

\$3.50

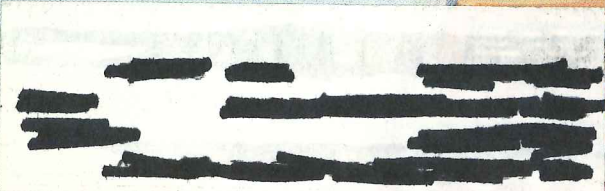
PROFILES

The Magazine for Kaypro Computer Users

July 1987

**COMPARING WORDPERFECT
AND MICROSOFT WORD**

**LOTUS MACROS:
A TUTORIAL**



LOCAL AREA NETWORKS

HANDYMAN

TURN YOUR KAYPRO ON TO HANDYMAN!!!

AUTO DIALER

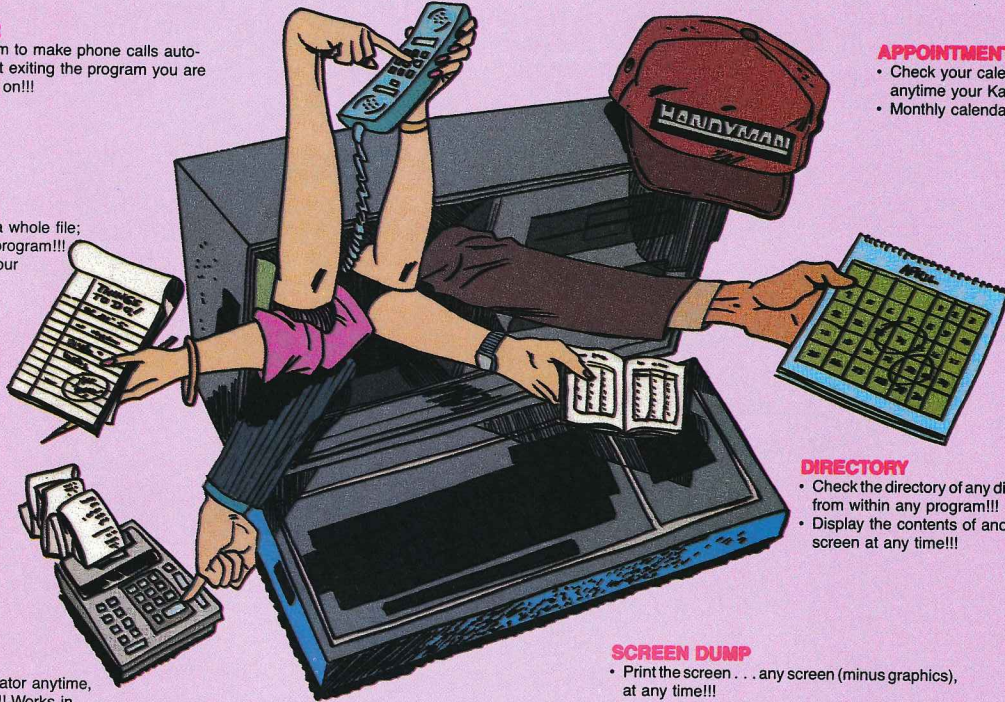
- Use your modem to make phone calls automatically without exiting the program you are already working on!!!

APPOINTMENT CALENDAR

- Check your calendar, schedule appointments anytime your Kaypro is on!!!
- Monthly calendars 1752-2099 AD!!!

NOTEPAD

- Write a note, paragraph, letter, a whole file; anytime, from within any other program!!!
- Edit another file without leaving your current file!!!



DIRECTORY

- Check the directory of any disk, any user number, from within any program!!!
- Display the contents of another file on your screen at any time!!!

CALCULATOR

- Punch up a four function calculator anytime, whenever your computer is on!!! Works in decimal, binary, hex!!! Works from within a spread sheet, or any other program!!!

SCREEN DUMP

- Print the screen . . . any screen (minus graphics), at any time!!!
- Dump to your printer, or to a disk file!!!

- "Disk Full" message? With **HANDYMAN** you can check the disk directory and erase superfluous files from within any program!!!



Turn your Kaypro on!!! HANDYMAN is there!!!

HANDYMAN Is a plug-in board for your Kaypro!!!
HANDYMAN Works with all Kaypro CP/M models!!!
HANDYMAN Easy to install!!!
HANDYMAN We'll talk you through it over the phone!!!

HANDYMAN Includes software in ROM and its own working RAM!!!
HANDYMAN You never have to load it!!!
HANDYMAN Single stroke commands!!!
HANDYMAN is compatible with all CP/M application programs!!!

HANDYMAN Uses no main memory!!!

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Includes: All brand new components mounted in a Kaypro 10 case.
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 800 Kybte (quad-density) Panasonic floppy-disk drive. (Reads single and double sided double-density disks too.)
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These are **complete computers — not upgrades**. Price and availability subject to change. Allow 3 weeks for delivery. Add 3% for credit card purchases (computers only) and \$20.00 shipping and handling. Call for prices on 30, 40, 50, & 100 Megabyte computers. 90 day warranty.

NEW — HANDYMAN Version 1.3

Now complete with File Manager. Copy files from any drive/user to any other d/u without leaving your original application file. Now enter Appointments with a single keystroke. Now available with Advent Turbo ROM. (Optional)

And much more. **HANDYMAN Still uses No Main Memory.**

Still only \$124.95

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 I use _____ (Wordstar or Perfect Writer).

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Charge my

California residents add 6% sales tax \$ _____
 Shipping and handling (\$5.00 **HANDYMAN** — \$20 K-20) \$ _____

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Signature _____ TOTAL \$ _____

Phone (____) _____ - _____ Eve (____) _____

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I am interested in the CP/M MS-DOS operating system. (CIRCLE ONE)

PROFILES

The Magazine for Kaypro Computer Users

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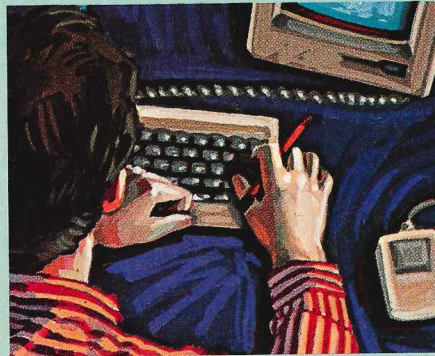
BY DAVID WEINBERGER

Here's an UNERASE
program that shows
how it's done

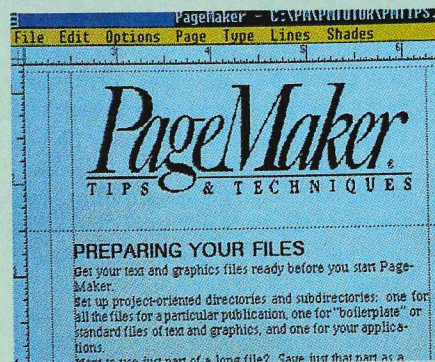
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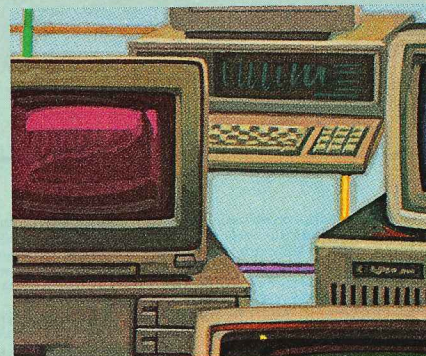
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ON THE COVER:

Local area networks are tying individual computerists back together. "Connectivity" is one of the new buzzwords being heard. Artist Kristen Funkhouser offers her vision of "connectivity."

Editors' Notes

LANs, bugs, macros, BIOS calls, and writers' tools

July means fireworks, family picnics, and summer fun. July is also a good time to do all those things you've always intended to "get around to"—and that's where *PROFILES* can help. This month's issue is jam-packed with information that will help you enhance the use of your Kaypro.

Local-area networks (LANs) are highlighted this month. Writer Robert Sawyer gives you the inside scoop on how they work, where they work best, and also where they are *not* appropriate. A common pitfall in the computer world is to do something just because it's possible—we don't think that's necessarily a wise strategy. Read "Local Area Networks—*The good news and the bad*" to see if one makes sense for you.

Ted Silveira offers a hands-on review of PageMaker in "Electronic Paste Up." This contender in the desktop publishing market for MS-DOS has a lot going for it, and Ted gives you his honest opinions.

Spreadsheets helped bring microcomputers into the office; Lotus 1-2-3 made them an office star. Joseph Comanda presents a step-by-step tutorial on how to use macros within Lotus—a great productivity tool.

Writers were one of the first groups to wed themselves to micros, so naturally tools for writers were one of the first software categories to

bloom. Spelling checkers were among that first crop. The Word Plus started off as a spelling aid, but it can do much, much more. See how to use it to solve crossword puzzles and more in "Advanced Uses of The Word Plus."

Writing is not a static activity and word processors have had to improve too. Perhaps you've outgrown yours. In "Other' Word Processors" Jim Spickard looks at two popular alternatives for MS-DOS: Microsoft Word and WordPerfect.

And finally, we have two offerings for programmers. "In Search of Programming Bugs" details techniques for tracking down the infamous critters. And for all you hardcore CP/M programmers we have "BIOS Calls Your Mother Never Taught You." David Weinberger gives you an UNERASE program in assembly language to demonstrate how those direct instructions to the BIOS work.

Also of interest is Brock Meeks' "Life at 300 Baud" column, which asks the question: Are online data bases a threat to national security?

Check out *PROFILES*' "Classifiles" classified ads—there are some new items and great summer deals.

Enjoy.



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Terian Tyre

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EDITORS/WORDPROCESSORS

- 7012) **VDO**: Ver. 2.5. Video Display Oriented editor. Full screen editor with help menus uses only 7K of memory!
7013) **WORDSTAR PATCHES**: Patch subroutines and patch locations for modifying Wordstar.
7048) **EXPRESS**: Version 1.0. A full screen editor designed for programmers. This editor can access files in any user area, on any disk from anywhere on disk to anywhere on the disk.
7049) **VDE**: Version 2.31. A small powerful text editor that takes up only 10K of memory.

EDUCATIONAL

- 7006) **DB HELP**: Dbase help program listing all Dbase II commands and functions. (Requires Dbase II).

GAMES

- 7000) **NEW ADVENTURE**: Enter into the Colossal Cave to find fortunes of treasures and gold.
7002) **DC10**: An exciting flight in the cockpit of a DC 10. Includes instrument representation. (Requires MBASIC).
7015) **GAMES, GAMES, GAMES**: Star Trek, Chess, Aliens and more. (includes source code).
7017) **BASIC GAMES**: Star Traders, Chase and Nuclear Reactor. (Requires MBASIC). (Requires Turbo Pascal).
7021) **THE MINES OF MORIA**: A complex fantasy game that changes every time you play it. (Requires MBASIC).

GRAPHICS (REQUIRES KAYPRO W/ GRAPHICS)

- 7003) **DDRAW**: Version 2.0. Create pictures on your screen and save them on disk to recall later. This program also allows you to dump graphics to your printer. (Includes PASCAL source code).
7034) **ARTIE**: Version 6.0. An excellent graphics design program that allows you to dump your art files to your Okidata or Panasonic printers.
7053) & 7065) **PLOT**: Version 3.3. A very impressive high resolution plotting system for dot matrix printers. The plotting program comes preconfigured for Epson, C. Itoh, and Okidata printers. Source code is included. High level language facilities for creating the vector files are supplied for MBASIC, TURBO PASCAL and Microsoft FORTRAN80. Requires disk 7065. (2 disk set. Must order both disks)

HACKERS/SECURITIES

- 7005) **DB SQZ6L**: Take this program and encrypt your Dbase II command files to protect them from prying eyes. (Requires Dbase II).
7046) **SCRAMBLE**: Version 2.0. A very effective way to protect your files. This program scrambles your file using an eight character password. Even the author says he could not decipher without the password!!!

LANGUAGES

- ALGOL**
7040) **ALGOL-M**: An algol subset suitable for learning algol. Includes compiler and interpreter.
APL
7063) **APL**: Yes you read right ... APL. Don't know much about this program except that it appears to be bug free and supports standard APL.

ASSEMBLERS AND STUFF

- 7026) **NEW ZASM**: A Z80 macro assembler that assembles standard Z80 mnemonics into Intel hex format.
7027) **ZMAC**: A Zilog mnemonic assembler that generates relocatable object code. Also included is ZLINK a linkage editor for programs assembled by ZMAC. Generates native code.
7033) **XLATE**: Version 5.0. Xlate takes 8080 source code using Intel mnemonics and creates a new Z80 source code using Zilog mnemonics.
7042) **DAZZLE STAR**: Z80 disassembler with built in editor. The editor uses Wordstar compatible commands.

BASIC

- 7041) **NBASIC**: Nbasic is a basic preprocessor for Mbasic and Basic*. This preprocessor allows the programmer to use alphanumeric labels, REPEAT/UNTIL loops, case statements and fortran like subroutine calls.

C

- 7023) **SMALL C COMPILER**: Version 2.0. Expanded version of Ron Cains Small C. (Includes sample programs).
7024) **SMALL C SOURCE**: Version 2.0. Source code for C compiler. For those who want to modify a C compiler. (Requires 7023 to compile itself!).
7025) **SMALL C MACRO FILES**: Macro source files for Small C.

COBOL

- 7068) **COBOL**: Compiles to interpreted code. Includes interpreter and full documentation.

FORTH

- 7038) **FORTH 83**: 1983 standard forth interpreter.

LISP

- 7036) & 7070) **ILISP**: This is an implementation of LISP based on the LISP dialect called SCHEME. (Requires CP/M 2.*). (2 disk set. Must order both disks)

MODULA 2

- 7064) **MODULA 2 SOURCE CODE**: This disk contains fifty Modula source code files. Included are many useful utility procedures.

PRINTER UTILITIES

- 7022) **FONTSY**: Banner program for all printers. (Includes source).
7028) **BRADFORD**: An excellent near letter quality printer program for your Wordstar or standard text files. Comes with five fonts for Epson MX w/Graffiti, IBM Dot Matrix, Star Gemini 10x/15x, and Epson FX/RX printers. A truly amazing program.

MISCELLANEOUS

- 7020) **EXPERT SYSTEMS**: Written in Pascal. (Requires PASCAL Compiler).
7039) **DESK MASTER**: A computer desk organizer. Desk Master comes with a calendar, card file, memowriter, and calculator.
7043) **TOUR**: Version 2.0. Document editor for outlining projects, also include desk calendar.

TELECOMMUNICATIONS

- 7004) **DBBS**: A space efficient dynamic bulletin board system that incorporates passwords. (Requires MBASIC).
7009) **MBYE**: Version 4.0. This is a remote console program for CP/M 80 computers. This disk contains assembly language source code only and is NOT for the novice programmer.
7010) & 7069) **ROS**: Version 3.4. Remote Operating System including PASCAL source code. Requires Turbo Pascal. (2 disk set. Must order both disks)
7069) **ROS**: Requires disk 7010. (Disk 2 of 2).

- 7011) **ROSMAC**: Set of machine dependent I/O and clock drivers for ROS V 3.3 and 3.4.

- 7018) **MODEM 7**: Powerful modem program that supports auto-dial for Signalman Anchor Mark XII, Hayes Smartmodem 300 or 1200, U.S. Robotics 300/1200 and PMMI 103 s-100 Plug-in.
7035) **MEX**: Version 1.11. Modem program that also incorporates a phone number librarian.

- 7054) & 7055) **PBBS**: A Small, very fast BBS program written in Z-80 assembly language. PBBS provides 8 level user profile, private and public message system, BYE504 or 339 bdos interface, automatic user/message automatic file maintenance. Plus more. (2 disk set. Must order both disks)

- 7058) & 7059) **MBBS**: A very powerful BBS. (Version 4.5). (2 disk set. Must order both disks)

- 7060) **MBBS UTILITIES**: Set of utility programs for MBBS.

- 7061) **IMP**: Version 2.44 Modem program that supports both KMD batch protocol in addition to MODEM7 type.

UTILITIES

- 7001) **CPM POWER**: Version 2.53. A CP/M subset with many additional commands.

- 7007) **DB UTILITIES**: Set of Dbase II utility programs and overlays. Includes source code.

- 7008) **FBAD**: Version 6.0. Checks your hard or floppy disk for bad tracks. Includes source.

- 7014) **YANC**: Version 2.4. Yet ANother Catalog program for those who attempt to keep themselves organized...

- 7016) **MISC. STUFF**: Contains XCCP, DASM, and I/O Cap.

- 7029) **QUIKKEY**: Version 2.0. Key redefinition utility.

- 7030) **SUPERSUB**: Version 1.3. Replaces SUBMIT on CP/M. Allows submit files and supports interactive mode.

- 7031) **EPEX**: Version 1.1. Environmental Processing EXecutive. EPEX is a very powerful environmental program with such features as batch processing including IF /ELSE /END /GOTO, named directories, aliases system control and much more. Includes full documentation.

- 7032) **EPEX TOOLS**: Tool package for EPEX V 1.1.

- 7037) **EGUTIL**: Set of CP/M utilities including free disk space by sector, file tagging, and hidden files.

- 7044) **NEWARC**: Set of archive tools written assembly language for increased speed. Tools include copy, add, del, directory, sort, and type. There is even a utility for running command files from the archive

- 7045) **CRUNCH**: Version 2.3. Utility for crunching and uncrunching files.

- 7047) **FU-12**: Full screen binary editor using commands patterned after Wordstar.

- 7050) **SPOOLBUFFER**: Througls all output to the printer to disk file then from disk to printer for more efficient use of CPU time.

- 7051) **CONIX**: Conix is an operating system that operates under CP/M. Some of the capabilities of Conix include path searching, automatic overlay, redesigned user areas, 8M Print spooler, user definable function keys, virtual disk system, user definable I/O devices and much, much more. Conix is a must for any serious CP/M user.

- 7052) & 7071) **CONIX DOCUMENTATION**: Complete documentation for Conix. (2 disk set. Must order both disks)

- 7056) **KMD**: Version 1.5. Very popular file transfer program.

- 7057) **LBRDISK**: This set of programs fool BDOS into thinking that a library is actually a logged disk device.

- 7062) **MAGIKEY+**: A key redefinition program that allows you to create and keep key definition files.

- 7066) & 7067) **FATCAT**: Version 2.4. A catalog program that allow cataloging hard drives as well as floppy disks. Very easy to operate and configure. (2 disk set. Must order both disks)

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Praise on patching

I have to write to compliment you on an excellent issue, May 1987. I find especially useful the article "Pinning Down Patch Points" by Joseph I. Mortensen. It is useful as an aid to patching in general, plus it lets me patch a program I use and enjoy, Out-Think, to make it easier to use. My thanks to your magazine and the author.

My other reason for writing is to ask if you could do an article on Z-80 boards for MS-DOS computers, so those of us using CP/M would know what to expect if and when we upgrade. Your article in the July 1986 issue, "Multi-Format Programs" by T.F. Chiang, was helpful, but did not go far enough. Specifically of interest, what programs will run on those boards and what problems can be expected? I think this might be of interest to both CP/M users and people who only have an MS-DOS machine, since a lot of CP/M software is cheaper than MS-DOS software. Thanks again for a very useful magazine.

George W. Richards
Rochester, New York

An article on Z-80 co-processor boards for MS-DOS computers is scheduled for an upcoming issue.

Index on disk

Thanks for the informative magazine. I've used it many times to improve the performance of my machine and its software. In fact, I've just installed two foot keys using the April 1987 article "Use Your Feet!" The big toe of my right foot is pressing the Control key whenever needed. Good article, thanks.

I would like to make one suggestion, though. It would be great if you would provide your yearly "Subject Index" on disk as well as in print. It is just aching to be used in a data base manager. It should be released into the public domain, which might even increase your circulation. Would it be too much to ask for 1985 and 1986 indexes to be released soon?

Steven L. Hughart
Sacramento, California

Your suggestion is well taken. Look for

both the 1985 and 1986 Subject Index on Kaypro's BBS—KUG ROS (619) 259-4437.

More on Adventure

I have read several letters in your magazine asking for help with the 550-point Adventure game. There must be thousands of people who have finished this game, but, while my son and I were working on it, we were unable to find any of them. Now that we have finally finished, we would be glad to help other Adventurers who are having problems.

We can provide hints or actual answers to problems. We also have a set of maps and lists of treasures, tools, magic words, and red herrings. Write to the below address about what help you need, and please include a SASE.

Judy L. Thomas
1411 Highland
Mt. Pleasant, MI 48858

Back to one issue

I just received your CP/M—MS-DOS issue. Bravo.

It is nice that you tried something out and were smart enough to change your mind when the notes came through. I use both, and I really missed your MS-DOS stuff. Thanks again.

Melvin Hausner
New York, New York

Request for Multiplan

I particularly enjoyed David Kutzler's article on "Using Multiplan to Track a Mutual Fund IRA" in the September 1986 issue. In the November "Letters" column there was a correction to one of the formulas. After making the correction, my formula for cell R1C9 still contained an error. I found that the parenthesis should be inserted after the portion of the formula reading `IN-V_D),365`, like so.

I have an MS-DOS Kaypro and have upgraded the RAM memory from 256K, which came with my system, to 768K. The information I needed to know (what chips to buy) also came from the "Technical Forum" column in *PROFILES*. By not having to buy a multi-function card to replace the one in the box, I saved some bucks.

In addition to Multiplan, I use Word-

Star, which came bundled with my system, and the pop-up desk-utility program. Since I am a member of the Bismarck PC Users Group, I have access to many programs offered on the bulletin board.

I would like to see more formulas to use with my Multiplan program since I have a hard time with those. I also would like to know if anyone is using Multiplan or other spreadsheets for construction cost estimating.

Lucille Doyle
Mandan, North Dakota

Puzzled

I appreciate very much your decision to publish MS-DOS and CP/M articles in one magazine. I still use CP/M—it's quite satisfactory for my purposes, but some day I will move to MS-DOS as well. Since *PROFILES* is an essential part of my computer learning curve, I'm sure I'll refer to back issues for MS-DOS information when the time comes.

Your writers, Silveira, Meeks, Sperry, et al., do a wonderful job.

Your advertisers would be glad to hear that every piece of software and hardware I have bought in the last year and a half has been from a *PROFILES* advertisement.

I do have a question—one that's been addressed in bits and pieces before—but one that I still do not have completely answered. Can someone explain for me why Kaypro CP/M uses the 2.2u1 version? What can be done to replace that system so that I can use, for example, ZCPR3, as well as some public domain utilities that haven't run under 2.2u1? If the ROM is flawed in some basic way, why can't Kaypro replace it with a more standard version? As you can see I still have misconceptions about 2.2u1; maybe one of your writers can help.

Wendell Oderkirk
Omaha, Nebraska

The 2.2u1 ROM for Kaypro CP/M computers was designed and implemented so that a single ROM could be used in every Kaypro CP/M computer. When the computer powers up, the 2.2u1 ROM can figure out how many drives are in the

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system and whether or not there is a hard drive.

It is true that the 2.2u1ROM (sometimes called the U-ROM) does not allow some public domain programs and applications to run. However, most applications do run, and the software shipped with U-ROM computers works flawlessly. Also, the CP/M utility programs that came with it are easier to use and provide more power than conventional CP/M utilities.

Specifically, under the U-ROM the CONFIG program allows 80 keystrokes to a keypad definition, rather than four, which was the previous limit. Also, the U-ROM software package provides the menu-driven DUTIL program, which can copy, format, and sysgen single- or double-sided disks. DUTIL is far easier to understand than a cryptic A0> prompt.

Kaypro does not offer upgrades or exchanges for its ROMs. However, Advent Products Inc., of Anaheim, California, (714/630-0446) and Micro Cornucopia of Bend, Oregon, (503/382-8048) both sell ROMs for Kaypro CP/M computers.

Kaypro overseas

While reading the March 1987 issue of *PROFILES*, I noticed a letter from someone who was asking for help in using a Kaypro 2X overseas, and in your answer, you said to look for an article on that subject in a later issue. In the hopes that this information may be of some timely use, I offer the following.

One of the key points that helped me make my decision to buy a Kaypro 4'84 was that it could work on European (or African) power supplies that range from 200-270 volts at 50 Hz.

I have been using my Kaypro 4'84 in Africa daily since October 1985. All I had to do to prepare the computer for this was to visit my dealer and have him show me which lead to move on the power board. The dealer's input is important as there were three different power boards shown in the manual and you want to move the correct wire. When I arrived in Africa, I moved the lead from the location marked 110v to the one marked 220v. Then I made a short extension cord that had the proper plug for the outlets I was using with a standard U.S. grounded socket at the other end. I could have just as easily bought a plug adapter or new power cords, as any



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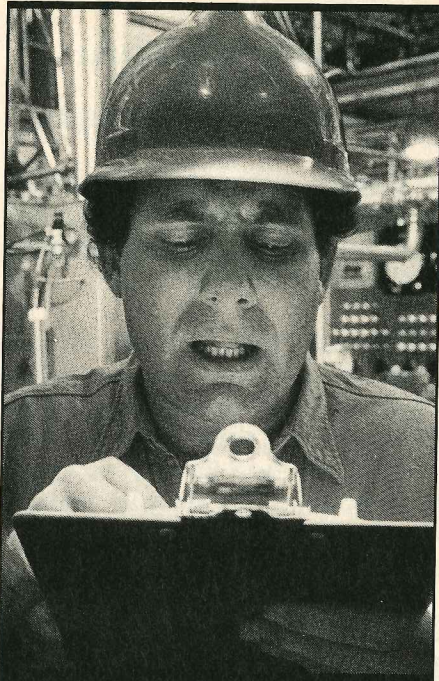
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Letters

computer store has them, but since I had the parts in my junk box, it was cheaper to make my own.

I also bought a C. Itoh/TEC Starwriter F-10 daisywheel printer. Once when I had the top off for cleaning I noticed a switch marked 110-220. I checked the owner's manual and it did indicate that it would work on 50 Hz. So, when I arrived in Africa, I moved the switch to 220v, plugged it into the same outlet the computer was using, and I have enjoyed problem-free computing ever since.

Both devices were adapted to their new environments in a few minutes with only a screwdriver, and they can be changed back to U.S. standards just as quickly. Add to this the fact that the Kaypro 4 can go on board an airliner as hand luggage and it makes an already great computer an even better choice for international travel. I couldn't be happier about the way my 4'84 has performed under such difficult conditions as voltage fluctuations, high heat and humidity.

Thanks for a great magazine. Unless you have taken an overseas tour in the Third World, you will never really appreciate Pizza Hut™, CompuServe and *PROFILES*.

Rev. James P. Cooper
Republic of South Africa

We stand corrected

I was quite surprised, when opening the March issue of my favorite computer magazine, to find my letter printed there.

However, your reply contained a serious error that could cause problems for many *PROFILES* readers. You said that "CompuServe states that its data format is seven data bits, even parity, and one stop bit . . ." That is not true, I quote from the CompuServe subscription booklet: "[use] 7 bit ASCII even parity or 8 bit ASCII no parity." Where the misinformation could cause real problems is in binary file transfer. The *CompuServe Users Guide* addresses this problem in the section on "Upload/Download/Access," noting that for some of the most popular telecommunications programs, binary transfer requires the 8-bit transfer standard. So, your assertion that I have figured out a way to get away with tricking the mighty DEC PDP-11 computers into accepting 8-bit communications, and that CompuServe will not help me in time of need, was incorrect. I was not "using a data format other than the one that CompuServe recommends." Far too many people, such as myself, depend on *PROFILES* for instruction and information to let that error stand uncorrected.

Michael Turner
Hamilton, Montana

We stand corrected. Rich Baker of CompuServe's Public Relations department states that CompuServe does indeed support 8 data bits, 1 stop bit, no parity. Additionally, that information appears in the CompuServe Starter Kit manual, edition CS-467, on page 9 of the New User Information section.

Legend How to read this magazine

Every feature article in *PROFILES* has a legend code in the upper corner of the first page. These help you recognize at a glance what operating system(s) the article covers and the assumed knowledge level.

General is for all readers

Beginning is for novices

Intermediate is for average readers

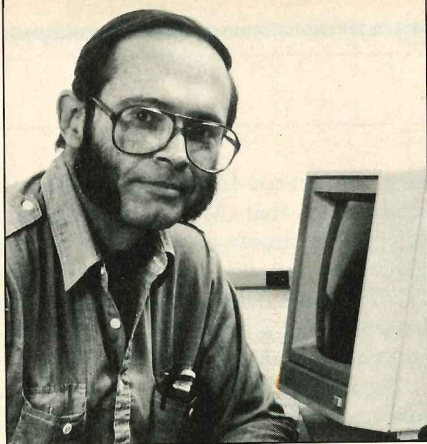
Advanced is for experienced readers

In addition, program commands in articles are highlighted in two ways—ones within text are **boldfaced** and ones that are full statements in their own right are put on their own line and set in a different typeface, like so:

command line

This allows you to quickly pick out the items you need to enter in a step-by-step tutorial for example.

Our goal is to make *PROFILES* an enjoyable part of your Kaypro computer.



First Impressions

External and internal modems

by Tom Enright

This month we'll look at three modems, two external and one internal. They cover the spectrum from inexpensive (\$200) to expensive (\$750), and from passable to high-performance. The modems for your perusal are the Novation Professional 2400, Okitel 1200, and "Volks i" 1200. The Novation and Okitel are external modems that require connection to a serial port on your computer. The "Volks i" 1200 is an internal modem card that is for IBM compatibles only.

All three modems are Hayes compatible. This means that each one responds to the Hayes command set, the defacto industry standard. So, when selecting or installing software, you simply choose "Hayes" and your chore is complete. No more knowledge of your modem's command set is needed unless you want to set up special parameters in the modem's command registers. Most users have no reason to do this as the default settings are usually satisfactory.

Novation Professional 2400

The Novation Professional 2400 is a high-performance external modem. Its primary distinguishing features are an LCD screen, alternate command set, and support for synchronous as well as asynchronous communication standards. The modem is contained in a beige plastic case that measures 5-1/2 inches wide by 10-1/2 inches long and one inch high. The volume control for the internal speaker is a thumbwheel on the left side of the case instead of being in back where Hayes puts it.

This modem comes configured as a Hayes compatible, so my first test was simply to hook it up and try using it. My communications software (ProComm

2.42) is already configured for a Hayes so no reconfiguration was needed. The modem worked so well that I didn't even look at the manual for three days, and then only to see what other features were available.

With the exception of a red power light on the front of the case all status

The Novation has a "personality module" that lets you control the modem parameters.

indications are made via the LCD screen. The LCD screen is the only feature of the modem that I didn't care for. Due to its placement (facing nearly straight up) you can only see it from in front of the modem looking down. It also has the same disadvantage of the LCD screens used on most laptop computers — it is very hard to read in poor light. To the left of the screen are six large and easy to use buttons. Their functions include: turn the modem on, turn it off, select data or voice mode, start a self-test procedure, select what mode the modem is in, and select transmission speed.

The on and off keys need no explanation. The data/voice key is to switch the telephone line between data and voice modes. You would normally leave it in voice mode and let your software take care of switching to data mode. The test key does just what it says — activates a self test that prints its results on the LCD screen. The mode key switches the

modem between answer, originate, and auto-answer modes. Finally the speed key selects 300, 1200, or 2400 baud asynchronous and 1200 or 2400 baud synchronous modes.

