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PROFILES

The Magazine for CP/M Users
February 1987

ELECTRONIC MAIL:
Choosing the service that's right for you

Maximize your printer's capabilities with dBASE

Cool It!
Installing a fan in a CP/M Kaypro

TurboROM: Ver. 3.4 just released: Provides substantial improvements to your CP/M Kaypro computer. Adds many new features to your computer. Compare the TuboROM with the competition, you can't get more performance for your money with any other product.

		The competition - P= partial feature M= circuit modifications required **Advent TurboROM features**
P	•	2 X to 4X speed on all disk writes (both hard and floppy)
	•	Faster disk reads (with Advent format)
•	•	Supports 48 and 96 TPI drives
M	•	Supports fast seek (3 ms) for 96 tpi floppys that's easily installed
•	•	Up to 4 floppy drives in any mix of SS, DS, 48TPI and 96TPI drives
	•	256 directory entries using Advent floppy format
	•	Up to 10 built in disk formats including Osborne, QX-10, Xerox, Micro C
	•	Super-speed disk copying with Turbocopy program
	•	Allows redefining of logical drive assignments
	•	Up to 2 Mbytes more storage on K10 hard disks
	•	Add a second or larger hard disk to K10s
	•	Up to 3.25K more program area on K10s
•	•	Built-in screen dump
•	•	Programmable cursor -- block, line, flashing, non-flashing
	•	Video screen blanking after 10 minutes of non-use (optional on '83s)
P	•	Improved video performance on '84 computers
•	•	Time displayed on 25th line of '84 computers (Real Time Clock required)
	•	Hard disk support built in (up to 112Mb)
P	•	Ram disk support built in (up to 2048K)
	•	Driver Software available for MicroSphere and SWP RAM disks
	•	User written device drivers supported
	•	32 charater type-ahead keyboard buffer
	•	ZCPR1 included - Supports ZCPR2 and ZCPR3
P	•	Advanced features list includes fine tuning floppy and hard disk performance
P	•	Full set of utility software provided
	•	Compatible with all Plu*Perfect CP/M enhancements
	•	Compatible with Uniform, Media Master, Fast Back, etc.
	•	No modifications required to your computer to use the TurboROM

TurboROM (Specify Kaypro model when ordering) **$79.95**

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- Expandable to include Real Time Clock /Calendar
- Expandable to include hard disks
- High reliability - Built to our proven high standards

Speed Comparison at 4 MHz - Times measured in seconds.

Function	Floppy	MicroSphere	SWP	Advent
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- User may select number of directory entries for each logical drive
- User-selectable block size for each logical drive
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- Expandable to include Real Time Clock / Calendar
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- Advanced features include complete user definable disk formatting
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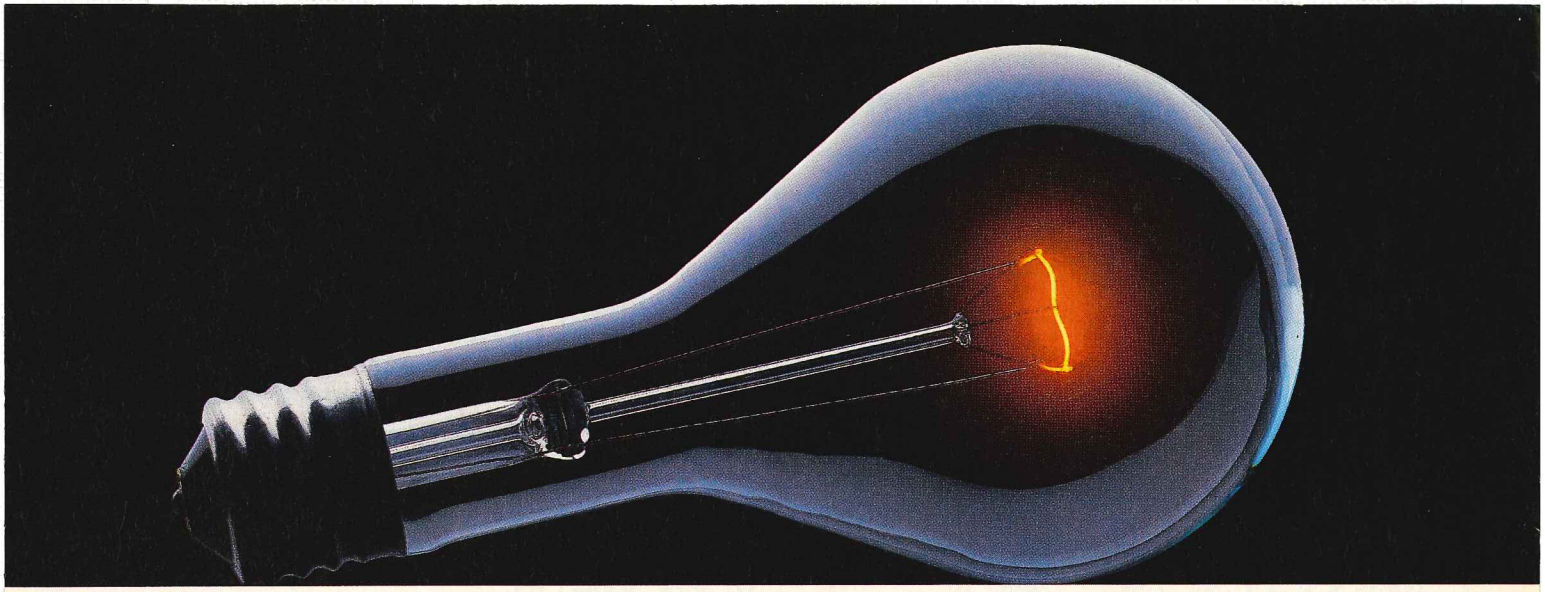

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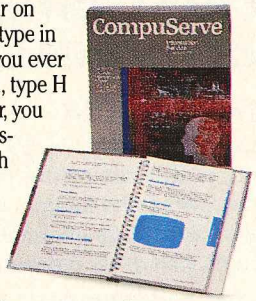

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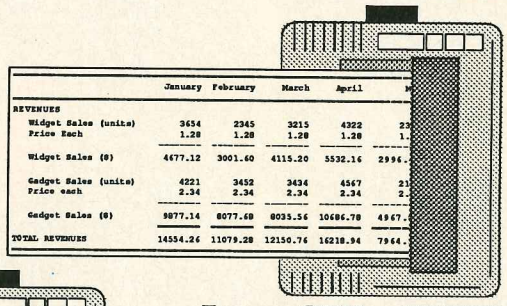

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REVENUES				
Widget Sales (units)	3654	2345	3215	4322
Price Each	1.28	1.28	1.28	1.28
Widget Sales ($)	4677.12	3001.60	4115.20	5532.16
Gadget Sales (units)	4221	3452	3434	4567
Price each	2.34	2.34	2.34	2.34
Gadget Sales ($)	9877.14	8077.68	8035.56	10686.78
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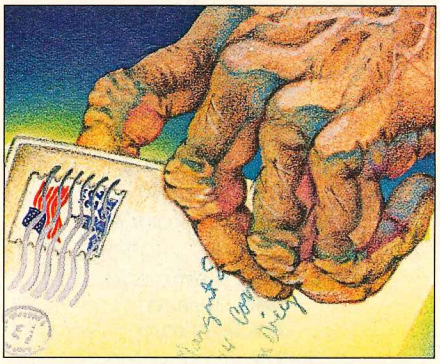

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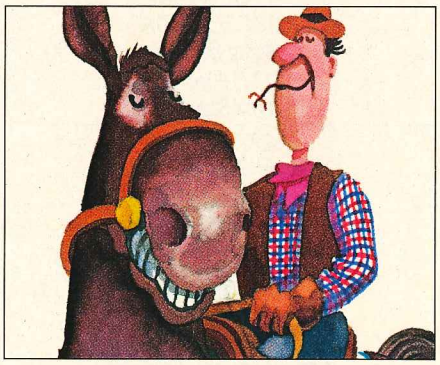
Basics of BASIC 28



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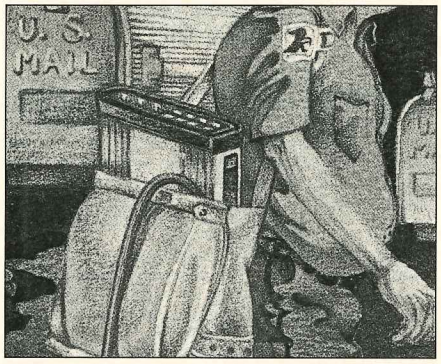

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On the cover:

Artist Mark Smith captures the essence of electronic mail – it's the same old information being delivered in a brand new way. This month's feature article, "Playing Post Office," offers an overview of E-mail services and suggests how to go about choosing a service that's right for you.

Editors' Notes

If heavy correspondence and frustrating games of telephone tag keep you from making the best use of your time, or if you frequently need to disseminate information to a lot of people in a lot of places, electronic mail may be your answer. This month Brock Meeks provides an overview of the E-mail industry, focusing on dedicated E-mail services.

The programming series continues with Jerry Houston's introduction of the bundled BASICs. In part 1, Houston describes the general characteristics of BASIC for the novice programmer. Next month, look for a tutorial on how to write BASIC programs, with emphasis on the ideals of structured programming.

Also for programmers is Isaac Szlechter's article "Copyrighting Computer Programs." If you plan to distribute your work, check this article for vital information on protecting your rights.

dBASE programmers will find practical tips for gaining access to all the capabilities of a dot-matrix printer in Marshall Moseley's article on printer control—"From Stubborn Mule to Workhorse."

Also in this issue is our year-end subject index, a guide to topics covered in *PROFILES* in 1986.

In the MS-DOS version of this issue, look for part 2 of Don and Sharyn Conkeys' tutorial for intermediate users on getting the most out of MS-DOS and for reviews of two programs for the business environment: Javelin, a data analysis program, and Harmony, an integrated business system.

In the CP/M version, you'll find step-by-step instructions for installing a fan in an '84 series Kaypro—a worthwhile and relatively simple task—and, for advanced users, a practical discussion of manipulating the bits in a byte using MBASIC.

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Diane Ingalls

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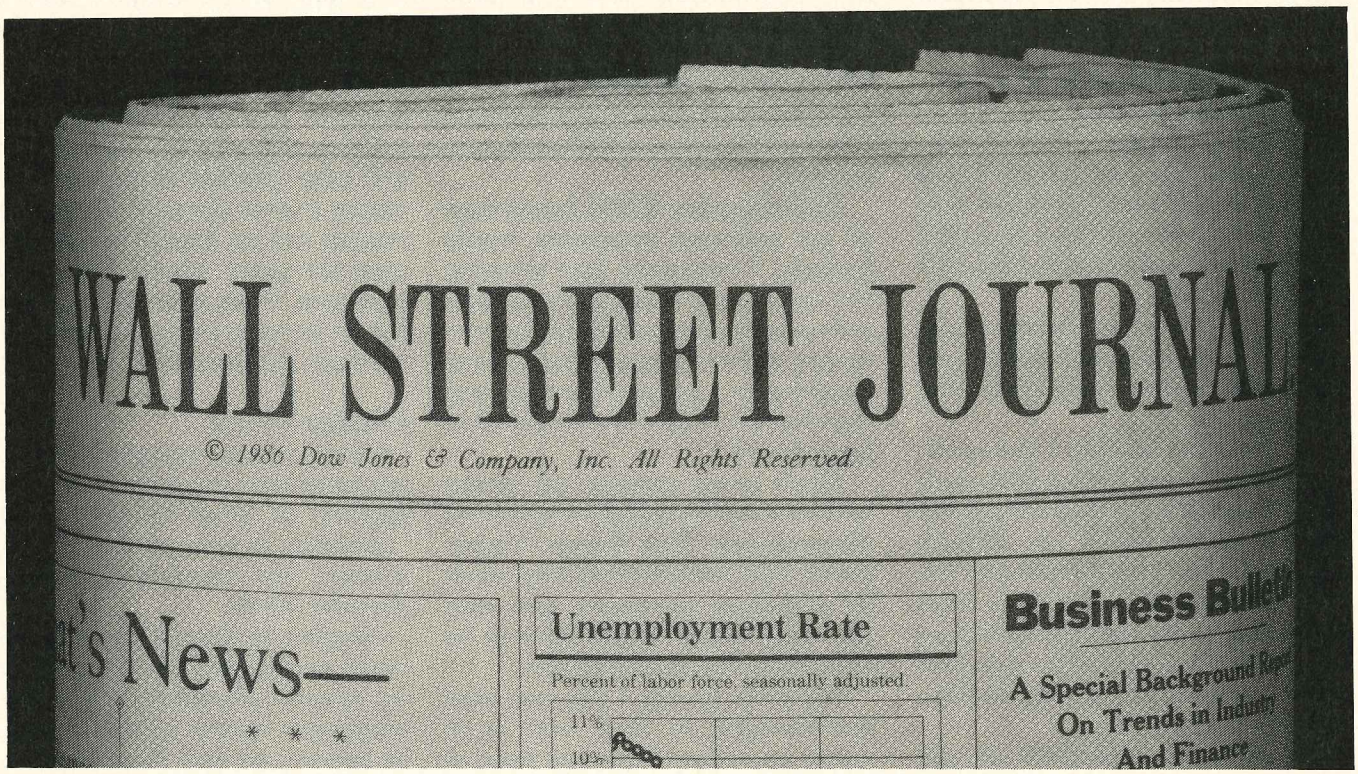

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Letters

Credit where credit's due

PROFILES wishes to offer belated thanks to the Aldus Corporation, whose PageMaker software was used to create the screen images in photos for the December/January article on desktop publishing. These included the cover photo and the photo on page 23.

As good as Wonder Stories

The September issue was full of interesting articles, seductive ads, and useful tips—as usual. I was pleased in particular to learn how to divide one file into two, since the problem had come up for me just a few days earlier.

With a year's experience under my belt now, I find each issue more and more relevant to my expanding interests.

As a matter of fact, I get something of the same feeling with each new *PROFILES* that I used to get in the mid-1940s when my favorite science fiction pulps arrived at the local newsstand—some first class dreaming to do, interesting letters from other readers, and once in a while, something of immediate practical value.

A couple of comments on the September issue: First off, why couldn't Brock Meeks tell us about the costs or charges for using the various online news retrieval systems? And second, could Marshall Moseley explain what a "keyboard macro" is?

Despite these picky questions, I do enjoy *PROFILES* and look forward to every issue. It's every bit as good as Thrilling Wonder Stories!

Norman W. Storer
Manasquan, New Jersey

The charges for using news retrieval systems should have been included—sorry for the oversight. We'll make sure such information is always provided in future columns.

When you assign a whole string of characters—usually a series of commands—to one or two keys via a keyboard redefinition program or by using similar capabilities within other types of programs, you are creating a "macro." Thereafter, you need only hit a key or two to give certain commands, and you save yourself a lot of typing.

Main board repairs

In November 1983, I purchased a Kaypro 4 for a price totaling close to $2,400.

In September 1986 I found none of my software programs would execute. I assumed that possibly the heads were misaligned, or that a thorough cleaning might be necessary, so I took the computer to my local dealer. I learned the following day that the main board needed to be replaced.

Much to my dismay, my dealer told me that the Kaypro 4 had been discontinued, that Kaypro Corporation had not provided any stock for exchange purposes, and that the main board would have to be shipped to Kaypro for repair.

Needless to say, I am not only discouraged to find that such major (monetarily) repairs need to be done, but most of all that no spare board parts have been kept for customer satisfaction—to say nothing of the fact that to date I still do not have a computer at my disposal!

My initial reason for purchasing a Kaypro and recommending them to others was due to my impression that they were a superior product. How disappointed I am.

I wonder if other Kaypro 4 owners could be contacted to establish whether they, too, have had similar experiences? Perhaps the ratings for Kaypro computers should include a column on repair and maintenance.

Rosalie H. Mechanic
Santa Cruz, California

Unfortunately, there's nothing PROFILES can do to alleviate your frustration. The problem you describe was addressed last month in "Q & A," but since it is of concern to a fair number of our readers, the information bears repeating.

If you own a Kaypro 2'83 or 4'83 and you have a problem with your main board, your dealer will have to send your machine to Solana Beach, California, for repairs. (Kaypro supplies its dealers with proper shipping materials.) This is because these main boards are no longer being made and therefore cannot simply be replaced. They must be repaired. Other parts are readily available through Kaypro dealers.

Disappointed

I was extremely disappointed, as I am sure many others were, with the quality of your recent article, "Learning to Recognize the Landmarks," by Thomas E. Wagner (October 1986).

Wagner is described as a freelance consultant with experience on several machines and several languages. Maybe so, but I suggest he bone up on his C language. Several serious, basic errors are contained in this article.

In the discussion of assignment statements on page 39, Figure 2, two statements are in question. The statement **string= 'Let it be';** is an outright error and will not compile. Strings must be contained in double quotes in C. The statement above that is also in error. The reader is led to believe the statement **sum = alpha++;** stores "alpha + 1" into sum. This is not true. What actually happens is this (assume alpha has value 1 upon reaching this code):

1.) The value of alpha (1) is assigned to sum.

2.) The value of alpha is then incremented by 1; thus alpha is 2.

This is about as far from what the article states as one can get. The key is that "++" is used in

POSTFIX form. Thus the increment will occur *after* the assignment. Using the PREFIX form of the "++" operator is not the fix. It will succeed in getting the value 2 (in my example) assigned to sum, but alpha will also be incremented to 2—something the author clearly does not intend from his other language examples.

On page 41, Figure 5, the decision statement

```
if dead
    move = sink;
```

is also in error if "dead" is declared as a variable (not a define, for example). "If" statements in C require enclosing parentheses.

Finally, Wagner states on page 43 that in this C "for" loop

```
for(i=0; i<flock; ++i)
    printf("%d Sheeps . . . \n,i);
```

"first the counter, i, is initialized (set) to zero; then the counter is tested to see if it is out of bounds; and finally, one is added to the counter *before the statements in the loop are executed.*"

There are no two ways about it; this is wrong. The counter is incremented (logically) at the bottom of the loop. This makes a tremendous difference, since the reader is misled as to the value of "i" within the loop. The given loop will not print the values 1 through 10 for "i" as Wagner suggests, but rather the values 0 through 9.

I realize the author prepended a note to the article stating that the code segments given were not intended to actually run, and that different implementations of languages exist, but the errors here are not explainable as "implementation differences." They are errors.

Please do not insult your readers with such poorly prepared articles in the future. I also respectfully suggest that Wagner become well versed in a language before trying to publish an article discussing same.

John T. Pearson
Lubbock, Texas

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Tom Wagner replies: Mr. Pearson seems to have confused an article on basic programming concepts with some sort of C tutorial, but I can only thank him for his valid criticisms of the article's examples written in C.

Concerning the string constant assignment **string = 'Let it be';** *and the* **if dead move = sink;** *substatement, I'm guilty as charged. Single quotes are used to signal* character *constants, such as 'A', with double quotes reserved for string constant expressions. This is firmly inline with Kernighan and Ritchie's definition of the language and most compiler implementations, as is the requirement for parentheses surrounding expressions in decision statements. I should have proofread the figures more carefully.*

The pre-postfix clarification would also be valid if this had in fact been a C tutorial. What I was attempting to illustrate with those examples, however, was the concept of assignment, *not incrementation. I said, in the original manuscript, "In the C example, a shorthand for 'plus one,' ++, is shown," thus skirting the extra 200 to 500 words explaining pre-post incrementation.* PROFILES *impulse to clarify was a good one, but unfortunately the clarification did not match the example, and I failed to catch the error in my proofreading of the text in final draft.*

My proofreading failed us again in the C "for" loop example. My original gloss was correct. It read: "In the C FOR loop, all the action is between the parentheses. First the counter, i, is initialized to zero; then a test can be specified (this optional specification turns the FOR loop into a kind of limited UNTIL loop); and finally, one is added to the counter for the next pass through the loop."

I simply failed to compare the edited text closely with the figures. I thank Mr. Pearson for his vigilance and would gently remind him that the illustrations were intended to emphasize the similarities between higher level languages, not point up their differences.

PROFILES *adds its apologies both to Wagner and our readers for errors introduced in the editing of this article.*

A bit on MTBASIC

I would like to comment on MTBASIC, the compiled BASIC that provides multi-tasking and windows on CP/M machines ("Multi-Tasking Software," August 1986).

The heart of MTBASIC is two novel features: multi-tasking and windowing. It is important to stress that these are independent features. Multi-tasking may be done with different tasks in different windows, but that is not necessary. And windowing alone is useful in screen design—e.g., status lines or game boards. I suspect that many will find windowing to be the more useful feature. In any case, the newcomer to MTBASIC can—and probably should—explore these new features one at a time.

Robert Bruner
El Cerrito, California

Expanding old vs. buying new

I don't want to abandon my Kaypro 4'84, I want to expand it! I would love to install a 20 megabyte hard disk and forget about swapping floppies forever. Advanced Concepts, Advent, and Emerald offer just what I want in their ads in *PROFILES*—but not at a price that seems reasonable.

I have enclosed seven ads for MS-DOS hard disks from *BYTE*, along with three ads for CP/M hard disks from *PROFILES*. A glance at the difference between them is instructive: the ads in *BYTE* prominently display the system price; the *PROFILES* ads barely mention them.

The actual prices are just as enlightening. A 20-MB system for a PC is about $400. The system for a CP/M Kaypro costs about $1,000. The hard drives are the same for either system, as is the OEM price. The controller boards are no more complex for CP/M, although lower volume may result in higher production costs. On the whole, I judge that there should be little price difference between the two systems.

Nonetheless, CP/M hard disk prices are two and a half times the MS-DOS prices. The fact that I can buy a new IBM clone, including a hard disk, for the same price as a hard disk upgrade for my old workhorse is one of the strongest reasons to retire the old 8-bit Kaypro and move up to a 16-bit machine.

I would buy a hard disk upgrade for my Kaypro at a competitive price. The current prices are so high that I may buy a new PC instead. If that happens, I will no longer be a potential customer for a RAM disk, software, or any CP/M products at all.

Thomas L. Adams
Saudi Arabia

Volume has everything to do with the pricing of hard drives—the more you sell, the less you have to charge. The outlets selling CP/M drives cannot buy in anywhere near the volume that outlets for DOS products do. Therefore they pay much more for the product. Hard disk controller boards for CP/M are more expensive to produce. System software to drive the hard disk is not as standardized for the CP/M environment, which means it is also more expensive.

Of course, there are other factors to weigh in deciding whether to switch to a PC—such as the need to invest in new DOS software and to learn a new operating system versus the flexibility of DOS machines and the fact that most new software is being written for DOS. Your particular needs must dictate your decision.

Q&A

by Marshall L. Moseley

Screen problems

When I use any of the EDIT or MODIFY commands with my 2.3b version of dBASE II, the cursor always appears two spaces to the left of where it should be. And also, any changes made at the cursor position affect the position two spaces to the right, which makes editing quite troublesome.

In addition, when I use MODIFY COMMAND, the editing screen comes up with a bunch of commas on the left side of the screen. Because I use this screen, the commas do get in the way.

Do you know of any way to cure or circumvent these problems?

Roger Robison
Salt Lake City, Utah

It appears that you have not installed your version of dBASE for your type of video display—that is, configured it for your specific system.

There should be a program on your dBASE master disk called INSTALL.COM, and the documentation for it should be in your dBASE manual. Copy this program to your dBASE working disk and run it. The first menu is for terminal (video display) installation. Kaypro does not appear on the list of terminals, so choose the ADM-3A. (The video command set on Kaypro CP/M computers is based on the ADM-3A command set.)

Running The Word Plus

I am the owner of a Kaypro 4'84. Is it possible to change the S option in WordStar to run The Word Plus spelling checker? I have searched through back issues and cannot find a patch to do this.

Glen Thompson
Schaumburg, Illinois

There is a patch to do what you want, though it does not allow The Word Plus to use any user-defined dictionaries. First, format a disk and place WordStar, The Word Plus, and DDT.COM on it (always make patches on a test disk first). In these instructions, what appears on the screen is in regular type, and what you enter in boldface. Since you have a Kaypro 4'84, I will assume that you have WordStar version 3.3. From the A0> prompt:

```
A0>DDT WSOVLY1.OVR
DDT VERS 2.2
NEXT PC
8400 0100
— S2817
2817 53 54
2818 50 57
2819 45 20
281A 4C 20
281B 53 20
281C 54 20
281D 41 20
281E 52 20
281F 4F 43
2820 56 4F
2821 52 4D
2822 00 .
— G0 ("G" zero)
A0>SAVE 132 WSOVLY1.OVR
```

For WordStar version 3.0:

```
A0>DDT WSOVLY1.OVR
DDT VERS 2.2
NEXT PC
8400 0100
— S2814
2814 53 54
2815 50 57
2816 45 20
2817 4C 20
2818 53 20
2819 54 20
281A 41 20
281B 52 20
281C 4F 43
281D 56 4F
281E 52 4D
281F 00 .
— G0 ("G" zero)
A0>SAVE 136 WSOVLY1.OVR
```

File transfers

I am thinking of buying the Kaypro 2000 or some other portable computer. Will I be able to send WordStar files between the portable and my Kaypro 4'84? If so, how easy will it be and what will I need?

