

**TAXES**  
Your 1040 Made Easy

VOLUME 3  
NUMBER 3

# FAMILY COMPUTING

## Telecomputing:

The New Wave in  
Communications

Buyer's Guides:  
Modems and  
Communications  
Software

Helpful Hints:  
Get the Most  
From Your  
Computer

Software to Bring  
Learning to Life

Plus: **K-POWER**  
Mini-Magazine for Kids

Inside: Original Programs  
for ADAM, Apple, Atari,  
Commodore 64 & VIC-20,  
IBM, TI, Timex, TRS-80



# FAMILY COMPUTING®

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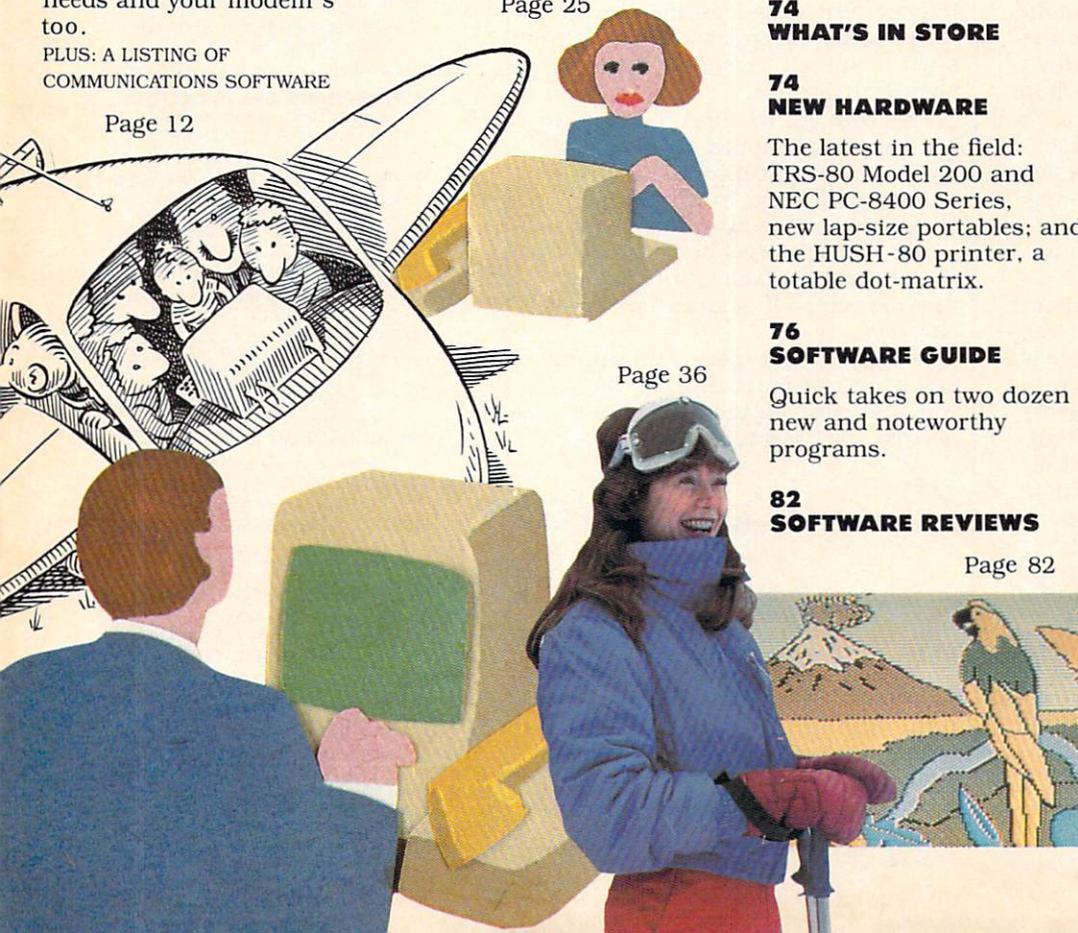


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COVER PHOTOGRAPH BY LANGDON CLAY



# LETTERS

## THE BEST OF THE BUNCH

I wanted you to know how excited I am about my subscription to FAMILY COMPUTING magazine. I recently bought my family a Coleco ADAM computer and your magazine complements it quite nicely. In all, I subscribe to 15 magazines a month, however, I don't know why I need the other 14. Yours is all I need! Thanks.

LARRY WOLFERSBERGER  
Shelby, Ohio

EDITOR'S NOTE: *Thanks for your words of praise. We were sorry to hear Coleco Industries announce in January that it would discontinue manufacturing the ADAM. For the foreseeable future, FAMILY COMPUTING will continue to support ADAM owners by publishing reviews of ADAM products and original programs for the machine.*

## A HIS-AND-HERS MAGAZINE

We love your magazine. Mrs. Frei especially looks forward to typing in your various programs every month. I enjoy your surveys covering equipment and software.

What prompts me to write this letter, though, is your *Mailing List* program in the November 1984 issue. Let me congratulate Brent Friedman for writing the program and you for publishing it.

Mrs. Frei is a school secretary, and she will use your program for her class and staff lists.

JACK E. FREI  
Freeport, New York

## A CLOSED WINDOW

After reading a review of *Window* in your magazine, I wrote to the company for information and subsequently ordered a one-year subscription to *Window*. I only received one issue of the five I paid for, and they do not answer my inquiries.

Do you know if the company has moved or gone out of business?

ELAINE ROTH  
Peoria, Illinois

EDITOR'S NOTE: *We're sorry you've had such trouble getting through to the makers of Window. We've also had difficulty reaching Window, Inc. for the past several months. Apparently, the company has gone out of business. For information on how to go about getting a subscription refund, you might try contacting the Better Business Bureau in Boston at (617) 482-9151.*

## CREDIT WHERE DUE

I am responding to a good article which appeared in your November 1984 issue, entitled "Software to Challenge Your Children."

Mentioned under the "Simulations" heading was a program called *Lemonade*, which is credited to Apple Computer, Inc. *Lemonade* is a MECC-copyrighted program that was licensed to Apple for inclusion on its master disk. Although copyrighted in 1980, it continues to be a very popular MECC product. For your information, *SELL LEMONADE* can be found on the MECC *Elementary Volume 3—Social Studies* package.

PAT KALLIO  
Marketing Coordinator, MECC  
St. Paul, Minnesota

## A SHOPPER'S DELIGHT

I have always enjoyed reading FAMILY COMPUTING. But when I saw the December 1984 issue with the "Shopping Guide for Computer Lovers," I was thrilled with your magazine.

I am the type of person who likes to look through catalogs comparing products and prices. I am always on the watch for good computer products at reasonable prices. Even if I don't plan on buying, I know that I can still compare with other dealers and pass the information on to my friends.

The section titled "Picture Perfect" really caught my eye. My family has been considering the purchase of a light pen and art software. This section will help us to plan and carry out our purchase.

Once again, I thank you for this wonderful feature, and I hope to see more "Buyer's Guides" and other wonderful features in the future.

DONALD IORIO  
Atascadero, California

## DISK DRIVES FOR THE TI

Ah, come on folks, give us TI-99/4A owners a break! Just because Texas Instruments abandoned us doesn't mean everyone else has. Your article on disk drives (September 1984) would lead a person to believe that there are none for the 99/4A. Quite the opposite is true! There are a number of units by various manufacturers available for the old girl. (The disk drives are made by TEAC [half-height], Shugart, and Control Data Corp. CORCOMP and Myarc,

among others, manufacture disk controllers, etc., for the TI-99/4A.)

So, she ain't dead yet.

R.W. WALTER  
Wheaton, Illinois

EDITOR'S NOTE: *Thanks for the hot tip. We listed disk drives that came with controllers for various computers, so that shoppers wouldn't have to assemble the units themselves. But, we're glad for the additional information.*

## CALLING ALL COCO OWNERS

As owners of TRS-80 Color Computers, we are interested in contacting other Color Computer owners to exchange programs and ideas. Please contact either John Lutsie, Route 9, Box 312, Asheboro, NC 27203; or Helen Reynolds, P.O. Box 754, Ramseur, NC 27316.

HELEN REYNOLDS  
Ramseur, North Carolina

## NOT FOR KNOW-IT-ALLS ONLY

Your magazine is really great. Along with your magazine, I have a subscription to one other computing magazine, and I have read many others. In my opinion, FAMILY COMPUTING ranks high above them all.

I own a VIC-20, and I don't have expanded memory. FAMILY COMPUTING has programs that don't require it, unlike the programs from other magazines.

FAMILY COMPUTING isn't mainly for the "computer know-it-alls." In most other magazines, they talk about things I don't need or really don't care about. FAMILY COMPUTING doesn't do that. I really enjoy your magazine.

JERRY LITTLE, age 13  
Pierce, Idaho

## UPDATE

As we go to press, Spinnaker Software is changing the name of its Trillium line to Telarium. The *Fahrenheit 451* and *Amazon* programs mentioned on pages 68, 69, 72, 80, and 86 of this issue are now being marketed under the Telarium label.

## STAY TUNED

Watch for the FAMILY COMPUTING TV Show on the Lifetime cable television network. The show presents 30 minutes of product demonstrations and helpful tips to make computing life a bit easier for every member of your family. Two new shows are presented each week at 10:30 a.m. EST on Tuesdays and Thursdays.