If the keys on the front aren't enough, there is a removable "personality module" on the back panel with 19 dip switches on it. These switches control the default power-up setting of modem parameters. They can also alter whether any of the RS232-C lines are normally tied high or low, which command set will be used, and whether an internal or external clock signal is used during synchronous operations.

When the modem has this many capabilities the manual can be somewhat threatening, and the manual for the Novation Professional 2400 proves this rule. It speaks much more to the very experienced user and computer professional than to the average user. But, remember that my initial test was to simply plug everything in and use it, and that approach worked just fine.

To be fair I'd have to say that this is one of the few products that is aptly named. The Novation Professional 2400 modem is meant for the *professional* level user. It will work for what most of us use a modem for, but in an overkill situation.

With support for synchronous operations, an alternate command set, and 19 dip switches on the personality module there is little that this modem can't do. So, if price is a consideration, this modem is not for you. However, if raw performance in nearly any conceivable situation is important, then this modem may be just what you're looking for.

Okitel 1200

The Okitel 1200 is an external 1200-

baud Hayes compatible. Being an external modem it doesn't care what kind of computer it's hooked up to. It, along with the Novation Professional, will work just as well on a Kaypro 2'83 or an Osborne as it will on a Compaq or IBM.

The Okitel 1200 has a gray plastic case 6.7 inches wide by 10.7 inches long and 1.4 inches high. It has the same LEDs that Hayes users are familiar with. The only departure is the volume control, which is a thumbwheel on the right side of the case. On the rear panel are the connectors for power, two phone lines (one for the line to the wall and one for a telephone), the on/off button, and eight dip switches. Nothing unusual, just a Hayes clone that sells for less than Hayes charges.

Okidata has always produced top quality documentation and the Okitel 1200 is no exception. The users guide for this modem is the best one that I have ever read. It strikes the happy medium between too much information and not enough. The new computer owner will find the instructions clear and understandable and the veteran won't be bored by long step-by-step procedures. Where other manuals use huge masses of boring text, this manual uses drawings. Drawings are also used to illustrate the operation of the modem—even old hands are liable to learn something here. I wish the rest of the computer industry could produce manuals of this quality.

The modem itself is just as trouble free and easy to use as the manual. The Okitel 1200 isn't flashy, but it is *dependable*. It is the kind of computer peripheral that you don't have to think about; it's always there and it always works. Since the Okitel is a Hayes compatible, I submitted it to the same test that I put to the Novation. I simply hooked up the wires and started using it. No changing of dip switches and no special setup commands. Everything worked like a charm—you can't ask for more than that.

The Okitel modem does depart from the Hayes command set in one area. It has three extra commands: a slash (/) causes a 125 millisecond pause, a period (.) sends a Morse Code "dot" and an underline character (⎵) sends a Morse Code "dash." According to the manual these commands are required by the FCC if the modem is to be used for

radio communication. HAM radio operators should be especially pleased that Okidata is taking their needs into account.

As you may have gathered by now, I'm very impressed by the Okitel 1200. It is being added to the list of modems that I heartily recommend. I would have more confidence in a metal, rather than plastic, case, but this is a personal preference that may not be valid for you. In any case, you'd have to look a long way to find a better value.

ever, the manual does not tell you this. It simply says that COM3 and COM4 are selected by moving the jumper, then it gives you the dip switch settings for COM1 and COM2. The connection between the jumper setting and dip-switch positions is never stated.

The rest of the manual is worded as a reference work for modem commands, internal register settings, and a few communications terms. No real tutorial material exists and the installation section is incomplete.

The Volks i 1200 comes with a few extras bundled in.

"Volks i" 1200

The "Volks i" 1200 is an internal, Hayes-compatible modem for IBM PCs and clones. The advantage to using an internal modem is having fewer cables sprouting from the rear of your computer. The price that you pay for this convenience is no indicator lights and a speaker that is hard to hear. These are characteristics of all internal modems.

The "Volks i" 1200 comes with a few extras bundled in the package. You get complementary subscriptions to The Source, CompuServe, and the Official Airline Guide. Also included is a rather simplistic modem program. This program supports dialing, command files, and XMODEM file transfers. The version of XMODEM supported by this software is the original with checksum error checking, not the later and more dependable CRC version. It is interesting to note that the regular cost of the bundled extras add up to more than the cost of the modem.

The manual that comes with this modem would have to be described as minimal. For example: the modem can be installed to use either the COM1, COM2, COM3, or COM4 serial ports. (The IBM hardware design supports four serial ports, MS-DOS supports only two.) A series of four dip switches selects whether the modem uses COM1 or COM2. By moving a jumper block the COM1 selection becomes COM3 and the COM2 position becomes COM4. How-

The modem itself seems more sensitive to line noise than other modems I have used. This manifests itself as scrambled characters in terminal mode and a high error rate during file transfers. Online sessions with the "Volks i" 1200 were marked with garbled text and excessive file transfer time due to retransmission of scrambled blocks.

I doubt that other models from the same manufacturer (Anchor Automation) would demonstrate this problem. I have used one other Anchor modem, several years ago, and it did not give me any problems or reason to complain about its performance.

Quick Reference Summary

Product: Novation Professional 2400
Manufacturer: Novation Inc.
 20409 Prairie St.
 Chatsworth, CA 91311
Phone: (818) 998-5060
Sugg. List Price: \$750

Product: Okitel 1200
Manufacturer: Okidata
 532 Fellowship Rd.
 Mt. Laurel, NJ 08054
Phone: (609) 235-2600
Sugg. List Price: \$449

Product: Volks i 1200
Manufacturer: Anchor Automation
 20675 Bahama St.
 Chatsworth, CA 91311
Phone: (818) 998-6100
Sugg. List Price: \$199

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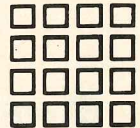
No system is perfect; CPI Business Systems are not exceptions. That's why users are entitled to support when they need it and that's why CPI continues to enhance each system regularly based on user's suggestions.

Most users need a little support when getting started so we include 45 days of FREE support with each application. Others charge hundreds of dollars extra. Users of CPI Business Systems can extend support for a full year for less than ten cents per day per application.

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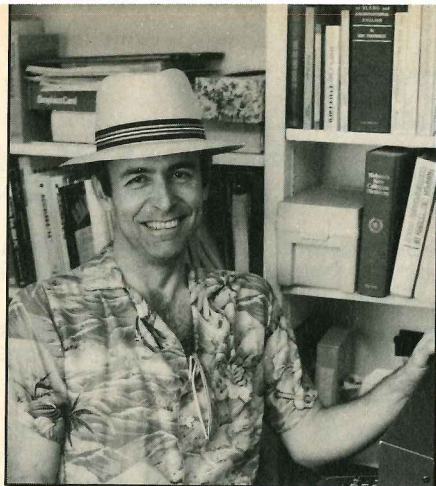
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MS-DOS: 128K (or more) & MS-DOS/PC-DOS 2.0 or higher - ANSI.SYS.
Printer: 132 columns (compressed pitch supported), continuous forms.
Disk/s: Dual Floppies/Hard Disk/Both - 191K recommended, less works.
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Flea Market

MS-DOS: MasterKey and Ultra Utilities CP/M: Sideways work alike and more

by Ted Silveira

In CP/M, I have several disk-patching programs, and I use them quite a bit (often to recover crashed files). So, when I started using MS-DOS, I looked for a similar program. The best-known program is Peter Norton's Norton Utilities, but since it's strictly commercial (buy before you try), I kept looking for some shareware equivalent (try before you buy). Here's what I've found:

MasterKey. This shareware program has many of the features of the Norton Utilities. Much of it is menu driven, with built-in help screens, and it'll work on either a floppy or a hard disk.

MasterKey has an excellent unerase function that will recover a file you've accidentally deleted (assuming you act immediately). Where UNDEL and some other unerase programs will only work on floppy disks, MasterKey works fine on hard disks, too. When you start the unerase function, it displays all the erased files in the current subdirectory, allowing you to select the one you want to recover. It can also recover an erased subdirectory under most circumstances.

A very good disk editor is also included. It will display any track and sector you want in both hexadecimal numbers and ASCII characters, allowing you to page through the disk using the PgUp and PgDn keys or to go directly to any sector. You can also make changes in any sector simply by entering the edit mode, moving the cursor to the spot you want to change, and then typing in your new values (in either hex or ASCII). As a safety measure, MasterKey doesn't actually write these changes to the disk until you specifically order it. This editor works very smoothly, with only one

quirk—PgUp moves one sector forward and PgDn moves one sector back, exactly opposite of every other MS-DOS program I've used.

A file-oriented editor is also included. This lets you move back and forth through the sectors of a single file, regardless of where they are on the disk.

If you're serious about disk patching you'll want Ultra Utilities.

This option is extremely useful when you're patching data or text files, whose sectors will often be scattered. In all other ways, this file-oriented editor is exactly like the disk editor I've already described, including the PgUp/PgDn quirk.

MasterKey also offers some less important but still useful options. With it, you can rename or erase files, set file attributes (read only, hidden, system, and archive) and dates, locate files on a disk, and get general information about the disk you're working on (sector size, number of tracks, and so forth).

In all, MasterKey is a very useful tool for poking and prodding individual bytes on your disks. Its unerase function makes it invaluable.

Ultra Utilities. If you're really serious about disk patching, you'll also want to get the Ultra Utilities, a set of three shareware programs. These utilities won't work with a hard disk, but with floppies, they deserve their subtitle—"The Wizard's Apprentice."

U-FILE is the simplest of the three utilities. It can display a file's directory information, change file attributes (hidden and system only), erase a file or group of tagged files, and unerase a file. It can also map your disk, showing you how each sector is being used, and will list all the sectors assigned to any particular file. In addition, it can build (or rebuild) a file from a list of sectors that you supply.

U-ZAP is a heavy-duty disk patcher. It will display a sector in both hex and ASCII and lets you change the hex display to either decimal or octal (!) if you want. It lets you edit disk sectors, either by absolute track and sector or by file, in much the same way that MasterKey does (choose a sector, move the cursor, type in changes, save changes). It will also copy sectors or fill a sector with a single byte. And it lets you search for individual bytes or strings of bytes either in a file or entire disk.

But U-ZAP's real magic appears when you have to work with a "non-standard" disk format. U-ZAP will interrogate any range of sectors and tracks on a disk and give you a report that will uncover any non-standard track or sector numbering and any non-standard track or sector sizes. Once you know how the disk is formatted, U-ZAP also lets you temporarily alter your disk parameter table (which defines the characteristics of the disk your drive expects to see) so that you can read the non-standard track or sector.

In other words, U-ZAP gives you the tools to read a disk that deviates from the MS-DOS norm. Why? Because one form of copy protection is to format a disk with one or more non-standard tracks or

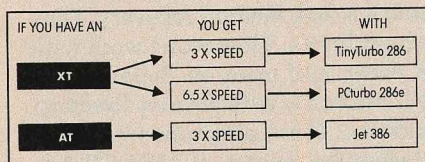
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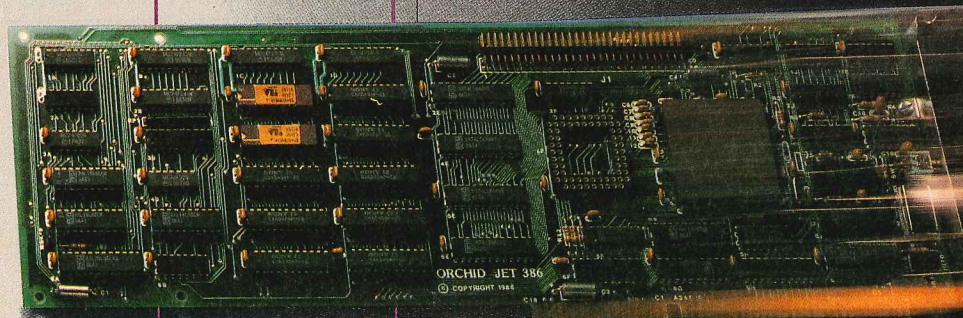
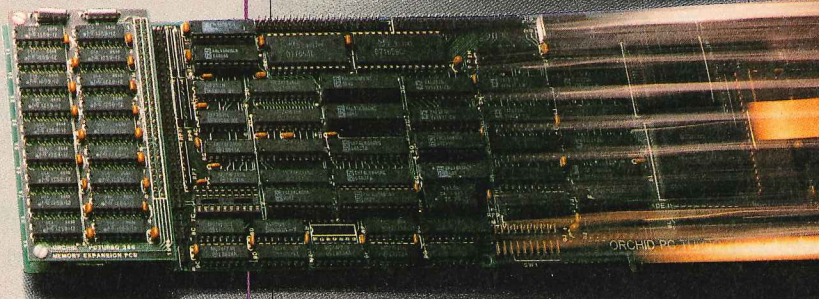
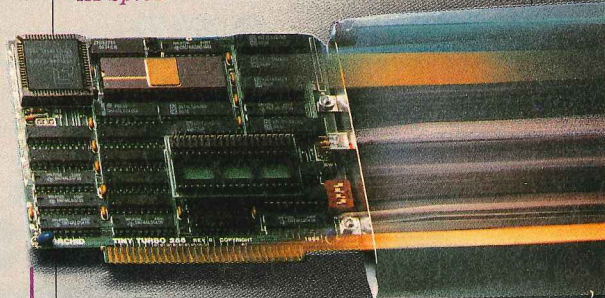
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sectors so that it can't be copied with the normal MS-DOS copy commands. (The people who wrote these utilities are not copy protection fans.)

U-FORMAT, the third part, is a disk formatting program. Unlike the standard MS-DOS format program, U-FORMAT can format a single track on a disk or even reformat a single track without destroying the data on the track—both tricks that will occasionally help you restore a crashed disk.

In addition, U-FORMAT lets you edit the disk parameter table (like U-ZAP) and format a non-standard track using odd track or sector numbers, an odd number of sectors per track, or an odd sector size. This trick, in combination with U-ZAP's disk interrogation, will let you make a duplicate of a non-standard disk so that you can make usable backup copies of certain kinds of copy-protected disks, if you have patience and some technical know-how.

The Ultra Utilities are powerful programs—if you're not careful, you can scramble a disk beyond recovery. They also have limits. They won't work with hard disks, and even on floppy disks, they'll work only with the root directory. In addition, these programs were written before the release of MS-DOS 3.0. They seem to work fine on floppies formatted under MS-DOS 3.2, but it's always possible there's some hidden incompatibility lurking there.

CP/M sorcery

Last month, while I was running down the list of public domain goodies I've recently stumbled across, I ran out of space before I could finish, so here's the rest:

CPMPDSW. The name looks like alphabet soup, but it stands for CP/M Public Domain Sideways, and the program is just what the name implies. This program by Ray Rizzuto will take an ASCII file and print it sideways on your printer paper so that you can use very long lines.

Most people use programs like these for printing big spreadsheets, but you can also use it to print ordinary text files, useful if you do newsletters, organizational charts, or genealogical charts.

The program requires either a Gemini or Epson-compatible dot-matrix printer.

Its print quality is fine for most purposes but it is dot-matrix draft quality rather than letter quality. You'll also find that files take longer to print this way, but that's to be expected.

The program's documentation is minimal, but fortunately, it's very easy to use. And while I haven't given the program a rigorous workout yet, it seems to do its job well.

File. If you use floppy disks and particularly if you use single-sided 191K floppies, you'll want to know about File, a free-for-noncommercial-use program written by David Weinberger. File is a housekeeping program, like NewSweep.

File has two features that make it different. First, it's under 4K, a bonus if you're using 191K disks. Second, File lets you attach a short note to every file on a disk—a description or date, for example. The program stores these descriptions in a special file on each disk—when you log in a new disk, File loads the descriptions and displays them next to the file names.

To make it easier to add the same note to a number of files, File lets you define a single "hot key" with a phrase of up to 20 characters.

File doesn't have all the features of NewSweep and it also doesn't understand anything about different user areas, so it's no good for people with hard disks. On the other hand, if you're using floppies and space is tight (isn't it always?), File may be just right.

Soffits? Some months ago, I did a column on games in which I mentioned LadUp, a public domain upgrade for Ladder (a Donkey Kong-style game included with most Kaypros). Not long after it appeared, I got a mysterious letter signed "Soffits." Along with the letter came two disks.

The HINT disk contains a great set of hints for conquering the different levels of the original Ladder. Better yet, the hints are in the form of an on-screen demo that shows you exactly what to do, including many tricks I'd never thought of. (Did you know you can jump on top of a wall?) It also contains a program that allows you to create your own screens if you get bored with the originals. The NEWLAD disk contains the same screen generating program plus 13 of the best screens from a contest Soffits ran. You

can get either disk for \$10, or both for \$15, from Soffits Software.

BackGrounder ii. BackGrounder ii, from Plu*Perfect Systems, is a very interesting program. It's a commercial memory-resident program in the vein of Write-Hand-Man/Presto! (but with a twist, as you'll see).

Once loaded, BackGrounder ii gives you access to "background CP/M"—at

CPMPDSW lets you print an ASCII file sideways on your paper.

the touch of a key you can suspend any program you're running and execute any one of a list of commands, including the usual DIR, ERA, etc., and some special BackGrounder commands. A second keystroke returns you to your original program, right at the point you left off.

Like Presto! and Write-Hand-Man, BackGrounder ii has a background calculator that works in decimal or hexadecimal, a notepad, a print spooler, and a screen dump. And it can store key macros so that it can often substitute for a key-definition program like SmartKey. The key macro function includes a record mode that you can turn on and off with a single keystroke.

But BackGrounder ii's biggest feature is its *task switching*. Using its SWAP command, you can "freeze" one application (like a spreadsheet), hop out to CP/M, run a second program (like WordStar), and when you're done, pick up the first program *exactly* where you left off. It accomplishes this feat by saving all of your computer's memory (including the first application program and its in-memory data) to disk and then restoring it all later when you return. (This isn't the first CP/M program with this feature, by the way—Write-Hand-Man had it some time ago.)

As nifty as this feature is, you have to be a little careful with it. Because you can switch between two major application programs, each one opening and modifying files that the other knows nothing about, you can run into trouble.

The BackGrounder ii manual claims that the program can monitor up to eight files that have been opened for writing but tersely says that beyond eight you will lose data. The manual also cautions you to avoid using SWAP with certain programs, including Turbo Modula-2 and the public domain NULU, because they move the file control block after a file has been opened. (The moral: Test your software before you risk important files.)

When you use SWAP, BackGrounder ii also lets you cut-and-paste information between the two tasks you have running, a sort of clipboard for data. This feature can be very useful, though you can only paste in data that your application program would normally accept from the keyboard (text, in other words).

BackGrounder ii is compatible with Echelon's ZCPR3 and ZRDOS, and, in fact, uses less memory with a properly set up Z-System. Plu*Perfect claims that BackGrounder ii uses 2.75K bytes in a normal CP/M system but only an extra 0.25K bytes if it's allowed to use space in the Z-System buffers. The program uses so little memory because, like Spectre Technologies' Presto Plus, it keeps many of its functions in modules on the disk and only loads them when needed.

Plu*Perfect has released a demo version of BackGrounder ii that you can pick up from most CP/M-oriented bulletin boards under the name BGII-DEM2.LBR. The demo version has some restrictions (it only works on drive A, for one thing), but you can get an excellent feel for the product by playing with it. Look for it on your local bulletin board or on KUG-ROS (619/259-4437). Also, **PROFILES** tells me that "A First Session with BackGrounder ii" is planned for an upcoming issue. †

Quick Reference Summary

Product: BackGrounder ii
Manufacturer: Plu*Perfect Systems
P.O. Box 1494
Idyllwild, CA 92349
Phone: (714) 659-4432
Sugg. List Price: \$75

Product: HINT and NEWLAD
Manufacturer: Soffits Software
P.O. Box 6658
Arlington, VA 22206
Sugg. List Price: \$10 ea./\$15 both



Life at 300 Baud

Are online data bases a threat to national security?

by Brock N. Meeks

George Orwell's 1984 is alive and well and living in 1987. According to official word from the Pentagon, online data bases may be a threat to national security, and those that use them may someday find "Big Brother" watching their every keystroke.

On October 29, 1986, former National Security Advisor Admiral John Poindexter quietly issued a directive that created a new security classification—"sensitive but unclassified information." The directive includes "human, financial, industrial, agricultural, technological, and law enforcement information."

Poindexter's directive broadened National Security Decision Directive (NSDD) 145 signed by the President in September 1984. NSDD 145 originally required federal agencies to protect sensitive but *unclassified* data. It also placed the National Security Agency (NSA) and the Department of Defense (DoD) in charge of data security for all federal agencies.

Then on November 11, 1986 a member of the Pentagon dropped a bombshell. Diane Fountaine, head of the Pentagon's information systems directorate, jolted a meeting of the Information Industry Association (IIA) by declaring that the Administration was studying ways to censor public data bases. These data bases contain unclassified information readily available elsewhere.

Fountaine also said that the Administration was looking at methods to restrict access to these online data bases. Such restrictions included requiring the user to provide proof of identity, and requiring data base companies to look over the shoulder of users and watch for suspicious behavior. However, Fountaine declined to elaborate on what

might be considered suspicious behavior.

"I don't believe the issue is whether or not we're going to protect information," said Fountaine, "The issue is: What are we going to protect, both within the federal government and within the industry?"

community to implement countermeasures, which includes pressuring private information providers into voluntarily censoring the contents of their data bases.

At the top of the Administration's data base hit list are those oriented toward scientific and technical information,

The Administration is concerned that online data bases are gold mines for foreign agents.

IIA President Paul G. Zurkowski recalls: "At that point, jaws were hitting the floor all over the auditorium."

Jerry L. Berman, chief legislative counsel for the American Civil Liberties Union, expressed concern that unless the new initiative was checked such controls might spread to non-electronic forms of information. "Our free society is in serious jeopardy," he said.

Online gold mine?

Apparently the Administration is concerned that online data bases are gold mines for foreign agents.

The impetus for this concern apparently stems from a secret Air Force report written at the request of the Inspector General. According to Ken Allen, IIA's vice president for government relations, "The Air Force study identifies foreign data base access as a significant defense concern."

However, access by foreign governments, most notably those in the Soviet Block, violates no laws. This situation has prompted the national security com-

especially Mead Data Central's Nexis, and Lockheed Corporation's Dialog.

Examples of NSDD 145 in action are already present.

"The Department of Commerce recently tried to obtain from private information companies a list of names and addresses of all citizens who use an unclassified data base," said IIA's Allen. "And NASA [National Aeronautics and Space Administration] has secretly established what it calls a 'no-no list' containing the names of university researchers and private companies who are denied subscriptions to unclassified NASA information solely because they have foreign customers or are involved with foreign researchers."

Add to those examples several visits made by agents from the Central Intelligence Agency (CIA) and the Federal Bureau of Investigations (FBI) to information providers Dialog and Mead Data. The agents routinely ask questions about who is using their unclassified information.

Speaking to the IIA, Mead's president

Jack Simpson said: "Until you have received cordial visits by representatives of the FBI, the CIA, and the Department of Defense, you can't appreciate the true extent of this issue." (On February 16, 1987, Mead Data purged the National Technical Institute Service (NTIS) file, which contains information on government contracts, from its system. However, the NTIS file is still available on Dialog, among others.)

Sum of its parts

Defenders of this new governmental control claim computers make it too easy to sift through thousands of unrelated bits and pieces of data and clip choice tidbits of information. And these tidbits, when assembled, might rate a Top Secret classification.

This "mosaic theory" was demonstrated by *Progressive* magazine in 1979 when it published an article based on public information that showed how to make a hydrogen bomb. That led the DoD into pressing the academic community not to deliver scientific papers

in open forums. The most recent case being in 1985 when the DoD advised the Society of Photo-Optical Instrumentation Engineers that a dozen unclassified research papers could not be presented during one of their annual meetings.

Presumably these papers, ultimately bound for an electronic data base, could be matched with other academic and research papers already online to form a classified, aggregate document.

The government's concern regarding this style of information gathering can be seen in a 1985 DoD "white paper" study.

The white paper report, called *Soviet Acquisition of Militarily Significant Western Technology: An Update*, calls attention to the dangers of piecing together unclassified information. Page 17 of that paper says information "taken in the aggregate, may reveal sensitive information concerning U.S. strategic capabilities and vulnerability."

IIA's Allen doesn't see it quite that way. "It is our position that any restrictions applied to a piece of information

should take place during the document evaluation process," he said, "not at the end-user level where constitutional privacy rights may be threatened." Allen is quick to add that the IIA fully supports the guarding of classified information, in the interest of national security. "Our objection is simply that you can't make unclassified information classified, it's a contradiction of terms on the most basic level," he said.

Critics take aim

The opportunity to air an opinion before a Congressional subcommittee is a seductive forum. And when the issue at hand deals with national security, and follows on the heels of a major Washington scandal, you are virtually guaranteed a captive audience. Critics of NSDD 145 recently seized on that rare combination of circumstances when they testified before the subcommittee of House Government Operations.

The two-day set of hearings took place in February of this year when the subcommittee took testimony on H.R. 145,

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the *Computer Security Act of 1987* (not the same thing as NSDD 145). The bill is designed to shift the issue of computer security, training, and the control of sensitive data in federal computers from the DoD and NSA and place it in the hands of the National Bureau of Standards (NBS).

piece of legislation.”

NCSC claims the bill would not set up a clear division of responsibilities, but instead would create a redundant bureaucracy and disrupt government computer security. The NCSC also claims that the bill would only create confusion as to who is in charge of

impose its security philosophy on data base vendors. But in Washington nothing is ever guaranteed.

If the government succeeds in stifling the flow of information from online sources, IIA's Allen wonders where it will all end: "Will we all, someday, need a passport to enter a public library?"

“ . . . you can't make
unclassified information
classified, it's a
contradiction of terms . . . ”

During the hearings many took the opportunity to ask the President to rescind NSDD 145. Some members of Congress took the opportunity to openly criticize the Administration on NSDD 145.

Rep. Jack Brooks (D-Texas), who chairs the subcommittee testified: "Admiral Poindexter and his staff transformed the National Security Council from an advisory office to the president into an operational element of the military and intelligence communities. In this role, they attempted to institute numerous controls and restrictions over the public's access to a wide range of unclassified government information.

"They ran rough-shod over the civilian agencies and private sector companies who objected to these policies. They instituted a campaign of intimidation that included sending FBI and CIA agents out to 'convince' companies to support their efforts."

Supporters of the bill have no trouble in letting the NSA continue to handle the defense community; however, they would like to see a clear definition of responsibilities, with the NBS handling all non-military computer matters.

Although H.R. 145 counts several Congressional leaders in its corner, final passage will be anything but a joy ride. The bill is opposed by the Administration, the Pentagon and National Computer Security Center (NCSC).

Mounting opposition

The NCSC issued a statement calling H.R. 145 "a superfluous and detrimental

federal computer security and would eventually destroy all the gains made under NSDD 145.

Testifying against the bill was Milton J. Socolar, special assistant to the Comptroller General. Socolar testified that in his opinion the DoD is much more capable of handling security measures than the NBS staff.

Small catch

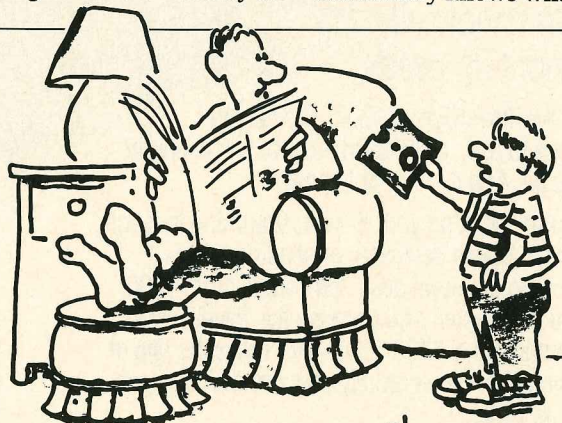
Passage of H.R. 145 won't solve the problem of allowing certain pieces of information to be classified, "sensitive but unclassified." In fact, the bill doesn't even address the issue of the process for deciding the appropriate classification for government information—those procedures would remain unchanged by H.R. 145. Small catch.

The bill, however, does distance the DoD from controlling unclassified data and makes it tougher for the military to

Last minute update

At press time the White House had calmed some of the controversy surrounding NSDD 145 by rescinding the directive signed on October 29, 1986 by former NSC advisor John Poindexter. In addition, a letter from White House Chief of Staff Howard Baker said that the policy outlined in NSDD 145 would be reviewed, but remain in affect until further notice. The White House gave no time frame for the review process.

"Clearly the whole problem of information classification is not over by a long-shot," said David Payton, director of government relations for IIA. "All that was rescinded was a piece of paper with a definition on it. The underlying policy in NSDD 145 still stands. So we're back to where we were a couple of years ago: the definition of 'sensitive but unclassified' is in the presidential directive, but nobody knows what it means." ■



Chase

"It's a note from my teacher!"

LOCAL AREA NETWORKS

The good news and the bad

by Robert J. Sawyer

First the good news: Local-area networking is a simple concept. A LAN is just computers and related hardware hooked together by cables so they can talk to each other.

Now the bad news: If learning about your computer hasn't already turned your hair gray, attempting to get a local-area network up and running surely will. Lack of standardization, misleading vendor claims, and Murphy's Law will all conspire against you.

I'd like to be able to say that all the sweat will be worth it, but that really depends on your application. "Connectivity" is the buzzword used by LAN fans. It refers to the synergy that supposedly results from hooking various components together. In a way, that's a step backwards. After all, not long ago the only way to compute was by hooking up a dumb

terminal to a central electronic brain.

Then desktop computers became available—terminal-sized machines with their own number-crunching muscle. The electronic umbilical cords were cut and people went off to compute on their own. The age of personal computing was here.

Now, we're supposed to hook ourselves back together. International Data Corp. predicts that by 1990, ten percent of microcomputers will be part of local-area networks. Some of the benefits of joining electronic hands are real; others are imaginary.

To see what I mean, let's consider how human beings network. Thanks to Toronto's ever-changing weather, each of my neighbors owns a fertilizer spreader, a lawn mower, a rake, and a snow shovel. Think of these items as their peripherals.

