ATARI EXPLORER™

PRINTER BREAKTHROUGHS

April/May 1985

$3

ATARI SHINES AT CES

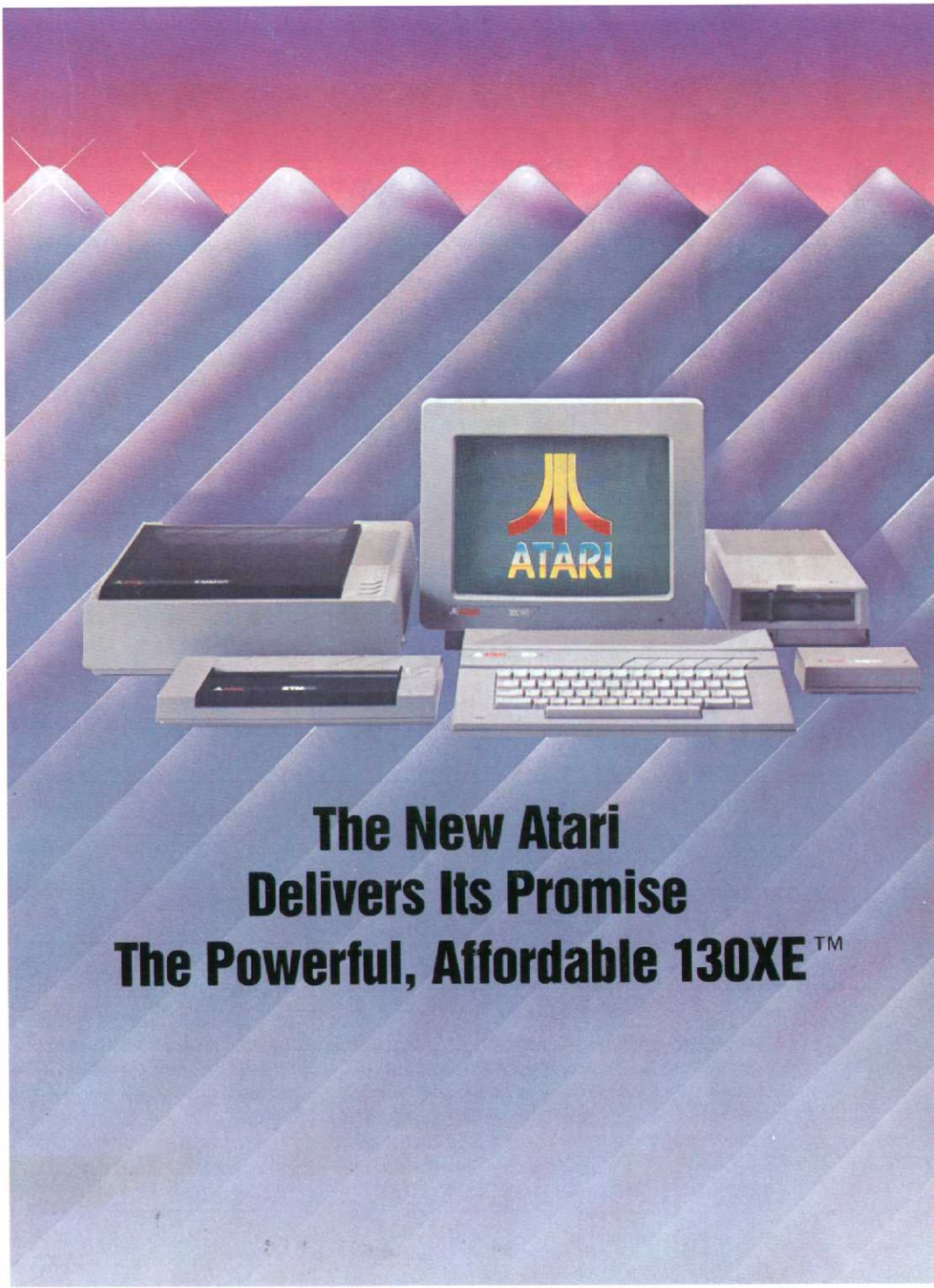
GREATEST BASEBALL GAMES

NATIONAL USER GROUP LIST

INTERVIEW WITH TOM SNYDER

ROM HIT PARADE

DISCOVER ELECTRONIC PUBLISHING



0 54
77000 12432

Expand Your Atari ...With peripherals from mpp

MicroPrint Parallel Printer Interface

- Works with Atari 400, 800, 600XL and 800XL
- Replaces Atari 850™ Interface Module
- Compatible with all software
- 5-foot cable with Centronics plug (compatible with Epson, NEC, Prowriter, etc.)
- Connects to serial bus on computer
- 2 Year Warranty

SOPHISTICATED SMART TERMINAL SOFTWARE ON CARTRIDGE

FEATURES:

- ☐ Supports XMODEM Protocol
- ☐ ASCII/ATASCII Translation
- ☐ Allows Transfer of Files Larger than Memory
- ☐ Upload/Download of Text and Programs
- ☐ 100% Machine Language
- ☐ Loads a 65 Column Screen Driver
- ☐ Multiple Buffers
- ☐ Off-Line Editing
- ☐ Variable Baud Rate
- ☐ Parity Options
- ☐ Full/Half Duplex

ONLY **$149.95**

mpp-1000C Modem

- Auto Answer/Auto Dial
- Direct Connect to Phone Line
- No Atari 850™ Interface Module Needed
- Includes AC Adapter/Power Supply
- Free CompuServe DemoPak™
- 1 Year Warranty
- Connects to Joystick Port
- Works on **ALL** Atari Computers

Atari and CompuServe DemoPak are trademarks of Atari Corp. and CompuServe.

MICROBITS PERIPHERAL PRODUCTS
225 Third Avenue, SW • Albany, OR 97321
ORDERS: 1-800-624-7532
CUSTOMER SERVICE: 1-503-967-9075

ATARI EXPLORER™

April/May 1985

DEPARTMENTS

2 **EDITORIAL**

9 **INPUT/OUTPUT**
Letters from our readers.

14 **NEWS YOU CAN USE**
Of robots, and VCRs, among others.

23 **EDUCATION**
An interview with Tom Snyder, plus educational game reviews, and more.

30 **LOGO NOTIONS**
WHEN Demons.

34 **HAPPY HACKER**
A hands-on look at the 130XE and DOS 2.5.

42 **COMPUTER CLASSROOM**
Getting into assembly language programming.

46 **BITS AND PIECES**
A mixed bag of useful tricks.

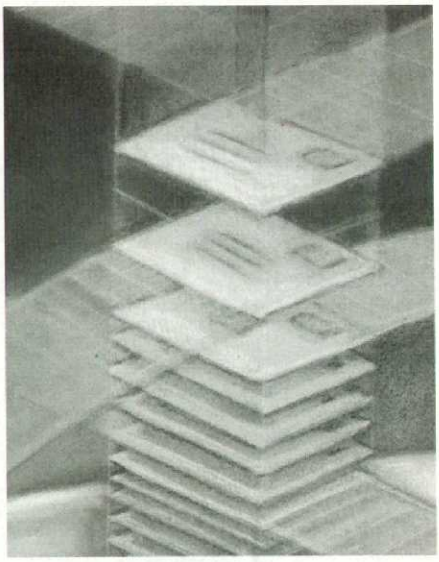
50 **USER FRIENDLY**
All about M.A.C.E.

58 **REVIEWS**
Cutthroats, Suspect, Stealth, HomePak, Flak.

FEATURES

4
THE PRINTED WORD: ATARI INTRODUCES THE XE AND ST PRINTERS
An exciting display of new printers by Atari.

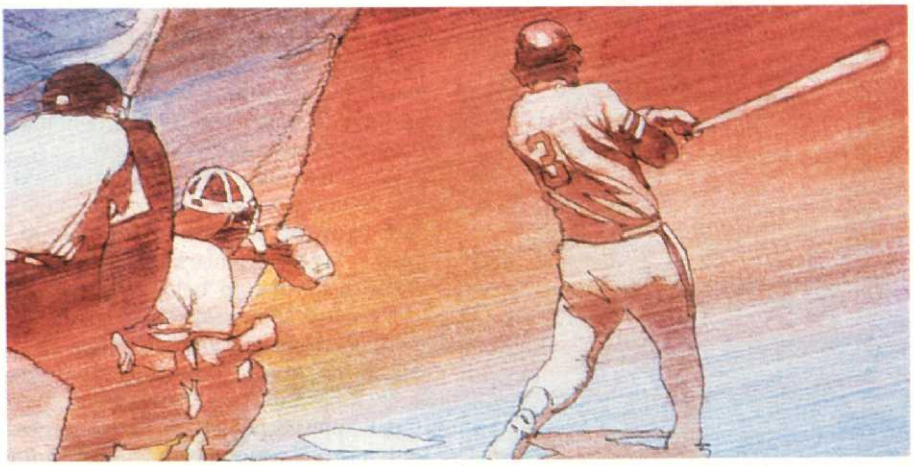
6
ATARI COMPUTER CARTRIDGES: A RETROSPECTIVE
Atari's treasure trove in ROM.



19
ELECTRONIC MAIL, TYPESETTING, AND MY ATARI
Everything you need to know about electronic publishing.

38
THE MANY WAYS OF ARRAYS
Keeping track of your Little Leaguers.

80
ATARI WINS BIG AT LAS VEGAS CES



74
KINGS OF THE ATARI DIAMOND
An assortment of baseball programs for Atari computers.

ATARI EXPLORER

Manager of Publications
Neil Harris

Managing Editors
David Heller
Dorothy Heller
Associate Editor
Ute Elisabeth Van Nuys
Technical Editor
David Duberman
Contributing Writers
Preeva Adler
Marsha Arnold
J.D. Bass
Connie Connors
Joan Delfino
David Duberman
Tracie Foreman
David Heller
Arnie Katz
Bill Kunkel
Richard Kushner
Rafael Rivera
Ute Elisabeth Van Nuys
Greg Varley
Joyce Worley
Designers
Graphic Eye
Production Manager
Susan Siegel
Contributing Illustrators
Frank Ansley
Matthew Foster
Hilary Nelson
Mick Wiggins
Circulation Coordinator
Lorraine Marshall
Cover art by Tony Avery

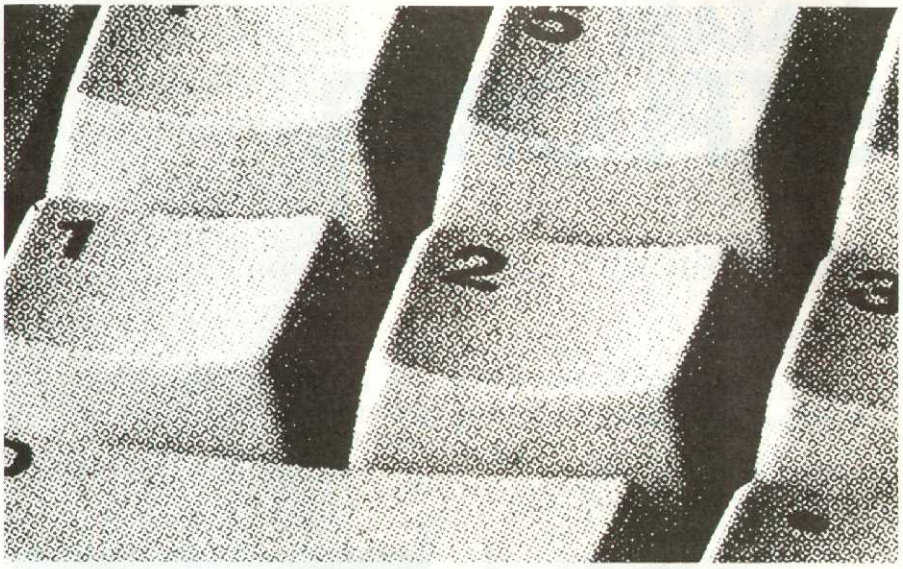
ATARI EXPLORER is published by Atari (U.S.) Corp., 1196 Borregas Ave., Sunnyvale, CA 94086. Third class postage paid at Chicago, IL. Copyright 1985, Atari Corp.

400, 800, 600XL, 800XL, 1200XL, 65XE, 130XE, 130ST, 520ST, XDM121, SDM121, XMM801, SMM804, XTM201, XTC201, STC504, Atari Explorer, Centipede, Missile Command, Super Breakout, Star Raiders, 1050 Disk Drive, XM301, SF354, SM124, SC1224, 1027, 835, 850, Bookkeeper, 825, 1020, 1450XLD, Touch Tablet, 1030, DOS 2.5, Eastern Front, Excalibur, Assembler Editor, Macro Assembler, DOS 2.0, DOS 3.0, Advanced Music Player, 2600, AtariWriter Plus, Atari Proofreader, Music Painter, and The Learning Phone are trademarks of Atari Corp.

AtariLab is developed by Dickinson College. All rights reserved. DEFENDER is a trademark and ©Williams 1980, manufactured under license from Williams Electronics. DIG DUG created and designed by Namco Ltd., manufactured under license by Atari, Inc; trademark and ©Namco 1982. DONKEY KONG is a trademark and ©Nintendo 1981. GALAXIAN is a trademark of Bally Midway Mfg. Co. licensed by Namco-America, Inc. Pac-Man and Ms. Pac-Man are trademarks of Bally Midway Mfg. Co., sublicensed to Atari, Inc. by Namco-America, Inc. Joust is a trademark and ©Williams 1982, manufactured under license from Williams Electronics, Inc. Qix is a trademark and ©of Taito America Corporation 1981.

SUBSCRIBE
For subscription and advertising information call (408) 745-4204.
Subscription: $15 for 6 issues (one year); $39.95 for 18 issues (three years). For subscription or address changes, please write: Subscription Department, ATARI EXPLORER, Atari Corp. P.O. Box 3427, Sunnyvale, CA. 94088-3427. Please submit articles to Editor, ATARI EXPLORER, Atari Corp., 1196 Borregas Ave., Sunnyvale, CA 94086.

Atari reserves the right, in its sole discretion, to reject any advertising in whole or in part.



EDITORIAL

I have to thank you.

A letter was sent to everyone who had a current subscription to the old Atari magazine. In it was word of the changeover in Atari's ownership and the new plans for both the company and this magazine. I asked you to write and tell me what you wanted from this magazine. That request was repeated in the letter column last issue.

The response was terrific—hundreds of letters from people who care about Atari and who let it be known that you're pulling for us out there.

Aside from the good wishes which are most gratefully appreciated, you said that you want this magazine to provide insight into Atari computers. You also asked for more articles on new products and, surprisingly (to me at least), for more profiles on "key players" inside Atari. Also, of course, more programs and more meat.

We're listening! In this and the next few issues you will notice this magazine evolving in answer to your requests. My experience back in the Atari world leads me to believe that Atari users need something that is fundamentally different than what is provided for other computers. I don't know if I can explain just what it is, but it will manifest itself on these pages with a broader perspective of computing than other system-specific magazines, and a look at the directions that we're taking as an industry and as a hobby. And we're sure glad you asked.

Last issue I promised more news on support for users groups. The first mailing to users groups on our master list went out in March. Included was a complete press kit from the CES in January with all the new product information. We also asked users groups to answer some questions and mail them to us. In case you represent a group and aren't on our list, send me your group's name, address, meeting location and dates, phone numbers of officers, number of members, and dates of any local shows in which the group participates.

A data base containing the most up-to-date list of groups has been created. This list will appear frequently in this magazine. It will be distributed in every way possible, including the ever-popular Customer Service department, and by electronic means.

What that last part suggests is that Atari is starting to use its technology to get in touch with you. The first step was to establish a BBS for Atari users. By calling (408) 745-5308, your computer and modem can connect with one of several Atari 800XL systems. As I'm writing this it's just getting off the ground with the user group list, but other information will appear quickly, like service center lists, calendar of events, and plenty more.

Lots of other projects are getting readied now. As they are launched, you'll find out about them first in these pages.

—Neil Harris

Imagine...

For COMMODORE 64 ATARI APPLE 11e/c AND IBM PCjr

A WORD PROCESSING PROGRAM!
AN INFORMATION MANAGEMENT PROGRAM!
A TELECOMMUNICATIONS PROGRAM!

ALL THREE PROGRAMS, ON ONE DISKETTE!, FOR ONLY $49.95*!

"Quite simply the best! The highest rating possible...the package should be part of every (computer) library." — ANALOG COMPUTING

"Russ Wetmore has done an EXCELLENT job! The program is flexible, powerful and very easy to use. $49.95 buys a heck of a lot of program." — REVIEW BY ARTHUR LEYENBERGER

"Performance: ★ ★ ★ ★ (Excellent) Value: ★ ★ ★ ★ (Excellent)
This three-in-one package is a bargain . . . one of the finest values on the market."
FAMILY COMPUTING

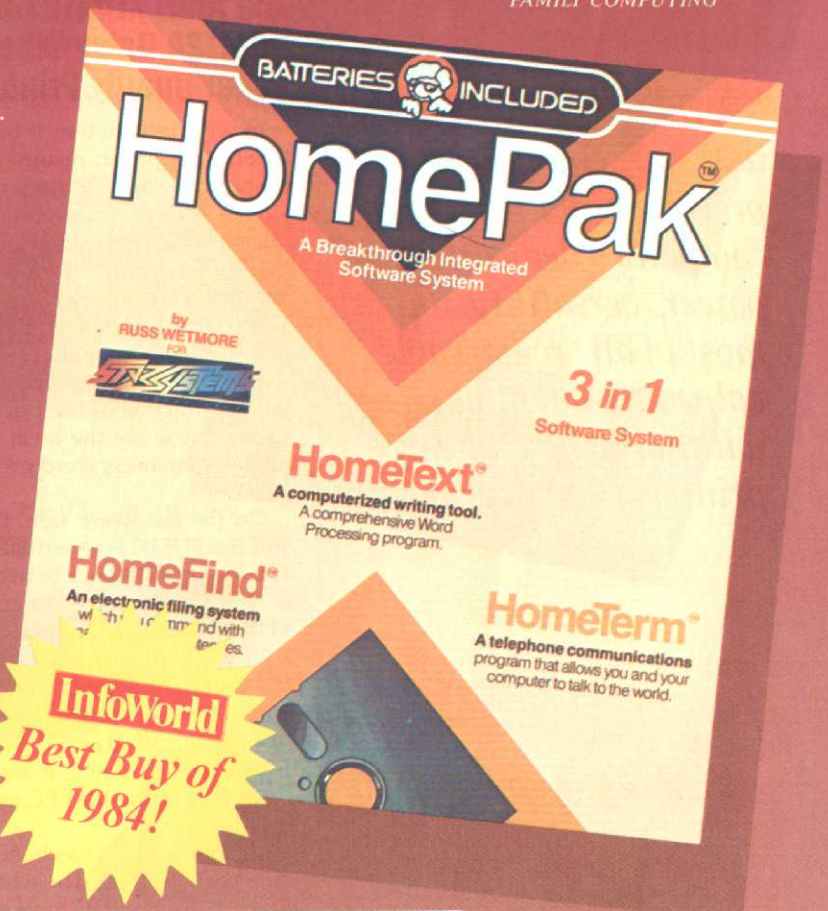
HOMETEXT WORD PROCESSOR.
HOMEFIND INFORMATION MANAGER.
HOMETERM TELECOMMUNICATIONS

Together they are **HomePak**: the three most important and most useful home computer applications in one integrated system — on one diskette!

The reviewers are unanimous: any one of these programs **alone** is well worth the price. So you're getting **three times the computing power**, with this exceptionally easy to use package:

- **all commands in simple English; no complex computer jargon, no obscure instructions**
- **all key commands are immediately available on the screen menu; additional commands can be called up for the more experienced user**
- **to help you, system status is displayed right on the screen**

And it's easy to use the three programs together. For example, in the "Merge" mode, you can take data stored in HOMEFIND and print letters and labels using **HOMETEXT**. Or, use **HOMETEXT** to write reports based on information you've called up via **HOMETERM**.



BATTERIES INCLUDED

"The Energized Software Company!"

WRITE TO US FOR OUR FULL COLOR CATALOGUE
of products for COMMODORE, ATARI, APPLE and IBM SYSTEMS

© 1985 Batteries Included.
For Product Information
Or Technical Support
Please Phone (416) 881-9816
U.S. Dealer Locater Service:
800-556-2283

30 Mural Street
Richmond Hill, Ontario
L4B 1B5 Canada
(416) 881-9941
Telex: 06-21-8290

APPLE, ATARI, COMMODORE AND IBM ARE REGISTERED TRADEMARKS RESPECTIVELY OF APPLE COMPUTERS INC., ATARI INC., COMMODORE BUSINESS MACHINES INC., AND IBM BUSINESS MACHINES INC.

Atari Introduces the XE & ST Printers

THE PRINTED WORD

by J.D. Bass

"Perhaps nowhere else within the new Atari product line is the company's dedication to power, versatility, and, most of all, remarkable value as evident as within the new line of printers."

All the TVs, VDTs, LEDs, and CRTs will never replace the medium of the written word: ink on paper. It's still the most efficient and eye-pleasing way to get your message across.

Perhaps nowhere else within the new Atari product line is the company's dedication to power, versatility, and, most of all, remarkable value as evident as within the new line of printers.

The printers run the gamut—letter quality daisy wheel, feature-packed high speed dot matrix, and low-priced color and monochrome dot matrix thermal transfer printers. They are all attractively designed, complementing the exterior design of the Atari computers they support.

A truly impressive start. Let's take a closer look.

The Atari XDM121 and SDM124 Daisy Wheel Letter Quality Printers

In writing, whether it be a personal letter, term paper, resumé or business report, how one's written work *looks* is almost always as important as what one *says*. Atari's two new letter quality daisy wheel printers produce remarkably fine, fully formed characters. They afford your written work the kind of print quality normally available only with a high-quality office typewriter—but at a fraction of the price. Needless to say, these are the ideal printers for home or business word processing applications.

On the hardware side, the XDM121 and the SDM124 are virtually identical. The major difference between the two is their respective interfaces. The XDM121 directly connects to the Atari 8-bit computers (the 400, 800, and all XLs and XEs). The SDM124 is equipped with a Centronics parallel connector. It connects to all Atari ST Personal Computers (the incredible 16-bit machines), as well as to the IBM PC and compatibles.

The daisy wheel mechanism is an extraordinary device. The wheel itself is a circular, rather flat, spoked piece of plastic. Around the rim of the wheel, at the end of the spokes, are the type characters arranged for printing. When the printer receives an instruction to print a certain character, the wheel spins to bring that character into striking position. After it prints the character, the wheel spins again to bring the next character into position. All this happens at a remarkable speed—the wheel spinning to bring characters into striking position, and the carriage moving into the correct horizontal print position.

The print wheel packed along with the printer is the handsome Courier 10 (10 characters per inch). It is not installed at the factory, but snaps right into place without complication. If you write in a foreign language, the XDM121's special diasy wheel overstrikes to produce the Atari international character set.

The printers are equipped with an easy-to-install (and remove) cassette containing a multistrike carbon film ribbon that provides excellent print quality and long life (about 190,000 characters). The multistrike ribbon lasts longer than one-strike carbon film because the same spot on the ribbon can withstand repeated strikes from the print wheel. One-strike carbon film and fabric ribbons are also available.

The printers feed paper with friction, like a typewriter. They accept single sheets, so you are free to use your personal or business stationery, or any other single sheet of paper up to 11.8 inches wide. A pin-feed tractor feeder and a single-sheet feeder are available as optional accessories.

Both printers are loaded with sophisticated features like boldface printing, underlining, and subscripts and superscripts (half-line and reverse half-line feed). They print bidirectionally for extra printing speed (12 characters per second). And the print mechanism is logic seeking, which means that the carriage never moves unnecessarily. The printers provide an excellent array of tabbing controls and page-length options, having the ability to store these commands in memory.

The printers' control panels feature two indicators (Power and On Line) and three built-in functions: Line Feed, to advance the paper; On Line, to switch the printer on- and off-line; and Top of Form, to set the desired top of page. Though the panels are feature-packed, they remain uncomplicated and easy-to-use.

The XDM121 has been designed for compatability with the *AtariWriter* word processor, as well as all other applications programs that support Atari 8-bit computers and printers (past and present). The SDM124 has been designed for software compatability with major word processing programs, as it em-

ploys industry-standard printing and formatting commands.

My one criticism of the printers is that certain formatting functions seem overly complex. However, when compatible word processing or other applications programs are driving the machines, there is little to bother oneself about. Without such a program, one must do a little arithmetic to figure line spacing, print pitch, and inches per page. Luckily, the documentation is very careful to present these points as clearly as possible.

The Atari XMM801 and SMM804 Dot Matrix Graphics Printers

As with the XDM121 and SDM124, the Atari XMM801 and SMM804 are nearly mechanical twins. The XMM801 is for use with the Atari 8-bit computers. The SMM804 is for use with the Atari ST Personal Computers, as well as with the IBM PC and compatibles.

At this low price, you won't find a dot-matrix printer more powerful and versatile. It's the perfect all-around printer for everyday use. What's more, both printers feature dot-addressable graphics capability.

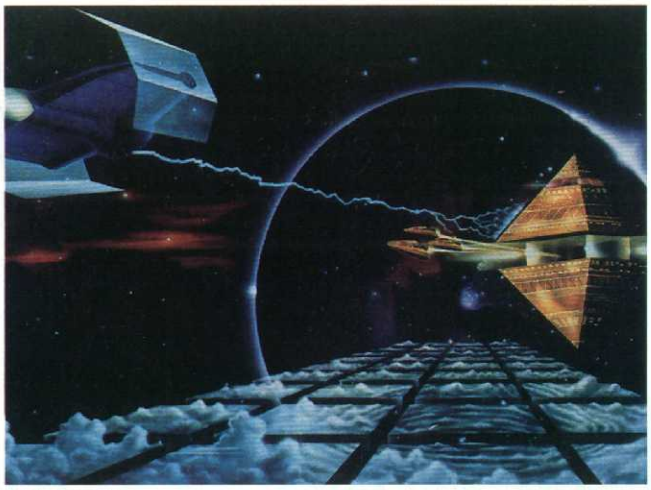
The dot-matrix printing method allows you maximum flexibility in formatting your written work. Conventional typewriters and daisy wheel printers have a different piece of type for each character. A dot matrix printer, on the other hand, prints every character with a single print head. The print head contains 8 dot wires (9 for the SMM804) that strike the ribbon in a matrix of 8 dots high by 9 dots wide. The microprocessor inside the printer keeps track of which dots to print and where to print them for any given character or print style.

Packed along with the printers is a multistrike carbon film ribbon cartridge. Both printers accept pin-feed computer fanfold paper or single sheets.

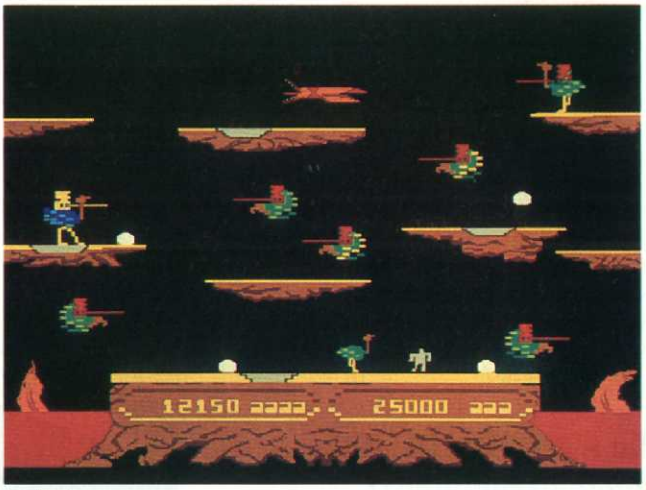
The printers offer a full panoply of fonts—pica, elite, condensed, and proportional. The elite and condensed fonts are as close to correspondence-quality as you're likely to get with a dot matrix printer. The two printers also feature a rich assortment of print styles—double width, boldface, double strike, underlining, and subscript and superscript characters. (The SMM804

CONTINUED ON 70

Printers that run the gamut—letter quality daisy wheel, high speed dot matrix, and low-priced color and monochrome thermal transfer dot matrix.



STAR RAIDER



JOUST

Still Fun After All These Years

Atari Computer Cartridges: A Retrospective

by Arnie Katz & Bill Kunkel

One of the less obvious casualties of the Great Videogame Shake-out is the ROM cartridge. They haven't completely disappeared, of course, but most new software is published on floppy disk.

There are several reasons for the change. The advances in hardware have fed the popularity of large-memory entertainment programs, which are not suitable for the cartridge format. Disks are cheaper than carts to manufacture. Because the price of disk drives has fallen more than 30 percent in the last two years, more computer owners have mass storage devices now than was formerly the case.

Caught up in today's disk-o-mania, it's easy to overlook the treasure trove of entertainment cartridges produced by Atari for its home computers. Many Atari carts are faithful adaptations of coin-ops that collected mountains of quarters in the family amusement centers. The best of the designs have proven their ability to entertain and challenge players on millions of play-screens across the land.

Naturally, not all cartridges have risen to classic status. Some just got old. So, here's a rundown of Atari's best entertainment cartridges.

GALAXIAN

This multi-wave invasion contest is the prototypical vintage action game. Its elegantly simple play-mechanic is as absorbing in 1985 as it was when Namco created the coin-op more than six years ago.

Only those totally jaded with target-shoots will fail to enjoy this sequel to *Space Invaders*. The aliens don't march down the display like so many sitting ducks, but swoop back and forth across the screen like cosmic birds. The dive-bombing nasties pose a far greater threat to the player's horizontally mobile cannon/ship than the marching monsters of *Space Invaders*.

The graphics, astonishing at the time, have held up well. Watching the space birds glide out of formation is still a treat, but keep moving and firing or the cannon is doomed.

CENTIPEDE

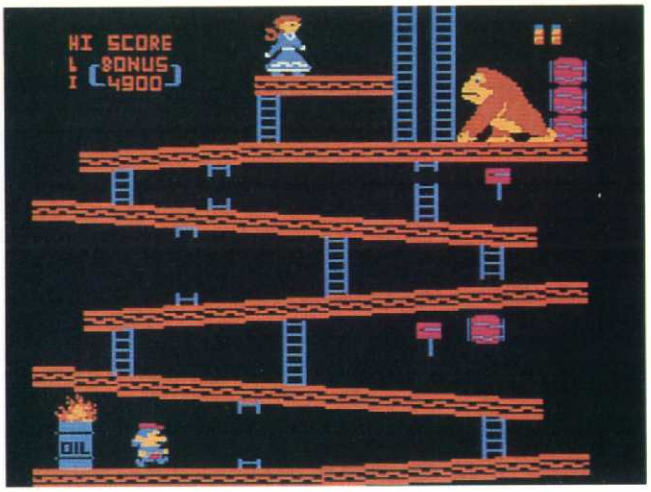
Atari's 1981 coin-op utilized the invasion game play-mechanic in a highly innovative fashion. "*Galaxian* with bugs" may sound like a bizarre premise for a game, but no one can quarrel with this title's enduring popularity.

The main antagonist is a hundred-legger that travels down the garden playfield toward the player's bug sprayer. Mushrooms function as barriers, shaping the centipede's route. For the first time in any invasion contest, the player's weapon moves vertically as well as horizontally. This makes it possible for the player to avoid deadly collisions with spiders, fleas and the like.

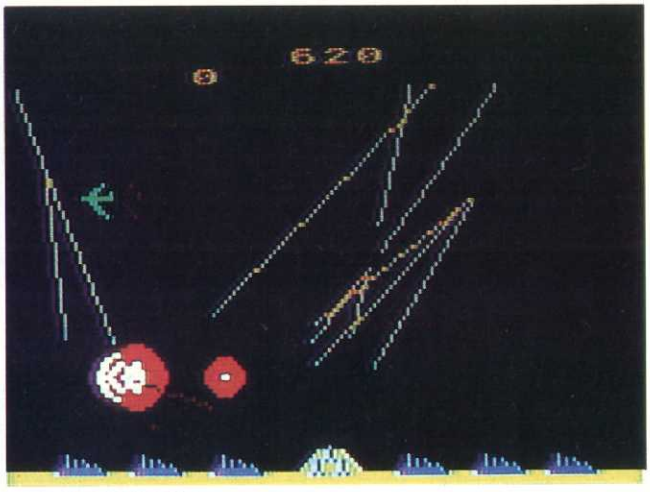
One thing that the cartridge lacks is the sheer speed of the coin-op. Arcade aces may well miss the machinegun-rapid fire of the bug sprayer, but *Centipede* remains quite challenging in this edition.

DONKEY KONG

Some games follow the leader, while others set the trend. This cartridge is



DONKEY KONG



MISSILE COMMAND

based on a Nintendo play-for-pay machine that introduced the jumping and climbing game genre. The player guides Mario the maintenance man through a three-screen quest to rescue his girlfriend from the clutches of the titanic gorilla *Donkey Kong*. The hero must climb to the top of each play-screen, dodging *Donkey Kong's* barrels or busting them open for bonus points with a sledgehammer.

Despite its ground-breaking play-mechanic, the design of *Donkey Kong* has rarely been "aped" by other publishers. Thus it remains a singular entertainment experience.

The popularity of *Donkey Kong* has made multi-media stars of both Mario and his simian adversary. It has also sparked a sequel, *Donkey Kong Jr.*, which is also available on cartridge from Atari. In this one, the player controls the son of *Donkey Kong*, who is trying to free Daddy from Mario's cage.