Edward K. Eckert
Saint Bonaventure, New York

The Kaypro 2000 and 4'84 use different operating systems, have different disk formats, and even use different types of disks. All these facts would seem to preclude file transfers between the two computers. Fortunately, the Kaypro 2000 and 4'84 share some characteristics—they both have RS-232C serial ports and they both have been sold with telecommunications programs.

You can connect the two serial ports using a null modem cable, which is a cable specifically designed for computer-to-computer communications, rather than for telecommunications.

Kaypro does not sell a cable to connect your two machines. However, you can have one made for between $25 and $50. Your dealer can probably make one; if not, look in the yellow pages under computer accessories. You will have to provide whoever manufactures the cable with the serial port pin assignments for each computer. You can find the pin assignments in the back of your Kaypro User's Guide.

Once you have a cable connecting the computers, you must run telecommunications programs on both systems, making sure that the internal settings of both

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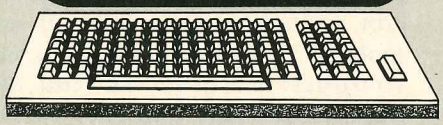

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The internal modem

Is the Kaypro 4'84 internal modem Hayes compatible? Also, what is the port address of the modem? I want to know because I want to use Write-Hand-Man as a phone dialer, and it needs to know the port address.

George W. Richards
Rochester, New York

The Kaypro internal modem is not Hayes compatible. I do not know if you can use Write-Hand-Man to dial the modem, but I doubt it. The only software I know of that works with the internal modem is the version of MITE bundled with the 4'84, 10 and Robie. If you want software to dial the modem, you may have to write it yourself.

The Kaypro internal modem uses a Texas Instruments dual tone and pulse dialer and the TI single-chip modem (chip numbers TMS99531 and TMS99532, respectively). Both of these chips are accessed through the Zilog Z-80 PIO and SIO chips (chip numbers 3881 and 3884).

Translation: Programming for this modem is hard. *It requires that you use assembly language and that you have the technical specifications for the dialer, the modem, and the PIO and the SIO chips. These specifications are available through Texas Instruments and Zilog.*

With that in mind, here are the port addresses for the internal modem, along with their functions.

Port Address	Device	Function
0D	ZSIO 2 CHAN.B	Modem Data I/O (this is the address you wanted)
0F	ZSIO 2 CHAN.B	Modem status control I/O
21	PIO CHAN.B	Modem control lines, with the bit functions described below
23	PIO CHAN.B	Modem PIO control port

Bit Functions

0 1sb digit to dial (output)
1 1sb digit to dial (output)
2 1sb digit to dial (output)
3 msb digit to dial (output)
4 0=touch tone
1=pulse dial
5 0=not loop back (test mode)
6 0=off hook (on line)
7 1=digit present to dialer chip not BSTROBE input present next digit from dialer chip

Where do I find it?

In the November 1986 issue of *PROFILES*, in "Flea Market," Ted Silveira mentioned several items that I am interested in, but he failed to state where they could be obtained. Among them were the programs PARKER, TIMPARK1, WHEREIZ and SCRNSAVE. Could you tell me who manufactures these items and where I can find them?

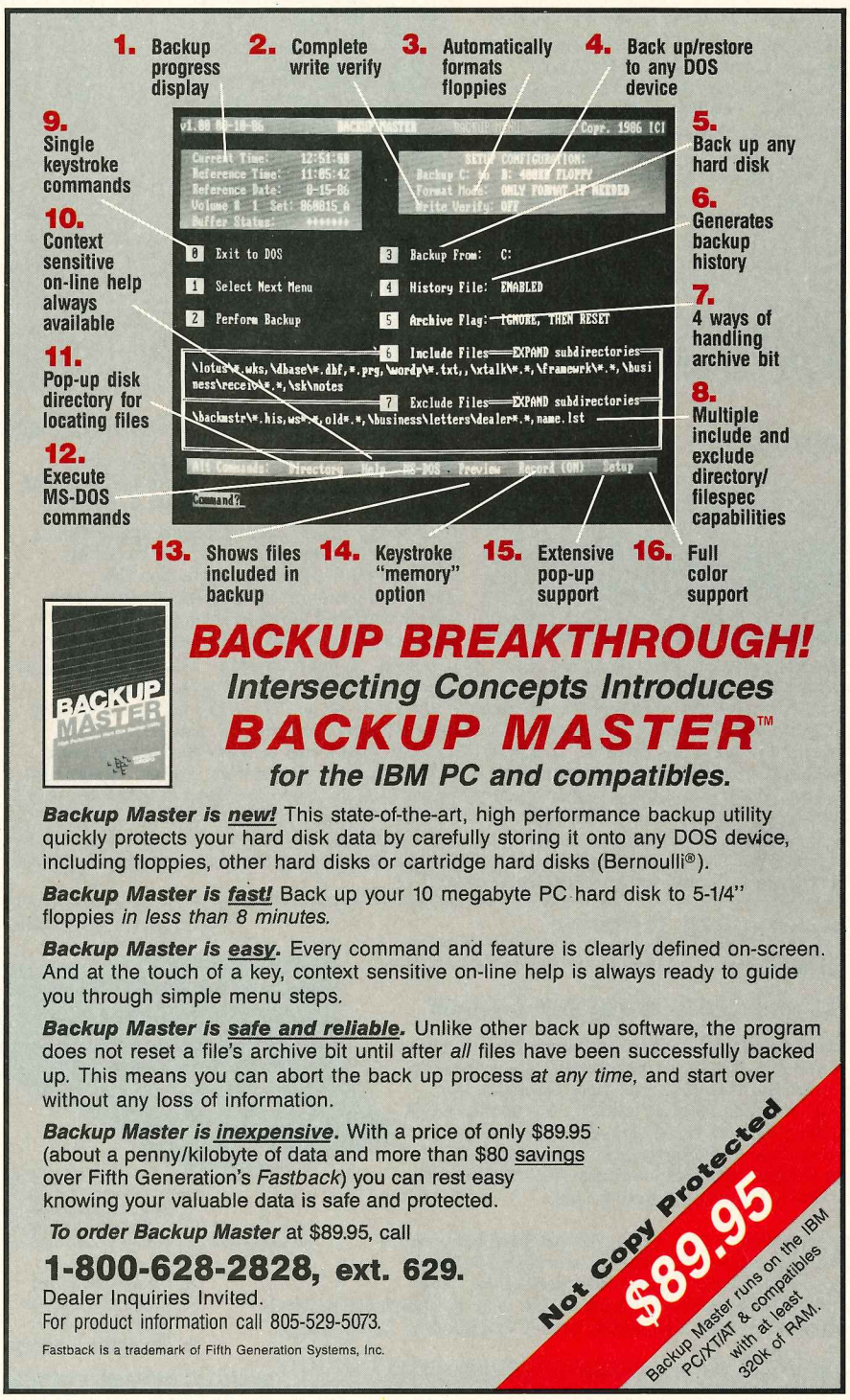
Banner C. Segraves III
Dover, Delaware

The only item Ted Silveira mentioned, other than programs you have named, was the Mini-Winnie hard disk. The Mini-Winnie is available from Advanced Concepts Engineering and Consulting, 8926 S.W. 17th Street, Boca Raton Florida 33433. To order call (305) 482-7302.

The programs you mentioned are free; if you can find them you can use them. They may or may not be copyrighted. For more information see "Copyrighting Computer Programs" in this issue.

The most common way to acquire public domain software is to link your computer to an RBBS via modem.

The KUG ROS (Kaypro Users Group Remote Operating System) bulletin board has an entire section devoted exclusively to public domain programs mentioned in PROFILES. *You can contact KUG ROS at (619) 259-4437.*



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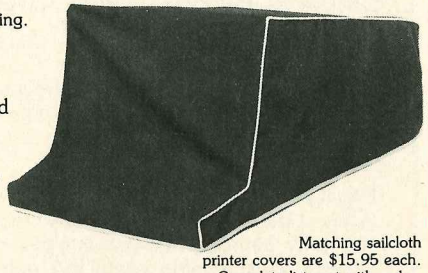

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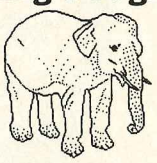

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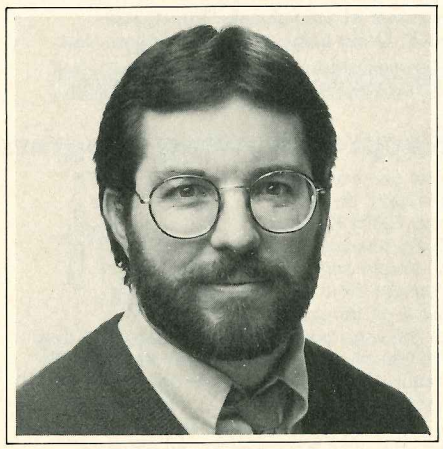

by Brock N. Meeks

A look at two conferencing systems

Every day more people are using computer conferencing systems, a component of many bulletin boards and online services. Each system has its own personality, derived from the interests of the people who use it. The personality of a system focused on software development will differ greatly from a system dedicated to nuclear disarmament.

This month we'll look at two conferencing systems with distinct personalities. The first system, based in the San Francisco Bay Area, is a regional network, meaning that it draws its users largely from a single metropolitan area. The second system is somewhat like CompuServe—it draws its users from all corners of the globe.

Going to the WELL

The Whole Earth 'Lectronic Link (WELL) is sponsored by the Point Foundation and Network Technologies, Inc., which publishes the *Whole Earth Review* (WER). WER covers topics as diverse as the war in Nicaragua, satellite communications, and software reviews. Its electronic counterpart, the WELL, is just as diverse.

John Coate is assistant sysop of the WELL and self-proclaimed "glad-hander" of the system. Coate says, "The basic intent of the WELL is to provide a place, a forum if you will, where people can come together online—meet online and discuss what's important to them.

"People use the WELL to discuss technical stuff, like computers, but mostly we find people discussing what's important in their lives. It's like the WELL is becoming a refuge for the intellectually hungry."

There are more than 100 conferences, which fall into three larger categories: the "real world," computers, and the WELL itself.

In the "real world" are conferences with titles as diverse as Earthstewards, True Confessions, The Corner Pub, and Sexuality. This part of the WELL is the most active. It's where people discuss their favorite topic: themselves—their lives, loves, work, play—and all with unflinching candor.

In the computer category of the WELL are conferences for several computer systems, including Kaypros. In addition, there are also conferences dedicated to computer-related topics. These include programming languages (Forth, UNIX), computer graphics, and telecommunications, to name a few.

The third category contains files related to the general workings of the WELL. Here you'll find system news, help files, and online manuals describing each of the WELL's different commands.

The software that drives the WELL is called PicoSpan. It was developed to take advantage of the UNIX operating system. PicoSpan, although easy to use at the basic level, becomes difficult because the more advanced features require some knowledge of UNIX commands. You can find documentation for these advanced features in the Help section. Be warned, UNIX commands are not for the weak-hearted.

In addition to computer conferencing, the WELL provides electronic mail (E-mail) and real-time computer conferencing. Real-time conferencing allows a group of people who are online at the same time to type messages to each other. Every comment entered from your keyboard can be seen by all others participating in the same real-time conference. (This is like CompuServe's CB Simulator.)

The WELL allows any business, non-profit organization, or private group to form private conferences. These private conferences are conducted on an "invitation only" basis and are not available to the general public. For example, the Sierra Club runs a private conference to provide online information for club members who own computers and modems.

The WELL resides on a VAX 750 computer and can handle 17 users simultaneously. To reach it you can make a long-distance phone call, access your local Telenet node, or use Telenet's PC Pursuit phone network (for more information on PC Pursuit, call 800/368-4215).

Costs for the WELL are $8 a month and $3 an hour for 300/1200/2400 baud rates, for all hours

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of the day. If you use Telenet there is an additional charge of $4 an hour, making it $7 an hour for non-prime time hours (between 6 p.m. and 7 a.m. and on weekends). It's an additional $20 per hour for prime time. All billing for the WELL is handled via MasterCard or Visa.

To sign up, call (415) 332-6106 for 300/1200 baud modems, or (415) 332-7404 for 2400 baud modems, and follow the prompts. At the Telenet "@" prompt enter **c well**. For voice information call (415) 332-4335.

Byte on the bitstream

The Byte Information Exchange (BIX) is the electronic extension of *BYTE* magazine. Sponsored by *BYTE*'s publisher, McGraw-Hill, BIX provides high-quality technical information on all computer-related topics. BIX offers computer conferencing, program uploading/downloading, and E-mail.

According to Doug Webster, marketing director for BIX, the system provides a forum where microcomputer enthusiasts can come together in focused online discussions. "People can exchange opinions, ideas, and information with each other and with *BYTE* staff members," he said.

In the computer conferences you can discuss any kind of computer system, operating system, or computer-related topic. In addition, *BYTE* columnists moderate their own conferences with BIX users.

The technical conferences often draw the top names in the industry. In the Apple conference, for example, you have access to members of Apple's new GS computer design team. Both the designers of the computer and independent software developers are available to answer questions and defend their system design. The Kaypro conference is moderated by former *PROFILES* editor Tyler Sperry. Each Kaypro system is discussed on BIX, from CP/M to the Kaypro 2000.

BIX is primarily a technical forum, but it also carries non-computer-related conferences. A sampling of topics includes Soviets, Food, Cats, Space, and Computers and the Government.

Real-time conferencing is not available, but it's on the way. "Right now we don't have the hardware to support real-time conferencing," Bond said. "However, we've taken in over 20 proposals for a hardware upgrade, and real-time conferencing is one of the first new features we'll offer."

BIX, which is available through the Tymnet packet-switched network, draws users from all over the world. (People living in Chicago, San Francisco, Los Angeles, and Boston can reach BIX via a local phone number.) On BIX I've discussed telecommunications with folks from England, politics with an administrator from South Africa, and beer with a bloke from Australia.

Besides the conferences, BIX also has an extensive public domain software library to draw from (or add to). Programs are available for several different types of computer systems. In addition, programs published in *BYTE* each month are placed in the library. Bond says this library, called Listings, is the most-used feature on BIX. (BYTEnet, *BYTE*'s bulletin board, is still in operation and provides these programs as well. You can reach the BBS at 617/861-9764; 300/1200 baud. There is no fee for using BYTEnet.)

Among the most popular conferences on BIX is Microbytes. Here you can access the latest microcomputer industry news. Microbytes provides both short news stories and feature articles.

The E-mail function on BIX is adequate, at best. The editor is UNIX-based and clumsy to use. Although you can send messages to other BIX users, you cannot send messages to any outside E-mail service.

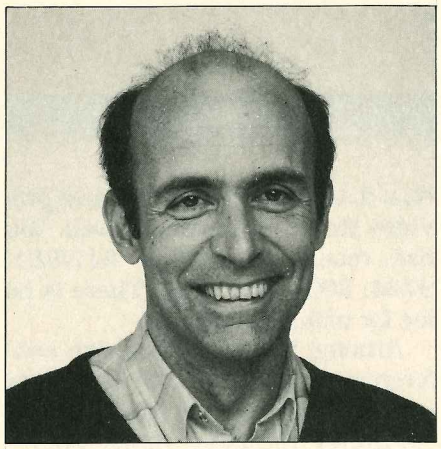
The writers' conference should interest many Kaypro owners. This conference is split into two main sections—one for beginners and one for professionals.

BIX runs on an Arete computer and can handle 80 users simultaneously. It will soon be able to handle 120. BIX is expected to have more than 12,000 users by the end of this month.

BIX charges are handled either by Visa or MasterCard. A subscription costs $25 (a one-time registration fee); charges are $12 an hour during prime time (7 a.m. to 6 p.m.) and $9 an hour in non-prime time. Online time during weekends and holidays (24 hours a day) is billed at non-prime rates. If you call BIX using Tymnet, you incur a surcharge of $6 an hour during prime time and $2 an hour during non-prime hours. These rates apply for the contiguous 48 states only. Rates for areas outside this region differ.

For more information on BIX, call (603) 924-9281.

Flea Market



by Ted Silveira

Winter games

Though computer games are big sellers on many computers, they've always been scarce in CP/M. The problem is graphics—it's hard to produce arcade-style games when all you've got to work with are simple block graphics or, worse yet, just the standard ASCII letters, numbers, and punctuation marks.

However, the lack of good graphics hasn't completely deterred all game programmers. Most of you got at least two arcade-style games, Ladder and Catchum, with your Kaypros, and there are others. Here's what the public domain has to offer in the way of game software.

Arcade games

Ladup. If you like Ladder, the Donkey Kong™ takeoff that came with many Kaypros, but you've mastered all of its screens, you'll be happy to have Ladup, a set of files that adds seven new screens to your copy of Ladder. Some are even tougher than those in the original game, so plan on wasting many more hours at the keyboard with this one.

Aliens. This game is a CP/M version of Space Invaders™, one of the first big video arcade games. As the game begins, rows of menacing extraterrestrial aliens march toward you, blinking their eyes and flapping their wings. You dodge left and right with your laser cannon, shooting down aliens and ducking behind protective barriers when the aliens shoot back. If any of them land, it's all over for you.

Aliens has six variations, each more difficult than the preceding one. In games 1 and 2, the aliens can't shoot back, so they're sitting ducks for your laser. In game 3, the aliens can shoot back, so you have to dodge their lasers or hide behind the barriers. In game 4, the aliens are invisible; in game 5, both the aliens and your protective barriers are invisible; and in game 6, the aliens, the barriers, and your laser are *all* invisible (you call this a game?). Only game 3 is worth playing more than once.

Aliens is a surprisingly good recreation of the original Space Invaders, even though the author had to use Xs, Os, Ms, and other characters to create the invaders. But if you're any kind of a game player, Aliens won't hold your attention for long—arcade games have evolved far beyond the static, shoot-'em-up style of Space Invaders. Still, it's worth getting just as a sample of some programmer's ingenuity.

Mchase. This is another maze game, a cross between Ladder and Catchum (or Donkey Kong and Pac-Man™, if you prefer). In this game, you run through a maze collecting pomegranates (no, I don't know why) while dodging or jumping over the native inhabitants, who may be asleep, lethargic, frightened, or aggressive (especially if you wake them up).

As in Ladder, you start a maze with a certain number of points. You gain points for every pomegranate you pick up before you reach the exit, but you also lose points for the time you spend in the maze. As you exit each maze, you move into a new one, with a new pattern and a new set of inhabitants, who will behave differently from the last set. In the Bizarre Bazaar maze, for example, almost everyone's asleep when you start, and those who aren't have clearly just woken up. But as you go dashing through the bazaar, grabbing pomegranates and stumbling over the sleepers, some of them wake up and become quite agitated. By the time you make it to the exit, the whole bazaar is a confused mass of people rushing madly about.

I like Mchase quite a bit, as much as Ladder (my other favorite among the arcade games). You need a combination of strategy and dexterity to win, and there are enough different mazes to keep you interested for quite a while. (You can freeze the action to look things over, but that's cheating.)

Frun. Frun is a distant relation of the arcade game Qix™. By moving your cursor around a grid, you try to "paint" a light trail across as much of the screen as possible without colliding with any of the obstacles that suddenly appear at random locations. When you finally run into an obstacle, the

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game ends. Your score is the number of grid squares you have covered.

Frun is almost entirely a game of reflexes and dexterity. I don't find it (or Qix) very interesting, but then I'm not very good at it, either.

Adventure games

Unlike arcade games, adventure games are well-suited to CP/M computers because they don't require any graphics. Instead, an adventure game starts with a description of a place—your current location and the things you see around you. You then move around this new landscape and overcome various obstacles by typing in simple commands—**go north**, **catch bird**, **drop stick**, and so on. An adventure game doesn't require fast reflexes; it's a puzzle for you to solve, and often the central part of the puzzle is figuring out what your goal is. These games are simple to play but addictive.

Adventure. The original adventure game is the near-legendary Adventure™ itself, which started out as an underground game on mainframe computers. The most common version now circulating on microcomputers is the updated 550-point version of Adventure, similar to the original game but with extra treasures and hazards thrown in. This game will keep you busy for weeks. Pay attention to everything you see, make a map as you go, and let the bird deal with the snake.

Survival. In Survival, you find yourself in a wrecked space ship on the moon. There are lots of places to investigate here, including some

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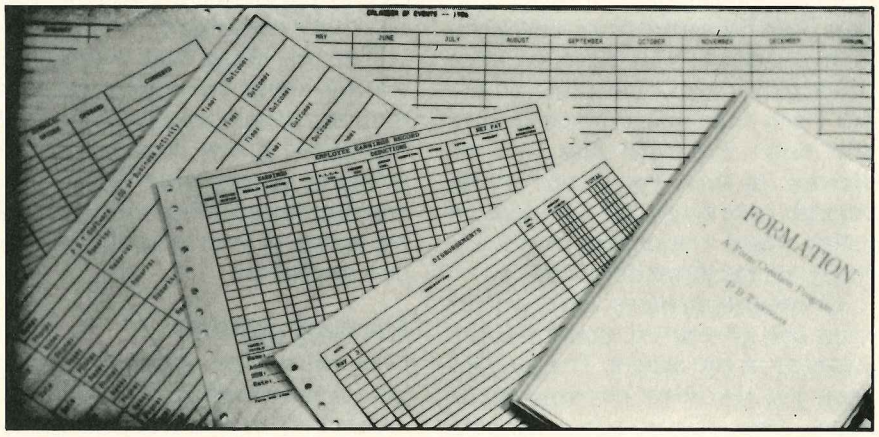

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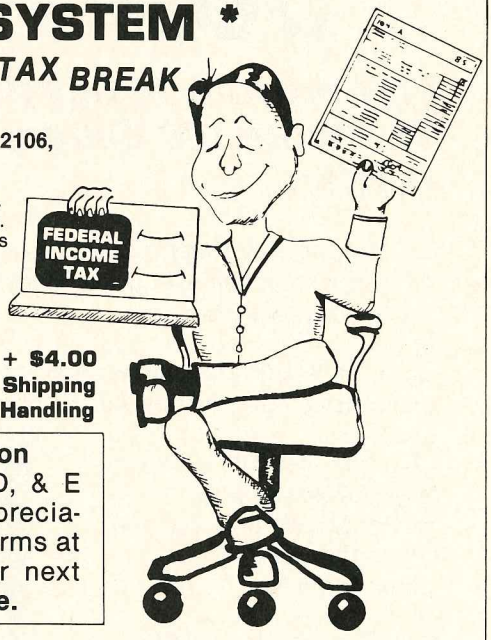

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trackless wastes and a space station. And the game has some interesting twists—you have to keep track of your oxygen (now where did I see that spare bottle?), and you don't have all day to look around. In fact, you've got barely enough time to get off the moon to safety. (And remember, there are really six cardinal directions.)

Other Adventures. Once you've tried one adventure, you'll see the patterns in the others. The puzzles vary, but the basic strategy is the same. Two of my other favorite adventure games are LostGold, which drops you off near an abandoned gold mine, and DogStar, which leaves you on an enemy space ship.

All four of these games play pretty well, though the toughest, by far, is Adventure itself. Survival, LostGold, and DogStar are all written in MBASIC, so you can modify them after you've solved them. (You can also peek inside them for clues, but that's cheating.)

The one thing that can be frustrating about adventure games is their limited vocabulary. They only recognize a few words and will refuse to do anything until you hit one they know. If *leap* doesn't work, try *jump*; if *take* doesn't work, try *get*, and so on.

Strategy games

Like adventure games, strategy games have nothing to do with the "real-time" action of arcade games. Instead, they're usually adapted from classic board games and call for good planning rather than good reflexes.

ZChess. I'm not a chess player, by any means, but ZChess seems to me to be a well-done game. It lets you play either white or black and updates the board positions after every move. You can also set the number of plays (from one to six) the computer is allowed to look ahead when it figures its moves. With a one-move look-ahead, it took ZChess about five seconds to make each move and thrashed me soundly. With a six-move look-ahead, ZChess still hadn't made its first move after 30 minutes—I didn't have the patience to find out whether the program was hung up in some endless loop or just slow. I imagine that a good human chess player could beat ZChess handily, though with a six move look-ahead, the human might die of boredom first.