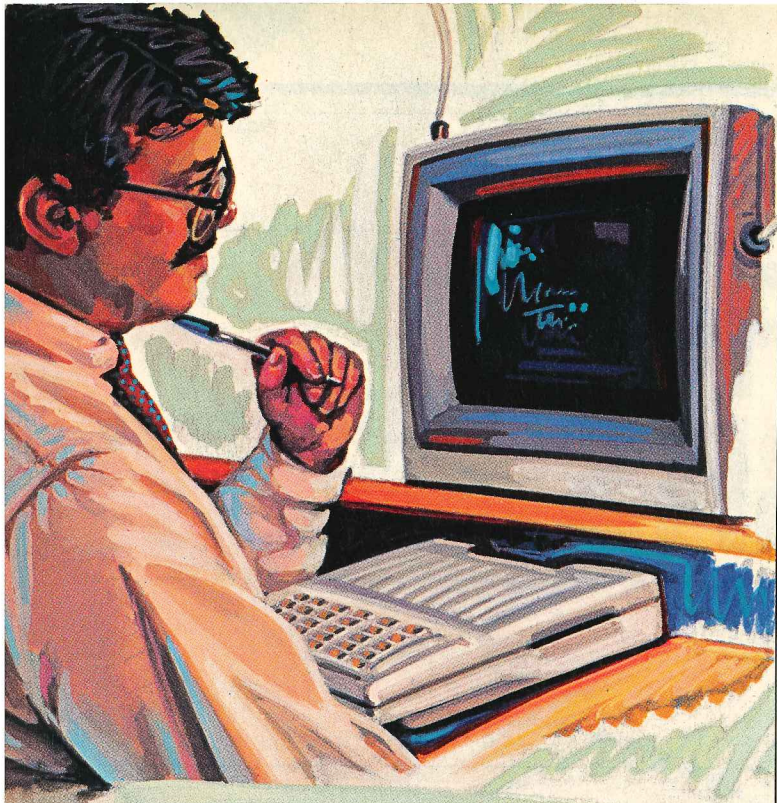
Peripherals have two things in common: they cost money and they aren't used constantly. Because of this, my neighbors and I could share one of each between us, rather than us all having our own. But I don't want to wait for the guy down the street to finish raking his leaves before I can go to work on mine. You just don't see peripheral sharing happening much in real life.

Despite this, your LAN salesperson will sing the virtues of sharing computing peripherals, such as printers and modems. It's a song that belongs on a Golden Oldies station, because it hasn't kept pace with the times. Consider: prices for traditional computer hardware have dropped substantially. Today, you can buy a 1200-baud modem for \$150 and a dot-matrix printer with near-letter-quality output for \$500. By contrast, count on spending around a thousand bucks per computer to install a LAN.

Sure, maybe you've got a high-end laser printer in the office, or a 9600-bits-per-second (bps) super modem, but does everyone need direct access to it? Anyway, giving people their own peripherals avoids the proverbial eggs-in-one-basket problem: An office with ten printers isn't bothered when one goes down, but an office counting on a single printer may be paralyzed if that unit buys the farm.

Does that mean LANs are useless? Not at all. But you have to





employ one effectively to get your money's worth. Let's take another people-oriented example. I have a friend who's a lawyer, another who's an expert in investments, and a third who knows all about the Middle East. I phone these people constantly for information and they feel free to call me when they need to know something about writing or microcomputing. This kind of knowledge-sharing works well in real life and it also works well with computers. In fact, swapping information is the only justification, in my opinion, for putting in a local-area network.

Now, some people move data around without using a LAN. The information travels by AdidasNet, moving between computers just as fast as it can be hand-carried on a floppy disk. If data only has to be shared occasionally, this system works fine. However, floppies can get lost or damaged easily. They hold only a small amount of information. And, perhaps worst of all, with multiple copies of a report, spreadsheet, or data base scattered around an office, there's no way to make sure that everyone is working on exactly the same version. If you need to move large amounts of information frequently between a specific group of users, it's time to consider a local-area network.

Most LANs chuck floppies in favor of a centralized "file server." A file server has one or more high-capacity, fast-access hard disks, containing both shared data and shared programs. A built-in central processing unit looks after the job of distributing the files as required.

Often, AT-compatible computers fill the role of file servers. Some manufacturers will tell you that the same computer can be used simultaneously for other tasks, but being a server is usually a full-time job. Some companies also make specialized hardware that can only be used as file servers.

Last October, Kaypro announced a series of computers based on the sophisticated Intel 80386 microprocessor. The Kaypro 386 Model N is an ideal file server. It's available with 170, 280, 380, or 660 megabytes of hard disk storage and up to 16 megs of random-access memory (RAM).

Although I said sharing peripherals is an inadequate cost justification for most networks, once you have a LAN in place

you may want to try pooling printers and modems anyway. If so, you may have to invest in separate print servers and communications servers.

Controlling network access

Having all of your office's programs and data online sounds great, doesn't it? But there are still problems. Say I access the file server to retrieve a draft of a written proposal. It's downloaded into the RAM of my computer and I go to work on it. Five minutes later, you decide to work on the same proposal, so you download a copy, too. When you knock off for a coffee

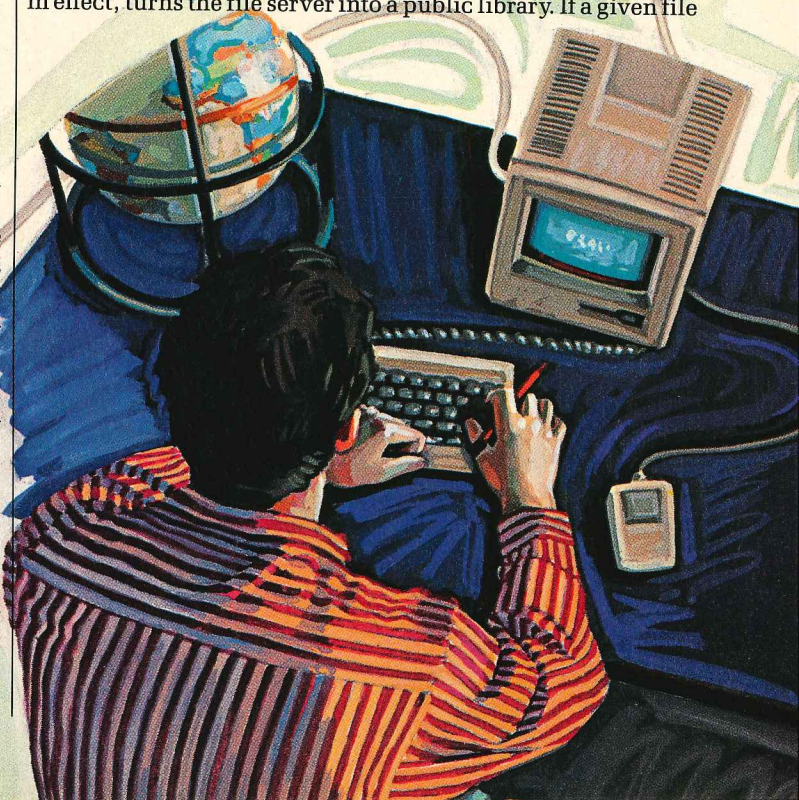
Some benefits of joining electronic hands are real; others are imaginary.

break, you save your work back to the file server. When I save my version a few minutes later, it obliterates yours by overwriting it.

Even worse, we both could have coincidentally tried writing our separate versions of the file back to the server at the same time. This could destroy both copies.

There are several schemes designed to forestall such disasters. Unfortunately, each has its disadvantages. The simplest method is to designate all files as read-only. This can be done in both MS-DOS and CP/M. It lets several people access the same document without any of them being able to change it. Of course, this is really only useful for static spreadsheet templates or boilerplate text.

As of release 3.1, MS-DOS also supports "file locking." This, in effect, turns the file server into a public library. If a given file



has been signed out by a user, MS-DOS can lock it, effectively removing it from circulation. No one else can access it until the original user is finished.

These operating-system techniques are great, as far as they go. For a truly effective local area network, you'll need a more complex traffic control system. The most common is "Carrier Sense Multiple Access with Collision Detection," or CSMA/CD. ("Carrier Sense" means that the individual computers on the net are aware of the flow of information moving down the cables; "Multiple Access" means that several of them can transmit to the net at once.) CSMA/CD forces each computer to drive safely, looking carefully for other traffic before sending a packet of information onto the data highway.

So far, so good. But frequently two or more computers will look out into the data stream, see that it is clear, and transmit simultaneously. Their data packets collide, damaging each other.

For CSMA/CD, such electronic fender-benders are a fact of life. To recover, error-checking protocols are used, similar to those that help in transferring files by modem. The receiving computer can easily tell if the data it gets has been damaged in transit. If so, it simply asks the sending computer to retransmit. Each computer is assigned a unique way of calculating how long to wait before sending the data again, thus avoiding endless repetitions of the original collision.

Although the data eventually arrives as intended, collisions waste time. It may seem that avoiding them altogether would be better than simply detecting them after they've occurred. "Carrier Sense Multiple Access with Collision Avoidance" (CSMA/CA) does just that. This is a traffic cop approach, taking the discretion for when to send away from the individual computers. Instead, each is given a specific timeslot during which it alone has the right of way. Unfortunately, this, too, has built-in inefficiencies. If a computer doesn't have anything to send during its allotted time, that time goes unused. If it comes up with something to say right after its time slot has slipped by, it has to sit idle, waiting for its turn to come around again.

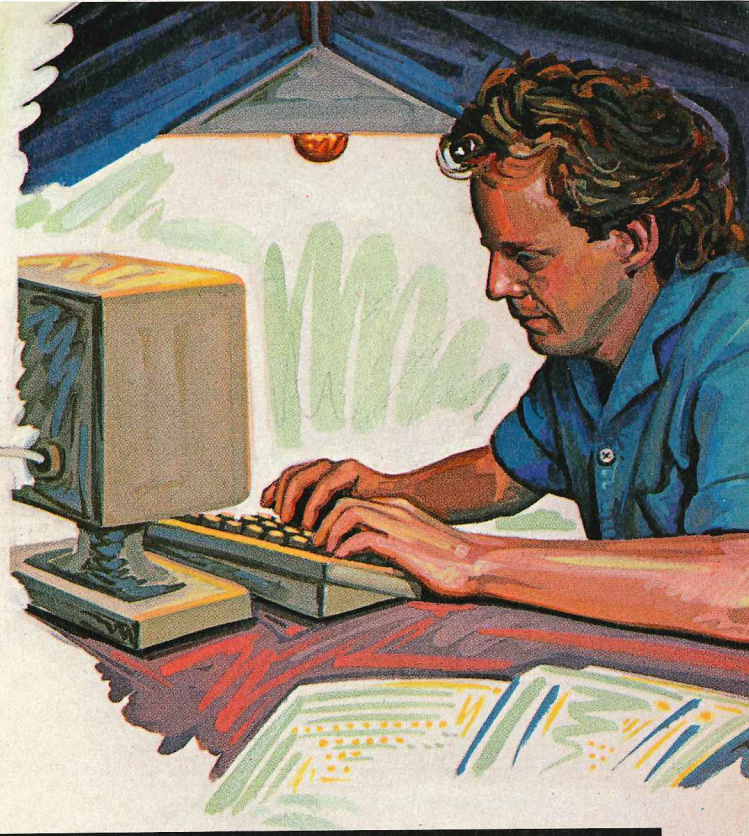
A variation on this method is "polling." The file server, or some other central control unit, periodically asks each computer if it has any data to transmit. If the answer is no, the next computer is polled immediately.

CSMA/CD and CSMA/CA are collectively known as "contention" networking schemes, because computers compete for access to the LAN.

The Institute of Electrical and Electronics Engineers (IEEE) is a major standards-setting organization. Digital Equipment Corp., Intel and Xerox formed a coalition that carefully monitored IEEE's progress towards a CSMA/CD standard. The resulting product was EtherNet, the most widely-accepted type of LAN.

Another method of avoiding data accidents is called "token passing." This ensures that only one computer has the floor at a time by passing a special electronic marker (the token) from station to station in turn. Only the computer currently holding the token is free to speak. IBM supports token passing.

Token passing is ideal when many users have to continually access small bits of information. Contention networks, on the other hand, are generally more efficient when a few large blocks of data are being exchanged.



Cable type affects the capacity of the network, its sensitivity to interference, and its cost.

Cabling types

Data exchange between a computer and the network may take place at anything between 1200 and 4800 bps. Think of these as on-ramp speeds. Once your information is actually on the network, it zips along at a much higher rate. Just what that rate is depends on the kind of cabling being used. Cable type also affects the capacity of the network, its sensitivity to electrical interference, and its cost. An average LAN requires about 3,000 feet of cable.

Twisted-pair wiring consists of two flexible strands of copper braided together. Generally speaking, this stuff is cheap—especially if the LAN will take the same grade of twisted pair used to hook up telephones. However, IBM's Token-Ring Network uses pricey custom twisted-pair wiring.

Twisted pair is the slowest cabling method: transmission speeds are usually between 500 kb/s (kilobits per second) and 1 Mb/s (megabits per second). It's prone to electrical interference. Although shielding the cable can solve that problem, it will also jack the price up. Using twisted pair also severely limits the maximum size of the network.

Even if you're not ready for a LAN now, if you think you might want to use a twisted-pair system in the future, you can save a bundle by having the cabling laid down next time you upgrade your phone system.

Most LANs run on *coaxial cable* instead of twisted pair. Coax has a central conductive core surrounded by an insulating shield. It allows speeds from two to 10 Mb/s. The thicker the cable, the farther it can carry a signal. Of course, as the cable

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LOCAL AREA NETWORKS

gets fatter, it becomes less flexible and harder to install. Your contractor will charge you between \$1.50 and \$15 per foot to put in coaxial cable.

There are two types of coax—baseband and broadband. Like twisted-pair wiring, baseband can only support a single communications channel. Hooking up additional nodes can be as easy as using a clamp with a point that pierces into the cable's core.

Broadband is much more expensive and requires each computer to be equipped with a radio-frequency modem. Using the same technology as cable TV, broadband supports hundreds of channels. These can carry not just data, but voice and video as well, making this the networking choice of the future. According to the consulting firm of Frost and Sullivan, 78 percent of coaxial networks will be broadband by 1990. Several miles can separate computers on a broadband network, making it a good choice for groups of buildings located on the same land.

Some newer networks, including those offered by Kaypro, can use fiber optics. These provide transmission speeds up to ten times faster than those available with coaxial cable. They are also completely immune to electrical interference. However, installation is expensive and the number of computers tapping into the cable has to be kept low.

If you don't plan to expand into multichannel voice-and-video networking, neither broadband nor fiber optics will be a cost-effective solution for you.

Topology

Networks are classified by shapes. Think of the computers and cables forming connect-the-dots pictures. If the wiring traces out an enclosed shape, then the LAN is called a "ring" network. If each computer is directly connected to a central file server, it's a "star." And if the nodes are hooked up like christmas lights along a single stretch of wire, then it's a "bus" network. In typically pompous computerese, these shapes are called "topologies," after the branch of mathematics that deals with changing geometric forms.

IBM chose the ring topology for its networks. This isn't surprising, since using a ring is the easiest way to incorporate a mainframe computer into a LAN. The computer stations (or "nodes") on a ring can be spread over a large distance. A ring is most effective with 30 or more nodes.

Generally speaking, rings use twisted-pair wiring and control access with token passing. A token-ring network works on a "Psst, pass it on" principle: when handing the token to the next machine, each computer also re-transmits all messages it has received.

Bus topology is the most common network design. It's best for nets of two to eight users who only want to share data occasionally. Either token passing or contention can be used to control access.

For many applications, the star layout is the most efficient. Every computer has a direct connection to the central file server. This requires more cabling (which increases costs), but it avoids collision problems altogether. Stars are tolerant of cable errors: a break in one section will only affect the single computer attached to it. On the other hand, the network is completely dependent on the file server. If that goes down, so

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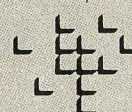


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does your LAN. A star works best with between two and 24 nodes.

Bear in mind that topologies aren't theoretical concepts. You actually hook the cables up in these patterns. Bus topologies often have the cable running in a false ceiling, with tap roots dropping down to the computers. Stars and rings, by their nature, work best if workstations are arranged in a circle. If they're stretched out one after another, you'll find a star cumbersome to set up.

*Networks are
classified by shapes:
ring, star, and bus.*

Network software

Just like the individual computers it's made of, a LAN won't do anything until you give it some software. Networking software, ranging in price from about \$125 to more than ten times that amount, usually consists of a series of programs that are loaded into your file server. These control the transfer of data between the network and the servers' disk drives, regulate who can access what data, and manage the sharing of files so that nothing gets lost in the shuffle. Some networking packages also include electronic mail capabilities.

The two biggest makers of networking software are Novell and Microsoft. Just as you need a different version of WordStar to run on a CP/M computer than on an MS-DOS computer, so you need different versions of networking software for different types of networks. Configurations of both Novell's Advanced Netware and Microsoft's Networks come bundled with various manufacturers' hardware (Kaypro includes Novell software with its network products). An end user (that's you or me) can also buy Netware from a dealer, but Microsoft only sells MS Networks to original equipment manufacturers (OEMs), including AT&T, IBM, 3Com, and Ungermann-Bass.

Advanced Netware, Version 2.0A, has a sticker price of \$1,595. It runs on 35 different networks, including the IBM Token-Ring Network, AT&T's StarLAN, ArcNet, EtherNet and OmniNet. Advanced Netware supports between 50 and 100 users per file server. Also available from Novell is SFT Netware, Level 1, with "system fault tolerance" features. It will keep the LAN up and running even if one or more components fail. Base price for the SFT version is \$2,995.

Vendors often add their own customer user interfaces (pull-down menus, icons, and so on) to Netware or MS Networks, so these packages can look radically different from one network to the next.

Another important part of many networking software packages is NETBIOS (NETwork Basic Input-Output System). The BIOS in your PC controls the sending and receiving of data from your computer's parallel and serial ports. Likewise, NETBIOS handles conversations back and forth between network hardware. Since its announcement in late 1984, NET-

**WHAT'S
AVAILABLE
IN
SOFTWARE**

According to International Data Corp., the local-area network hardware market in 1986 was dominated by five vendors. IBM had the biggest share (19.5 percent), split between its new Token Ring Network (2.7 percent) and its older PC Network (16.8 percent). Novell was running a close second at 19.4 percent. 3Com has 18.3 percent; Corvus, 11.6 percent; and Orchid Technology, 7 percent.

The **IBM PC Network** was released in August, 1984. It's a reasonably fast broadband bus network, transferring data at 2 Mb/s using CSMA/CD. IBM claims it's good for networking up to 72 PCs with normal coaxial cable, or up to 1,000 users with custom IBM cable. Big Blue promises that PC Network will support all IBM PCs, present and future, except the PCjr. DOS 3.1 is required. A five-station configuration costs \$729 per user.

Last year, IBM introduced its **Token-Ring Network**, using specially-shielded twisted-pair wiring. Any software developed for the PC Network will also run on the new token system. A four-station starter kit costs \$4,065. Additional users are \$828 a piece, including network-interface cards. Up to 260 users can be supported on a single ring and multiple rings can be connected together. (IBM Corp., 900 King St., Ryebrook, NY 10573, 800/426-2468.)

Novell's **S-Net** is a star-shaped LAN using twisted pair wiring. Data moves at 500 kb/s. This company also makes some of the most popular networking software. (Novell Inc., 748 North 1340 West, Orem, UT 84057, 800/226-8238.)

3Com makes a series of bus-topology CSMA/CD network products, based on the EtherNet standard. The **EtherSeries** comes in thick and thin versions, according to the diameter of the baseband coaxial cable being used. Up to 1,024 stations can be supported, separated by over a mile. (3Com Corp., 1365 Shorebird Way, Mountain View, CA 94043, 415/961-9602.)

Corvus Systems makes **OmniNet**, a CSMA/CA network for up to 64 users. OmniNet has a 1 Mb/s transfer speed and can link MS-DOS and Macintosh computers. Cost is a low \$199 per user. (Corvus Systems, Inc. 2100 Corvus Drive, San Jose, CA 95125, 408/559-7000.)

PCnet from Orchid Technology is a direct competitor with IBM's PC Network. It's a broadband CSMA/CD web, hooked-up with standard cable-TV wiring. Transfer rates are 1 Mb/s. Up to 255 PCs can be supported. The base price for two stations is \$1,090 and additional users cost \$495. An add-on package called LanCom gives remote users dial-in access. (Orchid Technology, 47790 Westinghouse Dr., Fremont, CA 94539, 415/490-8586.)

— R.J. Sawyer

BIOS, developed jointly by Sytek and IBM, has become an industry standard.

Things to look for

Buying a LAN is a complex undertaking. There are literally hundreds of things that can influence your choice, including vendor reputation, cost, and potential for expansion.

Different LANs use different methods to hook up computers.

course may get you a better system, but when things stop working you may end up with a bunch of competing servicepeople blaming each other.

Time for one more round of good-news, bad-news. The good news is you now know the basics of local-area networking. The bad news is, like everything else in computing, things keep changing so you'll have to make an effort to keep up to date. Already starting to appear are networks that use cellular

Literally hundreds of things influence your LAN choice, including vendor reputation, cost, and potential for expansion.

Some do it just by plugging a cable into the computer's serial port. Others require a special card that goes in an expansion slot on a PC.

For MS-DOS systems, the card-based hook-ups are usually best. Most contain their own microprocessors to look after network communications chores. LANs that just plug into a serial port shift these tasks to the computer's CPU, slowing it down noticeably. (One million network-interface cards were sold in 1986, according to a survey by Future Computing, up from 400,000 the year before.)


"Throughput" is a measure of the total amount of information that can be transmitted over a network. In practice, this will be something less than the maximum data transfer speed permitted by the cable. If 10 Mb/s is theoretically possible, three or four Mb/s may be all you get in reality, because of idle time, collisions, and hard disk access rates. A network carrying many short messages will have less throughput than one carrying a few longer ones.

Not all software applications packages will run on all networks. Although you won't require a separate copy of a program for every node on your net, license agreements often demand an additional payment if a piece of software is going to be placed on a LAN.

Science-fiction writer Arthur C. Clarke, a Kaypro user, once wrote a story called "Dial F for Frankenstein." In it, the world telephone system finally gets as many interconnections as a human brain. The LANs we're talking about aren't nearly that complex, but, nonetheless, all these connections will require substantial maintenance. Some consultants recommend that each LAN have a dedicated system operator—an in-house expert coordinating the network. If you have more than ten stations on your LAN, you may indeed need a resident guru. That person's salary must be figured in when determining how much a local-area network will cost.

Security is important, too. If sensitive material (such as employee records) is going to be stored in the file server, you may want a LAN with built-in password control.

Is it best to buy from a single vendor? Or should you pick and choose components from a variety of companies? The latter

telephones instead of hard wiring and LANs that integrate data, voice and image. One thing is definite—LANs are here to stay. 

Robert J. Sawyer recently wrote and narrated a series of three one-hour radio documentaries on the history of science fiction for the Canadian Broadcasting Corporation. He lives in Toronto and won't let any of his neighbors borrow his rake.



"Electronic repair service? Our laser printer malfunctioned again—"

Electronic

Paste Up

Aldus' PageMaker comes to MS-DOS

by Ted Silveira

Through 1985 and 1986, when Apple Computer dominated desktop publishing with its Macintosh computer and LaserWriter laser printer, the leading desktop publishing software package was Aldus' PageMaker. Now that desktop publishing fever has hit MS-DOS, Aldus is trying to repeat its success by translating PageMaker into this new environment. But here PageMaker isn't the pioneer, as it was on the Macintosh—it faces powerful competition from programs such as Xerox's Ventura Publisher (reviewed here last month).

Like Ventura Publisher, PageMaker is a *page makeup* program that lets you electronically "paste up" pages on your screen. With it, you can mix text and graphics on-screen to create a WYSIWYG (what-you-see-is-what-you-get) image of your pages, an image that accurately represents what you'll get when you print your pages on a laser printer or typesetter. And the MS-DOS version of PageMaker is not an afterthought on Aldus' part—it's a professional-quality program that does everything the Macintosh version does . . . and then some.

The basics

To run PageMaker, you first need Microsoft's Windows software (Aldus includes a limited run-time version in case you don't want to buy the full version). Windows provides a Macintosh-like interface for your MS-DOS computer, complete with multiple windows and pull-down menus. In addition, any program that is written for Windows, like PageMaker, can use any video card, printer, and mouse or graphics tablet for which a Windows driver exists.

Because Windows is so complex, though, it works your computer very hard and exacts a heavy price in speed. PageMaker can theoretically run on any IBM-compatible, but Aldus specifically says that it should be used only on an IBM PC-AT or comparable computer, such as the Kaypro 286i. They are right to say so, for even on an 8 MHz XT compatible like the Kaypro PC, PageMaker is too slow to be really useful.

Along with Windows, PageMaker requires at least 512K RAM, with 640K recommended, a hard disk with at least 2

megabytes of free space, and a mouse. It also requires a graphics card—an EGA color card, Hercules monochrome card, or other high-resolution card that's Windows compatible.

For output, PageMaker supports any printer for which there is a Windows printer driver, including the Hewlett-Packard Laserjet and Laserjet Plus, the AST Turbolaser, any PostScript-compatible laser printer or typesetter (including the Apple LaserWriter and LaserWriter Plus), and various dot-matrix printers (for printing drafts).

The master page

When you start PageMaker, you first see a preliminary screen showing the Aldus logo with a menu bar across the top. From these menus, you can set PageMaker's page size and orientation, target printer, measuring system (inches, millimeters, picas, cicerós), basic type characteristics (font, size, etc.), columns, and so forth. These settings are just the defaults; you can always change them after opening a file.

When you open a new publication, PageMaker shifts to its *publication window* (see Figure 1 on the next page). Across the bottom of the screen is a wide green bar, which will contain at least a disk icon. Windows lets you open several different applications at once and jump between them; all programs you have open but not currently onscreen will show here as icons (the disk icon represents MS-DOS).

At the top of the screen, you'll see a blue PageMaker title bar and, below it, a yellow menu bar containing the drop-down menus. You'll also see two ruler bars, one below the menu bar and one at the left side of the screen, plus two scroll bars, one at the right side of the screen and one at the bottom, which you use to scroll through your publication. At the left edge of the bottom scroll bar, you'll see icons representing the pages of your publication, and in the upper right corner of the window, a small tool menu containing eight tool icons. In the center is a blank page showing the default column widths, column guides, and other elements.

Two of the page icons are labeled L and R. Select these icons to move to your *master pages* (left and right), which you use to

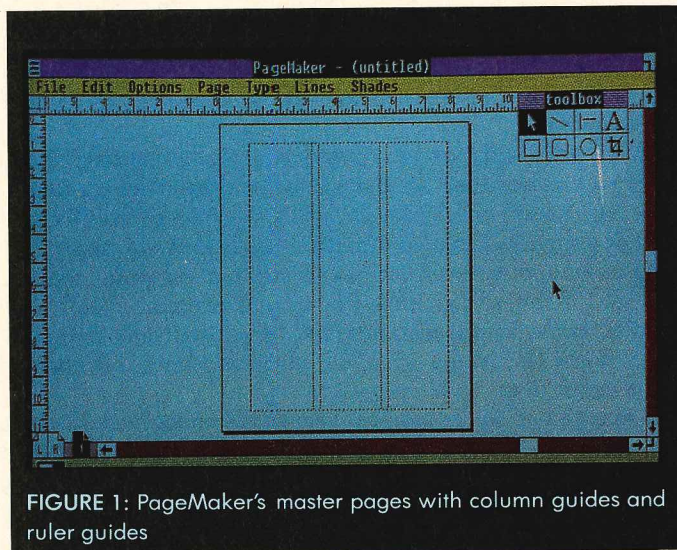


FIGURE 1: PageMaker's master pages with column guides and ruler guides

create the page templates for your publication. Here you can set the margins, number of columns (up to 20), column and gutter widths, horizontal and vertical guidelines (called ruler guides), and other elements that control the layout of your pages. You can also set the default type specifications and lay down any graphics or text you want to appear on every page.

PageMaker automatically creates columns of equal width, but you can make unequal columns just by grabbing a column guide with the mouse pointer and sliding it left or right. To make positioning such elements easier, PageMaker puts markers on the two rulers—as you move the mouse pointer, these markers slide along the rulers to give you precise distances and locations.

PageMaker automatically makes columns of equal widths, but you can easily change that.

Once you've set your master pages, you move to page 1 of your publication, which will show the column guides and other elements from the appropriate master page. To place text on the page, you select **Place** from the File menu and then choose a file from a list of files. Position the mouse pointer at the upper left corner of the column you want to put text in, hold down the mouse button, and drag the pointer down to the lower right corner of the column. As you drag, a rectangular frame will expand on the screen, following your motion. When you release the mouse button, the frame will fill with the first part of your text. You can then lay out a second column in the same way, picking up the text where you left off.

PageMaker won't automatically flow text into multiple columns and add new pages as it needs them. Instead, you must

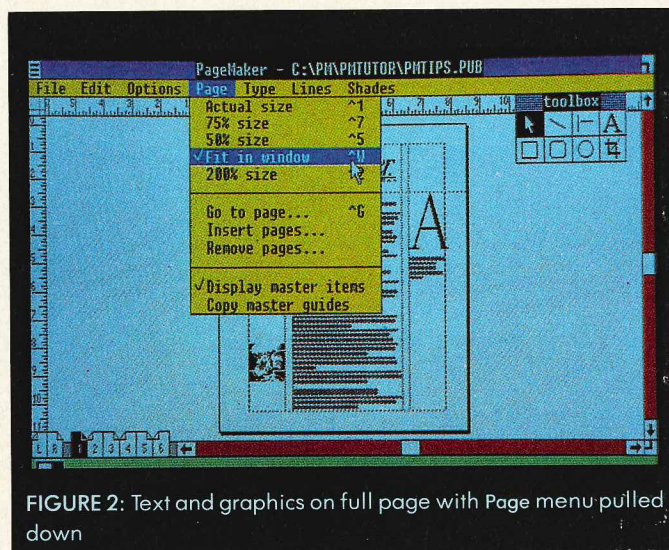


FIGURE 2: Text and graphics on full page with Page menu pulled down

place each column of type individually. Once you've laid out a text file, however, its columns are linked together so that if you add or remove a paragraph in one place, the text will be adjusted automatically (though you'll have to lengthen the last column if you've added text).

This method of placing text (and graphics) is almost a direct electronic translation of the manual method typesetters have used for years, except that electronic paste is much easier to work with. In fact, PageMaker uses the traditional paste-up process as a pattern or metaphor throughout, something that makes the program's functions very easy to grasp, especially if you have some graphic arts or paste-up experience. There's even a *pasteboard* area, outside the page boundaries, where you can set blocks of text or graphics until you need them.

Several different views of your page are available, starting with a fit-in-window view, which displays a single page or a pair of facing pages reduced to fit onscreen. In this view, the body text of your publication will be greeked (represented by gray lines rather than actual characters). For more precise work, you can also use 50, 75, 100, or 200 percent views (see Figure 2 above). In any of the five views, you can use all of PageMaker's commands.

PageMaker has many other features that make page layout easier. Its screen layout is clear and uncluttered. It immediately rewrites the screen to show any changes in margins, columns, placement, and so forth. It lets you place horizontal and vertical ruler guides at any point on the page to help you align elements, and it has a snap-to effect that will pull blocks of text and graphics to align with both ruler guides and column guides. Its ruler markers are very useful in doing precise layout, and you can move the rulers' zero point to whatever position suits you. And there's an "undo" option that will reverse most of its commands.