MISSILE COMMAND

This jewel of a game is so perfectly balanced that it still has no serious rivals in its category. Even the compromises necessary to bring it to the home computer screen turned out to be beneficial simplifications for the most part.

The main change from the Atari coin-op is that the gamer controls one command center instead of three. This cleans up the situation by eliminating needless over-complication.

A less welcome difference is that the arcade machine featured a lightning-quick trackball controller, while home players use a Trak Ball™ or conventional joystick.

Most coin-ops must be altered to some extent for the home market. Here, the computerist clearly comes out ahead. *Missile Command* belongs in every software library.

PAC-MAN

The granddaddy of gobble games didn't come across well as a 4K videogame, but the computer cartridge is remarkably true to its inspiration.

Play a few rounds of this maze-chase, and it becomes easy to understand the almost hypnotic hold it once had on arcaders. Its labyrinth provides an ample arena for spur-of-the-moment strategy, and Pac-Man and the ghosts who chase him through the pellet-lined corridors are well drawn in a cartoon style.

MS. PAC-MAN

This sequel to *Pac-Man* enhances and embellishes the concepts introduced by its predecessor. There are three different mazes, more scrolling tunnels and mobile bonus prizes to delight the maze-game lover.

The cartridge edition is outstanding in every respect. Even the joystick control seems somehow more responsive than usual as the gamer steers Ms. P around the labyrinth.

DIG-DUG

Those who find the pre-set mazes of *Pac-Man* and *Ms. Pac-Man* confining are invited to create their own in *Dig Dug*. The player earns points by excavating tunnels in the varicolored soil of the playfield.

Lurking in small caves beneath the surface are monsters that can kill *Dig Dug* with a single touch. The miner can blow up Pooka the intelligent tomato or Fygar the fire-breathing dragon by pumping the action button. Harvesting the bonus vegetables before they disappear scores up to 8,000 extra points.

Since *Dig Dug* depended so much on its cuteness in the amusement centers, it's good to know that Atari's cartridge reproduces the graphics and music fairly accurately. *Dig Dug* isn't as challenging as some other action games, but playing it is a highly enjoyable experience.

DEFENDER

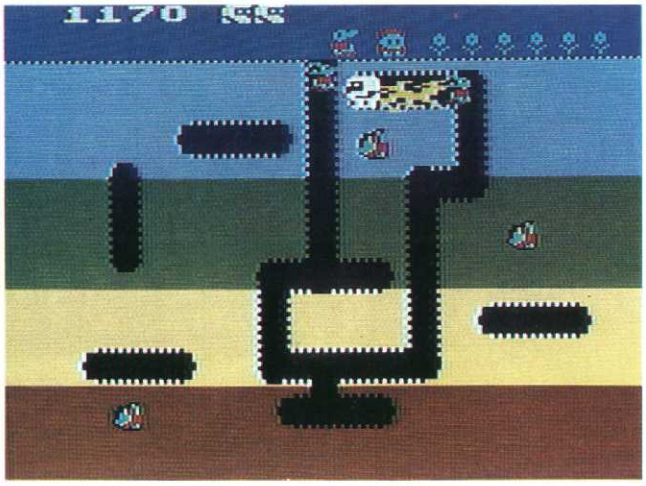
Frenetic action is the hallmark of this duo-directional scroller. Aliens have conquered the player's home planet, and it's up to the super-ship Defender to cruise the multi-screen playfield to rescue humans and destroy the invasion armada. You have to fight a half-dozen different aliens with laser and smart bombs, and that's not too shabby.

Few games boast a more devoted following than *Defender*. The home version of this science fiction shoot-out is guaranteed to heat the blood of any member of the blast brigade.

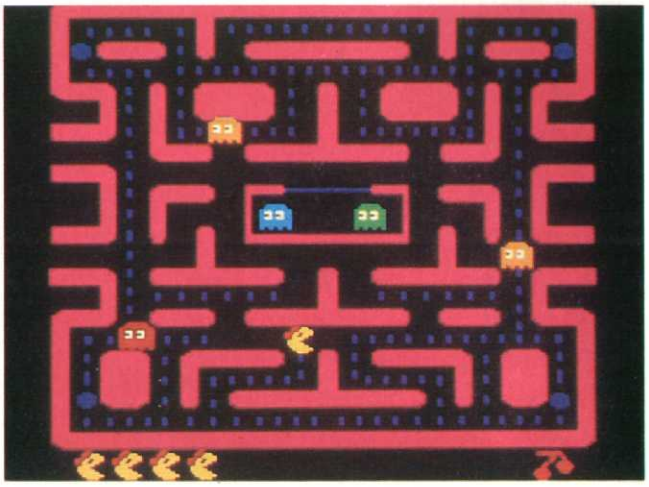
SUPER BREAK-OUT

Wall-bashing games are pretty scarce these days, perhaps because no one has designed a better one than this classic. *Super Break-Out* offers four different

CONTINUED



DIG DUG



MS. PAC-MAN

variations on the basic theme for one-to-four players. (Actually, the cart allows up to eight people to play if your machine has ports for four sets of paddles).

It isn't graphics or sound that makes this program a winner. Both are all right, but nothing spectacular. Play-action gives *Super Break-Out* its special zip. The "Progressive" version, in particular, gives gamers plenty of opportunity to work those angles as the walls march down the screen toward the horizontally movable paddle.

QIX

Although this line-drawing strategy contest was probably too cerebral for the amusement arcades, it can glue a gamer to the monitor for hours.

The player scribes lines on an otherwise empty playfield to create boxes covering 75 percent of the available area. A *Qix* whirls across the field, and two Sparx travel the lines to thwart this aim.

There's not much to look at in *Qix*, but graphics are largely a side issue for programs of this kind, anyway. *Qix* is that rare cartridge which is just as much fun the hundredth time it's plugged into the slot as it was the first.

STAR RAIDERS

Computerists rated this as the most popular program for two years in monthly polls conducted by *Electronic Games* magazine. Many attribute the early success of Atari computers, at least in part, to the allure of this first-person flying and shooting game.

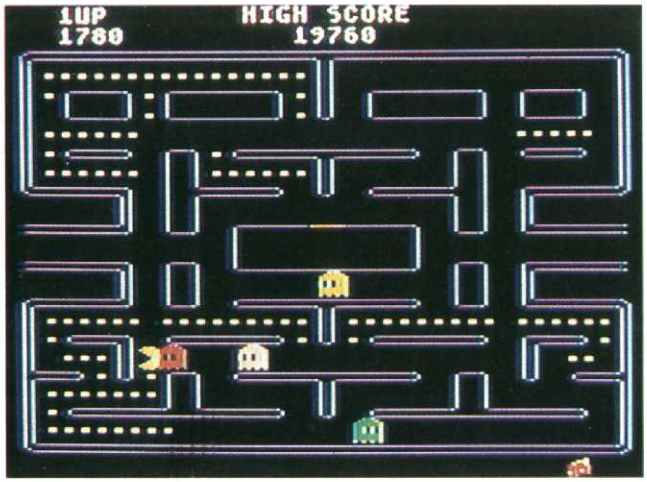
Star Raiders makes the gamer the captain of a single spaceship. Its mission: Save the universe from an alien invasion. Single-key commands allow the pilot to travel by hyper space or impulse drive, energize shields, select from two viewscreens, consult onboard computers or fire weapons.

Even after several years, this cart is still impressive. Other titles have eclipsed it graphically, but few have matched its excitement level.

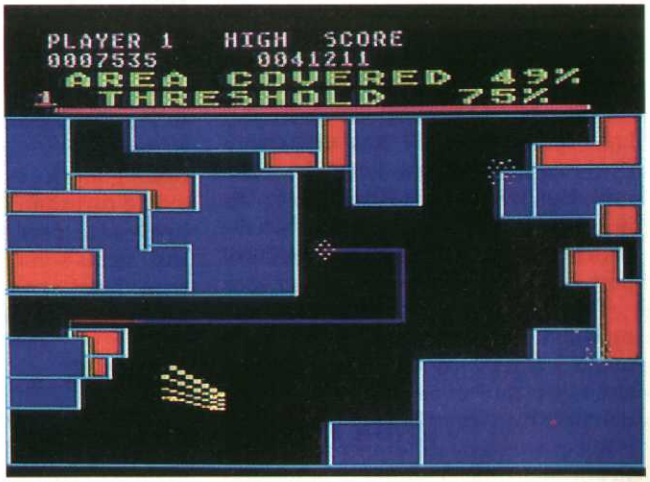
JOUST

A high point in arcade-to-home translations, this combat between knights mounted on giant winged birds moves to the home screen without a single feather out of place. The intricate graphics, superlative sound effects and flawless play-action all come through loud and clear in the cartridge edition.

One of the title's greatest virtues is that it can be played head-to-head as well as solitaire. Playing solo is fun, but guiding that ostrich through the sky against live opposition is even more entertaining.



PAC-MAN



QIX

The volume of mail we received after our debut issue was staggering. Because of this, most of these letters were edited to fit into the space available.

XE Series (compatible with 800 XL)

Available second quarter.

Number	Description
65XE	New model of 800XL
130XE	128K RAM
XM301	300-baud modem
XC141	14" color monitor

ST Series (16/32 bit computer series)

Available second quarter.

Number	Description
130ST	128K RAM
520ST	512K RAM
SF354	500K 3.5 inch drive
SM124	12" monochrome hi-res monitor
SC1224	12" RGB color monitor

Printers: See the review in this issue.

ST Series Drives

Is there a built-in disk drive? Are they compatible with software for the old Atari computers? Are BASIC and Logo built-in or are they cartridges?

William Thomas
Delta Atari User's Group
Stockton, CA

Can you hook up a 5 inch floppy disk to the 520ST? Is there someone who buys old Atari computers so I can "trade up?"

Tim Proster
Solon, Oh

Can I use my 1050 disk drive with a 130ST or 520ST?

Scott Quarmly
Sarasota, FL

Why are you using a 3.5 inch drive instead of standard 5.25 inch drives? In fact, more data can be stored on the 5.5 inch disks.

Austin Rains
Stockton, CA

Yes, the ST uses a 3.5 inch drive that is not in any way compatible with the old familiar 5.25 inch 1050's. The ST computers have the disk controller board built-in, which saves putting the electronics in each drive separately and makes them faster and less expensive than a 1050 drive. The ST's 3.5 inch floppy drive stores 500K on each diskette, far more than the larger diskettes due to a more precise mechanism.

BASIC or Logo will be built-in to the computer. Right now there's a possibility of different models, one with Logo and the other with BASIC.

On the issue of "trading up" from the 8-bit to the new 16/32-bit computers, there's no policy from Atari on this, but your local area may have a store or newspaper that specializes in "pre-owned" computer systems.

Remember that the ST line is totally different from the XE line (or your XL or 400/800 computer). It is as different from them as the 8-bitters are from the VCS game machines.

ST Memory Expansion

Is the 130ST expandable to more than 128K memory if you can't afford the 520ST with 512K now?

Cynthia Hawrylak
Franklin Park, IL

The ST computers are not designed to be RAM expandable. The cartridge port is for ROM expansion only, up to 128K of ROM per cartridge. Since the price difference between the 520ST and 130ST is only about $200, you should consider getting the 520ST if you think you'll need the extra RAM.

How Many Columns

The review of the new hardware studiously avoids any references to 40 or 80 column screens. Was this simply an oversight?

Tom Calmeyer
Richmond, VA

The screen of the ST computers is entirely bitmapped, not divided into 8 by 8 characters as in other computers. This allows the computer to display characters using a wide variety of typestyles, sizes, and with special effects like italics and bold facing. The result is the ability to create screen displays that look like a typeset page—like this magazine!

Since the maximum resolution of the ST is 640 x 400 dots, assuming 8 x 8 as the character size gives you an 80 column by 50 line display. Smaller sized characters would actually increase your resolution beyond this.

XL or XE

I have had an Atari 800 for almost three years now, and I am for a fact going to get a new Atari computer soon, but one thing I've *got* to know. Should I get an 800XL now, or hold off for the new XE product line? It would seem better to wait for the latest.

Mike Burks
Maize, KS 67101

There isn't really a whole lot of difference between the 800XL and the 65XE except for styling and the presence of the processor bus port on the XL. The 130XE is a definite step up if you need speed or extra capacity in word processing (see the review later in this issue).

New Printers + 1200XL

Are the new printers (letter quality daisy wheel, low cost dot matrix thermal transfer printer, and the high speed dot matrix impact printer) totally compatible with my 1200XL? Do any of these printers print graphics?

Chris Hays
Fords, NJ

The answer to everything is yes. All of the dot matrix printers will print graphics, and all the new products for the XE line are compatible with your 1200XL.

CONTINUED

What's the Difference?

What is the difference between the Atari computers, the XL series, and the XE series? Tom Carroll
Orland Park, IL

This is a question that bothers lots of people. The main difference between the first Atari computers, the 400 and 800, and the later XL and XE models, is the built-in program called the operating system, or OS.

All known hardware is compatible with all these Atari computers. And software developers who followed Atari's published standards had no problem with compatibility. However, some programs were written that only worked on the older computers. In most cases the software developers quickly corrected their products.

If you have an XL or XE computer and buy a piece of disk-based software that won't work, you should acquire a translator disk *from Atari Customer Service. For only $9.95, any problems with software incompatibility will disappear.*
For your copy, write to:
Atari Customer Service
PO Box 61657
Sunnyvale, CA 94088
Attn: Translator Disk

80 Columns for XL

I have an 800XL computer. Is there a way I could make this into an 80-column computer and still be able to use AtariWriter and Visicalc?
Robert Duffy
Des Moines, Iowa

The new 80-column monitor (the XM128) lets any Atari computer use 80 columns. However, the software that you use must recognize that this device is plugged in and transmit to it. The new AtariWriter Plus *(compatible with the original* AtariWriter*) supports both the 80-column monitor and the extra memory in a 65XE. Most software vendors will probably adjust their software to work with this peripheral.*

Networks

I have the Atari 800, 400, and 600XL. Is there an easy way of making these machines "talk" to each other? If so, I would think combinations of these could make for an extremely powerful network, comparable to large and expensive computer systems. Next I wish to purchase and use the 1027 letter quality printer and the newest Atari disk drive. Is there any problem going from one computer to another? Is there any problem using the AtariWriter cartridge with the 600XL and the 1027 printer? John F. Leahy
Chualar, CA

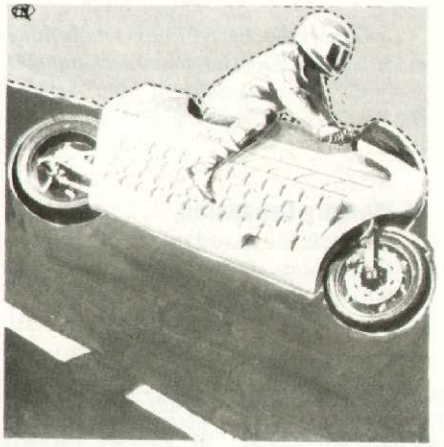
There have been whispers in the Atari back rooms of a low-cost networking system that lets Atari computers share data over a very simple system of wires. With luck, a prototype of such a system will be ready to show soon.

There is no problem when switching between these machines, except where you use up the 16K memory in the 600XL. The 1027 printer requires a printer driver to work properly with AtariWriter. *See the* News You Can Use *section in this issue for more on the printer drivers.*

Is Plato A Myth?

In the Summer 1984 issue of *Atari Connection* I read an article about Plato. I have not seen it in stores yet. Is it planned for release to the public at all?
Peter Joe
Villanova, PA

The cartridge that gives your computer and modem the ability to access the Plato system is officially called The Learning Phone. *This cartridge is finally ready to go and should be in stores by the time you read this. It is compatible with almost every modem, including the new XM301 and the 1030, 835, MPP, and 850-interfaced modems.*



AtariWriter + Tape

I write daily (using *AtariWriter*) but my time is limited. I need to know how I can SAVE on tape what I type daily, then add to it at a later time. I want the combined text to be stored as a single file. How do I do this?
Mary Shahpazian
Lincoln Park, NJ

Each time you want to add to a document on tape, you should start the session by using AtariWriter's *LOAD command to get your original document back from the tape. Make all the additions and alterations you like. When you're through, rewind the cassette and SAVE your new document on top of the old one. If you're a stickler for backing yourself up (a good habit, actually), alternate between two different tapes—just in case one copy goes bad.*

Where's the Proofreader?

Where can I find the Atari Proofreader program, advertised in the February 1985 issue? Katie Harrison
White Plains, MD

Will Proofreader work with an Atari 800 with 48K? J. Mooers Vainik
San Diego, CA

The Atari Proofreader *for* AtariWriter *should be in stores by now. You need to own a copy of* AtariWriter, *at least one disk drive, and have at least 32K in your Atari computer to use* Proofreader.

Overseas Compatibility

I am British and will be working in the USA for the next 18 months. When I return to the UK, will I be able to convert my 800XL computer and program recorder to the UK electrical system?
B. Greenwood
Fort Gordon, GA

The electrical part is easy—it's adapting the TV signal that rules out moving your computer across the ocean. In North America we use a form of TV Signal called NTSC. The European standard is called PAL. A computer designed for NTSC won't work with PAL TV's, period. So, you can either bring your American TV set along with everything else—not to mention a pile of electrical adapters—or get a European version once you return to Britain.

Player-Missile Story

Can you explain player-missile graphics? I've bought two books but neither explains it well.
David Mitchell
Euless, TX

That's a tall order in this short space. The general idea is that you draw a picture on the screen that serves as the background, or playfield. *Players and missiles are objects that can move over the playfield, without disturbing it. On computers without this capability this is usually a very messy job for the programmer—not on your Atari computer. The Atari Customer Service de-*

partment has a Demopac on Advanced Graphics *that should help—see the letter later in this section for ordering information.*

Bookkeeper + Keypad

I purchased the "Bookkeeper" software package which included the Atari CX85 numeric keypad. I have been informed that there is software which allows one to use this with other commercial programs. Where can I obtain this software? David G. Henry
Greenfield, WI

The numeric keypad is supposed to include a diskette with special "driver" programs that let this keypad function with other programs. If you don't have this disk, you should write to Atari Customer Service at PO Box 61657, Sunnyvale, CA 94088.

AtariWriter + 1027

Which printer option in AtariWriter do I select for a 1027 printer? When I select the 825 the spacing function doesn't work, the printer won't double space when the space index is set to 4. Is there a printer driver for the 1027? Also, is there plot software for the 1020 plotter? It would be nice to be able to duplicate plots from the screen.
James G. Bell
Issaquah, WA

There is a printer driver needed for older versions of AtariWriter *to properly utilize the 1027 printer. The driver is available from Gary Furr.*

A nice screen dump for the 1020 is available in the Atari SIG on CompuServe. Check your local users group if you don't have a modem, or better yet—get one!

1450XLD & MidiMate

Where or how can I buy the Atari 1450XLD? Where (if it is still available) can I buy the Atari Touch Tablet? Where can I purchase the MidiMate?
Paul Krejci
San Antonio, TX

There's no 1450XLD. It was announced under the old regime, but no units were ever shipped. Sorry. Better news is that the Touch Tablet is in distribution in most Atari dealers, and shouldn't be very hard to come by. The MidiMate (as described last issue in the Industry News *section) costs $495 (that's not a misprint) and is available from Bob Moore at Hybrid Arts, P.O. Box 480845, Los Angeles, CA 90048. You can call Hybrid Arts at (818) 508-7443.*

Telecommunications

I just tried to buy your 1030 modem but you stopped making it. Why? Can I still get the Communicator II kit?
Steve Yingling
Chillicothe, OH

The new XM301 Modem should be available by now, as should the remainder of the 1030's. The XM301 requires no separate power supply, can auto-answer, and plays the telephone's audio through your TV or monitor speaker. The 1030's advantage is the built-in terminal software, but with most people switching to more powerful software like Tscope and HomeTerm this shouldn't bother anyone.

1200XL + BASIC

I bought a 1200XL computer at a Montgomery Wards in Ventura. I ordered the BASIC language—Atari CXL4002, and learned that it is for the 400/800 computer. Now I have a computer I cannot program. Can you solve my problem? William J. Aberle
Santa Paula, CA

You have the correct BASIC cartridge for your computer! The CXL4002 works with all Atari computers in the 8-bit series.

Whither Plato?

Where can I find out about the availability of Atari products? For instance, does the Atari Plato cartridge actually exist? Is Ballblazer or Rescue on Fractalus available? Kevin Coleman
Leominster, MA

Keep your eye on this magazine. By next issue we should be able to gather a list of all Atari products that are available and those which are not. The Plato Cartridge is called The Learning Phone *and is available now. The two Lucasfilm games (see* Atari Connection, *Spring 1984) are now being sold by Epyx.*

Documentation Availability

As a director of the eastern Iowa Atari users group (Hawkatari), I would like to establish communications with the "New Atari." There are several questions brought up by our members. Is modem communications with Atari possible and to what extent? Can we get more information on the 1030 modem? Modemlink will not work with a disk drive, AMODEM does not work with the 1030, Disklink will not download binary, and there is no auto answer. Can we get schematics so that an auto-answer function can be implemented? Are the Technical Reference Notes, De Re Atari, and Demopaks still available? Will the documentation of the new lines be available so that custom application of the hardware will be as easy as it was in the past?
James Joehn
Atkins, Iowa

Yes, you can reach us by modem on CompuServe with the ID number 70007,1135. We are in the process of setting up an internal BBS system for user groups (see this issue's editorial).

A version of Amodem that supports the 1030 and 835 is available in the Atari SIG on CompuServe. So is Tscope, our favorite. We are trying to dig up as much technical information from the "Atari Archives" as we can. Anything on the 1030 will make it to these pages as quickly as we can find it.

The publications you list are all still available from the ever-suffering customer service department. Send $19.95 for De Re Atari, $29.95 for Technical Reference Notes, and $1.00 for each Demopac to Atari Customer Relations, PO Box 61657, Sunnyvale, CA 94088, Attn: Documentation. The Demopacs are short articles covering many interesting topics. Here's the complete list:

1. *Strings & Formatting*
2. *Data File Processing*
3. *Programming Examples*
4. *Atari Color Graphics*
5. *Advanced Graphics*
6. *Advanced System Features*
7. *Some Special Features*
8. *Software and Hardware Timers*
9. *Logo Info Pac*
10. *Logo Demo Pac*
11. *Logo Printer Pac*
12. *Touch Tablet Pac*

Modem Meets Disk Drive

I own a 1200XL, 1050 Disk Drive, and 1030 modem, and I was wondering if I can use the modem and the disk drive at the same time to LOAD and SAVE things I receive over the phone.
Joe D. Sebestin
Polson, MT

You need some terminal software that allows downloading and uploading. HomePak (reviewed in this issue) contains a nifty section called HomeTerm, which can upload and download with CompuServe and which has a capture buffer for other systems. The public domain program Tscope (available on CompuServe's Atari SIG or from your friendly neighborhood users group) also uploads and downloads with CompuServe. Another popular public-domain program is

CONTINUED

Disklink, which lets two Atari computers communicate easily with each other. There are lots of others floating around, too.

Write On

What criteria do you have for submitting an article to Atari Explorer?

Wayne H. Miller
Chesterland, OH

To make sure that your subject is appropriate for an article here, you can get in touch with us by letter (to P.O. Box 3427, Sunnyvale, CA 94088), by telephone (408-745-4204), or by E-Mail on CompuServe (to 70007,1135).

Manuscripts should be typed (or printed out), double-spaced, and use 2-inch margins. Please send a copy of the article and any accompanying programs on disk or tape.

It takes us 4–8 weeks to respond to unsolicited submissions, so please be patient.

Users Group Pack

My aunt sent in a card to renew my subscription to *Atari Connection*. Is it necessary to send in a different one for *Atari Explorer*? Also, I would like to know exactly what a "User's Group Pack" consists of.

Joseph Fomosa
Richmond Hill, NY

All paid subscriptions for Atari Connection *are honored for* Atari Explorer, *so you are in good shape.*

Users groups just getting started can write Atari Users Group Support in care of this magazine for a booklet with advice on how to start a users group. All groups should write in with the following information:

1. *Name and address of group.*
2. *Names, addresses, and telephone numbers of all officers.*
3. *Place and time of meetings.*
4. *Number of members, and the number of members who subscribe to this magazine.*
5. *Telephone number of any BBS's.*

Also, you should put us on the mailing list for your newsletter so we'll know what's up in your area.

Untangle My Subscription

In the Spring of 1983 I sent 2 purchase cards to *Atari Connection* and $10.00 for 4 more issues. To date I have received Summer 1983, Fall 1983, Winter 1984, Spring 1984, Summer 1984, and now the February 1985 issue of *Atari Explorer*. In July 1984 I sent a check for another 10 issues. Your label says my last copy would be August 1986, which would mean only 3 issues in 1985 and three more in 1986. Where are my other 4 issues?

Edward Perkins
Roseville, MI

According to my address label my subscription will expire in August 1985. This would mean that I would receive three issues, when I paid for four. The February 1985 issue was the only one I received so far.

Sam Cory
Towaco, NJ

The confusion is caused by the change in publishing frequency when we changed to the new Atari Explorer *format. While the* Connection *was quarterly (4 issues per year), this magazine is a bimonthly (6 issues per year). Subscriptions have been adjusted to take the increased number of issues into account. Your subscription is correct.*

USERS GROUPS

Users Group Near You

There is probably a users group in your neighborhood, and the listing below was compiled to help you find it. If you know of a group in your area that is not listed, let us know. Ask your local users group to send us its newsletter ASAP!

Call For Newsletters

One of the ways we get acquainted with your group's activities is by reading your newsletter. Send us each issue of your newsletter and we'll make sure that your group is added to this list—then Atari owners in your area can stop in at your next meeting!

Local users groups are the backbone of the Atari computer community. Users groups provide a forum to share ideas, to get advice, and to learn how to get the most from your Atari computer. Many users groups publish newsletters, make available public-domain software, and hold regular meetings with speakers on a variety of topics specifically for Atari computers. Support your local users group and they'll support you!

This list has been compiled from a variety of sources including groups in the Sunnyvale area and Ray Croker. If you know of any active groups that are not on this list, or of any groups on the list that are no longer active, please contact us at:

Atari Explorer
Users Group Dept.
PO Box 3427
Sunnyvale, CA 94088

ALASKA

FAIRBANKS ATARI COMPUTER ENTHUSIASTS
717 Bentley Drive W.
Fairbanks, AK 99701

ATARI COMPUTER CLUB OF ANCHORAGE
P.O. Box 104343
Anchorage, AK 99510

A.I.S. MICROCOMPUTER USERS' GROUP
21-662 H Apricot Street
Elmendorf AFB, AK 99506

ALABAMA

WIREGRASS MICRO-COMPUTER SOCIETY
109 Key Bend Road
Enterprise, AL 36330

ENTARI USERS' GROUP
108 Crestview Drive
Enterprise, AL 36330

MONTGOMERY ATARI COMPUTER ENTHUSIASTS
213 W. Vanderbilt Loop
Montgomery, AL 36109

HUNTSVILLE ATARI USERS' GROUP
3911 W. Crestview, N.W.
Huntsville, AL 35805
3rd Thur.

COMPUTER USERS OF THE SHOALS
UNA - Box 5050
Florence, AL 35632

BIRMINGHAM ATARI COMPUTER ENTHUSIASTS
346 Shades Crest Road
Birmingham, AL 35226

ARKANSAS

FT. SMITH ATARI USERS' GROUP
2672 South Enid Street
Ft. Smith, AR 72901

BLYTHEVILLE ATARI USERS' GROUP
1421 B Hemlock Drive
Blytheville, AR 72315

LITTLE ROCK ATARI ADDICTS
3900 McCain Park #139
N. Little Rock, AR 72116
3rd Sat

OBU ATARI USERS' GROUP
320 N. 7th Street
Arkadelphia, AR 71923

ARIZONA

NORTHERN ARIZONA COMPUTER CLUB
Box 122
Fredonia, AZ 86022

TUCSON ATARI COMPUTER ORGANIZATION
3755 E. 22nd Street
Tucson, AZ 85700

PAYSON ATARI COMPUTER ENTHUSIASTS
P.O. Box 919
Payson, AZ 85541

CONTINUED ON 55

You have already made your first mistake!

You thought that cassette recorder would handle your storage needs.

WRONG!

Don't make another one!

You think you need a disk drive to solve your storage problems.

WRONG!

You need 2 disk drives!

Any serious application practically demands at least 2 drives.

Word Processing
Spreadsheet
Data Base Management
Mailing List Software

All of these are made more powerful and, at the same time, easier to use if you have two disk drives.

So now it will cost twice as much, right?

WRONG!

You need an Astra single or double density dual disk drive. Two drives in one low-priced unit.

Astra Systems now has two new models for your ATARI:

ASTRA 2001

Single or Double Density Disk Drive

- Advanced Circuitry
- Rotary Doors
- Direct Drive Motors
- 360 Kbytes
- Reliable, Quiet Operation
- Fast Read/Write
- Easy Data Read

ASTRA "BIG D"

- Double Sided Drives
- Single or Double Density
- Direct Drive Motors
- 720 Kbytes

ALL DRIVES FURNISHED WITH SMARTDOS OR MYDOS*

*DOUBLE SIDED DRIVES

For nearest dealer or distributor call **(714) 549-2141**

*ASTRA SYSTEMS, INC.

2500 South Fairview, Unit L
Santa Ana, California 92704

Atari Loves Kids, and Shows It

by P.R. Adler

On December 8th, 1984, three Atari Corp. executives, with twenty-six Atari 800XL computers and 1000 T-shirts, participated in the *Children's Holiday Celebration*, a fund raising event for the Scholarship Fund of the *Children's Health Council* (CHC).

Atari loaned twenty-four of the 800XL home computers to the event's coordinators. The systems were then rented to participants, and the proceeds went directly into the Scholarship Fund. Two of the 800XLs and the one-thousand T-shirts were donated to the organization; the T-shirts will be sold by the *Children's Health Council* throughout the year.

"It was a neat day," said Ruth Kaplan, director of fund raising for the CHC. According to Kaplan, the three Atari people, James Copland, John Skruch, and Bryan Kerr contributed greatly to the success of the event. "They were extremely cooperative and helpful, just super people," she said. "Over 500 children paid to use the systems that were set up for the celebration. The two 800XLs were raffled off as door prizes, which raised $1000 for the Center."

The *Children's Health Council*, founded thirty years ago, focuses on "multi-problem" children. Ms. Kaplan said, "These are children who may have learning disabilities coupled with neurological damage or seizure disorders. Parents who have kids with more than one problem get conflicting opinions."

The CHC runs a therapeutic day school where "the whole child" is treated and evaluated. Ms. Kaplan told us "the CHC is trying to finance scholarships for the day school. The day school is expensive, around $9000 a year, but many students can go back into the public school system after two or three years. If a kid can feel accepted, and not that different, then he or she can improve."

Printer Drivers

AtariWriter owners who are using non-standard printers can purchase a printer driver that was customized for specific printer models. Many of these drivers were formerly available through the Atari Program Exchange, which is temporarily in limbo. The author of the drivers, Gary Furr, is now selling them direct.

These printer drivers give you access to all the special features of the printer such as underlining, elongated and condensed type, super- and sub-scripts, etc., without resorting to control codes.

Printer drivers are currently available for these models:

- Atari 1020
- Atari 1027
- BMC 401
- Brother HR-15/25
- Citizen MSP10
- Compactronic 58
- Diablo 620
- DTC Style Writer
- Epson MX-80/100
- Epson RX-80/100
- Gemini 10 and 10X
- IDS 480 Microprism
- C. Itoh Prowriter 8510
- Juki 6100
- Legend 880
- Mannesmann Tally 160/180L
- Mannesmann Tally Spirit-80
- NEC 8023A
- Okidata 80, 82/83, 84, 92/93
- Olympia NP
- Olympia RO
- Olympia Compact 2
- Panasonic 1091
- Radix 10/15
- Silver Reed 770
- Star Powertype

Printer drivers cost $10 each, payable by *cashier's check* or *money order* only. Specify which printer driver you need. Write to:

Gary W. Furr
P.O. Box 1073
Mountain View, CA 94042

If your printer is not on this list, send Gary a photocopy of the manual to your printer (making sure to include the section with control codes) and he will customize one for you for the same price.

Publishing for the People

Electronics Industry Association Pamphlets Explain Consumer Products

Fascinated by the avalanche of state-of-the-art art electronics? Want to know just what new types of video, audio, telephone, and computer equipment are available? Want to buy a new electronic gadget but can't understand the terminology on the box? There's free help out there—The Electronic Industry Association (EIA) can help you find the right product, help you wade through the technical jargon, and show you how to get the most enjoyment from your new purchase.

The EIA is the trade organization of the electronics industry. Its membership includes most major manufacturers of home electronics such as Atari, Panasonic, and Sony. Their products comprise "maybe 95% of the market," says Sally Browne, the Director of Consumer Affairs for the Consumer Electronics Group of the EIA.

The EIA publishes eight pamphlets that are available free, for a self-addressed stamped envelope. The publications are strictly educational and general in nature—not one brand name is mentioned.

The EIA publishes these pamphlets "so consumers can make better decisions," Browne said. "The marketplace dictated what pamphlets to publish." They guide the reader through three phases of living with home electronics. First, what is out there, second, how to buy it, and third, how to use the products safely at home. The "New World" guides that describe what is available in audio and video were released at the January CES, and Browne has received orders for 11,000 of them already. Since its publication in 1984, 510,000 copies of "How to Buy a Telephone" have been sent out to individuals.