Othello. Othello is a good computer version of the Othello™ board game (sometimes called Reversi). It's a deceptively simple game, played on a board marked into squares, that involves placing markers to capture territory. If you block a line of your opponent's markers at each end, the captured pieces become yours (they are

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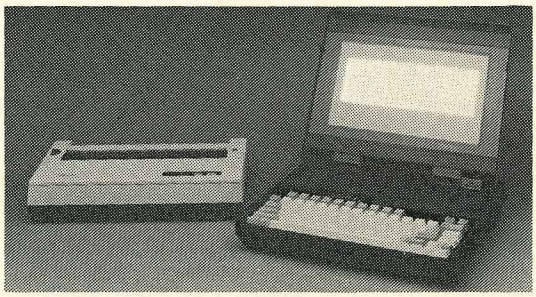

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flipped over to reveal your color—hence the name Reversi). The program also allows you to give a one to four chip handicap either to yourself or to the computer.

There is no documentation with the game, but even if you haven't played it before, you can figure out the rules easily enough (though the computer will make mincemeat of you while you do). I can't evaluate Othello's level of play because I'm no more of an Othello player than a chess player, but it's at least a talented novice and possibly better.

The MS-DOS corner—pinball

After the ruthless beatings I took from ZChess and Othello, you might think I'm not much of a game player. Not true—it's just that my real game is pinball. I prefer playing on a real-life Gottleib or Bally or Williams pinball machine, but computer pinball will do in a pinch. And in MS-DOS, I found just what the doctor ordered.

ECABall. ECABall (from the ECA-Net bulletin board at 818/896-7450) has some nice touches. Its balls and bumpers seem to have the most realistic action. And it doesn't suffer from the kind of point inflation many other pinball games do, in which a single hit immediately puts you in six figures.

However, ECABall also has a frustrating weakness—there are too many bumpers and not enough scoring targets. In fact, there's only one bank of four targets, while the rest of the table is filled up with nine bumpers. The result is that 1) I got bored trying to score points, and 2) the nine bumpers zinged the ball around so much that I often had the ball run out without ever having the chance to lay a flipper on it.

Blaster. Master Blaster has a good selection of targets, rollovers, and bumpers. So, although the ball action is not quite as realistic as in ECABall, the game plays somewhat better because there's more you can do (and hence, more skill involved). However, it only has one side runout (exit lane through which you lose your ball), instead of one on each side of the table as most real machines have. As a result, it's too easy to keep the ball in play. Still, the game's not bad.

ABlast. A step up is Advanced Master Blaster. It uses almost the same table layout as Master Blaster, but adds a few tricks, including a second set of flippers in the upper part of the table and a multi-ball trap that captures three balls and then releases them all at once. These extras make for an exciting game, and scores tend to run high (it's not hard to break 1,000,000).

Like Master Blaster, Advanced Master Blaster doesn't have quite the realistic ball action that ECABall does. It's also too easy to get the

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balls into the multi-ball trap and too hard to lose the ball down the runout. And I have the feeling that a couple of times I got extra balls without deserving them or got switched from Player 1 to Player 2 in the middle of a run. (I can't be absolutely sure, though—I was busy.)

Rain. Rain launches four balls at once, one shot from the plunger and three dropped from the top of the table. Like ECABall, Rain has a runout on each side of the table, and the ball motion is fairly realistic, though it has a slight slow-motion feel to it (some real pinball tables play that way, though). In addition, Rain has four multi-ball traps, so you can get many, many balls going at once.

Rain's problem is its table layout—there are notable dead spots on the table where nothing happens, and too many of the targets, ball traps, etc., are placed so that you can only hit them by accident (caroming off a bumper, for example), which removes some skill from the game. With a little tinkering, Rain could be an excellent game.

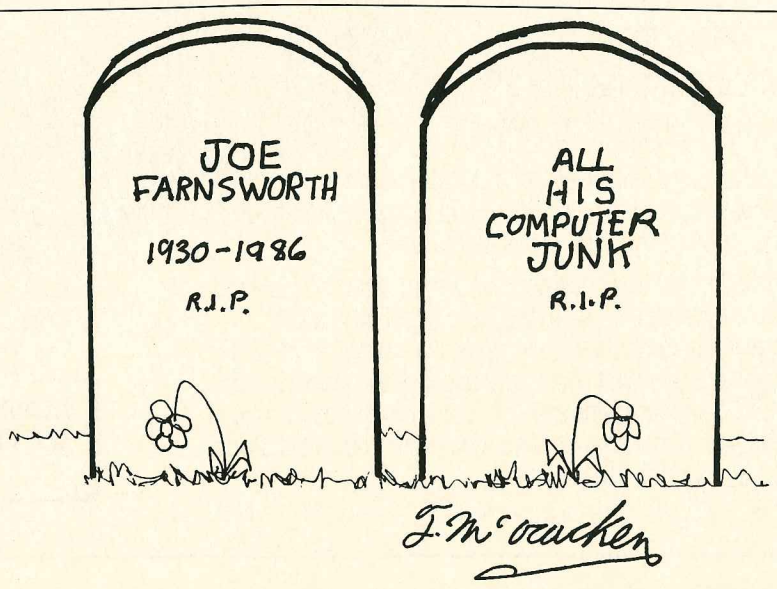
Twilight Zone. Twilight Zone has not only upper and lower sets of flippers but also a ghostly third set in a separate playing field. And it has no side runouts at all; instead there's an absolutely deadly "black hole" in the lower part of the playing field—stay away from it.

Twilight Zone has a reasonable set of targets (though the bonus multiplier is too hard to get at) and a multi-ball trap, and it launches two balls at once. Like Advanced Master Blaster and Rain, Twilight Zone frequently has you slapping four, five, or even six balls around the table at once.

All these games share weaknesses you expect from a computer simulation of a real pinball game. Ball collisions aren't realistic—the balls tend to travel together instead of caroming off one another. Balls occasionally fall through apparently solid flippers. And of course, there's no way to bump the table to nudge a ball into the right spot.

All five games are intended for a color graphics board and color monitor. I ran them using Kaypro's half-length multi-video card and a monochrome monitor in the color emulation mode that renders different colors as shades of green—they worked fine, though I had to adjust the vertical hold on my monitor at first. If you have one of the Kaypro PCs with a turbo switch, all five games will also run at 8 Mhz, though you need *good* reflexes to play at that speed.

All the CP/M and MS-DOS games I've mentioned here can be found on Kaypro's KUG ROS bulletin board at (619) 259-4437. Have some fun.



Kaypro 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. Kaypro User Groups (KUGs) exist in every state, in Canada, and in countries all over the world.

All officially recognized KUGs are recorded in a data base. These groups receive informational mailings and have access to KUG support programs offered by Kaypro Corporation. They also receive *ONKUG*, The Official Newsdiskette of Kaypro User Groups, compiled by Fred Zuill, KUG Manager.

Finding your KUG

To find the KUG closest to you, write to Fred Zuill, KUG Manager, at Kaypro Corporation, 533 Stevens Ave., Solana Beach, CA 92075; (619) 481-4368 (voice). Be sure to include your zip code. He will send you a list of the KUGs in your immediate area.

KUG ROS—a BBS

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 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.

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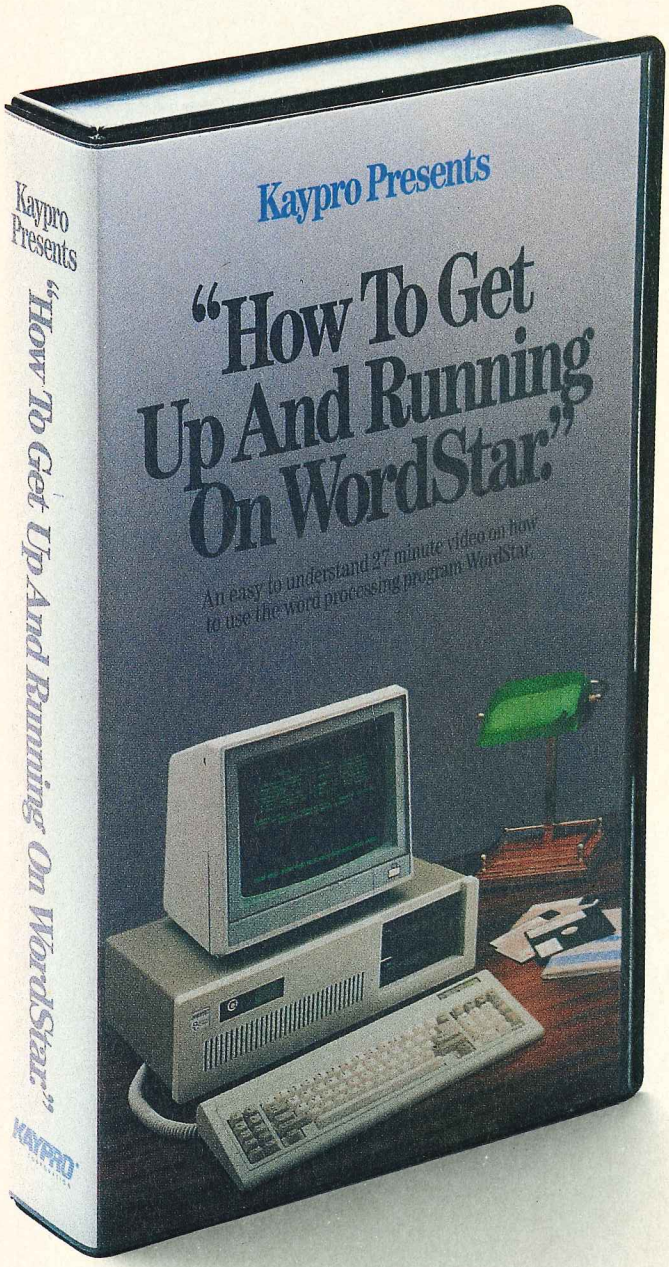

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Playing Post Office

An introduction to electronic mail services

by Brock N. Meeks

In 1959, U.S. Postmaster General Arthur E. Summerfield said, "Before man reaches the moon, your mail will be delivered from New York to California, to India, or to Australia by guided missiles. We stand on the threshold of rocket mail." Events haven't worked out quite as Summerfield predicted, but he was right about two things: the mail service of the future would be fast, and it would use high technology. The mail service of the future—electronic mail—is here today.

Electronic mail (E-mail), at its most basic, is the transfer of an electronic message from one person to another via computer and modem. These electronic messages are stored on a centralized computer, in a private "electronic mailbox" that you can open at your convenience.

These electronic mailboxes exist on several types of systems:

- Bulletin boards: Most bulletin boards have an E-mail function that allows one-to-one correspondence with other users.
- Dedicated E-mail services: The most prominent of these are Telemail, OnTyme, MCI Mail, AT&T Mail, EasyLink, ECHO, Quik-Com, and MAIL. These services specialize in E-mail and may offer both hardcopy and electronic delivery. Many offer international service.
- Information utilities: Several of the large commercial information utilities offer E-mail services. These include CompuServe's EasyPlex and The Source's SourceMail.

This article will focus on the dedicated E-mail services.

Into the 21st Century

Industry analysts have called E-mail the 21st Century version of today's telex. Michael Cavanagh, executive director of the Electronic Mail Association (EMA), a Washington, D.C.-based industry group, says of E-mail, "It saves money; it saves time; there's absolutely no doubt that in ten years electronic messages will be a routine part of the way we do business and carry out day-to-day correspondence."

E-mail was first aimed at corporations and large organizations, which generate the most conventional mail. John Houser, director of public relations for MCI Mail, says, "MCI Mail originally wanted to be the 'electronic post office' of the business world." The rest of the E-mail industry had similar aims. Although E-mail hasn't replaced the postal service, it does draw most of its profits (90 percent, according to a study by International Resource Development, an industry research firm) from business users. And it's easy to see why.

A business lives or dies by the information it makes available to its management, employees and customers. Often, the speed at which information is distributed can determine the outcome of a contract bid, labor negotiations, or an internal policy dispute. Using E-mail, all these situations can be handled without gathering large numbers of people in the same space. For example, a company with headquarters in New York could send out a report outlining a new marketing

ILLUSTRATION BY MARK SMITH

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strategy to all its nationwide franchises overnight. The next morning each franchise owner, reading his or her electronic mail, would learn about the new corporate policy. Wendy's, the hamburger chain, uses an E-mail system for this purpose.

Many corporations also use internal E-mail systems, allowing branch offices to communicate with each other. Hewlett-Packard, for example, uses E-mail in each of its nationwide offices to distribute corporate memos. In addition, engineers working on similar projects in different parts of the country can correspond with each other without the frustrations of playing "telephone tag."

EMA's Cavanagh believes the corporate use of E-mail will eventually lead people to use it for more routine, personal correspondence. "People who use it [E-mail] at the office are going to want to use it at home, too," he predicted. He cites the example of an early E-mail network, the Advanced Research Projects Agency (ARPA) set up by the Department of Defense—a system designed for the exchange of important scientific information. "After a time they found that there were also personal messages being exchanged, like plans for Friday night poker games. Once you get someone communicating regularly [with E-mail] you don't see them dropping off," he said.

E-mail and you

The basic advantage of E-mail is that it saves you time. We all juggle different activities throughout the day, and it can be maddeningly difficult to reach someone by phone or frustratingly slow to have to type and mail a letter. E-mail can free you from time-devouring correspondence and telephone tag.

Using an E-mail service for your daily correspondence lets you quickly read and reply to a day's worth of mail—and all before you leave for work or at day's end, depending on your schedule. *You* decide when it's most convenient to handle your correspondence. You have this freedom because E-mail allows you to ignore the typical constraints of time and geography. This freedom enables Peter Grunwald, an independent communications consultant, to conduct business with clients nationwide from his Washington, D.C., office.

"Most of my clients keep hours very different from mine," says Grunwald. "For example, by the time I'm on the road or in meetings, my clients on the West Coast are just getting into the office. For me to respond to their questions, they would have to call me first thing in the morning, which, of course, means they would be making phone calls at 5 a.m. West Coast time. And that's just not a practical way for either of us to do business. So all my clients use some kind of E-mail service."

(continued on page 26)

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Case Study: MCI Mail

Space does not permit full descriptions of each of the dedicated E-mail services, but a closer look at one of them should provide a basis for comparison when you're evaluating various services. For my money, MCI Mail is the best bargain around.

A subsidiary of MCI Communications, an alternative long-distance phone company, MCI Mail gives you more than just electronic mail. For $18 a year plus per-letter charges, you can also send paper mail (hardcopy) and communicate with any telex machine worldwide. You can log onto the Dow Jones News/Retrieval Service to get the daily news or read *The Wall Street Journal*. You avoid the DJNS sign-up fee, though you have to pay normal online charges. (See the September 1986 "Life at 300 Baud" column for a more detailed description of DJNS offerings.)

If you promise to spend at least $10 per month, you can even set up a private bulletin board to communicate directly with frequent correspondents.

MCI Mail provides gateways to the CompuServe and ARPA E-mail systems (but not yet to The Source and Western Union's EasyLink, the two other largest networks).

MCI Mail has four classes of domestic mail service. The most popular is the "instant letter." This is simply a message you send directly to another user's electronic mailbox. It costs 45 cents for the first 500 characters, 55 cents for the next 7,000 characters, and $1 for every 7,500 characters after that. Messages are delivered in the twinkling of an eye.

Hardcopy moves more slowly, though it is still quite fast. Your letter travels electronically from your computer to an MCI Mail postal center in one of six major cities in the United States or two abroad. When it arrives, it's laser printed on high-quality bond paper. (If you've paid a $20 annual fee, the printer will even reproduce your letterhead and signature.) The letter is then placed in a bright orange envelope for delivery.

How quickly this envelope arrives at its destination depends on the urgency and your checkbook. MCI Mail offers three domestic hardcopy mail options: four-hour letter, overnight letter, and regular MCI Mail letter. It also offers an international option.

The four-hour letter delivery is the quickest, but your addressee must live within 25 miles of Philadelphia, New York, Washington, Chicago, or Los Angeles—the only MCI Mail postal centers offering this service. These letters are delivered by Purolator, a courier service. They cost $30 for up to six pages, plus $1 for every additional three pages.

Sending an overnight letter gets your message delivered by noon on the next business day, although your message must reach the MCI Mail center before 11 p.m. Eastern time, or it will be delayed. You can send up to six pages for $8; each additional three pages cost $1.

Regular MCI Mail letters are simply deposited in the nearest mailbox after they've been laser printed at an MCI Mail postal center. The U.S. Postal Service handles the final trip to your addressee's home. The price is $2 for the first three pages, plus $1 for every three additional pages.

You can also send a "world" letter. These are delivered anywhere in the world, and the cost is $5.50 for a 7,500-character message. They are printed in Brussels, Melbourne, or the United States (depending on where they are going) and flown to the destination country. World letters are delivered by the destination country's postal service.

If your international letter is urgent, you can choose to have it delivered by courier—in one to four days, depending on location—anywhere in Europe. The cost ranges from $14 to $30.

For under $3 per 1,000 characters you can send an electronic message to any telex machine in the world—a great help if you do business overseas.

MCI Mail also has a variety of other advanced services designed for corporate and high-volume users. Automatic electronic mailing lists, custom hardcopy mailings with inserts, company-specific bulletin boards and so on all have their markets.

MCI Mail can be accessed through local phone numbers in more than 50 major cities, or via an 800 number or Tymnet. The local numbers have no connect charges—you just pay for the letters you send, not the time composing or uploading them. Using the 800 number will cost you 15 cents a minute at any time of day for 300/1200 baud access. Tymnet costs five cents a minute.

Now the drawbacks: The MCI Mail editor is crude, at best. If you are used to a good word processor, you will not enjoy writing letters online. Unfortunately, this is a universal trait among electronic mail systems. Text editors are not a strong selling point. Any message of importance or great length should be composed offline and uploaded to the system.

MCI Mail's menus are wordy, though clear. You will always know what to do next, but once you get used to the system you will find the menus somewhat annoying, especially at 300 baud. Fortunately you can bypass them as well as increase certain letter-forwarding capabilities by signing up for Advanced Service—a good deal if you write a lot of letters. But beginners and occasional users will find MCI Mail among the friendliest of the E-mail systems—which partly accounts for its success. **—B. Meeks**

(continued from page 24)

Grunwald explained that during a 15-minute online session before he leaves for work, he can check for any messages his clients may have sent since his last log on. He can then reply to any waiting messages, or send out any important information he has for his clients. "I usually check my E-mail three times a day," he says. "I find that by using E-mail I can turn messages around much faster. Since no paper is generated, I can write a quick response or upload a full report without investing the extra time a hardcopy letter or phone call would take."

E-mail saves time in four important ways. First, senders and receivers usually respond to their own electronic mail; computer messages do not have to be processed by a secretary or intermediary. Second, there is no paper to deal with. Messages are composed on and read from a personal computer, with no hardcopy left behind. It is possible to store messages on a disk and create hardcopies of them, but most messages are never put on paper; if they're stored, they are stored electronically. Third, you can send your messages in any format you choose. You can send a formal report, an inter-office memo, a letter, or a casual note. And it can be a two-word greeting or a 2,000-word soliloquy. Finally, you can send a note from your laptop computer while standing in an airport phone booth, or from your PC while lounging in your pajamas. Should the notion appeal to you, there are even cellular modems available for use with laptop computers and cellular car phones.

When choosing an E-mail service, know what you want from it—before you pay the sign-up fees.

E-mail addenda

Most E-mail services offer options beyond one-to-one electronic correspondence. Some services allow you to send hardcopy letters to people who don't have an E-mail service. To use this feature you simply specify a physical address instead of an electronic one. Your message is then printed on paper and mailed to the addressee. (Some services even allow you to send out these hardcopy letters on your personal letterhead, complete with your signature.) Do you need to send a telex to Easter Island? No problem. Some E-mail services offer worldwide telex capability; your electronic mailbox doubles as a telex machine.

And if you subscribe to a commercial information utility, such as CompuServe, you're automatically given access to that system's E-mail service. A few of the dedicated E-mail services give you access to news and information services. Western Union's EasyLink service, for example, has a daily news service called FYI that lets you access the United Press International (UPI) news wire.

The other side of the coin

The potential of electronic mail is offset by several factors. Mark Winther, director of new communications services for Link Resources Corporation, a market research firm in New York, cites confusing documentation and poor user interfaces as major obstacles.

EMA's Cavanagh points out that you can't reach everyone via an E-mail system. Many people don't have access to a personal computer, and even among those who do, more than 60 percent don't own modems. In addition, users of one E-mail service can't exchange messages with users of a different service. (Imagine not being able to send a letter outside your home state and you've grasped the implication of the E-mail industry's lack of interconnection.) However, that situation is

Connections

Here is a partial list of electronic mail services you can write or call for more information:

- AT & T Mail, 1701 Campus Dr., Somerset, NJ 08873, (201) 271-3592
- Auto Mail, ADP Autonet, 175 Jackson Plaza, Ann Arbor, MI 48106, (313) 995-6400
- EasyLink, Western Union Telegraph, 9229 LBJ Freeway, Suite 234, Dallas, TX 75243, (800) 527-5184
- ECHO, 4739 Alla Rd., Marina del Rey, CA 90292, (213) 823-8415
- ITT Dialcom, 1109 Spring St., Silver Spring, MD 20910, (301) 588-1572
- OnTyme, Tymshare, 20605 Valley Green Dr., Cupertino, CA 95014, (408) 446-6000
- Quik-Comm, General Electric Information Services, Co., 401 N. Washington St., Rockville, MD 20850, (800) 638-8730
- MCI Mail, 2000 M. St. NW, Washington, DC 20036, (800) MCI-2255
- RCA Mail, RCA Global Communications, 201 Centennial Ave., Piscataway, NJ 08854, (800) 526-3969
- Telemail, GTE Telenet, 12490 Sunrise Valley Dr., Reston, VA 22096, (800) TELENET.

changing rapidly.

Because interconnection would allow E-mail users to generate more messages (you could then communicate with literally thousands of others on different services), the E-mail industry has made a concerted effort to provide interconnection. This effort is so intense that Cavanagh says there is "an absolute foot race" on among competitors to provide interconnection. "It's a frantic drive," he said.

Earlier this year MCI Mail and EasyPlex, CompuServe's E-mail service, announced such an interconnection agreement. It was the first such agreement in the industry. (Delphi, it should be noted, has had a one-way connection for some years. This allowed Delphi users to send E-mail to users of The Source or CompuServe; however, they could not receive any messages from users of those services.) Since the MCI Mail and EasyPlex announcement, several other E-mail services have formally announced interconnection plans.

Bringing the mail home

E-mail companies, which offer many other services besides computer-to-computer E-mail, are somewhat like today's grocery "super stores." Although this is an excellent marketing strategy, it doesn't make choosing your electronic mail service any easier. When choosing a service, know what you want from it *before* you pay the sign-up fees.

Will you use E-mail simply to correspond with an electronic pen pal? Do you need a service that integrates online data base access with electronic mail? Maybe you want to send both hardcopy and E-mail to hundreds of people—will the service you're considering deliver both? What about sending international mail? If you don't speak the language, does the service have a translation option? And, of course, are most of the people you want to communicate with on the same system, or available via an interconnection of some kind? These questions and more should be carefully considered.

Furthermore, each E-mail service has its inherent advantages and disadvantages. Some, such as MCI Mail, are easy to use; others, like Western Union's EasyLink system, are cryptic. Rates vary widely—some charge you for every minute you spend online, others don't. Again, the system you use will depend on your particular needs.

Do some comparison shopping. Call or write for information packages from several different services (see list on page 26). Compare features, talk with users of different systems and get their feedback on what they like and dislike about their services, and then make up your own mind.

Brock Meeks is a contributing writer for PROFILES *who specializes in telecommunications. His work has also appeared in* BYTE *and other computer-oriented publications.*

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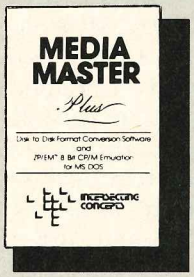

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The Basics of BASIC

Part 1: Getting oriented

by Jerry Houston

Because some form of BASIC is bundled with all Kaypro computers (currently MBASIC for CP/M and GW-BASIC for DOS), and because BASIC was specifically designed for novices, it's the language many people interested in learning to program start with. BASIC provides a relatively painless introduction to programming; those who aspire to the "priesthood" of professional programmers will go on to learn other languages.

This article will be split into two parts. Part one, this month, is intended for those who are new to programming in general and don't have extensive experience working with BASIC. It is a description of some of the general characteristics of BASIC, coupled with a discussion of certain concepts that pertain to all languages, and it may be of interest even to "old hands."

Part two, next month, will deal more specifically with the writing of programs, particularly ways to make BASIC programs more nearly approach the ideals of structured programming as it is practiced with other languages such as Pascal and C.