Typography

Once you've laid columns of text on a page, you have to define the typeface, size, spacing, and other features for the body text, title, headings, and so forth. In PageMaker, this process is very

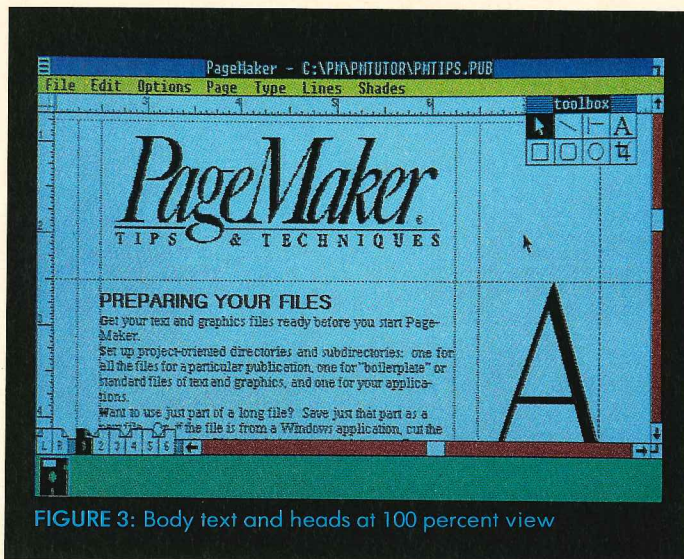


FIGURE 3: Body text and heads at 100 percent view

straightforward—you use the mouse to highlight a section of text and then select the typographic features you want from the Type menu. When you're done, the highlighted text is rewritten according to your specifications.

For a section of text, you can set the *font* (which includes the typeface and type size) and the *leading* (the spacing between lines). If you are using a PostScript printer, such as the LaserWriter, you can set the type in whole-point increments from four points to 127 points and the leading in half-point increments.

You can set the text *alignment*—fully-justified, left-justified, right-justified, or centered. You can set the maximum and minimum allowable word spacing and letter spacing. You can turn automatic hyphenation on and set the hyphenation zone. You can set tabs and choose a *leader* character (such as a period) to fill in the tab space.

You can kern the text (reduce space between awkward pairs of letters, such as T and o). In PageMaker, you can manually kern individual letters, or you can have it automatically kern letter pairs for you over a specified point size. If you choose automatic kerning, the program will kern all those pairs for which it has kerning information (taken from the type font file).

You can also create large initial caps, bulleted lists, numbered lists, and other special effects, but not automatically. To set a large initial cap, for example, you must create the large capital letter individually, position it on the page, and then rearrange the text to run around it.

Graphics

When you want to add graphics to your publication, PageMaker gives you two choices. First, you can use the program's built-in tools to create boxes, circles, and ruled lines of various kinds. You can also fill drawn shapes with patterns or shades of gray. The drawing tools are not sophisticated, but they're good for creating sidebars, boxed text, and so forth.

Second, you can import graphics from other programs, including both bit-mapped and line art. PageMaker can read bit-mapped graphics from PC Paint, PC Paintbrush, Windows

Paint, or any program or optical scanner that can create files in those formats. It can also read bit-mapped files in the new tagged image file format (TIFF). PageMaker can read line art from AutoCAD, In-a-Vision, Windows Draw, Lotus 1-2-3, and Symphony, as well as files in the new Encapsulated PostScript (EPS) format.

You place graphics on the page just as you place text: **Place**, select a file, and then use the mouse pointer to draw a frame. You can also import graphics by using the Windows clipboard. Windows allows you to "freeze" PageMaker (or any other Windows application), switch to another program, mark a section of the screen from the second program, "cut" that section to the Windows clipboard, return to PageMaker, and then paste the image from the clipboard into the current PageMaker file.

Once you've placed a piece of art on the page, you can resize it very simply via mouse by grabbing a side or corner and pulling, or you can crop it in much the same way by using PageMaker's cropping tool. You can also move art around on a page or even off the page to the pasteboard for later use.

If you place a piece of art in the middle of a block of text, PageMaker doesn't automatically reflow the text around the art—you have to adjust the column widths manually to create the proper size hole. If you want an irregular runaround, you must manually break every line by inserting carriage returns. This method is not ideal, because if you add or delete text

Resizing line art or bit-mapped art is very simple with PageMaker.

above the irregular runaround, PageMaker will readjust the column, forcing you to rebreak all the lines around the graphic.

Unlike the Macintosh world, which has definite standards for graphics file formats, the MS-DOS world has only several quasi-standards—PC Paintbrush in bit-mapped art, AutoCAD in line art, and some others. PageMaker does a good job of covering the field, though its coverage is not complete. Until stronger standards are set, that's about the best we can hope for.

Alterations

PageMaker lets you change your publication's layout, type specifications, and other characteristics at will, and it includes a text editing mode so that you can add, delete, or edit text directly. You could, in fact, write all of your text in PageMaker, though for anything more than short passages, you'll want to use your regular word processor.

Within PageMaker, you'll find it easy to make the minor adjustments needed to fine-tune your publication. To boldface a word, just highlight it with the mouse pointer and then select boldface from the Type menu. To move a graphic or enlarge a headline, just grab and pull.

But PageMaker is not quite so graceful with major changes. To change every major heading from 16 point Times Roman to

18 point Palatino, for example, you must scroll through the publication, select every heading you want to change, and then set the new type specs. And to narrow or widen your publication's columns after you have laid out text, you must adjust the width on each page individually.

File handling

When you open a new publication, PageMaker creates a special publication file (with the file type PUB). As you add text and graphics files to your publication, PageMaker reads the source files and includes the information in the publication file, along with all your layout information. Thereafter, PageMaker works only on the publication file, leaving the source files intact.

This method of handling files has three consequences. First, you don't have to keep track of a lot of separate files for your publication, just the one PUB file, which can be a blessing if you need to ship the file to someone else for further production or printing. Second, if you make any changes while in PageMaker (by editing some text, for example), these changes will not be reflected in your source files. So, if you want your source files to be current (that is, to match what will be printed in your publication), you must edit them separately. And third, if you want to make major changes to your text or graphics files, changes that need to be done with your word processor or

graphics program, you'll have to re-import the edited source files, after first deleting the originals from your publication file. The second and third points won't matter if you work with short publications, but they will if you deal with long documents that go through several revisions.

PageMaker does a good job of importing files. Aside from the graphics file formats mentioned earlier, it can read text files from Windows Write, Microsoft Word, MultiMate, WordPerfect, WordStar, and XyWrite, as well as standard ASCII text files and DCA (document content architecture) files. When PageMaker reads a file from a word processor that it recognizes, it lets you import the file with much of its current formatting intact (including type specs, in some cases) or reformat the file according to the current PageMaker specifications. If it doesn't recognize a file type, it will ask you to identify the file.

As mentioned earlier, PageMaker also lets you import parts of files through the Windows clipboard by cutting and pasting, something that could be a real help when working with "foreign" programs.

Printing

When it comes time to print, PageMaker can control any printer for which there is a Microsoft Windows printer driver. (I listed them earlier in "The basics.") You can have any number of printers installed and then select the one you want at print

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time (though for good results, the final print must be done on the printer specified when the publication was created).

The type styles and sizes available on each printer depend upon what type fonts you have installed (the PageMaker manual gives instructions for installing new fonts). If your publication specifies a type size that the printer can't produce, PageMaker will use the closest smaller size available.

When you print, you can scale the page size up or down, and you can create large pages by *tiling* (printing parts of a page on different sheets that can later be pasted together by hand). If

PageMaker can control any printer that has a Microsoft Windows printer driver.

you're using a PostScript laser printer, you can also print *thumbnails*, reduced-size versions of your pages printed 16 to a sheet.

Printing is done through the Windows print spooler, which will handle the job of feeding the file to the printer while you run another program. Page make-up programs print slowly because they make such heavy demands on the printer, so the spooler is a real bonus.

Summing it all up

I like many things about PageMaker. It's a sophisticated program that does many things I haven't even mentioned—page numbers, reversed type, repeated page elements, and so forth. But even though it takes time to master all that PageMaker can do, its basic operation is simple and obvious—call it intuitive, if you want—to a large degree because it follows the process of manual layout and paste up so closely.

At the same time, it has many nice touches that experienced users will come to appreciate. It has keyboard shortcuts for important commands, an undo command, and automatic "mini-saves" that help protect you in case of power failures. Its on-screen tool box can be moved around so that it doesn't get in your way. Its pasteboard is extremely useful when you want to create a design by trial and error.

And PageMaker places few restrictions on what you can do. Even the column guides, for example, are only guides—if you want to lay down a column of text that completely ignores the guides, you can, with no extra effort. This freeform approach makes PageMaker ideal for *ad hoc* designs and for short publications that have complicated layouts involving many elements—ads, brochures, flyers, and so forth.

To top it off, PageMaker's documentation is very good. It comes with an excellent tutorial, that is very thorough, very clear, and very well arranged to lead you from the simple to the more complex. And to its credit, the tutorial goes well beyond the mechanics of operating the program to discuss the problems and techniques of designing publications. The reference manual is also good, though it's considerably slimmer than the


tutorial and could use some beefing up. I was disappointed, though, that PageMaker comes with only one short set of sample files to practice with—it would be very useful to have half a dozen or even more sample publications to play around with before setting out to tackle a real-world project.

Yet another strength of PageMaker is (or will be) its close relationship to the Macintosh PageMaker. Version 2.0 of Mac PageMaker will directly accept publication files from PC PageMaker, and the next release of PC PageMaker is expected to read Mac PageMaker files in the same way. And there is, in the distance, the promise that PC PageMaker will be able to incorporate Macintosh graphics. This PC-Macintosh compatibility could turn out to be very important in some cases, because the Macintosh-PageMaker combination is already so well established in desktop publishing circles. For example, most copy shops and other service bureaus that offer laser printer or Postscript typesetter output use Macintoshes rather than PCs.

PageMaker also has a number of weaknesses. It absolutely requires the speed of an AT-class computer. On the Kaypro 286i, its performance is fine, but on an 8 MHz Kaypro PC, it is irritatingly slow in many operations.

Also, while PageMaker shines on short documents with freeform layouts, like brochures, it does less well on long documents, especially those with consistent layouts, such as books or manuals. First, PageMaker doesn't have batch pagination. It won't automatically flow new text from one column to another, creating new pages as it needs them. Instead, you have to set a number of pages beforehand (which you can alter, of course) and then lay out every column on every page individually. Second, because of the way PageMaker handles its files and its formatting, you can't easily make global changes in a large publication, as you can in a program like Ventura Publisher that uses style sheets. You can create large publications with PageMaker; it's just not as easy as it could be.

PageMaker has its minor annoyances, too. Like Ventura Publisher, it won't use expanded or extended memory. It uses generic screen fonts instead of true representations of the fonts you'll see when you print (though size, line breaks, etc., will be accurate, of course). And the program becomes surprisingly awkward if you try to run text around graphics in an irregular shape, especially if you later have to reflow the text.

Overall, PageMaker is an excellent program, easy to grasp and yet sophisticated enough for almost any kind of work. Aldus has not simply translated its successful Macintosh program to MS-DOS, it has improved on the original. And things will only get better. 

Ted Silveira is a freelance author and has taught writing at San Francisco State University. He is a contributing editor for PROFILES.

Quick Reference Summary

Product: PageMaker
Manufacturer: Aldus Corporation
 411 First Ave., South, Suite 200
 Seattle, WA 98104
Phone: (206) 622-5500
Sugg. List Price: \$695

PageMaker vs. Ventura Publisher

How does Aldus' PageMaker version 1.0 compare to Xerox's Ventura Publisher version 1.0 reviewed here last month?

PageMaker is the better program for doing short, free-form layouts—ads, flyers, brochures, and similar items. Its whole style makes it an excellent program for situations in which every page is going to be different, particularly if you're going to be mixing lots of graphics with text in many different sizes and styles. It also has an edge if you favor a design-as-you go approach to page layout.

Currently, PageMaker is the choice if you're committed to Microsoft's Windows environment, though Xerox has announced that a Windows version of Ventura Publisher will be available by the end of the year. PageMaker will also clearly have advantages if you work with the Macintosh.

Ventura Publisher, on the other hand, is the better program for working on long documents or documents that have fairly stable formats, such as newsletters, books, reports, and manuals. Its batch pagination, automatic footnoting, and other features make such projects a breeze. Ventura Publisher is also the program to choose if you expect more than minor revisions to a document, because it uses easily-changed style sheets for formatting and because it automatically updates your text source files with changes.

Ventura Publisher is your only choice if you already have a PC-compatible like the Kaypro PC and can't afford to buy an AT-class computer.

PageMaker has a much better tutorial than Ventura Publisher, but Ventura Publisher has a better reference manual and comes with more sample files to learn on.

PageMaker is somewhat easier to learn, mainly because it follows manual methods so closely. On the other hand, once a style sheet has been set up, Ventura Publisher will give an inexperienced person more precise results (and will do it more quickly).

Right now, if I had to choose just one program to do everything, I'd take Ventura Publisher. But things are changing rapidly, even though the programs have only just appeared. Aldus is said to be considering a style sheet option for a future revision. And in March, Xerox announced an update of Ventura Publisher that removes many of the deficiencies of version 1.0—the new version will include automatic kerning, cropping and sizing of line art as well as bit-mapped art, on-screen rulers, tracking and letter spacing, and features to improve the program's handling of short, freeform documents. Stay tuned . . .

—T. Silveira

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In Search of Programming Bugs

Techniques for tracking them down

by Ed Quillen

Computer lore has it that the first bug remains to this day, on exhibit in the Naval Museum at Dahlgren, Virginia. There you can see a moth taped to a 40-year-old logbook from a primitive Mark II computer, which used neither transistors nor vacuum tubes, but mechanical relays that clicked up and down like telegraph sounders.

This infamous insect flew into Relay #70 on Panel F one afternoon. When the relay closed, the moth was crushed, the circuit stayed open, and the program crashed. Some hours later, naval technicians found the problem and preserved the creature for posterity.

However, the Mark II moth was not the first bug known to computing. As Rear Admiral, then Commodore Grace M. Hopper noted on the log, it was only "the first actual case of a bug being found." Judging by that comment from a pioneer, it appears that computers have always been infested with tiny problems that are hard to find — which is as good a definition as any for the bugs that plague us whenever we write instructions for a machine.

When we write those instructions, we're writing a program in any of the dozens of languages available for personal computers. Whatever language we write in, its instructions must be translated into the only thing a machine can understand — machine language, which is a series of ones and zeros. This translation is performed by programs known as compilers or by interpreters that work with a given language.

Compilers and interpreters do an excellent job of finding certain kinds of errors. If you tell the machine to PRINT when you meant PRINT, or if you tell it $A=3\&B$ when you meant $A=3*B$, the compiler will halt and give you an error message because it didn't understand the instruction.

Such bugs are called syntax errors. They're annoying, but generally they're not hard to remove. The compiler will point you to the offending line, and many versions of modern languages will immediately put the bad line on the screen so you can fix it right away and try again.

The bugs we're worried about here are those that occur when

the compiler does understand the instruction — but what you told it to do isn't what you wanted.

Here's the difference. $A=3\&B$ will be a syntax error in most languages because "&" isn't anything the compiler understands. $A=3+B$ is acceptable as far as the compiler is concerned, but it's a bug if you really wanted the machine to take the value of B, subtract it from 3, and store the result in A. In short, you wrote $3+B$ when you should have written $3-B$. However, when you're running your program you don't know about that, or any of about a million other ways that bugs can creep into programs. All you know is that your program has problems. Correcting those problems means getting rid of the bugs. Before you can eradicate the critters, you have to find them.

And when your program contains hundreds of lines of source code, you get the distinct impression that it would be easier to find the Forbidden Secret of the Great Pyramid than to find the bugs. Sometimes it works that way. But often, you'll be able to locate your bugs right away. Just as ants always show up at picnics, and bees are drawn to flowers, programming bugs have their favorite spots, and those are the places to begin your search.

What's new?

If your program worked before, and you've made some changes, it's almost a certainty that the bugs lurk in the new material, so that's where you should start.

Often, though, that's easier said than done, because we're not sure where the new material is, and we don't have an old version at hand to check against the new version.

After all, it's time consuming to save our work so that we'll have those old versions available. It's tedious to keep notes like "PROGRAM.004 worked fine through the sort, but PROGRAM.005 dies when you ask it for the report." It's irksome to sprinkle comment lines through your program like "Runs okay to here" or "This conversion routine replaces the routine on page 6 of the 8/24 listing of PROGRAM.009."

But it's more irksome, tedious, and time consuming to try to

remember just what changes were made and where they went. You might well end up wasting all your work because the only way you can straighten things out is to start all over. Remember the sign that you see in some garages: "Why is there never enough time to do something right, but always enough time to do something over?"

Doing it right means keeping track of your program, change by change. It means saving your program frequently, under a different name each time so that you don't overwrite your earlier versions. It means regular printouts of your source code so that you can easily examine the entire listing. This generally means proceeding at a tortoise-like pace. But remember who won the race with the speedy hare.

Variable variations

You might think that when you type `X=2` into your computer, that's just what the computer stores. However, computers can store information in many different formats, and each programming language has its own peculiarities.

Doing it right means keeping track of your program, change by change.

In most BASICs, for example, you have integers, single-precision numbers, double-precision numbers, and strings. Each is stored differently in the computer. If `X=2` and `X` is an integer, it will be stored in memory as 00000010. But, if `X` is a string, it will be stored as 00110010.

As you can see, those aren't even within a day's ride of being the same thing, even though they look the same to you when they show up on the screen. If your program expects one kind of variable and receives another, you've got one of the most stubborn bugs known to computational science.

Its symptoms are diverse. You could see sorts that come out in the wrong order; in the world of numbers, 9 comes before 10, but in the domain of strings, 10 comes before 9. You might see inaccurate or inappropriate mathematical results if you divide two integers and expect an answer with a decimal point.

You can find yourself confounded by the program's inability to find relationships that you know are there if you're thinking in numbers and the machine is working with strings. Database languages like dBASE can be especially perplexing in this regard. You'll get 0 for an answer if you ask it to `COUNT FOR CATEGORY = 5` if `CATEGORY` was set up as a character field rather than a numeric field; you'll need to specify `COUNT FOR CATEGORY = '5'` to get the answer you were seeking.

In many languages, a program with confused variable types will often fail to branch properly. Assume that the value of `B` has been calculated earlier in the program, and we come to this pseudocode option:

```
IF B=1 then do THIS
IF B=2 then do THAT
ELSE do OTHER
```

Every time you run it, it does OTHER, even when you're sure that `B` has to be 1 or 2. But if `B` is a double-precision number, rather than an integer, the machine might have reckoned `B` as equal to 1.0000000000182, as a result of inescapable rounding errors that occur inside every calculating device.

Because `B` is never exactly equal to 1 or 2, your program never does THIS or THAT. The solution might be as simple as converting `B` to an integer (as with the BASIC statement `B=INT(B)`) before the branch.

A related difficulty occurs when you forget the difference between a regular variable and an arrayed variable—`D4` and `D(4)` are not the same variables.

Look for these problems anywhere that data moves from one section of your program to another. Solving these problems means knowing your programming language well—what kinds of variables it uses, and how it handles each kind.

A highly-structured language like Pascal or C will require you to declare the type of each variable before you can use it, which eliminates many of these potential headaches. Other languages generally assign default types to variables—the default being what the language will assign if you don't specify something. Numeric languages like BASIC generally set numbers as the default type, but one version might use single-precision and another double-precision.

A programming language is a tool, and good artisans know what their tools will do. If you don't, you face some baffling bugs.

Roving out of range

Your program is most likely set up to deal with data only within a certain range. For instance, if it handles dates and the months come in as numbers, it won't know what to do with a month zero or a month 18 or a month -4.7653.

The place to look for these problems is where data comes into the program. You bring cool evening breezes into your home while keeping the bugs out by putting screens over the windows and doors. You bring useful data into your program while keeping the bugs out by screening the data when it enters your program.

Wherever data comes in, put up filters to make sure the data is within range and in the form you want it. Here's a pseudocode way to ask for trouble when you're asking for a month:

```
DISPLAY "Please enter the month."
INPUT month
```

The well-intentioned user might enter September or Sep or 9/ or 9.0. The user might even enter the 9 that your program is expecting. The other kind of user might try -31.&02AF just to see what happens. Even if you're the only one who will ever use this program, will you remember in six months precisely how the month is supposed to be entered if you don't use this program every day?

Protect yourself and those who use your programs; filter data as it comes in to keep it in the proper range and form. To put it in pseudocode:

```
LOOP to get month
  DISPLAY "Please enter the month"
  DISPLAY "as a number from 1 to 12"
```

(continued on page 36)

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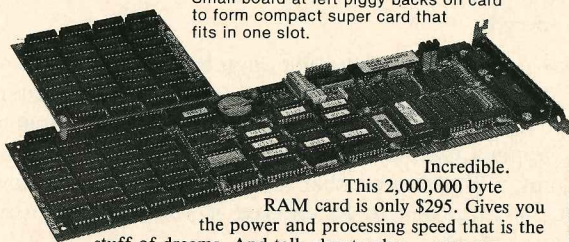
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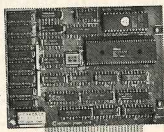
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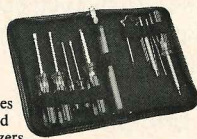


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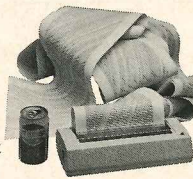
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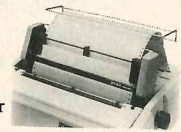
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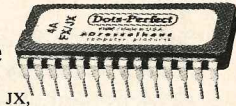
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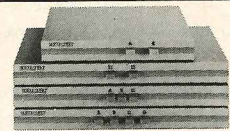
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```

INPUT month
IF month is NOT integer
  LOOP again
IF month < 1 OR month > 12
  LOOP again
ELSE month is within range.
  LEAVE LOOP
END LOOP to get month

```

Look in the loops

One reason computers are so useful is that they'll just keep doing the same thing over and over, for as long as we want them to go through their loops. But loops in programs can be like those broomsticks summoned by the Sorcerer's Apprentice in *Fantasia*—they never stop.

An endless loop usually results from forgetting to increment the loop counter, or resetting the loop counter so that it never reaches its terminal value. You wouldn't do that on purpose, but if the loop is lengthy, you might have forgotten what variable you were using for the counter, and used it elsewhere in the loop. To explain in pseudocode:

```

LOOP while N < 1000
  N = N + 1
  Some tremendously complicated routine
  A very long operation
  Another complicated procedure
    in which N is somehow set to zero
  Yet another complicated routine
END LOOP

```

It's obvious that poor N will never get past one, let alone clear up to 1,000. It isn't always so obvious inside a real program loop—but that's where to look if your hair turns gray while you're waiting for a loop to finish. One way to save your sanity is to have the program display the counter every time you run through a loop while developing a program.

Another bug common to loops is the overloaded accumulator, most often found in loops within loops. An *accumulator* is a variable used to store sums, and it's easy to forget to reset it to zero. You end up with sensationally inaccurate results.

Suppose you're writing a payroll program. You want to prepare the quarterly reports, which means stepping through each employee's records and adding up the weekly wages for a quarterly total. You want to print that and then go to the next employee. Your program works this way:

```

LOOP through employees
  GET an employee's pay record
  LOOP through pay record
    FIND each week's pay
    ADD each week's pay to Total_Pay
  END LOOP through pay record
  PRINT Employee and his Total_Pay
END LOOP through employees

```

For the first employee, Total_Pay will be accurate. But Employee No. 2 will show a Total_Pay that is the sum of his and Employee No. 1's. Employee No. 147 will show total wages that an auto executive might envy because you didn't set

Total_Pay back to zero after printing each Employee and his or her Total_Pay.

The same bug will cause strings to reach shocking lengths if you keep concatenating and fail to reset to the null string at the appropriate spot. When you use flags for program control, they can get smitten by this bug if you neglect to reset the flags for each go-round. One time to be especially alert for this bug is when you change a one-time procedure into a loop.

Breakpoints, traces, and steps

Although bugs can lurk anywhere in a program, the areas that we have covered are the best places to start looking. Often you can exterminate the vermin just by inspecting the suspect portions of your program. Sometimes those bugs are like the pernicious "no-see-ums" that plague camping trips. You know the bugs are swarming around a certain vicinity, but finding the precise source of the plague will require closer examination.

To be certain of the general area where your bugs are lurking, insert *breakpoints* in your program. As you gain experience, you'll know where to insert them for best advantage. At first, put breakpoints between the major sections of your program.

At a breakpoint, the program stops executing and displays values of selected variables. Compare those values to what you think should be there. If all is well, proceed to the next breakpoint. If not, you're well on your way to isolating your problem.

How much information you can conveniently gather at a breakpoint depends on the language. With some, you'll have to insert detailed statements just to get a few values. With others, you can call on built-in facilities for a full dump of each variable in use.

Breakpoints are like snapshots of the status of your program at a given time. *Traces* are more like movies. In some languages, you can set up a trace so that one variable is the star of the show—each time the variable appears, the appropriate program line is displayed, along with the variable's value. In others, such as BASIC, the trace facility just shows line numbers as they execute; you'll have to insert instructions to get more information.

With the right equipment, you can examine a movie one frame at a time, and that's similar to what happens if your language allows you to *step* through a program. It's slow, because the program will execute one statement at a time, and it won't move on until you tell it to. At each stop, you can see exactly what your variables are doing. When you've isolated a bug to a loop, but you haven't been able to get any closer to the problem, it's time to step through the loop, statement by statement.

Stubs and pieces

The more places you have to look for a bug, the harder it is to find. If you've isolated the bug to one or two lines, you're close to getting rid of it. But if all you know is that the bug is lurking somewhere within 50 program lines, you still face a lot of work.

To keep your task simple, build your program in small segments. Construct each segment carefully and test it thoroughly to make sure it is actually doing what you think it should. Find out what it does with values that are out of range

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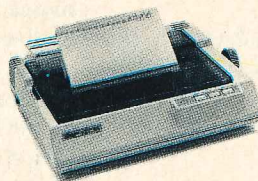
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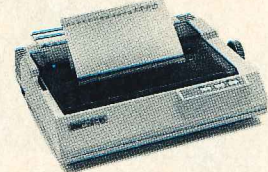


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and with borderline values. Make sure it doesn't contain any endless loops or outrageous sums. Then assemble these tested components into your program.

Making good parts doesn't guarantee that your program will perform perfectly, because parts that don't fit together won't work properly. One way to help things fit together is to use stubs when you're testing the main body of the program. Stubs are messages that explain what the "part" is supposed to do.

Many programs will perform subroutines or procedures, based on a variable, like this:

```

COMPUTE balance
  IF balance > 10,000
    DO Bills
  IF balance >= 0
    DO Payroll
  IF balance < 0
    DO Chapter__1 1
    
```

Before writing or installing the routines for each option, put in some stubs to be sure the program is calling the right routine. Stubs aren't elaborate:

```

BILLS
  DISPLAY "Bill-paying subroutine called."
  RETURN to menu
END BILLS
    
```

```

PAYROLL
  DISPLAY "Payroll subroutine called."
  RETURN to menu
END PAYROLL
    
```

```

CHAPTER__1 1
  DISPLAY "Chapter 1 1 subroutine called."
  RETURN to menu
END CHAPTER__1 1
    
```

When testing the controlling part of your program you can insert various values and make sure the program moves to the proper procedure. If you wait until you've inserted the actual code for those procedures, arrange to have your meals sent to you—you won't be leaving your keyboard for a long time.

Art and science

Debugging may appear to be an occult art, especially when you see a master programmer at work. You'd swear that he has mystic inspiration as he moves rapidly to the problem and applies an elegant correction.

But actually, debugging isn't anything more than the application of the "scientific method" you were taught back in junior high school: Define the problem, formulate a hypothesis, test the hypothesis. And keep at it until you come up with an answer.

Ed Quillen is a Salida, Colorado-based freelance writer, who enjoys programming in his free time.

The World's Smallest Battery-Operated Full-function Printer
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This amazing printer weighs only 2.2 pounds (with batteries) and measures 11 by 4.5 by 1.75 inches. With its built-in parallel interface, the TTXpress printer can connect to any of your Kaypro computers including the II, IV, 16, 286i, and the Kaypro 2000 laptop.* We even include a printer cable!

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Advanced Uses for The Word Plus

More than just a spelling checker

by Robert J. Sawyer

The Word Plus is much more than just a spelling checker. Its 11 programs provide a toolbox for solving word puzzles, doing multiple global find-and-replace operations, and analyzing your writing. This article will show you how to get the most out of this "toolbox."

Usually, spelling checks are done under the control of the master program TW.COM. As TW runs, it calls up three other Word Plus programs: SPELL.COM, REVIEW.COM, and MARKFIX.COM. TW can be invoked in two ways. If you type TW, the program will prompt you for the name of the file you want to check and the name of a special dictionary to be used along with the general update dictionary, UPDICT.CMP.

A special dictionary is the ideal place to put words specific to a given project. For example, I added "LOOKUP," which is the name of one of The Word Plus' programs, to the special dictionary that I'm using to check this article. If I'd put it in my general update dictionary, later I might type "lookup" when I meant "look up" and the proofreader would let it pass unchallenged. Note that if you type a file name after TW on the command line you won't get a chance to specify a special dictionary.

SPELL.COM finds words not in the main word list. Normally, you would let TW.COM call SPELL for you, but if you want to do it yourself, type:

SPELL file name \$switches (optional)

Switches are commands that modify the way the program operates for the current session. Acceptable switches for use with SPELL are:

\$F write incorrect words to file ERRWORDS.TXT
 \$Fn write incorrect words to ERRWORDS.TXT on drive n
 \$PL print out incorrect words and list them on screen
 \$C save the context of each misspelled word in the file ERRWORDS.CON

\$B don't check spelling of text between backslash characters (useful if your file includes program listings or passages that contain unusual or foreign words—use the dot command ".\" at the beginning and end of sections to be skipped during proofreading)

\$I don't check spelling of words that are all in capitals (handy if you use many acronyms)

\$S don't check spelling of dot commands

REVIEW.COM reads the unrecognized words listed by SPELL.COM in the file ERRWORDS.TXT and presents them, one at a time, for marking, ignoring, correcting, or adding to your update or special dictionaries. REVIEW is normally only run from within TW.COM.

Looking up words

The Word Plus comes with a 45,818-word dictionary called MAINDICT.CMP. The programs ANAGRAM.COM, LOOKUP.COM, and FIND.COM let you browse through this word list.

Give ANAGRAM.COM a string of letters and it will report all words in MAINDICT.CMP that can be made by rearranging those letters. The string of letters may contain one or more "?" wildcards, each representing a character that can be replaced by any letter. Invoke ANAGRAM like this:

ANAGRAM letters

If you type "RATS," for instance, ANAGRAM will display "ARTS," "STAR," and "TSAR."

LOOKUP.COM searches MAINDICT.CMP for the correct spelling of a word. Invoke it like this:

LOOKUP word \$switch (optional)

Only one switch is acceptable, \$L, and it means that the first letter of word might be incorrect, so do a longer search.

LOOKUP is a weakling by today's computerized-proofread-

ing standards. Whereas CorrectStar 4.0 (part of WordStar 4.0) will offer the correct spelling of "psychology" even if you type "cykologi," LOOKUP throws up its hands in defeat if you've got more than one letter wrong.

For serious searching, use FIND.COM instead. The word you give it can contain one "*" wildcard (meaning one or more consecutive unknown letters) and as many "?" wildcards as you like (each one representing one unknown letter at that position in the word). Invoke FIND like this:

FIND word

If you type SIL*, for example, FIND will report the correct spelling of silhouette. My wife does crossword puzzles and sometimes when I'm working she calls out, "What's a nine-

*The Word Plus'
main dictionary
contains a raft
of dubious words.*

letter word for trustee? The second and third letters are I and D and the last letter is a Y." After a moment I call back, "Fiduciary" and she thinks I'm brilliant. But all I've done is type:

FIND ?ID?????Y

You can use FIND's wildcards to discover simple rhyming words. For instance, if you give the string "*ILES" to FIND, it provides 18 possible rhymes for *PROFILES*.

If you type only an asterisk after FIND, the program will list every word in MAINDICT.CMP. If you've got an MS-DOS system and 775K of disk space, the following command will expand MAINDICT.CMP into a file that you can read:

FIND * > file name

I did this myself and after blindly trusting The Word Plus for three years, I was shocked to see that its main dictionary is bursting with proper names and contains a raft of dubious, non-English, or out-and-out misspelled words, including "Affaires," "Apologie," and "Atlantes."

Breaking up is hard to do

WordStar has so-called "Hyphen Help," an annoying feature that stops reformatting in the middle of a paragraph to let you manually position the cursor at the place where a hyphen should go. Thanks to The Word Plus, you'll never have to go through that rigmarole again.

HYPHEN.COM peppers a file with soft hyphens (hyphens that don't print unless they are being used to break words over two lines). The original file is preserved as a BAK file. If no file name is specified, HYPHEN will present a "?" prompt. If you then type in a word, the program will show its proper syllabification. Invoke HYPHEN like so:

HYPHEN file name (optional) \$switch (optional)

Only one switch is acceptable, \$n; this inserts hyphens into words longer than n letters (default is 13).

If you run HYPHEN then reformat your document from beginning to end, you will have accurate hyphenation wherever required.

HYPHEN uses typesetters' rules for determining where to hyphenate. It also consults the supplied file HYEXCEPT.TXT, a list of 392 words that are exceptions to those rules. This is a plain ASCII (non-document) file, so you can add the proper syllabification of any words you find HYPHEN has trouble with.

Counting and sorting words

WC.COM counts the words in a file. It includes dot commands and words containing numbers in its tally, but skips isolated numbers. Hyphenated words are counted as a single word. Invoke WC like this:

WC file name

DICTSORT.COM makes a complete, alphabetized list of the words within a file. It forces words to all capitals and discards duplicates. The original file is preserved as a BAK file. You can use DICTSORT to make your own special dictionaries for use with The Word Plus' spelling checker. Invoke DICTSORT like this:

DICTSORT file name

WORDFREQ.COM reads a file and makes another file with the extension FRQ, which contains a list of all the words in the original file along with the number of times each appears. This can give you an idea of whether you've overused a specific term in your document. WORDFREQ also displays the total words in the original file, the number of unique words, and the number of words appearing only once. Generally, the fewer unique words, the more readable your writing is. Invoke WORDFREQ by typing:

WORDFREQ file name \$switch (optional)

Only one switch is acceptable, \$A, which sorts the word list alphabetically (default is by frequency).

MARKFIX

MARKFIX.COM is a global-search-and-replace utility. When it's used under the command of TW.COM, it finds typos and substitutes the correct spelling. However, it has many other applications.

MARKFIX reads words from FILE2 and replaces or marks each occurrence of those words in FILE1. If FILE2 is not specified, MARKFIX will assume it is called ERRWORDS.TXT.

If FILE2 just contains a list of words, those words will be marked wherever they appear in FILE1. If FILE2 contains words in the format BADWORD/GOODWORD, each occurrence of BADWORD in FILE1 will be replaced with GOODWORD. The original FILE1 is preserved as a BAK file. Invoke MARKFIX like this:

MARKFIX FILE1 FILE2 (optional) \$switches (optional)

Acceptable switches are:

\$Mx use x as marking character (default is *)

\$L mark words that change length (so you can find them with a word processor and reformat the paragraphs they're in)

Many people have trouble with words that sound similar but are spelt differently. For instance, sometimes I type *your* when I mean *you're*. The Word Plus comes with a file called HOMONYMS.TXT that lists the 862 most-commonly-confused words. MARKFIX can use this file to tag these words so you can check them in context with your word processor. Just type:

MARKFIX FILE 1 HOMONYMS.TXT

HOMONYMS.TXT lists the 862 most-commonly- confused words.

HOMONYMS.TXT is a plain ASCII file. You can edit it in non-document mode to remove any words you know you always use correctly.

Merge printing with The Word Plus

If you don't have a merge-printing program, MARKFIX can do the job for you. To try this out, make a file called TEMPLATE.LTR that looks like this:

```
NameA NameB
Housenumber Streetname Streettype
Cityname, STATECODE Zipnumber
```

```
Dear Mrms. NameB:
How are things in Cityname?
Best wishes,
```

All the words except "Dear," "How are things in," and "Best wishes" are variable names: places where you want personalized information to be inserted.

Now make a separate non-document file called TEMPLATE.VAR. List each of the different variables in your template letter, one per line, followed by a slash. It should look something like this:

```
Mrms/
NameA/
NameB/
Housenumber/
Streetname/
Streettype/
Cityname/
Statecode/
Zipnumber/
```

To send one of these letters to Terian Tyre, *PROFILES* co-editor, make copies of the two templates and call them TYRE.LTR and TYRE.VAR.

To insert the variables, open TYRE.VAR as a non-document and type in the correct values after the slashes, like so:

```
Mrms/Ms
NameA/Terian
NameB/Tyre
Housenumber/533
Streetname/Stevens
```

```
Streettype/Avenue
Cityname/Solana Beach
Statecode/ca
Zipnumber/92075
```

Now run this command:

MARKFIX TYRE.LTR TYRE.VAR

Once your disk drives stop whirring, open TYRE.LTR and you'll see:

```
Terian Tyre
533 Stevens Avenue
Solana beach, CA 92075
```

```
Dear Ms. Tyre:
How are things in Solana beach?
Best wishes,
```

MARKFIX has put the two-letter state abbreviation all in capitals, matching the way STATECODE was printed in the template letter. It's also made both substitutions for the variable CITYNAME. Unfortunately, the two-word city name confused it and "beach" has been left uncapitalized. Still, not a bad effort.

You can speed up copying of the templates and the repetitive executing of MARKFIX by using a submit file (in CP/M) or a batch file (in MS-DOS).

Helping prepare an index

Many index-generating programs require you to mark words to be indexed with special characters. MicroPro's StarIndex, for instance, expects general index entries to begin and end with ^P, in the same way that WordStar expects underlined words to begin and end with ^S. The Word Plus can take the drudgery out of marking words for indexing.

Let's say you want to use StarIndex to produce an index for a file called ANIMAL.TXT. The first step is to produce a list of words to be included in the index. WORDFREQ is the ideal tool for that job, so issue this command:

WORDFREQ ANIMAL.TXT \$A

Open the resulting file ANIMAL.FRQ as a non-document and you'll see something like this:

```
5 AARDVARK
6 OF
3 PLATYPUS
13 THE
3 ZEBRA
```

Using the frequency numbers as a guide, delete the lines containing words you don't want in the index.

To get rid of the the numbers and blank spaces to the left of the words, delete them as a column block. Then mark what's left in the file — which should be just the words you want in the index — as a regular block and write it out to a new file called WORDS.LST.

Give the command to find each carriage return/line feed pair and replace it with a slash followed by carriage return/line feed. You should end up with each line in the file containing one word followed by a slash. Save ANIMAL.FRQ.

(continued on page 57)

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"OTHER" WORD PROCESSORS

Part 1: WordPerfect and Microsoft Word

by Jim Spickard

I like WordStar. But then I've pattered with it (a patch here, a patch there), as I did with my first car. Now my WordStar is lean and trim and can run with the best of them.

But not everyone likes to rebuild cars, and not everyone likes to rebuild word processors, either. I've learned a lot by my efforts, but most people would rather just boot up and write, and they need more features than WordStar provides. Which program should they choose?

*Each program is
loaded with features,
yet each attracts
a distinct audience.*

Different strokes

Some people like sports cars and some like trucks. Both get you there, but they drive very differently. Though most of the major MS-DOS word processors have similar features and prices, their "look and feel" varies a lot. You have to know what you like in order to make a choice.

How about you? Do you want a speed demon: A command-driven program that taxes your memory but saves your time? Or do you prefer menus, from which you can choose the command you need? Do you need a command summary permanently on the screen? Or would you rather call up help when you need it? Do you want commands clustered on the function keys? Or divided between function keys, keypad, control keys and (perhaps) a mouse? Do you want a complete page design studio? Or just a very smart typewriter?

You have to choose, you see. And lists of program features

won't help you much. It's the interface that matters most.

The best way to find out whether you like a piece of software is to "test drive" it. Check it out on the kind of machine you use. But most software dealers aren't ready for you to spend several days learning each of several programs in the hopes that you will buy one from them. You've got to do a little sifting first.

To help you sift, I'll review four of the best full-featured MS-DOS word processors from the user's point of view. This month I'll compare WordPerfect and Microsoft Word; next month I'll look at MultiMate Advantage and Nota Bene. After reading both articles you should have a very good idea of whether one of these programs is right for you.

Each program is loaded with features, yet each attracts a distinct audience. The first three are designed for office work, but perform it very differently; the last is designed for scholarly writing. If you're looking to trade your WordStar for something more advanced, you may only have to decide to which audience you belong.

The big two

WordPerfect and Microsoft Word are both power-houses. Each includes automatic footnoting, spell-checking, a thesaurus, mail merge, index and table-of-contents generation, on-screen column display, simple math, foreign-language support, and enough extra features to fill several inches of manuals.

Plus, each makes good use of your screen's capabilities and supports dozens of printers including daisywheel, dot matrix and laser. I was able to get each of them to use my Citizen MSP10 to the fullest, though not without a bit of sweat on my part, as I'll explain below.

Both programs have attracted a lot of attention in the industry. *InfoWorld*—whose reviews are oriented toward the business community—rates both quite highly for office work, though their reviewers give WordPerfect an edge in easiness and product support. *The Whole Earth Software Catalog*—aimed more at independents—praised both, especially Microsoft Word's formatting abilities. You can't go wrong with either

program, if you like the way they work.

WordPerfect has recently replaced WordStar as the best-selling word processor. It has been such a success that its Orem, Utah publisher has changed its name from Satellite Software, Inc. to WordPerfect Corporation—appropriate for what's basically a one-product company.

Microsoft, on the other hand, is a multi-product firm. Nearly everyone uses one or another of their programs—at least a DOS (MS-DOS) and BASIC (GW-BASIC). Their technical expertise is unsurpassed, and Word shows it.

Both programs run on other computers—a plus for those who switch machines a lot. WordPerfect runs on the Apple II (though the DOS version is better), DEC's VAX, and Microvax II, the Macintosh, Amiga and Atari ST. Microsoft's Macintosh version has just been rewritten to add most of Word's DOS features.

WordPerfect

People who like typewriters will like WordPerfect a lot. Its clean interface reminds one of the writer's delight (or nightmare): a fresh blank page. The screen is open, so just type. The machine never gets in your way.

Typing is straightforward. Tabs and margins set easily, your left pinkie can reach F6 and F8 to toggle bold and underline, text automatically reformats as you write. Cursor control is centered on the keypad, which keeps your right hand busy. Other commands cluster on the function keys to your left.

Function keys combine with the Control, Shift, and Alt keys to give you 40 major commands. Most of these display a menu of sub-commands at the bottom of the screen. Menus are up to three levels deep, but only for the most abstruse commands; common commands require just one keystroke.

This neat division of labor between right and left hands is only marred by the Control key, which sometimes moves the cursor (\wedge LeftArrow and \wedge RightArrow) and sometimes deletes (\wedge Backspace and \wedge End), besides expanding major functions. Otherwise the arrangement is logical and easy to learn.

The only WordStar commands I miss are \wedge W and \wedge Z to scroll the screen without moving the cursor, \wedge QP to return the cursor to its previous location, and \wedge Kn (n=any number between zero and nine) to mark places in the file.

WordPerfect is WYSIWYG (What-You-See-Is-What-You-Get)—including centering, margins, tabs, columns and various typographic arcana. We can think of text files as a long train. WordPerfect inserts special cars in this train to indicate how to treat the text that follows. The first cars in line give details about the file: margins and tab stops, which font to use, whether to justify the text and so on. Unlike WordStar, you don't have to reset your margins and tabs every time you call up a document. Just hook those cars on once, and they'll be there whenever you revise.

If you do reset your tabs, they change the way subsequent text is displayed—much like Perfect Writer's @STYLE command. This feature allows you to avoid the one drawback of WordPerfect's WYSIWYG system. WordPerfect displays margins, so if you use elite type for letters as I do your text will run off the right side of the screen. Just set the margins to zero and 78 when you write, then change them to 10 and 88 when you print. Your text will look just fine.

Underlining, centering and boldfacing are likewise marked by cars—in this case surrounding the text to be highlighted. (They appear as colors—or shades of monochrome on Kaypro's multi-video board; only underlining appears in normal monochrome mode.) If you want to shift type styles—from pica to elite, for example—you insert a "font change" character; if you want to block indent a paragraph you insert a "block indent" character.

These added train cars act very much like WordStar's embedded print characters, except there are a lot more of them, giving WordPerfect more flexibility. And just like WordStar when you turn off the "on-screen display" command (\wedge OD), you normally can't see these characters in your text.

To see them—and change them—push **ALT-F3**, which displays the hidden commands on the lower half of the screen; the normal text is on top. Cursor keys move you to the command you want to oust, and a backspace eliminates it. Easy enough.

The net result is a clean yet powerful interface that doesn't get in your way.

*You don't have to
reset your margins
and tabs every time
you call up a document.*

Features

Many of WordPerfect's other features—search-and-replace, block moving, and mail merge, to name a few—are similar enough to WordStar's that I'll not comment on them here. Regarding the ability to "undo" mistakes, and to work with two documents at once in different windows, I need only say: WordPerfect has them, and they work well.

Of more interest to serious writers are WordPerfect's spell checker, thesaurus, automatic footnotes and macros. I'll treat each in turn.

WordPerfect does not have a separate spelling program that runs when editing is finished. WordPerfect's Speller is built in: Whether you want to check a word, a page or your entire text, you just type \wedge F2 and follow the menus.

Of course it helps to have a hard disk; otherwise you have to pull the program disk and put the spelling disk in drive A. The dictionary is large and gives you lots of possible correct spellings. It includes a phonetic routine, in case you spell by ear.

The thesaurus is also quick, though once again you need a hard disk to avoid disk swapping. You can browse from synonym to synonym just like you can with a real thesaurus (a feature Microsoft Word has also captured—see below), though this thesaurus is not as complete as the one I patched into WordStar. But most writers will find it adequate.

Automatic placement of footnotes and endnotes is a breeze. Just type \wedge F7, choose which kind of note you want, and type it

in. You can specify the type of footnote call, the line spacing, whether to use numbers, letters or characters (and of what type), and whether you want long footnotes wrapped onto a subsequent page. Anyone who remembers Perfect Writer's 300-character limit on footnotes will be pleased with WordPerfect: Notes can be "no more than" 16,000 lines long—about 300 pages.

Notes are WordPerfect's only exception to WYSIWYG. You

fect's deeper menus by using macros to automate oft-repeated commands. The only drawback is that each macro is stored as a separate disk file; once again, a hard disk makes life much easier.

Installing WordPerfect is not difficult. A booklet guides you through the process, the most complicated part of which is installing a printer. Unless you have one of the several score printers WordPerfect recognizes you will have to specify all

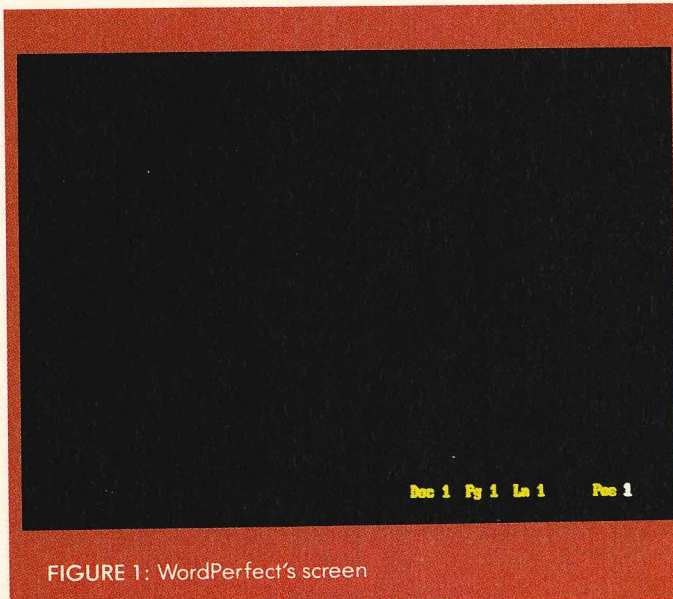


FIGURE 1: WordPerfect's screen

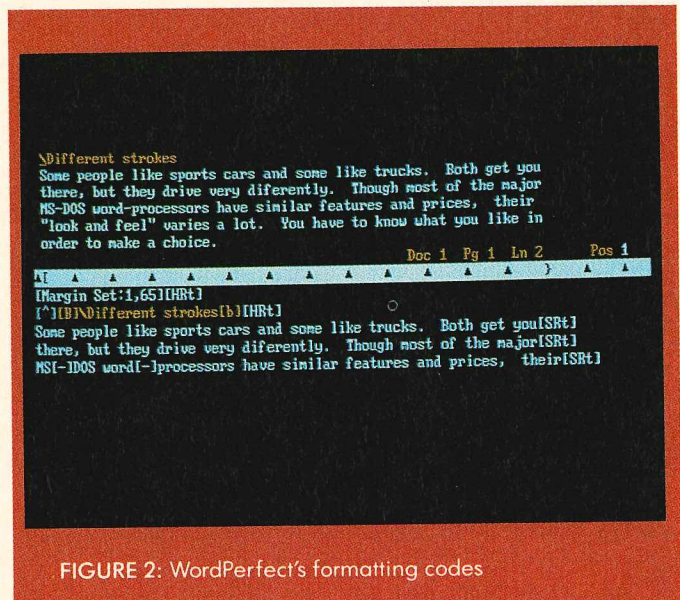


FIGURE 2: WordPerfect's formatting codes

can see the footnote calls, but have to use a special mode to see the notes themselves. Global margin changes also don't work on footnotes. You have to reset the margins of each note separately—or else spell-check the entire document, which sets the note margins automatically.

Changing from footnotes to endnotes (or back) is a bit of a pain. You have to enter edit mode, delete the footnote number, cut the footnote, return to document mode, create an endnote and paste your text back in. Fortunately you can automate this with a macro—the manual shows you how, as it shows you how to get around most of WordPerfect's minor quirks.

Macros

Macros are lists of commands that the program executes automatically: one or two keystrokes taking the place of many to perform the same task. Most word processors don't have them.

Let's say you write letters in one style and manuscripts in another. Build a macro for each that contains the typefont, margins, tabs, and other set-up information you need, including a return address for correspondence. When you start writing, just call the appropriate macro, and you're ready to go!

WordPerfect lets you automatically repeat macros or chain them to one another, and can even wait for new text while the macro is working. You can easily build an index, for example, with a macro that searches for a word, lets you insert an index code, then repeats. Power users can avoid many of WordPer-

fect's capabilities. But WordPerfect provides a separate program to aid you. It doesn't take much technical skill.

Problems

WordPerfect does have some objectionable aspects. Most annoying is the delay in screen reforming following an edit. The screen changes instantly above the cursor, but not below it. This leads to the uncomfortable experience of dropping down a line to fix something and having the word one is seeking move away as the paragraph reforms.

Similarly, when I moved rapidly through my text I occasionally appeared to reach an end of file—though I knew more text was there. I had to hit the down arrow key a couple of times before the rest of the text appeared. The Apple version of the program has the same flaws, though the delays are longer because of the slower machine. It's obviously a design problem, not a minor bug.

I'd like to have more flexible cursor movements, and be able to scroll the screen without losing my place. I'd like to be able to delete the line left as well as the line right, though I could solve this with a macro. But these complaints are minor. Most of WordPerfect's little touches are nice: The automatic saves every five minutes without my having to think about it; the ability to load more of the program into memory for faster operation; and the well-prepared manual that is full of tips for heavy users.

Do I like WordPerfect? I have to answer "Yes, but . . ." Had I

not spent so much time modifying WordStar to give it the features it once lacked, I would certainly invest in this program.

I recommend WordPerfect for anyone who likes typewriters but wants something more powerful. As we'll see in a minute, Microsoft Word has some very attractive attributes that WordPerfect lacks. But as an overall package, WordPerfect is hard to beat.

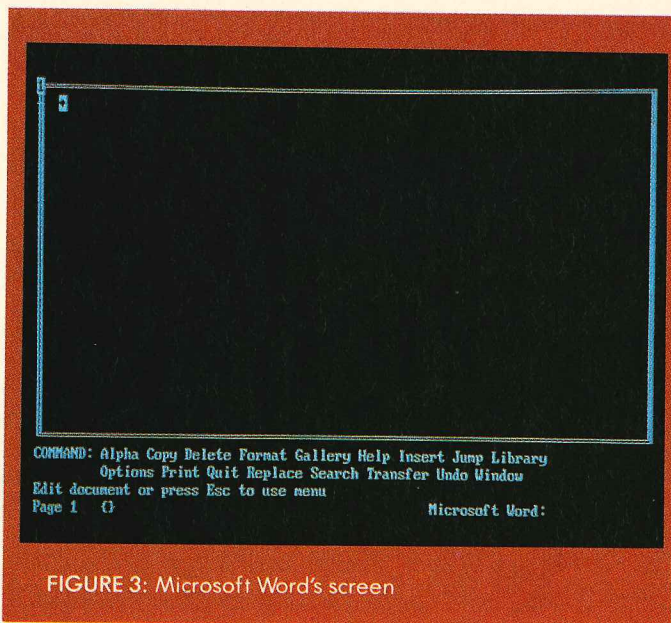


FIGURE 3: Microsoft Word's screen

Microsoft Word

If WordPerfect acts like a typewriter, Microsoft Word acts like a design studio. Flexible and complicated, it rewards the effort you put in. No word processor I know gives you so much control over the appearance of your text or provides so many features. With no other word processor, however, are you as likely to leave so many features unlearned.

Let's start with your screen. Word has not one, but three, possible display options, among which you must choose. Each begins with an almost blank screen (see Figure 3 above). But with each option the letters and text highlights appear different.

Taking WYSIWYG to great heights, in normal mode Word uses graphics to display underlining, boldface, italics, strike-throughs, super- and subscripts, even small capitals onscreen. It's really a treat to see those italics lean over! If you have a Hercules-compatible display card—the Kaypro multi-video card set to MG2 works fine—type **word/h** and you get 43 lines of text rather than the standard 25. If you prefer color to graphics, just call up the program with the /c switch set: **word/c**. One color represents all the non-standard typestyles, though.

Word is a smart program. You don't have to tell it what kind of graphics card and monitor you have—it looks for itself and adjusts accordingly. Unfortunately the Kaypro multi-video card is also smart: In normal mode the program and card fight, producing snow. Better use the /c or /h program switches. Keep the video card in color mode and set the /h switch if you like

graphics but just 25 lines of larger type.

(If you use a RAM resident utility like SuperKey or PolyWindows, you're stuck with color mode: The graphics text confuses the utility and freezes the screen.)

Now you have to choose how to enter text.

Word divides commands into two groups: style and document commands, which you enter from a menu; and edit commands which you enter directly. The former begin with

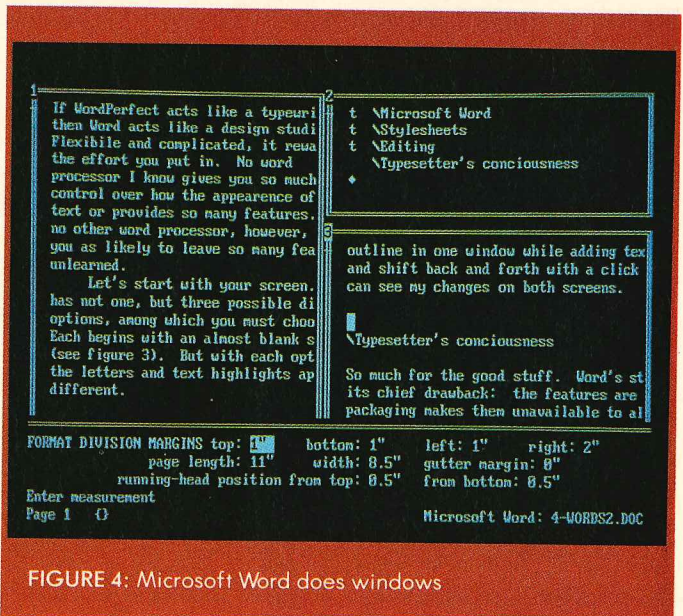


FIGURE 4: Microsoft Word does windows

Escape (Esc), then the first letter of the menu choice—conveniently displayed at the screen bottom. For example, **Esc-PP** lets you print a file.

Edit commands use function and cursor keys combined with the Control or Shift key, or a mouse.

Word works best with a mouse. You don't have to have one—you can do nearly everything you need with the keyboard. But the keyboard commands aren't logically arranged, which makes editing tiresome. The mouse replaces the most troublesome ones—letting you speed through your text and around the screen.

With a mouse, editing really flies. Not only can you move around the screen more easily, but if you want to scroll through a file, just move the mouse pointer to the left side of the screen and click. Zoom! You're there! In your text a click of the left button selects a character, a click of the right selects a word, both together a sentence. In the left margin, the left button selects a line, the right a paragraph, both the entire document.

Of course you'll still need to use the keyboard: the mouse only helps speed cursor movement, text selection, moving and copying. And that's a good thing. Having to return to the keyboard to delete text prevents lots of errors.

The mouse also speeds menu selection: It's still faster to type **Esc-FDM** to reach the "Format Division Margins" submenu, which you need every time you want to change the margins. But with the mouse you can go directly to "page width," for example, without hitting the Tab key eight times—a definite improvement, I'd say.

I wasn't convinced until I'd tried the program both ways. Now I'm a believer!

Stylesheets

Once you've decided between keyboard and mouse, you'll have to choose whether to use one of Word's most powerful features—stylesheets.

Stylesheets let you preset your text's appearance—both on the screen and at the printer. You attach a stylesheet to a

Stylesheets let you preset your text's appearance.

document, then attach a two character label to each paragraph. Word automatically formats that paragraph the way you like.

When I write letters, for example, I like to use elite type and 1-inch margins, with my return address and closing 3-1/2 inches from the right edge of the paper. My letter stylesheet contains paragraph codes for address, closing, salutation, and so on. Word automatically positions these paragraphs on the screen, adjusting the line length to fit the smaller typefont.

If I want to change styles, I don't have to reformat the entire document. I just replace one style sheet with another. I write single-spaced on the screen, for example, but like double-spaced reports. Five keystrokes and a menu choice, and the change is made.

Once designed, stylesheets really speed up work. Designing them, however, is not for the faint of heart. Word's manuals provide all the information you need, but you have to learn a rather arcane jargon to understand them. Bravery and patience help too. Many offices name one employee "stylesheet guru" to create stylesheets for everyone to use.

You don't have to use stylesheets, though. My stepmother tried them for a time, but decided they were too much trouble. Now she uses tabs and carriage returns as she did on her typewriter. When she wants to switch from single- to double-space, she uses the Format Paragraph menu. Word gives her no trouble at all.

Whether you use stylesheets or format your text directly, any setting will be saved for your next edit session. With Word, you don't have to set anything twice.

Editing

After choosing your display, your input device, and whether you'll use the stylesheets, you're ready to start writing. Here Word is very flexible—though complicated.

Entering text is straightforward. You type and Word wraps your prose into sentences and paragraphs. Text formats instantly with every change. My only complaint is that dashes—typed as two hyphens—break at the line ends instead of staying together. Holding down **^Shift** while you type the first hyphen solves this, however.

Word gives you three ways to delete text: you can backspace over it; or you can mark characters, words, sentences, lines or

paragraphs, then either push the Delete key or type **Esc-D** and a carriage return.

Backspacing sends deletions to a buffer, from which they can be retrieved with **Esc-U** (for "undo"). If you have added text since the last backspace, though, your deletions are lost: instead **Esc-U** undoes what you've added! (A second **Esc-U** brings it back again.)

Pressing Delete sends deletions to the "scrap," a more stable buffer. You can reinsert it with the Insert key. This is how you move text if you don't use a mouse: delete it to scrap, insert it in its new place. The technique is quick but dangerous. If you clean up the new location before retrieving the text, you risk losing it permanently.

A safer method is to type **Esc-D <name>**. This deletes the text and stores it under a code name. You retrieve it by typing **<name> F3**. Just remember that name! The command **Esc-C <name>** copies text in a similar manner.

Does Word sound complicated? It is, but it's also loaded with features that leave other programs behind. Many of these are similar to WordPerfect, making a comparison appropriate.

Take for example Word's glossaries, which are somewhat like WordPerfect's macros. Glossaries allow you to store often-used text and recall it at will. (That's how **Esc-D** deletions work.) Unlike WordPerfect, I can't store commands in glossaries; but I can squeeze many glossaries into a single file, saving my disk.

Word's thesaurus provides more synonyms than WordPerfect's, and lets you browse extensively from term to term until you find the word you want. It's the best I've seen.

Automatic footnoting is straightforward. You can't have both endnotes and footnotes at once, but notes are automatically renumbered after any changes. You can use any symbol you want to mark them. **Esc-JF** lets you jump between footnotes and reference symbols easily.

The comments about deletions apply with vigor to footnotes, however. If you delete the footnote mark from the text with a backspace, the whole footnote is gone—unless you undo it right away. Better be careful here.

Word's spell checker is familiar to many Kaypro owners: It's based on The Word Plus. It is faster than WordPerfect's, though neither as complete nor as useful for checking single words on the fly. (Like WordPerfect, Word really demands a hard disk.)

Word lacks WordPerfect's ability to "redline" text—useful for lawyers—but its outline processor is much better. For some, this feature will be enough to justify the choice of the program.

Unlike a stand-alone outliner, Word's outline structure is well integrated with the program, and is *always* available. You just switch to "outline view" and your document structure emerges! Moving outline headings in "outline edit mode" moves their underlying text automatically. It's a snazzy way to revise documents, and makes for clearer prose.

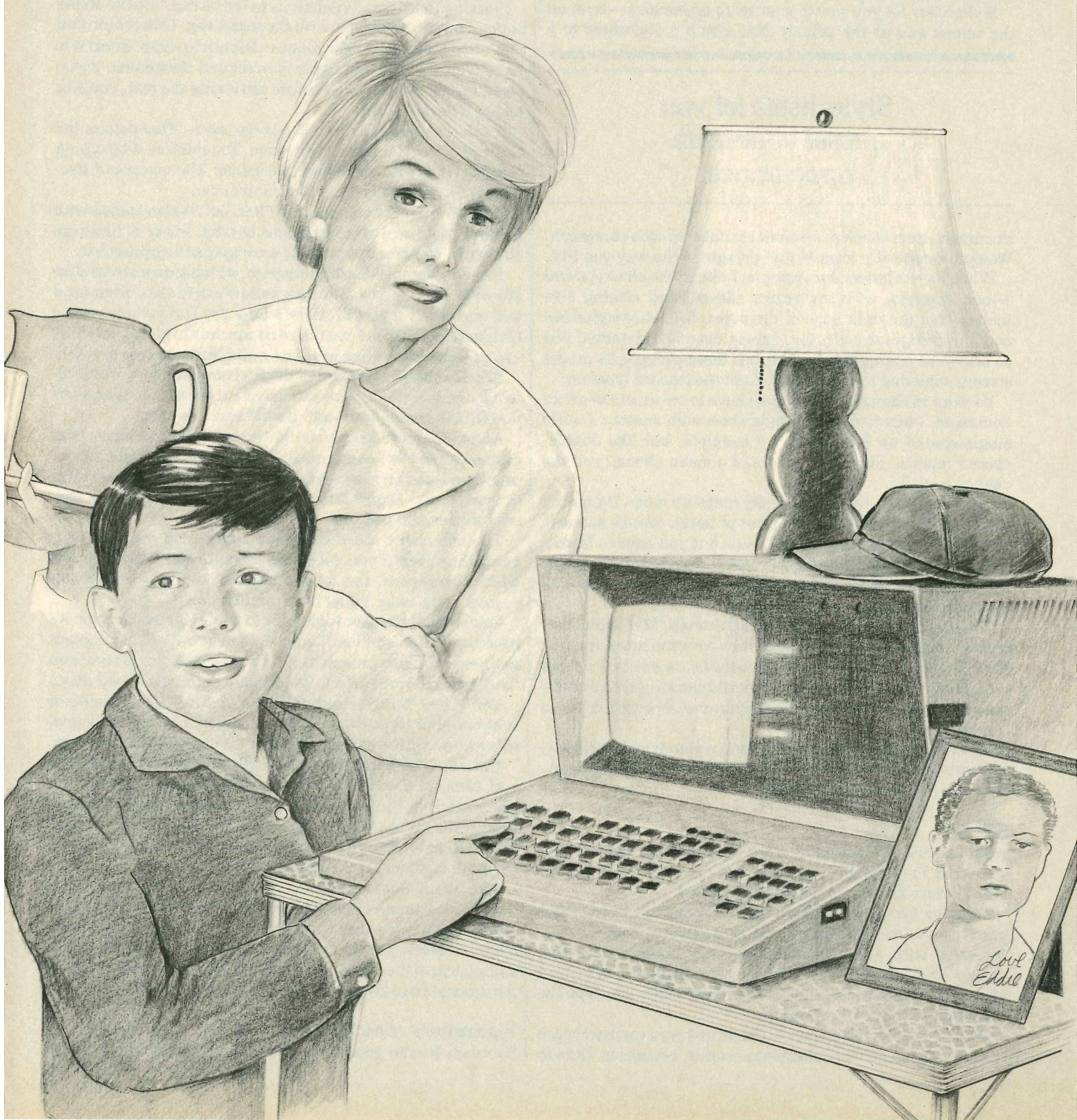
And Word does windows! Not just two windows, each holding a separate document as with WordPerfect. But up to eight, which can either view several documents or one document in several places. I put my outline in one window while adding text to the other, and shift back and forth with a click of the mouse. I can see my changes on both screens.

Typesetter's consciousness

So much for the good stuff. Word's strength is also its chief

(continued on page 57)

BIOS Calls Your Mother Never Taught You



Here's an UNERASE program that shows how it's done

by David Weinberger

A major part of any operating system is handling the details of disk I/O. Details like which sectors on the disk belong to which file, which sectors are available to store new information, and updating the disk directory. You, as the computer user or programmer, are isolated from having to keep track of the myriad details of managing disk I/O. This is as it should be. Normally you don't want to be bothered with all of that. You simply want to read from, or write to, a particular file and you let the operating system take care of the details.

Sometimes, however, you need to do something the operating system won't normally allow—like unerasing a file. To perform an unerase operation you have to bypass normal programming conventions and manipulate the operating system directly. More specifically, you work with the BIOS (Basic Input/Output System).

This article will show you how to do this on CP/M machines in Turbo Pascal. The program chosen to illustrate BIOS manipulation is a handy utility everyone should have. It shows you every file on a disk, including erased ones, and lets you unerase the ones that can be unerased. The code will be explained, section by section.

It's assumed you are an experienced Turbo Pascal programmer—direct BIOS calls are powerful, and therefore dangerous. The explanations cover how CP/M and our example program work, but not any of the basics of using Turbo Pascal.

How CP/M works

CP/M originally became popular because it made programs much more portable than they had been in the past. This meant that programs could run on different CP/M machines with little or no adaptation. CP/M accomplished this by isolating a program from much of the mechanics of what an operating system does.

CP/M provided a list of commonly requested functions in its BDOS (Basic Disk Operating System)—functions to write a character to the screen, write data to a disk file, and so on. An assembly language programmer requested a function by issuing a BDOS *call*. To write a character to the screen, for example, the programmer would put the character to be written into the E register and the number of the appropriate BDOS function into the C register. The BDOS function is executed by jumping to address 0005h and letting the operating system handle the rest of the work. In Turbo Pascal you simply issue the instruction to write a character and let the compiler load the registers and jump to address 0005h. Either way the programmer doesn't worry about how the computer actually accomplishes the function.

It's like putting your money into the juke box and pressing the right number buttons. So long as the right music comes out, who cares how the juke box went about selecting your

particular record? Because CP/M has standardized the buttons for programming functions, and you have that list, you can write programs that will run on any standard CP/M machine.

But how, in fact, are the functions accomplished? This is where BIOS calls come into play. In our previous example we loaded a character to be printed in the E register, a BDOS function number in the C register, and jumped to address 0005h. Address 0005h is the entry point for CP/M's BDOS. At the BDOS entry point is another jump instruction to the BDOS itself. The BDOS, which is the same on all CP/M systems, calls as many BIOS operations, which are *different* on various CP/M systems, as are required to accomplish the task at hand. It is this interface between the BDOS and BIOS that allows CP/M programs to work on different machines.

How the BIOS works

Although the BIOS for different brands and models of CP/M computers are different, they are all alike in one regard: the BIOS always begins with a series of "jump vectors." These are addresses at which the code to accomplish various tasks exists and they're always in the same order on any CP/M computer. The list of vectors is like a table of contents, except the list contains assembly language instructions to jump to the indicated address. The order of the list is standard. So, when the programmer requests function #2 (print a character to the screen), CP/M goes to the BDOS, which goes to the BIOS jump vector and, in turn, is sent to where the actual routine to print a character lives.

There is a small price one pays for this great convenience: sometimes CP/M's BDOS functions do *too much*. In some cases you may want greater control over the computer than the BDOS allows. For example, CP/M wants to handle all the details of writing data to disk files for you. It keeps track of unused disk space and figures out where on the disk to write the data. Then it records in the directory where on disk it has put the data. The programmer does not have to muck about with the disk directory at all, a major time and headache saver. As a matter of fact, CP/M's BDOS won't let the programmer muck about in the directory at all.

This brings us to our sample program, UNFILE. When CP/M erases a file, all it really does is replace the first character of the directory entry with a hexadecimal E5h. To unerase a file, you need only change the E5h to the number of the user area where the file resides. But to do that, you have to be able to read and write in precise locations within the disk directory, which the BDOS will not allow you to do. CP/M, through the BDOS, wants control over anything that is read from, or written to, the disk directory. So, to accomplish the task that we have set for our program, we have to bypass the BDOS and take control of the BIOS ourselves.

Taking control of the BIOS

Since the BDOS performs all of its operations by using the BIOS jump vectors, so will we. Fortunately Turbo Pascal lets you use the BIOS jump vectors easily. Borland's Turbo Pascal is the only high-level language I know that provides this kind of programming support as part of its basic design. Direct CP/M BIOS calls in Turbo Pascal take the form:

BIOS(Function,Parameter);

"Function" is an integer number corresponding to the entry in the BIOS jump vector table that you want to execute. "Parameter," not required for all BIOS calls, is the integer number of any data required by the particular call. For example, the BIOS call to print the letter "E" on your screen would be:

BIOS(3,69);

The fourth entry (starting with zero, so the number is 3) in the BIOS jump table is the CONOUT routine, which writes a character to the console. The letter "E" has an ASCII value of 69, so that number is the optional argument.

The UNFILE program—its setup

Now let's go through the program code (Listing 1, UNFILE, is on page 51). The numbers in the left margin were added for reference; they are not part of the program itself. The notation "L#" means line number.

Remember that when mucking about with BIOS calls even small errors can destroy the data on your disk. You have been warned! Be extremely careful if you experiment with direct BIOS calls on your own.

UNFILE reads the disk directory one sector at a time and displays each file name on the screen. If a file has a lower-case "e" or a graphics character in front of it, that file has been erased and you can attempt to recover it. Otherwise you may enter a carriage return to skip the file or erase it by pressing "E." The program continues until the user enters an "X" (to exit), even if that means more than one pass through the directory.

L5. The disk directory consists of 32-byte File Control Blocks. These FCBs contain information such as the file's name and where on the disk its data can be found. The very first byte contains the user area number of the file if it is in use and an E5h if it is either unused or erased. To unerase a file, all you have to do is change the E5h to the user area number of the file (usually zero on floppy-based systems).

L7. This sets up a buffer, that is, reserves a block of memory. This buffer (called fcbbuff) will contain all the FCBs in the disk directory; there are a maximum of 64 allowed in CP/M.

L15-19. Use a BIOS call to select which drive we will be working with. (You could also do this in Turbo by using a BDOS call.) You might want to change L18 so that it will accept drives beyond B, if you have a hard disk. The BIOS call expects drive A to be called zero, B to be called 1, etc., so in L19 we subtract 65 from the character entered in L1. Why 65? Because the ASCII code of A is 65, and B is 66.

L19 also contains our first BIOS call to select the drive. It is eighth in the list of calls. (See Table 1 on this page for a complete list of BIOS calls.)

L21. We set the track using a BIOS call. The directory is always on the second track for floppy-based systems, and the

Table 1: BIOS VECTOR TABLE

BIOS NUMBER	VECTOR OFFSET	TITLE	DESCRIPTION	SET PARAMETER
0	00	WBOOT	Warm boot	C=Drive
1	03	CONST	Console status: Ready?	A=Status
2	06	CONIN	Read from console	A=Char
3	09	CONOUT	Write to console	C=Char
4	12	LIST	Write to list device	C=Char
5	15	PUNCH	Write to punch device	C=Char
6	18	READER	Read from reader device	A=Chars
7	21	HOME	Move drive head to Track 0	N/A
8	24	SELDSK	Select disk	C=Drive
9	27	SETTRK	Set track	C=Track
10	30	SETSEC	Set sector	C=Sector
11	33	SETDMA	Set DMA address	BC=Address
12	36	READ	Read sector	A=Status
13	39	WRITE	Write sector	A=Status
14	42	LISTST	Get status of list device	A=Status
15	45	SECTTRAN	Sector translation	
16	48			

tracks are numbered from zero. So our argument to select track #2 is the number 1. (On Kaypro 10 hard disks the directory is on track 4, so the program must be altered before it will run properly on a hard disk.)

L24-28. Read the contents of the directory into memory. The computer reads one sector at a time and there are 16 sectors in the directory. At L25 we have the BIOS set the sector to be read. Then at L26 we tell it where in memory to place the sector just read. This is accomplished through the SETDMA function. (DMA stands for Direct Memory Address.) We want each sector to be read in 128 bytes ahead of the previous sector. We do this by finding the address of the beginning of the buffer. (The statement

addr(fcbbuff[1,0])

gives the address in memory of the first byte of the first FCB in the FCB buffer set up on line 7.) Then we add to that the number of bytes already loaded into it (the number of sectors times 128). We then read the sector in L27.

UNFILE—the main action

L31-59. Now begins the main loop of the program, going through the buffer file name by file name. In general, our procedure will be as follows: We will check to see if it is an empty FCB (L32). If it is used, we write the file name (L37-40) and then ask the user to enter a character (L43). If it is an "E" or a "U," we'll either erase or unerase the file (L46-53); if it is neither, (and also isn't an "X") we will get the next name. We will keep going through the buffer until the user types in an "X" (L59) to exit.

L32. When you format a disk, all the FCBs in the directory are filled with E5s. Even after fairly heavy use, it is highly likely that at least some of the FCBs will never have been used. If the FCB has never been used, we don't want to erase or unerase it—we just want to ignore it. If the first byte is E5h, it may be unused or it may be a used, erased file. Therefore, the way to tell if it is unused is to look at the second byte of the FCB. If it is an E5h, it is an unused FCB.

L35. If the first byte of the FCB is a zero, then it is an active, unerased file. We print a space to keep all the file names lined up. Names of files that have been erased are prefaced with either a graphics character (on '84 series Kaypros) or a lower-case "e" (on '83 series).

L37-40. This prints out the file's name, which begins with the second byte and continues for eleven bytes. The FCB does not include a dot to separate the name from its extension, so the program supplies the dot after eight letters. (If the file's name does not occupy all eleven characters, it is padded with spaces in the FCB.)

L42-44. This prints a message telling the user that pressing an "E" will erase, "U" will unerase, "X" will exit, and carriage return will continue. Then we get a character (using the kbd option in L43 so that the character will be accepted even without entering a carriage return afterwards) and turn it into an upper-case letter.

L46-52. If the file is to be unerased, its first byte must be made into a zero. If it is to be erased, its first byte must be made into an E5h. To do this we change the first byte of the FCB in the buffer (L47). The tricky part is writing the change back to disk. The smallest unit that can be written is a sector, 128 bytes. Each sector contains four FCBs. If, for example, the files on the disk are named A, B, C, etc., and we alter B, then write it and the next three files in the buffer (C,D,E) back to the disk, the files B-E will overwrite A-D. In short, we have to find where the original sector breaks existed in the file.

The program does this by first finding out the sector number we are dealing with (L49). All along we have been keeping track of how many FCBs we have passed. To figure out the sector number, we subtract one from the FCBcounter, divide by four and drop the fraction. The best way to see that this works is to try it out.

Now that we know the sector number, we figure where the sector starts in the buffer by using the same technique as in L26, and at the same time we set the DMA, telling the computer where to get the data it is about to write to disk. In L51 we set the sector number and at L52 we actually write the sector. We need the 1 in this BIOS call to tell the BIOS that we are writing to the directory. If we did not specify that this is a directory write the BIOS would perform the write operation when it "got around to it"; directory writes are crucial and should be done immediately.

L56-59. These lines take care of the loop. It increases the FCBcounter by one and, if we have gone through all 64 possible FCBs, it loops back to the beginning. (It also, at L58, notifies the user that the entire buffer has been gone through.)

Making it more

This program is handy just the way it is, or it can be easily modified. For example, you could let the user have the option of changing the file's name or be able to alter one of the file attributes. In fact, there's the kernel of a custom file housekeeping utility here.

Whatever you do, however, be careful. Remember that by using BIOS calls, you are doing acrobatics without CP/M's net.

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Listing 1: UNFILE (Unerases Files)