# COMPUTING CLINIC

ARCADE GAMES FOR APPLE II • THE JAPANESE MSX STANDARD •  
BUSINESS PROGRAMS FOR THE COMMODORE 64 • TV/MONITOR  
FOR THE ADAM

BY JEFFREY BAIRSTOW

## How can I write graphics programs similar to arcade games for my Apple IIe?

CHARLES PAYNE

Golden, Colorado

Since the Apple has no built-in sprites, unlike the Atari, Commodore 64, or TI-99/4A, quality animation is more difficult—but not impossible. Applesoft BASIC includes the DRAW and XDRAW commands, which allow you to draw an entire shape at once anywhere on the screen, and then erase it (to make the background reappear). And, there's a "collision register" that your program can test to determine whether your shape has hit anything else on the screen.

One potential game-design tool is the new Apple Sprite Logo (\$299, Logo Computer Systems Inc., New York, New York), which is an impressive version of the language, and also includes a sprite board for the Apple IIe.

A less expensive alternative is to start with programs that can be modified to suit your purposes. I'd suggest you get a copy of *Animation, Games and Sound for the Apple II/IIe*, by Toni Fabbri (Prentice-Hall, \$16.95). This book has a selection of graphics programs in BASIC that you can adapt to make your own games. The book is available with a companion disk, which includes the programs mentioned.

## Where can I obtain a catalog of business software for a Commodore 64?

BEVERLY J. SHIELDS

Binghamton, New York

Several companies offer business software for the Commodore 64. The best known package is probably the top-selling spreadsheet, *Multiplan*,

JEFFREY BAIRSTOW, a contributing editor, is a technical journalist. He was the founder of *Computer Decisions* magazine, and has taught math and computer science. His family, including two preschoolers, uses a variety of computers.

but there are also inventory management, accounts receivable and payable, payroll, and general-ledger programs. Two popular sourcebooks for Commodore 64 owners are *Commodore Software Encyclopedia* (Howard Sams, \$19.95), and *The Blue Book for the Commodore 64*, edited by Barry A. Fleig, Robert F. Cutler, and Tom C. Checkel (WIDL Video, \$17.95). Both are available in most bookstores. Mail-order catalogs of business software for the C 64 are available from Protecto Enterprises, 22292 N. Pepper Road, Barrington, IL 60010; (312) 382-5244.

## Is the attempt to create an MSX standard in Japan a significant new development that will affect home computers in the U.S.?

JOSEPH AUSTIN

Cary, North Carolina

The MSX standard was developed jointly by Microsoft (Bellevue, Washington) and 14 Japanese companies, including such well-known consumer-products companies as Sony, Canon, Pioneer, Matsushita, Mitsubishi, Hitachi, Toshiba, Yamaha, JVC, and Sanyo. Three Korean companies, the German firm Siemens, and the Dutch firm Philips also have purchased the license to manufacture MSX computers.

MSX computers conform to certain specifications: the same 8-bit microprocessor, the same audio and video chips, Microsoft BASIC, 8K bytes of RAM (minimum) and 32K of ROM, 40-column display, 16 colors, a cartridge slot, and joystick support.

Although at least 10 Japanese manufacturers sell MSX computers in Japan and Europe, only Spectra-Video (a Hong Kong-based company) and Yamaha are now marketing them in the U.S. Both companies have very limited distribution.

However, Sony, Pioneer, Panasonic, and Toshiba, among other giants, exhibited MSX computers at

the Winter Consumer Electronics Show, in Las Vegas. Representatives from these companies said they were "evaluating" the U.S. market.

Several of the MSX computers on display are designed to interact with videodisk players and videocassette recorders; the Toshiba computer has the *Bank Street Writer* word processing program built-in.

## Can I connect the Sears [4084] TV/monitor (mentioned in your September 1984 issue) to my Coleco ADAM? My computer uses the expansion module that connects to the ColecoVision game system.

STEVE CORNWELL

Ithaca, Michigan

The Sears TV/monitor can be used with either of the ADAM systems, but you will not be able to take advantage of the monitor's RGB capability because the ADAM does not have that feature. Thus, it may be slight overkill for your computer.

The ADAM unit may be connected to the TV antenna terminals of the Sears unit using the RF modulator, or directly to the video-input terminal of the monitor. Just make sure the monitor is set for 75 ohms.

However, to get sound from this (or any other) monitor, you'll probably need to buy or make a special cable to run from the ADAM's 7-pin AUX VIDEO port to the monitor's audio port. The specifications are given on page 9 of the ADAM *Operating Tips Brochure*, second printing. This brochure did not come with early shipments of ADAM, so check with Coleco at (800) 842-1225 if you don't have it.

Some monitors come with cables that have a 5-pin DIN connector at one end (for the ADAM memory console) and audio and video jacks at the other. These cables may work. 

Send your questions to: *Computing Clinic*, FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

# BUYER'S GUIDE TO MODEMS

BY NICK SULLIVAN

You can't live without the telephone. And you're getting pretty attached to your computer. What if you hooked the two together? Just think—you could send your favorite program to a friend! Play a game with Granny, who lives in Alaska! The necessary link? A modem.

Unlike prices of computers, printers, monitors, and disk drives, prices of modems have not dropped much during the past year. Modems can cost as much as or more than the computers they work with (up to \$900), probably because they've been aimed, to date, more at the business market than the home market.

But the recent introduction of new high-speed (2400-baud) modems for business use means that prices on 300- and 1200-baud modems should begin to drop. After all, a modem consists of a single chip (often made by Texas Instruments), compared to the dozens of chips and circuit boards needed to make a computer, and is relatively easy to assemble. As it is, there are good modems on the market for under \$80 (see chart on next page).

A modem connects your computer to the telephone lines—the same telephone lines you use to order a pizza. The modem translates computer data (an "on/off" digital signal) into data that the phone lines carry (a "wavy" analog signal). Then, the modem at the other end translates the analog signal back to digital so the other computer can understand it. (See "How Does a Modem Work" in the February Dr. Cursor's Clinic.) Think of a modem as an interpreter at the U.N. Better yet, don't think about it at all. Just plug it in and follow directions!

## WHAT YOU NEED TO CONNECT

To install a modem and successfully "telecompute" you need, besides your computer, four things:

1. A modem.
2. A cable between the modem and the serial port on your computer; or a plug-in slot for the modem.
3. A standard telephone line with a modular plug (preferable) or a standard telephone handset.
4. Communications software.

Here's a rundown on these four elements, followed by some features that you should look for in a modem.

**External Modems.** Modems connect to the serial port (RS-232) on your computer with a cable. If your computer comes with the standard 25-pin RS-232 port, as the Kaypro or Compaq do, all you need to connect most modems is the basic 25-pin serial cable.

On Apple II plus and IIe, IBM PC, and some TRS-80 models, you first need to install a serial card, which is not standard equipment on the computer. On the TI-99/4A, you need a serial card and expansion box. All these computers use the standard 25-pin cable. When purchasing a serial card, however, make sure it's designed for communications as well as printers.

Atari and Commodore computers require an interface (such as the Atari 850, for Atari) or special cable, unless you use modems specifically designed for those comput-



ers. These include the Atari 1030 and the Commodore 1650. There are interfaces (such as Omnitronix's Deluxe RS-232C Interface, at \$39) that give the C 64 a standard 25-pin serial port. Make sure you test any such interface with a modem before you buy.

For Timex, both the Byte-Back and Westridge (16K required) modems are designed to plug into the back of the computer. The Apple IIc, IBM PCjr, Macintosh, and TRS-80 Color Computer have nonstandard serial ports and require special cables.

But, just as printer manufacturers have started doing, some modem manufacturers now sell computer-specific cables with the modems. Anchor Automation sells cables for most popular computers (except the C 64); the Apple modems are sold with cables for the Apple IIe, IIc, or Macintosh; and so on. If these ready-made cables are available with the modem, buy them.

**Internal Modems.** For the Apple II plus and IIe, and the IBM PC and PCjr, there are internal modems. These are circuit boards that plug into slots inside the computer, and act both as serial cards and modems. This is a big plus, saving you the cost of a serial card. (However, if you later decide to buy an external modem, you'll then have to buy a serial card.) Internal modems also save on peripheral clutter around your computer. And, they are obviously designed specifically for one computer, often carrying on-board software (in ROM chips) to help get you started.

The new ADAMLink modem for the Coleco ADAM also fits inside the computer, and comes with software on a digital data pack.

These internal modems can be a good deal. For instance, the new Zoom/Modem IIe for the Apple IIe (Zoom Telephonics) amounts to a serial card, 300-baud modem, and software for \$179. And the modem has a speaker so you can hear the phone ringing, etc. For an extra \$50, you can get a full-fledged communications package.

**Built-in Modems.** Some of the little "lap" portable computers come with built-in modems as standard equipment. The TRS-80 Model 100, in fact, now selling for under \$400, is a pretty good deal if you think of it as a modem plus a computer. If you don't already have a computer, and think you primarily want to experiment with telecomputing, don't overlook this bargain. Also, see announcements of the new TRS-80 and NEC portables in New Hardware in this issue.

**Phone Connection.** In order for your computer to communicate with a distant computer, the modem must be connected to the telephone lines. You are simply "making a call," and sending data instead of your mellifluous voice.

Virtually all modern modems have modular jacks so you can plug in the telephone line. These are called direct-connect modems, to distinguish them from acoustic couplers, the old-fashioned modems with cups that fit over the telephone.