Tracing BASIC's roots

BASIC, as you may already know, is an acronym that stands for Beginner's All-purpose Symbolic Instruction Code. It was developed by John Kemeny and Thomas Kurtz in the mid 1960s.

Around that time a practice called "time sharing" became very popular. This was a method whereby the owner of a large computer could rent part of its data processing capacity to other users and share the actual computer time. Time sharing is still common at colleges and universities—students, professors, and researchers all share one powerful computer that even a department wouldn't be able to afford.

Time sharing created a situation in which relatively inexperienced users had substantial computing power available to them for the first time, and they needed to be able to develop their own programs. The computer languages in those days, however, were not easy to learn. Even ALGOL, a reasonably straightforward language with much to recommend it, never really became popular on this side of the Atlantic. Engineers and scientists used assembly language and FORTRAN. Business users had COBOL (COmmon Business Oriented Language) and assembly language. But none of these commonly available languages was appropriate for novice computer users. Beginner's All-purpose Symbolic Instruction Code was exactly what was needed by thousands of new programmers.

The original BASIC language was very limited, containing about 20 keywords (words that have a special meaning in a computer language). In the past 20 years, manufacturers of BASIC interpreters and compilers have added "enhancements" to the language, resulting in a whole class of advanced BASICs that are no longer compatible with each other. MBASIC and GW-BASIC are representative of these new and powerful BASICs.

A BASIC program written 20 years ago would very likely run under most versions of BASIC today, but few people would care to write a program the old way. Even something as simple as placing the cursor at a particular spot on the screen before a word is printed requires modern enhancements.

In summary, then, BASIC's purpose was (and still is) to provide a means for novice computer users to write their own programs. Though not considered powerful compared to other languages, BASIC falls somewhere between "adequate" and "formidable." Good BASIC compilers compete very well with FORTRAN or COBOL in terms of processing speed.

ILLUSTRATION BY GREG MARTIN

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Interaction with the user

BASIC today comes in interpreted and compiled versions, although the interpreted type has always been more common. In fact, BASIC's reputation for slow execution comes from people's experience with interpreted versions of the language.

Interpreters and compilers were discussed at length in "A Survey of Programming Languages" (*PROFILES*, September 1986), so I won't spend much time explaining them here. An interpreter is a program that you run from the operating system. (The BASIC interpreter is called MBASIC.COM, GW-BASIC.EXE, or simply BASIC.COM). Once you run the interpreter, it presents you with the well-known "ok" prompt, and at that point you can write or run your BASIC programs. The interpreter must be run *every* time you run or write a program. It runs the entire time, "translating" your programs into machine code one statement at a time—a relatively slow process.

BASIC's purpose is to provide a means for novice computer users to write their own programs.

A compiler, on the other hand, is run one time to convert your BASIC program (usually a text file) into a COM or EXE file that you can run directly from the operating system. The compiler reads the text file, figures out what you are trying to do, and creates executable machine code. Compiled BASIC programs are much faster than interpreted versions.

BASIC modes

Interpreted versions of BASIC provide some special benefits for new programmers. One of the most important is that most instructions in BASIC are available in two different modes—immediate and deferred. In immediate mode, an instruction is executed as soon as it is typed at the terminal and RETURN is pressed. This is handy for testing statements that are new and unfamiliar. If you can't remember whether the SQR() function returns the square root of a number or the square of that number, just type **PRINT SQR(4)** and press **RETURN**, and you'll get either 2 or 16.

Deferred mode is used to execute a program that has been entered and perhaps stored for later use. In deferred mode, each line of an interpreted BASIC program starts with a line number. The line numbers tell the interpreter the order in which statements are executed—line 1 first, line 2 second, etc.

In immediate mode BASIC does what you tell it to right away; in deferred mode it does not do anything until you tell it to RUN the program in memory. If, for example, you have typed a program consisting of lines numbered 1 through 10, the BASIC interpreter will not run it until you type **RUN** and press **RETURN** (or ENTER). RUN is an example of a command.

This is a good time to differentiate between commands and statements. A *command* deals with the program as a whole, while a *statement* is an instruction within a program. Following are some examples of commands:

- LOAD—loads a program into the computer's memory from where it was stored on the disk;
- SAVE—stores a program from the computer's memory to a disk;
- RUN—executes a program.

Examples of some common statements are:

- INPUT—gets information from the user;
- PRINT—sends program output to the screen;
- FOR—begins a set of instructions that will be executed a specified number of times;
- = (equals sign)—assigns a value to a variable.

The distinction between commands and statements is never easy for the beginner, but as you learn more about the language you'll be able to appreciate the difference. To reiterate, a statement is usually an instruction within a program. Addition, subtraction, the creation of memory variables—all are accomplished with statements. Statements in BASIC usually start with a line number. A command is an instruction such as RUN that involves the program as a whole.

Returning now to our discussion of immediate and deferred mode, these are what give BASIC much of its power. For example, a common procedure is to write a program in deferred mode, RUN it, then check the value of the memory variables using immediate mode and see if the program did what it was supposed to.

Consider the following set of statements, which could be part of a program. (This example is for those who already know what a FOR . . . NEXT loop is. Don't be dismayed if you don't understand it.)

```
100 FOR COUNT = 1 to 100
110     a statement goes here,
120     another one goes here,
130     yet another one here,
140     the last one here,
150 NEXT COUNT
```

The idea, of course, is that the statements on lines 110-140 are a "loop" that is to be executed 100 times, as the variable COUNT is incremented from 1 to 100. If something goes wrong with the program while it is executing this loop—even if the program stops with an error message—you can find out in exactly which iteration (which time around the loop) the problem surfaced by entering the immediate mode statement **PRINT COUNT**. If COUNT is always the same number,

it might be an important clue as to the nature of the problem.

Once the problem is discovered, it's easy to change a statement or two, then reRUN the program. Using interpreted BASIC, changes can be tested immediately. This combination of instant access to the values stored in variables and the interpreted running of programs makes BASIC so "interactive" that it seems almost conversational.

BASIC symbolism

To recap a bit, the "S" in BASIC means *symbolic*—BASIC uses symbols that are easily intelligible to humans. The keywords used in BASIC, for example, are borrowed from English, and each means very nearly the same thing in BASIC as it does in ordinary usage. Though the word PRINT would ordinarily bring to mind printing something on a sheet of paper, it isn't too difficult to think of PRINTing to the CRT screen of a terminal. RUNning a program certainly requires no explanation. And since BASIC programs are made up of lines of instructions to the computer, LISTing a program makes sense. Other keywords may not be quite so intuitively clear, but their meanings are still easy to understand.

Aside from keywords, the most common use for symbols in BASIC is in the creation of variable names. When creating a variable you designate a symbol—a variable name—and assign a value to it. The statement "LET X=10" creates a symbol named X having a real number value of 10.

As pointed out in the first article of this series, machine language is the only language understood by computers, and machine language has no place for symbolic names. Like other language translators, BASIC takes care of the task of translating symbolic variable names that you understand into information the computer needs. BASIC must keep track of the names you give to variables and replace all references to them with the actual physical addresses where they're stored in memory.

Data types

While we're on the subject of variables, let's talk about data storage, data types, and variable names. Since this discussion is meant to be introductory, I'll certainly simplify things a bit, but it's important to understand why a computer needs to know what *type* of variables you're using for a particular purpose, what the advantages and disadvantages of the different data types are, and how to differentiate among them inside a BASIC program.

BASIC understands and manipulates three types of data: integers, real numbers, and character strings. (*Ed. Note. For further explanation of these data types, see the November 1986 "Technical Forum."*)

Integers. An integer is a whole number, such as 1, 2, 3, 26 or 109. Any number that has a fractional part—4.5, 7.23 or 110.4—is not an integer.

A numeric variable in a BASIC program that is not specifically defined to be an integer is assumed to be a real number variable instead (more on these below). That is, BASIC does not make integers a "preferred" (default) data type. Most languages do, because integers and memory variables having integer values use less memory than other data types. Entire operating systems and large application programs have been written using only integers.

Mathematical operations done with integers are faster than those done with real numbers.

Integers can range in value from -32,768 to 32,767. Why? BASIC stores integers in two bytes (16 bits). One of the bits denotes whether the number is positive or negative, leaving 15 bits for the number. The highest number expressible in 15 bits is 32,767; the lowest is -32,768. (There are actually 32,768 numbers in both the positive and negative range—zero counts as a positive number.)

Mathematical operations performed with integers both conserve memory and are faster than those performed with real (fractional) numbers. For that reason, BASIC programmers like to use integers wherever possible. For example, integers are usually employed in iteration statements (a programming technique for repeating a task a specified number of times).

Real numbers. Of course, the world often deals in fractional amounts, not nice, simple integers. Whether you are figuring interest, adding up the phone bill, or simply counting money, fractional numbers are unavoidable. The creators of BASIC knew this and created the *real number* data type.

Real number, or "floating point," variables can express numbers that have fractional parts, such as 3.14159. Since they can also express whole number values, such as 4.0 or 213.0, it might seem to make a lot of sense to let all numbers be real number variables, and as mentioned earlier, that in fact is the default condition in BASIC. But there are drawbacks to using real numbers: loss of accuracy or "precision," and slower processing time.

BASIC stores real numbers using exponential notation—that is, as a fractional part and an exponent, or power of 10. The number 567.9, for example, is written as 5.679 x 10^2 (five point six seven nine times ten to the second power). Most BASICs allocate enough memory (a large enough number of bits) to hold a fraction

that is significant only to six places or so, with the rest of the bits used to represent a power of 10. That means that although a large number like 123456123456 could be stored in a variable, it would actually be represented in the computer's memory as 123456-000000—close enough for Congress, maybe, but not good enough to get a spacecraft to Mars. Because of this lack of precision, such variables are often unacceptable for applications like accounting and bookkeeping.

Also, because of the additional complexity of doing math with floating point numbers, a computer program that depends on them heavily will not run nearly as efficiently as one that uses all integers.

Most BASICs do provide a "double-precision" version of the floating-point variable that can represent very large and small numbers with precision to about 16 decimal places, but they make a program run even slower yet, and they still don't guarantee that every number can be represented with complete accuracy.

Unlike other languages, BASIC can represent strings of characters with a single variable name.

Strings. Unlike some other languages, BASIC can represent entire strings of characters with a single variable name. The *string* data type deals exclusively with such strings of characters. A name, an address, or even an entire series of words can be assigned to a single string-type variable.

When dealing with character strings, BASIC uses the ASCII character set. Understanding what ASCII characters are is important because by using ASCII characters BASIC can let you make more efficient use of both your printer and your video display. ASCII characters can, for example, be used to create menus onscreen and to send control codes to the printer that can change margins, page length, or type styles.

ASCII (American Standard Code for Information Interchange) was originally designed to be a code used for data communication, sort of a computerized version of Morse code, but it was adopted by many computer manufacturers as a way to express character data in memory.

In ASCII, each letter has a corresponding number. "A" is 65, for example, "B" is 66, "C" is 67, and so on. Each character's number is stored in a single byte (eight bits) of memory, and up to 256 different characters can be represented. That's enough for all of the upper-case letters, the lower-case letters, numerals, punctuation, and special control characters (like backspace, DELete, RETURN), with lots left over for graphics or other special uses.

BASIC uses a rather complex method of storing strings and for keeping track of the most recent values that have been assigned to them. It's one of the inefficiencies that gives BASIC bad press, and this complex storage scheme can lead to other kinds of slow-downs when a program runs, due to a feature of BASIC affectionately called "garbage collection," which can make the computer pause from several seconds to several minutes. (That's when BASIC runs out of room to store new copies of strings as even more new values are assigned to them, and it must stop executing long enough to erase all the old values and straighten out its thoughts.)

Variable names

Since the same kinds of bits are used to represent numeric and alphanumeric values, there needs to be a way to let the computer know what type of data a variable contains. In BASIC, the type of variable is designated by the character appended to the end of the variable name. Here's a list of them and what they represent:

VARNAME (no suffix)—single-precision real number
VARNAME#—double-precision real number
VARNAME%—integer
VARNAME$—string (of characters)

In the early days some BASICs allowed variable names in which only the first two characters were significant. Thus the variables TABASCO and TAXRATE both were shortened to TA inside the interpreter. Fortunately, the modern BASICs supplied with Kaypro computers allow variable names up to 30 characters long, and every character is significant. Modern programming methods stress using meaningful variable names in programs. (Far from looking "professional," cryptic and difficult-to-read computer programs are the sure mark of an inexperienced programmer.)

Summary and preview

We've discussed what BASIC is, where it originated, what it was meant to do, and why it was designed the way it was. We've talked about immediate and deferred modes, line numbers, and variable names, and learned why there is a difference between the computer's representation of numbers and strings of characters.

In the next article, I'll show what can be accomplished in a program with just a few simple BASIC statements, and prove that BASIC programs *can* be just about as cleanly structured as those written in other languages.

Jerry Houston teaches programming, applications, and related topics at three colleges and writes for several computer publications. He is also currently writing a book on the C language.

Bit-Wise BASIC

How to isolate, merge and shift individual bits

by Richard Amyx

Most of you probably feel that Boolean logic is the domain of assembly language programmers. The process of isolating and testing bits, merging the bits of two bytes together, and shifting the bits left and right is something assembly language programmers do. However, almost any Boolean operation can be done in MBASIC.

The purpose of this article is to give you some *practical* instructions for manipulating the individual bits of a byte using the MBASIC interpreter (bundled with CP/M-based Kaypros). I stress the word "practical" because I do not intend to make this piece another dry discussion of logical functions. I intend to tell you only how to do what needs to be done and then give you a real-world example. The example I've chosen shows you how to print "inverse" characters (white-on-black) on a dot-matrix printer.

This article is written for advanced BASIC programmers, assumes you have some knowledge of Boolean logic, and that you are familiar with programming the Epson MX-80 printer in graphics mode.

Inverse "video" on hardcopy

A while back I needed some white-on-black printing to simulate the screen display of a client's product. I reasoned that it would be fairly easy to produce this effect on my Epson MX-80 with Graftrax. But, after examining the Epson's 9 x 9 dot patterns, I found that it wasn't as easy as I'd originally thought.

The Epson has nine pins in its printhead; however, the information to control the nine pins must be encoded in only eight bits (the number of bits in one byte). Moreover, during normal printing the space between lines of print is created by paper movement, not by printhead contact. However, when printing characters in inverse, all "blank" space between the lines must be printed with black ink. In order to reproduce this "reverse video" I found that I needed two rows of dots above and two rows of dots below each character so that a single line of the inverse print would merge properly with the following line to give a consistent background.

Figure 1, below, shows the dot arrangement of one inverse video character cell: two rows of dots above, nine rows for the character, and two rows of dots below. Because 2 + 9 + 2 = 13, and 13 just won't go into 8 (bits), I had to figure out a way to get the data to the printer. One method would have been to separate each inverse character into two groupings of data manually (eight bits and five bits), but that would have meant keying in twice as much data. Entering data by hand is tedious and also increases your chances for error. Besides, one objective of programming is to let the computer do as much of the work as possible.

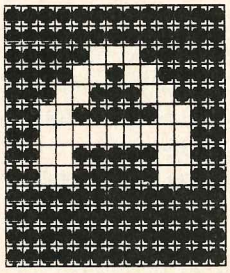

Figure 1: Typical Inverse Character

Horizontal dots are shown as separate rather than overlapped, the way they actually print.

Luckily, I remembered that the two rows of dots at the top and bottom of the character cell are constant. And of the nine remaining rows, only seven rows are used unless the character has a descender (like the tail on a "g"). So for each line of inverted print on the paper I needed to print two lines of graphics. The first line took care of the upper eight rows and the second line printed the lower five rows.

I wrote an MBASIC program to build the pattern for each character cell. As it ran I would go through the character set in the Epson manual, entering in a 1 for each blank dot (which would become black) and a 0 (zero) for each printed dot (which would become white). The program would take care of translating the binary-bit patterns into decimal numbers for the MBASIC data statements.

Then I could merge the constant top two dots with the upper six bits of character data for one byte, and the lower three bits of character data with the constant bottom two dots for a second byte (with the lowest three bits of the byte set to zero).

(continued on page 36)

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```
100 '*************************************************************************
110 '*                                                                       *
120 '*     INVPRINT.BAS -- Prints inverse (white on black) characters on     *
130 '*     an Epson MX-80 with Graftrax.  Demonstrates MBASIC techniques     *
140 '*     for merging bytes (OR), masking bits (AND), and shifting bits     *
150 '*     of a byte left and right.                                         *
160 '*                                                                       *
170 '*************************************************************************
180 '
190 DEFINT A-Z
200 CHRSP=&HFF:          '11111111B - All bits (dots) set.
210 CHRSP2=&HF8:         '11111000B - Top five bits (dots) set.
220 TOPTWO=&HC0:         '11000000B - Top two dots.
230 BOTTWO=&H18:         '00011000B - Bottom two dots of bottom five.
240 BOT3=&H38:           '00111000B - Bottom three dots of bottom five.
250 SPACE8$=CHR$(27)+"A"+CHR$(8):   'Epson code to advance paper 8 dots.
260 SPACE5$=CHR$(27)+"A"+CHR$(5):   'Epson code to advance paper 5 dots.
270 '
280 DIM RAWDAT(96,9):    'Array for unshifted character bits.
290                      'Requires nine bytes per character.
300 DIM ADAT1(96,9):     'Array for top eight printed character bits.
310 DIM ADAT2(96,9):     'Array for bottom five printed character bits.
320 '
330 '   These first steps set up an 8-byte machine language program to
340 '   send one byte to the LST: device via BDOS.  See data at 10000.
350 '
360 DUMMY$=STRING$(8,42)
370 PTR=VARPTR(DUMMY$)+1:Z!=256*PEEK(PTR+1)+PEEK(PTR)
380 IF Z!>32767 THEN UADDR=Z!-65536! ELSE UADDR=INT(Z!)
390 DEF USR=UADDR:LDE=UADDR+1:POKEADDR=UADDR
400 FOR I=1 TO LEN(DUMMY$)
410 READ A:POKE POKEADDR,A:POKEADDR=POKEADDR+1
420 NEXT I
430 '
440 '   The actual inverse print program starts here.
450 '
460 FOR I=34 TO 43:              'Read raw character data into its array.
470 FOR J=1 TO 9
480 READ RAWDAT(I,J)
490 NEXT J:NEXT I
500 FOR I=34 TO 43:              'Build bytes for the top 8 dots.
510 FOR J=1 TO 9
520 TEMP=INT(RAWDAT(I,J)/4):     'Shift data right 2 bits (align 6 MSB).
530 ADAT1(I,J)=TEMP OR TOPTWO:   'Merge data bits with top two dots.
540 NEXT J:NEXT I:               'Now we have top 8 dots of 13.
550 FOR I=34 TO 43:              'Build bytes for the bottom 5 dots.
560 FOR J=1 TO 9
570 TEMP=RAWDAT(I,J)*64:         'Shift data left 6 bits (align 2 LSB).
580 TEMP=TEMP AND &HFF:          'Mask off high byte (get rid of "carry").
590 IF I>63 THEN 610:            'Leave a hook for lower case.
600 ADAT2(I,J)=TEMP OR BOT3:GOTO 620:   'Merge data bits with bottom 3 dots.
610 ADAT2(I,J)=TEMP OR BOTTWO
620 NEXT J:NEXT I
630 INPUT "Character string";INWORD$:      'Input characters to print.
640 TEMP=9*LEN(INWORD$)+2*LEN(INWORD$)+2:  'Calculate dot length of string.
```