```

1: (* UNFILE.PAS      (c) 1986 David Weinberger
2: Shows all files on a disk, including erased ones, and lets you
3: erase or unerase them. An example of BIOS calls.      *)
4:
5: TYPE fcbtype = array[0..31] of byte;
6: VAR  bytctr, FcbCtr, sectnumb  : integer;
7:      fcbbuff  : array[1..64] of fcbtype;
8:      drive, c  : char;
9:      unusedFCB : boolean;
10:
11: BEGIN
12:
13: writeln('UNFILE (c) 1986 D. Weinberger');writeln;
14:
15: write('Select drive: ');
16: read(kbd,drive);
17: drive:=upcase(drive);
18: if drive 'B' then drive:='A';
19: bios(8,ord(drive)-65); {Select drive }
20:
21: bios(9,1);           {Set the track}
22:
23: {FILL BUFFER}
24: for sectnumb:=0 to 15 do begin
25:   {SET SECTOR}      bios(10,sectnumb);
26:   {SET DMA}         bios(11,addr(fcbbuff[1,0])+(sectnumb * 128));
27:   {READ SECTOR}    bios(12);
28:   end;
29:
30: FcbCtr:=1;
31: REPEAT {----- LOOP THROUGH BUFFER -----}
32:   if fcbbuff[FcbCtr,1]= $e5 then unusedFcb:= true else unusedFcb:= false; {}
33:   if not unusedFCB then begin                                     {}
34:     writeln;                                                    {}
35:     if fcbbuff[FcbCtr,0]=0 then write(' ');
36:     {Write the filename}
37:     for ByteCtr:=0 to 11 do begin                                {}
38:       if ByteCtr=8 then write('.'); {Add dot before extension}
39:       write(chr(fcbbuff[FcbCtr,ByteCtr]));                       {}
40:     end;                                                         {}
41:   {Get Keystroke}
42:   write(' E/rase, U/nerase, eXit, or CR to continue -- ');
43:   read(kbd,c);          {Get char from keyboard}                {}
44:   c:=upcase(c); write(c);
45:   {DO SOMETHING}                                               {}
46:   if C in ['E','U'] then begin                                  {}
47:     if C='U' then fcbbuff[FcbCtr,0]:=0 else fcbbuff[FcbCtr,0]:=$making E5;{}
48:     {figure where sector starts}                                {}
49:     sectnumb:=trunc((FcbCtr-1)/4);                               {}
50:     bios(11,addr(fcbbuff[1,0])+(sectnumb * 128));
51:     bios(10,sectnumb); {SET SECTOR}
52:     bios(13,1);       {WRITE SECTOR}                             {}
53:     end; {'E' or 'U'}                                         {}
54:   end; {Not an unused file}                                     {}
55:                                     {}
56:   FcbCtr:=succ(FcbCtr);                                        {}
57:   if FcbCtr=64 then begin FcbCtr:=1;                            {}
58:     writeln(' ginning'); end;                                   {}
59: UNTIL C='X'; {----- END LOOP THROUGH BUFFER -----}
60:
61: end.

```

Using Macros in Lotus 1-2-3

A tutorial to get you running at full speed

by Joseph Comanda

Lotus 1-2-3 is one of those programs that does a good job of satisfying every level of user. It offers beginners a visually simple column-and-row structure, a fast menu system, and extensive on-screen help. For the other end of the user spectrum Lotus provides a full-featured programming language for developing complex spreadsheet applications.

It even has something for all those in between. Typically, intermediate users have mastered the menu system and are ready for shortcuts. When they first started out with 1-2-3, they were satisfied just by having that menu at their fingertips. But as they get more familiar with it, they become conscious of the fact that some tasks are more cumbersome than they need be. It takes five separate keystrokes to delete one spreadsheet row, for example — something most word processors can do in one.

That's where macros come in handy. Actually, macros, like 1-2-3 itself, can serve both intermediate and advanced users equally well. At their simplest, macros are keystroke shortcuts that can speed up your work. At the same time, more advanced users can design complex macros to create what are, in effect, spreadsheets with built-in programs.

In Lotus a macro is a sequence of keystrokes that performs a task when linked to a particular Alt-key name. You can have 26 of them in a single spreadsheet (Alt-A through Alt-Z). Building a macro involves entering the keystroke sequence as a label in an empty cell and then giving the cell a name with the Range Name command.

This tutorial is for those of you who can already handle the basics like saving and retrieving spreadsheets and are fairly comfortable with using the Lotus menu system. You'll learn how to build and execute simple macros and how to organize them into collections. You can build the sample macros using a copy of any existing Lotus spreadsheet.

*Advanced users
can design complex
macros to create
built-in programs.*

Building a macro that saves files

For your first macro let's create one that everyone can use, a macro that saves an existing spreadsheet. A good way to start designing any macro is to think through the steps involved in executing the task you want to automate. Then you can translate those steps into actual keystrokes. If you can't remember what they are, go through the steps jotting them down as you do them. These are the steps to save an existing file:

1. Bring up the Lotus menu.
2. Select the File option.
3. Select the Save option.
4. Press the Enter key to accept the current name.
5. Finally select Replace to save the current spreadsheet on top of the old one.

Below are the Lotus keystrokes to perform that operation:

1. / (bring up the Lotus menu)
2. f (select the File option)
3. s (select the Save option)
4. ~ (press the Enter key)
5. r (select the Replace option)

Note: Lotus uses a tilde (~) to represent the Enter key.

Now you're ready to build the macro. Minimally, it will involve two steps. First, you'll have to enter the keystrokes into a spreadsheet cell. Then you'll have to give the cell a name.

1. Move a screen or two to the right in your current spreadsheet until you find a blank range to work in.
2. Type: `'fs~r`
3. Press the Enter key to end the entry.

The single quote character (') at the beginning tells Lotus the entry is a label. If you had started with the slash key, Lotus would have thought you were trying to bring up the menu. When saving a macro in Lotus you must give it a name. Since this is a save macro, call it Alt-S. The symbol for the Alt key in macro names is the backslash (\), so the name for this macro will be \S. Use the following steps to name the cell containing the macro.

1. Move the pointer to the cell containing the macro.
2. Type: `/`
3. Type: `r` (selects the Range menu option)
4. Type: `n` (selects the Name option)
5. Type: `c` (selects the Create option)
6. Type: `\s` (the macro name)
7. Type `~~` (once to complete the name and a second time to accept the macro cell as the range).

Now that you've created a macro, you can try using it. Since this macro will only work properly with spreadsheets that have been previously saved, make sure you've saved the spreadsheet at least once by hand before executing the macro. After doing this, you can execute the macro from anywhere in the spreadsheet by holding down the Alt key and pressing the letter of the macro, in this case, "S."

Try it. If it works the "WAIT" message will appear in the upper right corner of the screen and the disk light will come on briefly as the file is saved.

If it didn't seem to work, make sure you executed it correctly—that you entered the right keystrokes into the macro cell, and that you named it correctly. Once you've got it working, go on to the next section where you'll make a change to it.

Editing a macro

The save macro you just finished building is fine for saving existing files under the same name. Often that's good enough. But sometimes you want to change the name of a file *before* saving it, and it would probably be a good idea to give yourself the option every time.

What you need to do is tell Lotus to pause in the middle of the macro so you can either type in a new name or press the Enter key (~) to accept the old name. There's a special pause symbol in Lotus, a question mark surrounded by curly brackets: {?}. When the program encounters this character sequence in a macro, it pauses for the user to enter information and then resumes when the Enter key is pressed.

All we have to do is go back to the macro cell and stick the pause symbol in the right place. If you're not sure where the macro cell is, you can use the following sequence of steps to find it.

1. Press **F5**, the GoTo key.
2. Then press **F3**, the Name key.
3. Select **\S**.

Use **F2**, the Edit key, to make your changes to the macro. The new macro should look like this: `'/fs{?}~r`

Try out this new one and make sure it's working right. Another advantage of this macro is that if you hit it by mistake, when it pauses, you can use the Escape key to back out of it a step at a time.

Setting up a macro area

The instructions given above are good enough to get you started, but if you're planning to get serious about macros, it's better to go about it in a more organized manner. Instead of sticking macros anywhere you happen to have a free cell, you should keep them in a special area of the spreadsheet. In fact, you should develop a habit of using the same general location in each of your spreadsheets.

I like to tab over from A1 to the first or second free screen and make that my macro area. In fact, I enter the words Macro Area into a cell and give the entire area the name "MACRO AREA." Then I can always go to it when I want to change a macro or create a new one. It also makes it easier to transfer macros to another spreadsheet.

Figure 1, below, shows a good way to organize the macro area. It starts in cell AA1, and the macro information is arranged in three separate columns. The only column that matters to Lotus is near the middle (AB). It contains the actual macros, each of which has a unique Alt-Key combination name. The other columns are there to help anyone trying to figure out what's going on. The first column (AA) has the names of the macros entered as labels for easy identification. The last column (AD), which is two columns to the right of the macro, contains a description of the macro.

FIGURE 1: A Sample Macro Area

	AA	AB	AC	AD	AE	AF	AG
1	Macro Area						
2							
3	Macro						
4	Name	Macro					Description
5	=====						
6							
7	\D	'/wdr ~			Delete a row		
8							
9	\E	'/re ~			Erase a cell		
10							
11	\I	'/wir ~			Insert a row		
12							
13	\N	'/rnc{?} ~ ~			Name cell		
14							
15	\S	'/fs{?} ~ r			Save file		
16							
17	\W	'/wcs{?} ~			Change column width		
18							

Each macro in Figure 1 takes up a single cell. Lotus permits macros to take up more than one cell (in fact, it's a good idea to break larger macros up into smaller pieces), but it requires that they occupy a range of contiguous cells in a single column. When executing a macro, Lotus starts at the top of the range and works its way down until it encounters a blank cell. That's why each macro in our example is separated from the one below it by a blank cell; we don't want macros executing automatically one after the other.

Set up a proper macro area in your spreadsheet that looks something like the one in Figure 1 and build some of the macros in it. It might be a good idea to start with Alt-N (Name a cell). You can use it to name the rest of the macros. A tip: when you enter the macro name as a label in the first column, you'll have to precede it with a single quote (') otherwise Lotus will think you're hitting the repeat key.

Here's some more information on other macros in Figure 1.

Alt-D (Delete a row). Be careful with this macro. It deletes the current row *without warning*. You should be especially careful that you're not deleting a row that might have a macro in it somewhere off to the right. It might be safer to leave off the tilde at the end. In that case the macro would stop with the row highlighted for deletion, allowing you a number of options. You could either hit the Enter key to delete the row, use the Down Arrow key to include more rows in the deletion, or hit the Escape key a few times to cancel the operation.

Alt-E (Erase a cell). This macro erases the contents of the current cell. Again, if you leave off the tilde at the end, you make it a more flexible command. It all depends what you want.

Alt-I (Insert a row). This one is the counterpart of the Alt-D macro. It inserts a new row at the position of the pointer.

Alt-W (Change column width). This macro changes the width of the current column. It pauses so you can select the width before completing the process.

A macro to enter months

Let's do one more macro before moving on to another subject. The macros you have done so far all use the Lotus menu, but you could have a macro that doesn't do that at all—or even one that combines menu operations with spreadsheet entry.

The macro you're about to build starts in the current cell (the one from which you issue the command to execute it) and fills in 12 cells across with the months of the year right-aligned. It's one of those macros that is probably more trouble to build than the trouble it saves you. It depends on how much use you have for it. But it's a great example of what a macro can do, and it will give you practice in breaking a macro up into separate cells.

We'll call it Alt-M (Enter months). This is what it will look like. It takes up 12 spots so you'll need a lot of open cells.

```

1  "January{Right}
2  "February{Right}
3  "March{Right}
4  "April{Right}
5  "May{Right}
6  "June{Right}
7  "July{Right}
8  "August{Right}
9  "September{Right}

```

```

10 "October{Right}
11 "November{Right}
12 "December~

```

Notice that you need the single quotation mark in front of the double quotation mark that right-aligns the label. Without it Lotus would ignore the right-alignment instruction.

The other thing you'll notice is the use of a special symbol for the pointer movement: {Right}. Lotus has a number of special symbols for pointer movement commands and function keys, among other things. Some of the more common ones appear in Figure 2 below.

FIGURE 2: Special Key Symbols

Function Keys		Pointer Keys	
F2	{Edit}	Up Arrow	{Up}
F3	{Name}	Down Arrow	{Down}
F4	{Abs}	Left Arrow	{Left}
F5	{GoTo}	Right Arrow	{Right}
F6	{Window}	Page Up	{PgUp}
F7	{Query}	Page Down	{PgDn}
F8	{Table}	Home	{Home}
F9	{Calc}	End	{End}
F10	{Graph}	Shift-Tab or Ctrl-Left Arrow	{Big Left}
		Tab or Ctrl-Right Arrow	{Big Right}
Miscellaneous Keys			
Delete	{Del}	Escape	{Esc}
Backspace	{BS}	Pause	{?}

Transferring macros to other spreadsheets

You've just created a few macros that will be useful to you in any spreadsheet, but they only work in this one. It would be nice if you could save the macros in one central location so you could use them in whatever spreadsheet you were in. HAL, a Lotus 1-2-3 add-on product, permits you to do something like that, but Lotus by itself does not. (Ed. Note: For more information on HAL, see page 60 of the May 1987 PROFILES.)

However, you're not limited to reentering them in each new spreadsheet. There are a number of techniques you can use to get your "library" of macros into all your spreadsheets.

The first method will work for any new spreadsheet you create from now on. You can set up a macro library spreadsheet—call it MACLIB—where you keep all your general-purpose macros. Then, whenever you want to start another spreadsheet, you retrieve MACLIB, save it under a new name (a very important step), and use it as the basis for the new spreadsheet.

Of course, that won't help you with existing spreadsheets. But MACLIB is still a good idea because it keeps your macros where you can find them.

With existing spreadsheets, you can use Lotus' File Combine command to bring individual macros, or even the entire macro

CP/M Hardware

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0k RAM Disk \$309.95 1024k RAM Disk \$469.95
256k RAM Disk \$349.95 Expansion Board (0k) \$202.50
512k RAM Disk \$389.95 256k Expansion RAM \$40.00
768K RAM Disk \$429.95

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Now you can add hard disks to any CP/M Kaypro computer. Yet another reason not to sell your old workhorse to get the extra performance you now require. Add an additional half height drive inside most Kaypro 10s, or install a single full height drive up to 56 Mb. If complete systems are not what you need, then order just the parts you want. Call for more information.

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USING MACROS

range, into another spreadsheet. This will keep you from having to reenter the macros, but their range names won't come with them, so you'll have to name them again.

Here are two scenarios. In both cases you will use the File Combine command. If you've created a macro library file, try them out.

Scenario 1: You want to bring in the whole macro library file into a spreadsheet you're working on. These are the steps you would take:

1. Move to the section in your current spreadsheet that you want to use for the macro area.

2. Type: /

3. Type: f (select the File option)

4. Type: c (select the Combine option)

5. Type: c (select the Copy option)

6. Type: e (select the Entire file option)

7. Type: **maclib** (specify the file you want to bring in)

8. Type: ~ (hit the Enter key)

9. You'll then have to go about assigning range names to all the macros you transferred in.

Scenario 2: You want to bring in just the save macro from MACLIB.

1. Move to the cell where you want the save macro to be.

2. Type: /

3. Type: f (select the File option)

4. Type: c (select the Combine option)

5. Type: c (select the Copy option)

6. Type: n (select the Named range option)

7. Type: \s (specify the range you want to bring in)

8. Type: ~ (hit the Enter key)

9. Type: **maclib** (specify the file the range is in)


10. Type: ~ (hit the Enter key)

11. You'll then have to name it \S in the current spreadsheet.

There's one catch to this method. If you want to bring in macros individually, you'll have to make sure that when you name multi-cell macros, you include the entire macro in the range name. For execution purposes, Lotus only requires you to include the first cell of the macro in the range. But when you transfer in a macro, only the part included in the range will come in.

Next

By now you should be ready to build some of your own step-saving macros. You can probably think of a few you could use right away. If you're stuck for ideas, though, browse through the selection of Lotus how-to books at your local store.

Lotus 1-2-3 is one of the most powerful software packages on the market, and much of that power comes from its macro capabilities. With practice, you can create macros that will make your computer do most of your work for you. Isn't that why we bought the machines in the first place? 

Joseph Comanda is a freelance writer and software trainer living in Philadelphia.

THE WORD PLUS

(continued from page 41)

Open WORDS.LST as a non-document. Manually insert a ^P before the first word to be indexed.

Now find each carriage return/line feed pair and replace it with ^P, followed by carriage return/line feed, followed by a second ^P. When the find and replace is finished, each word in the document should now have one ^P before its first letter and another ^P after its last. If a stray ^P has appeared on the last line of the file, delete it.

Mark the entire file as a column block and move your cursor to the top of the file. Read in ANIMAL.FRQ. With your cursor still in line one, use the space bar to move it past the longest word in the file—column 20 should do the trick. Move the column block you marked a moment ago to this position. Each line in your file should now look something like this:

```
AARDVARK/      ^PAARDVARK^P
```

Except for the blank spaces, this is the standard BADWORD/GOODWORD MARKFIX file format. To get rid of those blanks, do a global search for a space and replace it with nothing. You'll probably have a bunch of carriage returns at the end of your file. Delete these as a block.

Modifying The Word Plus

As distributed, MARKFIX doesn't recognize ^P. We have to tell it that this control character is now legally part of a word. The Word Plus doesn't have an installation program. Indeed, because the individual programs have built-in error-checking routines, they crash if you modify them with a debugging utility. Fortunately, most of them check for the presence of a customization file called TWOPTION.CMP.

Some versions of The Word Plus come with this customization file already on disk. If yours didn't, you can make one in about ten seconds. Open a non-document called TWOPTION.CMP.

On the first line, type all the non-alphabetic characters that are legal within a word.

On the second line, type the character your word-processing program uses for an inactive soft hyphen followed immediately by the character your program uses for an active soft hyphen, if it's different. End each line with a carriage return. For WordStar users, TWOPTION.CMP should look like this:


```
c^c_
```

The "c" characters in line two are The Word Plus' way of indicating control characters, so c^ is the same as ^^ (1E hex) and c_ is ^_ (1F hex).

To make MARKFIX recognize ^P, add "cP" to the first line and save the file.

We're all set to tag words for indexing. Run this command:

```
MARKFIX ANIMAL.TXT WORDS.LST
```

All the words you specified in WORDS.LST are now surrounded by ^P codes in ANIMAL.TXT. Unfortunately, MARKFIX will have made them all begin with lower-case letters. You can either use your word processor to search for each occurrence of ^P and correct capitalization as needed, or use this copy of ANIMAL.TXT only to generate the index. 

Robert J. Sawyer is a Canadian freelance writer.

OTHER WORD PROCESSORS

(continued from page 47)

drawback: the features are there, but their packaging makes them unavailable to all but the most persistent "power user."

Word was apparently designed by a typesetter—or at least someone afflicted with typesetter's jargon. Take a good look at the screen-bottom menu in Figure 3. Can you tell me, offhand, what "Gallery" means? Or "Transfer"?

Then there's the menu in Figure 4. Note how the measurements are all in inches. They don't have to be: you can tell Word to measure things in centimeters, pica or elite spaces, points or lines. But most word processors measure horizontally in spaces, vertically in lines. I'm used to setting tabs at eight spaces, not .80 inches.

The problem was more severe when I installed my printer. Word uses specially formatted files for printer instructions—and none of the prepackaged files fit my needs. I spent three hours creating a file that used all my printer's capabilities—and I'm good at such things.


The manuals helped some, but not enough. Two 300-page binders contain lots of information about the program, but are not well organized. Jargon makes index browsing tricky. Onscreen help is not context-sensitive and only lists the easiest tasks. Fortunately Microsoft's telephone support is good, but it's not toll free.

Minor bugs like the ease of deleting footnotes and the tendency of temporary overflow files to clutter one's disk—a real problem if you use floppies—are offset by Word's instant screen reformatting and ease of cursor movement. Were it not for the mouse, however, I would not be happy with this program at all.

Which do I personally use?

That mouse—plus the stylesheets and the ability to see 43 lines of text in Hercules mode—make the difference though. I've never liked typewriters: I edit while I write, and can scarcely finish a sentence without changing it.

I admire WordPerfect's honesty and its ease of use. I'd recommend it to almost anyone. But when I've got something important to write, I find myself booting up Word.

I should tell you, though: I've ordered a book on writing mouse drivers. If I can add a mouse to WordPerfect, I may swing the other way. 

Jim Spickard is a remote editor for PROFILES, and he frequently does comparative software reviews.

Quick Reference Summary

Product: WordPerfect, version 4.2
Manufacturer: WordPerfect Corporation
266 W. Center St.
Orem, UT 84057
Phone: (801) 227-4000
Sugg. List Price: \$495

Product: Microsoft Word, version 3.1
Manufacturer: Microsoft Corporation
16011 N.E. 36th Wy.
Box 97017
Redmond, WA 98073
Phone: (206) 882-8080
Sugg. List Price: \$450

Learning DOS and Lightning

by Brian F. Schutt and Steve Gilliland

Our reviewed products this month include an excellent tutorial package for DOS (both PC/MS-DOS) and a memory caching program. Both products aid users in speeding up their work—one does it by providing a better understanding of the operating environment, the other does it by physically making oft-used information instantly available.

Learning DOS, An Interactive Guide to the PC Operating System

PC users have become so good at making application programs sing that someone has decided it's time they learned the secrets of the PC's operating system as well. Learning DOS, An Interactive Guide to the PC Operating System is an excellent tutorial program produced by Microsoft Corporation for anyone with some knowledge of IBM and compatible PCs, as well as those who are sitting down to the keyboard for the very first time. For the veteran users who "already know this stuff," there's even a Quick Reference guide included with the program. Learning DOS is easy to use (it's menu driven), and its informative style greatly adds to user productivity.

The minimum system requirements are an IBM Personal Computer or compatible, one disk drive, PC/MS-DOS 2.0 or above, and a minimum 256K RAM. The program is not copy protected.

Features and Performance. By far the best feature of Learning DOS is the Quick Reference. Many PC users haven't become acquainted with DOS until now for various reasons, one of which is that a standard DOS manual intimidates all but hardcore computer scientists, engineers, and technicians. But what if there were a version of the DOS manual for novices and newcomers, focusing on everyday commands and operations?

Microsoft went a step further and put such a version on the screen. The Quick

Reference is a menu-driven dictionary with brief, concise definitions of commands and instructions for performing file management tasks, and it includes a section on advanced commands for more experienced users.

Learning DOS features two courses: a two-hour session geared for users of computers with floppy drives only, and a five-hour session geared for users of

After each summary the course features an informative troubleshooting section. The section displays the error messages that occur if a procedure is performed incorrectly and describes the actions that most likely led to the error message, including equipment malfunctions—after all, computers are only human! One complaint: in cases where new disks prove defective, the course

*Topics follow a pattern:
opening remarks, how-to
instructions, practice
sessions, and a summary.*

computers with a floppy drive plus a hard disk. The Quick Reference is applicable to either environment, and users of either system will find both courses worth taking. By following the courses, beginners graduate to the advanced commands in due time.

The user/student can control his or her progress within the course by means of Escape codes that direct the program to a different topic, to the menu, to quit the session, or to the index. Both courses feature how-to instructions plus an introductory session about DOS. From there the student goes to work.

Topics follow a consistent pattern of opening remarks, step-by-step how-to instructions (for example, how to copy files from one disk to another), practice sessions where the student has a chance to exercise the procedure at least once, and a summary of the session. Learning is directed and reinforced by repetition, and the examples are all very practical. A typically creative session uses area codes and phone numbers to describe the basic organization of directories and files on a hard disk.

inappropriately advises users to discard the disks instead of returning them to the vendor for refund.

Learning DOS even has an excellent log-in feature so it can track the student's progress through the course. If the learner has to quit the session for whatever reason, he or she returns to the course to see a check mark next to the subjects already completed.

A few other complaints: Upon exiting from the Quick Reference, the cursor retains the form of a character bar. Users who had their cursor in another mode, such as a character underscore, will not appreciate having to restart DOS in order to obtain the other cursor format.

Technical excellence is also lacking in several of the screens, with garbage appearing in the margin or in the middle of the screen. One screen contains the same sentence twice, and another screen entirely omits the course control message. Also, the section that instructs the student on using the course encourages trying shortcuts, but an error message appears inconsistently when one attempts some legitimate shortcuts.

Likewise, an error message appears inconsistently when solving a practice problem the long way.

In summation, the program is very easy to use and highly appropriate for all users of application programs on the PC. The various commands and control codes are easy to use and understand. Also the program generally handles errors in a way that encourages the user to make it over the hurdles and move on to finish the course. In fact, one of options lets the user select hints for solving practice problems. The course even has a few cute cartoons to break up the routine—a helpful feature, particularly in the five-hour course for hard disks.

Documentation and Support. Documentation for the program is generally good. A well-organized, accurate booklet of 34 pages simply introduces the course and instructs the user on starting the program. The booklet further serves as a well-written supplement to the on-screen course. Unfortunately, the booklet's soft cover is less than durable, and it's so much larger than the rest of the booklet and so thin on material that the edges are easily crumpled.

The manufacturer does not accept collect calls, nor does it maintain a toll-free technical support number. But for the price of a phone call you get a quick response from support people who know the product, are personable and anxious to solve problems. —B.F.S.

SCORECARD

Features:	Very Good
Performance:	Very Good
Documentation:	Good
Ease of Use:	Excellent
Error Handling:	Very Good
Support:	Very Good

Lightning

Looking for an easy and inexpensive way to speed up disk drives? Tired of copying to a RAM disk every time the computer is turned on, then praying for constant power? PCSC's "Lightning" is the answer.

Lightning, a product of Personal Computer Support Group, Dallas,

Texas, and no relation to Borland's Turbo Lightning, uses the principle of memory caching to monitor disk activity and hold the data in memory, making it instantly available. As data accumulates in memory the need for time consuming disk access is progressively less. Result: more and more speed.

It runs on the Kaypro PC, IBM PC and compatibles and needs MS/PC-DOS versions 1.1 or higher, 128K of system memory and one floppy disk drive.

Features and Performance. Memory is allotted to Lightning by the user and the more it gets, the more it speeds up one, two or more floppy or hard disk drives.

Typing **L** at the **A >** prompt dedicates a 60K memory buffer to hold disk information. During normal operations Lightning keeps track of when the disk is accessed and what information is most often requested during that access. It copies that information into the buffer. As you work, operations get faster and faster.

Programs using overlay files (like WordStar, data bases and most accounting packages) speed up dramatically enough to bring back the feeling of awe inspired when you first used a computer. Spreadsheets and other programs that use RAM almost exclusively don't show such a noticeable change. Still, Lightning does speed them up.

Disk "reads" are captured, while disk "writes" are passed through to the floppy or hard disk. A power glitch is still painful, but at least disk information remains intact. Compare that with a RAM disk, which can be wiped out by a power failure or system reset. Lightning provides RAM disk benefits without the risk and without the loss of time spent manually loading one. If the user insists on using a RAM disk with Lightning, Lightning simply ignores it. But the wiser course is to use Lightning exclusively and toss the RAM disk software on the bone pile.

Lightning's memory allotment may be increased or decreased from the default 60K (**L 250** uses 250K of RAM, **L 30** uses 30K). The more memory used, the greater the speed improvement. Individual drives are easily taken on or off (**L A OFF**). If the system requires a device driver such as those used with many

high density floppy drives, no problem. Putting the line

DEVICE=LIGHTNING.SYS

immediately after the device driver line in the CONFIG.SYS file will cause Lightning to intercept calls to and from the device. The publisher says Lightning works well with most devices which intercept ordinary disk requests.

Lightning can be told to ignore long disk requests of more than "n" sectors (**L M=n**). The theory apparently is that shorter blocks are more efficient because calls to an overlay file are generally shorter than calls for a large block of data. Experiments with this command showed little benefit.

Lightning also works well with other memory resident programs, staying out of the way of keyboard macro programs, background notebooks, calculators, calendars and a print spooler. It's easily unloaded (**L U**), freeing memory for other uses, though a computer reset may be required if Lightning was loaded before certain other memory resident programs.

Disadvantages are few. Changing programs lessens the speed up factor since it takes time for the most frequently used disk "hits" to accumulate. There is no way to save the accumulation of disk data stored to memory. If an application contains many disk intensive operations (as with many accounting programs), it may take some time for Lightning to reach its potential. Naturally, whenever the computer is restarted, the waiting time for full speed begins again.

Anything less than a 256K system negates some of Lightning's potential. Lightning makes good use of every scrap of memory it's given. The default of 60K is good, but 250K is much better. With a memory expansion card using Intel's "Aboveboard" protocol, Lightning can use a staggering one-and-a-half million bytes (i.e., 1.5 megabytes) of memory.

The less expensive version of the program is copy protected, a nuisance when booting from a hard disk and making a disk change necessary when loading from floppy-based systems. But the entire purchase price of the protected version is credited when upgrad-

User Groups

Learning to operate a computer is not easy—everyone needs help at one time or another. This is precisely the reason why user groups were born.

Basically, a user group is a collection of computer owners and users who learn from each other. These are non-profit membership organizations devoted to making life with a computer easier.

Almost every computer brand and operating system has user groups that support it; many groups are a mixed bag. For example, owners of many different brands of computers find they all use the same operating system, and therefore, have some common ground.

Most user groups have members with a wide range of expertise and experience—from absolute beginners to those who have “working” knowledge to people who are “power users.” Often people’s expertise breaks down into types of software applications—word processing, data base managers, spreadsheets, telecommunications, etc. Perhaps more often, a member’s knowledge is specific to a particular piece of application software.

The bottom line is that user groups are a veritable goldmine—and the mother lode is information, an expert overnight, and no one does it alone.

KUGs

For those readers who own Kaypro computers, Kaypro User Groups (KUGs) exist in every state, in Canada, and in countries all over the world. To find the KUG closest to you, write to Fred Zuill, KUG Manager, at Kaypro Corporation, 533 Stevens Avenue, Solana Beach, CA 92075; (619) 481-4368 (voice). Be sure to include your zip code.

Fred Zuill also maintains a BBS—the KUG ROS—for the exchange of information and help. It contains a message section, as well as lots of public domain software for both the CP/M and DOS operating systems. Public domain programs mentioned in *PROFILES* can also be found there. The system is online 24/hrs, 7 days a week, and can run at 300/1200/2400 baud.

KUG ROS — (619) 259-4437

Reviews

ing to the unprotected disk, so all is forgiven.

Documentation and Support. An included BASIC program graphically demonstrates the program’s capabilities. Random 128-byte sectors are read from the floppy disk, and the sector numbers flashed on the screen. As the random reads begin to find the sought after sectors in Lightning’s memory, the operation speeds up. Information on the screen reports that at first, when most of

*A typical disk
access time saving
is 80 percent
or more.*

the sectors are still on the disk, the computer can read about four sectors per second. After about a minute that number goes to 10 and a couple of minutes later the computer is reading 19 sectors per second. Impressive, but as with most demonstrations, it’s tilted to make the product look good.

A more practical and impressive test is using the program for awhile, then exiting to the system and typing **LS** for a summary of Lightning’s activities while operating in the real world of everyday applications. After what is usually a short time, the summary will typically show a disk access time saving of 80 percent or more.

Type **L HELP** and you get a list of available commands, each with a short explanation. Unfortunately, a few of the available commands are not covered in the written documentation. Some, like the earlier discussed “**L M=n**” can be figured out by the determined user, but two references to “**BREAKTHROUGH 286**” on the help screen were total mysteries. A call to PCSG revealed it to be an 80286 microprocessor speed-up board manufactured by PCSG.

The written documentation is very good, even though the failure to discuss all commands available on the help screen indicates it is out of date. It’s written in a conversational style and avoids jargon. The program is so easy to use that extensive documentation is

unnecessary. Unfortunately, instructions on creating and editing the **CONFIG.SYS** file to install Lightning for certain device drivers are added as an afterthought. They are located on the last, unnumbered, page of the manual. This is more than a minor irritation, because an incorrectly configured system could refuse to recognize the Lightning program.

Telephone support is freely available. Collect calls are not accepted, but questions are answered quickly and courteously. PCSG has a genuine interest in creating satisfied customers.

Lightning is a rare find. It does its job well, with almost no problems for users at any level. Few programs can boast as much. Lightning is a cost effective addition to almost any system. —S.G.

SCORECARD

Features:	Very Good
Performance:	Excellent
Documentation:	Very Good
Ease of Use:	Very Good
Error Handling:	Good
Support:	Very Good

Brian F. Schutt is currently a programmer for a Northern California banking service bureau, and previously held analyst positions in the telecommunications and medical standards fields. He considers Pascal, word processing, and data base management systems his specialties.

Steve Gilliland is a microcomputer educator, writer and consultant. He is a member of the Review Committee of the Professional Software Programmers Association.

Quick Reference Summary

Product: Learning DOS, An Interactive Guide to the PC Operating System
Manufacturer: Microsoft Corporation
16011 N.E. 36th Way
Redmond, WA 98052
Phone: (206) 882-8088
Sugg. List Price: \$49.95

Product: Lightning, version 4.53
Manufacturer: Personal Computer Support Group, Inc.
11035 Harry Hines Blvd.
Dallas, TX 75229
Phone: (214) 351-0564
Sugg. List Price: \$49.95, copy protected; \$69.95 unprotected

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*Based on 16 megabytes of RAM.

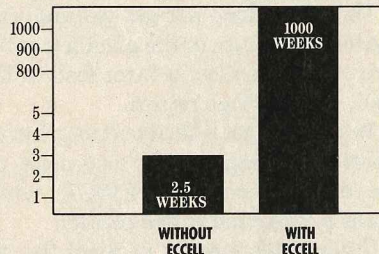
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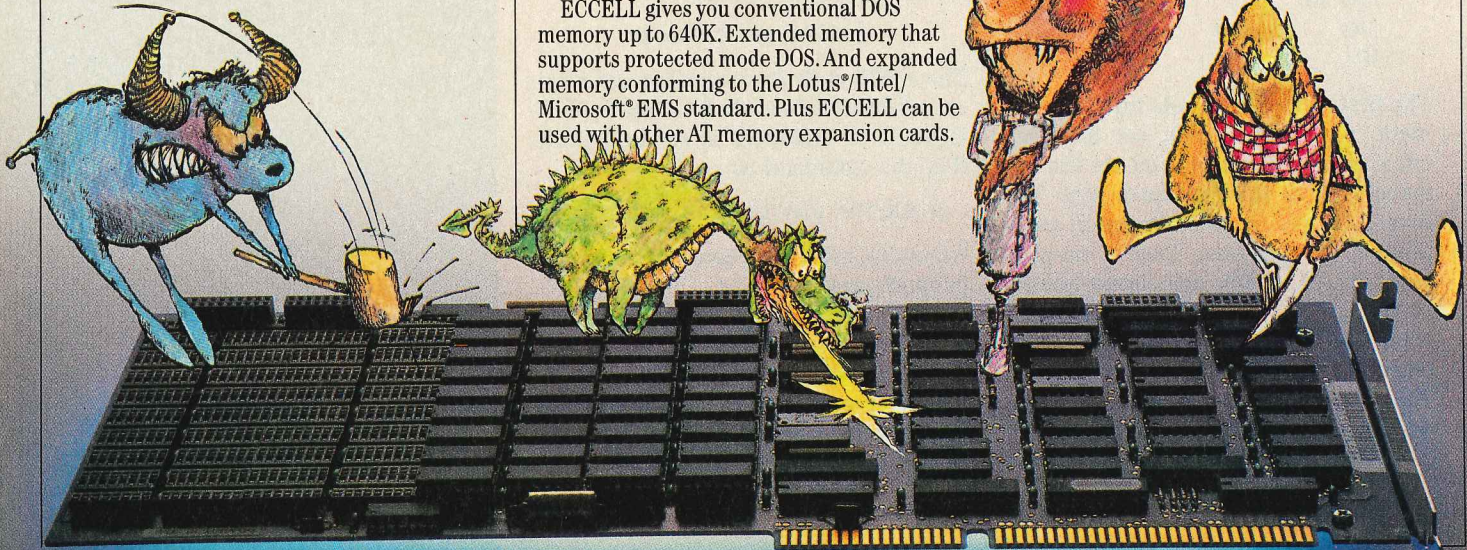
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Tip Trader

edited by Marshall L. Moseley

Found a shortcut? Solved a nagging problem? Discovered an easier way to do something? If you have and you'd like to share your tip with other readers, please send it to Marshall Moseley, "Tip Trader" editor, PROFILES Magazine, 533 Stevens Ave., Solana Beach, CA 92075.

Key reassignment and batch files

Last month I told you how to reassign keys under MS-DOS using ANSI Escape sequences and the PROMPT command. I ran into problems using this technique with batch files; it did not seem to work. A little research revealed that the problem is the ECHO command. If ECHO is set OFF, no key reassignment will take place. Including the command ECHO ON in any batch file containing reassignment commands will remedy this.

Beginning WordStar

For those of you new to WordStar, here is a tip for starting off your work sessions. Rather than typing new dot commands every time you create a new document, create a series of text files, each one containing a set of dot commands that you use frequently.

For example, I have a file called HEADER.LTR that I use for letters. It contains the following dot commands:

```
.OP
.PO 15
.MT 10
.FO Page #
^PA
```

The first three commands turn off automatic page numbering, set the page offset to 15 characters, and set the top margin to 10 lines, respectively. The fourth creates a footer that will print "Page 1" on page one, "Page 2" on page two, etc. And for near-letter-quality printing, ^PA sets the alternate character pitch to 12 cpi (assuming your WordStar is patched for ^PA to do this). This condenses the characters somewhat, enhancing their appearance.

When I open a new document that is

going to be a letter the first thing I do is type ^KR. WordStar responds "Name of file to read?" I type HEADER.LTR, press Enter, and it is read from disk into the new document. I have all my dot commands and am ready to go.

You can have other header files for other types of documents: HEADER.IDE for idea lists, HEADER.OUT for outlines, etc. Each one should contain the commands needed for that particular type of document.

dBASE and printers

Fledgling-dBASE programmers working with the commands SET DEVICE TO PRINT, SET FORMAT TO PRINT, or SET PRINT ON often discover that their printers will not print the last line of text sent by a program. This is because many printers have a printer buffer—a small amount of memory (the size varies) used to hold data before it is printed.

That data does not get printed until the buffer fills up, or the printer receives one of three codes: a form feed, a line feed, or a carriage return.

To get that last line of text to print and advance the paper to the next page, use the dBASE command EJECT, which sends a form feed to the printer.

If you wish simply to print the text and have the printer ready to print on the next line, send a carriage return and line feed together. When PRINT is set ON the command will be:

```
? CHR(13) + CHR(10)
```

The ASCII code for a carriage return is 13, while 10 is the code for a line feed. If DEVICE or FORMAT is set to PRINT, then the command is:

```
@ XX,YY, SAY CHR(13) + CHR(10)
```

where XX and YY are coordinates on the printed page.

A bug in SideKick

SideKick, the popular RAM-resident utility program from Borland International, has a bug in the calculator portion of the program. When used on an

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80286-based computer (such as the Kaypro 286i), the calculator may produce errors when dividing large numbers. For example, the result of dividing 93,500 by 31,167 should be 3, but the defective calculator shows it as 2.4.

To fix the problem you must patch the file SK.COM using the MS-DOS utility DEBUG (this patch has appeared in both *PC Magazine* and *InfoWorld*). Make sure DEBUG.COM and SK.COM are on the same disk or in the same directory, then type **DEBUG SK.COM**, and press Enter. You will see a hyphen, which is DEBUG's prompt. Now type:

```
S 100 L9A00 2 FE CB
```

and press Enter.

You will see two four-digit numbers delimited with a colon. Ignore the left-most four. The rightmost four should be 70BB, or something similar. Now type:

```
E NNNN 2 B0 63
```

and place that rightmost number where NNNN is. Press Enter, type **W** and hit Enter, then type **Q** and press Enter again. The calculator should now work correctly.

Labels

I am a great advocate of labels. The rear panel on the Kaypro 10 had labels on every connector, so that when you peeked back there, keyboard cable in hand, you didn't end up plugging your keyboard into the internal modem.

Unfortunately the newer [Kaypro] MS-DOS computers don't have labels on their rear panels (except those required by law). You can make your own, however. Start with some masking tape and a fine tip ball point pen. Open up your computer's users guide to the page containing the rear panel diagram, and create a small label (1/2 inch by 1/2 inch) for each connector. Place each label next to or above the connector it describes. Since you sometimes look over the top of the computer while working with cables, you may want to place the labels upside down.

A sticky problem

A while ago I had some problems with my keyboard keys sticking. I hesitated to

use oils on them because I had heard that could have adverse affects on the key's function. However, a spray called Elmer's Slide-All works very well. It has a liquid carrier that evaporates off in seconds, leaving a thin film of Teflon on the keyshaft. I used it on my Return key several months ago, and it seems to be a good long term fix.

Terrance A. Quinn
Metamora, Illinois

Ed. Note: A few caveats about cleaning your keyboards with sprays. First, disassemble the keyboard casing and work only with the keyboard itself. Second, spray only the keycap and keyshaft, not the keyboard circuitry. Invert the keyboard before you spray it. When you're done, clean the keycap and the circuitry around it with compressed air (you can buy canned air at photographic specialty stores).

Changing MITE

MITE uses ^K as a local command character. You should change this to another character, because many RBBS systems use ^K as an abort code. (An abort code allows you to skip bulletins you have already read, or to cancel an action you're no longer interested in.)

To make the change, start at MITE's Main Menu. Press **O** to go to the Option Menu. From there press **K** to change the local command character. MITE will prompt "Enter new ASCII character:." Type a new control sequence and press Enter (Return on CP/M keyboards). The most commonly used sequence is ^L.

Steve Sanders
Tampa Bay, Florida

(Ed. Note: People new to MITE should see the "Beginner's Luck" column in the March 1986 issue of PROFILES.)

A simple redefinition

I used SmartKey on my Kaypro 10 for a long time before thinking of this: redefine the colon to lowercase and the semicolon to uppercase. This saves a

great deal of shifting.

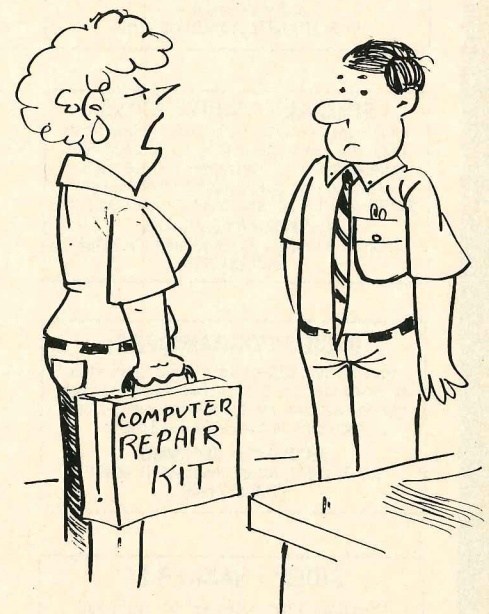
Alfred D. Hershey
Syosset, New York

Flying through a file

The other day I came across a great little shortcut in WordStar. When a global search and replace is done, the screen redraws itself every time it finds the word you are replacing. If you have a long document, this can take quite a long time. Try this:

After you give the ^Q^A command with "entire file, replace without asking" parameters, and WordStar starts replacing the string, press one of the arrow keys. The screen will not redraw itself until the end of the document. Depending on the number of replacements WordStar is making, this shortcut chops the time by a factor of about three.

Valeri Stapel
Oceanside, California



"I can't pronounce it, but it's the \$480.64 part."

by Marshall L. Moseley

NewSweep

I discovered a few new capabilities of NewSweep in William Murdick's useful article ("Beginner's Luck," April 1987). I am curious, however, about the "Y" option (Set File Status). When I invoke it, NewSweep queries "Which Flags (1-4,R,S,A)." I know that "R" sets a file to Read Only status, but what do the others do?

Bill Sharp
Lawrence, Kansas

To answer your question you must first understand what a flag is and what it is used for.

As an example let's look at a mythical file called CUSTOMER.DXF. Each letter in this file's name—C, U, S, etc.—is stored in the form of a byte. A byte is an eight digit binary number; the digits within a byte are called bits.

Each byte in a file name has eight bits, but only seven of them are used to designate the character. The eighth bit, called the high bit, goes unused. The developers of CP/M decided to use the high bits in file names to hold information about the file. For example, when the high bit in the first letter of the file name extension (above it would be the D in DXF) is set to one, then the file is read only. If the bit is zero, then the file is read/write.

The high bit in the second letter of the file extension designates whether it's a system file or not. A system file is effectively shielded from any disk operations (DIR, PIP, etc.). The "S" option under NewSweep will set this bit, making it a system file.

The third letter's high bit is the archive bit. Certain backup programs set this bit when they copy a file. This allows those same programs to copy selectively—if the archive bit is set, they ignore the file. The "A" option controls this flag.

The flags 1-4 denote the high bits in the first four characters of any file name. Those four bits can be arranged in 16 different ways, allowing you to have 16 different file types. No program I know of uses these flags, but Digital Research

made them available, and Dave Rand (NewSweep's creator) dutifully gave you the power to control them.

Finally, if you've set any of these flags and wish to undo what you have done, simply tag the files you wish to change, choose the "Y" option, type a blank space, and press Return. All the flags will be reset.

Different computers

I recently purchased an Atari 520ST and now want to transfer my Kaypro 2'83 programs to it. How do I go about this?

W.C. Hicks Jr.
U.S. Army APO

You don't.

Programs—the files on disk that contain instructions for the computer to follow—are very machine specific. Those instructions work only with a particular processor and operating system. Transferring programs to another computer, which uses a different processor and operating system, is almost impossible. So while it is physically possible to transfer program files from your Kaypro to your Atari, the programs you transfer will be useless.

You can transfer, and sometimes use, data files. Data files contain information that program files work with. For example, data files from the CP/M version of dBASE II can be used by the MS-DOS version with no problem at all.

Such transfers are performed in two ways. The first method involves using a telecommunications program to transfer files via each computer's serial port. The second (and more efficient) way is to use a multi-format program, which causes one of your disk drives to behave like a drive from another type of computer.

For more on these programs see T.F. Chiang's article "Multi-Format Programs," in the July 1986 issue of PROFILES.

Aging masters

I have had my master disks for going on four years. I have never seen any mention in computer magazines, user group newsletters, etc., of the life of a master

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disk (assuming good storage conditions). Is this something to worry about and is it time to copy the master files onto new disks?

Durwin A. Schmitt
Littleton, Colorado

Given good storage conditions (a dry, cool, dust-free area away from any electric appliances or magnetic fields), the life of a master disk is indefinite. However, it is always time to make copies of your master disks. If the thought crosses your mind, do it.

In fact, it's a good idea to make backups of both your master disks and important data files and then store them far away from your computer. If your computer is at home, store them at work, and vice versa. That way a disaster, such as a fire or flood, won't destroy valuable software or data.

Buying cables

I want to buy a printer cable for my Kaypro PC. What is the going price for such a cable?

William Collins
Chicago, Illinois

If you live near a fair-sized metropolitan area, you can buy the cable you need (a standard IBM parallel printer cable with a DB-25 connector at one end and a Centronics connector on the other), for as little as \$6. You should never pay over \$20.

I find that many people pay too much for cables. Standard cables (printer cables, modem cables) are available in the range stated above. If the cable you want is a non-standard one, then you can have it manufactured for between \$15 and \$25.

When having a cable made for you, you must provide the pin assignments for both the connector on your computer, and the connector on the peripheral you will be using. Those assignments are listed in the back of your User's Guide and in the peripheral's manual.

You should look for a place that specializes in bulk computer products, such as cables and disks. Look in any local computer publication, and in the phone book under "Computer Supplies." Shop and then shop some more.

Some things to remember: You should specify exactly what you want. Toward

that end, learn cable terminology.

When presented with the cable, examine it carefully. Look for cracks or breaks in the casing and for defects at the point where the cable meets the connectors. Look inside the connector to make sure that no pins are bent and that no pin holes are blocked. If feasible, insist on a testing the cable before you leave the store.

DOS considerations

I purchased a Kaypro PC about a year ago and I love it. I have been using MS-DOS 2.1, which came with my computer. I now have PC-DOS 3.1 available and I'm wondering if there are any good reasons to switch to it. I use Kaypro's bundled software and shareware mostly.

John A. Heidt
Beloit, Wisconsin

Considering your needs, I don't think you need to switch operating systems.

Both PC-DOS 3.1 and MS-DOS 3.1 are an improvement over MS-DOS 2.1. They each have a new device driver called VDISK, which creates a virtual disk (and uses extended memory in 80286 computers), but you have RAMDISK, which works better than VDISK. If you have the 128K of extra memory possible in a Kaypro PC, RAMDISK will access it.

Version 3.1 (of both PC- and MS-DOS) does have some new commands that come in handy, but they aren't worth making the switch. The reason is simple: the version of MS-DOS that came with your computer was thoroughly tested on your computer. Who knows what 3.1 will do? While the Kaypro PC is very IBM compatible and probably will work quite

well with PC-DOS (my 286i does), there are simply no guarantees.

I/O card jumpers

I own a Kaypro 286i, with a serial port and a printer port on a half-length expansion board. I have just bought an internal modem that I have set to be COM1, the primary serial port. How do I adjust the 286i I/O board so that the serial port is COM2?

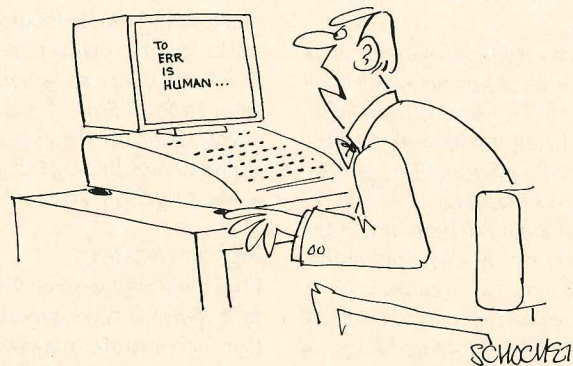
Donna Morrisy
Jackson, Mississippi

Remove the 286i I/O board from your computer and place it in front of you, with the external connectors pointing to the right and the card edge connector pointing down. In the lower-left corner of the board you will see two plastic blocks at positions J1 and J2. J1 controls the serial port designation.

J1 may contain a small plastic block, with four hourglass-shaped metal tabs inside it. Note that the two rightmost tabs have gaps in their centers, while the leftmost two do not. To change the serial port designation, lift the plastic block out of its socket and rotate it 180 degrees, so that the leftmost tabs now have gaps in their centers. Replace the block in the socket. The serial port is now COM2.

If there are DIP switches at J1, then set switches 1 and 2 OFF, and switches 3 and 4 ON. If the switch block says OPEN and CLOSED, rather than ON and OFF, just remember that CLOSED = ON and OPEN = OFF.

The block at J2 controls the printer port designation, LPT1 OR LPT2. The instructions for changing it are exactly the same as for J1.



"Quit rubbing it in!"

Using system configuration info under GW-BASIC

by Tom Enright

We've spent the last two months finding out how to read system configuration information that MS-DOS saves in low-memory. Including that ability in your programs achieves greater flexibility and avoids problems when someone with an unusual system runs one of your programs. In May you learned how to read several of the system configuration parameters using Turbo Pascal. In June you learned to read, and understand, MS-DOS's equipment list at 0040:0010h and 0040:0011h. This month you will learn how to accomplish the same operations in GW-BASIC.

BASIC, GW or otherwise, is not as flexible a language as Turbo Pascal. Some of the manipulations required for our program are not directly supported in BASIC. For that reason we have to take some roundabout routes to arrive at the same destination. We'll cover those methods in detail when we get into the program itself.

Equipment list review

As you remember from May and June, the equipment list is two bytes of data pertaining to disk drives, default video mode, serial ports, serial printers, and how many printers are installed. The data is encoded in several "bit-fields" within the 16-bit equipment list. The bit-fields are up to three bits wide and, with one exception, are independent of the other bit-fields.

Decoding the bit-fields takes us into the realm of binary numbers. Some of the bit-fields are single-bit flags indicating that some piece of equipment is either present or not present. Others are numbers indicating how many of something are present. There are 16 bits in the equipment list and they are referenced by counting from right to left beginning with zero.

The bit-fields decoded by our GW-BASIC program are: disk drive flag (bit

0), initial video mode (bits 4-5), number of disk drives (bits 6-7), number of serial ports (bits 9-11), serial printer flag (bit 13), and the number of printers (bits 14-15). These are the most useful bit-fields for the majority of programming uses.

One of BASIC's shortcomings is that it doesn't directly support bit-shift operations.

BASIC adaptations

Earlier I mentioned that we would have to work a little harder to accomplish our task in GW-BASIC. We need to use more roundabout methods in two areas: reading the equipment list and shifting the bits. In Turbo Pascal we simply read the entire equipment list into an integer variable and then operated on that value. Also, Turbo Pascal has an instruction for bit-shift operations. Unfortunately, GW-BASIC falls short in both areas.

We can use GW-BASIC's PEEK statement to read memory addresses, and sometimes you can get away with reading in the entire 16-bit equipment list. The problem occurs when the 16-bit number is too large. If the system being checked has more than one parallel port, reflected as the number of printers attached, the 16-bit number is too large and GW-BASIC will give you an "OVERFLOW ERROR" message. For that reason we have to operate on the two bytes of the equipment list separately.

GW-BASIC's other shortcoming is that it doesn't directly support bit-shift operations. We can get around that with a mathematical trick. If you divide an integer by two, the bits of that number

are shifted one place to the right. So we simply divide by two until the bits are shifted as far as we need. For example, if you need to shift the bits of an integer variable right four places, do this:

```
FOR I = 1 TO 4
    NUMBER = NUMBER / 2
NEXT I
```

This only works on integers, not floating point numbers. Floating point numbers are stored in a completely different format than is used with integers.

Other than working with the equipment list one byte at a time and using a different method for shifting the bits, our GW-BASIC program works very much like its Turbo Pascal forerunner.

Touring the code

If you look at the listing that accompanies this month's column (on page 68), you'll notice that it is somewhat longer than last month's Turbo Pascal listing. We can do the same things with GW-BASIC, it just takes more lines of code. Now it is time to take a walk through the listing to see how it works.

Line 1000 defines all variable names starting with any letter between A and Z as being an integer. This simply resets the default variable type to integer instead of single precision floating point. Unless you append an exclamation point (!) or number sign (#) to a variable name, it will default to being an integer.

Line 1010 merely jumps past the subroutine area to the start of the main portion of the program. I put my subroutines near the start of the program. This is an arbitrary choice on my part, I like the subroutines up front.

Lines 1020 to 1090 comprise the subroutine to mask off unwanted bits and shift the result as far to the right as needed. The variable "I" contains the equipment list value. Before calling this

subroutine, MASK is assigned the required value to eliminate the unwanted bits and SNUM is assigned the number of bits to shift. The result of the masking operation is assigned to VALUE in order to preserve the equipment list value for further operations. Lines 1060 to 1080 perform the shifting operation by dividing by two as many times as the value of SNUM. The final result is returned to the main program in VALUE.

Lines 1150 and 1160 take care of getting the first byte of the equipment list. Since GW-BASIC's PEEK statement only works within the current data segment, we reassign that data segment in line 1150. In line 1160 we actually get the low-order byte of the equipment list. Notice that in this program I am using *decimal* numbers instead of hexadecimal. A decimal 64 is the same as 40h, which is the memory segment that we want. Decimal 16 is equal to 10h (the offset to the first byte of the equipment list).

Lines 1200 and 1210 print the status of the disk drive flag on the screen. Since the disk drive flag is the rightmost bit of the equipment list, there is no need to shift the bits. We simply AND the equipment list with one and print the result.

Lines 1250 to 1280 take care of the initial video mode. Line 1250 assigns the correct mask value to MASK, line 1260 puts the number of bits to shift into SNUM, and line 1270 calls the subroutine for masking and shifting. The result is returned in VALUE, which we print in line 1280.

Lines 1320 to 1350 perform the same set of operations for the number of disk drives bit-field. Remember that this parameter is the number of drives minus one, so we add one to the result before printing.

At this point we have used up all the bit-fields in the low-order byte of the equipment list. So, line 1410 obtains the high-order byte so that we may continue with the program.

The rest of the program is a repetition of masking unwanted bits, shifting the bits, and printing the results. Lines 1450 to 1480 handle the number of serial ports, lines 1520 to 1550 take care of the serial printer flag, and lines 1590 to 1620 print the number of printers (actu-

ally the number of parallel ports) present.

Line 1630 restores the data segment from the one that we set in line 1150 to the segment that GW-BASIC normally uses. And, finally, line 1640 ends the program.

While our GW-BASIC program does require more instructions to perform the task than Turbo Pascal, it could have been done in less space. By eliminating the comments and putting several instructions on each line, the program could be much shorter. However, one instruction per line and lots of comments make the program easier to understand.

Since this column frequently fills a tutorial role, ease of reading and understanding is important in any listing presented here. For that reason I try to present listings in the most readable

style. You can compact the code as much as you like in your own programs. Just remember that you may have to read and understand your own listing several months later. So, if you put five or six instructions on each line and forego comments, you may make your own job harder to do later on. It's embarrassing to be unable to understand your own code a couple of months later.

The idea of the last six installments of this column has been to show you the information MS-DOS makes available—if you know where to look. Finding out about what information is available is often more difficult than writing the programs. More information can be gleaned from books like *A Programmers Guide to the IBM PC* by Peter Norton. His books aren't the only ones with this information, but they are some of the best.

Program listing

```

1000 DEFINT A-Z
1010 GOTO 1140 ' Bypass subroutines
1020 '
1030 ' Mask and shift bits
1040 '
1050 VALUE = I AND MASK
1060 FOR Z = 1 TO SNUM
1070 VALUE = VALUE / 2
1080 NEXT Z
1090 RETURN
1100 '
1110 ' End subroutine area,
1120 ' start mainline
1130 '
1140 CLS
1150 DEF SEG = 64 ' New data seg
1160 I = PEEK(16) ' Get low byte
1170 '
1180 ' Diskette drive status
1190 '
1200 PRINT "Diskette drive status :";
1210 PRINT (I AND 1)
1220 '
1230 ' Initial Video Mode
1240 '
1250 MASK = 48 ' Mask with 00110000 binary
1260 SNUM = 4 ' Bits to shift
1270 GOSUB 1020 ' Mask and shift
1280 PRINT "Initial video mode :";VALUE
1290 '
1300 ' Diskette drives
1310 '
1320 MASK = 192 ' 11000000 binary
1330 SNUM = 6
1340 GOSUB 1020
1350 PRINT "Diskette drives :";VALUE + 1
1360 '
1370 ' Useful parameters from low byte are
1380 ' now exhausted, so we get the high
1390 ' byte and continue.
1400 '
1410 I = PEEK(17) ' Get high byte
1420 '
1430 ' Number of Serial ports
1440 '
1450 MASK = 14 ' 00001110 binary
1460 SNUM = 1
1470 GOSUB 1020
1480 PRINT "Number of serial ports:";VALUE
1490 '
1500 ' Serial Printer
1510 '
1520 MASK = 32 ' 00100000 binary
1530 SNUM = 5
1540 GOSUB 1020
1550 PRINT "Serial printer status :";VALUE
1560 '
1570 ' Total printers
1580 '
1590 MASK = 192 ' 11000000 binary
1600 SNUM = 6
1610 GOSUB 1020
1620 PRINT "Total printers :";VALUE
1630 DEF SEG ' Restore BASIC data segment
1640 END

```

New Products

edited by Suzanne Kesling

The following new product listings are not reviews and should not be considered endorsements. To be considered for publication in this column, press releases should be sent to Suzanne Kesling, "New Products" Editor, c/o *PROFILES Magazine*, 533 Stevens Ave., Solana Beach, CA 92075. Releases must state prices and whether products run under CP/M or MS-DOS. Include black and white photos if available.

Estimating program for printshops

The Printshop Estimator is an estimating tool for the small printshop.

It instantly prints out an estimate with three keystrokes; it types out a quote with another keystroke. If the customer accepts the estimate, typing an "T" will print an invoice, first asking if you want to change the price before invoicing.

Deposits will be deducted, and tax will be included on the invoice. The program will print an invoice number at the top and the terms at the bottom, both changeable by the user.

Other features include storage for 20 estimates, quantities up to 999,999, and invoices include date and printshop name automatically.

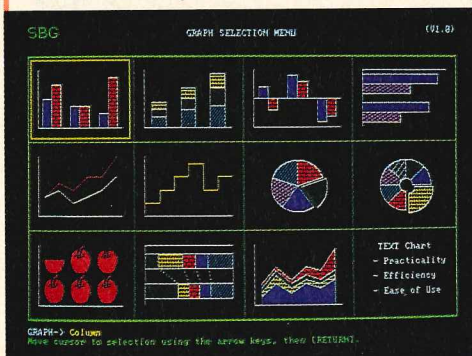
\$99. MS-DOS computers. Turquoise Products, 4760 N. Creosote Pl., Tucson, AZ 85749; (602) 749-1739.

Graphic charts

Stella Business Graphics is a chart and graph generation program. It offers 11 graphic data formats—pie, doughnut, area, column, stacked column, deviation, bar, percentage, line, step, and pictograph. A twelfth format is a text chart that produces outlines or bullet charts for use as slides, overheads or presentation handouts.

The data screen allows you to enter or change data without closing the program, and it offers arrow-key cursor movement from cell to cell plus easy exchange of rows and columns.

In the process of perfecting a chart, you can move from a bar chart to the data screen, back to the bar chart, over to the chart selection screen, and on to a pie chart of the same data with single keystrokes.



\$199. MS-DOS computers with standard graphics boards (Hercules, CGA, EGA) and monochrome or color monitors. Stella Systems, Inc., 10430 South De Anza Blvd., Suite 185, Cupertino, CA 95014; (408) 257-6644.

Computer pinball

NIGHT RIDER is a pinball simulation game. With nine skill levels, both the novice and pro can find themselves challenged.

The color graphics and sound effects add to the realism of play, and a two-player mode is available. High game and high ball are saved to disk and "tilting" is possible.

\$29.95 plus \$3 for S&H. MS-DOS computers with a color monitor. Generic Computer Products, Inc., P.O. Box 790, Dept. 27E, Marquette, MI 49855; (906) 249-9801.

Problem solving on the PC

Verisim is a decision making software package for managers. It gives you finger-tip access to problem solving

on the computer. Verisim is for anyone who has to estimate, budget, or forecast when a data base of actual numbers is not available.

It employs the Monte Carlo technique, a random sampling method that owes its name to work done in the 1940s as part of the Manhattan Project.

The program can calculate thousands of samples of a formula with as many as ten variables to determine the likelihood of an event occurring.

Verisim can be used as a stand-alone application, or to generate key data input for spreadsheets or project schedules. It has a menu-driven format, on-screen instructions, online help and an example packed manual.

\$179. MS-DOS computers. Requires MS-DOS 2.0 or higher. AccuQuest Corporation, 11911 Brighton, Houston, TX 77477; (800) 654-3041, in Texas (713) 879-9240.

Negotiating with confidence

The Art of Negotiating is a software program that helps people prepare for negotiations. It is based on the teachings of Gerard Nierenberg, the father of modern negotiation.

The software is designed to help you succeed in any type of negotiation—from asking for a raise, to selling a house, to resolving a personal dispute, to negotiating a corporate merger.

The program asks questions and lets you answer in plain English. Instructions for entering information and moving through a program are right on the screen, and there is a HELP section that can be reached from anywhere in the program.

The software leads you through crucial areas of preparation, and it offers suggestions and asks questions about the people involved. After going through the program you can walk away with concrete, strategically sound plans of action, a sharp awareness of what your opposer may

do and an overall feeling of confidence.

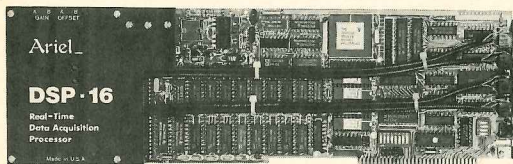
\$495 includes a User's Guide with a tutorial and two books by Gerard Nierenberg. MS-DOS computers. Experience in Software, Inc., 2039 Shattuck Ave., Suite 401, Berkeley, CA 94704; (415) 644-0694.

Data acquisition processor

The DSP-16 is a PC plug-in card that includes a complete signal acquisition, synthesis and processing system. It combines two channels of high-speed, high-resolution input/output conversion, a large data buffer and Texas Instruments' second generation Digital Signal Processing (DSP) microprocessor, the TMS32020.

The DSP-16 can buffer up to 256K samples of incoming or outgoing data, or up to one megasamples with optional memory expansion.

The analog subsystem is complete; it includes input buffering, antialiasing filters, output filters, and input/output sample and holds. Its 16 bit



resolution and 50 KHz sample rate make it suitable for full bandwidth, high-fidelity audio.

Supplied with the DSP-16 is a program development system and five software application programs including: Data Acquisition, Digital Audio Effects, Storage Oscilloscope, Audio Loop Editor, and Waveform Synthesizer.

\$2,495. MS-DOS computers. Ariel Corporation, 110 Greene St., Suite 404, New York, NY 10012; (212) 925-4155.

MS-DOS tutorial aid

The Teaching Assistance Package (TAP) provides an opportunity for managers and users to learn the more advanced features of the MS-DOS

operating system.

The program utilizes color slides for visual introduction and reinforcement of student kit materials, hands-on class exercises contained on a



student disk for full understanding of software functions, and test materials for final exam or homework assignments.

The Teaching Assistance Package is a multi-sensory course designed to introduce you to advanced features and commands such as creating batch files, using CONFIG.SYS, using EDLIN, and DOS commands such as FIND, SORT and JOIN.

\$490. MS-DOS computers. TAP Development Corporation, 1422 East Charleston Blvd., Las Vegas, NV 89104; (800) 231-5455, in Nevada (702) 386-0072.

Color video card

InColor Card is a color version of the Hercules Graphics Card Plus. It runs applications for enhanced color monitors.

The card is capable of displaying 16 colors out of a 64 color palette, in 720 x 348 pixel resolution. The board can also display any application in white on black, or in two other selected colors.

InColor Card includes the Hercules printer port on a chip, which can be disabled to prevent conflicts with other cards in the system. Also included are FontMan, a font editor for use in RamFont mode, and a graphics mode screen dump for use

with Epson and IBM graphics printers.

\$499. MS-DOS computers with a multi-synch color monitor. Hercules Computer Technology, 2550 Ninth St., Berkeley, CA 94710; (800) 532-0600.

Keystroke signature

Logo and Signature Rasterization Service will rasterize any logo, favorite image, or signature for your laser printer's format, allowing you to download the image into any document printed on your laser.

Signing letters can be as easy as one command to download a signature that looks more realistic, because the service allows for gray scales.

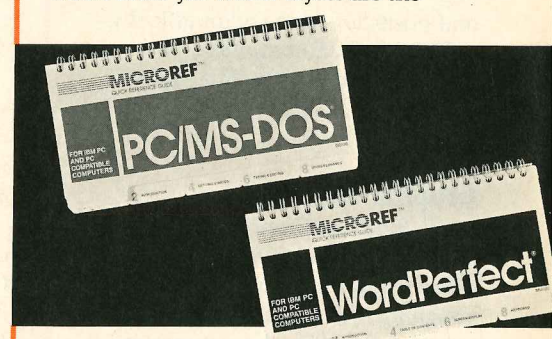
Several laser formats are available, including Hewlett Packard, Canon, NCR, Xerox, Ricoh, and other popular laser printers.

Images can be downloaded with basic programs as well as popular desktop publishing packages.

All logos up to two square inches are \$250, each additional square inch is \$50. Signatures are \$50. Koch Software Industries, 11 W. College Dr. Bldg. G, Arlington Heights, IL 60004; (312) 398-5440.

Quick references

MICROREF for PC/MS-DOS and MICROREF for WordPerfect are the



newest in the quick reference guide product line. The flip-up guides sit by your computer on built-in easels.

The PC/MS-DOS reference guide

covers PC-DOS versions 2.0 through 3.2, and the WordPerfect guide covers 4.1 as well as 4.2 for IBM-compatible computers.

The guides contain step-by-step procedures and extensive examples for casual users as well as advanced commands for experts.

Pages are constructed of durable plastic with thumb index tabs for quick access to procedures. A Table of Contents, complete Glossary, and Index save you time searching for information.

\$19.95 each. MS-DOS computers. Educational Systems, Inc., 3175 Commercial Ave., Northbrook, IL 60062; (800) 553-2212.

Accounting system

BusinessWorks PC is a full-featured accounting system designed for

medium- to small-sized companies. It includes many features including online help at most prompts, and help messages also contain a page number reference where you can turn for addition information.

Pop-up "show" windows list needed information such as account numbers, invoice numbers or other information anytime the user needs them.

Each module can send financial information to other programs, including Lotus 1-2-3, Multiplan, WordPerfect, and WordStar. In addition, BusinessWorks reports can be sent to files on the hard disk.

The System Manager module serves as the controller of the package, and it includes password security, printer specifications, and a color palette that lets you customize

the colors on the screen.

\$95 for the System Manager and \$395 for each accounting module. MS-DOS computers. Manzanita Software Systems, One SierraGate Plaza, Suite 200-A, Roseville, CA 95678; (916) 781-3880.

Electronic notes

Prospecting Plus reduces the need for pen and paper on the desks of sales and marketing professionals. It helps you organize sales leads, marketing information, and after-sales support facts to cut the paperwork load.

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\$795. MS-DOS computers. Key Systems, Inc., 512 Executive Park, Louisville, KY 40207; (800) 223-5637

Disk doctor

Disk Technician is a software system that repairs hardware — it prevents, detects, repairs, and recovers hard disk media failures before data is lost.

The system consists of a single 5-1/4-inch disk and works on both hard and floppy disks.

The program performs automated daily, weekly and monthly hard disk system testing and repairing of every single byte on the disk, occupied or not. It checks for soft error rate, track alignment, and for magnetic retentivity. All unsafe soft errors are either repaired or blocked. If in use, programs and data files are automatically moved to a safe area before data is lost.

An early warning detection system removes unreparable marginal areas from use.

\$99.95. MS-DOS computers. Prime Solutions, Inc., 1940 Garnet Ave., San Diego, CA 92109; (619) 274-5000.

Product Updates

Fancy Font has been updated to version 3.0. This version allows you to capture graphics from any Hercules, EGA, or CGA screen. It also includes the ability to edit and print fonts, and has new fonts licensed from Bitstream. You can select colors on printers such as Epson's EX80 and JX80. SoftCraft, Inc., Madison, WI □ The **ProWriter Jr.** dot-matrix printer from C. Itoh has been upgraded to the **ProWriter Jr. Plus**. With more speed and memory, and faster throughput, this model has an increased speed of 33 percent, allowing it to print 160 cps in draft mode. Also, the buffer memory has been increased to 8K. C. Itoh Digital Products, Inc., Torrance, CA □ **TWIST & SHOUT!** is now **LONG & LOUD!**, a sideways and banner printing software package for CP/M and MS-DOS. This new version 2.0 includes better screen handling, easier installation, more printer support, four type sizes in sideways printing mode, and more. T&W owners can upgrade for \$5. Spectre Technologies Inc., Woodland Hills, CA □ The prices of the **Courier 1200** and **Microlink 1200** modems have been cut. The cuts of 30 and 22 percent to these 1200 baud modems are realistic and competitive. Both modems are auto-dial, auto-answer devices. When operated at 1200 baud they are Bell 212A compatible. USRobotics, Inc., Skokie, IL □ Okidata is now offering a **Lotus-compatible Microline 292/293 Driver** that reduces printing time of graphics developed with Lotus 1-2-3 and Symphony. The driver allows color and black-and-white graphics at multiple densities. And it enables higher quality graphics by allowing printing at very high density (240 x 144 dpi). Okidata, Mt. Laurel, NJ □ The **5825XP**, **5835XP**, and **5845XP** are the new models in the CalComp 5800 Series color electrostatic plotting systems. Each features a 32-bit microprocessor that improves throughput by reducing load and rasterization time for high-density vector data. CalComp, Anaheim, CA.

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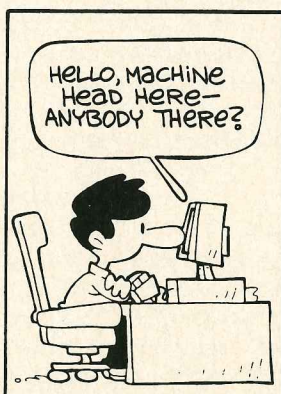
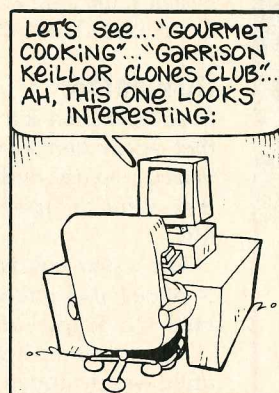
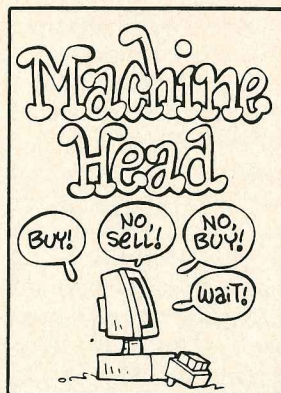
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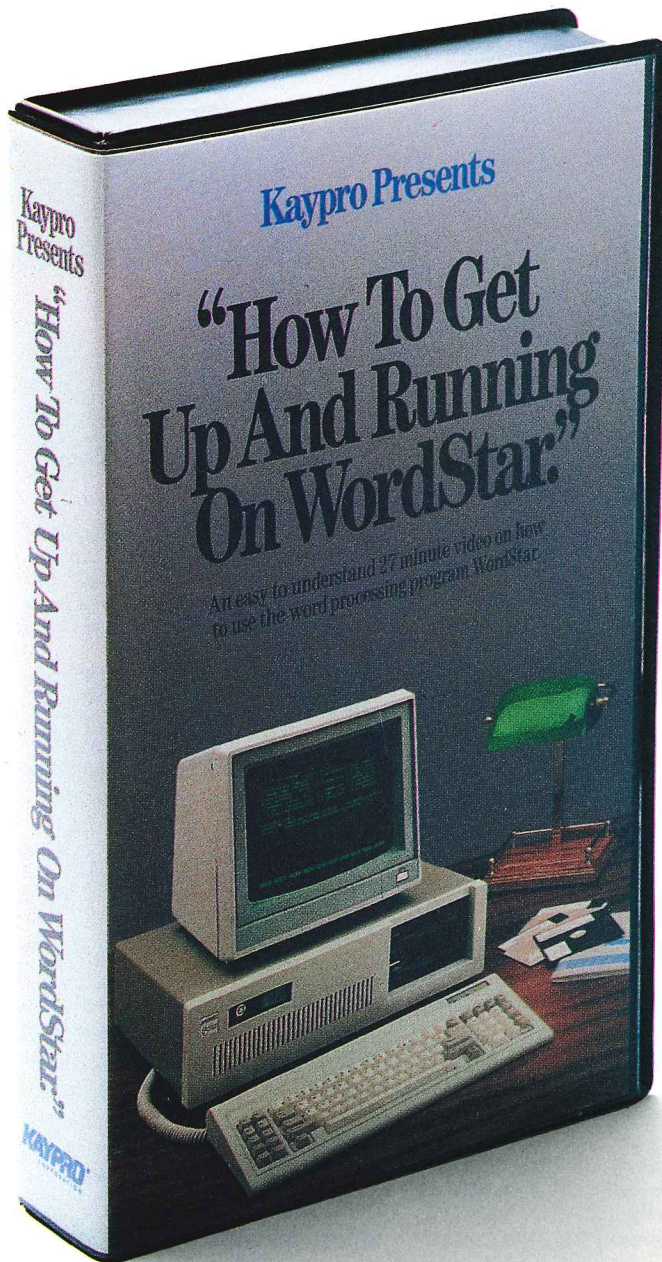
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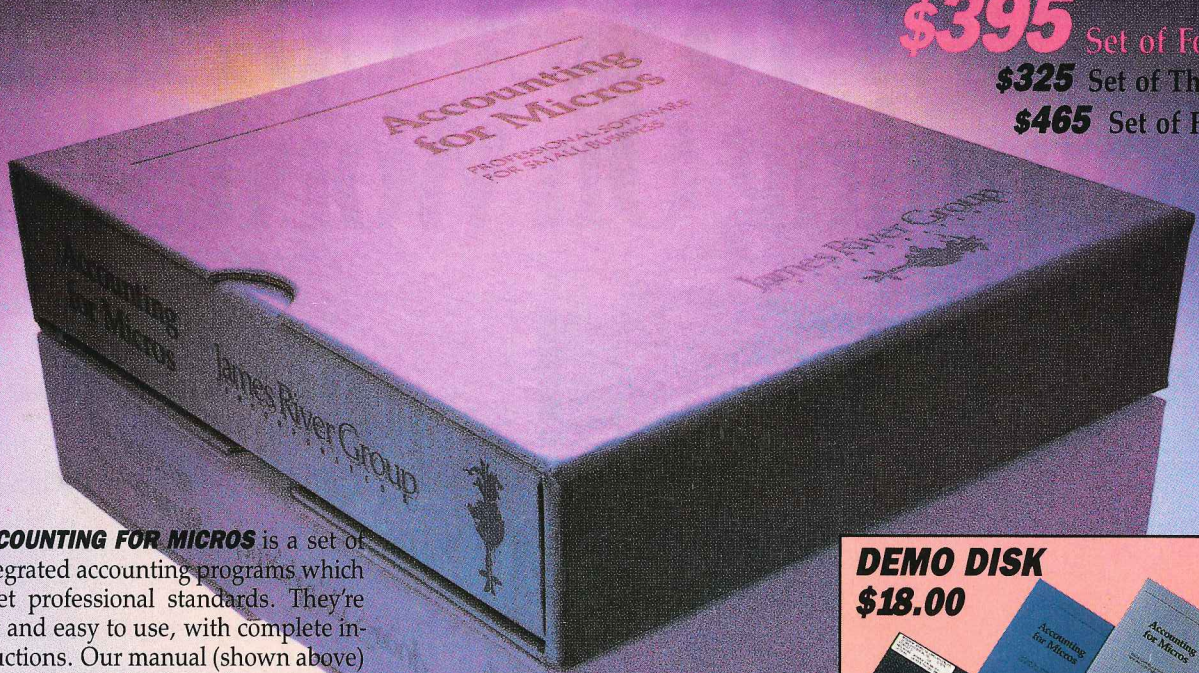
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