Some modems have two jacks—one for an outside telephone line and one for a line to your phone. This way, you

can keep your phone connected to the modem, and the modem connected to the outside lines. Otherwise, you have to unplug the line from your phone and plug it into the modem whenever you switch from voice to data.

## TIME IS MONEY OPERATING COST COMPARISON: 300- vs. 1200-BAUD MODEM

If you use a modem with any kind of regularity, you might want to give serious consideration to a 1200-baud modem. Its extra speed can recoup the extra cost with on-line savings. For instance, though a 1200-baud modem transfers information four times faster than a 300-baud modem, 1200-baud usage rates (off peak) from information services such as CompuServe and The Source are not nearly four times as much. (CompuServe: \$.10/min. @ 300 baud; \$.21 @ 1200-baud. The Source: \$.13/min. @ 300 baud; \$.43 @ 1200-baud.) And, when connected to a bulletin board or sending a file to another computer, you'll generally accomplish the same tasks in one quarter of the time with a 1200-baud modem, thus slashing phone usage costs.

And, as the example below shows, phone time can translate to a big phone bill quite quickly. We used Zone 2 (California) dialing rates, but you should make your own comparison. Use the transmission times listed here, get out the phone book, and make the calculation with your local dialing rates. (In many areas, a local call costs less than \$.10, no matter how long the call lasts.) You might also consider how long-distance rates would add up.

Remember: If you're just "chatting" with someone on the computer, a 1200-baud modem won't do much good. No one can type that fast, and a 300-baud modem is more than fast enough to keep up. It's only when using bulletin boards, information services, and sending or receiving files that the extra speed comes into play. But, if you have a modem, you'll probably do all of the above.

Here's a relative cost comparison with one sample transaction, which highlights the differences in cost between 300- and 1200-baud modems.

File size: 40K  
Number of words: 5,278  
Equivalent pages of text: 17  
Transmission time @ 300 baud: 24:32 min.  
Transmission time @ 1200 baud: 6:38 min.  
Zone 2 dialing: @ \$.10 first minute  
@ \$.05 each additional minute or fraction.

Cost to send to another microcomputer:  
300 baud: \$1.30  
1200 baud: \$.40  
1200-baud savings: \$.90

Approximate cost of same transaction on CompuServe  
300 baud: \$3.80 (\$1.30 + \$2.50)  
1200 baud: \$1.90 (\$.40 + \$1.50)  
1200-baud savings: \$1.90

If you were to spend 10 hours a month (or 120 hours a year) to send files at these rates, you'd save about \$550 over the course of a year using a 1200-baud rather than 300-baud modem. That's worth thinking about when price-shopping for modems.

—BILL HOWEY

Acoustic couplers, though considered old-fashioned and less efficient than direct-connect modems (because they sometimes allow ambient room noise to creep onto the line), do have one major advantage over direct-connect modems. The couplers can be used in hotel rooms or phone booths, or anywhere phone lines are hard-wired and not connected with detachable modular jacks. Thus, for those on the move, an acoustic coupler might make sense.

Important note: If you have a "call-waiting" feature as part of your phone service, it will wreak havoc with your computer communications. When you're connected to an outside computer, the call-waiting buzz will disconnect the call.

**Communications Software.** To make a computer work, you need software. A computer will not sing, write your letters, crunch your numbers, or in any way, shape, or form amuse you without software. Alas, the same is true of a modem. Not only does the software have to work with your computer, but it has to work with your specific modem. (See "Tips on Buying Communications Software.") Some of the newer internal modems have "on-board software" built into them (on ROM chips), but most of it is not very powerful.

Many "high-end" manufacturers are also "bundling" full-fledged communications software with their modems (see chart). In many cases, this "free" software could be the determining factor in deciding which modem to buy. The software is designed to work with that particular modem, and may be worth \$75-\$125.

Novation sells the popular *Crosstalk* as part of its Access 1-2-3 package, Hayes bundles various versions of *Smartcom* with its different modems, Prometheus throws in *Mite* with some models, and Microcom includes software with its MacModem. Try out this software. If it's easy for you to use, and does what you want, you're better off buying the package than trying to outfit your modem with software at a later date.

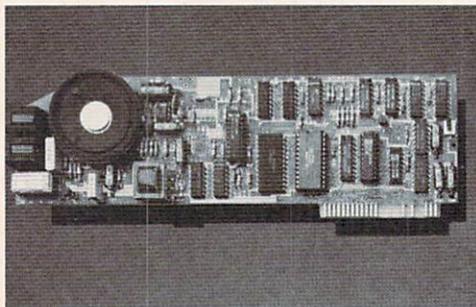
An important point to remember: As with computers, the modem will not be able to do certain things unless the software allows for it. For instance, a modem will not dial numbers from memory unless the software can do it.

### FEATURES TO CONSIDER IN A MODEM

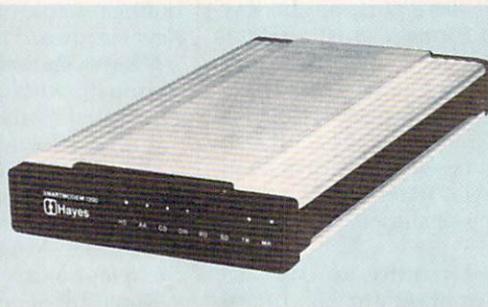
**Auto-dial/Auto-redial.** To make a call on a manual-dial modem, you must dial a number on the telephone, and wait for the connection. This is marked by a high-pitched telephone tone (and on some modems by the welcoming word, CONNECT, on your screen). Such a manual dial method is no great hardship (how hard is it to dial a telephone?), but "auto-dial" modems do have advantages.

For one, you can dial the numbers straight from the keyboard, which means you don't have to switch from phone to keyboard. Second, depending on your software, you usually can store phone numbers in a directory, and dial them automatically with a one- or two-key command.

In addition, with the right software, an auto-dial modem can be programmed to keep redialing a number if it's



Zoom Telephonics' Modem IIc



Hayes Smartmodem 1200



Anchor Automations' Volksmodem 12

## 300- AND 1200-BAUD MODEMS

Manufacturer	Model	Price	Baud Rates	Bundled Software <sup>2</sup>	Hayes Compatible	Operations <sup>3</sup>	Special Features/Computer Type
Anchor Automation	Volkmodem	\$79	300		No		Voice/data switch; cables for many computers (\$12.95 each)
Anchor Automation	Volkmodem 12	\$299	1200/300		Yes	AD/AA	Voice/data switch; cables for many computers
Anchor Automation	Signalman Mark X	\$169	300		Yes	AD/AA	RS-232C cable included
Anchor Automation	Signalman Mark XII	\$399	1200/300		Yes	AD/AA	RS-232C cable included
Apple Computer	Modem 300	\$225	300	Apple Term	Yes	AD/AA	IIC or IIE kit; software does not transfer files
Apple Computer	Modem 1200	\$495	1200/300	Apple Term	Yes	AD/AA	IIC or IIE kit; software does not transfer files
Atari Computer	1030 <sup>1</sup>	est. \$80	300	ModemLink/AMODEM	No		All Ataris; software does not transfer files
Byte-Back Co.	Byte-Back Modem	\$149	300	SpectraTerm or ZCOMM	No		For Timex computers
Cermetek	1200PC	\$495	1200/300	Crosstalk XVI	Yes	AD/AA	Aux.phone jack; LED bank; IBM
Cermetek	1200	\$595	1200/300		Yes	AD/AA	Aux.phone jack; LED bank; \$100 towards software
Coleco	ADAMLink Modem <sup>1</sup>	\$99	300	ADAMLink	No	AD	Internal modem; ADAM only; software does not transfer files
Commodore	1660 Modem/300	\$99	300	Software	No	AD/AA	C 64, VIC-20, Plus/4, C 16; internal speaker
Commodore	VIC Modem	\$79	300		No		C 64, VIC-20, Plus/4, C-16; software doesn't transfer files
Epson	CR-103	\$179	300	Modem 103	Some	AD/AA	For CP/M computers
Hayes Products	Smartmodem 300	\$289	300		Yes	AD/AA	Internal speaker; LED bank
Hayes Products	Smartmodem 300	\$339	300	Smartcom I	Yes	AD/AA	Internal speaker; Apple IIC cable; LED bank
Hayes Products	Smartmodem 1200	\$699	1200/300		Yes	AD/AA	Internal speaker; LED bank
Hayes Products	Smartmodem 1200B	\$599	1200/300	Smartcom II 2.0	Yes	AD/AA	Internal modem for IBM PC
Hayes Products	Micromodem IIe	\$329	300	Smartcom I	Yes	AD/AA	Internal modem for Apple IIe
IBM	PCjr modem	\$199	300		No	AD/AA	Internal modem for IBM PCjr
MFJ Enterprises	MFJ-1237	\$54	300		No		
MFJ Enterprises	MFJ-1233	\$169	300		No		TTL and RS-232 input and output
Microcom	ERA 2	\$499	1200/300	ERA 2	Some	AD/AA	External modem/also internal version for IBM PC
Microcom	MacModem	\$599	1200/300	MacModem Software	No	AD/AA	For Apple Macintosh
Microperipheral	Autoprint Microconnection	\$179	300	Software	No	AD/AA	Direct connect to Atari and C-64; voice/data switch; Built-in Centronics-parallel port
Multi-Tech	MultiModem	\$549	1200/300		Yes	AD/AA	Stores 6 numbers
Mura	MM-100	\$69	300		No	AD/AA	For all RS-232
Novation	Apple-Cat 212	\$319	1200/300	Com-Ware II	No	AD/AA	Internal modem; Apple II plus, IIe only
Novation	Smart Cat Plus	\$499	1200/300	Mite	Yes	AD/AA	For IBM, Macintosh, CP/M
Novation	Access 1-2-3	\$599	1200/300	Crosstalk XVI	No	AD/AA	Internal modem for IBM PC
Novation	J Cat	\$149	300		No	AA	For all RS-232
Prentice Corp.	Popcom Pipeline	\$574	1200/300	Pipeline	Yes	AD/AA	For IBM PC
Prentice Corp.	Popcom Complete	\$599-\$674	1200/300	PC Complete	Yes	AD/AA	Internal and external versions for IBM PC
Prometheus	ProModem 1200	\$495	1200/300		Yes	AD/AA	Internal speaker; buffer to 64K; LED bank
Prometheus	ProModem 1200A	\$449	1200/300	Built in	Yes	AD/AA	Internal modem for Apple II; real-time clock
Prometheus	ProModem 1200B	\$399	1200/300	Mite	Yes	AD/AA	Internal modem for IBM PC
Prometheus	ProModem 1200M	\$549	1200/300	ProCom-M	Yes	AD/AA	Software and cable for Apple Macintosh
Racal-Vadic	Maxwell 300	\$350	300		Yes	AD/AA	Internal modem for IBM PC; external for RS-232
Radio Shack	DC Modem 1	\$99	300		No		For all RS-232
Radio Shack	DC Modem 2	\$199	300		No	AD/AA	For all RS-232
Radio Shack	Acoustic Coupler	\$149	300		No		For all RS-232
Radio Shack	DC 2212 Modem	\$399	1200/300		Yes	AD/AA	For all RS-232; LED bank
Racal-Vadic	Maxwell 1200	\$595	1200/300		No	AD/AA	Internal modem for IBM PC; external for RS-232
Transend Corp.	Apple ModemCard	\$275	300	w/I-Pac (\$339)	No	AD/AA	Internal modem for Apple II
U.S. Robotics	Password 300	\$199	300		Yes	AD/AA	Internal speaker; for all RS-232
U.S. Robotics	Password 1200	\$449	1200/300		Yes	AD/AA	Internal speaker; for all RS-232
Westridge	Westridge 2050 <sup>1</sup>	\$119	300	M-Term	No	AD/AA	For Timex; software doesn't transfer files
Zoom Telephonics	Networker	\$129	300	Zoom Communications; \$50 more for Netmaster	No		Internal modem for Apple II
Zoom Telephonics	Zoom/Modem IIe	\$179	300	as above	Yes	AD/AA	Internal modem for Apple II; speaker