```
650 N1=TEMP MOD 256:N2=INT(TEMP/256):      'Tell Epson that 256*N1 + N2 bytes
660 LPRINT CHR$(27);"L";CHR$(N1);CHR$(N2);:'  of graphic data are coming.
670 FOR J= 1 TO 2:                        'Lead with two dots.
680 POKE LDE,CHRSP:DUMMY=USR(0)
690 NEXT J
700 FOR I=1 TO LEN(INWORD$)
710 IY=ASC(MID$(INWORD$,I,1))-31:         'Find the appropriate data.
720 FOR IX=1 TO 9
730 POKE LDE,ADAT1(IY,IX):DUMMY=USR(0): 'Print the top 8 dots.
740 NEXT IX
750 FOR J=1 TO 2:                         'Print two dots between characters.
760 POKE LDE,CHRSP:DUMMY=USR(0)
770 NEXT J
780 NEXT I
790 LPRINT SPACE8$:                       'Advance paper 8 dots.
800 LPRINT CHR$(27);"L";CHR$(N1);CHR$(N2);
810 FOR J=1 TO 2:                         'Print bottom of leading 2 dots.
820 POKE LDE,CHRSP2:DUMMY=USR(0)
830 NEXT J
840 FOR I=1 TO LEN(INWORD$)
850 IY=ASC(MID$(INWORD$,I,1))-31
860 FOR IX=1 TO 9
870 POKE LDE,ADAT2(IY,IX):DUMMY=USR(0): 'Print bottom 5 dots of character.
880 NEXT IX
890 FOR J=1 TO 2:                         'Print bottom of two-dot separator.
900 POKE LDE,CHRSP2:DUMMY=USR(0)
910 NEXT J
920 NEXT I
930 LPRINT SPACE5$:                       'Advance paper 5 dots for next line.
940 GOTO 630:                             'Loop back for more input.
950 END
10000 '-------------------------------------------------------------------------
10010 '     Machine language routine to output one byte to line printer
10020 '     (LST: device) by a BDOS call.
10030 '
10040 DATA &H1E,&H00,&H0E,&H05,&HCD,&H05,&H00,&HC9
10050 '
10060 '   This is the code the data represent:
10070 ' LD      E,CHAR          ; Put the character to be printed in E
10080 ' LD      C,5             ; 5 is the BDOS list one character function
10090 ' CALL    5               ; Call BDOS
10100 ' RET                     ; Return to MBASIC program
20000 '-------------------------------------------------------------------------
20010 '     Character Data
20020 '
20030 DATA 225,193,151,055,119,055,151,193,225: ' A
20040 DATA 125,001,001,109,109,109,109,131,147: ' B
20050 DATA 131,131,125,125,125,125,125,187,187: ' C
20060 DATA 125,001,001,125,125,125,057,131,199: ' D
20070 DATA 001,001,109,109,109,109,109,125,125: ' E
20080 DATA 001,001,111,111,111,111,111,127,127: ' F
20090 DATA 131,131,125,125,109,109,109,161,161: ' G
20100 DATA 001,001,239,239,239,239,239,001,001: ' H
20110 DATA 255,125,125,001,001,001,125,125,255: ' I
20120 DATA 243,243,253,253,125,125,001,003,127: ' J
```

(continued from page 33)

A little lingo

Before I launch into explanations of how to effect the solution, we should understand each other on a few conventions.

Bit positions. The positions of bits in a byte are numbered in *reverse* order of normal counting: 7 6 5 4 3 2 1 0. Bit 7 is the highest order bit (value 128 when set). Bit 0 is the lowest order bit (value 1 when set). Powers of 2 increase to the left in binary notation just as powers of 10 increase to the left in decimal notation. Shifting bits "up" means moving them to the left; shifting bits "down" means moving them to the right.

Set and *reset*. To set a bit means to make its value 1. To reset a bit means to make its value 0 (zero).

Hexadecimal notation. In the program, I have used hexadecimal notation for the various masks and constants because hex notation more clearly indicates the binary numbers it represents than does decimal notation. More information about these binary conventions can be found in virtually any book on computer theory or programming.

The awful truth

A truth table is a chart that displays the results of a given logical operation—in this case, the Boolean operators AND and OR. Truth tables come in handy when logic gets convoluted and you need to know what the results of a certain logical operation will be. Here is the table for the AND function.

1 AND 1 = 1
1 AND 0 = 0
0 AND 1 = 0
0 AND 0 = 0

This is all you need to know about AND for most practical applications: To be sure that a bit is reset, AND it with 0. A bit ANDed with 1 retains its original value. In general, AND takes things apart. It lets you mask off bits you don't want or mask out specific bits you do want.

To "mask off" a portion of a byte means to "zero" (reset) its unwanted bits. This is done by ANDing the byte under scrutiny with another byte (the mask) that has the unwanted bits equal to 0 and the bit(s) to be tested set to 1. After the AND operation, the unwanted bits of the byte being tested will be 0, and any set bit(s) in the portion to be tested will remain set. (Conversely, to "mask out" a bit means to isolate the bit by the same process. "Masking off" refers to the unwanted portion of the byte; "masking out" refers to the wanted portion.) In this way, specific bits of a byte can be isolated and tested.

Here is the truth table for OR:

1 OR 1 = 1
1 OR 0 = 1
0 OR 1 = 1
0 OR 0 = 0

This is all you need to know about OR for most practical applications: To be sure that a bit is set, OR it with 1. Set bits are not reset during an OR. In general, OR puts things together. It allows you to merge the bits of two bytes without losing any set bits in the process, and it allows you to set specific bits of a byte without changing the bits you're not operating on.

Bit-shifting is the simplest concept of all. When you multiply a binary number by a power of 2, the bits shift up, just as a decimal number moves when you multiply it by a power of 10. When you divide a binary number by a power of 2, the bits move down, just as a decimal number moves when you divide it by a power of 10.

Here's the rule: To shift bits left (up) *n* positions, multiply the binary number by 2 to the *n* power. To shift bits right (down) *n* positions, divide the binary number by 2 to the *n* power.

In general, AND takes things apart; OR puts things together.

Byte Construction Co., Inc.

Now I'll talk you through the program listing so that you can see how these principles have been put into practice. Notice the constant definitions and array dimensions in lines 200-310, then skip down to line 460, where the actual inverse print program starts. Lines 360-420 poke an 8-byte machine language "printer driver" into memory.

I chose to do all the byte construction right at the beginning of the program to save time during the processing of any data. This required three 96 x 9 arrays: one for the raw character data (RAWDAT), one for the built-up upper eight bits (ADAT1), and one for the built-up lower eight bits (ADAT2). During the processing of data, then, the program can go directly to the ADAT1 and ADAT2 arrays for the print information. These arrays are keyed to the ASCII values of alphanumeric characters so that the first printable ASCII character, a space (ASCII 32), occupies position 1 in each array. (Because I've shortened the program for demonstration, only a portion of the arrays—positions 34-43, corresponding to the letters A through J—are used here.) The first thing the program does is read raw character data into the RAWDAT array.

The first manipulation that has to be performed is to merge the constant top two dots with the the upper six bits of character data. To do that, we first have to move the upper six bits down two positions to make room for the constant two dots. This is done in line 520 by dividing the raw character byte by 4 (2 to the second power). The result of that operation is then ORed with a byte that has its upper two bits set (TOPTWO). And presto! One byte for the upper eight dots of an inverse character has been built.

Next, we have to merge the lower three character bits

with the constant two bottom dots. In this demonstration program, where I have included only a few capital letters, there are only two bits to be concerned with, and the bottom three dots of each character are constant. Note, however, the "hook" in line 590 for treating lower-case characters.

The first thing to do in building the lower five dots of print data is to shift the lower two character bits up six positions to place them in the upper two bit positions. This is done in line 570 by multiplying the raw character byte by 64 (2 to the sixth power). The result of that operation is then ORed with a byte that has bits 3, 4, and 5 set (BOT3). This gives you the single byte for the lower five bits of data.

Tilt! What's the TEMP=TEMP AND &HFF in line 580? When you shift bits down, or divide by powers of two, the lower order bits simply disappear—fall into the bit bucket, as the saying goes. But MBASIC works with two-byte integers, which allow a maximum value of FFFFh, or 32,767. If it did not, you would be limited to a maximum integer value of one byte: FFh, or 255. Therefore, when you shift bits left, you may have to be concerned with the higher order bits that get shifted up into the higher order byte. If you checked the numerical result after multiplication by 64, you would see a "wrong" answer. ANDing the result with FFh (00FFh, actually, but the MBASIC editor kindly removes the leading zeros) masks off—gets rid of—any set bits in the higher order byte.

And now, with the print data ready to go, the program flow is this:

INPUT some characters to print (line 630)
CALCULATE the number of bytes to be printed as graphics (line 640)
SET up the printer (lines 650-660)
PRINT the upper eight dots (lines 670-780)
ADVANCE the paper eight dots (line 790)
SET up printer for next row of graphics (line 800)
PRINT the lower eight dots (lines 810-920)
ADVANCE the paper five dots (line 930)
LOOP back for more input (line 940)

The stunt

If you're following the source code (on pages 34-35) and looking for LPRINT instructions in the printing portion of it (lines 670-920), you may be a bit confused. If everything had worked as it should, each line that says "POKE LDE, variable:DUMMY=USR(0)" would have read "LPRINT CHR$(variable);". However, it turned out that my version of MBASIC has a philosophical disagreement with my Epson printer about LPRINTing graphic data. LPRINTing the graphic data resulted in a hiccup in the middle of each line and bytes lost at the end of each line. The solution to that unexpected problem was to bypass MBASIC's printer driver, sending the graphic data to my printer through CP/M's BDOS. What the machine code does is explained in program comment lines 10060-10100. The BDOS routine comes straight out of the CP/M manual, and the USR function is set up exactly as described in the MBASIC manual.

Putting the machine code into memory is the stunt. The technique, which is called "string packing," replaces the elements of a string variable stored in memory with machine code for a USR routine. The advantage of string packing is that you don't have to be concerned with the exact location of the machine code in memory. Its disadvantage is that it is not appropriate in all situations, particularly if you're doing a lot of string handling in BASIC.

Caveats and disclaimers

The demonstration program as it appears here will work only with an Epson MX-80 printer. Although virtually any bit-programmable dot-matrix printer should be able to create the inverse letters illustrated here, printer control codes for non-standard functions are highly idiosyncratic. If you are not using an Epson MX-80, refer to your printer manual to see what its equivalent control codes are.

Finally, remember that printing the inverse letters got complicated only because my MBASIC would not communicate properly with the MX-80. It is possible that LPRINT might work with your printer.

But I don't need white-on-black printing!

The techniques described in this article—those for printing as well as for bit manipulations—apply directly to printing the fancy kinds of three-dimensional curves, polygons with lines joining their vertices, and so forth, that are commonly used to represent computer graphics. The Epson MX-80 will allow a horizontal resolution of 72 points per inch and a vertical resolution of 120 points per inch (for a total of 760,320 points on an 8-1/2 x 11-inch page). Obviously, if you tried to keep track of all those points at one time, you'd never achieve that kind of resolution with a 64K system. But if you build your bytes one bit at a time, you need to be concerned with only 960 bytes—one line's worth—at a time.

The bit-manipulation techniques also allow you a measure of hardware control over your computer and peripherals. For example, my Kaypro 4'84 has a tendency to leave its disk drives running for lengthy periods of time under certain circumstances. The drive motors are controlled through bit 6 of the system status byte: if that bit is 1, the motors are on. If that bit is 0, the motors are off. I can turn the drive motors off when I know I'm through with them by reading in the system status byte, resetting bit 6, and returning the altered byte to the system status port. (This is different for pre-'84 Kaypros. Check your manual.)

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Cool It!

Installing a fan in your CP/M Kaypro

by James Carucci

If you have an '84 series Kaypro, have you ever wondered why there's a covered three-inch hole in the rear panel? I certainly did. So I checked around and discovered that Kaypro had prepared the computer case for the installation of a fan. I'd read that heat is the enemy of computer chips, so I decided to have a fan mounted in my Kaypro. When I checked with my dealer, he said the fan listed for $30 and his technician could install it for another $20. Well, my spirit was willing but my wallet was weak, so I dropped the idea for several months.

Then a recent hardware-upgrade article in *PROFILES* (April 1986) caught my eye. Fan installation was mentioned only in passing, but it motivated me to finally do the job. I shopped around for hardware, questioned members of my Kaypro Users Group, and came up with a neat, simple, *inexpensive* design (see Figure 1 on next page). Installing a fan for under $20 is a satisfying job that is easy enough for even the technically timid.

Why install a fan?

Your disk drives, with their moving parts and close tolerances, are notorious for producing heat. Internal modems contribute more heat, and the power supply is the worst of all. These components are located right next to the fan port for maximum cooling—if there *is* a fan.

The old adage, "If your computer runs for three months, it'll run forever," is generally true, *unless* you allow it to overheat. Computers kept in operation for long periods of time may overheat because the internal temperature tends to build up over hours of use. When hot weather accompanies extended use, computer failure is an even greater possibility.

A friend who runs a Remote Operating System (a BBS that stays on 24 hours a day) had to deal with this problem. After his system crashed several times due to heat buildup, he installed a fan and a thermometer to monitor the operating temperature inside his Kaypro. Without a fan, his 2X functioned at about 30 to 40 degrees above room temperature. Now that the computer is fan-cooled, it generally stabilizes at 10 to 20 degrees above room temperature.

Let's get started

If you've never opened your computer before because you were afraid to, this could be the project you've been waiting for. On the other hand, if you're a "techie" who has an intimate knowledge of your Kaypro's inner workings, you should know both the value of a cooling fan and how easy it is to install one. So no more excuses—here is an easy and inexpensive example.

Total cost for all parts is about $18. The only tools needed are a couple of screwdrivers, and maybe a pair of needle-nose pliers. (No soldering is required because the fan is wired directly to the existing power switch.) The fan I used was purchased from Radio Shack (Archer part #273-242), although any three-inch diameter A/C fan can be used. Aside from the fan, the remaining hardware is common and easily obtained. (The washer diameter and length of machine screw specified in Figure 1 are not critical—substitutions can be made. For instance, you could use machine screws long enough to pass completely through the fan housing. The longer screws would allow you to position and tighten the nuts on the outside of the housing instead of on the inner flange.)

Anything suitable may be used in place of the faucet washers, too. But keep in mind that a space at least 1/4 inch wide is needed between the back of the computer and the fan housing to hold the air filter. Rubber washers are recommended because they cushion the fan, allowing quieter operation.

Plastic screen or some other material could be substituted for the 1/4-inch mesh screen. I opted to use the metal "hardware cloth" because it is easy to obtain,

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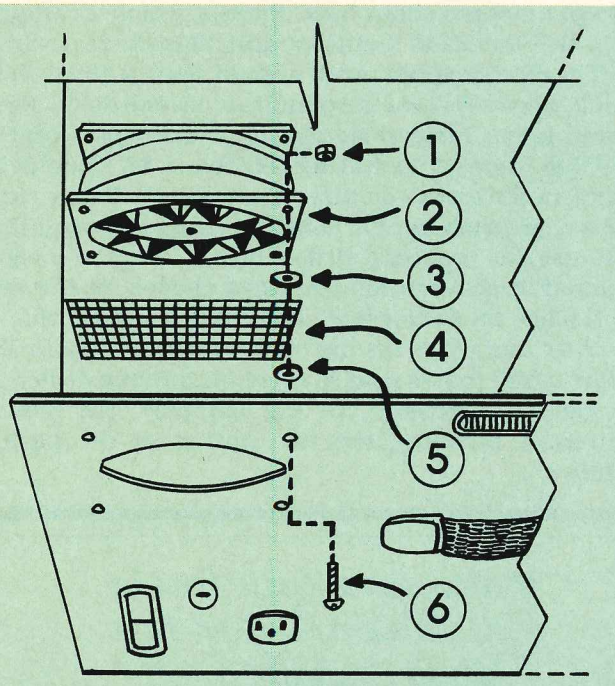

MATERIALS LIST

Item*	Description	Price
1	Nuts for machine screws. Need 4.	--
2	120v A/C fan, 3 inch diameter.	14.95
3	Flat washers, 1/2 inch diameter with 1/4 hole.	.56
4	Screen, 1/4 inch mesh. 1 piece 4 inches square.	.85
5	Neoprene faucet washers, 1/4 inch. Need 4.	.79
6	Round head machine screws, 6/32 × 1 inch. Need 4.	.56
—	Foam rubber filter material, 3-1/2 × 6-1/2 inches.	.88
	total cost =	$18.59

*Item numbers refer to Figure 1

durable, and may act as a heat sink. All you need is something to keep the air filter from rubbing against the fan rotor. Foam rubber is probably the best filter material to use. Large sheets 3/16 inch thick are sold as "air conditioner filters" at department and hardware stores. You will want a strip 6-1/2 inches long by 3-1/2 inches wide.

Step-by-step instructions

Now that you have purchased the parts, collected your tools, and sent the kids away, you're ready to begin. Here are step-by-step instructions for the project. *Always begin by disconnecting your computer from its power supply and unplugging the power cord from the rear panel.* (See accompanying article on this page for more on safety.) Next, remove the cover of your machine. Now unscrew and remove the fan port cover plate from the rear panel. From inside the computer, push the power switch free from the case. Pull it away from the rear panel, but don't disconnect any of the wires.

Before continuing, you should check the clearance of the fan housing and screen in relation to the reset switch, fuse holder, and other possible obstructions inside your machine. Pay particular attention to the reset button—if you plan to leave it on the rear panel, you may have to rotate the exposed wires of the switch away from the fan and screen. (See accompanying article on this page for a bit more on relocating the reset button.)

You may have noticed that the Radio Shack fan has only two wires to connect; there is no green or "ground" wire. So to ensure that the fan is grounded to the computer case, use a small screwdriver to scrape away a bit of the paint from the rear panel of your computer. Do this around the four screw holes on the outside surface, where the screw heads will touch the case. Also, file the paint off the fan housing at the four corners where the nuts will make contact. This procedure will ground the fan to the computer case.

Now you are almost ready to connect the fan to the computer's power. But first, strip about 1/2 inch of insulation off the fan's wires. Next, examine your computer's power switch. (Note that the power switch and wiring on *your* computer may vary slightly from the following description.) There are six wires clipped to six connection posts on the rear of the switch. The lower two wires are green and are grounded to the computer's case. Of the remaining four wires, the two on the left are

While the Lid is Off

If you are a beginner and a little timid about tinkering, try a "warm-up" project before installing the fan. Once you have the hood off your Kaypro, why not move the reset button to the front panel? It only takes a few minutes, and it's great experience. The article "Enhancing Eight-Bit Hardware" in the March 1986 *PROFILES* has a detailed discussion of this project.

While the computer is open, take some extra time for security measures. In particular, it's a good idea to borrow an engraving tool from your local police or sheriff's department and permanently mark your computer. I engraved my social security and driver's license numbers on the bottom of the computer case and on the keyboard. I wrote the same information with an indelible marker on the inside of the hood (where I also left a nasty note for any would-be thieves).

Finally, I recommend you check all of the power connections, wires and plugs to make sure they are snug in their sockets. You may find a loose connection during such an examination, as I did. Always keep two things in mind whenever you tinker: 1) some components retain a nasty charge even in a "cold" machine, and 2) static electricity can ruin computer chips, so don't touch them unnecessarily. Guard against static by working barefoot, and ground yourself by frequently touching a metal table or faucet. Good luck, and have fun!

—J. Carucci

black and the two on the right are white. The top pair of wires (one white and one black) are "hot"; they are connected to the power plug. The middle pair of wires (one white and one black) are attached to the "switched power poles"; this is where the fan will be connected.

Keeping the fan on your work table outside the computer, pass its wires through the rear panel to the power switch. One at a time, attach the leads from the fan to the middle connection posts on the power switch—one to the black, the other to the white. To do this, first remove the existing connection and thread the fan's wire through the hole in the bare post. Then force the clip and wire back on, making sure to return it to the original post. Needle-nose pliers may be helpful if the clips are too snug to remove by hand.

Note that the fan motor operates on alternating current; it can't be hooked up "backwards." However, you may have a problem if the wires are wound around the side brace, a cable, or some other obstruction inside your machine. So before continuing, check to make sure the fan can be slipped into place without any difficulty. When you are satisfied with your wiring, push the power switch back into the rear panel.

Now to test the fan: The safest way to do this is with a switched outlet like the one on a power conditioner or power strip. With the power strip off, plug your Kaypro in and switch it on. Then switch on the power strip and check that the fan is running. *Be sure to disconnect the power again before proceeding.*

"Positive air pressure"

A properly installed cooling fan will charge the computer with "positive air pressure"; that is, the fan will suck (filtered) air into the machine. With this in mind, examine the fan closely. You should find two arrows marked on the housing. One arrow shows the direction the fan rotates; the other indicates the direction of air flow. Orient the fan so that the air flow arrow points to the front of the machine. Then insert the screws, rubber spacers and screen. Position the screen so it is evenly spaced over the port, put a flat washer on each screw, and then slip the fan onto the four screws. Install the nuts and tighten by hand. Then use a screwdriver to tighten the screws from the back.

Test the operation of the fan again. It should run, drawing air into the machine. Now insert the filter (I recommend using double thickness.) The 1/4-inch faucet washers create a space between the rear panel and the fan that easily accommodates the doubled filter. Now replace the computer's cover and you're finished. (The two flat-head screws go on top.)

Fan installation in older Kaypros

If you purchased your Kaypro before 1984, it probably doesn't have a precut fan port. Don't despair—you can still cool your computer. You will need to locate a special punch that will cut a neat, clean hole in your computer's case.

Most machine shops have chassis punches ranging up to two inches in diameter, and shops that perform custom electrical-box work should have a three-inch punch. Borrow or rent the punch so you can do the work in your home, instead of lugging your Kaypro into the machine shop. A rental fee of about $5 should be sufficient for a two- or three-inch punch. If you can't find a three-inch punch, consider using a smaller fan.

To use the tool, first drill a hole through the case, centered at the location you have chosen for the fan. Next, place the cutter half of the punch on one side of the case, and place the die on the other; then join the two by a bolt that is passed through the hole drilled in the case. To actually cut the fan port, the bolt is tightened, bringing the two halves of the punch together.

Make sure your fan is 120 volts A/C and has been designed for electronic cooling.

Determine the placement of your fan carefully, keeping in mind the location of the power switch and the heat-producing disk drives. Remember that a fan of any size can be placed anywhere, as long as it does not interfere with other components.

Even a small fan may be difficult to install on the cluttered rear panel of some early Kaypro models. If this is your problem, consider mounting the fan on the *bottom* panel of your machine. There are several good spots, depending on the size and location of your disk drives. Finally, regardless of where you mount it, make sure the fan you install is 120 volts A/C and has been designed for electronics cooling.

Invest a little time

It took me 20 minutes to install a fan in my Kaypro 2'84, and I put one into a friend's 2X in half an hour. You may take a little longer, especially if you dally to look over the components, check the connections, and do some of the things mentioned in the accompanying article. But when you're finished, you'll have spent less than $20 on a project that should increase the life of your little friend. From then on, when you sit at your keyboard merrily humming to yourself, your Kaypro will hum coolly back to you.

James Carucci is a doctoral candidate at Southern Illinois University in Carbondale, Illinois. His Kaypro 2'84, now fan-cooled, is kept busy working on his dissertation in archaeology. He can be reached electronically via the "Paperback" R.O.S. at (618) 529-1595.

FROM STUBBORN MULE TO WORKHORSE

Controlling the Gemini 10-X printer with dBASE

by Marshall L. Moseley

Dot-matrix printers are fast and convenient, but they can sometimes be rather obstinate beasts. For example, the Gemini 10-X, sold with many Kaypros, can print italics, seven international character sets, true underlining, six print pitches, superscripts, and subscripts. But you cannot control these features from the panel on the printer; special codes for each feature have to be sent to the printer by software. This article will tell you how to use dBASE to print in double-strike and double-width mode and do underlining, plus how to change the print pitch, switch to the italic character set and change the default page length. With dBASE—and knowledge of your printer's codes—you can talk to the printer in a language it understands (the special codes) and turn your Gemini 10-X from a stubborn mule into a productive workhorse.

This article will demonstrate techniques for controlling your printer using dBASE II or III. I'm assuming you have a working knowledge of dBASE—that you know how dBASE does things, and you have written at least a rudimentary program or two. You should also be familiar with your operating system (MS-DOS or CP/M) and WordStar. Hereafter I will refer to both dBASE II and III simply as dBASE. The program examples, starting with the AT-SAY command (shown as @ . . . SAY) and the print command, will be in dBASE III. Where applicable, syntax differences for dBASE II will be included with the examples.

AT-SAY and the print command

dBASE uses a powerful command to place characters and numbers in exact places on the screen or on paper: the AT-SAY command. AT-SAY uses X and Y coordinates to define precise locations where text will be printed. For example, if you wished to print the letter A in the center of your screen, you would designate the row (12) and the column (40); the row is the X coordinate and the column is the Y coordinate. The command would be **@ 12,40 SAY "A"**. This command is very useful because it allows programmers to place information and prompts precisely where they want them on the screen.

The dBASE print command is a question mark (?). Rather than moving the cursor to specific screen coordinates, the print command will move it from wherever it is down one line, place it in the first column, and print the designated text there. For example, if you wished to print the words "MY NAME IS HAL," at dBASE's dot prompt you'd simply type **? "MY NAME IS HAL"**. The "double print" command, denoted by two question marks (??), prints the text wherever the cursor happens to be (the line-feed and carriage return are omitted).

From the screen to the printer

Both the AT-SAY and the print command deal with the screen. What have they got to do with controlling your Gemini printer? The answer lies in the unique way in which dBASE addresses printers.

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There are two ways of programming dBASE to use a printer: by echoing everything that appears on the screen to the printer using the SET PRINT ON command, or by making dBASE think the printer *is* the screen by using SET DEVICE TO PRINT.

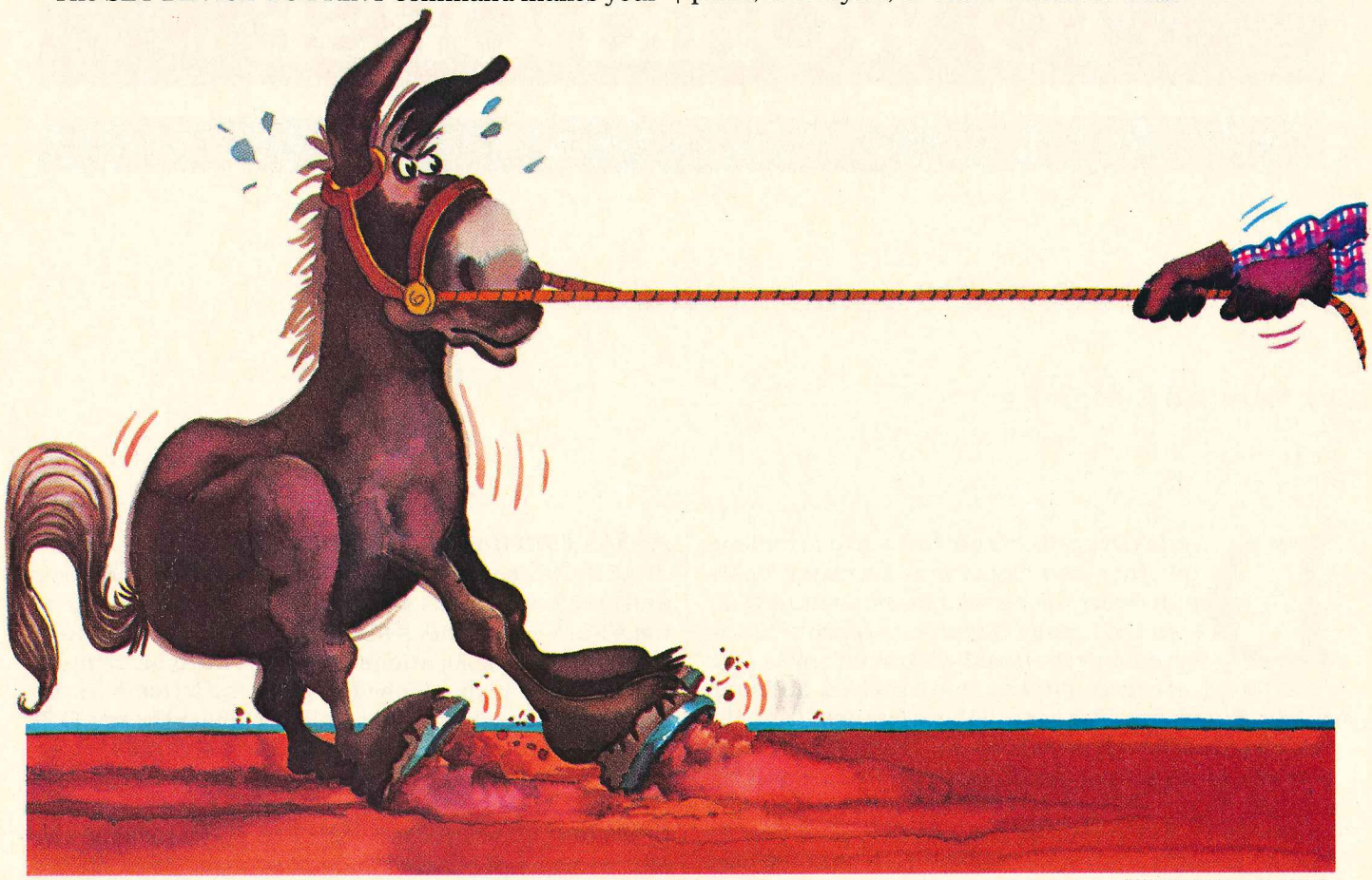
Typing **SET PRINT ON** will send everything that appears on the screen to the printer. This allows for some quick and dirty reports and for printouts of both data file structures and dBASE status displays. The command **SET PRINT OFF** stops this feature.

The SET DEVICE TO PRINT command makes your printer the display. (In dBASE II this command is SET FORMAT TO PRINT.) Once the DEVICE or FORMAT is set to PRINT, dBASE thinks your printer is the screen. Using SET DEVICE TO PRINT and dBASE's AT-SAY command, you can print reports, labels—anything, really—and place text exactly where you want it.

There is one important limitation to your new "screen": You cannot tell the print head to move backward. For example, you cannot tell the printer to move from position 2,2 (row 2, column 2) to position 1,1 (row 1, column 1), because this tells the printer to move back one row and to the left one column. Most printers are incapable of this action. When dBASE sees a command like this, it thinks you want to go to position 1,1 *on the next page* and does a form feed to get you there. Remember, when the DEVICE is SET to PRINT, all AT-SAY commands *must* be in sequence from left to right and top to bottom.

Printer codes

Now comes the fun part—making the printer do tricks. Every printer is designed to accept codes that tell it what to do. Some codes are simply letters; when the computer transmits the code for the letter A, the letter A is printed. Some codes tell the printer what to do (line-feed, form-feed, etc.), while other codes change print pitch, font styles, or entire character sets.



ILLUSTRATIONS BY TOM VOSS

Your printer understands ASCII codes, which take one of three forms: the *character* itself (A, for example); a *decimal number* corresponding to the character (the decimal code for A is 65); or a *hexadecimal number* corresponding to the character (A in hexadecimal is 41h). Decimal numbers, of course, are in base 10, while hexadecimal numbers are in base 16. You can use an ASCII chart to tell you the decimal and hexadecimal codes for characters.

dBASE transmits ASCII codes in decimal form, using the CHR function. For example, a look at the Gemini 10-X printer manual reveals that the printer code to change to compressed printing is ^O. The ASCII decimal code for ^O is 15. In dBASE this decimal code is written **CHR(15)**. Assuming the DEVICE (or FORMAT in dBASE II) has been set to PRINT, the AT-SAY com-

mand in dBASE to change to compressed printing is **@ 1,1 SAY CHR(15)**. To transmit this same code using the print command, at the dot prompt you would type **? CHR(15)**. From this point on the Gemini will print condensed characters until you issue a code to change the printing back to its original size.

In the rest of this article, I will use the AT-SAY command for examples, but remember that you could also use the simpler print command in most cases.

Double-strike mode

Double-strike mode causes the Gemini to print each character over itself again. The print head will print the letter B, for example, move backward, and print B again in the same spot, thus making the character darker and bolder.

The code that starts double-strike printing is ESC G, so the dBASE command is **@ 1,1 SAY CHR(27)+CHR(71)**. Cancel double-strike with ESC H. The dBASE command is **@ 1,1 SAY CHR(27)+CHR(72)**.

Double-strike comes in handy when you want certain words or phrases to stand out. Text printed in double-strike catches the eye and is more easily readable than the text around it. Note the difference between:

Client: HENRY HOLMES

and

Client: **HENRY HOLMES**

Underline mode

Underline mode, like double-strike mode, allows you to put special emphasis on designated text. You can use underlined text in conjunction with double-strike mode, double-width mode, and different print pitches.

ESC - 1 (ESC hyphen one) initiates underline mode. The command in dBASE is **@ 1,1 SAY CHR(27)+CHR(45)+CHR(1)**. The code to turn off underlining is ESC - 0 (ESC hyphen zero). The dBASE command is **@ 1,1SAY CHR(27)+CHR(45)+CHR(0)**.

Please note that your Gemini 10-X will underline blank spaces as well as characters. This means that lines of text with trailing blank spaces will look ragged, and that the spaces between words will be underlined.

The relief pitches

Print pitch is the distance between printed letters. The Gemini measures print pitch in characters per inch (cpi), and the printer's default setting is 10 cpi. The alternate pitches available are 12 cpi and 17 cpi. (Actually, even more pitches are available by using double-width mode, explained below.)

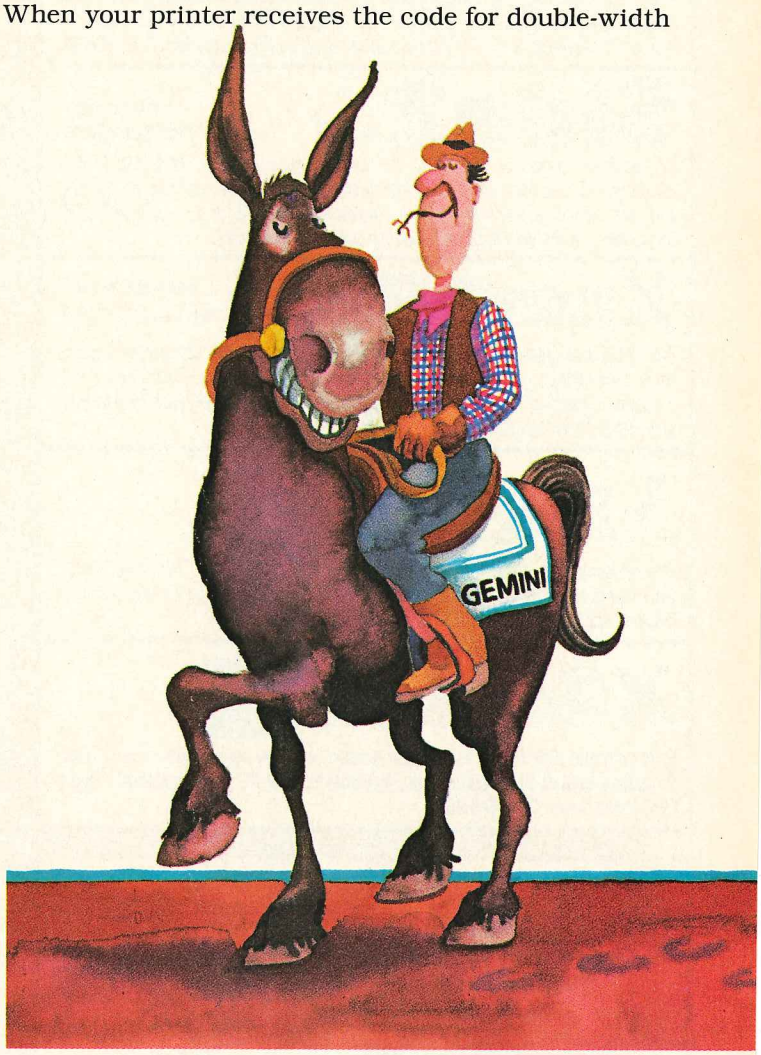
You can switch to any of the alternate pitches by sending the set-print-pitch code to the printer. This code is ESC B *N*, where *N* is a number that designates the print pitch—1 for 10 cpi, 2 for 12 cpi, and 3 for 17 cpi. If you wished to change the print pitch to 12 cpi, for example, the code would be ESC B 2. In dBASE this is **@ 1,1 SAY CHR(27)+CHR(66)+CHR(2)**.

The code that changes the pitch back to 10 cpi is ESC B 1, which in dBASE is **@ 1,1 SAY CHR(27)+CHR(66)+CHR(1)**.

Each alternate pitch has its own uses. By combining 12 cpi pitch with double-strike mode, you can produce near-letter-quality text. Spreadsheet users will be glad to know that using 17 cpi allows you to print 136 columns on standard eight-inch-wide paper.

Double-width print

When your printer receives the code for double-width



print, it divides the current cpi setting by half, thus doubling the width of the characters. Text printed at 10 cpi becomes 5 cpi, 12 cpi becomes 6 cpi, and 17 cpi becomes 8.5 cpi.

The code that starts double-width printing is ESC W 1. In dBASE this translates to **@ 1,1 SAY CHR(27)+CHR(87)+CHR(1)**.

End double-width printing with the code ESC W 0 (zero, not the letter O), which in dBASE is **@ 1,2 SAY CHR(27)+CHR(87)+CHR(0)**.

Double-width characters are especially useful for titles. Someone reading a report with the title printed in double width can tell at glance what the report is. Also,

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if the text is placed correctly, double-width titles can give a report a more professional look. Hyphens printed in double-width mode make good borders between items in a report.

The italic character set

The Gemini 10-X has nine character sets: the standard character set, seven foreign character sets, and an italic character set. Printing text in italics gives it special emphasis. Italics also give reports a more professional look than underlining or boldfacing.

The code to select the italic character set is ESC "4". In dBASE, that's **@ 1,1 SAY CHR(27)+CHR(52)**.

The command to deselect the italic character set and reinstate the standard set is ESC "5". In dBASE, it's **@ 1,1 SAY CHR(27)+CHR(53)**.

Use memory variables to designate line numbers and in turn control the loop.

(Hold it. Why are there quotes around the 4 and the 5? And why is their ASCII decimal value not equivalent to their numeric value [as has been the case with every other printer code]? The answer to both questions is that the code is for the *characters* 4 and 5, not the numbers 4 and 5. Examine an ASCII chart and you will see that.)

Italic characters can also be used in headings and footnotes, or to accent printed numbers.

Setting the page length

The Gemini has a code that changes the page length from its default of 11 inches to anywhere between one and 32 inches. The code is ESC C 0 *N* (zero, not the letter O), where *N* is the number of inches you wish the form to be. Suppose you wanted to make the page length six inches. In dBASE the command would be **@ 1,1 SAY CHR(27)+CHR(67)+CHR(0)+CHR(6)**.

Change it back to the default with **@ 1,1 SAY CHR(27)+CHR(67)+CHR(0)+CHR(11)**.

dBASE is often used to print labels, invoices, and specialized forms, all of which differ from the standard 11-inch page. When using odd-sized paper, set the page length to match the paper you are using. This ensures that when you issue a form feed the print head will line up correctly with the next page.

Putting it all together

Knowing the printer codes and how to use them is only half the battle; real progress comes when you use those codes to create a report or form that both communi-

(continued on page 48)

COPYRIGHTING COMPUTER PROGRAMS

How to protect your work

by Isaac Szlechter

If you go beyond writing programs for your own use and begin to create programs for commercial purposes, you should be concerned about protecting your rights to your work. It's true that you automatically hold the copyright on your programs as soon as they're created, and that technically you don't *have* to register them with the Copyright Office in order to claim the copyright. But in reality, prudence demands that you protect yourself against copyright infringement by taking certain steps within a certain time period.

In this article, I'll present an overview of the copyright regulations as a whole, along with information that pertains to copyrighting computer programs per se. This article is not intended to replace legal advice on the particulars of your situation, but to give you a basic understanding of the copyright laws.

Your rights

Copyright is a form of protection provided by the laws of the United States to the author of "original works of authorship," including computer programs. The Copyright Act gives the owner of a copyrighted program the exclusive right to do—and to authorize others to do—the following:

- reproduce the copyrighted program.
- prepare derivative works based upon the copyrighted work.
- distribute copies of the copyrighted program to the public by sale or other transfer of ownership, or by rental, lease, or lending.

These rights give you control over how your work is used and assure you that you receive payment for any use of your work.

Copyright protection exists from the time the work is created. It is an "incident of the process of authorship"—that is, the work immediately becomes the property of the author who created it. Only the author or those deriving their rights through the author can rightfully claim copyright.

In the case of works made for hire, the employer, and not the employee, is considered the author. Seymour Vidur, a Brooklyn, New York, attorney, explains, "The copyright statute defines a 'work made for hire' as a work prepared by an employee within the scope of his employment, or a work specially ordered for use as a contribution to a collective work, as a supplementary work." Two parties can also expressly agree in writing that a work will be considered a work made for hire.

What's not protected?

Several categories of materials are generally *not* eligible for copyright protection:

- works that have not been fixed in a tangible form of expression.
- titles, names, short phrases, and slogans; familiar symbols or designs; mere variations of typographic ornamentations or lettering; or mere listing of contents.
- ideas, procedures, methods, systems, processes, concepts, principles, discoveries, or devices, as distinguished from a description, explanation, or illustration.
- works consisting entirely of information that is common property and containing no original authorship.

Securing a copyright

The way in which copyright protection is secured is frequently misunderstood. Under the law, copyright is secured automatically when the work is created—no publication or registration or other action in the Copyright Office is required. There are, however, certain definite advantages to registration:

- registration establishes a public record of the copyright claim.

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- registration is ordinarily necessary before any infringement suit may be filed in court.
- if made before or within five years of publication, registration will establish in court the validity of the copyright.
- if registration is made within three months after publication of the work, or prior to an infringement of the work, statutory damages and attorneys' fees will be available to the copyright owner in court actions. Otherwise, only an award of actual damages and profits is available to the copyright owner.

Copyright is secured automatically when a work is created, but there are advantages to registration.

How to register a program

If you choose to register your program, send the following three things in the same envelope to the Copyright Office, Washington, D.C., 20559:

- a properly completed application (Form TX).
- a $10 filing fee payable to the Register of Copyrights.
- a copy of the program being registered.

The copy must contain identifying portions of the program (the first 25 and last 25 pages), reproduced in a form readable without the aid of a machine or device—either on paper or in microform—together with a page containing the copyright notice, if any.

"The Copyright Office believes that the best representation of the authorship in a computer program is a listing of the program in source code," said J. Smith, a Copyright Office spokesman.

If a published user's manual (or other printed documentation) accompanies the computer program, two copies of the manual must be sent, along with one copy of the identifying portion of the program.

The copyright notice

A notice of copyright is required, even on works published outside the United States. The notice should contain the following elements:

- the symbol © (the letter "c" in a circle), or the word "Copyright," or the abbreviation "Copr."
- the year of first publication of the program.
- the name of the owner of copyright—for example, "© 1985 John Doe."

If a program is distributed only in machine-readable form—e.g., on diskettes—the copyright notice should be placed so that in printouts it appears with or near the title or at the end of the work. It may also be

displayed at the user's terminal at sign-on, or it may be continuously displayed on the terminal. It can also be part of a label if it's reproduced so as to withstand normal use.

Limits of copyright protection

A program is automatically protected from the moment of its creation and is ordinarily given a term enduring for the author's life, plus an additional 50 years after the author's death.

A U.S. copyright does not provide worldwide protection. "There is no such thing as an 'international copyright' that will automatically protect an author's program throughout the entire world," said Smith.

Protection against unauthorized use in a particular country depends on the national laws of that country. However, most countries do offer protection to foreign works under certain conditions simplified by international copyright treaties and conventions. For a list of countries that maintain copyright relations with the United States, write to the Copyright Office and ask for "International Copyright Relations of the United States," Circular R38a.

Transfer of copyright

Copyright, according to attorney Vidur, "is a personal property right, and it is subject to the various state laws and regulations that govern the ownership, inheritance, or transfer of personal property, as well as terms of contracts."

Transfer of copyright on a nonexclusive basis does not have to be done in writing, but the transfer of *exclusive* rights is not valid unless that transfer is in writing and is signed by the owner of the rights conveyed.

"It is a good idea to confer with a lawyer who specializes in computer law or intellectual property before you enter into any agreement," advises Vidur.

What "public domain" means

Public domain software is software that has no copyright protection and is therefore open to use by the public. Anyone can use it and reprint it without permission.

When does computer software enter the public domain?

With very few exceptions, the copyright on any work published or copyrighted before September 19, 1906, has now expired, and the work has permanently fallen into the public domain in the United States. The copyright has also expired for software first published or copyrighted between September 19, 1906, and December 31, 1949, and not renewed—obviously, this doesn't take in much territory.

Under the copyright law in effect prior to January 1, 1978, copyright could be lost and software could fall into the public domain in several situations. The most common were publication without copyright notice, expiration of the first 28-year copyright term without renewal, or final expiration of the second copyright term.

For work first published on or after January 1, 1978, certain omissions of, or defects in, the copyright notice may lead to loss of copyright protection if steps are not taken to correct the omissions or defects.

Software enters the public domain if the author leaves the copyright notice off, fails to register his work within five years after publication without the notice, and does not make a reasonable effort to add the notice to all copies that are distributed to the public in the United States after the omission has been discovered.

Checking copyright status

If you want to find out the copyright status of a software program, there are several ways to go about it:

- examine a copy of the work for a copyright notice, place and date of publication, author, and publisher.
- make a search of the Copyright Office catalogs and other records.
- have the Copyright Office make a search for you.

Copyright investigations often involve more than one of these methods. In many cases, it is important to consult a copyright attorney before you reach any conclusions about the copyright status of computer software.

Even if you conclude that a work is in the public domain in the United States, this does not necessarily mean that you are free to use it in other countries. Every nation has its own laws governing the length and scope of copyright protection, and those are applicable to uses of the work within that nation's borders. Thus, the expiration or loss of copyright protection in the United States may still leave the software fully protected against unauthorized use in other countries.

For more information

Questions relating to copyright problems not mentioned in this article can be addressed to the Information and Publications Section, LM-455, Copyright Office, Library of Congress, Washington, D.C., 20559. The hot-line number is (202) 287-8700. You may also order application forms at any time by telephoning (202) 287-9100.

The following publications may also be useful and may be obtained from the Copyright Office:

- Circular R1. "Copyright Basics."
- Circular R2. "Publications on Copyright."
- Circular R22. "How to Investigate the Copyright Status of a Work."
- Circular R61. "Copyright Registration for Computer Programs."
- Circular R99. "Highlights of the Current Copyright Law."

Isaac Szlechter is a freelance writer who specializes in business and technology reporting.

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cates effectively and is pleasing to the eye.

Before printing, give some thought to how you want the report to look—what information it will contain and where that information will be placed. Make a sketch of a typical report, and make different items boldface or italics to see how they look. Make several sketches, then choose the one that works best.

Once you have a preliminary design, start thinking about writing the program to create it.

It's fairly easy to use the printer codes I have described. Change to an alternate font or pitch by prefacing any text with the proper printer code. For example, if you have first name and last name fields called, appropriately enough, FNAME and LNAME, the code to print the contents of those fields might read:

```
@ 10,05 SAY "CUSTOMER -"
@ 10,16 SAY TRIM(FNAME)+" "+TRIM(LNAME)
```

To print the first and last names in italics, you would modify this program to read:

```
@ 10,05 SAY "CUSTOMER -"
@ 10,15 SAY CHR(27)+CHR(52)
@ 10,16 SAY TRIM(FNAME)+" "+TRIM(LNAME)
@ 10,42 SAY CHR(27)+CHR(53)
```

The place where the first printer code goes is obvious—just before the beginning of the first name. But how do you know where to place the second code, the one that turns off italic printing? Find the maximum width of the fields or memory variables you are printing, and then figure out how many columns they will use. Then place the second code in the column after the last column in which text could appear.

When I write a program to generate reports, I like to use two loops: The primary loop controls the program itself and is usually a Boolean DO-WHILE loop—for example, DO WHILE .NOT. EOF(), or in dBASE II, DO WHILE .NOT. EOF.

The second loop prints a page at a time. At this stage, knowing the characteristics of the printed page—how many lines and columns there are—becomes very important. You can use memory variables to designate line numbers and columns and, in turn, control the loop. For example, your program might print one block of text per line, then increment the line memory variable by one. At the bottom of each loop you check to see if the line memory variable is equal to 66 (the number of lines per page). If so, that page is done. You reset the line number variable and move on to the next page.

Conclusions

Once you get the hang of using these special printer control commands, they can make a big difference in the appearance of your printed material.

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PROFILES 1986 SUBJECT INDEX

Nancy Mulvany, Indexer

The following is an index, by subject, of all major articles that have appeared in the 1986 issues of *PROFILES*. However, the contents of the "New Products" and "Product Updates" departments have not been indexed.

References to specific Kaypro computer systems are listed under either "CP/M Kaypro computers" or "MS-DOS Kaypro Computers." Similarly, operating system specific references are listed under "CP/M operating system" or "MS-DOS operating system."

If you are looking for references to particular products, look first under "software products (commercial)" or "hardware products." Products that are discussed in relation to particular applications are listed by name as subject entries.

Public domain software for CP/M computers is listed under the heading "public domain software (CP/M)." Those with MS-DOS computers should look under "shareware/public domain (MS-DOS)."

To enhance the readability of the index, the December 1986/January 1987 issue citation has been shortened to (Dec). In addition, there are two versions of this issue. The page numbers affected are referenced as:

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Tip Trader

edited by Marshall L. Moseley

If you have a tip you'd like to share with other readers, send it to Marshall Moseley, "Tip Trader" editor, PROFILES, *533 Stevens Ave., Solana Beach, CA 92075.*

This month I have a couple of tips for you, in addition to those from our readers.

Into the disposal

A while back I wrote a batch file that, among other things, installed a RAM-resident program in memory. When installed, the program displayed an annoying status message. I went looking for ways to get rid of that message and soon discovered MS-DOS's NULL device.

A device is a part of MS-DOS that can receive and/or send data—a disk drive is a device; so are your keyboard and monitor. Devices have names like A: (a disk drive), LPT1: (the printer port), or COM1: (the serial data port). Devices do not have to physically exist; a RAM disk, for example, is a device that behaves like a regular disk drive but exists only in memory.

The NULL device also has no physical existence. It is your operating system's garbage disposal: you send data to it and that data simply disappears, never to be heard from again.

For example, if the program you're installing is called RAMRES.COM, and you want to hide the message it displays, you would type: **RAMRES > NULL:**.

The greater-than symbol redirects any messages from RAMRES that would appear on the screen to the NULL device.

NULL also comes in handy when using the PAUSE command in a batch file. PAUSE stops the file execution and automatically displays the message "Press any key when ready." You may want to display your own prompt and hide this one. So you would type: **PAUSE > NULL:**.

Running programs

A little-known feature of the CP/M program COPY is its ability to create or modify a disk so that the disk automatically runs any program you designate whenever it is cold booted.

Place your CP/M disk in drive A and your program disk in drive B. From the A0> prompt, type **COPY**. From the first menu, choose **O** for *O*ther options. From the Other options menu choose **Sysgen**. You will be prompted to enter the command you want the computer to execute. If you want to run WordStar automatically, for example, type **WS** and press **RETURN**.

COPY will then place the CP/M operating system on your program disk, along with the command you typed. The next time you boot on that disk, CP/M will automatically run the program you designated.

COPY is not available for any of the CP/M Kaypros that use the universal ROM.

dBASE programming tip

dBASE has a command called APPEND that writes records from another file into the currently selected file, depending on a condition. The syntax is APPEND FROM <filename> FOR <condition>. For example, an APPEND FROM UPDATES FOR NAME="JONES" would write to the data base currently in use every record in the file UPDATES in which the NAME field holds the character string JONES. Sounds pretty good, huh? Well, it's *slow*, especially if the data base you are searching is very large. I know a much faster way, even though it is harder to code.

First, make the file currently in USE the PRIMARY data base, and make the file you wish to append from the SECONDARY data base. Index the secondary data base on the search key—i.e., if the condition involves NAME, index on NAME. Of course, creating an index file every time would be time consuming, but you really have to do it only once. Then carry out any and all operations on that file using the index.

With the secondary file indexed on the search key, use the dBASE command FIND. FIND locates a record in an indexed data base (even a huge data base) very quickly, usually in two seconds. If your file were indexed on NAME, for example, you could search for Mr. Jones from the interactive mode simply by typing **FIND JONES** (no quotation marks this time). FIND searches the data base and stops at the first record containing the designated search string.

Once you're on the selected record, **USE PRIMARY** and **APPEND BLANK**. Then use the **REPLACE** command with prefixes that denote which data base information is being taken from and where that information is being written to. The command **REPLACE P.NAME WITH S.NAME**, for example, would replace the NAME field in the PRIMARY data base with the NAME field in the SECONDARY data base.

Here is a short program that demonstrates this technique. The PRIMARY file is CUSTOMER, the SECONDARY file is UPDATES, the index file is NAMIND, and NAME is a field common to both data bases.