Bulk copies are available for less than the printing cost. The EIA publishes the pamphlets with the proceeds from the Winter and Summer Consumer Electronics Shows.

Here are their titles, with the envelope size and postage required for each:

- "Audio—Your New World of Listening" [#10 envelope—37 cents].
- "Video—Your New Window on the World" [#10—37 cents].
- "How to Buy a Home Computer," which has a good section on budgeting and peripheral equipment,[6" × 9"—57 cents].
- "How to Buy a Telephone" [#10—20 cents]
- "Television Safety: A Guide for Consumers" [#10—20 cents].
- "Video Safety: A Guide for Consumers" [#10—20 cents].
- "Audio Headset Safety" (#10—20 cents].
- "A Consumer Service Guide for Audio and Video Products" [#10—20 cents].

Only single copies are complimentary. For additional copies and information write to:

Electronic Industries Association
Consumer Electronics Group
P.O. Box 19100
Washington, D.C. 20036

CONTINUED

Video Recorders Meet Personal Computers

From Baby's First Step to Recording Mom's First Video Game

Using your video recorder (VCR) to record baby's first step is great, but did you know that you can team up your VCR and Atari computer to record Mom's first try at a new video game?

Have you ever discovered a high-scoring strategy for a game and forgotten what you did by the time the game was over? Have you ever had a LOGO program randomly generate the most beautiful pattern ever—never to see it again? Don't get upset—just reach for a box of video tape.

By daisychaining your Atari computer to a VCR and then to your TV, it's possible to make a recording of whatever happens on the screen. This makes it easier to debug programs, review output of graphics programs that use random number generators, or get an instant replay on your favorite video games. If you have a modem, but don't have a disk drive, your VCR can even tape your electronic conversations.

The composite video port, marked "monitor," that exists in all Atari computers is the key. The only additional equipment you need is a cable with a 5-pin *DIN* connector at one end, and two *RCA-type* plugs at the other. Remove the TV cables from the "video in" port on your VCR. Plug the DIN connector into your computer, and insert the RCA plugs into the video input. Leave the video output connection alone. Leave the VCR off while you turn on your Atari computer and adjust the tuning on your TV. Then, if necessary, turn on the VCR and adjust the tuning on it. You are now ready to have fun.

At Atari, VCRs have been used for years as an aid to debugging programs and games. The testers hook up VCRs to their computers before putting a program or game through its paces. "We call the programmers with a bug and if they can't fix it, we send them a tape that they can play in slow motion," said Eric Ginner, a software tester who has worked on many games. The tapes provide a backup to the tester's memory. On video tape, the exact sequence of commands is stored automatically and testing proceeds faster. Ginner has also hooked up his home TV to his 800XL, "just for fun."

There are commercial applications, too. Briarpatch International, based in Mountain View, California manufactures and markets "The Trivia Tapes," video tapes of trivia questions. Trivia fans display the tapes on TV for entertainment at parties. The tapes are made by programming the questions and answers, using an Atari 800XL computer as a data base manager.

According to Michael Round and Jack Thorne, founders of Briarpatch International, they produced "The Trivia Tapes" as an outgrowth of their interest in trivia, video and computers. Round and Thorne own 3 Atari computers, 2 printers, and 6 disk drives between them. Trivia is a big part of Thorne's act as a D.J. in a Cupertino, California night club. "I guess the tapes were a natural progression," Round said.

To produce the tapes in quantity, Round and Thorne hook up an Atari computer to as many as 7 VCRs at a time. The company uses its Atari computers for the complete operation—to program the tapes, produce them, and display them at clubs.

Coupling a VCR and computer seems to be the perfect marriage of technologies, and we're sure that you've discovered some pretty exciting applications. If you're using your Atari computer with a VCR in an interesting application, we'd like to hear about it—and so would our readers!

Want more information about The Trivia Tapes? *Then write:*

Briarpatch International
P.O. Box 39040
Mountain View, CA 94039

Online Encyclopedia

Replacing bulky and expensive paper volumes with an electronic version of the same information, Grolier has put its Academic America Encyclopedia on five national and three regional videotext networks. Grolier offers a special subscription rate of $49.95 a year for unlimited reference on CompuServe. This does not include CompuServe access charges, which are about $6.00 an hour. Subscribers to Gateway, a regional videotext system in California, have access to the Academic American Encyclopedia included in their service charge.

The encyclopedia is updated every three months. This is a change from its former twice-yearly update policy. Grolier also puts more information into its electronic encyclopedia than its paper edition. There are also fact boxes, embedded cross references, See Also references, and bibliographies.

"We just keep expanding," said Ted Mendelsohn, Vice President, Information Services for Grolier Electronic Publishing. "We don't have the paper and binding constraints of the traditional encyclopedia. We can cover new things." The update policy—a complete update every 13 weeks—"is unheard of in an encyclopedia," Mendelsohn said. Updates occur in January, July, and October.

Information from the Grolier electronic edition can be downloaded to disk to be printed out and viewed at leisure. However, there are no illustrations as in paper encyclopediae.

Grolier Academic American Encyclopedia is offered on CompuServe, Dow Jones, BRS, Dialog, Vu/Text, and regionally on Gateway, Viewtron, and Keycom. Grolier Electronic Publishing is located at 95 Madison Avenue, New York, NY 10016.

News from CES: Hubot and other Robots

At the Winter CES, some of the newest home electronics were rolling around on their own. Heathkit/Zenith, Tomy, and Hubotics were showing self-controlled robots in Las Vegas.

Today's robots are not breaking any new ground in technology, but they are covering the old ground very nicely. The rolling stock incorporates software speech synthesis, tape recorders used in ingenious ways to record motion commands and voice messages, Sonar and infrared sensing; radio control, and even some programming capabilities.

All of the robots on the market today combine a few of these technologies. Heathkit's Hero Jr., for example, is programmable, navigates without any outside guidance, and has speech synthesis modules and the sensing technologies. The Tomy Omnibot has radio control, and can record commands and voice on a cassette tape.

There is one robot, though, that incorporates more technologies than any other. It is called Hubot, and it resembles a mobile video cabinet. From the top of his beige plastic case down, Hubot contains seven kinds of gizmos. The robot has, in vertical order, a black and white TV, a sonar sensor, a digital clock and thermometer, a Z-80 based computer, an AM/FM stereo radio, two disk drives, and an Atari 2600 VCS game player and infrared sensors. It is the only robot with a TV and video game built in.

Hubot is controlled by its on-board computer, and the programming is quite clever. The fact that Hubot has a TV screen built in makes it easy to understand how to program its functions. The options are presented as a menu on the screen. "There's two whole sides," said Michael Forino the president of Hubotics. "The system side is a full personal computer. The control side is where we have all the other functions." The Hubot computer has 64 K-bytes of RAM, runs CP/M, and has special commands built into its BASIC that directly control the robot.

Don't run out and buy Hubot to replace your personal computer, though. Hubot costs $3,995, and isn't in production at the moment.

The Council on Exceptional Children's Improved Special Education Software

The Council on Exceptional Children, founded in 1922, is a 48,500 member association of educators and administrators who deal with the problems of child development and learning. Their definition of "exceptional" also includes gifted or precocious children. Now, the CEC is going state-of-the-art with a new *Technology and Media Division*. One of their goals is to improve software for special education.

The CEC is a national organization with thirteen special interest divisions. These divisions deal with the different problems of child development, such as mental retardation, learning disabilities, communication and behavioral disorders, and physical handicaps. The newest of the thirteen divisions—the *Technology and Media Division*—was created just to keep abreast of the latest technological developments in special education. This division is sponsoring a conference on special educational software to be held in Alexandria, VA., the first Thursday and Friday in May. "The idea is for people to interact with the goal of improving software," said Lynn Smarte, public relations director for the CEC. Invitations have been sent to parents, teachers, publishers and program developers, many of whom are bringing works-in-progress to the Conference. There are also several federally funded project groups bringing their products for evaluation. According to Smarte, "It's not just what's on the market—we're evaluating the real cutting edge."

The CEC has also announced the winners of its Special Education Software contest. Two programs for Atari computers won honorable mention. The programs were "The Talking Wheelchair," developed by John Bennin who works for the Baraboo, Wisconsin School District, and a series of programs for gifted children, *Odd One Out* and *Ready Set . . .*, marketed by Sunburst Communications, Inc., Pleasantville, New York.

"The idea is for people to interact with the goal of improving software."

The National Conference on Special Educational Software is part of the CEC's involvement in the Special Education Software Center. The Center is a cooperative venture between SRI International, which provides technical help to those who are developing educational software. Assistance includes access to the LINC Resources data base in Columbus, Ohio.

According to Phyllis Baker, who is coordinating creation of the data base at LINC Resources, anyone can call a toll-free number, describe the educational problem, and find out what software to use. The data base's parameters include factors such as disability or learning problem, skill area, computer type, and level of curriculum.

The CEC also publishes many books and directories in the field of special education and will also conduct computer searches of their data bases for interested parents and educators. More information can be obtained by contacting:

The Council on Exceptional Children
1920 Association Drive
Reston, VA 22091-1589

The Conference Manager of the National Conference on Special Education Software is Elsa Glassman, who can be reached at (703) 628-3660. The toll-free number for the LINC Software Database is: 1-800-327-5892.

COMPUTER PALACE WE KNOW ATARI!

CALL US AT (503)683-5361 FOR INFORMATION

INDUS GT DISK DRIVE

- Free Software
- Double Density
- 1-Yr. Warranty

Our Most Popular Drive!

We recommend and sell more of these drives than any other. It's so quiet that you'll probably forget you are using a disk drive. Flip-up dust cover, LED readout, and FREE SOFTWARE (DOS XL, Word processor, Database, Spreadsheet, Programming book by *Datamost*!)... This package is hard to beat!

New Low Price **$259.95**

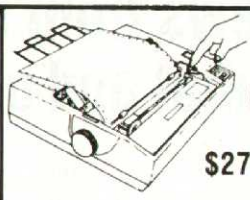
TRIVIA-QUEST

48K Disk $39.95

- Program Covers 4 Disk Sides
- Outsmart Your Friends
- Outwit The Dragon
- Join The Quest

A new concept in computer gaming. Intellectual challenge, strategy and arcade action. Each player assumes the role of a lord with a questing party of three characters. Complete the quest, earn the most gold by answering questions and battling the dragon. Win the favor of the king and thus, the game.

- **Utility Disk:** 1000 Additional questions plus create your own... **$24.95**



Super-5 CPA80 Printer

$279.00

+ FRT

A "best buy"! Features "square dot" print head with the best print quality for the money. 100CPS, bi-directional, graphics, and EPSON compatible. Plain or Pin-fed paper.

GAMES

Star Raiders	13.95
Joust	35.70
Robotron	35.70
Donkey Kong	27.90
Dig Dug	27.90
Defender	17.95
Ulysses	19.95
Tennis	13.95
Ultima II	52.50
Ultima III	39.95
Bounty Bob	44.90
Strip Poker	31.50
Bridge 4.0	22.50
Spy vs Spy	26.90
Castle Wolfenst	26.90
Poker Sam	22.50
Bristles	26.90
Cutthroats	31.50
Enchanter	31.50
ML Baseball	35.10
Chess 7.0	59.50
Checkers	44.90
Pitstop II	35.10
Computer Ambush	52.50
Broadsides	35.10
Kampfgruppe	52.50
Adventure Writer	26.90
Ali Baba	26.90
Return Hercules	28.90
Savage Island	17.90
Voodoo Castle	17.90
Secret Mission	17.90
Dimension-X	31.50
Zombies	31.50
Bruce Lee	35.10
Conan	35.10
Ghost Busters	26.90
Archon II	35.10

EDUCATIONAL

Hundreds of Titles Please call us **(503) 683-5361**

BOOKS

Misc:	
6502 Programming	18.95
6502 Subroutines	17.95
Advd Pro Tech At	14.50
Advent w/Atari	14.95
Assem Lan Progr	15.95
Basic Atari Bas	15.95
Basic Atari Kids	12.95
Best Antic w/Dsk	24.95
Elementary Atari	14.95
Atari	
Assembler	15.95
Basic Fast & Bet	19.95
Basic Source Bk	12.95
For Kids 8-80	15.95
Games & Rec	14.95
Graphics & Arc	16.95
Playground	9.95
Roots	14.95
Sound & Graphics	10.95
Users Encyloped	19.95
W/55 Programs	14.50
Compute:	
2nd BK Mach Lan	14.95
FBO Atari Graph	12.95
FBO Atari Games	12.95
FBO Atari	12.95
Great ADV Games	12.95
2nd Bk of Atari	12.95
3rd Bk of Atari	12.95

FREE CATALOG

with any order ... or send $1 (refundable with first purchase)

You will receive the most comprehensive reference catalog available. Containing hundreds of software and hardware listings with illustrations and descriptions, our main catalog will give you the answers you need. Join our mailing list and receive free flyers with updates and special offers.

IF YOU DON'T HAVE OUR CATALOG... YOU'RE MISSING OUT!

BUSINESS

Assm Editor	31.50
Monkey Wrch II	29.95
Atariwriter	39.95
Letterperfect	87.90
Spell Wizard	44.90
ABC Compiler	69.95
B/Graph	62.50
Peachtree G/L	95.00
Peachtree A/P	95.00
Peachtree A/R	95.00
Home Accountant	67.50
Synfile	49.95
Syncalc	49.95
Syntrend	49.95
Synstock	35.10
Home-Calc	35.10
Mac/65	87.90
Action	87.90
Basic XL	87.90
Writer's Tool	87.90
Tele-Talk	44.90
Financial Cookbk	44.90
Basic Cartridge	29.90
Graphic's Gener	22.50
Microsft Basic 2	55.00

PARTS & MISC

Disk Cleaner	13.95
800 Power Supply	24.95
10 Disk Mailers	6.50
10 Generic Disks	13.95
Ten Key Pad	39.95
Touch Tablet	54.95
Compu-Serve	39.95
Indus Dr Stacker	19.95
Oak Monitor Std	29.95
Printer Stand	24.95
Disk Bank(50)	15.95
Disk Bank(35)	9.95
Regular Joystick	9.30
Deluxe Joystick	19.95
Swivel Base	39.95
Joystick Cord	2.95
Joystick Handle	1.49
Joystick Board	2.49
J stick 12' Ext	9.95
Surge Protector	39.95
Printer Intrface	69.95
64K for 600XL	79.95
Relax	99.95
Sherlock	26.90

SPECIALS

Rally Speedway	19.95C
Shamus	9.95D
Pacific Cst Hwy	9.95D
Crossfire(T-D)	9.95
Match Racer	9.95D
Slime	9.95D
Bandits	9.95D
Jawbreaker	9.95D
Eastern Front	9.95T
Canyon Climb(T-D)	9.95
Pool 400	14.95C
Speedway Blast	14.95C
Repton	9.95D
Wayout	9.95D
Threshold	9.95D
Stellar Shuttle	9.95T
Wiz of Wor	17.95C
Deluxe Invaders	17.95C
Gorf	17.95C
Miner 2049er	17.95C
Choplifter	19.95D
Lords of Karma	9.95D

D Disk **T** Tape **C** Cartridge

NEW! COMPUTER PALACE B.B.S.

We are now running a bulletin board system as a service to our modem customers. You will be able to place an order with us by using your modem; just follow the screen instructions. We will be featuring download files such as public domain games, utilities, and program demos. We will have a section about the latest Atari products, news, and rumors, and for those frustrated adventurers, there will even be a section of hints and answers for the whole Atari adventure realm!

Give us a call! **1-503-683-7454** (6:00p.m. to 8:00a.m. PST)

Protect Your Equipment DUST COVERS

Custom fitted, attractive leather brown color.
- ATARI 400, 800, 600/800/1200XL, New XE&ST, 410, 810, 1050, 1025, 1027, CX85
- EPSON, GEMINI, PROWRITER printers
- INDUS, RANA, PERCOM, TRAK disk drives

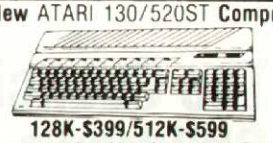
Additional covers ordered at same time

ONLY **$8.95** EACH | ONLY **$7.95** EACH

Peachtree Software

Now, one of the most popular accounting systems is available for Atari. *Back to Basics Accounting System* is a double entry, accrual accounting system consisting of three interactive packages for the small business: **General Ledger, Accounts Receivable and Accounts Payable.** A powerful system, it includes automatic posting, system generated mailing labels and password security. For the non-accountant, it comes with one of the most comprehensive manauals we have seen. For the expert, it will finally put your Atari in business. Requires 2 drives. **48K Disk**-System Package...**$195.00**. Each...**$95.00**

New ATARI 130/520ST Computers



128K-$399/512K-$599

The current flagship of the Atari Family has arrived, utilizing the speed of the Motorla 68000 CPU. With 128K or 512K, you will have power at prices you won't believe. And with a mouse, pull-down menus, windows, icon graphics and cut and paste features that allow you to integrate spreadsheet, text and graphic files; creative solutions have never been easier. The quantities are limited, so place your order now to get yours as soon as possible.

DISK NOTCHER SPECIAL! New!

Only $9.95

Now use both sides of your diskettes

Simply place the disk against the built-in stops and squeeze

One of the most versatile data-base programs available.

Super Mailer PLUS

48K Disk $49.95

Features:
- LIGHTNING FAST RETRIEVAL
- FAST SORTS ON ANY FIELD
- SUPPORTS UP TO 4 DRIVES
- SINGLE OR DOUBLE DENSITY
- STORE ABOUT 1200 RECORDS PER DISK SIDE IN DOUBLE DENSITY
- MUCH MORE!

New Enhanced Version **2.0**

Includes:
- ON-SCREEN PROMPTS
- HELP SCREENS
- STATE ABBREVIATION TABLE
- PRINT LABELS 1, 2, or 3-UP
- REDEFINABLE FIELDS
- MERGE-CREATE COMBINATION FILES
- DELETE DUPLICATE-AUTO or MANUAL

New! Mail Merge Utility... $19.95

Now you can use your Super Mailer + records with *Atarwriter* and *Letter Wizard*. Use names and addresses to create form letters. Input special characters into the word processing programs to tell super mailer + where to put the information. It's as easy as 1...2...3!

New Price...$29.95 **Cartridge**

Open up a whole new world of **BASIC** computing ease. 33 direct mode commands and functions. Also includes a machine language monitor to interact with the 6502.

Now Available for the XL!

COMPUTER PALACE

OPEN M-F, 9-6 Sat. 10-4 (Pacific Time)

2160 W. 11th Avenue Eugene, Oregon 97402

MasterCard VISA AMERICAN EXPRESS

USE YOUR CREDIT CARD & CALL

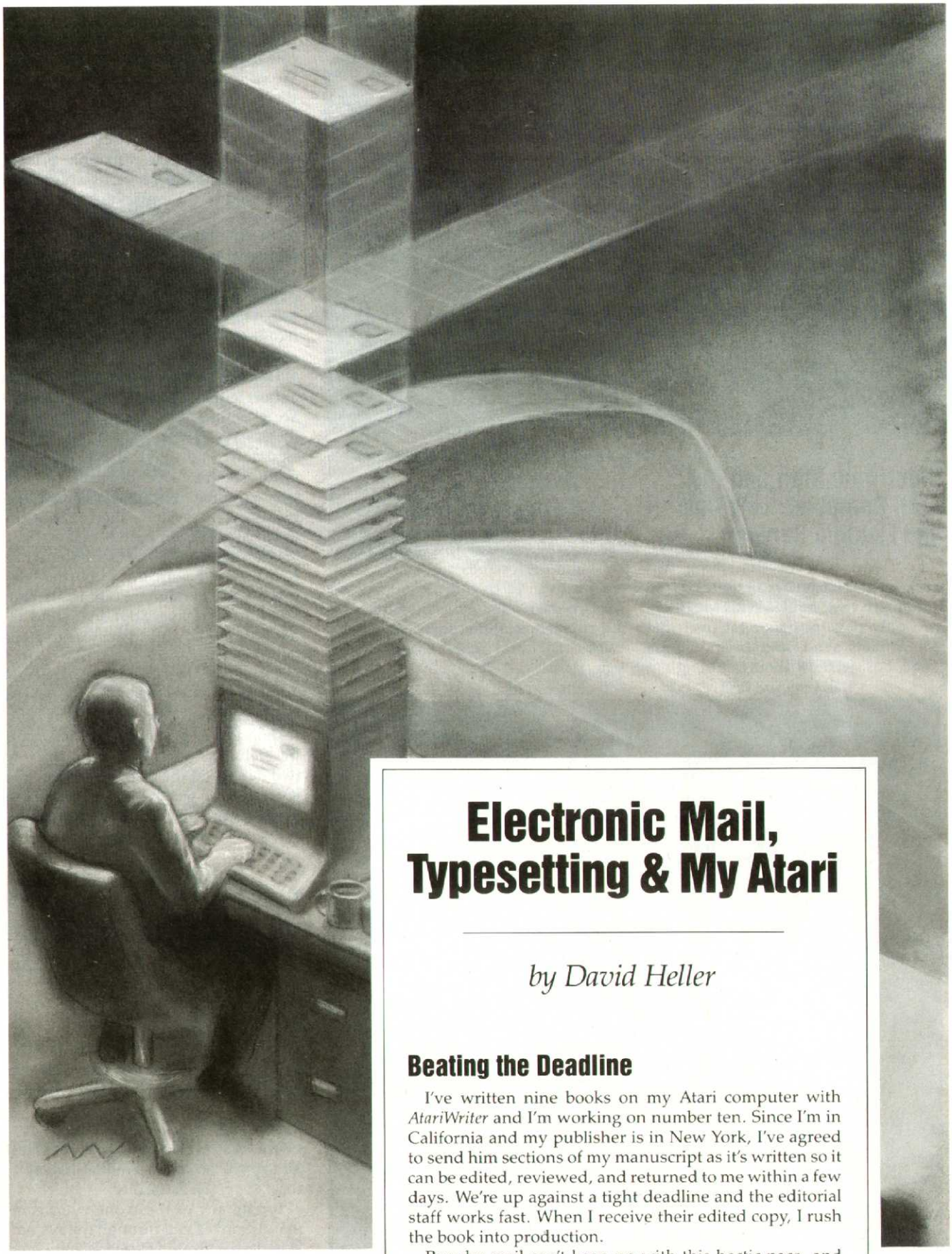
Toll Free 1-800-452-8013

★ ORDERS ONLY, PLEASE ★

There's never a penalty for using your credit card!

For Information, Call (503) 683-5361

SHIPPING INFO: Minimum $2.90 Ground, $4.75 Air. Actual Cost depends on weight. Call (503) 683-5361 for information. **WARRANTY INFO:** Everything that we sell is warrantied by the manufacturer. If any item purchased from us fails to perform properly when you receive it, call us at (503) 683-5361 so that we can assist you. No returned merchandise accepted without authorization. Defective software will be replaced with another copy of the same program, otherwise, no software is returnable.



Electronic Mail, Typesetting & My Atari

by David Heller

Beating the Deadline

I've written nine books on my Atari computer with *AtariWriter* and I'm working on number ten. Since I'm in California and my publisher is in New York, I've agreed to send him sections of my manuscript as it's written so it can be edited, reviewed, and returned to me within a few days. We're up against a tight deadline and the editorial staff works fast. When I receive their edited copy, I rush the book into production.

Regular mail can't keep up with this hectic pace, and the air-express services are inconvenient and expensive. Our solution is electronic mail.

CONTINUED

ILLUSTRATIONS BY MICK WIGGINS

I compose my manuscript with *AtariWriter* and save the text to disk. When I'm ready to send my work to my publisher I turn on my modem, boot up my terminal software, and transmit my manuscript over telephone lines—without ever having to leave my office.

Finding an electronic mail service to meet our demands wasn't easy. We evaluated a number of services, including *EasyLink* and *Telex WorldWide Access* from Western Union; The U.S. Postal Service's *E-Mail;* The Source; CompuServe; and MCI Mail. All of these services offer important features and benefits, and fill different needs. But MCI Mail seemed to offer the best features for *our* particular application. Be sure to check out each of the available services before deciding on an E-Mail service for your needs. (see *Electronic Mail,* ATARI CONNECTION, Spring 1984)

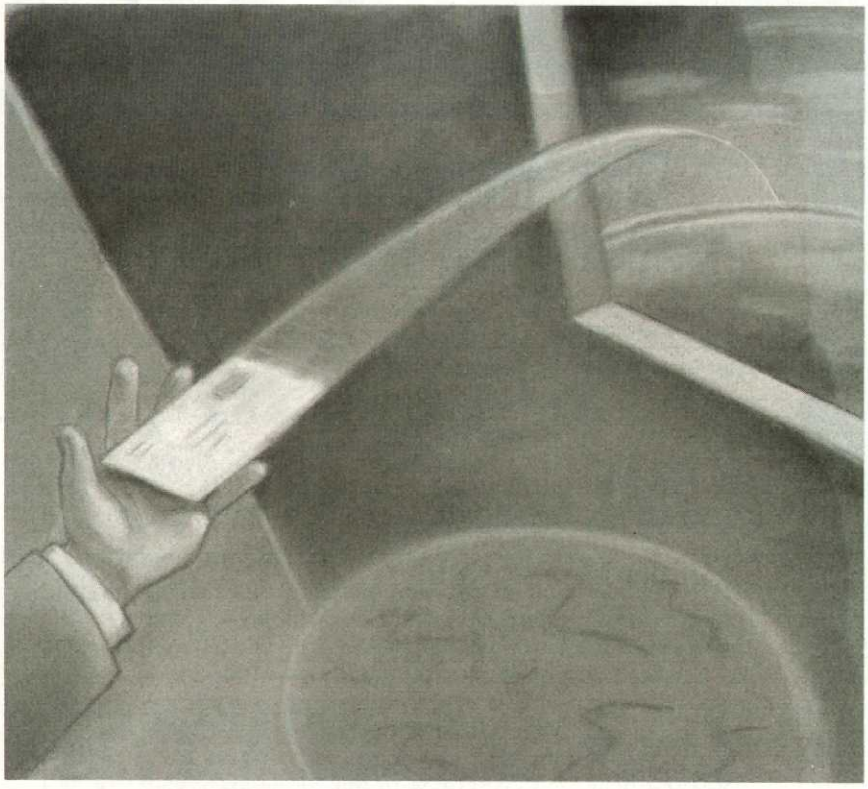
Electronic Mail and My Atari Computer: Low Cost and Flexible Service

Low cost was the first thing that drew us to electronic mail. Rates differ, but all are reasonable. With MCI Mail you only pay "postage" for mail that you actually send, and an annual $18 "mail box fee." Without running up a bill I can dial a local access number, check my "INBOX" to see if I've received any mail, retrieve it, or, compose or edit a new letter at my "DESK," then log off.

But cost wasn't the only criterion. We needed a flexible service that would allow us to send instant memos to each other, and let me get "hard copy" to the publisher the next day, or within a few hours if the rush was really on. MCI Mail offers us four delivery options:

- Instant Mail
- Four-Hour Mail
- Overnight Mail
- MCI Letter

Instant Mail is a fast, low cost delivery option that we use to send memos to each other. As with all electronic letters, I write my memo using *AtariWriter.* I then save the memo on disk, log on to the local MCI Mail service, and send the memo on its way. When my publisher checks his "INBOX" my memo is waiting for him—just a few seconds after I've sent it. He can read the memo as it scrolls down his screen, save it to disk, or print it out. *Instant Mail* postage is a low $.45 for the first 500 characters, and $1 for messages between 501 and 7500 characters in length.



When I send a manuscript to my publisher, it has to be on paper so he can distribute it to his editorial staff. We've found that the best way to do this is by using *Four-Hour* or *Overnight* services. After the manuscript leaves my terminal, it's transmitted electronically to a New York substation, printed out by a high-speed laser printer, then delivered to the publisher within four hours or the next day, depending on the option I've chosen. *Overnight* delivery costs $8 for the first eight pages of text, and $1 for every additional eight pages. MCI's *Four-Hour* service costs $30. These prices have saved us more than 40 percent over standard air courier services.

I usually preface my manuscript with a short letter to the publisher. This preface is printed on a copy of my letterhead stationery, with a replica of my signature imprinted above my typewritten name. Advanced users can register a number of signatures and letterheads on the system, then choose the one that's right for each occasion.

I don't use MCI's *Letter* option when I correspond with my publisher—it's just not fast enough for our needs. But, I do use this delivery option to send letters to friends, and to answer reader's queries. Letters are first transmitted electronically to the post office nearest the recipient's address, then delivered by regular mail. For cross-country correspondence, this option usually cuts the delivery time down from three to two days, and the $2 postal charge per letter is often worth the convenience of being able to take care of all my correspondence without having to leave my office.

Easy to Use Electronic Mail

MCI Mail, like most other E-Mail services, is easy to use. All the commands you enter are in plain English. Here's a sample of the screen you see when you log on as a regular user:

You may enter:

SCAN	**for a summary of your mail**
READ	**to READ messages or LISTS**
PRINT	**to display messages nonstop**
CREATE	**to write an MCI letter**
CREATE LIST	**to make a distribution list**
DOWJONES	**to Dow Jones News/Retrieval**
ACCOUNT	**to adjust terminal display**
HELP	**for assistance**

Typing any of these one-word commands moves you through the system. When you arrive at each system sub-

level, you're asked to enter information in a logical fashion, just as if you are working at your desk. Of course, if you ever get stuck you can type "HELP." If the going really gets rough, you can call MCI's Customer Support people at a toll-free number.

Correspondence at the Speed-of-Light

MCI Mail offers services for individuals and businesses—I've covered only the services I use. All you need to get your correspondence moving at the speed-of-light is an Atari computer, the *AtariWriter* word processor, terminal software that allows up- and down-loading, a modem, and an electronic mail service subscription.

A Bonus Program to Format Your Electronic Correspondence

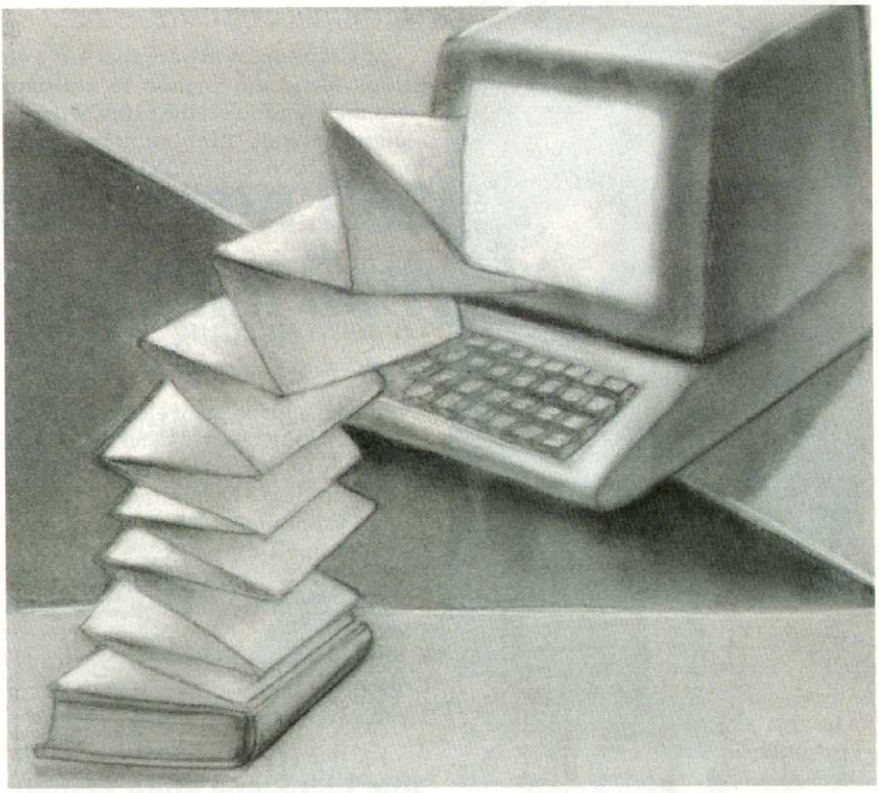
MCI Mail, like many other electronic mail services, is accustomed to receiving correspondence that is composed on an 80-column word processor. They ask that you press RETURN at the end of each 80-column line. This means that when you compose a letter using *AtariWriter*, you have to press RETURN *every other* screen line (you're working on a 40-column screen).

We've provided a program named "Formatter" at the end of this article that does this for you automatically! It takes files created with *AtariWriter* and creates a new file formatted specifically for MCI Mail.

Electronic Production: Typesetting from Your Atari Computer

Sending manuscript electronically to my publisher dramatically reduces the project's overall time. But only half the job is complete. After I receive the edited copy, the book has to move into the "production phase." This is where my words get typeset and pasted onto book-sized boards for the printer.

Until recently, typesetting was a cumbersome and error-prone process. First I'd deliver a printed copy of my manuscript to the typesetter. Then a keypunch operator would *retype* my words into the machine. Because operators make typing mistakes, I had to spend valuable time editing *galleys* (the typesetting machine's first output).



Now, with the help of *AtariWriter* and my Atari 830 modem, I'm able to transmit my manuscripts directly to the typesetting machine, bypassing the operator and removing any chance for typing errors, speeding up the process, and reducing typesetting costs.

Most typesetters are now equipped to receive your text electronically over telephone lines. But you've got to lay a little groundwork before you can take advantage of direct electronic transfer.

