046 | 280 IF Q>144-S THEN L=L+1:PRINT#2, STRING$(S1," ");MID$(L$,145-S,72-S)
  4393 | 290 IF Q>216-(S*2) THEN L=L+1:PRINT#2, STRING$(S1," ");MID$(L$,217-(S*2)
         ,72-S)
   987 | 300 CS=0:GOTO 110
  1865 | 310 IF A>32767 THEN A=(65536!-A)*-1
   661 | 320 RETURN
  1756 | 330 I=INSTR(L$,"'"):IQ=I-1:X=1
  2683 | 340 IF LEN(L$)=INSTR(L$,"'") THEN X=2:RETURN
  2716 | 350 N=VAL(LEFT$(L$,4)):N$=STR$(N):LN=LEN(N$)+2
  1813 | 360 IF I<=LN THEN X=3:RETURN
  2596 | 370 Q1=INSTR(L$,B$):IF Q1>I OR Q1=0 THEN 430
  3168 | 380 Q2=INSTR(Q1+1,L$,B$):IF Q2 THEN I=INSTR(Q2,L$,"'")
  1392 | 390 IF I=0 THEN RETURN
  2863 | 400 Q3=INSTR(Q2+1,L$,B$):IF Q3>I OR Q3=0 THEN 430
  3170 | 410 Q4=INSTR(Q3+1,L$,B$):IF Q4 THEN I=INSTR(Q4,L$,"'")
  1386 | 420 IF I=0 THEN RETURN
  1484 | 430 FOR I=IQ TO 1 STEP -1
  1265 | 440 C=ASC(MID$(L$,I,1))
  1380 | 450 IF C<33 THEN NEXT I
  2939 | 460 QM=Q:X=4:RL$=LEFT$(L$,I):Q=LEN(RL$):RETURN
  1182 | 470 PRINT#2, CHR$(12)
  3389 | 480 PRINT#2, STRING$(10," ");F$;STRING$(32," ");"Page ";PN
  2610 | 490 PRINT#2,:PRINT#2,:PN=PN+1:L=3:RETURN
```

Figure. Replacement lines for the Model 4.

```
  2916 | 100 IF PN THEN SYSTEM"ROUTE *DO *PR":GOSUB 480
  5242 | 110 IF EOF(1) THEN CLOSE:IF PN THEN SYSTEM "RESET *DO":LPRINT CHR$(12):E
         ND ELSE END
```

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Listing 1 continued

```
03570          LD      B,16            ;16 bytes again
03580 ONEB     LD      (HL),'.'        ;Assume it will be unprintable
03590          LD      A,(IX)          ;Get the byte
03600          CP      ' '             ;Control character?
03610          JR      C,ONEC          ;Yes -- go
03620          CP      80H             ;Graphics or special?
03630          JR      NC,ONEC         ;Yes -- go
03640          LD      (HL),A          ;Else we'll print it
03650 ONEC     INC     HL              ;Point to next display location
03660          INC     IX              ;And next data byte
03670          DJNZ    ONEB            ;Loop 16 times
03680          @@DSPLY LINBUF          ;Now display the line
03690          POP     BC              ;Recover earlier counter
03700          RET
03710 ;---------------------------------------------------------
03720 ;  Program data area
03730 ;---------------------------------------------------------
03740 ;  Messages
03750 ;----------
03760 SIGNON$          DB   LF,'Sector Reclamation Program',CR
03770 DRIVE?$          DB   LF,'Drive to search for sectors ==> ',ETX
03780 BAD_DRIVE$       DB   'Illegal drive or disk not mounted.  Try again.',CR
03790 MAX$             DB   LF,'Highest cylinder number ==> '
03800 MAXCYL$          DB   '   hex',LF
03810                  DB   LF,'Highest sector number   ==> '
03820 MAXSEC$          DB   '   hex',CR
03830 BADFIL$          DB   'Illegal file name.  Try again.',CR
03840 OUTFIL?$         DB   'Name of file to receive data.  Do not save the',LF
03850                  DB   'file on the search drive.                ==> ',ETX
03860 FILPRMT$         DB   'N)ew file or A)ppend to previous file    ==> ',ETX
03870 MARKED$          DB   LF,'This sector has been added to the save list',CR
03880 SEC$             DB   LF,'Cylinder '
03890 CYLNUM           DB   '      Sector: '
03900 SECNUM           DB   '    ',CR
03910 SECPRMT$         DB   LF,'N)ext  P)revious  A)bsolute  M)ark  R)eview  F)ile
03920 CYLNDR?$         DB   'Cylinder (2 hex digits) ==> ',ETX
03930 SECTOR?$         DB   'Sector   (2 hex digits) ==> ',ETX
03940 ;----------
03950 ;  Memory buffers
03960 ;----------
03970 LINBUF           DC   79,' '          ;Space for one display line
03980                  DB   CR
03990 DRV$             DB   $-$
04000 CURSEC           DB   0               ;Current sector
04010 CURCYL           DB   0               ;  and cylinder
04020 MAXSEC           DB   $-$             ;Maximum sector
04030 MAXCYL           DB   $-$             ;  and cylinder
04040 SAVPTR           DW   SECLIST         ;Pointer to 1st free space in list
04050 ANSBUF           DS   16              ;User response buffer
04060 FCB              DS   32              ;File control block
04070 SECBUF           DS   256             ;Room for a sector
04080                  DS   100             ;Room for stack
04090 STACK            EQU  $               ;First byte above the stack
04100 SECLIST          DW   -1              ;Table extends "forever"
04110 ;
04120                  END  BEGIN
```

End

a two-character cylinder number, a hyphen, and a two-character sector number. You could improve this display with the entries shown in columns and with pauses between screens if the list is long. Also, you might want to add a feature that lets you edit the list and remove unwanted or duplicated entries.

Saving the Sectors

The next major section, beginning at the label SAVLIST, takes the table of designated sectors and writes each to a file. It begins by asking you for a file name, makes sure it can open the file, and then uses each table entry to read, display, and save a sector.

After it prompts you for a file name, the program asks whether it should append new sectors to a file or create a new file. If you ask to append the sectors, the program aborts if it cannot find the file on disk. It also aborts if it cannot open the requested file.

Three utility subroutines are at the end of the program. The first writes 79 spaces and a carriage return to a buffer and loads the buffer's address into the HL register pair. The buffer creates a line of text to be displayed on the screen. Rather than writing a character or two of information to the screen at a time, the program usually fills the line buffer and sends the entire line to the video display.

The second subroutine converts a two-character ASCII number, expressed in hex form, into a 1-byte binary value. It stores the final value in the C register and returns with the carry flag set as an error indicator if it cannot successfully convert the number.

The final collection of subroutines reads a sector into a memory buffer, then displays that sector in both hex and ASCII form on the screen. It begins by using the @RDSEC SVC to get the current sector using the values at IY and IY + 1. It translates that sector, one line at a time, into displayable form.

The subroutine called Oneline creates each line of the final display. The program reads through the sector buffer byte by byte, uses the @HEX8 SVC to translate each byte to hex format, and places the result in the line buffer. After it translates 16 bytes in this manner, it starts again and tries to interpret each byte as a displayable character. Bytes that represent values less than a space character or greater than the delete character (ASCII 127) are displayed as periods.

If you are an assembly-language novice, a good way to improve your skills is to start with a program like this and add as many new features as you can. Run the program, make a backup copy of the source code, and see how you can improve the program. You might want to add row and column numbers to the display screen, handle error situations differently, or improve the input routines.

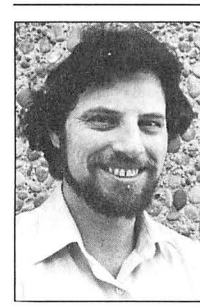
Goodbye

This is the 59th, and last, Next Step column I'll write for the Models I, III, and 4. (January's Next Step will be the first to focus on the Tandy 1000.) It all started when I suggested a five-part tutorial for *80 Micro* about adding machine-language routines to Basic. Neither the editors nor I expected this column to run for five years.

Much has happened in the computer industry in those five years. I began this column with a single-drive, 48K Model I running at 1.7 MHz and considered it a reasonably powerful system. My newest computer has 2 megabytes of memory, an 80-megabyte hard drive, and it costs less than the Model I, but runs several times faster. I can't imagine the computer that will be on my desk in another five years, but I know it will be exciting.

I'm sad to see this version of The Next Step come to an end because I've had a great deal of fun with it and learned from readers who made suggestions or urged me to write about certain topics. None of us are born knowing how to program; the friends I've made through this column did much to educate me and shape the direction of the column.

I want to thank *80 Micro*'s editors for giving me complete freedom in this column and allowing it to run as long as it has. And I would like to thank you all for arguing, criticizing, suggesting, sometimes applauding, but most of all, for reading The Next Step. It's been a good five years. ■



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4 9 14 19 24	154 159 164 169 174	304 309 314 319 324	454 459 464 469 474
5 10 15 20 25	155 160 165 170 175	305 310 315 320 325	455 460 465 470 475
26 31 36 41 46	176 181 186 191 196	326 331 336 341 346	476 481 486 491 496
27 32 37 42 47	177 182 187 192 197	327 332 337 342 347	477 482 487 492 497
28 33 38 43 48	178 183 188 193 198	328 333 338 343 348	478 483 488 493 498
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52 57 62 67 72	202 207 212 217 222	352 357 362 367 372	502 507 512 517 522
53 58 63 68 73	203 208 213 218 223	353 358 363 368 373	503 508 513 518 523
54 59 64 69 74	204 209 214 219 224	354 359 364 369 374	504 509 514 519 524
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79 84 89 94 99	229 234 239 244 249	379 384 389 394 399	529 534 539 544 549
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102 107 112 117 122	252 257 262 267 272	402 407 412 417 422	552 557 562 567 572
103 108 113 118 123	253 258 263 268 273	403 408 413 418 423	553 558 563 568 573
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104 109 114 119 124	254 259 264 269 274	404 409 414 419 424	554 559 564 569 574
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Program Listing 2. Macro commands used in Listing 1.