```
*FINDEM.CMD
SET TALK OFF
STORE "          " TO MNAME
ERASE
@ 10,01 SAY "Enter name—>"
@ 10,15 GET MNAME
READ
STORE TRIM(MNAME) TO
   MNAME
SELECT PRIMARY
USE CUSTOMER
SELECT SECONDARY
USE UPDATES INDEX NAMIND
FIND &MNAME
IF #=0
   @ 11,01 SAY "Not found."
ELSE
   @ 11,01 SAY "Replacing."
   SELECT PRIMARY
   APPEND BLANK
```

```
    REPLACE P.NAME WITH
        S.NAME
ENDIF
SELECT PRIMARY
USE
SELECT SECONDARY
USE
RETURN
```

Note the use of a macro in the FIND command. There are other considerations, of course (such as duplicate records), but you can program for those contingencies.

Jerry Rotramel
San Diego, California

More Perfect tips

In the September 1986 "Tip Trader," Joe Noel, writing about RAM disks and Perfect Writer, says "RAM is the only way I can have Perfect Writer, Formatter, Printer, and Speller, plus data files, available simultaneously without constantly reloading floppies."

Here is another way: Reduce the size of the 65K swap file, which will then give you room to fit Perfect Speller onto the Perfect Writer disk. You can reduce the size of the swap file using PWCONFIG. By chopping the file down to 25K, I have room to cram Perfect Writer's spelling, editing, formatting, and printing programs, as well as a key definition program, onto a single disk.

Of course, a swap file of 25K means that you can only edit files of 20K or so. My solution is to place Perfect Printer (PP.COM) on each of my data disks. Why? Because while my program disks always seem to be jammed, my data disks always have some space available, and the free space on my program disk allows me to have a swap file of 40K—very adequate for most uses.

Christopher Hosford
Miami Beach, Florida

GW-BASIC hot keys

Purely by accident I discovered that holding down the ALT key and pressing alpha keys produces a series of GW-BASIC keywords. Twenty-two of the 26 characters have preassigned commands (for example, ALT-A is AUTO, ALT-L is LOCATE, etc.). I was amazed to discover that I could find this nowhere in the manual. It sure speeds up GW-BASIC programming, though.

Rev. Richard W. Beebe
Fryeburg, Maine

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Using WordStar's column mode

WordStar is a versatile and powerful program, and part of that power lies in its ability to manipulate *columns* of text. Using WordStar's column mode and block movement commands, you can mark columns, move them anywhere in your text, even print multiple columns of justified text on a single sheet of paper.

To demonstrate the use of these commands, I'll show you how to use WordStar to produce a very respectable newsletter consisting of two justified columns of text, with little or no messy paste-up involved.

Planning the layout

The first thing to do is carefully plan the layout of the finished product. Then determine how many lines of text will be printed on each page of your newsletter and also the widths of the margins around the text. For simplicity, assume a margin of 1/2 inch all around a standard 8-1/2 by 11-inch page. That will allow 10 inches, or 60 lines of text at the WordStar standard default of six lines per inch. Therefore, a two-column newsletter can have up to 120 lines of formatted text on each page.

We'll also assume that each column of text will be 36 characters wide (at a pitch of 10 characters per inch) and that there will be a space of three characters between the columns. Newspaper professionals call this vertical space the "gutter."

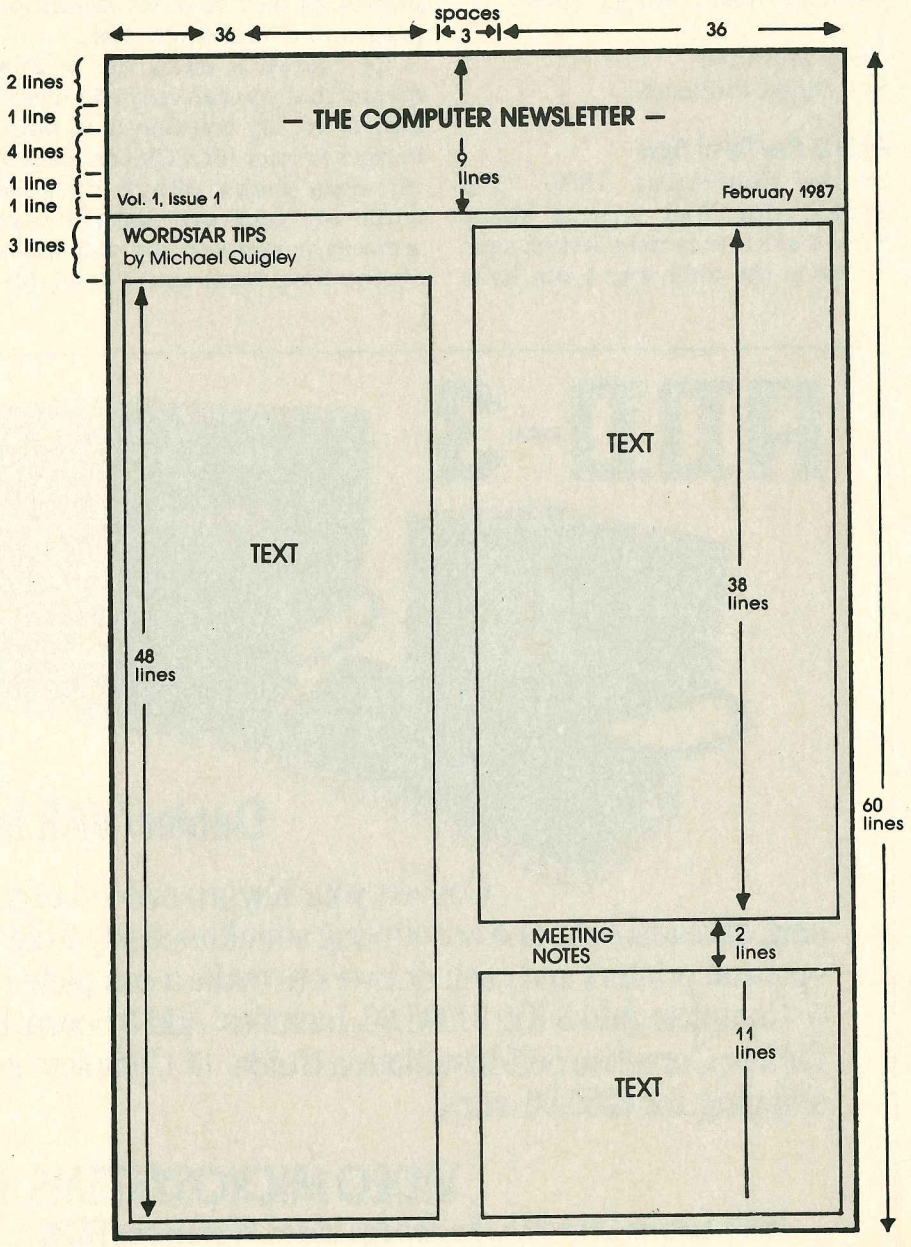
Now, open up a file for the newsletter and adjust the top and bottom margin settings through the use of **.MT 3** and **.MB 3** dot commands. Put these commands at the beginning of the file so you will be able to see where the page breaks occur on the printed page.

Don't worry about the left and right margins now. Go ahead and use the WordStar default settings. It's a lot easier to edit text when you have the full width of the screen to work with.

Typing the copy

Let's assume that you will be producing a one-page, single-sided newsletter that contains a single article. Begin typing the copy into the file, and stop after approximately 500 words.

After you've typed in all of the copy, adjust the right margin to the



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narrower column width of 36 characters by typing ^OR 36.

Re-forming the copy

Go back and re-form the entire file using the ^B or the ^Q^Q^B command. When you're finished, your file should be one long, narrow strip of text. If you haven't already, this is a good time to save your work with the ^KS or ^KD command.

On a piece of paper, list each article by title and the number of lines it takes up. This is your "copy log." Since there is only one article in our example, this step may be omitted. However, the importance of a copy log increases with the number of articles.

Fitting the copy

Next, prepare a "dummy sheet" like the one shown in Figure 1 (on page 60). A dummy sheet is a sketch that shows where each article will appear. It doesn't have to be anything fancy, just a piece of paper that shows how many lines are available in each column, as well as how many lines are taken up by each article.

Refer to the copy log for article lengths. While sketching out the dummy sheet, try to position the articles in such a way that the total page presents readers with an attractive, easy-to-read newsletter. Don't forget to leave room for the newsletter's "flag" (the nameplate that usually appears at the top of page one), as well as space for article headlines, bylines, and any graphics you plan to use.

Here's where your editing skills come into play. If the articles take up more lines than are available, trim words, sentences, and sometimes whole paragraphs to make the articles fit. If, on the other hand, the articles are too short to fill the available space, add words, graphics, or some blank lines between the articles.

When your dummy sheet is complete, you should have a pretty good idea of what the finished page will look like when it is printed. More importantly, you'll know exactly where to break up an article that continues on the next column or page.

Moving the text

Now the real fun begins. First, turn on WordStar's column mode toggle with the ^KN command. Normally, when you mark a block of text with the ^KB and ^KK commands, the screen is highlighted across its entire width. (*Ed. note: The '83 series CP/M Kaypros do not have highlighted video; the blocks are denoted only by the <B> and <K> markers.*) When you turn on column mode, the highlighting appears only in the columns between the begin and end block commands.

Now move the right margin out to 75 characters (36 characters for the first column, plus the three-

character gutter, plus 36 characters for the second column) with the **^OR 75** command. Type in the flag (newsletter name, volume number, and date) using the wider margins. Center the flag using **^OC**.

You are now ready to begin moving text around according to the dummy sheet you've prepared. In Figure 1 you can see that the last half of the article, starting with line 51 (the 48th line of the article plus three lines for title and byline) must be moved to the second column.

Move the cursor to the first character in the upper left corner of the block of text to be moved (the first letter in line 51) and mark it using the **^KB** command. Then move the cursor to the last line to be moved and position it exactly in column 37—one space to the right of the text. Mark the end of the block with the **^KK** command.

Notice that only the block of text and not the whole screen is highlighted. (If you're *not* in the column mode, you'll see the entire screen between the ^KB and ^KK commands highlighted.) Now move the cursor to the position where you want the block of text to appear (line 10, column 40) and, using the **^KV** command, move the entire block of marked text to its new position. When everything looks right, unmark the block with the **^KH** command.

When you move a column, any text that existed to the right of that block will move to the left to fill up the space that was vacated. For this reason, I like to work from left to right when I move text around.

Continue moving the text, using your dummy sheet as a guide, until you've placed all of it in the right place.

To see what the finished product will look like, you can get rid of the embedded print commands temporarily by using the **^OD** toggle. However, I recommend leaving the print commands visible.

Printing the newsletter

One step remains before you send the newsletter to the printer. Go back to the beginning of the file and turn off microjustification by placing a **.UJ OFF** dot command after the .MT and .MB commands. If you omit this step, your columns won't justify properly when the newsletter is printed.

Save the file and print a test copy. If the margins aren't perfect, adjust the page offset (the left margin) with the **.PO** dot command.

Finishing up

If the copy looks good, you can take the page from the printer and simply add some borders around the text with a fine-tipped black marker and straight-edge. Then take your newsletter "master" to the nearest instant print shop.

Michael Quigley is a search and rescue pilot with the U.S. Coast Guard.

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Technical Forum

by Tom Enright

Screen output speed

If you have a DOS machine, you've probably noticed that screen I/O is unusually slow. Both the '83 and '84 series CP/M Kaypros print information on their screens faster than DOS machines. The reasons for this are closely tied to the flexibility of the two classes of computers. CP/M machines are essentially text oriented, while DOS machines are designed for both .text and graphics in several modes.

Because of their flexibility, DOS computers have a complex and convoluted BIOS. The BIOS section dealing with screen output is especially complex, which means it's slow. However, there is a way to get fast screen output on a DOS computer. Since DOS machines use memory-mapped video, you can simply write directly to the RAM that controls what appears on the screen. Direct screen output is more than 50 times faster than what you get by letting DOS do it.

Direct screen output is more than 50 times faster than letting DOS do it for you.

Screen output speed test

The two 8088 assembly language listings accompanying this column demonstrate the differences in screen output speed. Both programs do essentially the same thing: They clear the screen, print 24 lines of Xs, and repeat the process ten times. The first one, SCRNI.ASM, lets DOS do most of the work, while the second, SCRND.ASM, writes directly to video memory.

Both programs are compatible with either monochrome or CGA video cards. To assemble either of these programs you need Microsoft's Assembler (MASM.EXE or ASM.EXE), the DOS linker (LINK.EXE), and EXE2BIN.EXE to create the final COM file. Since the assembler doesn't come with your computer, these sample screen writing programs have been placed on Kaypro's KUG ROS BBS in both source and executable forms. They are in an archive file named SCRNTEST.ARC. You will also need to download ARC512.EXE to remove the programs from the archive.

The following batch file saved as COM.BAT will assemble either of the test programs.

```
MASM %1,%1,%1;
LINK %1;
DEL %1.obj
EXE2BIN %1 %1.COM
DEL %1.EXE
```

Type **COM SCRNI** or **COM SCRND**, depending on which of the programs you want to assemble. Note that when assembling either program you will get a warning message that no "STACK SEGMENT" was found. This is normal for COM files, and the message should be ignored.

The program—in brief

The following explanation of how these programs work is *not* complete—space constraints preclude having both the program listings and a full explanation in the same column. This month I'll get you started, but I must defer a detailed explanation, especially of the second program, until next month. At that time I will also discuss some modifications to make these procedures more useful for general programming in both assembly language and Turbo Pascal.

The first program (SCRNI) starts by saving the number of iterations on the stack. It then erases the screen, positions the cursor to line zero at column zero, and prints a full screen of Xs. The program then gets the iteration count from the stack, decrements the count, and repeats from the label "tloop" if the count is greater than zero. The instruction "loop tloop" takes care of subtracting one from the count and determining whether to repeat the loop or to continue to the next instruction.

The second program (SCRND) is considerably longer than the first one. That is because it must determine the current video mode, decide *where* in memory to write the string of characters, and also write the string for itself. The first program lets DOS make these decisions. The advantage to the second program, as I've said, is that it will do the same thing more than 50 times faster than the first program.

(listings found on page 66)

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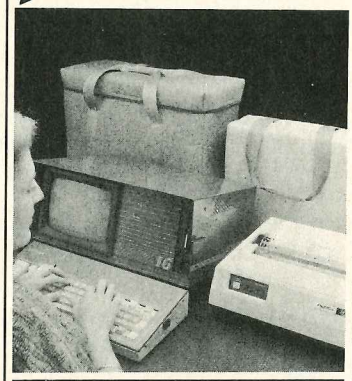

Rain, high humidity, dust, and occasional bumps and scrapes all damage your portable computer and components. We at Michele-Lynn have developed virtually waterproof, lightweight, and highly versatile computer carrying cases. These cases are handmade here in the USA using high quality water-repellent lined and insulated nylon. Designed with zippered inner top and velcro outer top for maximum moisture protection.

Yes, I would like to provide maximum protection and portability for my computer and components. I've indicated my color choice below:

[ ] Black [ ] Royal Blue [ ] Navy Blue [ ] Silver

CODE AND DESCRIPTION	COST	QTY.	TOTAL
cb1-fits Kaypro 1, 2, 4, 10 &16	$ 79.95		
cb1-fits Kaypro 2000 (computer only)	39.95		
cb2-DELUX fits Kaypro 2000 and all Components	69.95		
pb1-fits narrow width printers, i.e. Epson FX80	49.95		
pb2-fits wide width printers, i.e. Epson FX100	69.95		
mc1-universal monitor case	69.95		
combo1 cb1 & pb1 (Save $20.00)	109.90		
combo2 cb2 & pb1 (Save $12.00)	77.40		
Enclosed is my check or money order or charge my Visa or Mastercard Account.	Add 3.00 p/h		$3.00
	TOTAL		

Expiration Date:
Signature:
Ship To:

MAIL TO:

Michele-Lynn
1701 Oakbrook Drive
Norcross, GA 30093
or call 1-404-441-7526

Advanced Concepts "Mini Winnie"
HARD DISK SYSTEMS
For All CP/M Kaypro Computers!

Our EXTERNAL systems install in seconds! Includes an attractive vertical cabinet with integral P/S and fan, 3 foot cables. Everything necessary to plug in and go!

Our INTERNAL systems do not displace a floppy drive, do not require a power supply upgrade, use the highest technology winchesters available. No compromises.

COMPLETE SUBSYSTEMS

Plug in and run! Includes software, documents, cables, brackets as req'd.

5 mb EXTERNAL $465	INTERNAL
10 mb $665	10mb $740
20mb $790	20mb $845

Compatible with most other add-ons, including Microsphere & Advent RAM disks, SWP CoPower/RAM disk, Pro-8, Advent Turbo ROM, all speedup and double/quad density upgrades, ZCPR3, Microshell. (May require Host Extension cable @ $18.95 for other add-ons that also use the Z-80 socket.)

The key to the Mini-Winnie system is the INSTALL program, which links your drive and your computer, the way YOU want it. Extensive menu options allow selection of any ST-506 compatible drive, as 1 to 4 logical drives within CP/M at any drive letter. Diagnostic and format capability provided to match the installation. Distributed in SOURCE form.

We have club, use group, OEM/Dealer programs. Call for quantity schedule. If for any reason you are not satisfied, return for full refund within 30 days. All systems warranteed for 90 days. Info and manual $8.00 credited with system purchase. Specials subject to availability.

ORDER INFO: Call (305) 482-7302. Terms: UPS cash COD, check or M.O. Please allow 4 weeks for delivery. Fla. add 5% tax. Shipping extra. Please specify desired floppy format.

Advanced Concepts Engineering & Consulting
8926 S.W. 17th Street
Boca Raton, Florida 33433

Listing 1: SCRNI.ASM

```
cseg    segment public 'CODE'
        assume  cs:cseg,ds:cseg,es:cseg,ss:cseg

        org 100h
entry:  jmp start               ; bypass data

ioln    db      1920 dup(88),'$'

start:  mov     cx,10           ; # of iterations.
tloop:  push    cx              ; Save iteration count.
        mov     ax,0600h        ; Clear window request.
        mov     cx,0000h        ; Upper left corner.
        mov     dx,2480h        ; Lower right corner.
        mov     bh,07h          ; Desired video attribute.
        int     10h
        mov     ah,2            ; Position cursor request.
        mov     bh,00h          ; Page 0.
        mov     dx,0000h        ; Row 0, column 0.
        int     10h
        lea     dx,ioln         ; Point to output string.
        mov     ah,9            ; Display string function.
        int     21h
        pop     cx              ; Restore interation count.
        loop    tloop           ; Repeat if < 10 iterations.
        int     20h             ; End

cseg    ends
        end entry
```

Listing 2: SCRND.ASM

```
cseg    segment public 'CODE'
        assume  cs:cseg,ds:cseg,es:cseg,ss:cseg

        org 100h                ; This is a COM file

entry:  jmp start               ; bypass data line

ioln    db      1920 dup(88),00h

start:  mov     cx,10           ; # of iterations.
tloop:  push    cx              ; Save iteration count.
        call    cls             ; Clear screen.
        mov     ax,0007h        ; Set attribute.
        lea     bx,ioln         ; Point to output string.
        call    instr           ; Insert string procedure.
        pop     cx              ; Restore iteration count.
        loop    tloop           ; Repeat if < 10 interations
        call    cls             ; Clear screen
        int     20h             ; End

; CLS - Clear screen.
cls proc near
        mov     ax,0600h        ; Clear window request.
        mov     cx,0000h        ; Top left corner.
        mov     dx,2480h        ; Bottom right corner.
        mov     bh,07h          ; Video attribute wanted.
        int     10h
        ret
cls endp

; INSTR - Insert an ASCIZ string in video buffer.
;       AX - Desired attribute.
;       BX - FWA of ASCIZ string.
instr proc near
        push    es              ; Preserve registers
        push    bx
        push    ax
        mov     di,0000h        ; Offset in video RAM
        pop     ax              ; Set up attribute.
        mov     dh,al
        pop     ax              ; Get FWA of string.
        mov     si,ax           ; Put in source index
        mov     ax,00h          ; Clear register.
        mov     ah,0Fh          ; Get video mode request.
        int     10h
        cmp     al,07h          ; Monochrome?
        jne     ins0            ; No, assume color/graphics.
        mov     ax,0B000h       ; Monochrome segment address.
        jmp     ins1
ins0:   mov     ax,0B800h       ; Color graphics segment addr.
ins1:   mov     es,ax
ins2:   mov     dl,byte ptr [si] ; Character to insert.
        cmp     dl,00h          ; End of string?
        je      insx            ; Yes, exit.
        mov     es:word ptr [di],dx ; No, insert character & attr.
        add     di,02h          ; Point to next buffer loc.
        add     si,01h          ; Point to next character.
        jmp     ins2            ; Loop til done.
insx:   pop     es
        ret
instr endp