Notes: <sup>1</sup>Pulse (rotary) dtal only; <sup>2</sup>Software included with purchase of modem; <sup>3</sup>AD = Auto-dial, AA = Auto-answer

## PHONE NUMBERS OF MODEM/SOFTWARE MANUFACTURERS

**Anchor Automation**  
(818) 997-7758  
**Apple Computer**  
(800) 538-9696  
**Atari Corp.**  
(408) 745-4851  
**Batteries Included**  
(416) 596-1405  
**Byte-Back Inc.**  
(803) 532-5812  
**Cermetek**  
**Microelectronics**  
(408) 752-5000  
**Coleco Industries**  
(800) 842-1225  
**Commodore**  
**Business Machines**  
(215) 431-9100  
**CompuServe**  
(800) 848-8990  
**Code-A-Phone Corp.**  
(503) 655-8940  
**Epson America, Inc.**  
(800) 421-5426

**Hayes Microcomputer Products, Inc.**  
(404) 449-8791  
**IBM**  
(305) 272-2662  
**MFJ Enterprises, Inc.**  
(601) 323-5869  
**Microcom Inc.**  
(617) 762-9310  
**Microperipheral Corp.**  
(206) 881-7544  
**Microstuf**  
(404) 998-7798  
**Multi-Tech Systems, Inc.**  
(612) 631-3550  
**Mura Corp.**  
(516) 935-4888  
**Novation Inc.**  
(800) 423-5419

**Prentice Corp.**  
(408) 734-9810  
**Prometheus Products**  
(415) 490-2370  
**Racal-Vadic**  
(408) 946-2227  
**Radio Shack**  
(817) 338-2393  
**Software Publishing Corp.**  
(415) 962-8910  
**Transend Corp.**  
(408) 946-7400  
(BBS: 408-946-3616)  
**Triton Products Co.**  
(800) 227-6900  
**United Microwave Industries**  
(714) 639-9396  
**U.S. Robotics, Inc.**  
(800) DIAL-USR  
**Westridge**  
c/o Anchor Automation  
**Zoom Telephonics**  
(800) 631-3116

busy, or if there is no answer. This is particularly useful when you're trying to reach bulletin boards, as many have only one phone line and often are busy.

**Auto-answer.** This feature allows you to set the modem to automatically answer an incoming phone call. It's a nice feature because answering phone calls manually on the computer can be a little messy. With the right software, auto-answer modems also can be set in a "remote" mode, whereby outside callers can phone your computer and leave messages. If you wish to operate your own bulletin-board system or are running any kind of business, you'll want an auto-answer modem.

**Baud Rate.** The speed at which a modem sends or receives data is called its baud rate. The most common speeds are 300- and 1200-baud, or bits per second. Three hundred baud is roughly twice as fast as human speech, and transmits a bit more than 300 words (a little more than a typewritten page) a minute. Last year the most common speed was 300-baud; now 1200-baud is becoming accepted as standard; soon, it'll probably be 2400-baud.

A modem that operates at 1200-baud will also operate at 300-baud. This is key, because when communicating with another computer, both modems must be set (some adjust themselves) at the same baud rate. Now, several major manufacturers, such as Hayes, Cermetek, Multi-Tech, and Novation, have introduced 2400-baud modems. These modems, which also send at 1200- and 300-baud, are considerably more expensive (in the \$800-\$1,000 range). Because both modems in a circuit must use the same speed setting, these 2400-baud modems won't be truly useful until enough people have them.

**Hayes Compatibility.** Hayes is to modems as IBM is to computers—the most prevalent industry standard. Because of this, more software is written to work with Hayes modems than any other kind, and most uses the Hayes commands. And, more modems are made to operate like Hayes modems than any other kind. Thus, buying a modem that uses "Hayes commands" means that you'll have a wider range of software to choose from. You can use software not written for Hayes with a Hayes or Hayes-compatible modem, but it might not work smoothly.

Most Hayes-compatible software is designed primarily for Apple, IBM, or CP/M computers. If you have a Commodore or an Atari, you'll have to spend extra on a cable and interface to connect a Hayes-type modem. You'd spend significantly less buying a made-for-Commodore or made-for-Atari modem, or something like a Volksmodem, for which you can get ready-made Atari or Commodore cables.

**LED Indicators/Sound.** Communicating via computer can be an abstract experience. It's usually devoid of the color or sound we're accustomed to with TV, telephone, or even most computer software. But some modems have lights and speakers so that you at least know what's going on. The bank of LED lights on some modems might indicate "carrier detect," "auto-answer," etc. A speaker lets you know the phone is ringing when it's busy, and if you've reached a non-working number.

Internal modems, of course, have no lights, but they often come with speakers so you can hear the phone ring.

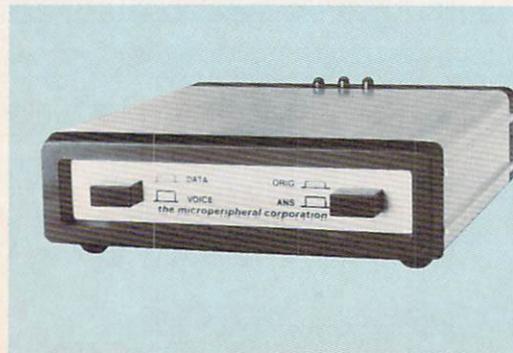
**Tone/Pulse.** Most modems sold today are capable of dialing over both a touch-tone line and a pulse/rotary line. Some, such as Coleco's ADAMLink and the Atari 1030 Modem, are "pulse only." However, they can still be used with touch-tone phones; the actual dialing will just be slightly slower. Pulse-only phones cannot, in most instances, be used in any kind of tone office phone system, such as a PBX system that requires a "9."

### MODEMS: THE GREAT EQUALIZER

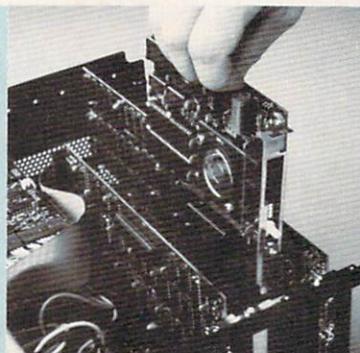
There's another point to keep in mind as far as compatibility goes. You do not have to have the same modem as a friend to communicate. You just have to use the same settings. With the same baud rate, etc., modem X should converse easily with modem Y.

In fact, sending files by modem is a good way to overcome incompatibility problems. For instance, if your Atari word-processing file won't load (and it won't!) in your friend's IBM, or vice versa, just send it by modem. Then the computer on the other end will be able to turn the file into a form it can read.