```
00100 ;-----------------------------------------
00110 ;  Macro Commands for Listing 1
00120 ;
00130 ;  Save this file as MACLIB/ASM or add
00140 ;  the necessary macros to your own library
00150 ;-----------------------------------------
00160 ;  Common Character Definitions
00170 ;-----------------------------------------
00180 ETX     EQU     03H
00190 LF      EQU     0AH
00200 CR      EQU     0DH
00210 ;
00220 ;-----------------------------------------
00230 ;  @@CKBRKC -- Check & clear <Break> bit
00240 ;-----------------------------------------
00250 @@CKBRKC  MACRO
00260         DEFINE  @CKBRKC,6AH
00270         SVC     @CKBRKC
00280         ENDM
00290 ;
00300 ;-----------------------------------------
00310 ;   @@CKDRV -- Check (and log) drive.
00320 ;   If drive number not specified, defaults
00330 ;   to value in C
00340 ;-----------------------------------------
00350 @@CKDRV MACRO   #DRIVE
00360         DEFINE  @CKDRV,21H
00370         IFEQ    %%,1
00380           LD      A,#DRIVE
00390           LD      C,A
00400         ENDIF
00410         SVC     @CKDRV,CHECK
00420         ENDM
00430 ;
00440 ;-----------------------------------------
00450 ;   @@CLOSE -- Close a file or device
00460 ;   #FCB defaults to value in DE
00470 ;   AF is altered
00480 ;-----------------------------------------
00490 @@CLOSE MACRO   #FCB
00500         DEFINE  @CLOSE,3CH
00510         IFEQ    %%,1
00520           PUSH    DE
00530           LD      DE,#FCB
00540         ENDIF
00550         SVC     @CLOSE,CHECK
00560         IFEQ    %%,1
00570           POP     DE
00580         ENDIF
00590         ENDM
00600 ;
00610 ;-----------------------------------------
00620 ;   @@CLS -- Clears the screen
00630 ;-----------------------------------------
00640 @@CLS   MACRO
00650         DEFINE  @CLS,69H
00660         SVC     @CLS,CHECK
00670         ENDM
00680 ;
00690 ;-----------------------------------------------
00700 ;   DEFINE -- Define a lable unless it
00710 ;         is already defined.
00720 ;-----------------------------------------------
00730 DEFINE  MACRO   #LABEL,#VALUE
00740         IFNDEF  #LABEL
00750 #LABEL  EQU     #VALUE
00760         ENDIF
00770         ENDM
00780 ;
00790 ;-----------------------------------------
00800 ;  @@DSP -- Display one character on the screen
00810 ;      #char defaults to value in C register
00820 ;-----------------------------------------
00830 @@DSP   MACRO   #CHAR
00840         DEFINE  @DSP,02H
00850         PUSH    DE
00860         IFEQ    %%,1
00870           LD      A,#CHAR
00880           LD      C,A
00890         ENDIF
00900         SVC     @DSP,CHECK
00910         POP     DE
00920         ENDM
00930 ;
00940 ;-----------------------------------------
00950 ;   @@DSPLY -- Displays line of text
00960 ;   LINE defaults to value in HL
00970 ;-----------------------------------------
00980 @@DSPLY MACRO   #LINE
00990         DEFINE  @DSPLY,0AH
01000         IFEQ    %%,1
01010           RPUSH   DE,HL
01020           LD      HL,#LINE
01030           SVC     @DSPLY,CHECK
01040           RPOP    HL,DE
01050         ELSE
```

Listing 2 continued

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PC-Four even works with assemblers such as MZAL and debugger/monitors such as TASMON so you can write, assemble, debug and run Z80 machine code programs on your PC. To use it you must transfer your old files to MSDOS disks first. For this we recommend PCXZ or Hypercross—see below for details.

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THE NEXT STEP

Listing 2 continued

```
01060           PUSH    DE
01070           SVC     @DSPLY,CHECK
01080           POP     DE
01090         ENDIF
01100         ENDM
01110 ;
01120 ;-----------------------------------------
01130 ;  @@EXIT -- Exits program
01140 ;  #RETCOD defaults to 0 (no error)
01150 ;-----------------------------------------
01160 @@EXIT  MACRO   #RETCOD
01170         DEFINE  @EXIT,16H
01180         IFEQ    %%,1
01190           LD      HL,#RETCOD
01200         ELSE
01210           LD      HL,0
01220         ENDIF
01230         SVC     @EXIT
01240         ENDM
01250 ;
01260 ;-----------------------------------------
01270 ;   @@FSPEC -- Move filespec or devspec
01280 ;       to an FCB or DCB
01290 ;   Test Z / NZ after using!
01300 ;   #Fname and #FCB are both required.
01310 ;   If #Fname is already in HL, use HL as filename
01320 ;   DE is set to #FCB
01330 ;   AF is altered.
01340 ;-----------------------------------------
01350 @@FSPEC MACRO   #FNAME,#FCB
01360         DEFINE  @FSPEC,4EH
01370         RPUSH   BC,HL
01380         IFNE$   #FNAME,HL
01390           LD      HL,#FNAME
01400         ENDIF
01410         LD      DE,#FCB
01420         SVC     @FSPEC
01430         RPOP    HL,BC
01440         ENDM
01450 ;
01460 ;-----------------------------------------
01470 ;  @@GTDCT -- Loads IY with address of drive's DCT
01480 ;     #Drive defaults to value in C
01490 ;-----------------------------------------
01500 @@GTDCT MACRO   #DRIVE
01510         DEFINE  @GTDCT,51H
01520         IFEQ    %%,1
01530           PUSH    BC
01540           LD      A,#DRIVE
01550           LD      C,A
01560         ENDIF
01570         SVC     @GTDCT
01580         IFEQ    %%,1
01590           POP     BC
01600         ENDIF
01610         ENDM
01620 ;
01630 ;-----------------------------------------
01640 ;  @@HEX8 -- Convert 1 byte to ASCII Hex
01650 ;    #Byte defaults to value in C
01660 ;    #Buf  defaults to value in HL
01670 ;-----------------------------------------
01680 @@HEX8  MACRO   #BYTE,#BUF
01690         DEFINE  @HEX8,62H
01700         IFGT    %%,0
01710          PUSH    BC
01720          LD      A,#BYTE
01730          LD      C,A
01740         ENDIF
01750         IFEQ    %%,2
01760          PUSH    HL
01770          LD      HL,#BUF
01780         ENDIF
01790         SVC     @HEX8
01800         IFGT    %%,0
01810          IFEQ    %%,2
01820           POP     HL
01830          ENDIF
01840          POP     BC
01850         ENDIF
01860         ENDM
01870 ;
01880 ;-----------------------------------------
01890 ;   @@INIT -- Opens a new or existing file
01900 ;       or device
01910 ;   Aborts on all errors except changed LRL
01920 ;   #Buffer is required.
01930 ;   #LRL defaults to 0 (256)
01940 ;   #FCB defaults to current value in DE
01950 ;   AF is altered.
01960 ;-----------------------------------------
01970 @@INIT  MACRO   #BUFFER,#LRL=0,#FCB
01980         DEFINE  @INIT,3AH
01990         RPUSH   BC,HL
02000         LD      HL,#BUFFER
02010         LD      B,#LRL
02020         IFEQ    %%,3
02030           LD      DE,#FCB
```

Listing 2 continued

Listing 2 continued

```
02040          ENDIF
02050          SVC      @INIT
02060          RPOP     HL,BC
02070          ENDM
02080 ;
02090 ;-----------------------------------------
02100 ;  @@KEY -- Waits for key at *KI device
02110 ;          keystroke returned in A
02120 ;-----------------------------------------
02130 @@KEY    MACRO
02140          DEFINE   @KEY,01H
02150          PUSH     DE
02160          SVC      @KEY,CHECK
02170          POP      DE
02180          ENDM
02190 ;
02200 ;-----------------------------------------
02210 ;  @@KEYIN -- Gets input line from user or /JCL
02220 ;  Buffer pointer and character length must
02230 ;  be specified.
02240 ;-----------------------------------------
02250 @@KEYIN MACRO    #BUF,#LEN
02260          DEFINE   @KEYIN,09H
02270          RPUSH    BC,DE
02280          LD       HL,#BUF
02290          LD       B,#LEN
02300          LD       C,0
02310          SVC      @KEYIN,CHECK
02320          RPOP     DE,BC
02330          ENDM
02340 ;
02350 ;-----------------------------------------
02360 ;    @@OPEN -- Opens an existing file
02370 ;         or device
02380 ;    Aborts on all errors except changed LRL
02390 ;    #Buffer is required.
02400 ;    #LRL defaults to 0 (256)
02410 ;    #FCB defaults to current value in DE
02420 ;    AF is altered.