Typesetting Codes

After you've chosen a type style for your manuscript, you and the typesetter have to mutually agree on a set of codes. When you imbed these codes in your text they'll automatically "tell" the typesetting machine how to treat each letter or phrase.

Here's a sample list of some typical typesetting codes and their functions to give you the idea:

<ct>	**Begin Chapter Title—Large bold type, centered**
<ctx>	**End Chapter Title**
<h1>	**Head 1—Large bold type, left justified**
<h2>	**Head 2—Medium bold type, left justified**
<txt1>	**Text 1—Regular text**
<txt2>	**Text 2—Bold text**
<it>	**Begin italics**
<itx>	**End italics**
<bl>	**Begin bulleted list**
<blx>	**End bulleted list**
<np>	**New paragraph**

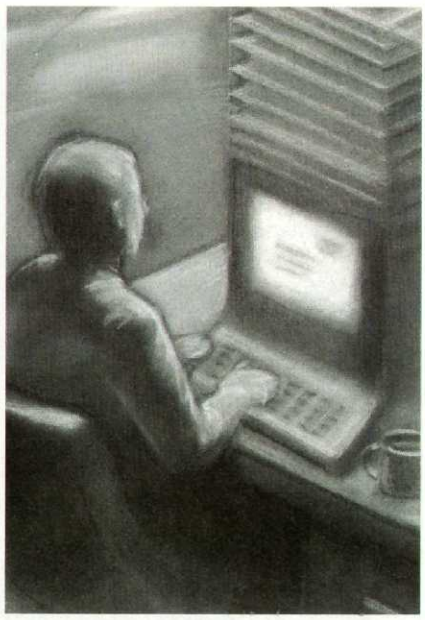
In these examples, each abbreviated typesetting code is surrounded with "<" and ">." These symbols set the codes apart from regular text, and tell the typesetting machine to give special treatment to the text that follows. You can surround your codes with any symbol that isn't tyically used in your text—a backslash (/) is a common favorite.

Imbedding codes in your text becomes second nature with a little practice, and is made easy with *AtariWriter*'s search-and-replace feature.

Here's what text looks like with codes imbedded and ready for transmission to the typesetter:

```
<ct>Introduction<ctx>
<txt1>
Here's what text looks like with <it>
codes<itx> imbedded.
<np>
<h1>Ready for Transmission<h1x>
<txt1>
This is ready for transmission. All you
```

CONTINUED



have got to do is press <txt2>RETURN<txt1>, and you're all set.
<np>

In this example, "Introduction" is surrounded by "<ct>" and "<ctx>" because it is a chapter title. When the document is actually printed the word "codes" is italicized; "Ready for Transmission" is a large bold type head; and "RETURN" is printed in bold type.

Terminal Software

Any terminal software that lets you *upload* (send information to a distant terminal), and select the *parity* between computers (odd, even, or none) works fine. I've been using JONESTERM and AMODEM public domain software that I got from my local Atari users group, but the choice is yours.

A Telecomputing Shopping List

To take advantage of electronic mail, or have your latest masterpiece electronically typeset, you need the following equipment as a minimum.

- Atari Computer—48K RAM minimum
- Disk drive—1 each, minimum
- Modem—Atari 830, 835, 1030 or third party
- *AtariWriter* word processor
- Terminal Software—commercial or public domain

Don't Lick Any More Stamps

Electronic mail and electronic typesetting are great time and money-savers for business people, writers, and anyone else who needs to get the word out fast. Both services have saved me many hours of waiting in line, and licking stamps.

Happy telecomputing!

Using Formatter

First enter the Formatter program and save it to disk. When you run Formatter you'll be asked to:

ENTER DEVICE:FILENAME

Enter the letter *D*, a colon and the name of the text file you've created using *AtariWriter*, then press RETURN. Don't use a filename extension when you name your text file. For example, "WORDS" is a good name, but "WORDS.TXT" won't work with this program. Numbers in the upper left-hand corner of your screen count each word as your text is loaded into the computer.

Once your text is loaded, the program formats your correspondence then asks you to "Swap disks and press RETURN." Place your "communications disk" (a blank formatted disk) in your disk drive, press RETURN, and your formatted text is saved with the extender ".MCI" tagged on to its name to identify it as a file that's ready for electronic mail.

Formatter Program

```
10 REM ** MCI FORMAT UTILITY **
12 REM ORIGINAL TEXT FILENAME MUST NOT
      HAVE AN EXTENDER.
14 REM EXAMPLE:  'FILENAME.TXT' WON'T
      WORK - 'FILENAME' WILL.
20 POKE 710,0:POKE 712,0
30 CLR :DIM F$(20),G$(20),B$(25000):T=
1:X=1
40 G$=".MCI"
50 ? CHR$(125):PRINT "ENTER DEVICE:FIL
ENAME ";
60 INPUT F$
70 CLOSE #1:OPEN #1,4,0,F$
80 TRAP 180:GET #1,A
90 IF T>=65 AND A=32 THEN A=155:T=1
100 IF T>=50 AND A=58 THEN B$(X,X)=CHR
$(A):X=X+1:A=155:T=1
110 IF T>=50 AND A=59 THEN B$(X,X)=CHR
$(A):X=X+1:A=155:T=1
120 IF A=155 THEN T=1
130 B$(X,X)=CHR$(A):X=X+1:T=T+1
140 POKE 752,1
150 PRINT :PRINT X:PRINT CHR$(125)
160 POKE 752,0
170 GOTO 80
180 CLOSE #1
190 POKE 752,1:PRINT CHR$(125):POSITIO
N 15,10:PRINT "WORKING"
200 FOR P=1 TO X-1:NEXT P:S=P
210 PRINT CHR$(125)
220 PRINT :PRINT "Swap disks, then pre
ss RETURN"
230 IF PEEK(764)<>12 THEN GOTO 230
240 X=1
246 IF ASC(M$)=46 THEN F$="A"
250 F$(LEN(F$)+1)=G$
260 OPEN #1,8,0,F$
270 TRAP 280:PUT #1,ASC(B$(X,X))
280 IF S=X THEN CLOSE #1:POKE 752,0:PO
KE 712,148:POKE 710,148:END
290 PRINT CHR$(125):PRINT :PRINT S-X
300 X=X+1:GOTO 270
```

Tom Snyder: From Rock 'n' Roll to Educational Software

by Connie Connors

Tom Snyder is president of Tom Snyder Productions, Inc., a four-year-old company that is developing some of the hottest educational game software around. His *Agent U.S.A.*, published by Scholastic, recently won the *Electronic Games* award for "Best Educational Game of the Year" and made *Billboard*'s Top Ten Software chart.

Tom, a native of Wellesley, Massachusetts, is a school teacher turned software designer. His interest in computers dates from 1964 when Tom, then a high school student, discovered a book about computers in his school's library. That book motivated Tom to design a computer circuit and a primitive computer that won third prize at an MIT science fair. Then his interest waned. Tom went on to college, where he majored in French literature. After graduating, he joined a rock and roll band in New York City.

Eventually, Tom turned to teaching and it was during his teaching years that he again became interested in computers. This time he discovered the power of the computer in a classroom setting.

AE: *When did your interest in computers resume?*

TS: I can remember a year before I got my first microcomputer—I saw it and couldn't believe that you could actually buy a computer for 800 bucks. Even though I wasn't a programmer, and I didn't know anything about computers—except what I had taught myself years before—I appreciated the power that they were selling in this tiny little box that you could buy for your home.

MARVIN LEWITON

Tom Snyder in the playtesting lab.

AE: *Did you buy it with school in mind?*

TS: No, but while I was a teacher, I thought of the computer as something to lighten up the drudgery. So, I started writing programs to do grades and keep reports on kids. And then slowly, the computer started creeping into the kind of teaching I did. But I never intended it to be an educational tool, and I still really don't. I'm still very skeptical about the computer being explicitly educational—or specifically curricular. Because all of the teachers that I knew, in addition to being organized and intelligent people, taught by force of personality. I had always believed that that was the most important thing in teaching.

"The computer helped me manage and enrich the environment—It got the kids excited."

But, what I started doing—and this has become the entire key element of success in the home market—was using the computer to help me manage and enrich the environment that I created. It got the kids excited.

For example, I used to do big simulations where the kids would pretend they were on a rocket ship to the moon. They would role play and have to keep track of their provisions, and in the course of doing this they would learn

CONTINUED

something about the solar system.

In the process, I started learning tricks to make the computer actually improve the quality of the simulations. There were group dynamics that the computer let me do, that nothing else would. So by the time I was through, I had five little simulations that were really unique environments that the kids were getting excited about. But the computer wasn't really teaching. The kids were teaching each other, or I was teaching them, or the books that came with the simulations that I wrote were teaching them—the computer was just creating the particular environment that let them learn. And then we started the company.

AE: *How do you begin designing a learning game?*

TS: We begin with an environment. I disdain starting with a "skill." If you start with a skill you build this artificial thing. So we use a much broader perspective. We create the environment in which that skill matters. A new program that we're designing now is *Halley's Comet*. A lot of people are making Star Wars kind of games with space ships but they don't teach you anything about outer space. We really wanted to capitalize on that, plus the fact that Halley's Comet is coming in two years. Also, we thought the solar system would be a neat body of knowledge to teach—using all the planets and their temperatures, gravities, and atmospheres. If you take a body of knowledge that is geographically located, then you have your environment automatically.

We had to spend a lot of time on the mathematics of it. If you think about it for a second, if you want the entire solar system to be in the simulation, and to be 100% accurate, the distance from one end of the solar system to the other is an incredibly long way. That's hundreds of trillions of miles, and so the simulation has to be able to deal with numbers that large. In order to orbit and manipulate your spaceship, you need a measure-of-scale-system that works all the way from one-kilometer to hundreds of miles—or the distance of the entire solar system.

Once we had that environment, we started working on what we'll call the game. We don't actually refer to it as the "game" though, we call it the "fiction," because we want to make sure it's more than "do the following five things." It's got to have more character to it. There were a million ideas for the fiction on *Halley's Comet*, but we wanted to come up with fiction that gave you incentive to go all over the solar system so that you learn the relationship of all these celestial bodies to each other. We built the fiction which has to do with you, this agent, and you're taking this performer around the solar system, and he's from Earth. The performer has this concert schedule all over the solar system, and the longer you can keep him playing, the higher you rise on the celestial top forty chart.

AE: *What should teachers and parents look for in educational software?*

TS: My answer is slightly different for home and schools, as it should be. Parents call me all the time saying, "I don't know how to judge if software is educational or not." The point I most often make in reply is that software for the home has got to be an enjoyable experience.

"Educational hooks built in —things that grab you."

A father called me the other day and said, "How can I buy worthwhile software for my kid? I just bought a computer. What can I get?" I told him to go into a computer store, preferably all by himself, spend one hour, and have the salesman show him the "coolest" piece of software he has—the one that intrigues you, the parent. Buy whatever turns you on, and seems to demonstrate the most outrageous new use the computer could have. I told him to take it home and play with it. I said that *if it's really intriguing to you it's automatically going to have little educational hooks built into it—little things that grab you and teach you something, or inspire you.* I told him to start using the software when he got home, and that the kid would end up in his lap, or at the computer in about ten minutes. Then I said, "you just sort of let it grow from there."

AE: *When does the "learning" begin?*

TS: Don't try to force educational content on your kid—you'll get it along with the fun. If you're walking by your childrens' room and you see them playing *AGENT U.S.A.* for instance, and you hear the kids talking to each other about the quickest route from Denver to Dallas, you don't have to be a professional educator to know something's happening there.

If it's intriguing it's automatically going to have educational hooks, things that teach you or inspire you.

AE: *What do you think about early learning software, now that you are a father?*

TS: There's a "play testing" program run by a guy at Harvard where kids come to his office in the afternoon. We've invented a term for the little kids called "lapware." It's unbelievably bogus. What we mean is, yeah maybe early learning software appears to work, but the only reason it looks this way is because there's a kid sitting on someone's lap, and what they're really trying to do is have a relationship with that person—not the software.

The Personal Computer: Learning Tool of the '80s

by Elisabeth Van Nuys

Interest in using computers for educational purposes is at an all-time high. Many parents, as well as teachers, are aware of the computer's potential as an educational tool, but there's a good deal of discussion about the best ways to utilize that tool.

Simulations, tutorials, drill and practice, word-processing, and programming all have their advocates and they can all teach children something. The problem is that there are two aspects to education: teaching and learning. Ideally, they go hand in hand. But, as even the best teacher will admit, the one does not always follow the other.

Children are great learners and the sheer amount of information that a child absorbs between infancy and adolescence is staggering. Yet, children learn selectively. They may resist learning some of the things we want them to learn while picking up information and behaviors that can drive us up the wall. Just exposing children to educational programs isn't enough. Children have to be motivated to use the material if they're to learn from it. The computer, if used wisely, can be a powerful and attractive means for delivering educational material in a patient, nonthreatening, and enjoyable way.

There are at least three different ways in which children can be motivated to learn with a computer. The first is to use extrinsic rewards. With extrinsic rewards, the program can be as dull as dishwater. The reward for using it comes later, in the form of better grades, higher scores, or other reinforcers. Parents use extrinsic rewards all the time. It's the old "if you do the dishes, then you can watch TV" ploy. It works—some of the time.

A second approach is to include motivators and rewards as part of the program. This is where we get all those "bells and whistles," included in some of the better educational programs. An attractive little tune that signals a correct answer, colorful graphics that follow correct input, all these and more, are designed to keep a child going and learning without much fuss. They're useful and they work—much of the time.

The third approach is to make a program so entertaining, so interesting, so rewarding in itself, that a child absorbs the educational content almost without being aware of it. Tom Sawyer used this trick to get his friends to whitewash his fence for him. He made the work of painting a fence seem like such a lark that kids were paying him for the privilege. Now that's motivation with a capital "M." It works almost every time —if the motivator is strong enough.

This issue, we'll be looking at programs that fall into that third category —educational games. Or, should we say games with an educational component? The distinction between the two gets a little blurry at times. Designing this kind of software, and doing it successfully, is like walking a tightrope. If the game doesn't "play," kids won't want to use it. If there's nothing to be learned by playing it, parents and teachers may give it a "thumbs down." These considerations have to be carefully weighed before the game goes into the box. Once it's out, it's up to the consumer to make the final decision.

Tom Snyder is one of the few software designers who has been successful in the educational game category. In our profile section this month, we feature an interview with Tom. His ideas about the use of game programs to provide "educational environments" that encourage human interaction are demonstrated by the kinds of programs he designs. Interestingly, teachers Rafael Rivera and Greg Varley (who reviewed Snyder's *Agent U.S.A.* and *Bannercatch*) mentioned the interactive elements of Tom's programs as one of their outstanding features. They did this before knowing the philosophy behind the games. To quote Varley: "The way these programs encourage cooperation and communication between players is absolutely marvelous." We agree.

Kids Teaching Kids

by Marsha Arnold

Just five minutes from the Golden Gate bridge, in a district known as "the Avenues," 320 elementary school students are slowly but surely making their way into the computer age.

Sutro Elementary School's first step on the road to high technology occurred a little over a year ago when it received two Atari 800 computers. Last September, two more Atari computers were purchased for the fourth and fifth grade classes.

Computer technology is still unfamiliar and perhaps a bit scary to some of the teachers. The teachers have an incredible number of things to do and little time for setting up computer curricula. The professionals at Sutro faced these facts and said, "Why not let kids teach kids?" And so a peer teaching approach was tried. Here at Sutro, the learning flows not only from teacher to student but from student to student as well.

CONTINUED

Two very bright fifth-graders, Brenda Ng and Florence Fong, are in charge of the computer program in Rita Stewart's well-run fifth grade classroom. They choose a program from a selection of tapes stored in the resource room, set it up, explain it to the other students, and trouble-shoot when problems arise.

The morning I visited Rita's class I observed an enthusiastic threesome at one of the Atari 800's. One student issued the commands, another typed them in, and the third checked the input.

"They didn't want to stop!"

Mrs. Stewart's fifth graders don't limit their helping skills to each other. They also take turns teaching the kindergarteners and first graders computer skills. "They didn't even want to stop!" exclaimed one fifth grader of her two energetic apprentices.

One of the goals of teachers at Sutro is to get as many children as possible to use and master the computer. The peer teaching approach seems to fill the bill. It not only frees the teacher to work with other students, but makes the children responsible for each others' learning successes. In Peggy Coughlin's third grade classroom, two students used the *Do It Yourself Spell* program to practice spelling words while Peggy worked with the rest of the class on math problems. The pair delighted in each other's successes. They set out to conquer those spelling words together and had fun doing it.

Give Your Computer a Breath of Fresh Air

The computer can indeed be a socializing agent rather than an isolating one. It helps to have the computer in the classroom, as they are at Sutro, rather than hidden away in a musty corner of the school library. In this way, computers become almost as familiar to students as pencil and paper. The atmosphere in the room becomes one of intimate cooperation in which kids know they can get help from each other. Good-natured conversation, interspersed with a fair amount of laughter, was what I heard as I approached the computers:

"What did you do that for? You were right!"

"It's easy. You just type it in."

"All right. You got one. Great!"

"I like playing around with it."

And playing around with the computer was what the children were doing. The peer teaching approach just makes play, and learning, more fun.

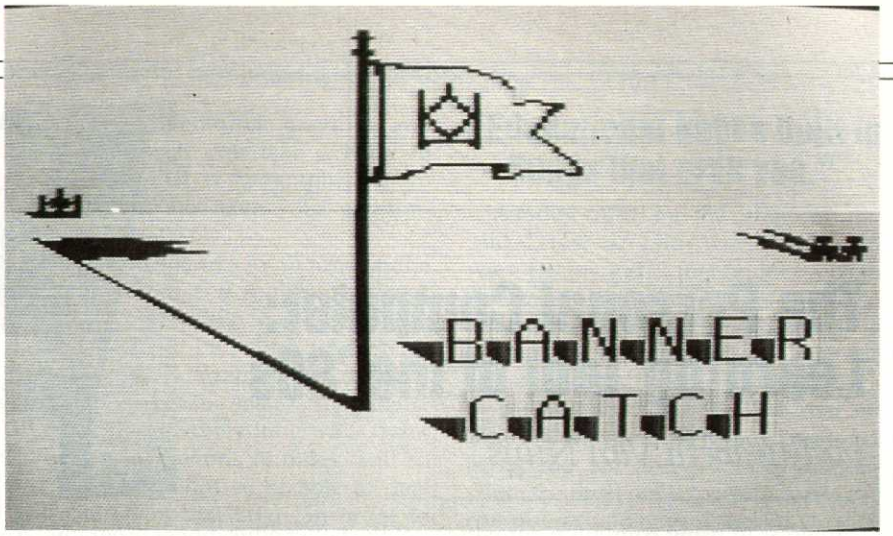
"Why did you mess up my program?"

Because the students view their time with the computer as fun, it is a non-threatening experience. Kumura Fouche and his teammate had just managed to erase a good ten minutes worth of work. Did I see tears? Frustration? Not at all. Bright-eyed Kamura leaned over and whispered to his friend, giggling, "The computer has a face, and he looks at you and says, 'Why did you mess up my program?'" No threat there! Peggy Coughlin, Sutro's unofficial computer specialist, reinforces that the children's coping skills sometimes work better with a computer than with a teacher. "It's not a person. It's a computer telling them so they'll try it again. An adult isn't there to say, 'I told you so.' It's between them and the computer."

Peer Teaching Par Excellence

The concept of peer teaching was perhaps best expressed by an eager third grader in Peggy's room. Tataneka Nelson spends some of her free time teaching her younger sister computer skills. "I teach her how to push the keys," says Tataneka.

"She knows how to do it as well as I do now." She pauses and adds, "My mom's having another baby, and I'm going to teach her too." Peer teaching . . . par excellence!



Bannercatch

Capture the Flag . . . Plus!

Reviewed by Greg Varley

Searching for an enjoyable, challenging, educational game for your children? *Bannercatch*, designed by Tom Snyder Productions, and published by Scholastic may be just what you're looking for.

In its simplest form, *Bannercatch* is a game of "capture the flag." At its more difficult levels it is almost an arcade game, requiring quick reflexes and fast thinking. Better yet, *Bannercatch* offers some real learning opportunities in the areas of cooperative planning, math skills, and map reading. It's essential to know that this is a two-player game. It demands cooperation and is an excellent game for parents who want to share the fun of using the computer with their children. Whoever the two players are, they'll be friends before the game is over. They have to be, because *Bannercatch* is a game that encourages communication and teamwork.

Meet MAX, the Evil Robot

There are five levels in *Bannercatch*, and in each the objective is to capture your opponent's flag and to return it to your own territory. The difference in *Bannercatch* is that your opponent is never another player. Your opponent is the program, personified as "MAX," and his band of evil robots. One of the key points is that no one has ever seen MAX's face. When you defeat one of MAX's robots, a small portion of MAX's

face is revealed. Using a blank graph provided with the game, you draw in MAX's face and read the message that awaits the successful player.

Teaming up for Success

Definitely a two-player game, *Bannercatch* is designed for team play and would be difficult to play alone. To win, the two players *must* work together. After playing this game extensively with my son, we found that we had to understand what each of us was going to do. If we didn't jointly plan things out clearly, we were in for trouble. *Bannercatch* does an excellent job of teaching the value of teamwork and helps create an understanding of the different roles within a team.

Understand Binary and Decimal Numbers and Find the Robot

Parts of the game require that the players learn certain concepts which will make the players' job easier. At any time during the game, players can "tap" into MAX's communication system. After they've done that, they've got to convert binary numbers into their decimal equivalents to understand where things can be found.

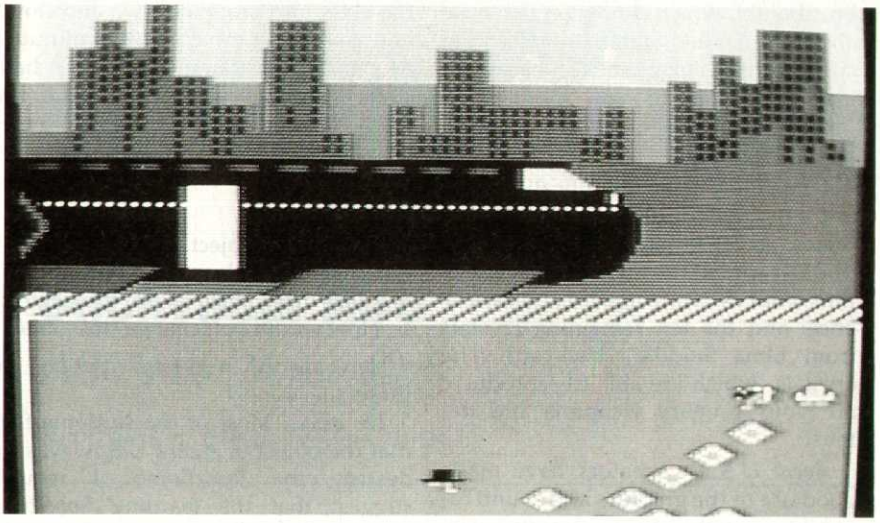
By using materials provided with the game, I explained to my son the concept of 8 bits in a byte, and how each bit can represent a decimal number. From that lesson, my son quickly learned to add up the bits to determine where game characters and objects, like the robot's flag or an individual robot, was or where it was going.

Developing Map Reading Skills

In addition to learning the teamwork and math skills needed to play this game, the players are also encouraged to learn map reading skills. Each player can only "see" a small space around the "human" that he is currently using, and the program only indicates that the "human" is in a certain sector. However, the playfield is divided into a grid with 64 sectors. A grid map is provided to help players figure out how to get where they want to go.

Ease of Use

The best way to familiarize yourself with *Bannercatch* is to first run it through its demonstration mode. Then you can begin play, turning to the manual for some of the finer details as the game progresses.



Bannercatch is suggested for ages 9 and up. I would agree with that age range provided that the younger children can handle a certain amount of frustration. The game itself is reasonably simple at the lower levels, but it may still take some time to learn the "tricks." This is not a program a parent can use as a babysitter. You should plan to get actively involved in playing and helping your youngster play. Even when two children are playing, an adult may need to help them the first few times.

A Highly Recommended Program

Overall, *Bannercatch* is exciting and enjoyable to play. Most importantly, it succeeds in teaching the concepts of teamwork and planning, binary numbers, and map reading skills.

Bannercatch is packaged in a sturdy plastic case that holds a game disk, manual, grip map, translation card (for interpreting MAX's questions), a graph sheet (for drawing MAX's face), a poster, and six *Bannercatch* stickers.

The highest recommendation for *Bannercatch* is that my son, age 11, wants to play it everyday. He also asked if we can keep our review copy so he doesn't have to wait for me to buy a copy.

One of these days, the two of us will complete level 5, and see *all* of MAX's face!

Agent U.S.A.

Travel, Action, Education!

Reviewed by Rafael Rivera

Agent U.S.A. by Tom Snyder Productions teaches geography in a lively, fun-filled, game format. Through the process of saving the United States from the "FuzzBomb," children learn the locations, shapes, and sizes of the states as well as the position of their capital and primary cities. In addition, kids also learn how to read and plan travel itineraries using train schedules.

Agent U.S.A. is designed for ages 9 to adult. After testing it with youngsters in the 10 to 12 age range, I find that I can definitely recommend it. It's fun, kids enjoy it immensely and it generates a lot of excitement.

The stage is set for this adventure with the recounting of Professor Elma Sniddle's experience. While seeking a power source for her newly invented TV, a dozen glowing crystals fell into her backyard. Upon placing one of these crystals into her invention, she was struck by a ray that turned her into a mass of fuzzy static. She was subsequently turned back into her former self, but only after accidentally stepping on another of the mysterious crystals. Meanwhile, the TV has been transformed into the nefarious

CONTINUED

FuzzBomb!, which is now on the loose about the United States, transforming citizens into "FuzzBodies" wherever it goes.

You, as Agent U.S.A., must find and destroy the FuzzBomb. For this task you must rely on an identification card; a plastic-coated map of the United States; access to information bulletins; photographs of the menace and his victims; your own intelligence and experience; and the ten remaining crystals from Elma Sniddle's backyard. The crystals, which are able to reproduce, are your primary weapons and defense.

Agent U.S.A.'s creators have made good use of the graphics and sound capabilities of the Atari computer. The graphics are entertaining and appropriate to the point of depicting accurate skylines of the cities visited by Agent U.S.A. The sounds of trains arriving and departing are complete with *Doppler effect*—a rise in pitch as the train approaches, and a fall in pitch as the train recedes. The traveling music has been, for some of my students, reason enough to play this game.

I had my sixth grade class work with the program in the classroom. I divided the class into groups of two and three and gave each group twenty minutes to explore the game. After they had several opportunities to play, we had a class discussion about their experiences with the program. Then they wrote their responses to these four questions:

1. What is the object of this game?
2. What did you learn from this game?
3. What did you like about the game?
4. How would you change this game?

Here are the students' reactions to these questions.

The object: Most of the students felt that the object of Agent U.S.A. was to destroy the FuzzBomb. I would suggest that the learning objective should be stated in the program itself—it wasn't.

What was learned: Most of the students said that they learned the names and locations of states, and how to spell the city names. Familiarization with the computer keyboard, and how to buy a ticket were mentioned by many students. I found two unique responses: "I learned how to gyp a train," and "You have to catch the train on time. You need to be careful and cautious about things."

What they like: Most of the students said that they really liked the sound and graphics elements of the game. The city skylines were considered an especially nice feature. Several liked being able to move all over the United States looking for FuzzBodies.

What they would change: "FuzzBodies that didn't move so much," said several students. Others would have preferred typing a number, rather than having to hunt-and-peck the names of the cities they wanted to get to. Several students wanted to replace the trains with cars or planes, and one girl wanted to be able to go into the cities. Most of the students wanted the game speeded up.

Most of my students felt that the names of the states, as well as their locations, can be learned from this game. The majority also felt that *Agent U.S.A.* would be useful in the home as well as in the classroom, though I see it primarily for home use.

I found *Agent U.S.A.* to be an entertaining and absorbing game that presents geographical material in a lively, playable, context. Sixth-graders were able to use this game after only the briefest introduction, and they (and their teacher) had a lot of fun playing it.

Stickybear Numbers

A Friendly Counting Program for Pre-Schoolers

Reviewed by Elisabeth Van Nuys

Stickybear Numbers is an elegant introduction to counting and number skills for children ages 3 to 6. Like its companion, *Stickybear ABC*, this program makes good use of the Atari's graphics and sound capabilities. The high-resolution pictures are a pleasure to see, and each animated sequence is accompanied by its own sound. This is one piece of software parents and teachers can use without reservation. The educational objectives are clear: number recognition, counting from 0-9, and basic addition and subtraction—all presented in a format that's easy to grasp. If this is your first foray into software designed for the sandbox set—go for it. *Stickybear Numbers* will be an ex-

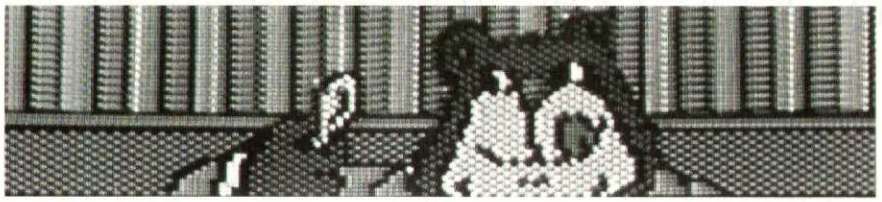
cellent addition to your software library.

Since it is intended for use by very young children, *Stickybear Numbers* is very friendly. Just press any number, or the space bar, and you're in business. Better yet, let your children try it. As the documentation suggests: "Children learn best by experimenting for themselves. Try to resist that almost overpowering impulse to intervene in the discovery process. You can have your turn later!" And you'll want to have that turn. So will almost anyone else who sees this program. I speak from experience. Having settled my twins (aged three) at the keyboard one day, I went to answer the telephone. It was a short conversation. Howls of frustration and screams of, "You're hogging my Stickybear!" soon brought me back into the family room where an unbelievable sight met my eyes. There, in front of the Atari, was Jonathan, our twelve-year-old game pro, playing intently with a piece of pre-school software! And he *was* hogging it!

Jonathan is well past the stage of number recognition, but I still had trouble prying him away from the keyboard. "Look at this," he said, "these pictures just go on forever." He had a good point, for, unlike the *ABC* program (which offers two animated sequences for every letter pressed), *Stickybear Numbers* offers a large number of pictures for every numeral.

Pressing the spacebar adds another dimension of learning fun. Use of the number keys, 0-9, reinforces number recognition and counting skills, but the spacebar is the key to simple addition and subtraction. Press 5, and you may see five colorful stars rotating on the screen. Press the spacebar—and one star disappears! The numeral shown on the screen changes as well, showing that you now have 4 stars. Press the space bar again and another star disappears and so on, down to zero. The space bar can then be used to increase the number of objects back to nine.

Stickybear Numbers requires an Atari computer with 48K and a disk drive. Included in the package are: the disk, a hard cover book, stickers, and a *Stickybear Numbers* poster. But, I'd be remiss if I failed to mention the documentation that comes with this program. It's blessedly brief, delightful, and to the point, offering sane guidelines for parents who want to make learning as much fun as it ought to be.



Stickybear ABC

ABC's For Youngsters

Reviewed by Elisabeth Van Nuys

Stickybear ABC is a delightful, clear, and easy-to-use introduction to the alphabet for very young children.

It's hard to find fault with this program. The animated graphics are very attractive and the music fits the action very nicely. Stickybear himself is an appealing character, and children, as well as adults, seem to enjoy his antics.

To use this program, a child needs only press one of the letter keys to call up one of two animated sequences. Auditory feedback, in the form of musical notes, immediately signals the child that his input has been received and that he has correctly chosen one of the letter keys. There's no need to worry that a very young child will press some other keys accidentally. The program anticipates such "errors."

When a child presses one of the number keys, a different set of notes is heard and nothing happens. The child simply tries again.

As an educator, I find this method of error handling ideal. Very young children, just beginning to explore a computer's keyboard, don't need to have their enthusiasm dampened by buzzes, raspberries, or other negative feedback. By rewarding correct input with action and by responding to errors with patience, *Stickybear ABC* sets a superior standard for software designed for the very young.

I tested this program with our three-year-old twins, as well as with a review group of pre-schoolers, and it came out a winner. None of the children had any difficulty in using the program and all seemed really responsive to the action sequences called up by their keystrokes.

Will *Stickybear ABC* teach your child to know the letters of the alphabet? The answer is yes—if you participate in using the program with your child. No program can "teach" letters. It can only present them. Your child may recognize the shape of the letter on the screen and learn to identify a similar shape on the keys, but to learn the actual letter names, requires a little adult (or older child) input. For example, a child may see two leaning lines that touch at the top and have a bar in the middle. At the beginning, it's important for someone who knows these things to point to that letter and say: "That's a letter A." Most children of three catch on quite quickly and are soon naming the letters for themselves. I'd like to emphasize that this need for parental (or teacher) intervention is not a flaw in the design of this program. In fact, this is one of its strengths because, for children of this age, social interaction can only add extra fun and a feeling of closeness to the learning experience.

Stickybear ABC is an electronic alphabet book and, like the better books of this kind, draws children back, time and time again, to savor their mastery of the material. My only disappointment, from an adult standpoint, stems from the lack of any further levels in the program. But this didn't seem to dismay the children at all.