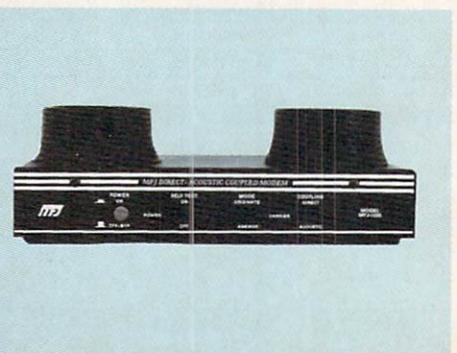
Modems can be the great equalizer. Just as they allow computers with different operating systems to share files, they allow people of different ages, sexes, races, or abilities to communicate with and learn from one another—without bias or convention getting in the way. (See *Editor's Note*, "The Human Connection.") Computer communications, even in their infancy, show great potential. **FC**



Microperipheral's Microconnection



U.S. Robotics' Personal Communicator



MFJ Direct/Acoustic Modem

dore 64 by Prentice-Hall), *AppleWriter II* (for the Apple II series by Apple Inc.), *Symphony* (for IBM PC by Lotus Development Corp.), *Get Organized!* (for IBM PC by Electronic Arts), and *Hometerm* (for Atari, Apple, Commodore 64, and planned for IBM PCjr, from Batteries Included) are examples. With such programs, you can prepare text, go on-line, and transmit the text, all from one program.

Some of the better (and more expensive) communications programs, such as *ASCII Express* (for Apple II series and IBM PC by United Software), have built-in text editors. These editors do not rank as full-fledged word processors, but are useful for writing short notes, or cleaning up a file you've downloaded before printing it out.

## SPECIAL FEATURES

There are some special software features that can make using your modem more enjoyable. If you use the conferencing or CB feature of CompuServe, or operate in a similar on-line environment where the words of several people appear on the screen at once, a "type-ahead window" gives you more flexibility. This window appears at the bottom of the screen and is a reserved area of two or three lines where you can type your next comment. Your text isn't sent until you press ENTER (or RETURN), and doesn't interfere with the incoming information, so you can continue to read on-screen what others are saying.

A real-time clock display is useful for keeping track of your on-line time. Programs such as *Hometerm* and *Personal Communications Manager* (for IBM PC and PCjr, by Microcom) display a running clock on the screen. This feature may save you from spending the rent money on an information service!

With menu-driven software, you can execute various tasks by choosing options. This type of software is generally easier to learn and use than command-driven software, which requires you to remember a long list of commands to type in. The latter can be a problem unless you have a good memory and use the software often. With some software, however, you can choose between menus or commands. If you plan to use the software often and are confident in your ability with a computer, look for software with this option. Operating with commands is cleaner and quicker than using menus.

## "TEST DRIVE" BEFORE BUYING

If at all possible, try to test communications software before you buy. Make sure it has the features you want and isn't too difficult to use. You should be able to change settings quickly and easily. Opening and closing the buffer should be as convenient as possible, preferably using a single keystroke. You should be able to tell quickly how easy it is to navigate.

For example, when on-line, you may have to experiment with the duplex setting from time to time. There are two types of duplex: full and half. If the system you've called "echoes" your characters, you'll want to be in full duplex. If there's no echo, set your software to half duplex so you can see your own typing. If you're set to half duplex and receive an echo, you'll see a doubling of letters (e.g., HHEELLPP). The cure is to switch to full duplex. Some programs allow you to change settings easily (*Hometerm*, *ASCII Express*), while others (such as *Apple Access* and *Personal Communications Manager*) require you to travel through a series of menus.

## HAPPY TRAILS

Getting a modem and communications software to work well together can be a nettlesome affair, though it's getting easier all the time. Stick with it and dream of that first magic moment when you've dialed and see on your screen the words, "WELCOME TO MCI MAIL," or "CONNECT." 

# COMMUNICATIONS SOFTWARE

SYSTEM	NAME/ COMPANY/PRICE	FILE TRANSFER	BUFFER SIZE	MACRO	MAX. BAUD	SIMUL. PRINTOUT
<b>ADAM</b>						
ADAM	ADAMLink (D/T) Coleco Industries Under \$100; w/modem	N <sup>1</sup>	8K	N	300	N
<b>APPLE II</b>						
Ile/e	Vidtex CompuServe \$39.95	B	12K	N	9600	N
II plus/e/e	ASCII Express United Software \$129.95	X	24K	Y	9600	Y
II plus/e/e	Netmaster 2.0 Zoom Telephonics \$69	S	42K	N	9600	N
II plus/e/e	Hometerm <sup>2</sup> Batteries Included \$49.95	X	9K	Y	1200	N
Ile/e	Apple Access Apple Inc. \$75	X	3K	Y	9600	N
Ile/e (128K)	pfs: Access Software Publishing \$70	A	32K	N	1200	Y
<b>ATARI</b>						
32K	AMODEM 6.0 Public domain	X	12K	N	1200	N
48K	Hometerm <sup>2</sup> Batteries Included \$49.95	X	7K	Y	1200	N
<b>COMMODORE</b>						
C 64	Vidtex (D/T) CompuServe \$39.95	B	30K	Y	600	N
C 64	Hometerm <sup>2</sup> Batteries Included \$49.95	X	11K	Y	1200	N
C 64	XMODEM 64 Public domain	X	21K	N	300	N
<b>RADIO SHACK</b>						
Color Computer 32K	Vidtex (D/T) CompuServe \$39.95	B	12K	Y	600	N
Model III 48K	Vidtex CompuServe \$39.95	B	23K	Y	19200	Y
<b>IBM</b>						
PC & PCjr (128K)	Vidtex Professional Connection CompuServe \$59.95	B	16K	Y	1200	Y
PC & PCjr (128K)	ASCII Express United Software \$189.95	X	28K	Y	38400	Y
PC only (192K)	Smartcom 2.0 Hayes Inc. \$149	S	4K	Y	1200	Y
PC & PCjr (96K)	Crosstalk XVI <sup>3</sup> Microstuf \$195	X	66K	Y	9600	Y
PC & PCjr (128K)	Personal Communi- cations Manager IBM \$100	S	N/A	Y	9600	Y
PCjr (128K)	pfs: Access Software Publishing \$95	A	32K	Y	1200	Y
<b>TI-99/4A</b>						
Expansion Box and RS-232 Card	Emulator II Triton Products \$19.95	S	2K	N	300	N
<b>TIMEX/SINCLAIR</b>						
16K TS 1000/1500	ZCOMM 16/64K (T) \$149 (\$119 kit) with Byte-Back Modem	S	15-60 Screens	N	300	Y
TS2068	Spectra Term w/Byte-Back	S	30K	N	300	Y

<sup>1</sup>New version will support downloading

<sup>2</sup>Part of Homepak (word processor, data base, communications program)

<sup>3</sup>CP/M version available; N/A = Information not available

N = None; B = B Protocol; X = XMODEM; S = Special; A = Text (ASCII) only

T = Tape; C = Cartridge; D = Disk; Unless noted, all programs are disk only

### Avoid Wavy Lines on Your C 64 Screen.

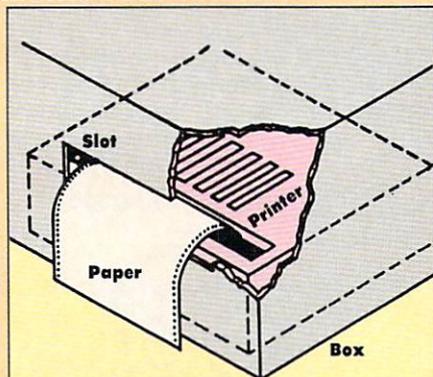
You're happily sitting at your C 64, computing away, and suddenly you see ripples going up your screen at approximately one-second intervals. It's not the first time you've been subjected to this aquarium effect, and the only relief you've found so far has been to turn off your computer and wait awhile. The cause? Recent C 64s contain a number of plastic video chips rather than ceramic ones, and when they overheat, they send wavy lines up your screen. Try placing a small desk fan next to your computer, and direct the air current across the back of the computer console. This usually cools the system sufficiently to avoid the ripple effect.

### Make Short Shrift of Disk or Cassette I/O Errors.

When you try to load from your disk or cassette, do you sometimes get a very disconcerting message the likes of: I/O ERROR ON DRIVE 1, OR DISK DRIVE EMPTY, OR FILE NOT FOUND, when you know files are on that disk? Or even worse, do you find that your computer is locking up? The culprit might be electromagnetic interference (EMI) emitted by your TV's flyback transformer, which could affect the information recorded (magnetically) on your disk or cassette.

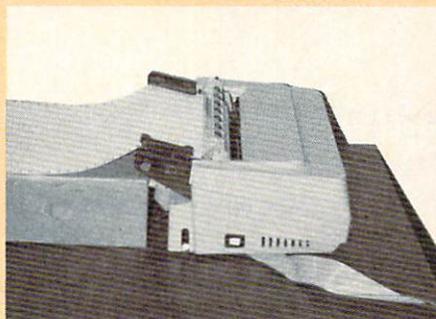
The solution's simple: The flyback transformer usually is on the left side of your TV, so move your disk drive(s) or cassette recorder over to the right side. If that's out of the question, make sure your drive(s) or recorder is at least six inches away from the TV. For ADAM and PCjr owners, distancing your TV or monitor is particularly important since your computers lack internal shielding to protect them from EMI.