02430 ;-----------------------------------------
02440 @@OPEN   MACRO    #BUFFER,#LRL=0,#FCB
02450          DEFINE   @OPEN,3BH
02460          RPUSH    BC,HL
02470          LD       HL,#BUFFER
02480          LD       B,#LRL
02490          IFEQ     %%,3
02500            LD       DE,#FCB
02510          ENDIF
02520          SVC      @OPEN
02530          RPOP     HL,BC
02540          JR       Z,$1?
02550          CP       2AH          ;;Check for LRL change
02560          JR       Z,$1?
02570          LD       C,A          ;;Else error code to C
02580          LD       A,1AH        ;;@ERROR SVC number
02590          RST      28H
02600 $1?      EQU      $
02610          ENDM
02620 ;
02630 ;-----------------------------------------
02640 ;  @@PEOF -- Positions oepn file to end of file
02650 ;  #FCB defaults to value in DE
02660 ;-----------------------------------------
02670 @@PEOF   MACRO    #FCB
02680          DEFINE   @PEOF,41H
02690          IFGT     %%,0
02700            PUSH     DE
02710            LD       DE,#FCB
02720          ENDIF
02730          SVC      @PEOF
02740          IFGT     %%,0
02750            POP      DE
02760          ENDIF
02770          CP       1CH              ;;Success?
02780          JR       Z,$1?            ;;Yes -- go
02790          LD       C,A
02800          LD       A,1AH
02810          RST      28H
02820 $1?      EQU      $
02830          ENDM
02840 ;
02850 ;-----------------------------------------
02860 ;    RPOP -- Version 2
02870 ;      Pops 0 to 6 registers from the stack
02880 ;      Example:  RPOP    BC,DE,HL,IX
02890 ;-----------------------------------------
02900 RPOP     MACRO    #R1,#R2,#R3,#R4,#R5,#R6
02910          IFGT     %%,0
02920            POP      #R1
02930          ENDIF
02940          IFGT     %%,1
02950            POP      #R2
02960          ENDIF
02970          IFGT     %%,2
02980            POP      #R3
02990          ENDIF
03000          IFGT     %%,3
03010            POP      #R4
```

Listing 2 continued

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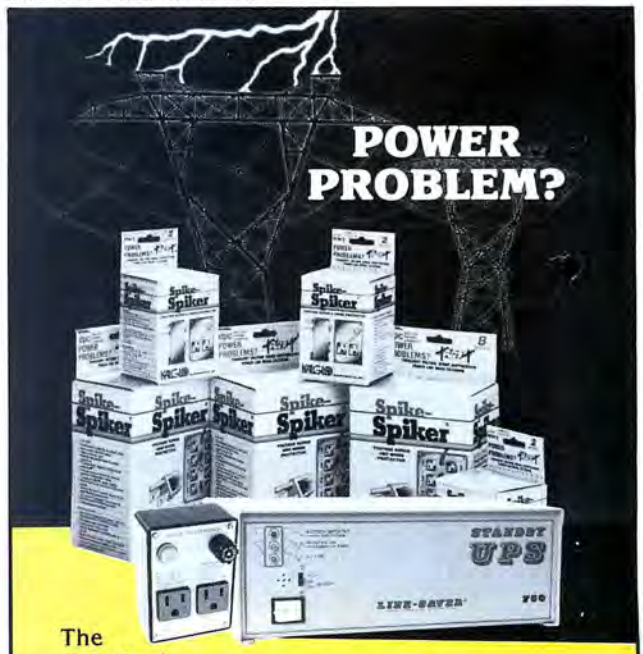

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Listing 2 continued

```
03020           ENDIF
03030           IFGT    %%,4
03040             POP     #R5
03050           ENDIF
03060           IFGT    %%,5
03070             POP     #R6
03080           ENDIF
03090           ENDM
03100 ;
03110 ;-----------------------------------------
03120 ;   RPUSH -- Version 2
03130 ;     Pushes Ø to 6 registers onto the stack
03140 ;     Example:  RPUSH   BC,DE,HL,IX
03150 ;-----------------------------------------
03160 RPUSH     MACRO   #R1,#R2,#R3,#R4,#R5,#R6
03170           IFGT    %%,Ø
03180             PUSH    #R1
03190           ENDIF
03200           IFGT    %%,1
03210             PUSH    #R2
03220           ENDIF
03230           IFGT    %%,2
03240             PUSH    #R3
03250           ENDIF
03260           IFGT    %%,3
03270             PUSH    #R4
03280           ENDIF
03290           IFGT    %%,4
03300             PUSH    #R5
03310           ENDIF
03320           IFGT    %%,5
03330             PUSH    #R6
03340           ENDIF
03350           ENDM
03360 ;
03370 ;-----------------------------------------
03380 ;     Invoke a TRSDOS 6 SVC
03390 ;     If "check" is specified, exit
03400 ;     through @ERROR if NZ flag is returned
03410 ;     from TRSDOS.
03420 ;-----------------------------------------
03430 SVC       MACRO   #NUM,#CHECK
03440           LD      A,#NUM          ;;A = SVC number
03450           RST     28H             ;;Perform SVC
03460           IFGT    %%,1            ;;More than one argument?
03470             JR      Z,$1?         ;;Go if no error
03480             LD      C,A           ;;Put error code in C
03490             LD      A,1AH         ;;@ERROR SVC number
03500             RST     28H           ;;Exit through @ERROR
03510 $1?         EQU     $             ;;Here if no error
03520           ENDIF
03530           ENDM
03540 ;
03550 ;-----------------------------------------
03560 ;  @@WRITE -- Write a record to a file.
03570 ;    #UREC defaults to value in HL(unused if LRL=256)
03580 ;    #FCB  defaults to value in DE
03590 ;-----------------------------------------
03600 @@WRITE MACRO   #UREC,#FCB
03610         DEFINE  @WRITE,4BH
03620         IFGT    %%,Ø
03630           IFEQ    %%,2
03640             PUSH    DE
03650             LD      DE,#FCB
03660           ENDIF
03670           PUSH    HL
03680           LD      HL,#UREC
03690         ENDIF
03700         SVC     @WRITE,CHECK
03710         IFGT    %%,Ø
03720           POP     HL
03730           IFEQ    %%,2
03740             POP     DE
03750           ENDIF
03760         ENDIF
03770         ENDM
03780 ;
03790 ;-----------------------------------------
03800 ;  @@VDCTL -- Calls one of the @VDCTL functions
03810 ;       #FNC is required
03820 ;-----------------------------------------
03830 @@VDCTL MACRO   #FNC
03840         DEFINE  @VDCTL,ØFH
03850         PUSH    BC
03860         LD      B,#FNC
03870         SVC     @VDCTL
03880         POP     BC
03890         ENDM
```

End

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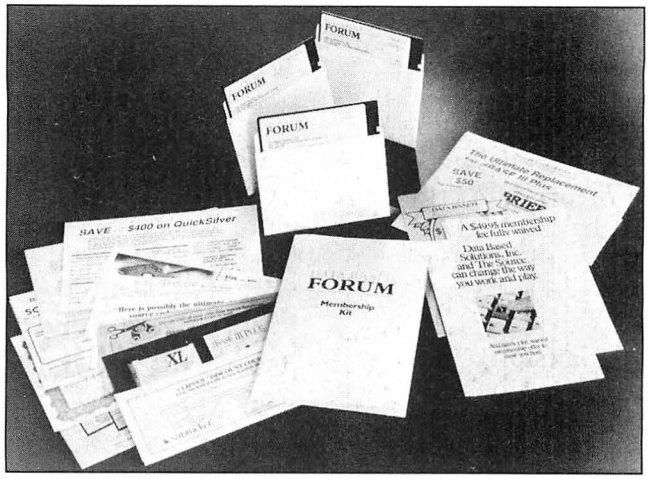

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Wordperfect Support

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Hijaaked Graphics

The graphics capture and conversion utility, Hijaak, converts graphics file formats with full resolution and grabs data from the screen or from HP Laserjet output for larger-than-screen images. Hijaak lets different desktop publishing systems, graphics packages, and computers share information. With its companion program, Inset, it can bring high-resolution images to documents you create with your word processor.

Hijaak sells for $89. It also comes bundled with Inset as the Inset Plus package for $149. For more information, contact Inset Systems Inc., 12 Mill Plain Road, Danbury, CT 06811, 203-794-0396.

Circle 550 on Reader Service card.

Presentation Graphics

Autumn lets you create charts and graphs. It features a 98-color palette (black and white output automatically turns to shades of gray) and a built-in symbol library. It can import worksheet files from Lotus's 1-2-3 and Symphony and, with the optional Metafile utility, file formats such as Lotus PIC, Autocad DXF, and Videoshow PIC.

Autumn supports several ink-jet, laser, and thermal printers and slide-making devices. It sells for $495 from Zenographics Inc., 19752 MacArthur Blvd., Suite 250, Irvine, CA 92715-9976, 714-851-6352.

Circle 551 on Reader Service card.

Business Graphics

Business Graphics II offers maximum resolution on most printers and plotters. You can choose from 12 different formats, three graph sizes, nine locations on the page, portrait or landscape orientation, and color or black-and-white dot-matrix support. The program offers a symbol library and an editing screen so you can create your own symbols or logos.

Business Graphics II includes a spreadsheet into which you can enter and label data. Then a keystroke transforms the data into a chart in the format you've selected. The program sells for $195 from Stella Systems, 10430 South De Anza Blvd., Suite 185, Cupertino, CA 95014, 408-257-6644.

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The Novel Approach

The Novel Approach is an expandable electronic filing system with six work areas that let novelists and non-fiction writers organize chapters; develop characters, subject and research topics, and bibliographies; build scenes; and maintain reference material.

The Novel Approach requires only 64K and costs $49.95 from Words & Moore Inc., P.O. Box 2381, Melbourne, FL 32901-2381.

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Basic Conversions

The Basic to C and Basic to Pascal packages convert IBM Basica (or similar dialects) to standard C or Turbo Pascal, respectively. The converters transform the spaghetti code into structured code and split a large Basic listing into several modules, detect dead-code that never executed, report the improvement, and automatically pinpoint syntax errors.

The economy models of both converters can handle up to 1,000 Basic statements and sell for $99. The commercial models handle an unlimited number of statements: Basic to Pascal sells for $185 and Basic to C sells for $250. Basic runtime libraries for both converters are available separately. Contact Gotoless Conversions, P.O. Box 835910, Richardson, TX 75083, 214-404-1404.

Circle 554 on Reader Service card.