As far as letter recognition programs go, *Stickybear ABC* is one of the best I've seen. It's attractive, clear, and easy to use. Best of all, it comes packaged with a variety of other materials, such as stickers, a full-color alphabet poster, and a hard-cover book featuring the whole Stickybear family. These additions make *Stickybear ABC* a multimedia presentation that's hard to beat.

Demons, Turtles and Things That Go Bump in the Night

by Jason Gervich

Demons to the Rescue

The world of Atari Logo is a strange and wonderful place, filled with turtles, pens, windows, envelopes, lists, numbers, words, toot, and, of course, *demons*. The Atari version of Logo was the first to include demons in its Logo word, giving you a new and very powerful control structure.

There are twenty-one WHEN demons in Atari Logo that spend all their time waiting for a specific event to occur. When the event occurs, they jump in and tell Logo to execute the list of instructions that accompany the event, then they pull back and wait for the next specific event to occur.

WHEN demons function like a WHEN/THEN control structure (WHEN something happens, THEN do something). They wait for an event to occur, and then perform the corresponding instruction. The *Demon/Collision Chart* lists all the WHEN demons available, and the events that each demon awaits.

Collisions Between Turtles and Pen Lines

Once a WHEN demon is told to wait for an event it keeps waiting, without further instruction, until the event occurs. WHEN demons don't have to exist inside a loop like IF/THEN structures. Figure 1 is an example.

Enter **SETUP** and the SETUP procedure selects Turtle 0, draws a line with Pen 0, and positions the turtle.

Now enter **GO** and the GO sets the turtle's speed to 25 and tells WHEN demon 0 to wait for a collision between Turtle 0 and a line drawn with Pen 0. When a collision is detected, WHEN demon 0 tells Logo to execute the instruction list:

][SETSP 0 PR [TURTLE 0 HIT THE LINE]

it then continues to wait for another collision. This example clearly shows the efficiency of using WHEN demons. If you had used an IF conditional, the program would have had to use a loop to continuously test for a collision. Enter Figure 2, and you'll see what I mean.

Enter **SETUP**, then **GO.LOOP** and you'll see the difference between the two methods on your screen. The turtle moves slower and rougher with the **GO.LOOP** because of the *recursive* (a procedure that calls itself) loop and constant collision checking.

In this slower method the *primitive*, **COND**, takes a collision # as its input. If the specified collision occurs at the exact time that **COND** is run, its output is "true." Otherwise, its output is "false." In **GO.LOOP**, the input to

Figure 1

```
TO SETUP
SS TEL 0 PD
FD 50 PU BK 25
RT 90 FD 50 RT 180
END

TO GO
SETSP 25
WHEN 0 [SETSP 0 PR [TURTLE 0 HIT THE LINE]]
END
```

Figure 2

```
TO GO.LOOP
IF COND 0[SETSP 0 PR [TURTLE 0 HIT THE LINE]STOP]
SETSP 25
GO.LOOP
END
```

Figure 3

```
TO COLLISION.UTL
SELECT.TURTLE.PEN
DRAW.LINE
WATCH.COLLISION
END

TO SELECT.TURTLE.PEN
CS CT SS TELL [0 1 2 3] HT
PR [Enter a turtle number (0-3)]
MAKE "TURTLE FIRST RL
PR [Enter a pen number (0-2)]
MAKE "PN FIRST RL
END

TO DRAW.LINE
TELL:TURTLE SETPN :PEN PD
FD 50 PT BK 25
RT 90 FD 50 RT 180 ST
END

TO WATCH. COLLISION
SETSP 25
WHEN ( OVER :TURTLE :PEN )
        [DETSP 0 CT ]PR ( SE [TURTLE]
TURTLE [HIT PEN] :PEN)]
END
```

COND is 0. When **GO.LOOP** is run, **COND** checks to see if a collision has occurred between Turtle 0 and Pen 0. If no collision occurs at that instant, the output of **COND** is "false"." Because **COND** is used as part of an IF/THAN type control structure, it has to keep looping to check for a collision.

You should use COND only when you're checking *once* for a collision. Use the WHEN demons when your program needs to check for the same collision *many times*.

You've got to observe two simple rules when using WHEN demons to detect collisions between pen lines and turtles:

1. The pen status must be up (PU) before activating the WHEN demons.
2. The pens and turtles should be selected *before* activating the WHEN demons.

A Turtle/Pen Collision Utility

Empty your workspace, save any procedures that you want to keep, and enter **ERALL**.

If you are using the Workspace Management Program (ATARI EXPLORER, February 1985), use the *EP* option to erase non-WMP procedures.

Figure 3 demonstrates *all* the possible collisions between turtles and pens.

The **WATCH.COLLISION** procedure uses the **OVER** *primitive* to decide which WHEN demon to activate. **OVER** takes two inputs, a turtle number, and a pen number, and outputs the corresponding Collision/Demon number.

Enter **PR OVER 1 2** and you'll get a 6. If you look up collision #6 on the Collision Chart, you'll see that it tells WHEN demon #6 to wait for a collision between Turtle 1 and Pen 2. By using **OVER** in this way it's possible to select the proper WHEN demon as the turtle and pen change.

Collisions Between Turtles and Turtles

Save your COLLISION.UTL procedures, empty your workspace, then enter Figure 4 to see how WHEN demons check for turtle to turtle collisions.

Enter **LINE.UP** and you'll see all the turtles lined up in a row. **EACH [FD 30 * WHO]** positions the turtles 30 steps apart from each other. The **WHO** out-

CONTINUED

puts each turtle's number (0–3) multiplied by 30. The white turtle in the center is number 0, and the brown turtle above, is number 1.

Now enter **GO**, and watch what happens when Turtle 0 and 1 collide. BANG!! When they hit each other the screen turns black, "BANG!!" is printed, and all the turtles go **HOME**.

The **ALERT.DEMONS** procedure tells demon #19 to wait for a collision between Turtle 0 and 1, and to execute the BANG procedure when the two turtles hit.

Now we'll modify this program to position all the turtles in different directions, and send them HOME if *any* of them collide with Turtle 0.

First edit the **LINE.UP** procedure by changing the line that begins with "EACH" to read:

EACH [FD 30 * WHO] EACH [RT 135 * WHO]

Now edit the **GO** procedure by replacing **TELL 0 RT 180** with:

TELL 0 RT RANDOM 360

Finally, edit the **ALERT.DEMONS** procedure by changing the line that begins with "WHEN" to read:

WHEN 19 [BANG] WHEN 20 [BANG] WHEN 16 [BANG]

Now enter **LINE.UP** then **GO** and watch the action!

FORWARD 100!

Now you know how to use WHEN demons to detect collisions between turtles and pen lines, and between turtles and other turtles. In the next issue we'll cover non-turtle collisions and explore larger projects using WHEN demons. Until then, FORWARD 100!

To get the most from LOGO NOTIONS *you should have a working knowledge of* Atari Logo. *You'll find all you need to know, and more, in* ATARI LOGO: Introduction to Programming Through Turtle Graphics *(Atari Corp.). Familiarize yourself with this manual. You should understand the basic concepts it presents in order to take full advantage of the articles in this series. You should also keep a copy of the* ATARI LOGO Reference Guide *(Atari Corp.) by your side. It provides a wealth of information you'll refer to often in your continuing exploration of Logo.*

Demon/Collision Chart

Demon/Collision	Type of Collision	Event
0	Turtle/Pen	Turtle 0 with Pen 0
1	"	Turtle 0 with Pen 1
2	"	Turtle 0 with Pen 2
3	Non-Turtle	Joystick button pressed
4	Turtle/Pen	Turtle 1 with Pen 0
5	"	Turtle 1 with Pen 1
6	"	Turtle 1 with Pen 2
7	Non-Turtle	Once per second
8	Turtle/Pen	Turtle 2 with Pen 0
9	"	Turtle 2 with Pen 1
10	"	Turtle 2 with Pen 2
11	Not used	
12	Turtle/Pen	Turtle 3 with Pen 0
13	"	Turtle 3 with Pen 1
14	"	Turtle 3 with Pen 2
15	Non-Turtle	Joystick position change
16	Turtle/Turtle	Turtle 3 with Turtle 0
17	"	Turtle 3 with Turtle 1
18	"	Turtle 3 with Turtle 2
19	"	Turtle 0 with Turtle 1
20	"	Turtle 0 with Turtle 2
21	"	Turtle 1 with Turtle 2

There are three types of collisions that WHEN demons look for:
- Between Turtles and Pen lines
- Between Turtles and Turtles
- Non-Turtle events

Figure 4

```
TO LINE.UPCT CS SETBG 57
ALL ST
EACH [FD 30 * WHO.
END

TO GO
ALERT.DEMONS
TELL 0 RT 180
FS ALL SETSP 50
END
```

```
TO ALERT.DEMONS
WHEN 19 [BANG]
END

TO BANG
CS SS SETBG 0 PR [BANG!!]
END

TO ALL
TELL [0 1 2 3]
END
```

C'mon, Cut it out!

Can $79.95 buy me an Atari 1030 Modem and software package?

YES! An Atari 1030 Modem guaranteed to work with your Atari Computer can be yours—all you need is at least 16K and a telephone line—you don't even need a disk drive.

The Atari 1030 Modem is an easy to use, high tech, high quality modem which automatically uploads to your Atari Computer.

And, with a disk drive you can take advantage of the disk communication software (included at no extra cost). This free package also includes introductory subscriptions to Compuserve (access to hundreds of free programs) and Dow Jones Retrieval Services at no additional cost.

Cut it out! Don't wait! Act now! Take advantage of this incredible offer—Atari quality at a lower price than any other modem!

Send coupon to:
ADD-ON Systems · 524 2nd St., San Francisco, CA 94107

YES! I want this extraordinary communications value! I'm ordering now so I can receive:
· 1 ATARI 1030 300 baud modem with built in software · Free Introductory Time on: Dow Jones, Compuserve · Disk Communications Software

The suggested retail value is $199.95 MY PRICE IS ONLY $79.95. Send me _____ number of packages at $79.95 per package to:

Name

Address City State Zip

Please make check payable to ADD-ON Systems.
Payment enclosed ☐ check ☐ money order
Bill my ☐ Mastercard ☐ Visa

ID# Expires

Credit Card Orders Only Call Toll Free
800 227 1617 X133
800 772 3545 X133 (inside CA)
California residents add 6½% sales tax.
Add shipping charges of $2.75 per modem.

Canadian residents please send U.S. dollars.
Allow 2-4 weeks for delivery.
Prices subject to change without notice.
Delivery subject to availability.

Hands-on Reviews of a 130XE Computer and DOS 2.5

by Neil Harris

How do you make a hacker happy?

Not just a little happy, mind you. What we're looking for is some dancing-in-the-streets and shout-it-to-the-rooftops happy.

There's an easy answer: just come up with a new piece of equipment, no strings attached, and faded xeroxes of preliminary documentation. Those ingredients are sure to yield many hours of interesting discoveries. This time was no exception.

The 130XE arrived without any great fanfare. It was almost lost in the glare of the ST's announcement. To this hacker anyway, this product looks like the best news in a long time for current owners of Atari's personal computers. The launch of the 130XE means that the 8-bit computer line is alive and well. It also provides a step up if you've been running out of elbow room with 64K or less.

The 130XE used the same modernized styling as the 65XE, with 45-degree angles dominating the case. The only external difference between this and the 65XE (besides the label) is the *Enhanced Cartridge Interface*. This is a connector next to the cartridge port (which is located in back of the computer on the XE series). The ECI was designed to let users and third parties plug in high-speed peripherals like fast floppies, hard disks, and custom I/O devices. It is used in conjunction with the cartridge port. This gives access to the memory and I/O chip select lines, 5 volts of power. External devices can detect the internal state of the 130XE system.

Internally, the 130XE includes 64K more RAM than the 65XE or 800XL. The most obvious use of this memory is for word processing, spreadsheets, and other RAM-intensive software. In fact, the forthcoming *AtariWriter Plus* (we'll let you know when it's available) is smart enough to detect the extra RAM and use it to increase the text memory. I don't know exactly how much extra that will give you, since I didn't get a copy of *AtariWriter Plus* yet, but you should be able to about triple the size of your text files.

If you want to write your own BASIC programs so they use this extra RAM you have to know exactly what you're doing. It isn't as if 64K were added to your free memory. The extra RAM is divided into four separate 16K chunks. By POKEing into memory location 54017, you can cause the normal RAM from location 16364 to 32767 to be replaced by one of the four chunks of extra RAM.

The formula for selecting extra RAM is:

POKE 54017, 193 + 4 * ADDRESS + 16 * MODE

For ADDRESS substitute a digit from 0 to 3, that picks which of the four chunks of memory you're using. For MODE pick a value from this chart:

MODE	6502	ANTIC
0	Extra	Extra
1	Extra	Normal
2	Normal	Extra
3	Normal	Normal

Who Gets the Extra Memory?

Access to the extra memory can be provided to either the 6502 CPU chip, the Antic video processor, or to both processors. This makes the extra memory extremely useful for software that needs lots of graphics. A program could switch the CPU's access over to the extra RAM and load a bunch of graphics data, or memory hogs like full-screen graphics images and giant scrolling mapboards. Once the pictures are in the extra RAM, the CPU switches over to the normal RAM where the program resides and the Antic chip operates off the extra RAM.

More Big News

So far, the picture is of a pretty spiffy computer, especially as software developers get their upgraded products out and really make the 130XE show its stuff. In fact, the Marketing Department at Atari is so excited about this computer's possibilities that a major advertising push is expected. There will be lots of these babies before too long.

But there's even more. This relates especially well to the 130XE but is also *really big* news for all you disk drive users. That story centers on DOS 2.5.

DOS 2.5 is the new standard that will ship with all Atari disk drives. As you may know, DOS 3 was never widely accepted because of problems with compatibility, despite the fact that it provides more space to use on the disk.

The new DOS 2.5 solves this problem by providing dual density that is *compatible* with the single density format now in widespread use.

DOS 2.5 formats a dual density diskette with 1010 sectors free instead of the 707 that were available under DOS 2.0. A dual density diskette can be used on a 1050 drive, although the 810 can't read them. When using a 1050 drive you can read disks of either format regardless of which version of DOS is loaded into your machine. The only limit is that DOS 2.0 won't notice the extra sectors on the diskette—or any of the files that reside on those invisible sectors.

The extra capacity of DOS 2.5 was achieved by squeezing 26 sectors onto each track instead of the 18 single density format of DOS 2.0. The 1050 disk drive will automatically sense which density diskette is loaded.

Atari plans to make DOS 2.5 available to anyone who needs it. Please, don't write me, I can't send it to you myself. It will be distributed to user groups and posted on bulletin-board systems and on CompuServe. It is a great improvement which has managed the astounding feat of maintaining compatibility so your diskette library doesn't have to be changed over.

Directory Options

When using DOS 2.5, some of the disk commands in BASIC change subtly. For instance, there are now two options for OPENing the disk directory. The normal method of OPENing the directory from a BASIC program was:

OPEN #1, 6, 0, "D:*.*"

This command still works. However, you can now specify mode 7 as follows:

OPEN #1, 7, 0, "D:*.*"

When reading the directory this way, some of the files' names may end up with angle brackets around them, like <MYPROG BAS>. This means that this file occupies space on the disk that DOS 2.0 cannot access. When trying to read this disk with DOS 2.0, these files will be invisible. They won't show up in the directory, nor will they be LOADable.

There are new options for the XIO that allow you to format a diskette. XIO 254 will format the diskette, first trying dual density to see if the drive supports it, then resorting to single density if necessary.

XIO 253 has been added to let you choose which density to use. When the mode number after the file number is a 0, the drive will only use single density. Option P has been added to the DOS menu as well to perform this function.

When the mode number is 34, the drive will insist on formatting in dual density. If an 810 drive is used, this results in an error message.

The XIO commands to format diskettes are:

XIO 254, #1, 0, 0, "D1:": REM DUAL IF POSSIBLE
XIO 253, #1, 0, 0, "D1:": REM SINGLE ONLY
XIO 253, #1, 34, 0, "D1:": REM DUAL ONLY

Memory Map Compatibility

When rewriting the DOS program to create this new version, care was taken to retain memory map compatibility wherever possible so that the trickier programs out there don't get crossed up. To find out what locations stay the same, see Table 1.

What do you get when you combine a 130XE with DOS 2.5?

This is a case where the whole is really more than the sum of the parts. To cap off all the excitement of these

CONTINUED

Table 1

Decimal Address	Hex Address	Name	Contents
1792	0700	BFLG	Boot flag, always 0
1793	0701	BRCNT	Number of sectors in disk boot, always 3
1794	0702	BLDADR	Where FMS is loaded into memory, always $0700
1796	0704	BINTAD	DOS initialization address, always $1540
1798	0706	BCONT	Where the boot program begins execution, $0714
1801	0709	SABYTE	Maximum number of open files, usually 3
1802	070A	DRVBYT	Drive allocation byte, one bit per drive
1803	070B	SAFBFW	Unused
1804	070C	SASA	Drive and file buffers location
1806	070E	DFSFLG	0 if there is no DOS.SYS, non-zero if there is
1807	070F	DFLINK	First sector of DOS.SYS file
1809	0711	BLDISP	Displacement to link bytes, always 125
1810	0712	DFLADR	$07CB, the address of the FMS (D:) handler table
1812	0714	XBCONT	Boot program
1900	076C	BSIO	BASIC Serial Input subroutine
1906	0772	BSIOR	Variant of BSIO
1913	0779		Disk write mode
1995	07CB	DFMSDH	FMS handler table, same address, different data
2016	07E0	DINIT	DOS Initialize subroutine
4993	1381	FCB	First of 8 File Control Blocks.
5121	1401	FILDIR	128 byte buffer for a disk directory sector
5440	1540	MINIDUP	Permanent portion of DUP.SYS
5540	15A4	SFLOAD	Entry point to DUP's load-a-binary-file routine
5542	15A6	STLOAD	used with SFLOAD
5545	15A9	LOAD	used with SFLOAD

new goodies, it turns out that DOS 2.5 also includes a new program called RAMDISK.SYS. When this file is present on a DOS 2.5 disk that is booted, it checks to see if the computer is a 130XE. When this is the case something very interesting happens.

A message appears on the screen. The computer informs you that it is setting up a RAMDISK. After a few seconds you return to normal operation.

What has actually happened is that DOS has formatted the 64K of extra RAM as if it were an extra disk drive. The drive has 499 sectors as well as a normal directory, just like a disk drive. It has an abnormal drive number, D8, which ensures that you won't have any conflicts with real drives. And it has a major advantage: it is *fast*! When you use a floppy disk you have to get data moving over cables and through ports, which is a slow process. On the other hand, when the "drive" is in memory, there are no moving parts, no I/O, just near-instant access to your files.

The boot-up process that sets up your RAMDISK automatically copies DUP.SYS and MEM.SAV to the RAMDISK, then cleverly modifies itself so that it looks there when you jump from BASIC to DOS and back. No more waiting for the DOS menu, that's for sure.

How fast is it? It's so fast . . .

It's so fast that it makes you change your habits. What I mean is this: during the course of a work session with the 130XE computer and DOS 2.5, I quickly learned to save *everything* to the RAMDISK instead of the real drive. At the end of the session everything is copied (using the DOS menu) from the RAMDISK to the real drive. Only the final version has to "crawl" bit by bit (literally!) through an I/O port.

To dramatize just how much of a gain this really was, I rigged up a useful two-part test. The best test of a RAMDISK is to perform some operation that is unusually disk intensive, constantly loading from the drive.

I happened to have a use for a "slide show," in which a program loads in pictures one after another. The sight of a computer doing this with some good pictures makes an impressive display. But where to find the pictures and some software?

SIG*Atari to the Rescue

On CompuServe there is a very active area known as SIG*Atari. This area serves as a repository for all sorts of programs and information, including a whole library for music and sound programs that can be downloaded to your computer via modem.

Part one of the test consisted of a time competition between downloading all files directly to a disk drive as opposed

Disk System Characteristics

The following figures refer to disks used to their fullest extent under DOS 2.5. Even the potential RamDisk of an Atari 130XE is listed here. Figures given are maximum possible when DOS is used "legally."

	Dual Density	Single Density	RAMDISK
Number of Tracks:	40	40	N/A
Number of Sectors per Track	26	18	N/A
Total Number of Sectors	1,040	720	512
Number of Sectors available to DOS	1,023	719	511
DOS Overhead, in Sectors	13	12	12
Number of Sectors Usable for File Storage	1,010	707	499
Number of Bytes per Physical Sector	128	128	128
Number of Bytes of Overhead per Logical Sector	3	3	3
Number of Usable Bytes of File Storage per Drive	126,250	88,375	62,375

Enhanced Cartridge Interface Connector

The following is a list of the signals available on the ECI connector:

	ECI Conn	Description
present 30 pin cart conn	A0-A12	1st 13 Address Lines.
	D0-D7	System data bus.
	R/W*	Processor read/write.
	PHI2	System clock.
	+5V	DC power.
	GND	Ground.
	S4	Chip select $8000–9FFF.
	S5	Chip select $A000–BFFF.
	RD4	ROM present.
	RD5	ROM present.
	CCTL	ROM bank control select.
14 pin extension	A13–A15	Upper 3 Address Lines.
	REF	Present cycle is a refresh.
	MPD	Math pack disable.
	RESET*	System reset.
	IRQ*	Interrupt request.
	AUDIO IN	External audio input.
	I/O1*	Chip select at D1XX.
	HALT*	ANTIC halt* signal.
	Reserved	Reserved signal line.
	Reserved	Reserved signal line.
	GND	Second ground.
	+5V	Second power.

to downloading first to the RAMDISK then copying to the drive. I ended up with 19 picture files and two slide show programs.

The result: it took 34 minutes (with a 1200-baud modem) to download direct to a disk drive; connect time charges for this would be about $4 and change. Using the RAMDISK it took only 19 of connect time and another 2 minutes to copy all files to a disk drive. The savings in connect charges are over 40%, and the overall time saving is 13 minutes out of 34, or almost a third. Extend this to a longer work session and you really appreciate the speed.

Part two of the test was the slide show itself. There's no comparison here. I modified the two slide show programs to work with D8 instead of the normal drives. To run the modified program I had to:

1. Go to the DOS menu
2. Delete D8:MEM.SAV
3. Copy all pictures to D8
4. Go back to BASIC
5. Run the slide show program

The steps before running the program took about 2 minutes. Once the program started to run, though, it quickly outpaced the normal program speed. A new picture was loaded (including the time to de-compress the pictures to form a full screen bitmap) in as little as 3 seconds.

It is possible to delete the DUP.SYS file from the RAMDISK if you need the extra space, but you must be certain to perform this command:

POKE 5439, ASC("1")

This tells DOS to look for the DUP.SYS program (the DOS menu) on drive 1 instead of the RAMDISK.

The Verdict

Overall, the 130XE is a surprising enhancement to the Atari 8-bit computer product line. Especially when used with DOS 2.5, the 130XE can increase your ability to use your computer productively by saving time and by providing a larger storage space.

In addition, it's a good looking machine.

For those of you with disk drives, make sure you check your local user group for a copy of DOS 2.5. It makes a big difference, regardless of the type of computer you're using.

JOIN CompuClub™ and receive the attention you deserve.

ATARI ®
Languages
Games
Business
Educational
Graphics
Utilities

- Receive our **disk** based catalog and pricebook.
- Buy from people who specialize in ATARI exclusively.
- Receive our 8 pg. newspapers 9 times a year filled with critiques, special tips, and classified ads.
- Get at least 25% off **all** titles (and often more!).
- Receive consistant low prices and prompt, knowledgeable service.
- Choose from over 1,500 software items.

JOIN
CompuClub™
Where Atari owners belong.

To join by phone call toll free **800-631-3111**
In Mass. call 617-879-5232
Please have credit card number ready!
Or return this coupon with $5.00*

YES, I want to be a preferred customer of CompuClub™ Rush me my catalog and price book. Enclosed please find my $5.00 registration fee.
Please make check payable to Compuclub™
Payment enclosed ☐check ☐money order
Bill my ☐Mastercard ☐Visa Expires_____
ID# _____
Signature _____
Name _____
Address _____
City_____ State_____ Zip_____
Atari Model _____

Hours: Mon. - Fri. 11.00 AM - 7.00 PM Eastern time
Answering services after hours
CompuClub™, P.O. Box 652, Natick MA 01760
*Overseas membership $25.00 per year
Atari - Trademark of Atari Corporation

THE MANY WAYS OF ARRAYS

by Richard Kushner

You're a Little League coach with twenty-five kids on your team. You've just given out the uniforms, and have a list of who has which uniform number. You've also recently purchased an Atari personal computer and disk drive (or tape recorder), and you want to use your Atari to maintain this list. You figure that this will make it easy to make changes if numbers change, if you add any new players, or if any of your players change teams. You've studied a little Atari BASIC but aren't sure of the best way to proceed.

Undaunted, you set out to write a program. You start by defining each of the players as a separate numeric variable, such as **PLAYER1, PLAYER2, PLAYER3** . . . up to **PLAYER25**. You already know that a *numeric variable* is just something that gets assigned a number value in your program. This value may or may not change in the program. The idea of thinking of a variable as a pigeonhole, a place to store things, is clear to you. You also know that in Atari BASIC, variable names can be as long as a program line, must begin with a capital letter, and can only use capital letters and numbers with no spaces. You've read that it is good practice to use names that provide some information about what they stand for. Thus, **PLAYER1,** is much better than **P1** or **PL1**. You also know that you're not the world's greatest typist, so you want to keep away from overly long variable names like **LITTLELEAGUEPLAYER1**.

You want your program to ask you to tell it the players' uniform numbers, and you want it to be able to list out all the players and their numbers on the screen. Scratching your head, you begin.

The first part of your program looks like Listing 1.

It seems a little troublesome to have to use all that programming (and typing!) to do what seems like a pretty simple job. Oh well, you shrug your shoulders and continue onward.

The screen display part of the program looks like Listing 2.

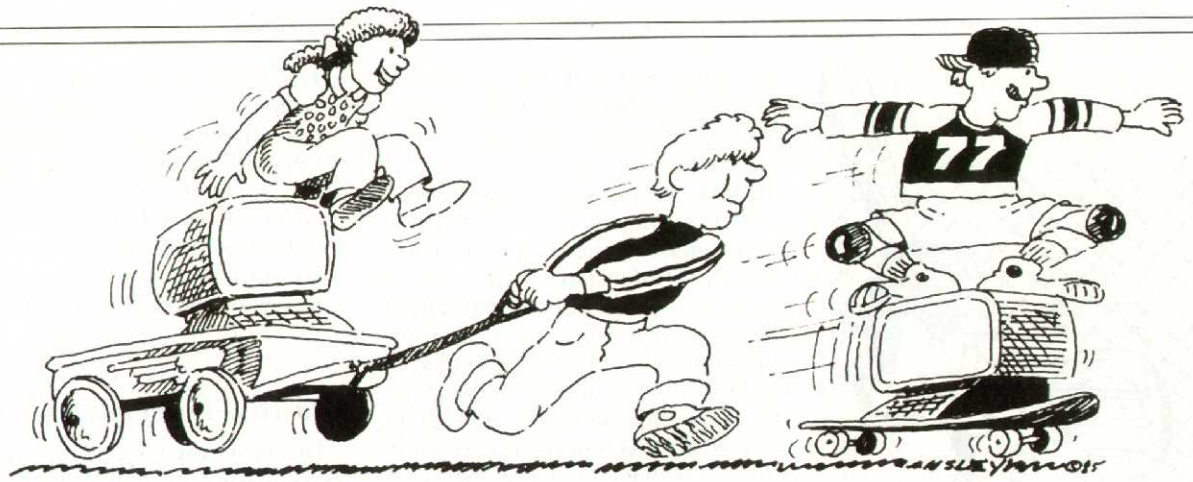
Now things are really troubling. Again you needed a separate program line for each player. What if the whole league of 250 players wanted you to do a similar list? There is a growing belief that there *must* be a better way!

This example is perhaps a little simple minded, but it does illustrate some important points regarding the use of variables in Atari BASIC programs.

Giving each variable in a similar group different names is important to distinguish them from each other. However, the approach above makes for lots of typing

Listing 1

```
10 PRINT "INPUT PLAYER 1 UNIFORM NUMBER"
20 INPUT PLAYER1
30 PRINT "INPUT PLAYER 2 UNIFORM NUMBER"
40 INPUT PLAYER 2
50 PRINT "INPUT PLAYER 3 UNIFORM NUMBER "
60 INPUT PLAYER3
70 PRINT "INPUT PLAYER 4 UNIFORM NUMBER"
80 INPUT PLAYER 4
90  REM
100 REM INPUT FOR PLAYERS 5 TO 23 HERE"
110 REM
480 PRINT INPUT PLAYER 24 UNIFORM NUMBER"
490 INPUT PLAYER 24
500 PRÍNT "INPUT PLAYER25 UNIFORM NUMBER"
510 INPUT PLAYER 25
```



and many lines of programming. If we wanted to find out who had uniform number 88 we would have to construct a similarly lengthy section of programming. As our Little League coach asked, isn't there a better way?

Arrays are the Answer

Yes, there is a better way. Using an *array* is the answer. But first things first. The first question is "what is an array?" One way of describing an array is to say that it permits the programmer to designate a collection of numeric variables with *one* variable name. Now, instead of designating the uniform numbers as **PLAYER1, PLAYER2, PLAYER3** and so forth, you may use an array variable. **PLAYER(X)** may be used to refer to the uniform number of the Xth player. **PLAYER(X)** is read "PLAYER sub X." The value in the parenthesis is called a *subscript*. Each data value in the array is called an *element*. By using an array we can do the uniform record keeping with a very simple piece of BASIC programming. The power of arrays is that they permit indirect addressing, which is a fancy way of saying that "X" in **PLAYER(X)** can be made to vary to fill in or find certain array elements at the program's discretion. The name "PLAYER" is attached to all array elements, only the subscript is unique. This is in sharp contrast to using string variables where you cannot change just one part of the name to select different members of the group. This is shown in Listing 3 which accomplishes the same job as Listing 1 (and is *much* shorter).

This is an example of a FOR/NEXT loop. We begin by carrying out an operation known as *dimensioning* the array. This is done in line 10. The **DIM** statement sets aside space (pigeonholes) for an array to be named **PLAYER**. It is required that you **DIM**ension an array before you use it. Otherwise you'll get an "ERROR 9" message whenever you refer to the array in your program.

Lines 20–60 constitute the loop used to fill the array with the uniform numbers. We could have gotten fancier and put in some statements to protect against bad input (such as inputting letters instead of numbers) and we could have permitted the user to stop before all 25 values had been given. However, we wanted to keep this clean and neat in order to concentrate on the array aspects of the program. You can create an equally simple piece of programming to print out the uniform numbers, just as the cumbersome programming in Listing 2 did. We'll leave that to you to work out. Also, simply by changing the values in lines 10 and 20, you can expand to as large an array as your computer can handle.

Before we go any further, let's state some rules that must be followed when using numeric arrays. Keeping these in mind will prevent all manner of difficulty in your programs.

Rule 1: All arrays must be **DIM**ensioned before they can be used, no matter how many elements the array will contain. Note also that **DIM PLAYER(25)** actually reserves space for 26 array elements, since the computer prefers to start counting at 0 rather than at 1. You are free to use or ignore the zeroth member of an array.

Rule 2: Be sure that your program never goes back to the statement that **DIM**ensioned your array. If this should happen, you will also get an "ERROR

CONTINUED

Listing 2

```
1000 PRINT "PLAYER 1 HAS UNIFORM NUMBER ";PLAYER1
1010 PRINT "PLAYER 2 HAS UNIFORM NUMBER ";PLAYER2
1020 PRINT "PLAYER 3 HAS UNIFORM NUMBER ";PLAYER3
1030 PRINT "PLAYER 4 HAS UNIFORM NUMBER ";PLAYER4
1040 PRINT "PLAYER 4 HAS UNIFORM NUMBER ";PLAYER4
1050 REM
1060 REM LISTING OF UNIFORMS FOR PLAYERS 5 TO 23 HERE
1070 REM
1240 PRINT "PLAYER24 HAS UNIFORM NUMBER ";PLAYER24
```

9" warning, and the program will halt. To satisfy Rules 1 and 2 it is advisable to put your **DIM** statements right near the beginning of your program, and never loop back to these statements.

Rule 3: You cannot READ or INPUT numeric variables *directly* into an array. This means that the following statement is not permitted:

40 INPUT PLAYER (20)

Instead, you must take an indirect approach, such as that used in Listing 3:

40 INPUT PLAYER
50 PLAYER(20) = PLAYER

We have used **PLAYER** as a temporary variable to help us INPUT data into our array. The same holds for trying to READ data.

Rule 4: Never assume that the elements of an array that you have created are initialized by the computer to be 0 when you **DIM**ension the array. This is a fairly small point, but one that can get you into trouble. The space set aside for your array may contain some "garbage" numbers; that is, numbers other than zero. If it is important in your program that your array contain all zeros (or any particular value), then put the value you want there, before you use the array with a loop like this.

100 FOR J = 1 TO 25
110 PLAYER(J) = 0
120 NEXT J

In Listing 3 we didn't need to do this since we were going to input 25 values of numbers anyway.