### Muffle That Printer!



### Feed Your Fanfold Paper Without a Catch.

If your continuous-feed, fanfold paper turns in upon itself when you're printing, or otherwise jams



up due to tension or twisting, here's a home remedy that should get it flowing like greased lightning in less than 10 minutes. Remove the paper from the box. Cut one of the short ends and both longer sides so they are only about 4 inches deep. Next, completely cut away the box's other short end, making sure the edges are smooth; the hole should measure approximately 10 inches across.

Place your paper on the table behind your printer and load it. Turn the box upside down and place it over the paper with the open end next to the printer. Arrange the paper leaving the printer to feed across the top of the box.

NEIL LEWBEL  
Stamford, Connecticut

Is the noise from your daisywheel printer driving you crazy? Well, sanity could be just a few minutes away. Procure a common cardboard box a few inches larger on all sides than your printer. Remove the flaps, and cut a hole in the back big enough for paper to feed into and out of, and to ensure a proper ventilation. Place it over your printer. If the box is sufficiently large, you might even wish to line it with sound-proofing, such as foam-plastic insulating board or egg cartons.

Be very careful to check if your printer is getting too hot—if it's heating up, remove the muffler.

### Computer Plus VCR: Tips For a Mix.

If you own a computer and a VCR, the possibilities for combining the two for applications that extend beyond their individual capabilities are myriad (check with your dealer to find out whether your two pieces of equipment are electronically compatible). Plug your computer into the RCA plug on the incoming switch side of the VCR. Set the computer, VCR, and TV to the same channel.

For a test run, LOAD a short program or game into the computer. Adjust the brightness and contrast knobs on your TV screen to get a perfect picture. RUN the program, or play a few minutes of the game, recording it all the while on your VCR. When you play it back, experiment with the VCR's fast forward/reverse capabilities. Plug a microphone into one of the jacks and, while the tape is running, record a little speech about the game's strategy, or, if your stereo is close by, record some background music to accompany the program. When you rerun the "sound and screen" tape you've just produced, use the VCR's stop option, LOAD a word-processing program into your computer, and record a screen of notes. The result will be an annotated tape of the program, which you can play on your VCR.

By mixing the media capabilities of a computer and VCR, you can create flexible and interesting applications for educational purposes, archiving, demo work, visuals editing, etc. Classroom or business presentations, for example, can be reduced to tapes of whatever computer programs, listings, or graphics you wish to use, accompanied by sound and large-screen capabilities. No more lugging around of heavy equipment, no more embarrassing on-the-spot glitches or lockups. Or, children can tape their best gaming moments or strategies and take them to friends' homes without worrying about software compatibility between different computers.

ROBERT GREEN  
Clarkston, Georgia

### HAVE A HINT?

We will pay \$25 for every hint (we've never heard of) which we publish. Please keep them short (not more than 300 words) and enclose diagrams or photos, if applicable. Send to: Helpful Hints, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. FAMILY COMPUTING cannot assume responsibility for the loss or return of any material.

# the PROGRAMMER

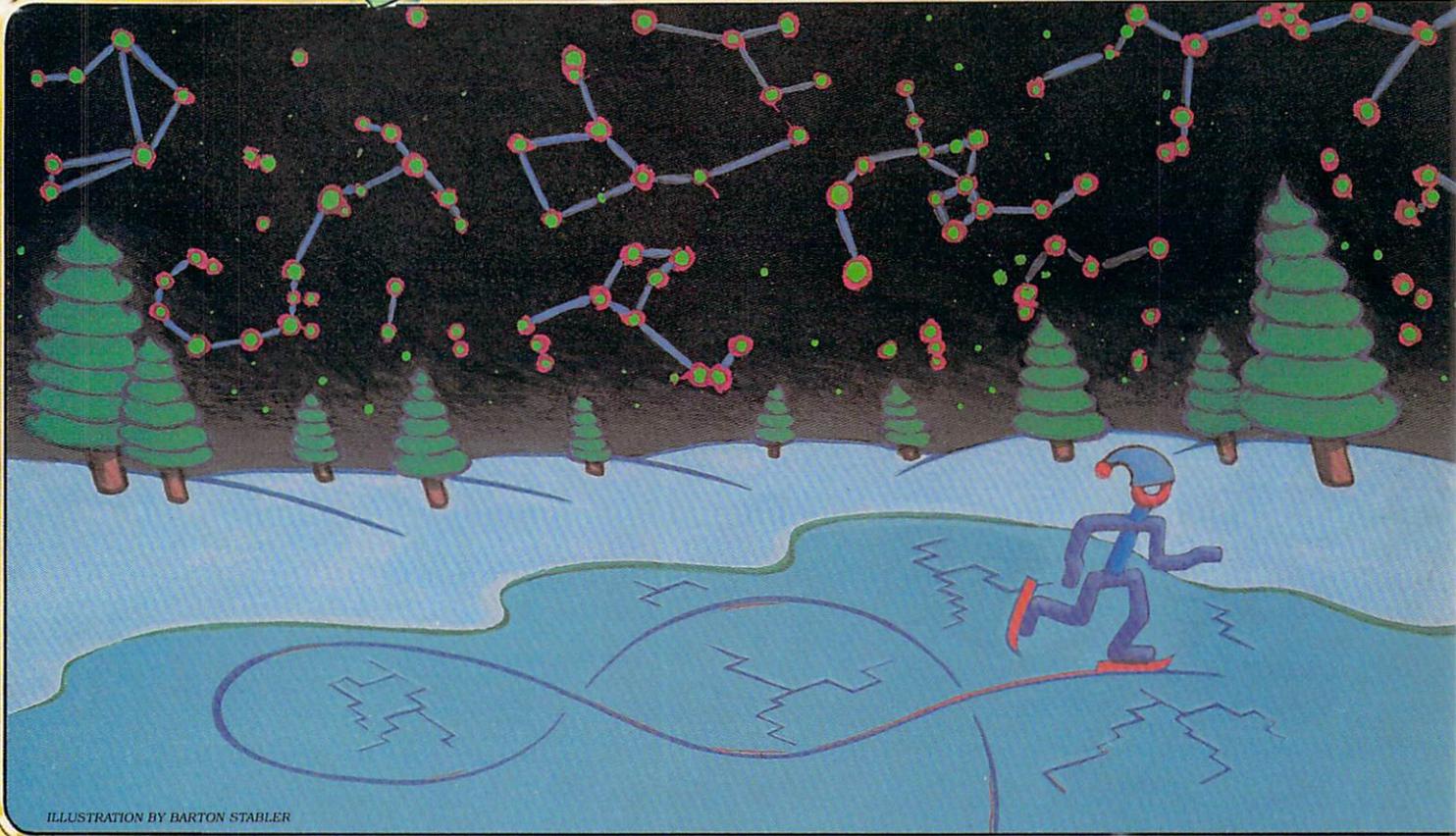


ILLUSTRATION BY BARTON STABLER

★	M	A	R	C	H	★
<b>BEGINNER PROGRAM</b>						
Page 44						
Scan the skies with <i>Zodiac</i> —without getting a crick in your neck!						
	<b>ARCADE GAME</b>					
	Page 59					
	It's been a great winter for skating—but don't you think it's getting a bit <i>warm</i> ? Real arcade action and sound. Play at your own risk!					
		<b>FEATURE PROGRAM</b>				
		Page 62				
		You don't have to be a programming pro to create professional-looking graphics on your C 64.				
<b>PROGRAMMING P.S.</b> Notes about previous months' programs. Page 64						

ILLUSTRATION BY JIM CHERRY III

Cherry

# ZODIAC

BY JOHN JAINSCHIGG

When people ask "What's your sign?" they're talking astrology—a mystical discipline based on the astronomy of the sun and local constellations. The 12 constellations of the zodiac appear to lie along a ribbon of sky, called the ecliptic, that encircles the Earth. As Earth moves through its orbit in the course of the year, the sun appears to move along this corridor and through the constellations, one by one.

The ancients tried to use their knowledge of the sun and stars to predict earthly events—and many people today still believe in the power of the constellations to influence human affairs. But even if you don't believe in astrology, the forms of the constellations, their names, and their histories are fascinating. To help you with your stargazing, we've created *Zodiac*, a program that will show you what these constellations look like in the sky. It'll also teach you their names, their brightest stars, and the days of the year when the sun seems to travel through them. Then, if you like, it'll quiz you on what you've learned!

(Note: The dates tradi-



tionally used by astrologers are slightly different from the astronomically correct dates used in this program. Between November 30 and December 19, the sun appears to travel through the constellation Ophiuchus, which is not part of the astrological zodiac.)