Backup and Recover

Taketwo Manager 2.0 is a memory-resident, automatic file backup and recovery utility with pop-up file-management and DOS functions. It can recover data from hard-disk crashes, accidental file or directory deletions, overwriting files, and accidental hard-disk reformat. The file manager provides a set of commands that further protect against data loss.

Taketwo Manager requires a hard disk and 256K. It backs up to all DOS devices and costs $139. Contact United Software Security Inc., 8133 Leesburg Pike, Vienna, VA 22180, 703-556-0007.

Circle 557 on Reader Service card.

The Forms Manager

EZ-Forms Executive 1.2 helps you create, fill out, and store your own personal and business forms. It also adds spreadsheet-style math and data-base merge features and includes over 100 forms you can modify.

EZ-Forms sells for $89 from EZX Corp., 403 Nasa Road One East, Webster, TX 77598, 713-338-2238.

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2002	Memory 256 with Clock	X							X				X						
2003	Memory 512K with Clock		X										X						
2006	Secondary Mem 256K			X									X				X		
2026	Memory 384K	X												X					
2009	Multifunction 512K with IO/Clock		X										X						
1098	Bilingual Mono/PP									X					X	X	X	X	X
1033	Monotext										X				X	X	X	X	X
1041	Game/IO/ Clock Board				X		X		X			X			X	X	X		
1050	IO/Dual Serial (XT)						X	X					X		X	X	X		
1052	IO/Dual Serial (AT)					X		X										X	X
1043	PP/Serial (XT)				X		X						X		X	X	X		
1045	Serial/PP (AT)				X													X	X
1037/1048	Parallel Chip Set & Cables (XT/AT)				X								X		X	X	X	X	X
9015	Game Port											X			X	X	X		
2004	Clock Chip								X				X		X	X	X		
1047	25-Pin Adaptor												X		X	X	X	X	X
2045	Modem 1200 Baud												X		X			X	
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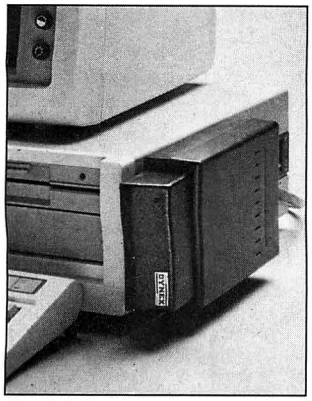


Data Module is a hard disk that can be moved from one computer to another.

Removable Hard Disk

The Data Module is an externally mounted, removable 20MB Winchester hard disk that you can expand by adding another data module. You can move the module from one computer to another of the same type. The Data Module sells for $995 from Western Dynex Corp., 3536 W. Osborn Road, Phoenix, AZ 85019, 602-269-6401.

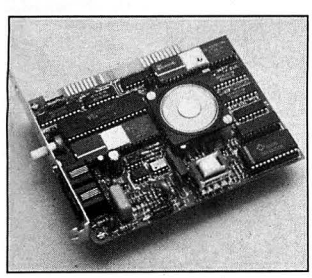
Circle 570 on Reader Service card.

Expanded Memory Simulator

Softbytes provides virtual expanded memory via software. Its device driver intercepts requests to map pages of expanded memory into a 64K page frame that applications designed to use expanded memory can access. Softbytes directs those requests so it stores data normally residing in an EMS's RAM memory banks on other existing system resources.

You can use extended memory, a hard disk, or a floppy to store EMS data, but it works best when you use extended memory. Softbytes sells for $49.95 from Vericomp, 8825 Aero Drive, Suite 210, San Diego, CA 92123, 619-277-0400.

Circle 571 on Reader Service card.



Zoom/Modem provides an on-board speaker with volume control and an audio jack.

Desktop Publishing

The newest version of the Powertext Formatter, 2.7, is designed around the concept of style sheets. Once you've created a style sheet, macros let you automatically place text into the format you want. Page layout, hyphenation, justification, and pagination are automatic. The program features a font manager that lets you easily switch fonts, sizes, and typefaces.

Powertext Formatter requires 384K and works with all popular word processors. It sells for $149.95 from Beaman Porter Inc., 417 Halstead Ave., Harrison, NY 10528, 914-835-3156 or 800-431-0007.

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The Equalizer

With the Equalizer, a PC compatible, and a modem, investors can have on-line contact with Charles Schwab & Co. to buy and sell stock, receive automatic portfolio updates, locate securities prices, and receive automatic alerts of trading activity concerning specified securities. The program also gives access to Standard & Poor's Marketscope and the Dow Jones News/Retrieval database services.

The Equalizer version 1.5 sells for $199 from Charles Schwab & Co. Inc., 101 Montgomery St., San Francisco, CA 94104, 800-334-4455.

Circle 564 on Reader Service card.

Zoom

The Zoom/Modem HC 2400 is a 2,400/1,200/300 bps Hayes-compatible internal half-card modem. It provides an on-board speaker with volume control, an audio jack, and support for four COM ports. A high-speed 16450 UART assures compatibility with 80286- and 80386-based computers operating at speeds faster than 8 MHz.

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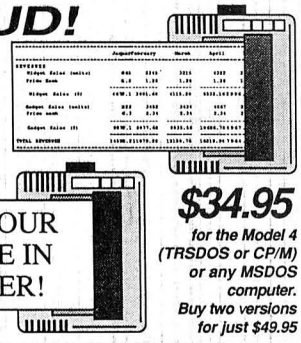

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The Zoom/Modem HC 2400 sells for $199 from Zoom Telephonics Inc., 207 South Street, Boston, MA 02111, 617-423-1072 or 800-631-3116.

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Keep on Talkin'

VOS, the Verbal Operating System, works with your computer and speech synthesizer to let your programs talk to you. It can speak words, spell, indicate upper- and lowercase letters, read punctuation, alert you to screen colors and highlights, and read pages, lines, columns, and windows.

VOS includes on-line verbal help, verbal macros, a find feature that can locate strings of up to 80 characters, and a special document reader so you can page through and read documents easily. The package requires 256K, two floppy drives or a hard disk, an RS-232 serial port, and a voice synthesizer. VOS sells for $550 from Computer Conversations Inc., 6297 Worthington Road S.W., Alexandria, OH 43001, 614-924-2885.

Circle 559 on Reader Service card.

VOS combines a computer and speech synthesizer to develop talking programs.

Elements of Style

The Keynotes Writer's Handbook is a pop-up grammar, spelling, and usage guide for writers who compose at the keyboard. It requires 128K and sells for $29.95 from Digital Learning Systems, 4 Century Drive, Parsippany, NY 07054, 201-538-6640.

Circle 555 on Reader Service card.

Keep It Simple

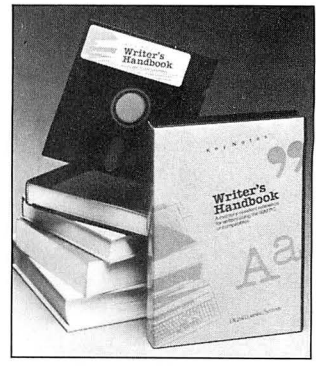
Keep It Simple Software has five new products for the MS-DOS market. Dirworks 2.0 is a DOS shell that lets you manage files and directories, run programs, and control various system functions in an integrated, full-screen environment with single-key commands and pop-up windows. Dirworks costs $40.

Menuworks simplifies the cumbersome steps of program customization to make it easy for you to modify such items as colors, passwords, help messages, titles, hot keys, and menus in programs or DOS functions. Menuworks sells for $40.

Irrworks, a financial-analysis program, computes internal rates of return, present and future value for arbitrary cash flows arising in corporate finance, real estate, and investment management. The program includes a pop-up five-function calculator and can accept data from spreadsheets. Irrworks sells for $89.

Homeworks computes home-mortgage amortization schedules and determines whether a given house is affordable according to the rules most banks use. The qualifier calculator uses income and expense information to determine for what size loan a buyer qualifies. Homeworks is $40.

Screenworks is a field-oriented text-management system for C programmers. It



For those who compose at the keyboard, Keynotes offers support at a keystroke.

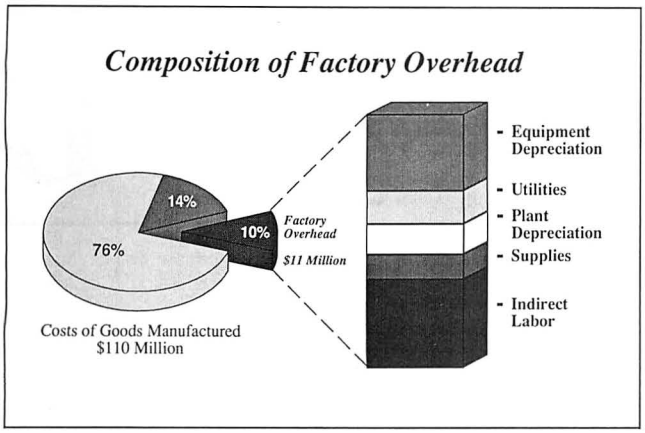


Chart 3.0 lets you directly link to data from Lotus's 1-2-3.

includes a subroutine library for total screen and keyboard control and supports the Microsoft, Turbo, and Lattice C compilers. Screenworks sells for $99.

All five programs require 256K and are not copy-protected. For more information, contact Keep It Simple Software Inc., 580 Fifth Ave., New York, NY 10036, 212-764-5477.

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More Presentation Graphics

Microsoft Chart 3.0 creates presentation graphics for business and scientific applications. The program supports a mouse and includes effects for 3-D bar, column, line, and pie charts. Text-charting capabilities let you prepare text-only charts and tables or integrate them with graphics. You can edit any image on screen.

Chart 3.0 lets you directly link to data from Lotus's 1-2-3, Multiplan, Dbase, and other programs. It sells for $395 from the Microsoft Corp., 16011 Northeast 36th Way, Box 97017, Redmond, WA 98073-9717, 206-882-8080.