I trust that you are beginning to see the value and power of using arrays when you have a collection of similar variables. Not only do arrays make programs shorter and easier to write, they permit you to manipulate numbers much more readily than if they all had separate names. For example, you might want to have a list of uniform numbers in numeric order, rather than player numbers in numeric order, that is, a list that might look like this:

UNIFORM #1 PLAYER 22
UNIFORM #2 PLAYER 3
UNIFORM #3 PLAYER 11

You would need to go through the list of players and find which player has Uniform #1, Uniform #2, etc. With arrays, this is a relatively easy thing to do. Without them, it is another long programming task. We'll leave it to you to try out both approaches.

So far we have used arrays as sort of one-dimensional lists. What if we wanted to include the age and telephone number as well as the uniform number of each Little Leaguer? We could, of course, have three separate arrays to handle this. However, once again, Atari BASIC comes to our rescue with the *two-dimensional array.*

The Two-Dimensional Array

The best way to explain a two-dimensional array is to first see one, as in TABLE 1.

We have gone from a one-dimensional list to a two-dimensional table. The "rules" we listed earlier, however, also apply to two-dimensional arrays. We must **DIM**ension the array with a statement like:

10 DIM PLAYER(25,3)
or
10 DIM PLAYER(3,25)

Either way is correct, it is just a matter of how you prefer to visualize the array. In the first case, the array can best be thought of as a row across representing the 25 players, with three pieces of information about each player listed underneath each player. In the second case, we have a column representing the 25 players, with three parallel columns containing the data of interest. The Table above fits this second description. Thus **PLAYER(3,4)** in our example is the third piece of information (the phone number) of **PLAYER(4),** which is 5556789. Keep in mind that either layout can be used, but it will affect which elements store which information.

A word of caution. The mathematics of two-dimensional arrays get somewhat

Table 1

PLAYER	UNIFORM NO.	AGE	PHONE NO.
1	23	10	5551234
2	12	9	5559876
3	35	11	5554321
4	10	11	5556789

And so on for the other 21 players.

Listing 3

```
10 DIM PLAYER(25)
20 FOR J=1 TO 25
30 PRINT "INPUT THE JERSEY NUMBER FOR PLAYER#";J
40 INPUT PLAYER
50 PLAYER(J)=PLAYER
60 NEXT J
```

abstract when you start manipulating items contained in the array. If your program involved sorting the array, it might use a complex statement like:

100 IF PLAYER(K+1,J+1)
> PLAYER(K,J) THEN
PLAYER(K,J) = PLAYER(K+1,J+1)

You will be all right as long as you keep in mind the rectangular format of the array, and which subscript refers to the rows, and which refers to the columns. It is always good practice to first run your program with known data to be sure that the right numbers come out when known numbers go in. Arrays gone awry are a good example of the computer axiom "GIGO"—Garbage In Garbage Out!

Listing 4

```
90 REM * FIND AVERAGE TEMPERATURE
95 DIM TEMP(7,3)
100 FOR DAY=1 TO 7
110 FOR READING=1 TO 3
120 READ TEMP
125 TEMP(DAY,READING)=TEMP
130 NEXT READING
140 NEXT DAY
175 REM
180 PRINT "    TEMPERATURE"
190 PRINT "Day 6AM 12N 6PM Avg."
200 FOR DAY=1 TO 7
202 PRINT DAY;"    ";
205 TOTAL=0
210 FOR READING=1 TO 3
220 TOTAL=TOTAL+TEMP(DAY,READING)
230 PRINT TEMP(DAY,READING);"  ";
240 NEXT READING
250 PRINT TOTAL/3
260 NEXT DAY
980 REM
1000 DATA 76 79 75 72 77 76
1010 DATA 74 79 81 75 80 83
1020 DATA 80 77 70 68 65 65
1030 DATA 65 67 76
```

Let's further reinforce our growing knowledge of arrays with another example. As a present, we received a weather station and have been recording the temperature at 6:00AM, Noon, and 6:00PM each day for one week. We want to write a program to accept all this information, and then print it out in an orderly table; including the average temperature for each day. We know that the average temperature is just the sum of the three daily temperatures divided by 3.

We have seven days worth of data and three measurements each day—clearly a perfect candidate for a **(7,3)** array. Listing 4 shows one way to write a program to accomplish our goals.

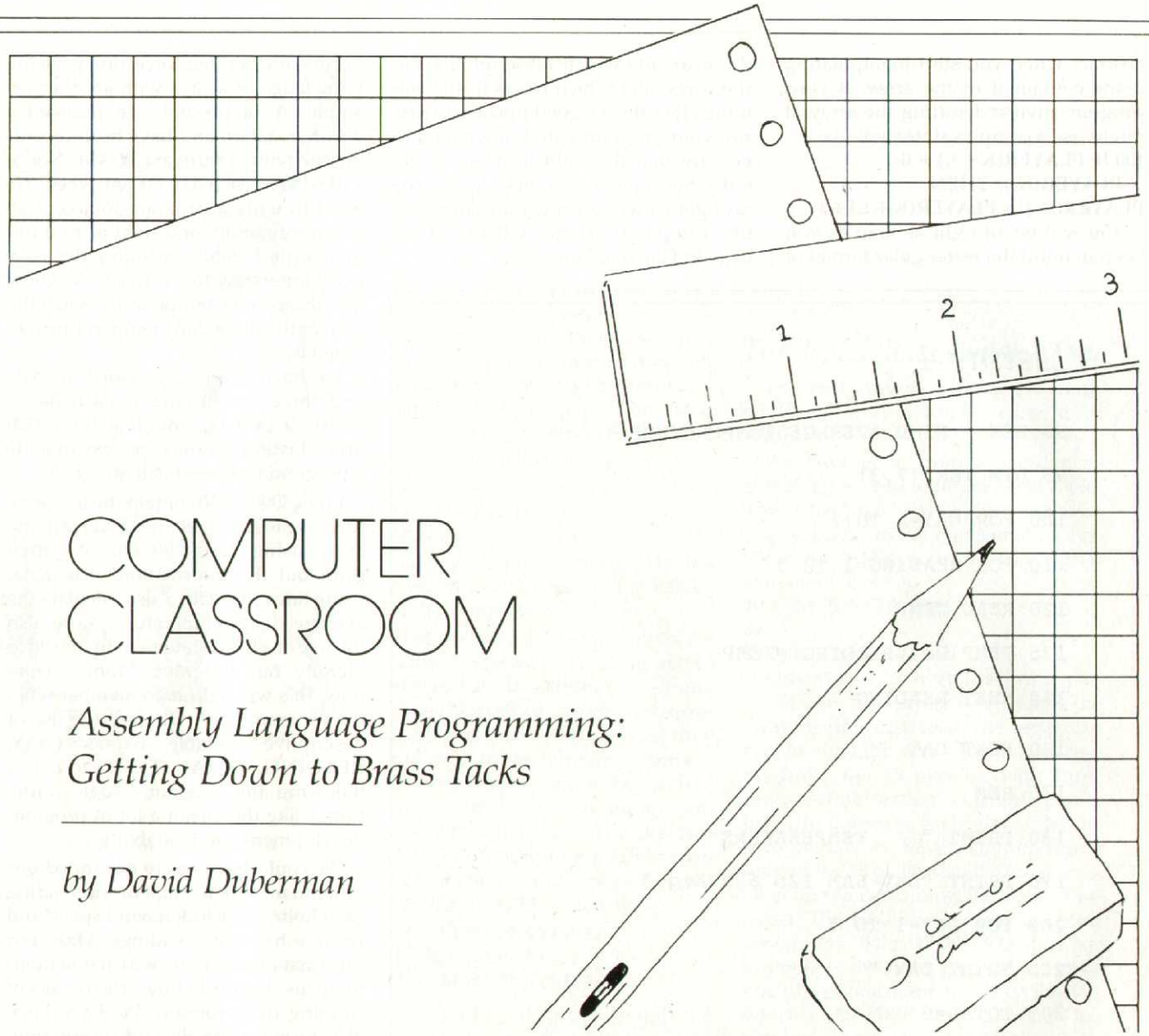
Lines 1000–1030 contain the temperature readings which are READ into the array using lines 100–140. We then print out the information in a table, using lines 205–250 to also calculate the average daily temperature. Note also the use of a REM statement in line 90 to identify our program. Months from now, this will help us remember what the program does. Observe the use of descriptive variable names **(DAY, READING, TOTAL, TEMP)** to aid in following the program's logic. Little things like this mean a lot in program development and readability.

We could have easily expanded our array to include a temperature reading each hour, or included wind speed and relative humidity readings. Only our imagination (and our weather station) limits us! Figure 1 shows the results of running this program. We have been able to input the desired information into an array, and output it in a concise form, including a calculation of the average temperature.

CONTINUED ON 45

Figure 1

	Temperature			
Day	6AM	12N	6PM	Avg.
1	76	79	75	76.66666666
2	72	77	76	75
3	74	79	81	78
4	75	80	83	79.33333333
5	80	77	70	75.66666666
6	68	65	65	66
7	65	67	76	69.33333333



COMPUTER CLASSROOM

Assembly Language Programming: Getting Down to Brass Tacks

by David Duberman

Looking into Your Computer's Brain

This classroom really gets down to brass (or silicon) tacks and looks into your computer's "brain," the Central Processing Unit (CPU) that does most of the work. Your Atari computer's CPU belongs to the 6502 family, a popular microchip used in many home computers. This amazing device, about the size of a fingernail, operates at the blinding speed of 1.79 million operations per second! Since it usually takes several operations, or "cycles," to execute an instruction, that translates to at least several hundred thousand instructions per second—still quite fast. This speed, added to the power of the complementary and special large-scale integrated (LSI) graphic chips (ANTIC and GTIA) allows your Atari computer to display graphics close to those seen on game machines at your local arcade. But professional arcade games aren't programmed in BASIC; it's much too slow. They're programmed in *assembly language*, so that each instruction you write is executed directly by the CPU at top speed without any intervening interpretation by a higher-level language. Chris Crawford, the designer of such great Atari strategy games as *Eastern Front*™ and *Excalibur*™, uses the power of assembly language to create extraordinarily complex and intricate programs that appear to use artificial intelligence. His games could have been written in BASIC, to a large extent, but only in machine language do they operate fast enough to work in real time.

You may already know that the BASIC language itself is a program written in assembly language. When you type in a command like PLOT or GRAPHICS, BASIC "interprets" it by reading each character and deciding what steps it must take to produce the desired result. BASIC programs execute slower than assembly language because each line must be re-interpreted each time it is executed in the program. Some versions of BASIC (on big computers) are *compiled*, which means that they are actually translated into a machine language program before they begin executing. An assembly language program is also completely translated (or "assembled") into machine language before it executes.

Pay Attention to Detail

If you've done much programming in a higher-level language like BASIC, you know that it's a detail-intensive activity. Make just one small mistake, and the program doesn't run and you get an error message. It's a fact of life that assembly-language programming is several orders of magnitude more detail-oriented than BASIC programming. With assembly language there is no higher-level language taking care of small details such as reserving memory for variables, creating the correct display list, or printing a question mark at a prompt for user input—it's all up to you. Leave out a crucial instruction and you won't get an error message—your computer will most likely lock up, and you must power down and restart to regain control. This attention to detail is balanced by the amount of control and speed of execution offered by assembly-language programming. You'll learn many assembly-language housekeeping shortcuts later in this series that will make your programming chores enjoyable and manageable.

The Assembler-Editor

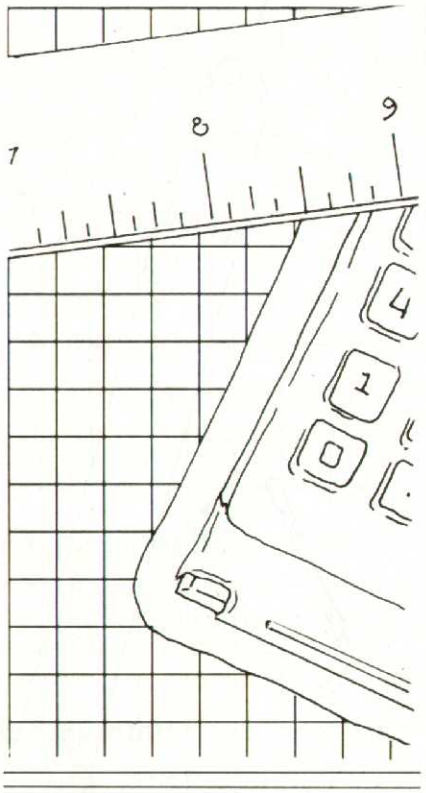
To write a program in assembly language, you first type it into your computer using an *editor* such as the one in the *Atari Assembler-Editor*™ cartridge. You then save your program on a disk or cassette. However, you can't just RUN the program, as in BASIC. It must first be processed by a program called an *assembler*. The assembler converts each assembly-language instruction to its equivalent in machine language and consecutively places the instructions in memory. By the way, the assembler and the editor aren't necessarily combined; in fact, some programmers enter their programs with a word processor for the advanced editing capabilities, then process the disk file with a stand-alone assembler such as the *Atari Macro Assembler*.

After the assembly process, you execute the program by "telling" the assembler (or a companion program called a *debugger* or *monitor*) where in memory to find the initial instruction.

The CPU and its Registers

The Program Counter

Here's where the computer's brain steps in. The CPU contains several



memory locations called registers that it uses for its own purposes. When you execute a machine language program, one register—the *program counter*—receives the beginning address of the program. From then on, the program counter is responsible for keeping track of which memory location contains the next instruction. The program counter is a sixteen-bit register which can hold a number from 0 to 65,535, also known as 64K. That is what limits a 6502-based computer to 64K of memory space.

The Accumulator

The principal eight-bit register is called the *Accumulator* or *A register* because it accumulates the results of arithmetic and logical operations. Most assembly-language operations use the accumulator.

X and Y Registers

Other registers are the *X* and *Y* registers. These registers are often used as index (or offset) registers to point to a sequenced array of data for accessing, or as counters for a loop.

The Stack Pointer

Another register called the *stack pointer* or *SP* is used to point to a 256-byte region in memory called the *stack*. The stack gives the computer one of its most powerful features—the ability to execute and rapidly return from subroutines, and to pass data back and forth between subroutines and the main program. A comparison is often made between the stack and a push-down dish stacking device in a cafeteria.

Both are last-in-first-out devices, because the last dish, or number, that you place on either type of stack is the first one you retrieve. If you've used Atari BASIC's POP command, you know how important it is to remove the return address for a subroutine or FOR-NEXT loop from the stack if it doesn't exit normally from the routine. Assembly language has an almost identical command, plus a PUSH command for placing a number on top of the stack. Unlike the cafeteria version, the Atari computer's stack doesn't move physically. Rather, each new entry is placed "under" the previous one in memory, and the stack pointer (SP) is changed by one to point to the new top of the stack.

The Processor Status Register

Finally, the *processor status*, or *P register* tells us the results of decision-making instructions. Bits in this register indicate which conditions exist, such as a negative or positive number, a zero, or an interrupt.

Fundamental Assembly Language Programming

The 6502 processor understands about 50 *opcodes* (short for "operation codes") that are referred to by three-letter names called *mnemonics*. Mnemonic means *memory aid*, and these three-letter names are abbreviations for the opcode's function. For example; **CMP** means to **CoMP**are, and **INX** means to **IN**crement the **X** register.

The LDA Opcode

The first *opcode* we'll explore is one of the most commonly used—**LDA**; the abbreviated name for **LoaD** Accumulator. Because all arithmetic and logical operations, such as the **CoMP**are opcode, are based on a number that's been loaded into the accumulator, the **LDA** opcode gets a lot of use.

CONTINUED

Addressing Modes

If you want to load a number into the accumulator or *A* register, it's got to come from someplace. This brings up a very important assembly-language concept known as *addressing modes*. Here's an example of a typical assembly-language program instruction.

LDA #3

LDA is the *opcode*, and the expression **#3** is its object, or *operand*. The combined *opcode* and *operand* is called an *instruction*.

The symbol in front of the *operand* tells the assembler what *addressing mode* to operate in.

The Immediate Mode

Although there are eight possible *addresing modes*, we'll only be covering three in this segment—the *immediate*, *absolute*, and *zero page* addressing modes.

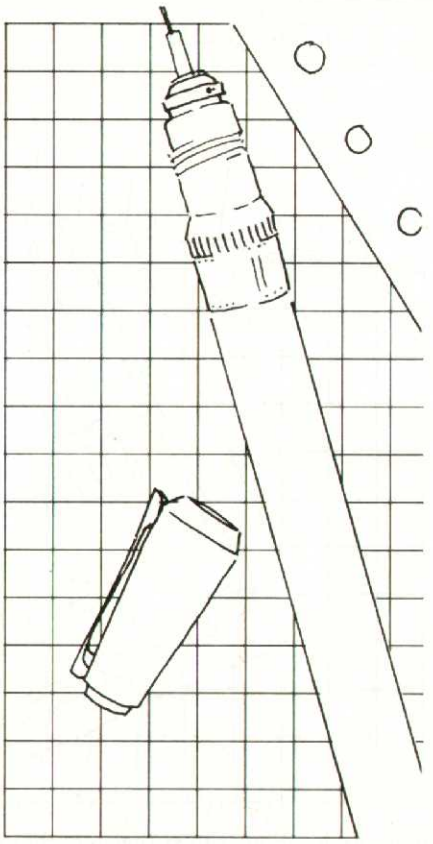
In the example **LDA #3**, the "**#**" symbol is used to tell the microprocessor to operate in the *immediate mode*. Operating in the *immediate mode* in this example means that the **LDA** opcode will take data from the byte that *immediately* follows it in the program—and in memory. In this case the *accumulator* will be loaded with the number 3. Since the accumulator is eight bits in length, the number that's loaded in must always be in the range of 0 to 255.

The Absolute Mode

When you use the **LDA** opcode in the *immediate mode* data is retrieved from the byte that *immediately* follows the instruction. But when you use the **LDA** opcode in the *absolute mode* data can be retrieved from any RAM or ROM memory location. (If you are using the **LDA** opcode to retrieve data from a RAM location it must have been placed there earlier, during loading or execution of the program.)

Some examples of data that you might want to load into the *accumulator* might include the bytes that define a bit-mapped graphics screen image, or the domestic character set, stored in decimal locations 57344-58386. (Refer to Computer Classroom, in the February 1985 issue of ATARI EXPLORER.)

If you know a data byte's memory address you can copy, or load, the contents of that memory address directly into the accumulator by using the *absolute mode*. (The *absolute mode* is sometimes referred to as the *direct mode*.)



Here's how you would load the contents of memory address 57344 (hexadecimal $E000) into the accumulator:

LDA $E000

The dollar sign (**$**) at the beginning of the *operand* selects the *absolute mode* of operation. The complete instruction, **LDA $E000**, means to take whatever value is contained in memory location $E000 (hexadecimal) and place it in the accumulator. With this mode, you can get a byte from anywhere in memory by just specifying its address. This works like Atari BASIC's PEEK function.

Kissin' Cousins

Cousins to the **LDA** opcode are **LDX** and **LDY**, which load the *X* and *Y* registers. Each of these can be used in either the *immediate* or *absolute* modes, and several others as well. We'll be covering the other addressing modes as this series continues.

The STA Instruction

You're now probably asking, what do I do with the number once I've got it in the *accumulator* register? One obvious course is to place it somewhere in memory, which is where the opcodes **STA**, **STX**, and **STY** (**ST**ore **A**ccumulator; **X**-register; **Y**-register in memory) come into play:

STA $2000

means to take the number that's currently in the accumulator and store it in memory location 2000 (hexadecimal). **STA** functions just like BASIC's POKE command, in that a value is placed into a memory location. In fact, BASIC accomplishes POKE with little more than a **LDA** followed by an **STA**.

The Block Move

The 6502 CPU isn't able to move data directly from one memory location to another. Any time data is relocated, it must pass through one of the three registers; *A*, *X*, or *Y*. A routine often used in assembly-language programming is the block move, where a block of data is transferred between different sections of memory. The block move is usually accomplished by using a single **LDA** instruction followed by a single **STA**, plus a couple of *increment instructions* (similar to FOR and NEXT in BASIC), repeated in a loop.

Since a **ST**ore instruction, like the one above, uses a number already loaded into a register, there is no *immediate mode* form of this instruction. **STA** has eight addressing modes, of which the most often used is the *absolute mode*. A special case of this mode is used to access data stored in the first page, or zero page, of memory.

The Zero Page Addressing Mode

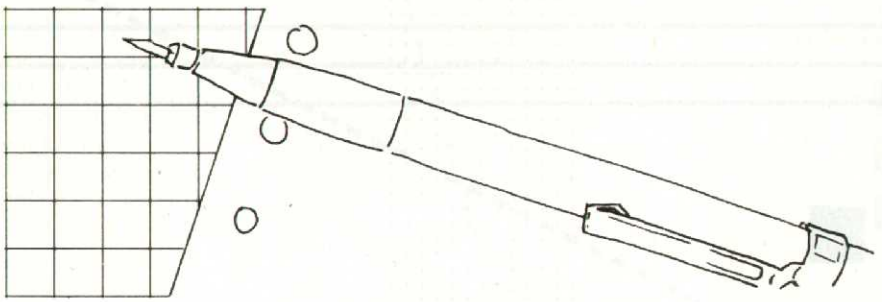
For programming purposes, it is convenient to regard the Atari computer's memory as organized into 256 *pages* or blocks of 256 bytes each. The high byte (the left two hex digits) of an address refer to the page, and the low byte (rightmost two digits) refer to the location within the block. For example, the two-byte address $4000 calls out the first byte of Page 40 hex, and two-byte address $0104 is the fifth byte of Page 1 hex. You must use two bytes to refer to all memory locations in the Atari computer, with the exception of the first 256 memory locations. The first 256 memory locations are called *page Zero* because the high byte is zero. (Remem-

ber, computers start counting at zero, not at one.)

If your program accesses a location anywhere in the first 256 bytes of memory, like **STA $0052**, the assembler automatically uses a form of the *absolute Mode* called *zero Page*. In this case the accessed address doesn't contain a high byte, so you can save a byte in your program by using this mode to tell the CPU that the address is only one byte long, not two. Of course, the **LoaD** instructions have a *zero page* form as well.

The *zero page mode* is the default addressing mode for instructions that have one-byte operands. If you try to use the *immediate mode* and forget to type the # sign, the assembler will interpret the instruction as *zero page mode*, with unexpected results.

You might ask, what good does saving one byte do? Actually, it helps quite a bit. Every little detail must be taken care of by the programmer, and programs in assembly language tend to be a good deal longer than programs that perform similar functions in higher-level languages. When writing for computers with limited RAM (sometimes even 256K isn't enough these days!), it's essential to save every possible byte. Conserving a byte or two wherever possible can also amount to significant improvements in execution speed, especially of commonly-used routines and loops. It's not uncommon for loops in assembly-language programs to repeat many thousands of times. For this reason the Atari Operating System reserves many *zero page* locations for its own use in time-critical I/O routines and the assembler uses still more, leaving precious few for the assembly-language programmer.



Coming Attractions

Now that we've laid the groundwork, we'll actually start programming in assembly language in the next installment.

Be Prepared!

Software

If you don't have an assembler, the *Atari Assembler/Editor* (Atari Corp., cartridge) is an excellent beginner's tool. If you think you'll be getting serious about assembly language programming, the *MAC/65* (Optimized Systems Software, cartridge), though more expensive, is an advanced Editor/Assembler that you can grow with. The programs featured in Computer Classroom will be compatible with both assemblers.

Recommended Reading

One essential Operating System sourcebook is *Mapping the Atari* by Ian Chadwick (COMPUTE! books). Although this book was written before the introduction of the Atari 1200XL™, 600XL™, and 800XL™ computers, most of its well organized and clearly presented material still applies. It's also a good idea to obtain a good reference guide such as *6502 Assembly Language Programming* by Lance Leventhal (Osborne/McGraw-Hill). Later on, you may also need the *Atari Technical Reference Manual* (Atari Corp.).

This is the third installment of Computer Classroom's Introductory Seminar *on Advanced Programming and Assembly Language. In Part One (ATARI CONNECTION, Summer 1984), we discussed the two number systems used in assembly-language programming; binary and hexadecimal. Part Two (ATARI EXPLORER, February 1985) introduced the Atari computer's memory map—the organization of memory into various use-related areas.*

ARRAYS...

CONTINUED FROM 41

This ends our brief exploration of numeric arrays. You may have noticed that we have avoided including the names of the players in our Little League example, or the names of the days of the week in our temperature example. This is because Atari BASIC treats information that uses the letters of the alphabet (known as "strings") quite differently than plain, vanilla numbers. Atari BASIC does not have the ability to work with arrays of strings. We can use other properties of Atari BASIC to simulate string arrays, but rather than go into that here, we'll close this discussion with a summary of what we have learned so far about numeric arrays.

Summing Up Numeric Arrays

- An array enables us to manage a number of variables by using one variable name.
- Arrays may be one- or two-dimensional, and are created with statements of the form **DIM ARRAY(X)** for one-dimensional arrays or **DIM ARRAY(X,Y)** for two-dimensional arrays.
- The array size is one larger than the number used because the computer starts counting at zero.
- Array elements can be used in BASIC statements wherever a simple numeric variable can be used.
- With arrays we will often find it convenient to use FOR/NEXT loops to process all elements or a block of these elements.

Now go to it! You will undoubtedly find many uses for arrays in your own programming. Keep the rules in mind, and the power and utility of arrays will be yours to command.

This article is based on the book Basic Atari BASIC *by James S. Coan and Richard Kushner (Hayden Book Company, Hasbrouck Heights, NJ) available at bookstores and computer stores nation-wide.*

BITS & PIECES

by David Heller

► A Mixed Bag of Tricks

Step right up! Enter this Bits & Pieces *column and witness tricks of the programming trade beyond belief! You'll be mystified as your Disk Operating System is miraculously transformed into a stupendous word processor. Then, watch in amazement as we show you some fancy string magic that helps sort out your programming chores. And, that's not all! Program lines will be deleted, and magically restored, right before your very eyes! Then, if you're an assembly language programmer, you'll be delighted by a short program that miraculously converts complex machine code to data statements in the blink of an eye. Later, those of you who like to delve into higher mathematics will be astounded by a program beyond belief! Yes, right here in this exciting column you'll watch as complex array equations, with up to twenty-six unknowns, are solved in seconds! Our show's grand finale is a kaleidoscope of brilliant color. So, wait no more, step right up, buy a ticket, and let the show begin!*

► You Already Have a Word Processor!

Yes, that's right! If you have a disk drive that includes DOS, you now own an easy-to-use word processor that will come in handy when someone borrows your *AtariWriter* cartridge.

A DOS 2.0 or 2.5 Word Processor

Using DOS 2.0 or 2.5 as a word processor is as easy as saying "abra-cadabra."

1. First, select the COPY function by pressing *C* and RETURN.
2. Next, type **E:,Device:Filename**. Here's an example:

E:,D1:WORDS.TXT

Your disk drive will whirl for a moment as the file name is recorded on your disk.

3. When your disk drive calms down, start writing that great novel or letter. You can edit your text with any of the editing keys. Editing can only be done on each line *before* you press RETURN.
4. When you've finished writing, press the CTRL and *3* keys and your prose is saved on your disk file.

Use the DOS's COPY function to review your text on the screen, or to print it on your printer. Here's how to do this using the above example:

Review text on screen:

To review your text on the screen press *C* to enter the DOS's COPY function, then type **D1:WORDS.TXT,S:**

Press the CTRL and *1* keys to Stop your prose as it scrolls down your screen—Press them again to continue scrolling.

Text to printer:

To print out your text, enter the COPY function, then type **D1:WORDS.TXT,P:**

A DOS 3.0 Word Processor

To use DOS 3.0 as a word processor just follow these step-by-step instructions.

1. Press C to load the COPY utility.
2. Answer *NO* to the question "APPEND (Y/N)?"
3. Enter *E:* when you are asked for the "Source device?"
4. Enter *D1:* in response to "Destination device?" This will set up a file on disk drive #1. If you'd like to use another disk drive, change the "1" to the disk drive of your choice.
5. Enter a file name of your choice when you are asked for the "Destination filename?" This is the name of the text file you'll be saving your prose to.
6. Once you've made all these entries press RETURN when your screen tells you to "Insert destination disk and press RETURN."
7. Your screen will clear, and the cursor will wait for you at the upper left hand corner of the screen. Now, you're ready to start writing!

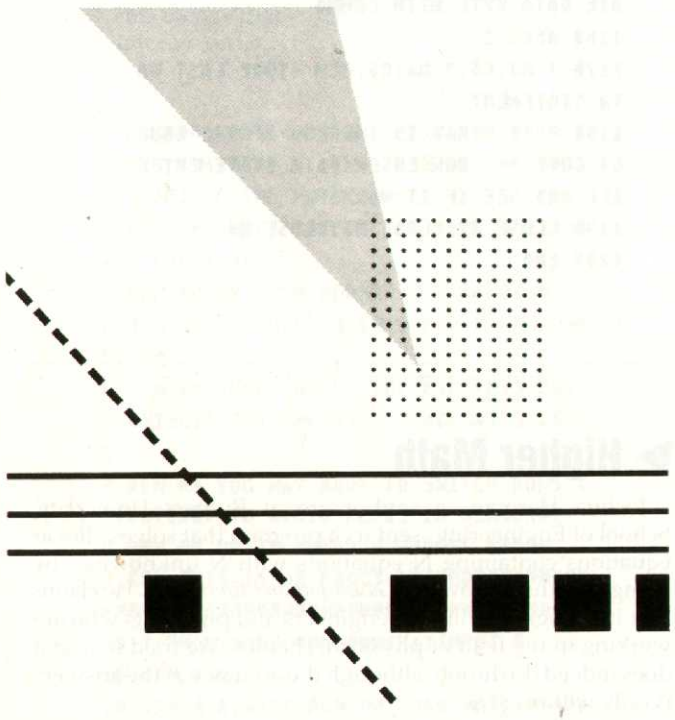
Use the keyboard's editing keys to edit your text. Editing can only be done *before* you press RETURN at the end of a line or paragraph.

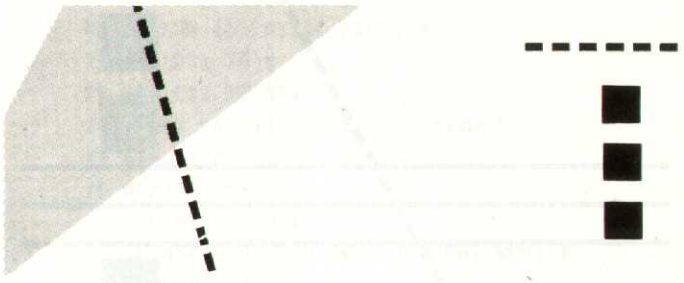
8. When you've finished writing, press the CTRL and 3 keys and your writing is saved on the file you've created on your disk.
9. Use the COPY utility to review your writing on the screen, or to print it on your printer.

Helpful Hints

Because your DOS word processor does not wrap words around at the end of each line, centering and lining-up text in columns is easy. What you see on your screen is what is printed out! With a little practice you'll be able to create some pretty fancy documents.

If you'd like to do some additional editing, just load your text file into *AtariWriter*. This lets you move paragraphs, change words, and do all the fancy things. But your built-in word processor is just right for notes on the fly!





▶ The Santiago Deleter

Pablo Larrain who lives in Santiago, Chile, South America, has devised a spicy way to delete unwanted program lines, and as a bonus, his program also allows you to save those deleted lines on a disk file if you ever need them again.

Another super-feature of Pablo's program is that it can delete itself after you've finished with it!

If you've got a disk drive, and a few minutes to type in this

```
30000 REM *** DELETER ***
30010 PRINT CHR$(125):PRINT "FIRSTLINE
,LASTLINE TO DELETE";
30020 INPUT FL,LL
30030 PRINT "INCREMENT";
30040 INPUT I
30050 LIST "D:SAVER",FL,LL:OPEN #1,8,0
,"D:DEL"
30060 FOR X=FL TO LL STEP I
30070 PRINT #1;X:REM RECORDS THE LINE
NUMBERS TO BE DELETED
30080 NEXT X
30090 CLOSE #1
30100 ENTER "D:DEL"
```

Using The Santiago Deleter

After you type in the Santiago Deleter, LIST it to a disk file like this:

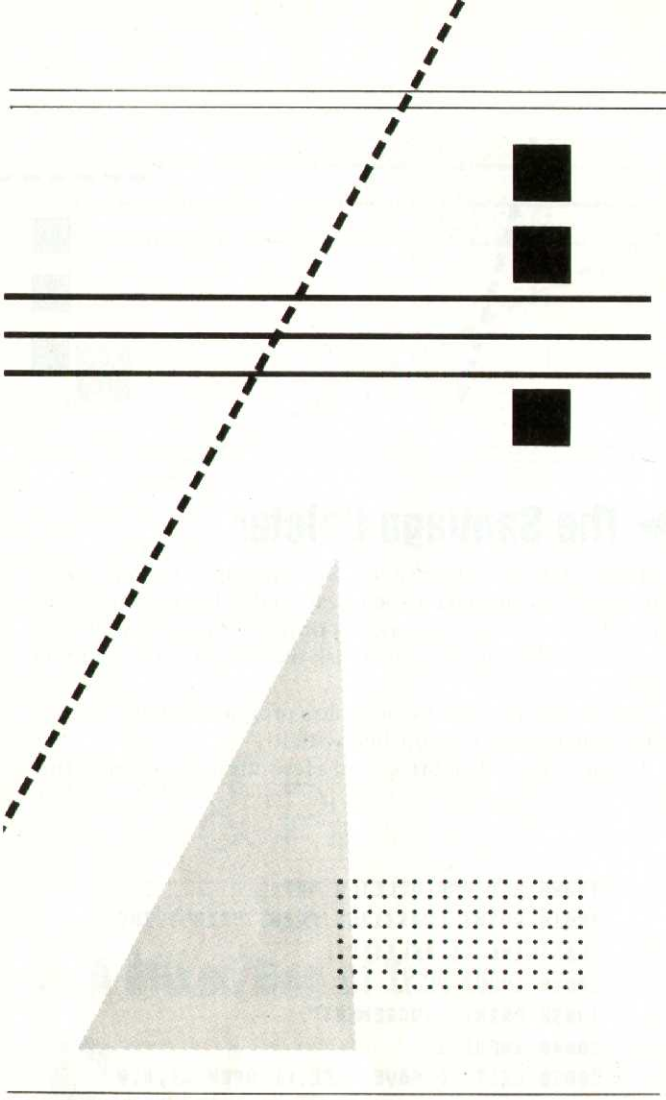
LIST "D:DELETER" [RETURN]

When you want to use Pablo's program just ENTER it into the program you want to edit like this:

ENTER "D:DELETER" [RETURN]

Type **GOTO 30000** and you'll be asked for the first and last line numbers you want to delete. Enter your choices, separated by a comma. Then you'll be asked for the spacing between lines. If your program lines are incremented by 10's, for example, just enter the number 10 and press RETURN. That's all there is to it! The program LISTs all the program lines it's going to delete to a new file named "SAVER" for future reference, opens a file named "DEL" that stores the line numbers you want to delete, then reenters the "DEL" file into your program to make the actual line deletions. Mucho spicy—no?