## ADAM/Zodiac

```

10 DIM na$(12),bs$(12),dt$(12,2),sn(12),str(12,18)
20 FOR x=1 TO 12
30 READ na$(x),bs$(x),dt$(x,1),dt$(x,2),sn(x)
40 FOR y=1 TO sn(x)
50 READ str(x,y)
60 NEXT y,x
70 HOME
80 PRINT TAB(13);"ZODIAC"
90 PRINT
100 PRINT "PRESS <V> TO VIEW THE"
110 PRINT "CONSTELLATIONS OF THE ZODIAC,"
120 PRINT "<Q> FOR A QUICK QUIZ,"
130 PRINT "OR <E> TO END THE PROGRAM."
140 GET k$
150 IF k$="E" OR k$="e" THEN END
160 IF k$<>"V" AND k$<>"Q" THEN 140
170 z=(k$="Q")
180 sc=0
190 FOR i=1 TO 12
200 IF z THEN x=INT(RND(1)*12)+1:GOTO 330
210 x=i
220 HOME
230 PRINT "THE SUN IS IN THE"
```

```

240 PRINT "CONSTELLATION ";na$(x)
250 PRINT "BETWEEN ";dt$(x,1);" AND ";dt$(x,2);"."
260 PRINT
270 PRINT na$(x);"'S BRIGHTEST STAR IS"
280 PRINT bs$(x);"."
290 PRINT
300 PRINT "PRESS ANY KEY TO"
310 PRINT "VIEW ";na$(x);"."
320 GET k$
330 HOME
340 FOR y=1 TO sn(x)
350 q=INT(str(x,y)/31)
360 HTAB str(x,y)-q*31+1
370 VTAB q+1
380 PRINT CHR$(42+37*(y=1));
390 NEXT y
400 FOR d=1 TO 3000
410 NEXT d
420 IF NOT z THEN 550
430 HOME
440 PRINT "WHAT CONSTELLATION"
450 INPUT "WAS THAT?";r$
460 IF r$=na$(x) THEN sc=sc+1:PRINT "RIGHT!":GOTO 480
470 PRINT "NO, IT WAS ";na$(x);"."
480 PRINT "WHAT IS ITS"
490 INPUT "BRIGHTEST STAR?";r$
500 IF r$=bs$(x) THEN sc=sc+1:PRINT "RIGHT!":GOTO 520
510 PRINT "NO, IT IS ";bs$(x);"."
520 PRINT
530 PRINT "PRESS ANY KEY TO CONTINUE."
540 GET k$
550 NEXT i
560 IF NOT z THEN 70
570 HOME
580 PRINT "YOUR SCORE WAS ";sc;" OUT OF 24."
590 PRINT "THAT'S ";INT((sc/24)*100);" PERCENT CORRECT"
600 PRINT
610 PRINT "PRESS ANY KEY TO CONTINUE."
620 GET k$
630 GOTO 70
1000 DATA CAPRICORN,ALGED I,1/20,2/18,13,121,213,335
1010 DATA 579,639,574,508,412,285,318,322,326,208
1020 DATA AQUARIUS,SADALMELIK,2/17,3/13,12,80,336,637
1030 DATA 138,13,74,72,315,625,715,373,372
1040 DATA PISCES,ALRISCHA,3/13,4/19,18,620,562,563,504
1050 DATA 505,508,516,550,643,677,585,521,438,287,196
1060 DATA 133,70,10
1070 DATA ARIES,HAMAL,4/19,5/15,7,482,609,671,283,268
1080 DATA 107,48
1090 DATA TAURUS,ALDEBARAN,5/14,6/21,13,265,174,237
1100 DATA 298,331,8,126,460,513,580,677,463,557
1110 DATA GEMINI,CASTOR,6/21,7/21,16,75,77,22,174,397
1120 DATA 495,587,233,232,292,228,382,512,578,739,735
1130 DATA CANCER,BETA CANCRI,7/21,8/11,5,739,50,329
1140 DATA 453,698
1150 DATA LEO,REGULUS,8/12,9/16,14,580,741,426,360,236
1160 DATA 55,119,153,731,687,504,497,318,351
1170 DATA VIRGO,SPICA,9/21,11/1,12,668,567,458,430,370
1180 DATA 245,246,331,143,419,353,345
1190 DATA LIBRA,ZUBEN ELGENUBI,11/1,11/22,6,296,42,224
1200 DATA 634,658,720
1210 DATA SCORPIO,ANTARES,11/23,11/30,15,329,269,56
1220 DATA 119,274,367,359,450,512,573,694,659,532,470
1230 DATA 411
1240 DATA SAGITTARIUS,NUNKI,12/19,1/19,14,229,41,289
1250 DATA 294,266,383,422,239,485,487,576,670,659,687
```

## Apple/Zodiac

```

10 DIM NAS(12),BS$(12),DTS(12,2),SN(12),STR(12,18)
20 FOR X = 1 TO 12
30 READ NAS(X),BS$(X),DTS(X,1),DTS(X,2),SN(X)
40 FOR Y = 1 TO SN(X)
50 READ STR(X,Y)
60 NEXT Y,X
```

# COMPUCOPIA

## SHORT - SHORT PROGRAMS

### ADAM/CROSSED WORDS

```

10 HOME
20 PRINT "Please input any string"
30 INPUT "(e.g., your name). ";a$
40 HOME
50 x = INT(RND(1)*22)+1;y = INT(RND(1)*31)+1;vx = INT(
RND(1)*3)-1;vy = INT(RND(1)*3)-1
60 FOR i = 1 TO LEN(a$)
70 VTAB x:HTAB y:PRINT MID$(a$,i,1);
80 x = x+vx:y = y+vy
90 IF x < 1 OR x > 22 OR y < 1 OR y > 31 THEN i = LEN(
a$)
100 NEXT i:GOTO 50

```

### TIMEX SINCLAIR 1000 & 1500/CROSSED WORDS

```

10 SLOW
20 PRINT "PLEASE INPUT ANY STRING"
30 PRINT "(E.G., YOUR NAME)."
40 INPUT AS
50 CLS
60 LET X=INT (RND*21)
70 LET Y=INT (RND*32)
80 LET VX=INT (RND*3)-1
90 LET VY=INT (RND*3)-1
100 FOR I=1 TO LEN AS
110 PRINT AT X,Y;A$(I)
120 LET X=X+VX
130 LET Y=Y+VY
140 IF X<0 OR X>21 OR Y<0 OR Y>31 THEN LET I=LEN AS
150 NEXT I
160 GOTO 60

```

### TRS-80 COLOR COMPUTER/CROSSED WORDS

```

10 CLS: CLEAR 500
20 PRINT "PLEASE INPUT ANY STRING"

```

```

30 INPUT "(E.G., YOUR NAME)";AS
40 CLS
50 X=RND(15)-1;Y=RND(32)-1;VX=RND(3)-2;VY=RND(3)-2
60 FOR I=1 TO LEN(AS):PRINT@X+32+Y,MID$(AS,I,1);
70 X=X+VX;Y=Y+VY
80 IF X<0 OR X>14 OR Y<0 OR Y>31 THEN I=LEN(AS)
90 NEXT I:GOTO 50

```

### TRS-80 MODEL III/CROSSED WORDS

```

10 CLS: CLEAR 500
20 PRINT "PLEASE INPUT ANY STRING"
30 INPUT "(E.G., YOUR NAME)";AS
40 CLS
50 X=RND(15)-1;Y=RND(64)-1;VX=RND(3)-2;VY=RND(3)-2
60 FOR I=1 TO LEN(AS):PRINT@X+64+Y,MID$(AS,I,1);
70 X=X+VX;Y=Y+VY
80 IF X<0 OR X>14 OR Y<0 OR Y>63 THEN I=LEN(AS)
90 NEXT I:GOTO 50

```

### CUSTOMIZE YOUR 3-D PLOTTER!

If you liked last month's *3-D Surface Plotter* program (page 92), you'll love it when it draws pictures *you* design!

The key's in line 60. You can change what's to the right of the equal sign to just about any function involving X and Y . . . just so long as you don't end up dividing by zero. Bet you can come up with some really far-out shapes! For starters, try

```
60 Z=X+Y+50*((X>12)*(X<12))*(Y>5)*(Y<5))
```

## COMPUTER TRIVIA CONTEST



Are you a trivia talent? Think you know everything there is to know about computers? Then check out K-POWER's Computer Trivia Quiz! We challenge you to answer every question correctly. We'll randomly pick two winners from all the correct entries we receive by March 22. Lucky winners will be sent Suncom's *PQ: The Party Quiz Game*, which includes special controllers that let up to four teams take on one another to see who can answer questions fast-

est. So give it a try! Send your entry c/o K-POWER, 730 Broadway, New York, NY 10003.

1. What are the names of the famous sidekicks in Infocom's *Planetfall* and in Trillium's *Amazon*? \_\_\_\_\_
2. What does BASIC really stand for? \_\_\_\_\_
3. What is the full name of the woman who has a computer language named after her? And what was her part in computing history? \_\_\_\_\_
4. Which word means "a sloppy computer program"?  
Baud \_\_\_\_\_ Buffer \_\_\_\_\_ Kluge \_\_\_\_\_ Deuce \_\_\_\_\_
5. What do the designers at Ozark Softscape (they designed *M.U.L.E.*) do to brainstorm for game ideas? \_\_\_\_\_
6. Why did the designers at Atari build in a feature that automatically changes the screen color after a certain amount of time? \_\_\_\_\_
7. Who wrote and recorded that great song: "BASIC Ain't the Language of Love"? \_\_\_\_\_
8. Who is this guy? (below) \_\_\_\_\_



Name \_\_\_\_\_ Age \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Telephone ( ) \_\_\_\_\_ Male \_\_\_\_\_ Female \_\_\_\_\_  
 Computer(s) I use: \_\_\_\_\_