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Legal Forms

Microlawyer contains over 100 common legal documents for personal, business, and corporate use. A lawyer designed the forms, which you prepare on your word processor and use in conjunction with legal advice.

Microlawyer sells for $59.95 from Progressive Peripherals & Software Inc., 464 Kalamath St., Denver, CO 80204, 303-825-4144.

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Bigger Hard Disk

The Model KXP-230ZT Hard Disk Expander is a hard-disk controller that uses data-compression and file-compaction techniques to increase drive capacity an average of 100 percent. It also stores data more efficiently to speed disk operations and access. The Expander includes an error-correction code that can handle errors up to 512 bytes long.

The Model KXP-230ZT costs $249 from Konan Corp., 4720 S. Ash Ave., Tempe, AZ 85282, 603-345-1300.

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Convert to PC-Write

PC-Write DCA Conversion package lets you transfer document files between PC-Write and other word processors that support the Document Content Architecture (DCA). The documents thus transferred won't lose their formatting descriptions.

The DCA Conversion package is shareware and sells for $29. For more information, contact Quicksoft Inc., 219 First North, #224, Seattle, WA 98109, 206-282-0452.

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Bowling League Secretary Software—MS-DOS; Model III/4. O-K Audio, 543 Cedarwood, Middletown, OH 45042, 513-423-0321.

Data-Log-96: A menu driven data base for MSDOS computers. Easy file and format creation. Why pay more? A real bargain at $19.95 pp. The Cecap Co., 27233 Kane Lane, Oak Ridge North, TX 77385-9028.

$$$WIN with Thoroughbred/Harness, Greyhound Handicapping Software. . .$31.95, enhanced. . .$51.95. Professional Football Handicapper. . .$41.95. Basketball Handicapper. . .$51.95. Software Exchange, PO Box 5382-M, W. Bloomfield, MI 48033. Free information: 313-626-7208. Orders: 1-800-527-9467.

Music Software for voice and guitar. Version 3.0 of the Music Transcription System from Questar Products provides full screen graphics editing of melody lines, lyrics, and guitar chord notation on your IBM PC, Tandy 1000, or PC compatible. Enter songs and play them back through your computer's built-in speaker, or create and print songs and lyrics of your own. Special features include choice of Treble, Bass, Alto, or Tenor clef; all major key and time signatures; automatic transposing; high quality printing; and efficient/easy-to-use menu based design. Requires DOS 2.0 or above, 256K, monographics or color graphics display, and IBM/Epson compatible printer with graphics. Regular $49.95. Holiday special: $29.95 plus $2 s/h. through January 31. Send for free brochure. Questar Products Ltd., 1252 Westover Trace, Acworth, GA 30101. JA

Templates of Doom, makes a game of learning Lotus 1-2-3. $49.95 plus $2.50 S/H. 30 day money-back-guarantee. Solar Systems Software, 8105 Shelter Creek, San Bruno, CA 94066, (415) 952-2375.

PUBLICATIONS

Free IBM Software Catalog. Powerful, quality software of all types, edited and menu-driven to run with A>GO at the prompt. From $3.75 a disk. Ask for the PACKAGE DEAL: Games #1, Edit, Qubecalc, PC-File+, Qmodem. 6 disks for $20.00. 3.5 and 5.2 inch formats. Interface Software & Systems, D, Box 329, Cookstown, Ontario, Canada L0L 1L0. Call 705-435-6972. AP

Disk Service Manual. ($20), Computer Phreaking ($15), Cryptanalysis Techniques ($15), Absolute Computer Security ($15), Integrated software ($10). Catalog $1 (40+ Publications/Software). Consumertronics, 2011 Crescent, Alamogordo, NM 88310.

Tandy 1000 programs/Newsletter. Send for information. Soda Pop Software, PO Box 653, Kenosha, WI 53141.

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Free MS-DOS Shareware catalog! Business, games, utilities, programming, education. $3.95/disk. AP Software, 269 Springside Dr., Hamilton, Ontario. Canada L9B1P8. DE

Radio Shack, Tandy Owners! Find the computer equipment Tandy no longer sells. Pacific Computer Exchange buys and sells used Tandy TRS-DOS, MS-DOS, and Xenix computers and peripherals. We sell everything from Model 3's to Tandy 6000's and all the printers and hard disks to go with them. If we don't have it in stock, we will do our best to find it for you. We have the largest database of used Tandy equipment to draw from. All equipment comes with warranty. Pacific Computer Exchange: The **ONE** source for used Tandy equipment. Call 503-236-2949. 1031 SE Mill, Suite B, Portland, OR 97214. DE

Media Conversion for Tandy Models to over 800 systems including Magtape, Micro Computers, Mini Computers, Word Processors and Typesetters. Pivar Computing Services, Inc., 165 Arlington Hgts. Rd., Number 80, Buffalo Grove, IL 60089. 312-459-6010.

HARDWARE

Clone Kits, Modems, Hard Drive Kits, disk drives, printers, memory, and IC's. Distributor pricing to end users and dealers. For catalog call 1-800-833-2600, in Ohio call 513-531-8866. FREE SHIPPING.

Megabyte Expansion board for Models 4/4P. $119.95 with RAMDrive software. Memory, shipping extra. Details: RAI, Box 7084, Hampton, VA 23666.

5MHz Speed Up for Models 4/4P. $24.95, ($2 S&H). Non-gate array models. Details, contact: RAI, Box 7084, Hampton, VA 23666.

Nationserv. Online information Network, 3960 Covert Ave., Evansville, IN 47715, (812) 477-5343.

Tandy Model 12, 128K, 2 drives, manuals, Scripsit, Visicalc, reformatter program for translating system 34 or 36 diskettes. Don't need system anymore. What's your offer? Martin Heller, RR 1 Box 196, Eucha, OK 74342. 918-435-4433.

Special Introductory Offer: ¢heapware Label Maker (IBM PC and compatible only) for 3 across labels; $6.00. 800-NICOLAI (312-642-6524). DE

Media Conversion for Tandy Models to over 800 systems including Mag tape, micro computers, mini computers, word processors, and typesetters. Pivar Computing Services, Inc., 165 Arlington Hgts. Rd., Number 80, Buffalo Grove, IL 60089. 312-459-6010.

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Word Processor. Full-featured, w/mail-merge. BASIC for Models I, III, 4 (III mode) 16K–48K. Justify, underline, set fonts, graphics. 20 page manual. Specify your system. $10 tape, $12 disk. Tandy 1000 compiled, $25. Del Hinrichs, 2116 SE 377th, Washougal, WA 98671-9732. NV

SIX2XTND(C) extends TRSDOS(R) 6.2.X past 1987 to 2099. No hidden protection. Money back guarantee. Send $14.95 US. $3 S&H. Check or money order to: Michael Jacobs, Box 552, Stn. K, Toronto, Ontario, Canada M4P 2G9. JA

FOR SALE

Modem Owners—Order software, hardware, supplies, on-line at discount prices. Faulkner Supply, 919-383-4905. MY

TRSDOS

Share Your Model 4

Timeshare 2.0 runs on a 128K Model 4 in Model III mode running LDOS 5.x or Newdos/80 2.0. It uses windows in a multitasking environment and lets you run two programs simultaneously. Timeshare resides in a hidden portion of memory and takes only 512 bytes of user RAM. It sells for $49.95 from C & D Programming, 500 Old Lane Road, Binghamton, NY 13903.

Circle 584 on Reader Service card.

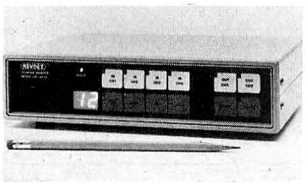
200 DOS

Disk Power II, a DOS for Tandy's 200K Portable Disk Drive-2, supports the drive's two-bank configuration and lets you jump from bank to bank, or back to the RAM directory. It also stores files portion by portion to disk without disconnecting, which lets you download files larger than the laptop's available RAM.

Disk Power II improves memory management for the Models 100/102/200 and enhances the built-in Basic, Text, and Telcom programs. It sells for $59.95 and is available from Ultrasoft Innovations Inc., 76 Main St., P.O. Box 247-DY, Champlain, NY 12919, 514-457-9293.

Circle 585 on Reader Service card.

Etc.



Keydex Buffer and Printer Sharer can connect up to four computers and two parallel printers.

Printer and Buffer Sharer

The Keydex UG-403 Buffer and Printer Sharer can connect up to four computers and two parallel printers. You can set it to automatically scan the input port for incoming data, or you can make the selection manually. The 256K buffer can store data until the printer is free. The unit can produce multiple copies and sells for $360 from Computer Friends Inc., 14250 Northwest Science Park Drive, Portland, OR 97229, 800-547-3303 or 503-626-2291.

Circle 588 on Reader Service card.

The Digital Line

With the Digital Starter Set, you can use your computer to control your model railroad. The set includes two digital locomotives with rolling stock, two electric switches (and a decoder to operate them), the central control unit (that you can use instead of a computer), a transformer, and track.

One operator can control both trains and switches independently. The Digital Starter Set sells for $965 from Märklin Inc., P.O. Box 319, 16988 W. Vector Rd., New Berlin, WI 53151, 414-784-8854.

Circle 591 on Reader Service card.

Programming Pascal

Pascal Precisely, by Judy Bishop, provides both experienced and novice programmers with a course on programming in Pascal and helps them move to more sophisticated languages like Ada and Modula-2. The book offers information on such topics as syntax, types and looping, character processing, calculations, parameters, dynamic data, and Turbo Pascal.