CONTINUED



► Attention Assembly Language Programmers!

David D. Bowman of Twin Falls, Idaho has been writing lots of programs in BASIC that use the **USR** statement to call in a machine language routine. He writes his machine language code with his *Atari Assembler Editor*, then uses a program he's developed called "OBJDATA" to convert this code to a series of numbered DATA statements for inclusion in his BASIC program.

David's program is the shortest, and easiest one of its type we've seen yet. And it's real easy to use!

It asks you for the "OBJECT CODE FILENAME," then for the "DATA STATEMENT FILENAME" you've chosen to store the DATA statements to. After you supply this information, you'll be asked if you want to watch the DATA statements being formed on your screen (E:), or printed on your printer (P:) as they are LISTed on your disk file.

After you've supplied this information, David's program takes over, and makes a file full of DATA statements that you can ENTER into your BASIC program.

David told us that he developed OBJDATA after he "got tired of converting all that hexadecimal assembly language code to DATA by hand." David's program has saved him lots of time, and is guaranteed to cut down on your work load too.

```
1000 DIM A$(99),B$(99),C$(99),D$(99),V
I$(10)
1010 ? "WHAT IS THE OBJECT CODE FILENA
ME      (INCLUDE D:)":INPUT A$
1020 ? "WHAT IS DATA STATEMENT FILENAM
E       (INCLUDE D:)":INPUT B$
1030 ? " SEND MIRROR IMAGE TO E: OR P:
":INPUT VI$
1040 OPEN #2,4,0,A$:REM OBJECT CODE FI
LE
1050 OPEN #3,8,0,B$:REM DATA STATEMENT
 FILE
1060 OPEN #4,8,0,VI$:REM MIRROR DATA T
O SCREEN OR PRINTER
1070 TRAP 1170:C$="1 REM LOCATION & LE
NGTH BYTES ":REM GET LOCATION & LENGTH
 BYTE
1080 FOR W=1 TO 6:GET #2,Q:D$=STR$(Q):
C$(LEN(C$)+1)=D$:D$=",":C$(LEN(C$)+1)=
D$:NEXT W:? #3;C$:? #4;C$:W=1
1090 W=W+1:C$=STR$(W):D$=" DATA ":C$(L
EN(C$)+1)=D$:REM GET UP TO 20 LINES OF
 DATA STATEMENTS
1100 FOR Z=1 TO 10:REM GET 10 BYTES OF
 DATA PER LINE
1110 GET #2,Q:REM GET A BYTE OF OBJECT
 CODE
1130 D$=STR$(Q):C$(LEN(C$)+1)=D$:REM A
DD LAST BYTE GOTTEN TO DATA STATEMENT
1140 IF Z=10 THEN ? #3;C$:? #4;C$:GOTO
 1090:REM STORE DATA STATEMENT & START
 NEXT ONE
1150 D$=",":C$(LEN(C$)+1)=D$:REM SEPAR
ATE DATA BYTE WITH COMMA
1160 NEXT Z
1170 ? #3;C$:? #4;C$:REM STORE LAST DA
TA STATEMENT
1180 ? :? "THAT IS THE END OF THE OBJE
CT CODE --- NOW ENTER DATA STATEMENT F
ILE AND SEE IF IT WORKS"
1190 CLOSE #2:CLOSE #3:CLOSE #4
1200 END
```

► Higher Math

Joshua Herman, a sophomore at Rutgers University, School of Engineering, sent us a program that solves "linear equations containing N equations with N unknowns," by using a method known as *Gauss-Jordan Elimination*. He claims that his program will help engineers and physicists who are working in the field of physic mechanics. We tried it, and it does indeed do the job, although the accuracy of the answers is only within .01%.

Here's an example of the type of problem that Joshua's program solves:

2A + B + C = 7
A + 2B + C = 8
B + C = 5

The answer here is A = 1, B = 2, and C = 3. But, when you enter this problem into Joshua's program you'll get an answer that has not been rounded off.

Using The Gauss-Jordan Program

After you run Joshua's Gauss-Jordan program you'll be asked "How many unknowns?" In the above example you would enter 3 (the three unknowns are A, B, and C).

Next, you'll be asked to enter numbers into the elements of array **A(X,X)**. Working from left to right, enter each of the coefficients, and the constant that follows the equal sign.

In the above example you'd enter,

2 [RETURN]
1 [RETURN]
1 [RETURN]
7 [RETURN]

for the information on the first row of the equation. The last row would be entered like this:

0 [RETURN]
1 [RETURN]
1 [RETURN]
5 [RETURN]

The computer goes to work after you've entered the problem, and when it's finished calculating, displays the answer on the screen.

Since the answer is displayed using the letters of the alphabet, from A to Z, use these letters, from left to right, when you write down your problem. For example, one line of a longer equation might look like this:

2A + B + 3C + D − 7E = 20

One word of caution: When "0" is one element of your equation, you *might* be asked by the program to "SWITCH ROWS." This means that you'll have to reenter the problem in a different row order.

```
1 REM ** GAUSS-JORDAN  ELIMINATION**
2 REM ** INPUT N (THE SIZE OF THE SQUA
RE PART OF THE MATRIX)**
3 REM ** INPUT COEFFICIENTS(BY HORIZON
TAL ROWS) **
4 REM ** BY JOSH HERMAN   9/30/84**
5 REM ** TO SOLVE N EQ'S FOR N UNKNOWN
S, **
6 REM ** INPUT ONLY  COEFFICIENTS AND
CONSTANTS INTO MATRIX, (INCLUDING ZERO
S)
7 REM ** YOU MAY HAVE TO SWITCH ROWS (
PIVOTING) TO AVOID ZEROS IN DIAGONAL.
8 REM ** OR TO AVOID ROUNDOFF ERROR
9 REM THIS IS AN EXACT METHOD**********
**************************************
10 ? "How many unknowns";:INPUT N
15 DIM X(N)
20 DIM A(N,N+1):REM ** LOAD MATRIX AND
 CHECK FOR ESSENTIAL PIVOTING
21 FOR D=1 TO N
22 FOR E=1 TO N+1
23 PRINT "A(";D;",";E;")=";:INPUT A
24 A(D,E)=A
25 NEXT E:NEXT D
26 FOR PIV=1 TO N
27 IF A(PIV,PIV)=0 THEN ? "ROWS MUST B
E CHANGED":STOP
28 IF ABS(A(PIV,PIV))<0.01 THEN ? "CHA
NGE ROWS TO REDUCE ROUNDOFF ERROR"
29 NEXT PIV:REM ** PROGRAM STARTS HERE
***
30 FOR R=1 TO N
40 B=A(R,R)
50 FOR J=1 TO N+1
60 A(R,J)=A(R,J)/B:NEXT J
70 FOR I=1 TO N
80 C=A(I,R)
90 IF I=R THEN GOTO 121
100 FOR J=1 TO N+1
110 A(I,J)=A(I,J)-A(R,J)*C
120 NEXT J
121 NEXT I
122 NEXT R
130 FOR L=1 TO N
140 X(L)=A(L,N+1):PRINT CHR$((L+64));"
=";X(L):NEXT L
150 END
```

▶ Kaleidoscope

To brighten things up, we've decided to end this column with a short graphics demo called "Kaleidoscope" that was submitted by thirteen-year-old Rafael Soriano of Pasadena, California.

We receive lots of short routines that draw interesting patterns on the screen. But Rafael's Kaleidoscope is easy to understand, creates exciting patterns in either Graphics mode 11 or 9, is lots of fun to modify, and is very pleasing to the eye.

```
10 REM Kaleidoscope, by Rafael Soriano
20 A=1
30 GR. 11
40 FOR B=1 TO 79
50 A=A+1:IF A>9 THEN A=1
60 COLOR A
70 PLOT B,C:DRAWTO 79-B,C
80 PLOT B,C:DRAWTO 79-B,190-C
90 PLOT B,190-C:DRAWTO 79-B,190-C
100 PLOT B,190-C:DRAWTO 79-B,C
110 C=C+6:IF C>190 THEN C=0
120 NEXT B:A=A+1:GOTO 20
```

M.A.C.E.—Michigan Atari Computer Enthusiasts

By David and Dorothy Heller

Just five years ago, in May 1980, a small group of Detroit area computer pioneers headed by Arlan Levitan, decided to meet once a month at a local computer store. "We'd sit around, drink coffee, swap information, and play with the computers," says Kirk Revitzer, the group's current president. "It was informal and intimate. Back then, if someone had said that our small group would grow to 1000 members and hold meetings in a large auditorium at the Southfield Michigan Civic Center, he would have been laughed out of the store."

M.A.C.E.'s growth has been phenomenal. Part of the group's success can be attributed to the broad acceptance of Atari's personal computers, but most of the credit has to go to the group's leadership and members who have made sure that M.A.C.E. provides a forum for the meaningful exchange of useful information.

Spreading the Word

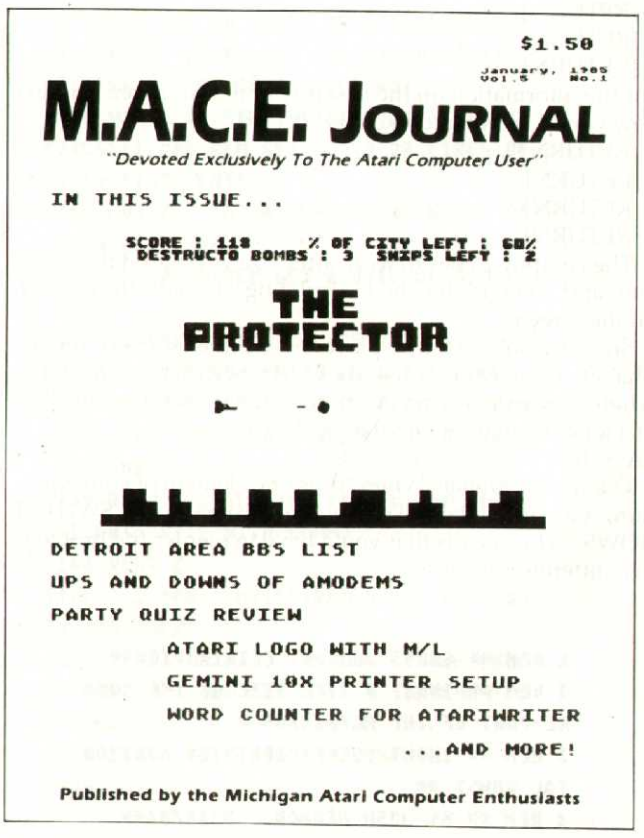
Communicating ideas and disseminating information at M.A.C.E. takes many forms that not only benefits group members, but the entire Atari community at large.

Monthly Meetings

Monthly meetings, usually attended by more than three-hundred members, form the nucleus of the Group's activities. Here, members of all ages gather to expand their Atari horizons.

Giving members time to make copies of the group's extensive public domain software library is the first order of business. When the disks stop whirling, a question and answer session covers topics as varied as the internal wiring of the computer to telecomputing (one of the most popular topics). The atmosphere is friendly and relaxed, geared toward helping the new Atari computer owners derive the maximum benefit from their machines.

"Demo time" is the center piece of each meeting. During this session, commercial and member-contributed software is projected on a giant ten-foot overhead screen. When the meeting breaks up, the demos are given to lucky members as door prizes. From time to time, software or hardware vendors visit a meeting to display their wares, answer questions, and frequently offer the club's members special group discounts.



To wrap up each meeting, the members of M.A.C.E.'s Special Interest Groups (SIGs) get together. SIGs typically meet on their own schedule in one of the member's houses, and the monthly meeting at the Civic Center gives them another chance to exchange information and plan their group's activities. Today, M.A.C.E. SIGs help members learn more about assembly language; telecomputing; Atari music (based on *Advanced Music Player*, an APX program); graphics; hardware; and computer literacy for new Atari computer owners.

You don't have to live in the Detroit area to benefit from M.A.C.E. membership. The *Journal*, the group's slick monthly magazine, provides product reviews, program list-

ings, M.A.C.E. information, and 'how to do it' articles to *all* its members, whether they live out-of-state or in a foreign country.

Telecomputing Trail-Blazers

M.A.C.E. members are telecomputing trail-blazers, and one member, Jim Steinbrecher, has led the way. He wrote the original AMIS electronic bulletin board (Atari Message and Information Service), then turned his talents to writing a number of popular terminal programs including MINIATERM; AMISTERM; and AMODEM, a sophisticated terminal program that guarantees error-free file transfer by checking each bit of information as it's transmitted. Jim hasn't rested on his laurels. His latest telecomputing marvels include DISKTRANSFER, a program that allows an entire 720 sector disk to be transferred between two Atari computers, and a version of AMODEM for use with Atari's 835 and 1030 modems.

Jim, like many other M.A.C.E. members, operates his own electronic bulletin board, the ARCADE BBS. If you've got a modem, and would like to log on, just call ARCADE at 313-978-8087.

Kirk Revitzer, the group's current president, operates a newer version of AMIS. He calls his BBS, "THE TRADING POST," because you can trade information, ideas, hardware, and software on his system in either 300 or 1200 baud. Dial 313-882-5909 to chat with Kirk.

Other members who run their own bulletin boards include:

- Club Vice President, Alva Thomas: DART BOARD BBS—313-538-0197.
- Disk Librarian, Dave Zappa: FREEDOM BOARD BBS—313- 771-4126.
- Recording Secretary, Dino Roggero: ETHERNET BBS (The original 1200 baud AMIS BBS)—313-531-1701.

M.A.C.E.'s Bulletin Boards and Hot-Line

The M.A.C.E. group operates two 24-hour bulletin boards and a telephone voice hot-line that are loaded with club information:

- Hot Line: 313-882-7104
- MACE BBS: 313-978-1685 (Mike Lechkum, Systems Operator)
- MACE WEST BBS: 313-582-0657 (Managed by Systems Operator Sharie Middlebrook—300/1200 baud operation.)

Start Your Own BBS With Help From M.A.C.E.

You don't have to be a M.A.C.E. member to start your own AMIS BBS. Just mail a check or money order for $5 to the Disk Librarian at the P.O. Box address listed at the end of this article, request "DISK Q," and you'll be up and running.

More Benefits of Membership

A $20 per year membership gets you a one-year subscription to the *Journal*, access to the club's eighty-five-disk public domain software library (more than 1000 programs), and enables you to take advantage of many cost saving group purchase offers.

The club's extensive software library includes arcade and adventure games, science programs, productivity software, computer utilities, and the latest telecomputing software.

A catalog of public domain software is available to *members only* for $1. The catalog includes a description of each program, the language it's written in, and rates each program's quality on a scale from 1 to 10.

Your Most Important Peripheral

A *M.A.C.E. Journal* editorial says that this club is "the most important peripheral you'll ever own." This holds true for all Atari Users' groups like M.A.C.E., who are dedicated to providing you with the finest Atari user support system available.

Vital Statistics

If you would like to become a M.A.C.E. member, receive their magazine, or participate in their Software Exchange Program, write:

Michigan Atari Computer Enthusiasts
P.O. Box 2785
Southfield, Mich 48037

If you have a modem, and want to chat with M.A.C.E., call either 313-978-1685, or 313-582-0675.

Hangman: The M.A.C.E. Version

Jim Wilson has written perhaps the best computerized *Hangman* we've seen. As you play against the computer, the letters you've already used are deleted from the display. At the end of each round your score and the computer's are displayed. Jim's computer adaptation is actually lots more fun to play than the traditional paper-and-pencil version.

Room has been left in the program, in lines 2040-2990, to allow you to insert your own words by entering additional DATA statements. Just make sure that the last DATA statement is the same as current line 2990; **DATA ******. The four asterisks act as a *flag* to tell the program that it's reached the end of the data.

```
10 REM HANGMAN 1.5
20 REM by Jim Wilson
30 REM (C) 1983 Wilson Software
40 REM Berkley, Mi
50 REM All rights reserved
60 REM Provided to ATARI EXPLORER
      courtesy of
70 REM M.A.C.E.
80 REM The Michigan Atari Computer
      Enthusiasts
90 REM
100 DIM ALPHABET$(26),ANSWER$(10),BODY
$(23),CHECK$(10),L$(1),NAME$(10),TYPE$
(13),UNUSED$(26),WORD$(26)
110 TYPE$="BY JIM WILSON"
120 GRAPHICS 17
130 POKE 53774,112:POKE 16,112
```

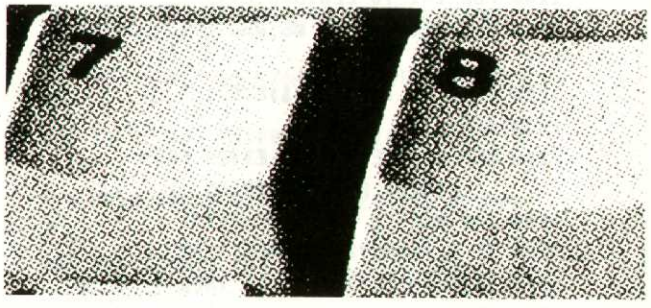
CONTINUED

```
140 POKE 712,50:POKE 708,58
150 FOR DELAY=1 TO 100:NEXT DELAY
160 X=0:Y=0
170 POSITION X,Y:? #6;"N":GOSUB 470:PO
SITION X,Y:? #6;" "
180 IF Y=10 THEN POSITION X,Y:? #6;"N"
:X=14:Y=0:GOSUB 560:GOTO 200
190 X=X+1:Y=Y+1:GOTO 170
200 POSITION X,Y:? #6;"H":GOSUB 470:PO
SITION X,Y:? #6;" "
210 IF Y=10 THEN POSITION X,Y:? #6;"H"
:X=2:Y=20:GOSUB 560:GOTO 230
220 X=X-1:Y=Y+1:GOTO 200
230 POSITION X,Y:? #6;"1":GOSUB 470:PO
SITION X,Y:? #6;" "
240 IF Y=10 THEN POSITION X,Y:? #6;"1"
:X=18:Y=20:GOSUB 560:GOTO 260
250 X=X+1:Y=Y-1:GOTO 230
260 POSITION X,Y:? #6;"M":GOSUB 470:PO
SITION X,Y:? #6;" "
270 IF Y=10 THEN POSITION X,Y:? #6;"M"
:X=16:Y=20:GOSUB 560:GOTO 290
280 X=X-1:Y=Y-1:GOTO 260
290 POSITION X,Y:? #6;"N":GOSUB 470:PO
SITION X,Y:? #6;" "
300 IF Y=10 THEN POSITION X,Y:? #6;"N"
:X=15:Y=0:GOSUB 560:GOTO 320
310 X=X-1:Y=Y-1:GOTO 290
320 POSITION X,Y:? #6;"A":GOSUB 470:PO
SITION X,Y:? #6;" "
330 IF Y=10 THEN POSITION X,Y:? #6;"A"
:X=3:Y=20:GOSUB 560:GOTO 350
340 X=X-1:Y=Y+1:GOTO 320
350 POSITION X,Y:? #6;".":GOSUB 470:PO
SITION X,Y:? #6;" "
360 IF Y=10 THEN POSITION X,Y:? #6;"."
:X=0:Y=1:GOSUB 560:GOTO 380
370 X=X+1:Y=Y-1:GOTO 350
380 POSITION X,Y:? #6;"A":GOSUB 470:PO
SITION X,Y:? #6;" "
390 IF Y=10 THEN POSITION X,Y:? #6;"A"
:X=4:Y=20:GOSUB 560:GOTO 410
400 X=X+1:Y=Y+1:GOTO 380
410 POSITION X,Y:? #6;"S":GOSUB 470:PO
SITION X,Y:? #6;" "
420 IF Y=10 THEN POSITION X,Y:? #6;"S"
:X=17:Y=20:GOSUB 560:GOTO 440
430 X=X+1:Y=Y-1:GOTO 410
440 POSITION X,Y:? #6;"G":GOSUB 470:PO
SITION X,Y:? #6;" "
450 IF Y=10 THEN POSITION X,Y:? #6;"G"
:GOSUB 560:GOTO 480
460 X=X-1:Y=Y-1:GOTO 440
470 RETURN
480 X=3:Y=12
490 FOR DELAY=1 TO 50:NEXT DELAY
500 GOSUB 3000
510 FOR I=1 TO LEN(TYPE$)
520 POSITION X,Y:? #6;TYPE$(I,I):X=X+1
530 IF TYPE$(I,I)=" " THEN GOSUB 580:N
EXT I
540 GOSUB 570:NEXT I
550 GOTO 590
560 FOR V=14 TO 0 STEP -0.5:SOUND 0,13
,4,V:NEXT V:RETURN
570 FOR V=14 TO 0 STEP -1:SOUND 0,13,4
,V:NEXT V:RETURN
580 FOR DELAY=1 TO 14:NEXT DELAY:RETUR
N
590 GRAPHICS 1:POKE 710,50:POKE 712,50
:POKE 708,58:YOU=0:ME=0
600 POKE 16,112:POKE 53774,112
610 POSITION 4,10:? #6;"HANGMAN 1.5":P
OSITION 3,12:? #6;"BY JIM WILSON"
620 Z=INT(32*RND(0)+1):RESTORE 2010:X=
INT(50*RND(0)+1)
630 ? " ENTER YOUR FIRST NAME "
640 INPUT NAME$
650 POKE 709,2
660 FOR I=1 TO X
670 READ WORD$
680 A=1
690 IF WORD$="****" THEN RESTORE 2010:
X=INT(50*RND(0)+1):GOTO 660
700 NEXT I
710 GOTO 790
720 FOR I=1 TO X
730 READ WORD$
740 IF WORD$="****" THEN RESTORE 2010:
X=INT(50*RND(0)+1):GOTO 720
750 NEXT I
760 ALPHABET$=""
770 A=1
780 IF WORD$="****" THEN RESTORE 2010:
X=INT(50*RND(0)+1):GOTO 720
790 GRAPHICS 1
800 POKE 16,112:POKE 53774,112
810 REM INITIALIZE REMAINING LETTERS
      STRING
820 UNUSED$="ABCDEFGHIJKLMNOPQRSTUVWXY
Z"
830 POKE 708,154:POKE 710,144:POKE 712
,144
840 POSITION 1,0:? #6;NAME$;"'S HANGMA
N"
850 POSITION 0,1:? #6;"_____
_____"
860 POSITION 13,2:PRINT #6;"SCORE"
```

```
870 POSITION 13,4:? #6;"YOU ";YOU:POSI
TION 14,5:? #6;"ME ";ME
880 POSITION 1,3:? #6;"******"
890 POSITION 1,4:? #6;"*     !"
900 FOR I=5 TO 14
910 POSITION 1,I:? #6;"*"
920 NEXT I
930 POSITION 0,15:? #6;"***"
940 POSITION 0,16:? #6;"***"
950 POSITION 12,9:? #6;"LETTERS"
960 POSITION 11,10:? #6;"REMAINING"
970 POSITION 11,11:? #6;"----------"
980 POSITION 11,12:? #6;"ABCDEFGHI":PO
SITION 11,13:? #6;"JKLMNOPQR":POSITION
 11,14:? #6;"STUVWXYZ"
990 REM PRINT BLANK SPACES
1000 POSITION 0,18:FOR I=1 TO LEN(WORD
$):? #6;"_ ";:NEXT I
1010 REM INITIALIZE CHECK WORD LENGTH
1020 FOR I=1 TO LEN(WORD$):CHECK$(I,I)
="*":NEXT I:ANSWER$=WORD$
1030 C=0
1040 POKE 752,1:? :? :? " GUESS A LETT
ER "
1050 POKE 709,10:POKE 752,1:CLOSE #1
1060 POKE 764,255
1070 OPEN #1,4,0,"K:"
1080 GET #1,L
1090 POKE 709,1
1100 GOSUB 1970
1110 IF  NOT (OK) THEN 1050
1120 L$=CHR$(L)
1130 IF L$="" THEN 1050
1140 REM REMOVE INPUT LETTER FROM
        REMAINING LETTER STRING
1150 FOR I=1 TO LEN(UNUSED$)
1160 IF UNUSED$(I,I)=L$ THEN UNUSED$(I
,I)=" ":GOTO 1180
1170 NEXT I
1180 REM REMOVE INPUT LETTER FROM
        STRING
1190 D=11:E=12
1200 FOR I=1 TO LEN(UNUSED$)
1210 POSITION D,E:? #6;UNUSED$(I,I):D=
D+1
1220 IF D=20 THEN D=11:E=E+1
1230 NEXT I
1240 REM REMOVE INPUT LETTER FROM
        INPUT REJECT STRING
1250 FOR M=1 TO LEN(ALPHABET$)
1260 IF ALPHABET$="" THEN 1290
1270 IF ALPHABET$(M,M)=L$ THEN ? "R":G
OTO 1050
1280 NEXT M
1290 REM CHECK WORD FOR INPUT LETTER
1300 C=C+1
1310 B=0
1320 FOR I=1 TO LEN(WORD$)
1330 IF WORD$(I,I)=L$ THEN B=1:GOTO 15
70
1340 NEXT I
1350 IF B=0 THEN 1370
1360 GOTO 1050
1370 REM HANGMAN CHARACTER
1380 BODY$="/-\(^.^)\_/!!!!)--(/\\/"
1390 ON A GOTO 1410,1440,1470,1490,151
0,1530
1400 REM HEAD
1410 POSITION 5,5:? #6;BODY$(1,3):POSI
TION 4,6:? #6;BODY$(4,8):POSITION 5,7:
? #6;BODY$(9,11):A=A+1
1420 GOSUB 1920:GOTO 1050
1430 REM BODY
1440 POSITION 6,8:? #6;BODY$(12,12):PO
SITION 6,9:? #6;BODY$(13,13):POSITION
6,10:? #6;BODY$(14,14):POSITION 6,11:?
 #6;BO
1450 A=A+1:GOSUB 1920:GOTO 1050
1460 REM LEFT ARM
1470 POSITION 4,9:? #6;BODY$(16,17):A=
A+1:GOSUB 1920:GOTO 1050
1480 REM RIGHT ARM
1490 POSITION 7,9:? #6;BODY$(18,19):A=
A+1:GOSUB 1920:GOTO 1050
1500 REM LEFT LEG
1510 POSITION 5,12:? #6;BODY$(20,20):P
OSITION 4,12:? #6;BODY$(21,21):A=A+1:G
OSUB 1920:GOTO 1050
1520 REM RIGHT LEG
1530 POSITION 7,12:? #6;BODY$(22,22):P
OSITION 8,12:? #6;BODY$(23,23):A=A+1
1540 POKE 709,10:POKE 752,1:? :? :? :?
 "SORRY, YOU HAVE BEEN HANGED."
1550 ? "THE CORRECT WORD WAS ";ANSWER$
;".":ME=ME+1:POSITION 17,5:? #6;ME:GOS
UB 3000
1560 GOTO 1760
1570 REM PLACE CORRECT LETTERS
1580 ON I GOTO 1590,1600,1610,1620,163
0,1640,1650,1660,1670,1680
1590 POSITION 0,18:? #6;WORD$(I,I):GOS
UB 1870:GOSUB 1700:GOTO 1340
1600 POSITION 2,18:? #6;WORD$(I,I):GOS
UB 1870:GOSUB 1700:GOTO 1340
1610 POSITION 4,18:? #6;WORD$(I,I):GOS
UB 1870:GOSUB 1700:GOTO 1340
1620 POSITION 6,18:? #6;WORD$(I,I):GOS
```

CONTINUED

```
UB 1870:GOSUB 1700:GOTO 1340
1630 POSITION 8,18:? #6;WORD$(I,I):GOS
UB 1870:GOSUB 1700:GOTO 1340
1640 POSITION 10,18:? #6;WORD$(I,I):GO
SUB 1870:GOSUB 1700:GOTO 1340
1650 POSITION 12,18:? #6;WORD$(I,I):GO
SUB 1870:GOSUB 1700:GOTO 1340
1660 POSITION 14,18:? #6;WORD$(I,I):GO
SUB 1870:GOSUB 1700:GOTO 1340
1670 POSITION 16,18:? #6;WORD$(I,I):GO
SUB 1870:GOSUB 1700:GOTO 1340
1680 POSITION 18,18:? #6;WORD$(I,I):GO
SUB 1870:GOSUB 1700:GOTO 1340
1690 REM REPLACE CORRECTLY GUESSED
        LETTER WITH CHECK CHARACTER
1700 WORD$(I,I)="*"
1710 IF WORD$=CHECK$ THEN POP :GOTO 17
30
1720 RETURN
1730 FOR DELAY=1 TO 25:NEXT DELAY
1740 FOR I=1 TO 8:FOR V=15 TO 0 STEP -
1:SOUND 0,26,10,V:NEXT V:NEXT I
1750 ? :? :? "VERY GOOD, YOU GUESSED T
HE WORD!":YOU=YOU+1:POSITION 17,4:? #6
;YOU:POKE 709,10
1760 POKE 752,0:? :? "DO YOU WANT TO P
LAY AGAIN?";:CLOSE #1:GOSUB 3080
1770 L$=CHR$(L)
1780 IF L$="Y" THEN CHECK$="":ALPHABET
$="":Z=INT(32*RND(0)+1):RESTORE 2010:X
=INT(50*RND(0)+1):GOTO 720
1790 IF L$="N" THEN 1820
1800 ? :? :? :? :POKE 709,10
1810 GOTO 1760
1820 ? :? :? :? :? :? "DOES ANOTHER PE
RSON WANT TO PLAY?";:POKE 709,10:CLOSE
 #1:GOSUB 3080
1830 L$=CHR$(L)
1840 IF L$="Y" THEN ALPHABET$="":CHECK
$="":GOTO 590
1850 IF L$="N" THEN GRAPHICS 0:END
1860 ? :? :? :GOTO 1820
1870 SOUND 1,60,10,15
1880 FOR K=1 TO 25:NEXT K
1890 SOUND 1,0,0,0
1900 ALPHABET$(C)=L$
1910 RETURN
1920 SOUND 1,40,12,15
1930 FOR K=1 TO 25:NEXT K
1940 SOUND 1,0,0,0
1950 ALPHABET$(C)=L$
1960 RETURN
1970 REM SUBROUTINE TO CHECK INPUT
        LETTER IS A TO Z
1980 OK=0
1990 IF L<65 OR L>90 THEN RETURN
2000 OK=1:RETURN
2010 DATA HOUSE,BANANA,HAMBURGER,BOOK,
BICYCLE,CHICKEN,SCHOOL,NECKLACE,THUNDE
R,GARAGE,AUTOMOBILE,TELEVISION
2020 DATA CABBAGE,FAMILY,STEREO,JACKET
,SLIPPERY,LAWNMOWER,ELEPHANT,ROBE,ELEV
ATOR,PRINCESS,STOMACH,LIZARD,CAT
2030 DATA SUGAR,MUSTARD,ENVELOPE,COVER
,CUCUMBER,BUSH,NEWSPAPER,SLIPPERS,CATS
UP,TOMATO,WRIST,SLEEVE,PICTURE
2040 DATA LIGHTNING,STOVE,HANGMAN,TRAI
N,COW,SWING,CHAIR,QUEEN,YELLOW,COUCH,A
WNING,FENCE,COMPUTER,MICROWAVE
2050 REM ----------------------------
2060 REM Enter your own words here.
        Make sure that the final
       data statement is "DATA ****"
2070 REM ----------------------------
2990 DATA ****
3000 RESTORE 3130
3010 READ PITCH,DURATION,REST
3020 POKE 540,DURATION
3030 IF PITCH=-1 THEN RETURN
3040 SOUND 0,PITCH,10,8
3050 IF PEEK(540)=0 THEN SOUND 0,0,0,0
:GOTO 3070
3060 GOTO 3040
3070 POKE 540,REST:GOTO 3010
3080 POKE 764,255
3090 OPEN #1,4,0,"K:"
3100 GET #1,L
3110 POKE 709,1
3120 RETURN
3130 DATA 204,36,9,204,36,9,217,12,9,2
04,36,9,173,36,9,182,12,9,182,36,9,204
,12,9,204,36,9,217,12,9,204,42,9,-1
3140 DATA 0,0
```



CONTINUED FROM 12

COMPUTER WIZARDS
530 South Dobson Road #359
Mesa, AZ 85202

NORTH WEST PHOENIX ATARI CONNECTION
P.O. Box 36364
Phoenix, AZ

NORTH WEST PHOENIX ATARI CONNECTION
P.O. Box 36364
Phoenix, AZ 80000

CALIFORNIA

ATARI ANONYMOUS
9616 Lemon Avenue
Alta Loma, CA 91701

VICTOR VALLEY ACE
16190 Wimbleton Drive
Victorville, CA 92392

BAKERSFIELD ATARI COMPUTER ENTHUSIASTS
3712 Rickey Way
Bakersfield, CA 93309

LOWELL ATARI USERS' CLUB
1655 47th Avenue
San Francisco, CA 94112

SAN LEANDRO COMPUTER CLUB FOR ATARI
P.O. Box 1525
San Leandro, CA 94577-0152
1st Tues.