cseg    ends
        end entry
```

C.P.I. BUSINESS SYSTEMS

Our software saves you money before it's installed

Computer Professionals, Inc. has been developing computer applications for business and industry for TWENTY years, often working behind the scenes for some of the biggest names in the industry. We have learned how to pack a lot of power into each computer program but we know that raw power and ability is worth little unless coupled with ease of use, good documentation and responsive support. CPI's Business Systems are all these things and more. They run faster, support larger capacities and cost less than any similar systems marketed today. They have been installed by thousands of users (since 1978) and are available from us directly or from your KAYPRO dealer. We specialize in KAYPRO systems.

We know that floppy disk users don't appreciate shuffling four or five disks in and out per application. We know that no users like to abort in the middle of an application to change printer pitch. We know that users don't like copy protection and complex licensing agreements. We don't believe that any systems with these 'features' can be considered easy to use so we left them all out of CPI Business Systems.

Fancy packaging and expensive type set manuals add greatly to the cost of most application packages but have little lasting value. Once your system/s are up and running for a week or so their real worth is their day-to-day productivity and responsiveness; the other materials gather dust. CPI Business Systems include **comprehensive manuals, sample data files, tutorial sessions, etc.—everything you need is included.**

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.

CP/M users may become MS-DOS users in the years ahead; CPI has planned ahead for this possibility and we provide data file conversion service to any user. CPI will, however, continue to support and enhance these fine systems for CP/M users for years to come. Your investments today will not be obsoleted by tomorrow's technology.

These powerful systems are described briefly below. If you don't feel confident yet ask for our 30+ page overview or try an application demo system at half price (demo prices apply to future system orders).

There are no extra charges for shipping, COD, etc. American Express, Mastercard, VISA card orders welcome. We ship in 48 hours. Please tell us what format you want (II/2X/4/10/16), etc. Demo systems in KAYPRO formats only.

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GENERAL LEDGER

$80.00 CP/M — $100.00 MS-DOS

Comprehensive system with most wanted features. Provides accurate and well organized financial information for your business. Programs adapt easily to your unique needs. Create, modify and list charts (3 formats); make new departments automatically. Easy journal entry process to enter, change, delete, list, save, increment reference- #'s, duplicate data from prior entry, last 7 entries on display; source/run totals; validate account numbers at entry; prior period adjustments; repeating entries for depreciation, etc. Trial Balance high speed posting option plus trial balance report, worksheet, detail general ledger. Financial Statements (4 formats): current year, current and prior year, current quarterly, cumulative quarterly; report on prior period/s; variable # of current period months, optional disclaimer lines, show ratios with 1 or 2 decimals, optional computation of ratios based on non-income amounts. Budget Reporting (3 formats): remaining or variance ($ and %); current, YTD, both; rerun prior periods; variable # months in current period. Full year Detail General Ledger. End-Of-Period makes backup file, updates repeating entries for next month, selects month/year end processing automatically; updates prior year's data. Accounting Transfer inputs data from other CPI Business Systems; posts; prints control reports; multiple transfers. Query Account/s to CRT or printer. Multi-client processing functions included for both CP/M and MS-DOS systems.

CAPACITIES: CP/M - 600 Accounts; MS-DOS - 2000 Accounts - 3-5 Digits for Account Numbers - 99 departments with 3.2 structure.

ACCOUNTS RECEIVABLE

$80.00 CP/M — $100.00 MS-DOS

Super system with Invoices, Service Invoices, Statements, etc. A full range of reporting abilities include Customer Reports, Ageing Reports, Transactions Reports, G/L Transaction List, etc. Auto billing feature eliminates mistakes. Sales can be distributed to 100 accounts. Build up statement option combines the virtues of ledger card history detail and the speeds of today's computers. Use preprinted forms and/or plain paper for invoices and statements.
CAPACITIES of 600 Customers (CP/M) 2000 (MS-DOS) - no limit on transactions, multiple customer disks OK.

PAYROLL

$80.00 CP/M — $100.00 MS-DOS

A complete payroll system supplied with current tax routines for every state. Multiple pay rates, multiple overtime rates, multiple other pay rates, eight user deductions (each can be an amount, a rate or %), deductions may be taken before or after taxes. Commissions, tips, tips considered as wages, earned income credit, SUI, SDI, etc. are all included. In short it's a very comprehensive payroll system but one which is very easy to use. Its functions include Employee File Maintenance; Employee Lists in multiple levels of detail; Input Worksheets; Time Card Entry; Regular, Overtime, Other, Commissions, Tips, Misc. Pay. Exception Processing is the rule so you need only enter variable data. Manual checks are processed quickly and easily. Weekly, Bi-Weekly, Semi-Monthly, Monthly pay cycles (run individually or combined); Departmental Payrolls; Checks; Check Registers; Deduction Registers; Earnings Reports; 941's; W-2's; Unemployment Reports; Multi-state; Manual Checks; G/L interface for Federal, FICA, State and Local Taxes, Federal/State Add-Ons, FICA, FUTA, SUI, SDI, EIC, 8 user deductions.
CAPACITIES - 600/2000 emp. (CPM/MS-DOS), 98 Tax File Rcds.

ACCOUNTS PAYABLE

$80.00 CP/M — $100.00 MS-DOS

Improve your cash management with this fine system. You'll get the up to date accurate picture of accounts to be paid, cash requirements for the data on file. Payments and notes vouchered automatically insuring timely payments. Complete check writing included. The system reports include Vendor File Lists, Open Vouchers, Ageing By Due Date, Discount Date Ageing, Cash Requirements, Check Registers, G/L Transaction List, Query Vendor Status, Credit Vouchers, Deleted Vouchers.
CAPACITIES of 600 Vendors, (CP/M), 2000 Vendors (MS-DOS) - no limit on transactions.

HARDWARE REQUIREMENTS

CP/M: 64K (53K TPA) & CP/M 2.0 or higher.
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.
CRT: 80/24 with Clear, Home, Clear to EOL, Up, Down, Left, Right.

CURRENT UPDATE:

NEW A/R STSTEM FOR CP/M AND MS-DOS USERS NOW SHIPPING. NEW FEATURES INCLUDE 4 LINE NAME AND ADDRESS, FINANCE CHARGES, VARIABLE AGEING, DESCRIPTIVE BILLING, ASCII OUTPUT FILES, MULTI-CLIENT PROCESSING. MANY NEW REPORTS, ITEM INVOICE FORMATS, SERVICE INVOICE FORMATS, STATEMENT FORMATS, ETC. FOR PLAIN PAPER AND MANY POPULAR PRE-PRINTED FORMS. TAXABLE AND NON-TAXABLE ITEMS ON SAME INVOICE. FLASH REPORTING TO SCREEN OR PRINTER; MORE . . .

First Impressions

by Tom Enright

A trio of useful products

This month I'll look at three products. The first one is FLASH, from Software Masters (DOS only), a disk caching utility that speeds up disk I/O. Second is "IN>SORT" from Kensa Software (CP/M and DOS), a program used to produce professional-grade indexes for books, magazines, or manuals. Last is PRO Mail from Hurd Computer Systems (CP/M and DOS), a mailing list manager for clubs and other small organizations.

Caching defined

Disk caching is a method of increasing the amount of RAM used to buffer disk I/O. Mainframes have used this trick for a long time, but the idea has caught on with DOS computers only in the last couple of years. The purpose of disk caching is to decrease disk I/O by buffering more information in memory than your operating system normally allows.

DOS sets up its own disk I/O buffers, but they are fairly small. A disk caching utility not only has larger buffers, it uses advanced monitoring techniques to make more efficient use of the buffer space as well. You get near RAM disk speed and you don't have to copy your data file to a real disk when you're finished. The key to cache buffer performance is its monitoring of your disk I/O.

Once a caching utility has set up its buffers it diverts all disk I/O requests through its monitoring routine. Then, when the first disk read is requested, an entire section of the disk is read into the buffer, instead of a single record or two. How much is read into the buffer depends on how many buffers have been set up and how large each one is. The next time that file is read, the cache monitor checks to see if the requested record is already in the buffer. If it is, the data is passed to your program and a time consuming disk I/O operation is avoided.

The monitoring process also keeps track of how often each buffer is accessed. If one buffer is read often, it is assigned a higher priority than a buffer that is rarely read. A low-priority buffer's space can be utilized to increase the size of a high-priority buffer, or it can be assigned to some other use. The details of buffer management vary among different caching programs, but the functions described above are common to most caching utilities.

FLASH

FLASH (version 4.7) has several features that make it more flexible than the average caching software. It lets you specify how much memory is used to buffer disk I/O. It can use normal, extended, or expanded memory for its cache buffers. And you can specify which files will have the highest priority.

FLASH's command options are far too numerous to list in their entirety. There are 24 optional commands in addition to the command to specify the amount of memory to use. Some of the optional commands modify the action of other commands. Others, like the "\S" option, print buffer statistics on the screen. You can use all the optional commands or none—FLASH can be very efficient even if you only tell it how much memory to use and let it set its own priorities.

To start using FLASH, you simply enter **FLASH XXX** (the Xs indicate how much memory you want it to use). Any command options can be appended to the original command line or entered later. Once FLASH is active, it will take a few disk accesses before the cache buffers are operating at full efficiency. The monitor portion senses which files you are using the most and adjusts the buffer priorities for you.

One optional command that most people will like is the "\W" or high priority (HI-PRI) command. When this command is entered, you are prompted to enter a list of files to receive HI-PRI status. If enough memory was specified, HI-PRI files will reside entirely in the cache buffers. This gives you file access time as fast as a RAM disk, and you don't have to copy the file back onto a real disk when you're finished.

Memory limitations may keep you from taking full advantage of the HI-PRI command. If you have less than 640K of memory and use other memory-resident software, you may not be able to make full use of the HI-PRI command. However, if you have extended or expanded memory, you can put the WordStar overlays or several hundred kilobytes of data in the cache buffers with room to spare.

The key to cache buffer performance is its monitoring of your disk I/O.

Even without expanded or extended memory, FLASH can increase your productivity significantly. I feel it is worth far more than its modest price—$49.95.

IN>SORT

Creating the index for a book or manual is not a popular job. Small revisions of the manuscript can mean hours of work revising the

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index. Indexing programs are available, but most of them work on word processor files. The problem is that the pagination of such files bears little resemblance to the final pagination if the book or manual is to be typeset. Professional indexes are prepared from final typeset copy, not word processor files. Most indexing utilities cannot produce a really professional looking index.

Also, in a professional index, the index entry and the text it refers to often are not exactly the same. (For example, a cookbook might have a section on pies, and part of that section might refer to apple pies. The index for that book could contain the entries "Pies, apple," "Pies, fruit filling," "Apples, use in pies," and "Desserts, pies, apple"—all of which refer to the same pages.) An indexing utility that uses only words marked within the text as its index entries doesn't work well in this situation. A human mind is needed to compose the correct index entries.

IN>SORT version 2.15 is designed to produce professional quality indexes. (That doesn't mean that you have to be a professional indexer to use the program—it only means that you should have the need to produce professional quality indexes.)

IN>SORT consists of three modules: an editor for entering and editing index entries, a sorting module, and a formatting module to put the index in its final form. The editor serves as a menu to the other modules. The output of the formatter is your index in an ASCII file ready for the typesetters.

There are only a few rules for editing your index. For example, sub-entries are separated by a greater-than symbol (>); words or letters to be ignored during sorting are enclosed in backslashes (\); and an entry can be repeated by simply entering an equals sign (=). The rules are simple and easily remembered.

There was only one thing about IN>SORT that I found irritating: The program expects to find all its files on drive A. There is a command to change the logged drive, but each time you move from one module to the next, the current drive is reset to drive A. To run the program from drive C and create an index on the same drive, you'll have to log onto drive C at least three or four times.

This isn't a major bug, just an annoying one. I'm sure the next version of IN>SORT will correct this oversight. It's a good sign when the only thing that I can find to complain about is something as trivial as this.

IN>SORT consists of three modules: an editor, sorter, and a formatting module.

PRO Mail

Most clubs and organizations have newsletters or other information that must be mailed periodically to their memberships. PRO Mail is an inexpensive mailing list data base manager suitable for such lists of individual names and addresses.

PRO Mail version 4.0, which is written in compiled dBASE, does have some limitations. Each data base—you can have as many as you wish—tracks first name, last name, company name, address, city, state, zip code, and a 50-character comment field. There is no place for a phone number, unless you put it in the comment field. Also, a second address field would come in handy for business addresses. The address field provided is limited to 25 characters. In some cases this may be too small.

Data base reports can be printed by name or zip code, but not by company name. Also, unless you use 14-inch-wide paper or have your printer already set to compressed print, the company name doesn't print on reports. Mailing labels do include a company name, if one is used, and skip it if not. Labels can be printed up to four across, so you aren't limited to buying a particular type of label.

The limitations of PRO Mail make it better at tracking names and addresses of individuals than of businesses. These limitations are not terribly important to most clubs, because they cater to individuals, not businesses. For such users, PRO Mail becomes an attractive and viable alternative to expensive programs.

Quick Reference Summary

Product: FLASH (DOS)
Company: Software Masters
6223 Carrollton Ave.
Indianapolis, IN 46220
Phone: (317) 253-8088
Sugg. Price: $49.95

Product: IN>SORT (DOS, CP/M)
Company: Kensa Software
P.O. Box 49
Cathedral Station
New York, NY 10025
Phone: (212) 222-6735
Sugg. Price: $79.95

Product: PRO Mail (DOS, CP/M)
Company: Hurd Computer Systems
6330 Lincoln Ave.
Cypress, CA 90630
Phone: (714) 220-2729
Sugg. Price: $49.95

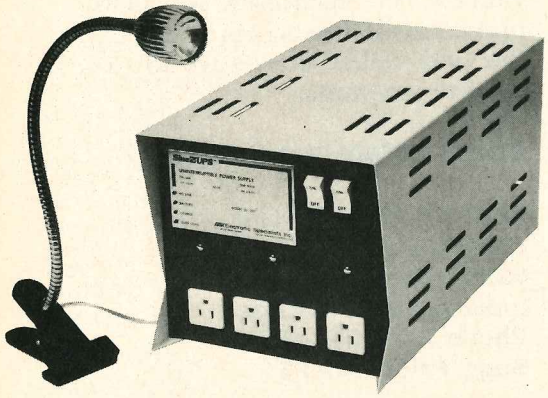
New Products edited by Suzanne Kesling

The following new product listings are not reviews and should not be considered endorsements. To be considered for publication in New Products, 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 on which Kaypro models products run. Include black and white photos if available.*

Power security

Electronic Specialists Inc. is introducing an uninterruptible power supply (UPS) that can provide up to 20 minutes of power during an extended power outage and can operate without disruptive switching transients.

Wide band EMI/RFI filtering and high-current spike suppression provide extended protection.



A front panel TEST switch permits power removal to check the front panel monitors and system operation. Other options include automatic blackout illumination and battery-saver automatic shut down.

$1,095 for 250 watts, $1,495 for 500 watts. Electronic Specialists, Inc., 171 South Main St., Natick, MA 01760; (800) 225-4876.

Computerized psychology

Mind Over Minors is a program that helps teachers and parents better understand and motivate children.

The program is based on the adult's and child's personality traits in conjunction with a data base of educational and psychological information. The computer analyzes the situation and produces a report that suggests some institutional techniques, disciplinary action, and child management ideas.

The program is available in two versions—one for parents and one for teachers. The parents' version is structured for children ages five to 18. It can provide insights into the strengths and weaknesses of a particular child. The teachers' edition offers techniques for working more effectively with individual students, while increasing academic performance and controlling their classroom behavior.

$49.95 for either version. DOS computers. Human Edge, 1875 South Grant St., Suite 480, San Mateo, CA 94402-2669; (800) 624-5227, in California (800) 824-7325.

It's HOT

HOT is a new utility that enables you to create customized menus, locate and edit any file in any drive, and more—all in single-keystroke operations.

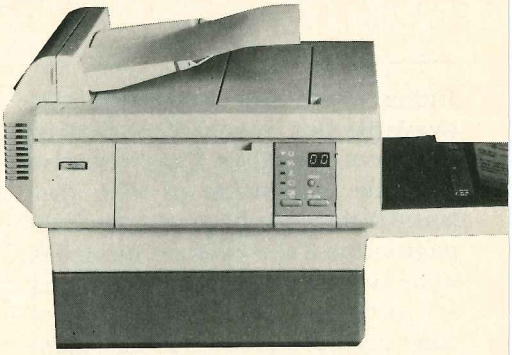
It automatically sets up a series of menus from which all programs and files can be accessed.

HOT is actually composed of many utilities. They include a file finder, text editor, a menu creation system, keyboard macro program, calendar, and more. The program also features an online tutorial.

$75. DOS computers. Executive Systems Inc., 15300 Ventura Blvd., Suite 305, Sherman Oaks, CA 91403; (800) 634-5545, in California (800) 551-5353.

Laser printer

The Sperry Model 37 is a compact laser printer. It can produce near-typeset quality, unique fonts, graphics, and bar codes.



It has a printing rate of ten pages per minute, 36-61 (emulation dependent) fonts in ROM, over 900K of RAM, high resolution (300 x 300 dpi), and an acoustic rating of less than 45 dba.

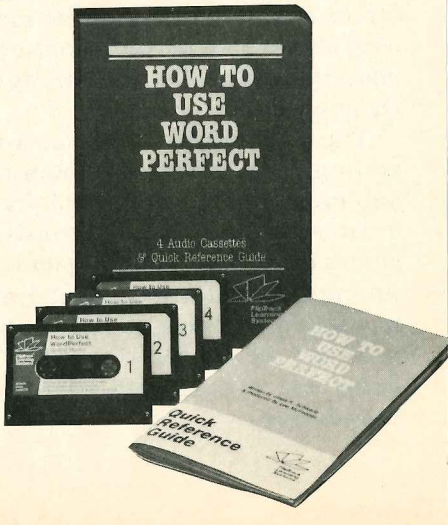
Contained within the printer, the EXPRESS language allows users to design their own logos, letterheads and special forms. EXPRESS also allows you to change fonts, draw vectors and circles, shade areas, and produce pie charts.

$3,500. Sperry Corp., World Headquarters, Blue Bell, PA 19424-0031; (215) 542-4213.

Learning WordPerfect

How to Use WordPerfect is a self-study audio cassette course that teaches both beginning and advanced use of the WordPerfect software.

Four cassette lessons of about two hours each enable you to work with the program itself—to create, edit, print, and merge-print a wide variety of documents. The course also covers the special features of WordPerfect such as the thesaurus, spell checking, outlining, footnoting, columns, and macros.

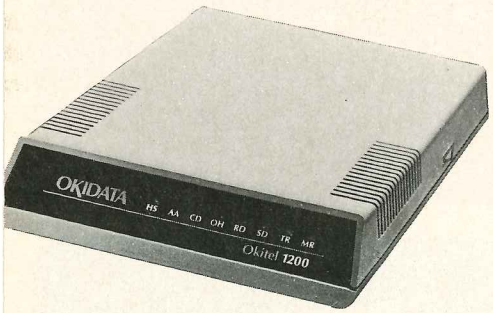


At key points in the lessons you are invited to turn over the tape for optional topics, extra practice and troubleshooting tips.

$89. DOS computers. FlipTrack Learning Systems, 999 Main, Suite 200, Glen Ellyn, IL 60137; (800) 222-3547.

300/1200 modem

Okitel 1200 is a 300/1200 bps external modem that offers automatic adaptive equalization, a feature that enables it to look at phone line characteristics and automatically adjust its filters to bypass any interference.



Users can program the modem with a delay that bypasses spurious phone line interruptions, including call waiting signals, to maintain the connection.

The Okitel 1200 is equipped with auto-dial, auto-answer, and re-dial capabilities, as well as automatic disconnection when the call is complete. It works with either Touch-Tone™ or rotary dial telephones.

$449. DOS computers. Okidata, 532 Fellowship Rd., Mt. Laurel, NJ 08054; (800) OKIDATA

Financial program

FINANCE 10 is a series of ten financial utility programs that combine the convenience of RAM-resident operation with a windowing environment.

Each module is also capable of exporting data to and/or importing data from application programs. And each utility is designed to be used independently or in unison with the others.

Some included modules are Loan Amortization, Lease vs. Purchase Analysis, IRA Calculator, and Personal Financial Statement.

$149. MS-DOS computers. Creighton Development, Inc., 16 Hughes St., Suite 106, Irvine, CA 92718; (714) 472-0488.

Printer papers

The Pro-Tech line of printer papers includes six different types of paper for different types of printers. They include ink-jet, thermal transfer, pen plotter, laser bond, 25 percent cotton, and printer bond paper.

The pen plotter paper is aimed at small format plotters designed for use with personal computers. It produces sharp graphics and prevents bleeding and feathering.

The laser bond paper has a 25 percent cotton content and is designed for use with desktop and high-speed laser printers.

All papers accept printing on both sides of the sheet and are available in a variety of formats, including cut sheet, continuous fanfold, and shipping rolls for converters.

Call for a distributor near you. James River Corporation, Groveton Division, (800) 258-0372.

Back it up

Backup Master is a hard disk utility designed to back up to floppies and protect hard disk data. It can back up a ten megabyte hard disk to 5-1/4-inch floppies in less than eight minutes.

It includes an extensive list of hard disk file and directory management support features, such as full directory "tree" and files display and preview file capabilities.

Backup Master does not reset a file's archive bit until all files have been backed up. This allows you to quit the backup at any point during the process.

$69.95. DOS computers. Intersecting Concepts, 4573 Heatherglen Ct., Moorpark, CA 93021; (800) 628-2828 ext. 629.

Product Updates

Move-It, version 4, now includes automatic file compression, X-Modem protocol, scripting files, and keyboard macros. The revision also comes with a program disk and a new user's manual. Woolf Software Systems, Inc., Canoga Park, CA □ Version 5.0 of **Tax Planner** includes all tax law changes for 1986, 1987, and 1988. The update will help professionals incorporate the tax code changes of the Tax Reform Act. TaxCalc Software, Inc., Fort Worth, TX □ Version 2.5 of **ProDesign II** has been released with more than 50 enhancements. Among them are on-screen menus, macro capability, and auto-dimensioning. American Small Business Computers, Pryor, OK □ **Newsroom Pro**, an updated version of The Newsroom, allows users to take a more professional approach to newsletter production. This update utilizes both screen icons and function keys. Springboard Software, Inc., Minneapolis, MN □ **Grammar Gremlins**, a grammar program designed for elementary school students, is now available in MS-DOS. The program presents grammar rules with 600 practice examples. Davidson & Associates, Inc., Torrance, CA □ **StatPac Gold** has released a new quality control and forecasting module that adds a dozen new time-series analysis techniques with presentation-quality graphics, plus a quality control program and 11 new forecasting techniques. The new module will be packaged with additional documentation. Walonick Associates, Inc., Minneapolis, MN □ **Software Bridge**, version 2.0, allows file conversion among nine word processors. Converted documents retain the function and format codes normally deleted by ASCII transfers. Systems Compatibility Corp., Chicago, IL.

Product Updates provides information about revisions of existing products. Users should contact the vendors for more complete information.

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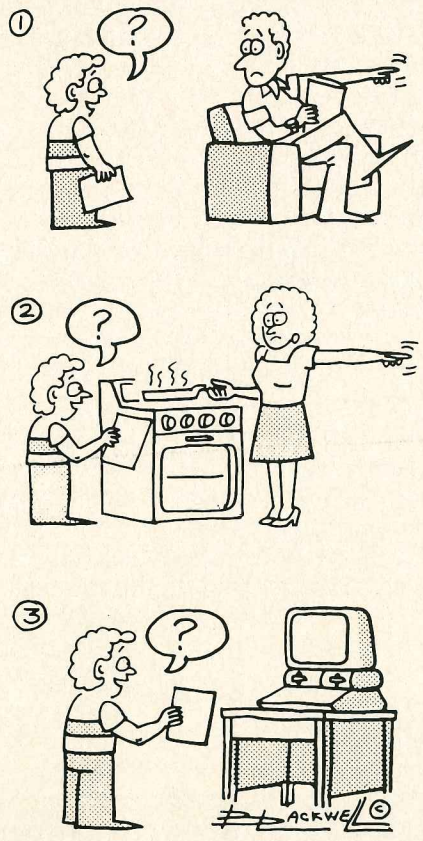

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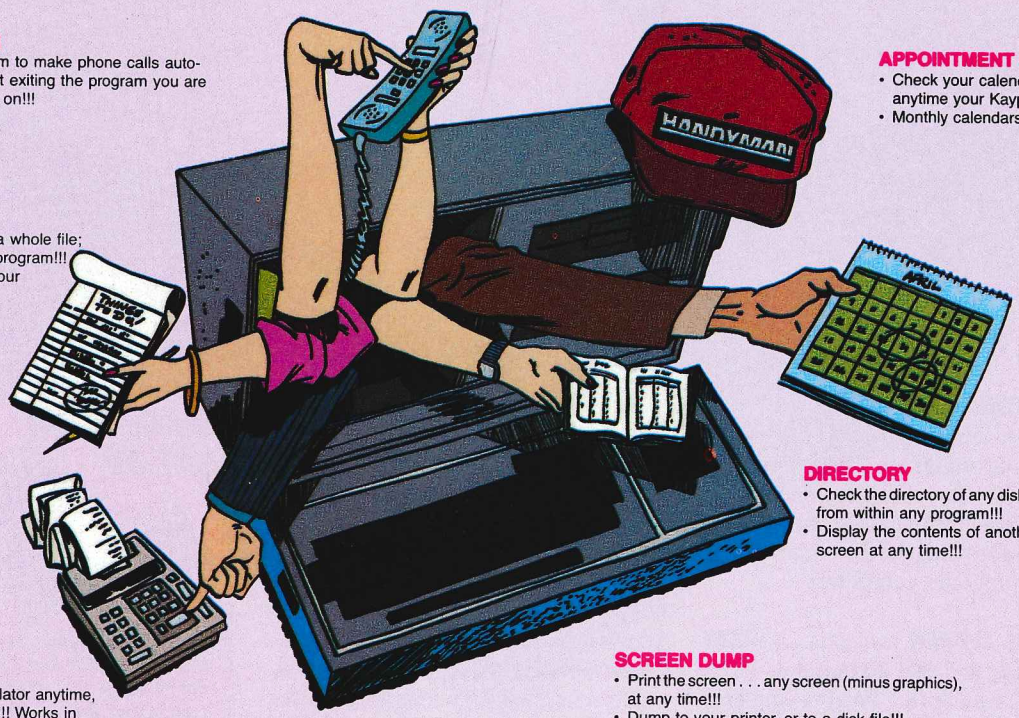

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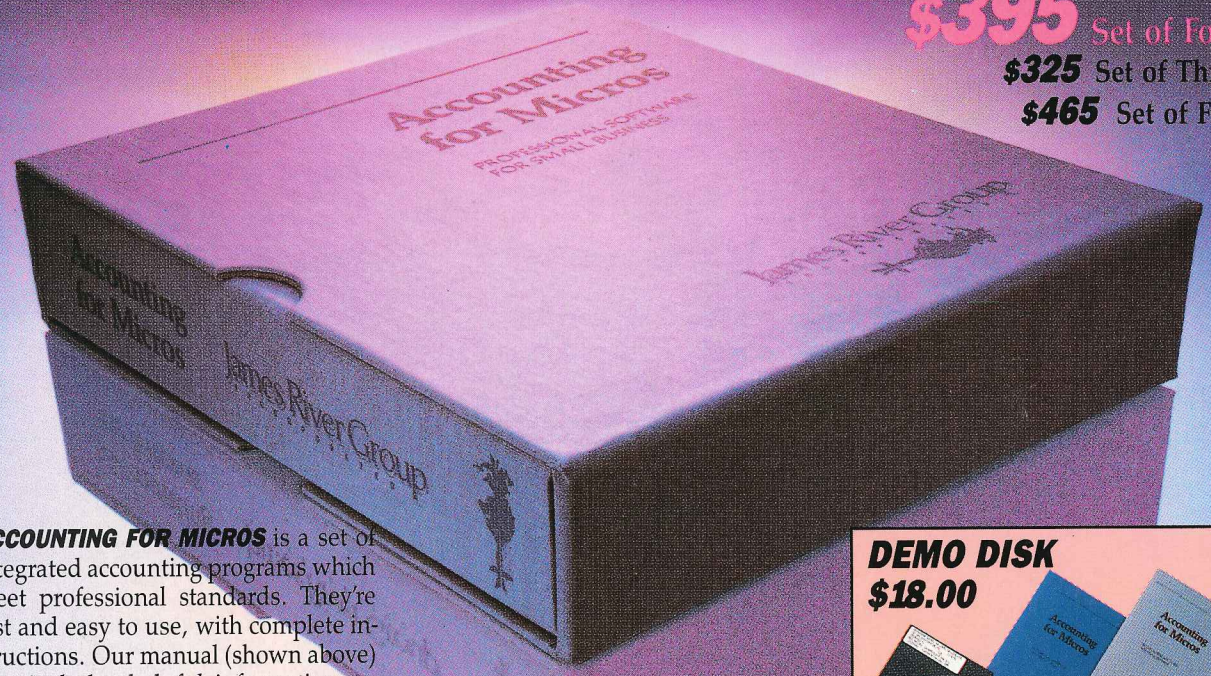

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