The 254-page *Pascal Precisely* (ISBN 0-201-17525-8) costs $19.95 from Addison-Wesley/Computer Science, Reading, MA 01867, 617-944-3700.

Circle 589 on Reader Service card.

Tax Reform

Supertax 1987 runs on the Tandy 1000/1200/3000 and the Models II/III/4 and incorporates changes from the 1986 Tax Reform Act to help you plan your taxes and prepare your return. The package prepares pages 1 and 2 of Form 1040, Schedules A, B, C, D, E, F, SE, and Forms

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Zucker Hard Card 20 - 20 Megabyte Hard Card by Zucker; Preformatted, easy to install into 1000/1000SX/1000TX. **$499**
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No Slot Clock by SMT - Installs easily onto the motherboard; does not use an expansion slot (1000/1000EX/1000SX). **$49**

UPGRADES by MicroMainFrame

Micromainframe EX-RAM 384 — Complete with 2 Memory Plus Style expansion slots for adding Tandy Cards; upgrades your EX to 640K (1000 EX). **$139**
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Seagate 20 Megabyte Kit - Requires removal of drive B, with Modified Western Digital Controller and easy to install instructions. (1000/1000SX) **$399**
Everex Modems — Internal Modems by Everex, complete with 1 year warranty and communication software (1000/1000SX/3000).

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2400 Baud Evercom II	**239**

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2441, 3800, 3903, and 6251.

The TRSDOS version requires 64K and two disk drives. The MS-DOS version requires 256K and one drive. Each sells for $169 from Rockware Data Corp., P.O. Box 866307, Plano, TX 75086, 214-596-0588.

Circle 587 on Reader Service card.

Program Writer

Quickpro + II automatically writes custom application programs for you that conform to the answers you give to its prompts. You don't need to know any special commands or programming languages. Quickpro + II writes Basic programs that you can save, list, modify, and further customize.

Versions of Quickpro + II are available for the Tandy 1000/1200/3000, the Models I/III/4, and the Color Computer for $29.50 from ICR Future Soft, P.O. Box 1446-DC, Orange Park, FL 32073, 800-872-8787 (operator 604).

Circle 586 on Reader Service card.

DIFFERENT TRACK

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Soundbuster turns your computer into a synthesizer. The package includes a full-sized card (fits the Tandy 1200/3000) with stereo/speaker connections, a MIDI interface, software with synthesizer (30 instruments), a sampler, and a sequencer.

Better than that, callers in the 415, 408, and 707 areas can dial 415-976-6448, select a song, and sing along with the background music. To hear Soundbuster in action, call 415-347-1174.

Soundbuster costs $249.95 from Yam Educational Software, 1432 Laguna Ave., Burlingame, CA 94010, 415-579-0822

Circle 590 on Reader Service card.

Soundbuster is all you need to become a music comp. . .er. . .music producer! Yeah. Then surround yourself with a few attractive members of the opposite sex and make them. . .er. . .stars! Yeah, that's the ticket!

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C ITOH Prowriter 1550-8510, NEC 8023-8025, APPLE DMP - IMAGEW	1/2 x18	$15/2 $ 42/6 $ 78/12	$7/1 $6 ea 2 or more	$15/3 $54/12 $288/72
IBM PROPRINTER (Standard Paper) (4201)	7/16 x 20	$18/2 $ 51/6 $ 96/12	$8/1 $7 ea 2 or more	$18/3 $66/12 $360/72
IBM PROPRINTER XL (4202)	7/16 x 27	$18/2 $ 51/6 $ 96/12	$8/1 $7 ea 2 or more	$18/3 $66/12 $360/72
RADIO SHACK-TOSHIBA-COMMODORE-PANASONIC-RICOH		RS LP-I-II-IV, CENTRON	730-737-739-779 (ZIP PACK)	$12/3 $45/12 $252/72
Carbon Film - DWP 210, DIABLO HYTYPE II Black (1445)	5/16 x 145	$18/3 $60/12 $342/72	$5 ea 3-11 $4 ea 12 or more	$24/6 $42/12 $234/72
DW II, DWP 410-510, RICOH 1200-1300-1600 Black (1419)	1/4 x 145	$18/3 $60/12 $342/72	$5 ea 3-11 $4 ea 12 or more	$24/6 $42/12 $234/72
Red, Green, Blue, Brown Colors (1419)	1/4 x 130	$21/3 $72/12 $414/72	$6 ea 3-11 $5 ea 12 or more	$30/6 $54/12 $234/72
Fabric (Long Life), DWP 210, DIABLO HYTYPE II Black (1458)	5/16 x 17 NOT EZ LOAD	$18/2 $ 51/6 $ 96/12	$8/1 $7 ea 2 or more	$21/3 $78/12 $432/72
DW II, DWP 410-510, RICOH 1200-1300-1600 Black (1449)	1/4 X 25	$18/2 $ 51/6 $ 96/12	$8/1 $7 ea 2 or more	$21/3 $78/12 $432/72
DMP - 100, LP VII, COMMODORE 1525, GORILLA BANANA (1424)	Inker Loop	$18/2 $ 51/6 $ 96/12	----------	----------
DMP - 200, 120, 130 (430 INSERTS & RELOADS) (1483)	1/2 x 20	$20/2 $ 57/6 $108/12	$7/1 $6 ea 2 or more	$15/3 $54/12 $288/72
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STAR MICRONICS RADIX 10	1/2 x 55	$18/2 $ 51/6 $ 96/12	$7/1 $6 ea 2 or more	$15/3 $54/12 $288/72
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MX-FX-RX 70-80-85, LX 80-90 (5/16 x 7)	1/2 x 20	$14/2 $ 36/6 $ 66/12	$7/1 $6 ea 2 or more	$15/3 $54/12 $288/72
MX-FX-RX 100-185-286, LQ 800 (1/2 x 18) LQ 1500 (1/2 x 14)	1/2 x 30	$18/2 $ 51/6 $ 96/12	$8/1 $7 ea 2 or more	$18/3 $66/12 $360/72
EPSON LQ 2500 (INSERTS & RELOADS ONLY)	1/2 x 15	----------	$7/1 $6 ea 2 or more	$15/3 $54/12
DX 20-35 Carbon Film (Multistrike), OLIVETTI ET-121-221	5/16 x 290	$21/3 $72/12 $414/72	(Call for Correctable Prices)	----------
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OKIDATA Pacemark 2350-2410 Black	1/2 x 100	$20 EACH	$20/1 $18ea 2 or more	$36/3 $132/12 $720/72
Microline 293-94	7/8 x 28	$30/2 $ 84/6 $156/12		
Microline 182-183-192-193 292 (7/8 x 16)	Inker Loop	$20/2 $ 57/6 $108/12		
ML-80-82-83-92-93 (Call for ML-84 Prices)	1/2 x 16	$21/6 $36/12 $198/72		
MANNESMAN-TALLEY MT-160, RITEMAN INFORUNNER (Inker Loop)	9mm x 11	$19/2 $ 54/6 $102/12		
MT-180-290	9mm x 13	$20/2 $ 57/6 $108/12		
RITEMAN 15 -SPIRIT 80 (SP80) COMMODORE 1526 (Multistrike)	1/2 x 35	$16/2 $ 45/6 $ 84/12		
PANASONIC KXP-1080-1090-1091-1092-1592-1595	Inker Loop	$16/2 $ 45/6 $ 84/12		

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Circle 152 on Reader Service card.

Continued from p. 108

RAM disk(s) (with the entire board as maximum disk size) for resident and non-resident programs and more. Diagnostic programs are provided with instructions. This board doesn't have a backfill of memory capability, but since I have 640K on the motherboard, I can't say if this will affect performance.

Michael Ballentine
Aurora, CO

Thanks for sharing your experiences. Actually, we noted the problems with the Orchid board in our September 1986 issue ("The Wonderful World of Tandy 1000 Add-ons," p. 40), but it bears repeating.—Eds.

Living on the Fault Line

I am angry, because I'm uncertain and frustrated. I feel like I'm standing on a hot griddle, ready to jump. But where? Are my neighbors any different?

First, I don't feel I can go anywhere for help. Spending $2 every time I call someone in Los Angeles for an answer is not adequate support. I'm not an expert, but I still know more than the people at the Radio Shack Computer Centers.

I read articles in your magazine, and I'm left frustrated. I've had one issue open to "In Search of Lost Superscripsit Files" since April, and I still don't understand it. I'm going to sleep with it under my pillow. Maybe that will help. The article makes me feel stupid, which I am not. I survived as a fighter pilot in World War II, and I have a Ph.D. in chemistry from Harvard. I'm just not interested in the wheels and escapements of the computer's mechanism.

Am I condemned to frustration? Must I return to school and get a degree in computer science? Perhaps the lack of help comes from living in the boondocks, but many computer users live in the boondocks.

Second, I have the uncertain feeling that one gets during a mild earthquake when the ground moves slightly, and I don't have anywhere to step.

Am I about to become an orphan? Dating runs out on the Model 4 at the end of the year. *But*, there is an update. However, it's not from Tandy. It delivered me into the hands of someone I won't deal with, a third party that I can't trust because it doesn't trust me. I bought the Logical Systems Inc. (LSI) update but returned it when I found that the disk is imprinted to prevent me from using it on more than one machine. I have four machines. I didn't hire four people to run these machines; if I did, I'd willingly buy four disks.

If I were a hacker, I could probably zap this protection and spread copy disks all over California. This protection scheme is much like gun registration. It only hurts the nice people like me. I don't intend to buy four copies to use on my systems and keep track of which disk is for which machine. I write letters on my Model 4P, print drafts on the DMP 130, and make final prints on a 4 that is hooked to a DWP 410. I don't even want to think if I'll have trouble. I don't like LSI's attitude that its customers are crooks. I'm not, and I won't purchase a copy-limited or protected disk.