**EDUCATION/FUN LEARNING**

Title Manufacturer Price	Brief description	Hardware requirements	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
CAVE OF THE WORD WIZARD Timeworks 444 Lake Cook Road Deerfield, IL 60015 (800) 323-9755 \$34.95 ©1984	A sure-fire way to get anyone from age 6 to adult to practice and learn 500 frequently misspelled words at 10 different difficulty levels. Game makes good use of C 64's voice synthesis.† —BUMGARNER	C 64 (d.). Joystick.	Unlimited warranty.	★	★	★	★	A	★
CHALLENGE MATH Sunburst Communications 39 Washington Ave. Pleasantville, NY 10570 (800) 431-6616 \$39.95 ©1984	Kids 7–12 practice addition, multiplication, subtraction, and division at a variety of skill levels in three games. Good drill but requires parental encouragement for continued use. —SUMMERS	Reviewed on C 64 (d.). Also for Apple II series, 48K (d.).	90-day warranty (includes user-damaged); \$10 fee thereafter or for backup.	★	★	★	★	E	★
DR. SEUSS' FIX UP THE MIX UP Coleco Industries, Inc. 999 Quaker Lane S. West Hartford, CT 06110 (800) 842-1225 \$34 ©1984	Electronic jigsaw puzzle for ages 4–10 features Dr. Seuss characters. Five levels of play intended to help develop memory and pattern recognition skills. —DAVENPORT	ADAM (cart.).	90-day warranty.	★	★	★	★	E	★
DREAM HOUSE CBS Software One Fawcett Place Greenwich, CT 06386 (203) 622-2500 \$39.95 ©1984	Landscape and decorate four houses. Ages 6–12 have fun visualizing different perspectives and design possibilities, and working with color schemes. —SUMMERS	Reviewed on C 64 (d.). Also for Apple II series, 48K (d.). Joystick.	90-day warranty; \$5 fee thereafter.	★	★	★	★	A	★
LOGIC BUILDERS Scholastic Software 730 Broadway New York, NY 10003 (212) 505-3567 \$39.95 ©1984	Build webs from a stable of shapes. Match webs to those created by computer or friends. Re-create ones from memory. Fun game helps develop analytical skills in adults and kids as young as 5. —FRANK	Reviewed on Apple II series, 48K (d.). Also for C 64 (d.).	60-day warranty; \$10 fee for 10 months thereafter.	★	★	★	★	E	★
LUCKY'S MAGIC HAT Advanced Ideas 2550 Ninth St., Suite 104 Berkeley, CA 94710 (415) 526-9100 \$39.95 ©1984	Parents and kids work together to create quizzes, including graphics and questions, for any subject desired. Great for practicing spelling lists. Extra subject disks available. —BUMGARNER	Apple II series, 48K (d.).	1-year warranty (includes user-damaged); free backup.	★	★	★	★	A	★
ROBOT ODYSSEY I The Learning Company 545 Middlefield Road, Suite 120 Menlo Park, CA 94025 (415) 328-5410 \$49.95 ©1984	Design and test circuit chips and build robots to aid in your ascent out of an underground city. Sharp pre-teens and up learn about circuit design and practice problem-solving.† —MORRIS	Apple II series, 64K (d.).	90-day warranty; \$10 fee thereafter or if user-damaged.	★	★	★	★	D	★
SPELL IT Davidson & Associates 6069 Groveoak Place, No. 12 Rancho Palos Verdes, CA 90274 (213) 373-0971 \$49.95 ©1984	Kids 10 and up (younger in some cases) practice spelling in four activities and two fun games, using 1,000 different words in 50 lists, or words you enter yourself.† —BUMGARNER	Reviewed on Apple II series, 48K (d.). Also for C 64 (d.); IBM PC/PCjr, 64K (d.).	1-year warranty (includes user-damaged); \$10 fee thereafter or for backup.	★	★	★	★	E	★
T.REX CBS Software One Fawcett Place Greenwich, CT 06836 (203) 622-2500 \$49.95 ©1984	You are a tyrannosaurus and must survive in an authentic prehistoric habitat. Fascinating simulation encourages exploration, and teaches about dinos, ecosystems, and more.† —MORRIS	Reviewed on Apple II series, 48K (d.). Planned for C 64; IBM PC. Joystick optional.	90-day warranty; \$5 fee thereafter if user-damaged or for backup.	★	★	★	★	A	★
U.S. ADVENTURE First Star 18 East 41st St. New York, NY 10017 (212) 532-4666 \$29.95 (Atari. C 64) \$34.95 ©1984	Travel around the nation taking the shortest route between two states. Learn order in which states entered union and other historical facts. —MORRIS	Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d.); IBM PC/PCjr, 64K (d.). Joystick optional.	90-day warranty; \$7 fee thereafter or if user-damaged.	★	★	★	★	A	★

**RATINGS KEY** O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

**GAMES** REVIEWED BY JAMES DELSON

Title Manufacturer Price	Brief description	Hardware requirements	Backup policy	Ratings					
				O	D	PS	GQ	EU	V
AMAZON Trillium Software 1 Kendall Square Cambridge, MA 02139 (617) 494-1200 \$39.95 (Apple) \$32.95 (C 64) ©1984	Tough text/graphic adventure, by novelist/filmmaker Michael Crichton. shuffles you from frying pan to fire as you try to solve a mystery set in South America. For ages 12+. †	Reviewed on Apple II series, 48K (d.). Also for C 64 (d.).	30-day warranty; \$5 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	@
CURSE OF RA Epyx, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$20-\$30 ©1982	Third game in Apshei series lets you continue sword and sorcery adventures in Egypt. Great play system mixes arcade playing skill with mapmaking and character growth. For ages 12+.	Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 32K (d. or cass.); C 64 (d. or cass.); IBM PC/PCjr, 64K (d.).	30-day warranty; \$10 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
EPIDEMIC! Strategic Simulations 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$34.95 ©1982	You're in command of the world's scientific and military resources, trying to cure a plague afflicting the Earth from outer space. Short-playing strategy game good for ages 12+. †	Reviewed on IBM PC, 64K (d.). Also for Apple I series, 48K (d.); Atari Home Computers, 48K (d.); IBM PCjr, 64K (d.).	30-day warranty; \$10 fee thereafter, if user-damaged or for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★
FIGHTER COMMAND Strategic Simulations 883 Stierlin Road, Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$49.95 ©1983	First-rate simulation of the Battle of Britain. 1-2 players control air forces of England and Germany during summer of 1940. Strategy game has 5 scenarios and 5 levels of play. A must for serious gamers. 12+. †	Apple II series, 48K (d.).	30-day warranty; \$10 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★
FORTUNE BUILDER Coleco Industries 999 Quaker Lane S. West Hartford, CT 06110 (800) 842-1225 \$34 ©1984	1-2 players buy and develop properties to build a fortune. Amusing and stimulating game, best yet for ADAM, goes beyond pure action. For ages 12+.	ADAM (data pack). Versions planned for Atari Home Computers; C 64. Game controllers.	90-day warranty.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
GHOSTBUSTERS Activision 2350 Bayshore Frontage Road Mountain View, CA 94043 (415) 960-0410 \$34.95 ©1984	Challenging, amusing "gamization" of hit movie features wonderful graphics, music, and easy-to-use play system. If you "ain't 'fraid of no ghosts," this one's for you. For ages 10+. †	C 64 (d.). Joystick.	1-year warranty.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
MONTY PLAYS SCRABBLE Epyx, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$29.95-\$39.95 ©1984	1-4 humans and/or computer opponents play classic game featuring variety of ability levels, and extras such as "hint" facility that teaches while you play. Lacks spelling checker. For ages 8+. †	C 64 (d. or cass.). Versions for Apple II series, 48K (d.); IBM PC/PCjr, 64K (d.) available from Ritam Corp.	30-day warranty; \$10 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	@
MYCHESS II Datamost 19821 Nordhoff St. Northridge, CA 91324 (818) 709-1202 \$34.95 ©1984	Learn while you play this chess program with many skill levels, clever if sometimes mediocre graphics, and occasionally awkward mechanics, but superb documentation. For ages 10+. †	Reviewed on Apple II series, 48K (d.). Also for C 64 (d.). Version planned for Atari Home Computers.	Unlimited warranty; \$10 fee for backup or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
PASTFINDER Activision 2350 Bayshore Frontage Road Mountain View, CA 94043 (415) 960-0410 \$31.95 ©1984	Steer futuristic vehicle over alien terrain, shooting/avoiding obstacles, picking up "artifacts" and delivering them to your bases in colorful skill/arcade game for ages 8+.	Atari Home Computers, 48K (cart.). Joystick.	1-year warranty.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
THE WYLDE Screenplay 1095 Airport Road Minden, NV 89423 (800) 334-5470 \$34.95 ©1983	Build novice knight into great hero by combatting monsters in third of "Warriors of Ras" arcade/role-playing series. Requires careful strategy, skillful action to survive. Easy-to-learn play system, for ages 12+. †	Reviewed on Apple II series, 48K (d.). Also for Atari Home Computers, 48K (d.); C 64 (d.).	90-day warranty; \$5 fee thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★

**RATINGS KEY** O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart; @ ★★★ to ★★★★, depending on price.

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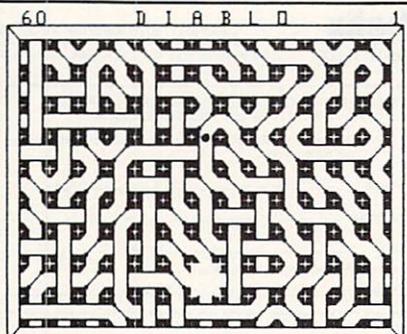
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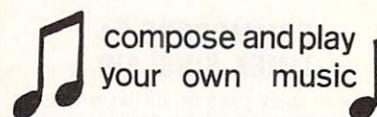
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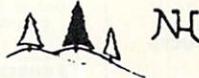
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