Has Radio Shack abandoned me? It says "No," but how can I believe that when I'm dumped into the hands of a third party? Should I junk the whole system before I get any deeper? If I dump the system for an upgrade, do you think it will be Tandy? Is anybody willing to make me an offer?

C. E. Dills
San Luis Obispo,CA

Send your correspondence to Input, 80 Micro, 80 Elm St., Peterborough, NH 03458. We reserve the right to edit letters.

Circle 107 on Reader Service card.

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Continued from p. 110

pect to support the screen editor on MDA machines in the next release.

Professional reviewers should comment on customer service when things go wrong. For Williams to state that he found that all the pages were punched on the wrong side of the manual without ever bringing it to our attention belittles the entire review process. Your readers want to know what is right with a product but also what the publisher does when something is wrong. A professional reviewer would call us with a complaint and report our response. This was not done.

Williams wrote, "Half of the 200-page manual is an assembly-language tutorial. Not a bad idea, although I've seen better treatments." Does that say anything about the content? I don't think he found a 100-page tutorial in Microsoft's MASM manual. We feel the tutorial is useful; the scope of the assembly coverage in our reference manual makes it easier for the beginner.

Williams wrote that the tutorial's descriptions of the 8086 and 8087 instructions are "too sketchy to be of much value for serious programming." Come now, a serious programmer probably has a bookshelf of references. You wouldn't expect to use only the assembler manual. That section of the manual only serves as a quick reference.

Williams seems to think that programmers don't use line editors anymore. MS-DOS users can't consider line editors to be antiquated; they get them with DOS and Basic. I don't intend to defend Edlin's, BasicA's, or GW-Basic's line-editing environment. I also prefer a full-screen text editor. We plan to improve ED/ASM's and support MDA, too.

Williams' text editor can probably save/load a plain text file faster than ED/ASM because it doesn't have to waste time converting a memory image to ASCII. ED/ASM does. That's why it's fast in its own format. However, it supports conversion to and from ASCII for those who need it. The tokenized format is not so important for space saving as parsing time during assembly. ED/ASM-86 also copies the existing ASM file to a BAK file before overwriting an existing ASM file, which takes time. Does his text editor do this?

Williams was silent as to why his test assembly took so long. His "Beats me" statement was unprofessional. One way to create a thousand errors would be to code this statement with a question mark:

```
DB 1000 DUP ?
```

The errors occur because the question mark isn't supported in ED/ASM-86. An equivalent statement using the expression evaluation supported by ED/ASM-86 is:

```
DB 1000 DUP 0.
```

If he had commanded ED/ASM-86 to generate a screen listing via the command A:,-sc-we, he would discover quickly what his problems were. Apparently he doesn't know about the convenient "wait on error" switch.

When Williams compared MASM's batch operation of less than two minutes to ED/ASM's 15 minutes, what was he trying to do? Was he assembling from the ASCII file he'd commented on? It spent time writing because he told it to. I find it unusual for him to use an assembler environment that permits a rapid investigation of errors to foolishly proceed and assemble to disk. Why waste time? The assemble to screen and wait on error facility has been available for years. Doesn't MASM have that convenience? Williams should have called and reported his problem. We would have helped him. Our users have expected that of us for years. We have provided that service.

Williams attacks ED/ASM's link file structure with the comment that link files are incompatible with object files. So what if ED/ASM's link format is different from MASM's? Not discussing each format's merits doesn't help the readers. We feel this should have been covered in the review.

An integrated assembly-language environment's purpose is to speed up program development. If programmers just want to type listings into a computer, they might as well get MASM, or provide the COM file in BINHEX listing. They wouldn't need to buy an assembler. But if someone wants to write assembly programs, an integrated environment is superior to MASM. Williams didn't cover that issue.

We don't feel that your readers got an honest appraisal of our product and company.

Roy Soltoff
President, Misosys Inc.
Sterling, VA

It must be called to the readers' attention when a major part of a program, especially a feature mentioned in advertising, requires a certain hardware configuration. My review clearly stated that only the screen editor has this requirement.

It is true, as Mr. Soltoff said, that Microsoft doesn't offer tutorial material in the MASM manual. Perhaps he should follow that example and devote more attention to explaining his assembler. Many books exist on assembly, but you can't go anywhere else for information on ED/ASM-86 besides the manual.

I don't apologize for my preference for a full-screen editor. I agree with the manual when it states that the line editor is relatively difficult to learn and that most users will use the screen editor.

The test file I used for the review was a program I'd assembled and executed without difficulty. I only expected to run a timing test. I didn't expect to engage in a lengthy debugging exercise; hence I did not inhibit the assembly to disk. As I mentioned in the review, I got the program to assemble, and I described what I did to "fix" it. Even then, ED/ASM-86 was very slow. Curiously, Mr. Soltoff doesn't comment on the lockups and other problems I had while using the debugger.

I looked forward to reviewing this product, but I was disappointed when I discovered it had little to offer. The premise of an integrated assembly development system is good, but why burden it with non-standard file formats and unusual hardware requirements?

Finally, I probably shouldn't have mentioned the mispunched pages, but I'm getting tired of serving as a quality-control department for software developers.

—David A. Williams

The Good and the Bad

I notice that questions from 1000 SX owners are appearing in your magazine; I am a satisfied 1000 SX owner, but I, too, am concerned about the compatibility of the myriad hardware devices that are available as add-ons.

The bad news: The Orchid Tiny Turbo 80286 CPU accelerator card grounds out at pin 32. I had one installed, and my computer worked perfectly for all functions in the 8088 mode but did nothing when I toggled into turbo mode.

The good news: From Lake City, MN, comes the P.C. Tech "Four Megger" expanded memory board. Just plug it in, add a couple lines to the Config.SYS, and go. I use this with Carousel, DBLDOS, Wordperfect, and First Choice, and also with various exercises involving my hard card. So far, I haven't had any problems.

You can configure the memory as

Continued on p. 107

80 Micro's BBS is open 24 hours a day. It offers programs you can download, special-interest groups, and a classified section. You can reach the board at 603-924-6985; UART settings are 300/1,200 baud, 8-bit words, 1 stop bit, no parity.

Changing of The Guard

I am usually content to leave prose in the hands of someone who wields it with considerable dexterity, *80 Micro*'s editor-in-chief, Eric Maloney. Maloney took the editorial helm of *80 Micro* in April 1982 and has steered us well—until now. I'm blowing the dust off my word processor to announce a changing of the guard.

Unfortunately, this issue (his 66th, by my count) is Maloney's last. *80 Micro*'s new "baby," *PC Resource* magazine, has grown beyond expectations, requiring his full-time attention. *PC Resource*'s gain is a significant loss to *80 Micro*'s readers and the community of Tandy computing.

Don't misunderstand me. I'm not trying to be sentimental. Maloney is a first-rate curmudgeon, known for savoring hearty dialogues and for starting them if one isn't in progress. The advertising community might breathe a sigh or two of relief at his departure. I doubt anyone on the upper floors of the Tandy Towers will mourn his absence for long. I'm sure Maloney doesn't give a tinker's damn in either case.

Maloney is the kind of journalist (there's only one kind, according to him) who mistrusts concerns outside a magazine's relationship with its readers. Advertisers, manufacturers, accountants, and salespeople have all felt the sting of his skepticism. We haven't been sued lately, but I occasionally hear from his victims, who inquire pointedly as to why we continue to endure the fallout from his nuclear barbs.

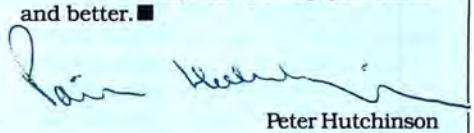
The answer is that you and thousands of other *80 Micro* readers have benefited enormously from six years of Maloney's independent, controversy-generating presence. First, he makes you think, which in this age of canned laughter and vapid media is a rare and good thing. But even more important is the honesty that Maloney's skepticism brought to our content. When you read a review in *80 Micro*, you get an unencumbered, uninfluenced picture of the product. We take our duties seriously.

Maloney knows what makes Tandy computing a little different from the rest of the pack, and he has worked hard to make *80 Micro* a publication that remains on target for its special audience. He's leaving us as the road takes another turn, and we'll miss his guidance.

I'm pleased to close by mentioning that Michael Nadeau will be handling the tiller starting next month. This means that *80 Micro*'s January issue will feature a new design, some new material, and a new editor-in-chief. Coincidentally, January's our eighth birthday, and Nadeau's the perfect person to guide *80 Micro* into its ninth year.

Nadeau has been our executive editor since April 1986, and he goes back some distance in the annals of Tandy computing. Formerly editor-in-chief of *Hot CoCo* magazine, he knows his way around a Radio Shack. As author of our "Home Computerist" column, Nadeau also knows his way around the inside of a Tandy 1000, and that augurs good things for our readership as 1988 gets underway.

If you're one of Maloney's many fans, we hope you'll visit with him from time to time in the pages of *PC Resource*. And if you've enjoyed his approach to *80 Micro*, please stay tuned. Michael Nadeau, the rest of the *80 Micro* staff, and I look forward to extending Maloney's legacy of journalism. . .and to exciting times ahead as Tandy computing gets better and better. ■



Peter Hutchinson

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Did Someone Cry Wolf?

Perhaps Jack Feldman missed some crucial points in his review of LDOS 5.3 (see Reviews, June 1987, p. 108) and in his reply to Roy Soltoff (see "LDOS Chaos," Input, September 1987, p. 115).

His warnings about mixing files on a disk (5.1.4, 5.1.4 converted, and 5.3) are totally unfounded. Even if you wanted to go to this extreme, you wouldn't attempt the "impossible task" of finding and converting all of your disks or marking the specific DOS on each disk, as he declares. The Dateconv utility serves that purpose and only converts those files that haven't been updated.

Distinguishing between 5.1.4-converted and 5.3 files is the same as showing two apples and calling one of them an orange. Even if you haven't converted a file, 5.3 won't hurt it if you try to read or write to it on an unconverted disk; 5.3 works with the file without a hitch and without altering the older dating scheme. The only thing missing when I create unconverted utility files under 5.1 on my 5.3 work disk is a time stamp in a directory listing.

Only the user password changes, not the owner (formerly update) password. The owner password works no matter what new user password another DOS might interpret from the date data being placed in the user location. Those files with full-access protection levels can be accessed from a 5.1 environment without worrying about passwords, because the other system first looks to the update entry for password protection.

The only problem occurs when you try to access protected files. But this is as it should be and is probably the reason that Logical Systems Inc. (LSI) and Misosys maintain the owner entry and use the user location for extended dating. From LDOS 5.1 I can copy protected files from a 5.3 disk, provided I use the passwords given in the 5.3 update documentation. Unlike unprotected files, with protected files I must use the owner password to execute it from 5.1, but I can easily change that "mysterious" user password to PASSWORD or a blank using the ATTRIB library command.

I could get long-winded on examples, but that would be moot; you get the same results if you use another DOS, such as Multidos or Dosplus.

But what's the point? After a quick sweep with Dateconv, a mixed disk is properly sorted and polished to the newer format, which you use anyway if you want to use LDOS and go beyond 1987. Isn't that the point in upgrading? Why go back to 5.1? And if you're upgrading, why mix files? LDOS 5.3 fixes things if you copy files to it, provided you use 5.3 as the resident DOS. If you use another DOS, such as Dosplus or LDOS 5.1 to move the files, Dateconv can fix these as well.

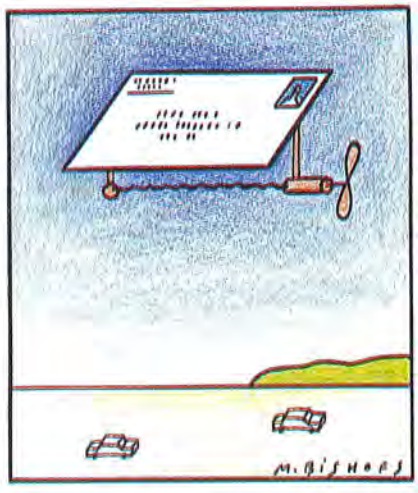

Illustration by Maris Bishofs

Mr. Feldman's complaint in his September reply to Mr. Soltoff about Repair is also curious. Sure, LSI (LS-DOS 6.3 and TRSDOS 6) and Misosys (LDOS) could have called it Fix, but when you fix something, aren't you repairing it? Regarding his comments about the Alien parameter, I submit that any disk not wholly compatible with a DOS is alien to it. TRSDOS and LS-DOS 6 have the same features; I don't hear screams of outrage from their users. I agree with the point that the use of the Alien parameter is redundant. But a desire for a Friendly parameter? Using Alien can't be worse (or sillier) than some MS-DOS commands.

The enhanced (and TRSDOS/LS-DOS 6 compatible) Forms and Setcom features make things easier. Has he ever checked parameter settings under 5.1? Good luck. If you had doubts about them, the only way to ensure they were set correctly was to re-enter the desired parameters using the Set command and hope that you got everything. Setcom and Forms spell these parameters out for you. You'll also notice this feedback feature present in the Copy and Kill commands.

Granted, LDOS is more complex than other operating systems. Naturally, a more sophisticated system requires a more precise instructional language, but this is because people who outgrew TRSDOS demanded these features. If you don't need the enhanced features, stay with TRSDOS or don't use them under LDOS. LDOS doesn't require you to use all of its power. I know several users that don't do any more with LDOS than they were capable of with TRSDOS 2.3 on their Model I's.

A strength of LDOS is its manual. Unlike most documentation, the LDOS manual is carefully designed and in most parts thorough in its explanations of commands and features. It isn't abbreviated like some manuals or full of hacker jargon like others. The 5.3 upgrade also features help files for both DOS and Basic. Finally, the author of LDOS 5.3 will answer your questions if you call Misosys.

If the technical stuff in the manual creates the impression that it's a tough-to-handle DOS, pull the pages that don't concern you.

After carefully exploring all the enhancements in 5.3 over previous versions of LDOS, I am impressed with the enhancements and the powerful freebies. It's worth the modest $35 upgrade fee, considering I get several times that worth in return.

David Goben
Mansfield Center, CT

Two Swords in the 1000

I own a Tandy 1000 and a Model 100. The two worst shortcomings of the 1000 are the lack of more expansion slots and the inability to add a CGA or EGA card.

Also, I wish the reviews of new products in *80 Micro* included model compatibility.

Roger Anderson
Sunnyvale, CA

At Sixes and Sevens with ED/ASM

It is with sadness that I bring another poorly researched product review to your attention (see "A Great Idea, Poorly Executed," July 1987, p. 32). A great idea, yes. Poorly executed, no.

The heading states that ED/ASM-86 "requires a color-graphics adapter." This is untrue. It works on a monochrome display adapter (MDA). The assembler, line editor, debugger, and linker work on MDA, CGA (color-graphics adapter), and EGA (Enhanced Graphics Adapter) equipped machines. Only the full-screen editor requires a CGA or EGA (emulating CGA) adapter. We ex-

Continued on p. 108

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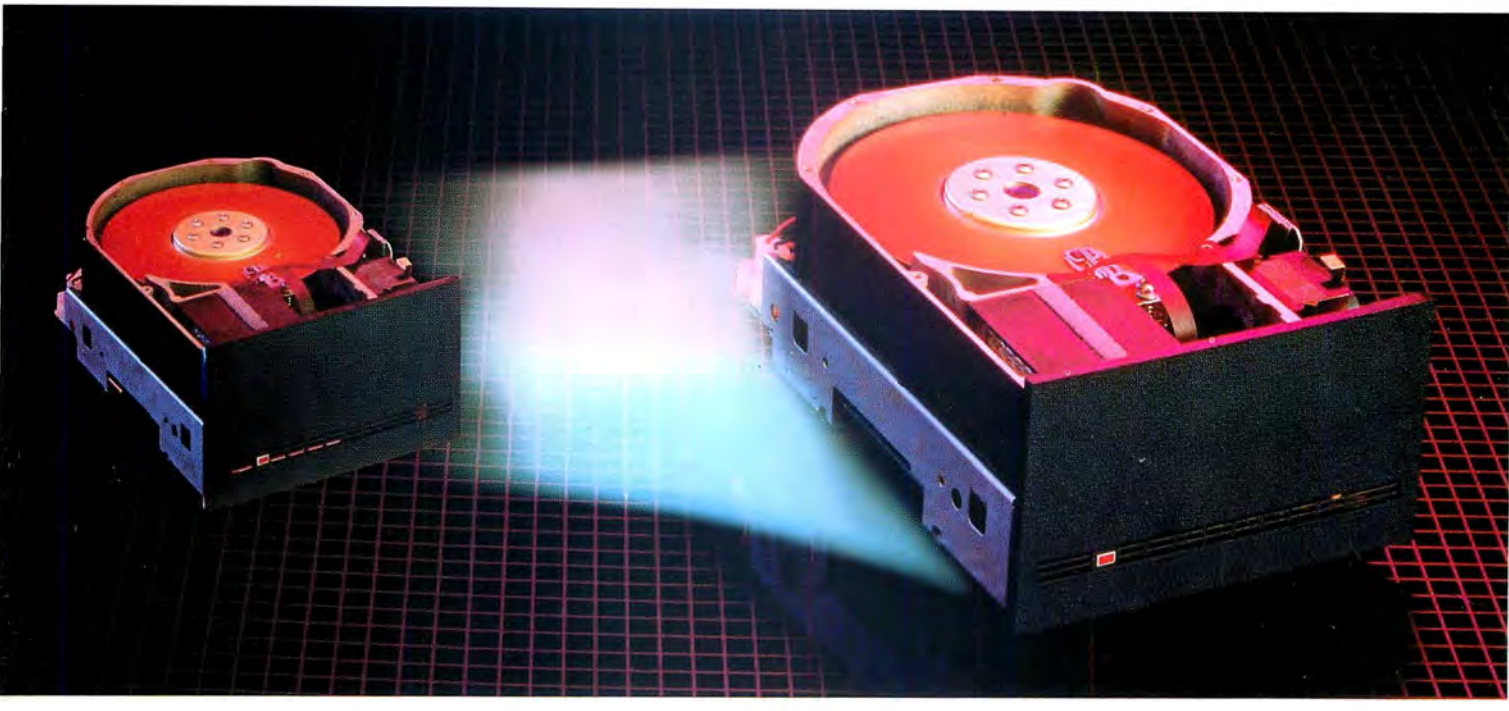

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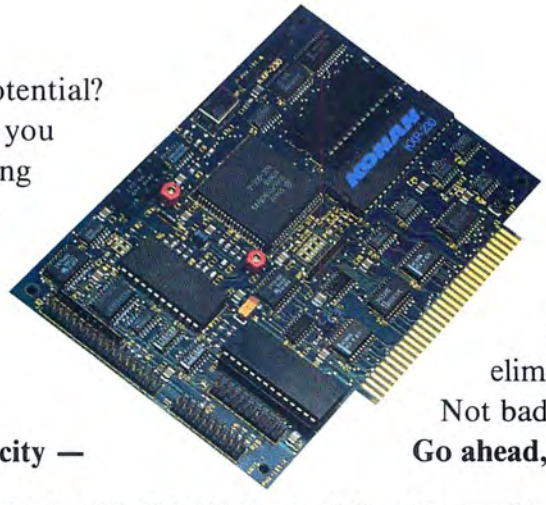

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