AROUND HERE ATARIANS
226 Palm Drive
Piedmont, CA 94610

VAL-NAP ATARI COMPUTER USERS'
2291 Sacramento Street
Vallejo, CA 94590

CORDELIA AREA COMPUTER GROUP
572 Silverado Circle
Cordelia Village, CA 94585

NAPA ATARI PROGRAMMING ASSOCIATION
2141 Shurtleff Avenue
Napa, CA 94559

DIABLO VALLEY ATARI USERS' GROUP
1404 Noia Avenue
Antioch, CA 94509

LIVERMORE ATARI USERS' GROUP
4382 Arabian Road
Livermore, CA 94550
2nd Tues.

MARE ISLAND 3D COMPUTER GROUP
723 Cypress Circle
Fairfield,CA 94533

BAY AREA ATARI USERS' GROUP
P.O. Box 50459
Palo Alto, CA 94303
1st Mon.

S.F. CHIPS
100 Lake Street, Apt. 2
San Francisco, CA 94118

SALINAS VALLEY ATARI COMPUTER ENTHUSIASTS
Russell Road, #98
Salinas, CA 93906

FRESNO ATARI COMPUTER SECTOR
834 West Street
Sanger, CA 93657

FRESNO ATARI COMPUTER ENTHUSIASTS
2530 W. Alamos
Fresno, CA 93705

C.A.U.C.U.S.
P.O. Box 15201
Fresno, CA 93702

SANTA MARIA/LOMPOC ATARI USERS' GROUP
P.O. Box 2286
Orcutt, CA 93455

THE WINDHOVER PROJECT
P.O. Box 5370
Vandenberg AFB, CA 93437

S.L.O. POKES ATARI COMP USERS' GROUP
P.O. Box 4156
San Luis Obispo, CA 93403

KERN VALLEY ATARI USERS' GROUP
P.O. Box 1833
Lake Isabella, CA 93240

VENTARI
1569 Raccoon Court
Ventura, CA 93003

ATARI HACKERS ANONYMOUS (A-HA)
365 Hillsboro Way
Goleta, CA 93117

SANTA BARBARA ATARI ENTHUSIASTS
5386 Ogan Road
Carpenteria, CA 93013

ATARI COMP. ASSOC. OF ORANGE COUNTY
P.O. Box 9419
Fountain Valley, CA 92728
4th Sun.

ATARI COMPUTER USERS' EXCHANGE OF WEST G
P.O. Box 5125
Garden Grove, CA 92645

THE ROYAL ORDER OF DIGITAL KNIGHTS
PSC Box 1906
March AFB, CA 92518

RIVERSIDE USERS GROUP FOR ATARI COMPUTER
11501 Spruce Ave.
Bloomington, CA 92316
Glendale Federal Savings, Riverside

SAN DIEGO ATARI COMPUTER ENTHUSIASTS
P.O. Box 203076
San Diego, CA 92138

THE DIGITAL CIRCUIT
2180 Wayne Road
Palm Springs, CA 92262

THE I/O CONNECTOR
P.O. Box 81444
San Diego, CA 92138

SPRING VALLEY, LA MESA ATARI COMPUTER US
10836 Wagon Wheel Drive
Spring Valley, CA 92078

ATARI ANONYMOUS – A USERS' GROUP
Foothill Computer Center
Upland, CA 91766

ATARI KIDS OF CLAREMONT
23602 Decorah Road
Diamond Bar, CA 91765

HOOKED ON ATARI COMP KEYBOARD SOCIETY
6055 Cahuenga Blvd. #2
N. Hollywood, CA 91606

A.B.A.C.U.S.
P.O. Box 1823
Mill Valley, CA 94941

DELTA ATARI USERS' GROUP
1720 South Hotchins #20
Lodi, CA 95240

WILLITS COMPUTER USERS' GROUP
P.O. Box 1213
Willits, CA 95490

A.C.C.E.S.S.
P.O. Box 1354
Sacramento, CA 95806

THE REDDING AREA COMPUTER ENTHUSIASTS
P.O. Box 6007-169
Redding, CA 96099

BOB AND MIKE'S OUR GANG COMPUTER CLUB
117 Rutherford Drive
Vacaville, CA 95688

SOLANO ATARI COMPUTER ENTHUSIASTS
5699 Cherry Glen Road
Vacaville, CA 95688

GAMING ACTIVISTS METHODICALLY EX. SERV.
80 Olde Forest Lane
Eureka, CA 95501

REDWOOD ATARI GROUP
2305 Jose Avenue
Santa Rosa, CA 95401
4th Sat.

MODESTO ATARI COMPUTER CLUB
P.O. Box 3811
Modesto, CA 95352
2nd Wed.

A-MAGIC
P.O. Box 1335
Merced, CA 95341

ATARI ENTHUS. COMMUNICATIONS NETWORK
4875 Alex Drive
San Jose, CA 95130

ATARI USERS' GROUP OF SOUTH SANTA CLARA
15250 La Rocca Drive
Morgan Hill, CA 95037

ESCAPE
76 Rancho Del Mar
Aptos, CA 95003

LOS ANGELES ATARI COMPUTER ENTHUS.
P.O. Box 7752
Van Nuys, CA 91409

THOUSAND OAKS GROUP ATARI
10836 Thousand Oaks Blvd.
Thousand Oaks, CA 91360

NORTH VALLEY ATARI COMPUTER USERS' GROUP
12824 Neon Way
Granada Hills, CA 91344

JPL ATARI COMPUTER ENTHUSIASTS
4800 Oak Grove Drive
Pasadena, CA 91109

LONG BEACH ATARI COMPUTER ENTHUSIASTS
2408 Eckleson
Lakewood, CA 90712

ISLAND COMPUTER ENTHUSIASTS
P.O. Box 1566
Avalon, CA 90704

SOUTH BAY ATARI COMP ENTHUSIASTS
5052 Range Horse Lane
Rolling Hills Estates, CA 90274

WEST LOS ANGELES ATARI USERS' GROUP
P.O. Box 84-396
Los Angeles, CA 90073

JUNIOR ATARI COMPUTER ENTHUSIASTS
1031 North Curson Ave.
Los Angeles, CA 90046

EL MOLINO COMPUTER CLUB
9484 Westside Road
Forestville, CA

COLORADO

THE COUNCIL OF ELROND
619 Gaylord Avenue
Pueblo, CO 81004

P3 ACE
P.O. Box 16751
Colorado Springs, CO 80935-6751

LOVELAND ATARI COMPUTER ENTHUSIASTS
629 W. 8th
Loveland, CO 80537

FORT COLLINS ATARI USERS' GROUP
616 1/2 E. Laurel
Fort Collins, CO 80521

ATARI COMPUTER CLUB OF DENVER
5407 W. 4th Avenue
Lakewood, CO 80226

STARFLEET ATARI COMP USERS' GROUP
7685 S. Datura Cir.
Littleton, CO 80120

BOULDER ATARI USERS' GROUP
363 Matchless Street
Louisville, CO 80027

EASTERN COLORADO GROUP
16486 E. 17th Place #118
Aurora, CO 80011

CONNECTICUT

ATARI USERS OF SOUTHERN CONNECTICUT
112 Hawthorne Drive
Fairfield, CT 06432

CENTRAL CONNECTICUT COMPUTER CLUB
149 Creamery Road
Cheshire, CT 06410

DISTRICT OF COLUMBIA

WASHINGTON DC ATARI USER GROUP
1800 G. Street NW
Washington, DC 20036
3rd Tues.

CONTINUED

FLORIDA

TRANSISTHMIAN ATARI COMP. ENTHUS.
PSC Box 417
APO, Miami, FL 34008

PANAMA CANAL ATARI USERS' GROUP
PSC Box 3268
APO, Miami, FL 34 2

TAMPA BAY AREA ATARI USERS' GROUP
812 West River Drive
Tampa, FL 33617

DADE CITY ATARI CLUB
Rt. 3, Box 754
Dade City, FL 33525

ATARI CLUB OF THE PALM BEACHES
15993 S.W. Eighth Ave., #B-101
Delray Beach, FL 33444

WEST BROWARD ATARI USERS' GROUP
9411 N.W. 10th Street
Jacaranda Lakes, FL 33322

CORAL SPRINGS ATARI USERS' GROUP
10122 N.W. 3rd Place
Coral Springs, FL 33065

ATARI BOOSTERS LEAGUE EAST
P.O. Box 1172
Winter Park, FL 32790

MIRACLE STRIP ATARI USERS' GROUP
110B Azalea Dr.
Eglin AFB, FL 32542

JACKSONVILLE ATARI COMP ENTHUSIASTS
1187 Dunbar Court
Orange Park, FL 32073

GEORGIA

WAYCROSS AREA COMPUTER CLUB
Route 5, Box 442-B
Waycross, GA 31501

RAINBOW
2326 Shirley Drive
Savannah, GA 31404

ATARI USERS' GRP, C.S.R.A. CLUB
3222 Crane Ferry Road
Augusta, GA 30907

ATLANTA COMPUTER SOCIETY, INC.
P.O. Box 888771
Atlanta, GA 30356

COMPUTER HOBBYISTS OF ROME
7 Wells Drive
Rome, GA 30161

CONTACT
696 Rollingwood Place
Stone Mountain, GA 30087

IOWA

HAWKATARI
2565 22nd Avenue
Marion, IA 52302

BLACKHAWK A.C.E.
729 Wildwood Drive
Waterloo, IA 50702
4th Sun.

M.A.G.I.C.
1125 Third Street
Ames, IA 50010

IDAHO

BOISE USERS' GROUP
1030 El Pelar
Boise, ID 83702

ALPHA CENTARI
P.O. Box 87
Newdale, ID 83436

POCATELLO ATARI USERS' GROUP
1025 Fairbanks
Pocatello, ID 83201

ILLINOIS

WAYNE CITY ATARI USERS GROUP
Rt. 242 South
Wayne City, IL 62895

LINCOLNLAND ATARI GROUP
2620 Lemont Drive
Springfield, IL 62704

VINCENNES ATARI COMPUTER ENTHUSIASTS
1730 South 12th
Lawrence, IL 62439

AURA
P.O. Box 156
Wood River, IL 62095

ILLINOIS CONSOLIDATED COMPUTER CLUB
121 S. 17th Street
Mattoon, IL 61938

ILLIANA A.C.E.
1 South Westville Lane
Westville, IL 61883

B.A.S.E.
P.O. Box 33
Bloomington, IL 61701

PEORIA ATARI COMPUTER ENTHUSIASTS
P.O. Box 132
Washington, IL 61571
1st Wed.

McDONOUGH COUNTY ATARI USERS' GROUP
604 W. Carroll
Macomb, IL 61455

Q.C. ATARI COMPUTER CLUB
1213 11th Street
Silvis, IL 61282

ROCKFORD ATARI COMPUTER CLUB
10062 Gentian Drive
Rockford, IL 61111

SEARLE ATARI COMP USERS' GROUP
G.D. Searle & Co., Box 5110
Chicago, IL 60680

COMPUTER SQUAD
2625 Corinth Road
Olympia Fields, IL 60461

CHICAGOLAND ATARI USERS' GROUP
385 N. Catalda Ave.
Woodale, IL 60191

SUBURBAN CHICAGO ATARIANS
P.O. Box 72266
Roselle, IL 60172
1st Sat.

LAKE COUNTY ATARI USERS GROUP
409 S. Elmwood Ave.
Waukegan, IL 60085
1st Saturday, Great Lakes Naval Base

INDIANA

WELLS ATARI COMPUTER OWNERS
1422 Hunter Road
Bluffton, IN 46714
2nd Tues.

ALIEN
7091 Broadway
Merrillville, IN 46410

CENTRAL INDIANA ATARI GROUP
7811 Clarendon Road
Indianapolis, IN 46000

KANSAS

WICHITA ATARI COMPUTER ENTHUSIASTS
825 N. Harding
Wichita, KS 67208

MID CONTINENT ATARI USERS' GROUP
115 East Oak Valley
Manhattan, KS 66502

KC-ACE
P.O. Box 25442
Shawnee Mission, KS 66225

LAWRENCE ATARI COMPUTER CLUB
P.O. Box 1415
Lawrence, KS 66044

KENTUCKY

CURSOR
Box 172-A, Route 3
Calvert City, KY 42029

LOUISIANA

BATON ROUGE ATARI GROUP
c/o Comp Elect, 1955 Dallas Drive
Baton Rouge, LA 70806

ATARI PROGRAMMING ENTHUS OF SLIDELL
130 Matthews Drive
Slidell, LA 70458

NEW ORLEANS ATARI COMP USERS' GROUP
8223 Plum Street
New Orleans, LA 70118

MASSACHUSETTS

HONEYWELL ATARI ENTHUSIASTS
131 Scituate Street
Arlington, MA 02174

NORTH SHORE ATARI COMP USERS' GROUP
P.O. Box 2052
West Peabody, MA 01960

SMAUG
c/o Video Connection
N. Dartmouth, MA 01843

MERRIMACK VALLEY ATARI COMP ENTHUS
159 Weare Street
Lawrence, MA 01843

BOSTON COMP SOC ATARI USERS' GROUP
9 Sullivan Terrace
Framingham, MA 01701

BERKSHIRE USERS' GROUP (ATARI)
P.O. Box 593, 10 Berkshire Hts.
Great Barrington, MA 01230

MARYLAND

ARINC MICROCOMPUTER CLUB
c/o ARINC Research, 2551 Riva Road
Annapolis, MD 21401

ATACOM USERS' GROUP OF BALTIMORE
6 Skylark Court, Apt E
Baltimore, MD 21234

WESTINGHOUSE ATARI GROUP
5 First Avenue S. Ferndale
Glen Burnie, MD 21061

A.U.R.A.
P.O. Box 7761
Silver Spring, MD 20907
1st Wed.

C.P.M. (Current Notes)
8309 Bella Vista Terrace
Ft. Washington, MD 20744
4th Tuesday

APL A.U.G.
c/o APL John Hopkins Univ.
Johns Hopkins Road, 8-136
Laurel, MD 20707

MAINE

A-MUG
c/o Hands On Comp, Box 1088
Westbrook, ME 04092

MICHIGAN

HOLLAND ATARI USERS' GROUP
260 Roosevelt
Holland, MI 49423

HOOTERVILLE HACKERS
7604 Red Arrow
Watervliet, MI 49098

BATTLE CREEK ATARI USERS' GROUP
2267 Gethings Road
Battle Creek, MI 49017

ATARI USER GROUPS INTERNATIONAL
P.O. Box 16132
Lansing, MI 48901

TRI-CITY ATARI USERS' GROUP
5560 Tamarix Lane
Saginaw, MI 48603

SOUTHEAST MICHIGAN ATARI USERS'
38476 Ann Arbor Trail
Livonia, MI 48150

HURON ATARI COMPUTER CLUB
P.O. Box 398
Milford, MI 48042

M.A.C.E.
P.O. Box 2785
Southfield, MI 48037
3rd Tues.

MINNESOTA

TWIN CITIES ATARI INTEREST GROUP
684 Queen Avenue South
Richfield, MN 55423

TWIN CITY ATARI GROUP
4145 Marriet Street
Minneapolis, MN 55409

MISSOURI

NODAWAY ATARI GROUP
Route #2
Maryville, MO 64468

McDONNELL DOUGLAS CO.
P.O. Box 516
St. Louis, MO 63166

MISSISSIPPI

COASTAL AREA ATARI USERS' GROUP
P.O. Box 5098
Biloxi, MS 39534
2nd Friday

NEBRASKA

OMAHA ATARI COMPUTER FEDERATION
P.O. Box 993
Bellevue, NE 68005

NEW HAMPSHIRE

NEW HAMPSHIRE ATARI COMPUTER CLUB
P.O. Box 5288
Manchester, NH 03108

NEW JERSEY

CENTRAL JERSEY USERS' GROUP
12 Hunterdon Avenue
Spotswood, NJ 08884

JERSEY ATARI COMPUTER SOCIETY
21 Meetinghouse Court
Vincentown, NJ 08088

PHILADELPHIA AREA COMPUTER SOC. ACUG
40 Balfour Lane
Willingboro, NJ 08046

MICROS OF MONMOUTH
P.O. Box 221
Englishtown, NJ 07726

JERSEY ATARI COMPUTER GROUP
40 Lawrence Road
Parsippany, NJ 07054
2nd Sat.

BAYWAY ATARI COMPUTER ENTHUSIASTS
P.O. Box 222
Linden, NJ 07036

NEW JERSEYS COMP CLUB OF BAYONNE
1 Oak Court West
Bayonne,.NJ 07002

NEVADA

HIGH SIERRA ATARI USERS' GROUP
303 East Emerson Way
Sparks, NV 89431

SOUTHERN NEVADA ATARI COMPUTER CLUB
P.O. Box 27617
Las Vegas, NV 89126

NEW YORK

BIT'S BYTE'S & PIECE'S
1103 Arrowbend Drive
Williamson, NY 14589

WESTERN NEW YORK ATARI USERS GROUP
P.O. Box 59
Buffalo, NY 14216

COMPUTER LINE ATARI
502 Dencary Lane Apt. L
Endwell, NY 13760

ACE OF SYRACUSE
322 Dickerson Drive
Camillus, NY 13031

A BUNCH OF ATARI COMPUTER OWNERS
90-A Partition St.
Saugerties, NY 12477

CAPITAL DISTRICT A.C.E.
P.O. Box 2233
Albany, NY 12220

HACKER'S HEAVEN
16 Marco Polo Drive
Latham, NY 12110

ATARI STAR USERS' GROUP
915 Oak Lane
North Woodemere, NY 11581

B.A.S.I.C.
2724 East 23rd Street
Brooklyn, NY 11223

ROCKLAND ATARI COMPUTER USERS' GROUP
29 Riverglen Drive
Thiells, NY 10984

ATARI USERS' GROUP OF WESTCHESTER
4 Charlotte Street
White Plains, NY 10606

BUSINESS ATARI USERS & DEVELOPERS
P.O. Box 3608
New York, NY 10185

LAJES ATARI USERS GROUP
Box 1644
APO, NYC, NY 09406

SPACE SIGNALS
401st CSG/SSRR
APO, NYC, NY 09283

AFCENT/AWACS ATARI COMPUTER GROUP
USAE, Box 201, AFCENT
APO, NYC, NY 09011

NORTH CAROLINA

ATARI COMP USERS' SOC FAYETTEVILLE
P.O. Box 1117
Fayetteville, NC 28302

CHARLOTTE ATARI USERS' GROUP
P.O. Box 221133
Charlotte, NC 28222

TRIANGLE COMPUTER CLUB
802 Madison Avenue
Cary, NC 27511

PIEDMONT TRIAD ATARI USERS' GROUP
6104 Knight Road
Greensboro, NC 27410

NORTH DAKOTA

FORX ATARI COMPUTER ENTHUSIASTS
1179 B Maxwell
Grand Forks AFB, ND 58205

OHIO

TRI COUNTY COMPUTER CLUB
344 East Patterson Street
Dunkirk, OH 45836

ATARI COMP ENTHUS OF SPRINGFIELD
2735 Conestoga Street
Springfield, OH 45503

MIAMI VALLEY ACES
P.O. Box 24221
Dayton, OH 45424

DAY-TARI
5579 Maefel Lane
Dayton, OH 45415

SIDNEY-SHELBY COMP USERS' GROUP
800 W. Russell Road
Sidney, OH 45365

CIN'TARI ATARI COMPUTER ENTHUSIASTS
1628 Bising Avenue#3
Cincinnati, OH 45239

ATARI COMP ENTHUS OF BROOK PARK
6180 Delores Blvd.
Brook Park, OH 44142

ATARI COMP ENTHUS OF CLEVELAND
1705 Lee Rd.
Cleveland, OH 44129

ATARI PEEKERS
2055 Reveley Avenue
Lakewood, OH 44107

LA' C.A.C.E.
5782 Andrews 106-B
Mentor On The Lake, OH 44060

BLACKHAWK COMP SCIENCE ASSOCIATION
843 Walbridge Avenue
Toledo, OH 43609

ATARI COMPUTER CLUB OF TOLEDO
606 Carlton
Toledo, OH 43609

ATARI COMP ENTHUS CLUB OF OHIO
10285 Caskie Road
Wayne, OH 43466

ATARI MICROCOMP NW AMATEUR RADIO OP
4749 S.R. 207 N.E.
Washington C.H., OH 43160

ATARI COMP ENTHUS OF COLUMBUS OHIO
PO. Box 849
Worthington, OH 43085

NEWARK AREA COMPUTER USERS
996 Lawnview Ave.
Newark, OH 43055

OKLAHOMA

TULSA COMP SOCIETY ATARI ENTHUS
121 S. 33rd Street
Broken Arrow, OK 74014

BARTLESVILLE USERS' GROUP
1814 Dewey
Bartlesville, OK 74003

DUNCAN AREA ATARI COMPUTER USERS
Route 6, Box 313
Duncan, OK 73533
3rd Tuesday

ATARI COMP CLUB OKLAHOMA CITY INC
PO. Box 32672
Oklahoma, OK 73123

OREGON

ATARI COMPUTER ENTHUSIASTS
3662 Vine Maple Drive
Eugene, OR 97405
2nd Sat.

PORTLAND ATARI CLUB
P.O. Box 1692
Beaverton, OR 97005
1st Monday

PENNSYLVANIA

BERKS READING AREA A.C.E.
25 Angelica Street
Reading, PA 19611

COMPUSTARS
888 N. Hanover Street
Pottstown, PA 19464

PACENET
Valley Stream Apts., J-304
Lansdale, PA 19446

NORTH AMER COMP SOCIETY-A.U.G.
149 S. Grant Street
Wilkes-Barre, PA 18702

EAST SCRANTON ATARI USERS' GROUP
8 Prescott Place
Scranton, PA 18510

ABE' ACES
P.O. Box 228
Whitehall, PA 18052
2nd Sat.

PACATRANYI EMPIRE
RR #5 Box 59
Danville, PA 17821

RED ROSE ATARI MEMBERS (RAM)
P.O. Box 7532
Lancaster, PA 17604

SOUTHCENTRAL PENN ATARI COMP ENTHUS
88 Cherry Lane
Carlisle, PA 17013

GREATER INDIANA CTY A.C.E.
R.D. 1 Box 167AA
Marion Center, PA 15759

WESTMORELAND ATARI ORGANIZATION
230 Clairmont Street
North Huntington, PA 15642

BETTIS ATARI USER DEVOTEES
3448 Forest Road
Bethel Park, PA 15102

PITTSBURGH A.C.E.
969 Edna Street
Bridgeville, PA 15017
2nd Monday

VALLEY ATARI COMPUTER CLUB
R.D. #2 Coleman Drive
Beaver, PA 15009

RHODE ISLAND

A.A.R.I.
65 Russell Ave.
East Providence, RI 02914

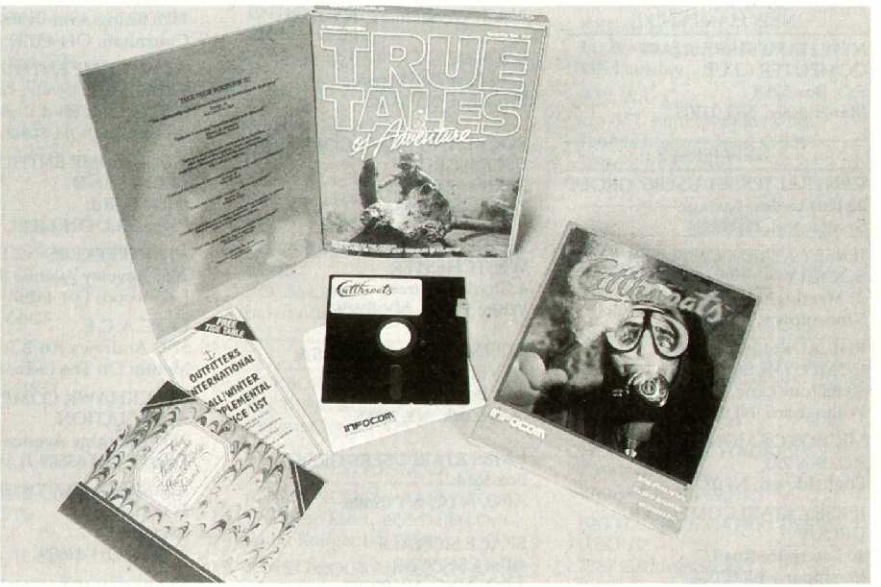
FIRST ATARI CLUB OF RHODE ISLAND
48 Dudley Avenue
Newport, RI 02840

CONTINUED ON 72

Infocom's Cutthroats and Suspect

Reviewed by David Duberman

It's ironic that two of the best new programs for the Atari personal computer do not make any use of the computer's graphics capabilities. But it begins to make sense when you learn the publisher's name—Infocom. *Cutthroats* and *Suspect*, two new text adventures from prolific Infocom are now available and both offer some new things—the packaging and some unique twists—and some old things. Alas, we'll see no more innovative game packages shaped like flying saucers and death masks; all Infocom adventures now come in the same book-sized box containing the program disk, assorted printed props, and a bound-in magazine-style introduction. Oh well, at least they're easier to shelve. There's something else that's new about both *Cutthroats* and *Suspect*—each has a special twist that sets it apart from all other Infocom adventures.



What is familiar about these two games is Infocom's trademark: an interrelated series of original, challenging puzzles presented in interactive story form on the monitor screen. "Interactive" means that you are the main character in the story. For the story to proceed, you must enter instructions at the keyboard every step of the way. You hold conversations with characters in the story, follow them, pick up and drop objects, and more. The better the adventure, the more control you have over the unfolding of the story. Infocom's latest adventures are so well-written that their fictional characters actually take on personalities and walk in and out of the scene as if they are alive. What's more, you must take careful note of your computerized companions' comings and goings to solve certain puzzles. This adds considerably to the complexity of "mapping" an adventure—keeping track of where you've been and how to get back there. Fortunately, Infocom's "Script" command lets you print out crucial parts of the adventure for a permanent record.

Dive into This!

Cutthroats' special twist involves alternate endings to the story. As a hard-drinking sailor on tiny New England-like Hardscrabble Island, you become involved in a scheme to plunder a long-missing sunken treasure ship. Depending on the nature of a certain revelation that's made to you early in the game (it's pretty obvious when it happens), you seek the treasure from either of two nearby underwater wrecks.

The two sunken ships present vastly different challenges, so *Cutthroats* actually gives you two bangs for your buck (or two adventures for your money). Of course, if you play both versions alternately, you'll need two disks on which to save your games.

In the game's violent opening, you are awakened at night by an old sailing buddy. He gives you a valuable map showing new, more accurate locations for two of the four treasure ships known to have fallen prey to the perilous shoals and narrow straits of Hardscrabble Harbor. As soon as he leaves, he is murdered outside your window by a dark figure.

The next day, a trio of sleazy local characters approaches you with a proposition. You have what they need—your diving skill and the correct coordinates for the treasure. You're not too crazy about their personalities and you really shouldn't trust them with your life, but there's no way you can retrieve

the treasure on your own, so you join them.

That much is preordained (you don't have to cooperate with them, but there isn't much of a story if you don't). The rest is up to you. Depending on which treasure you seek, you must obtain the proper equipment and learn how to use it. You start out with a modest bank account, a diving outfit, and an equipment price list and tide table. As it turns out, getting your money out of the bank without being plagued by a nosy islander is one of your first obstacles. Reaching either of the sunken ships isn't extremely difficult, but recovering its treasure and extricating your still-breathing self requires the usual brain-twisting; a generous use of the Save and Restore commands doesn't hurt either.

Cutthroats is categorized by Infocom as a "Tale of Adventure," a fairly accurate capsule description. The emphasis here is on action, although a certain amount of interaction is required at the beginning of the story. *Cutthroats* is a straightforward but challenging adventure game, and should take even an experienced puzzle solver at least a few weeks to work through. With a little common sense, even an inexperienced gamer should be able to make considerable progress.

A Mysterious Mystery

Suspect, in sharp contrast to *Cutthroats*, is anything but straightforward. Cast in the mold of Infocom's murder mysteries *Deadline* and *The Witness*, *Suspect* takes place on a rainy night in a large mansion. This time, instead of assuming the role of a detective, you are a reporter attending a society Halloween party in hopes of a story. Your hostess, Veronica Ashcroft, has inscribed a mysterious message on your invitation. Unfortunately, before you have an opportunity to ask her about it, she is murdered. What's unique about *Suspect* is that it's entirely open-ended. Your course of action is never "guided," as in the beginning of *Cutthroats*. For example, without giving too much away, you have the opportunity of covering up the crime if you act quickly.

Suspect is probably the most advanced Infocom game yet released. Its scope and complexity push the language and game parsers to their limits, as evidenced by the long disk accesses at most commands. The vocabulary you can use is quite large, and the language is generally well employed by Dave Lebling, who wrote this and *Starcross*, and co-authored the *Zork* series and *Enchanter*. Although there's no magic (and a lot more dialogue), *Suspect* has something of the feel of *Enchanter*, especially after you get to know the game and learn about the several alternative scenarios. Lebling's adventures possess a distinctive quality of 'openness' that sets them off from most others. The authors of *Cutthroats*, on the other hand, take a more restrictive, mechanistic approach, resulting in a less memorable, but still very good, gaming experience. I'm not normally a mystery fan, so if I had to choose one of the two before seeing either, I'd have picked *Cutthroats* without hesitation. Having played both, *Suspect* would undoubtedly now be my choice.

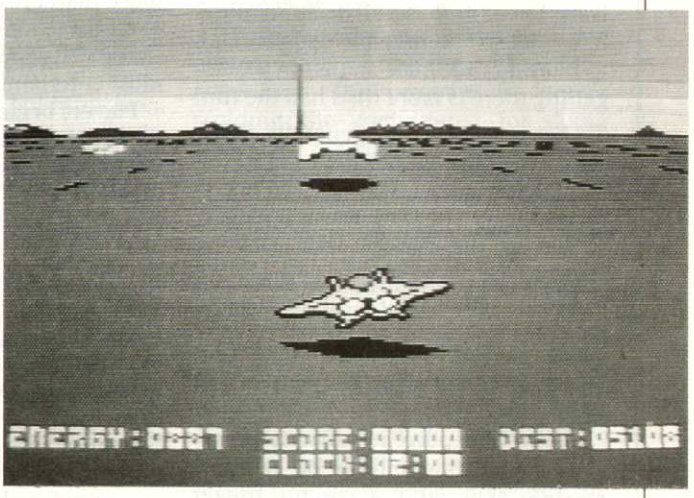
To succeed in this game, you must solve the murder before you yourself are caught and convicted for it. Yes, the culprit has framed you, and you have only a few hours to discover him or her and prove your case. Unfortunately, this time you don't have the power of the police behind you, and most of the guests consider you a nosy, obnoxious reporter. Unlike most Infocom adventures, you don't receive a running score in *Suspect*. The only way you have of knowing whether you are on the right track is by following your nose for news.

The party takes place in the ballroom of the Ashcroft mansion, but you are usually free to explore the ground floor of the house and the grounds in the immediate vicinity. The game "map" is relatively simple—experienced adventurers probably won't need to sketch it out. What's more, *Suspect* involves relatively few objects. However, there are many guests at the party, at least ten of whom count as significant figures in the story, if not in the mystery. Each has his or her own opinion about the others (and about you as well!), and it's up to you to determine which of these pertain to the mystery at hand.

Thus, by relying on only the few physical clues and your ingenuity, you must discover a motive for the killing, find the corresponding suspect, and prove your case. How, and to whom, do you prove it? That's another mystery to solve.

Stealth

Reviewed by Tracie Forman



The action's fast and furious—or slow and exacting—depending on how you play *Stealth*. This action offering by Tracy Lagrone and Richard E. Sansom challenges the player to pilot a single low-flying jet fighter into hostile enemy territory in a mission to reach and destroy the Dark Tower.

The jet flies a path down the center of the screen. As long as you fly in a straight line the pathway appears straight, while moving to the left or right changes the perspective to a dizzying turn. Enemy obstacles line both sides of the path, with enemy jets flying into attack positions directly ahead.

During the course of the mission, the player encounters various harmful and helpful items. Radar, scout ships, missiles, bunkers, tanks and fighters will all do their best to defend their home

CONTINUED

turf. Being hit by gunfire decreases precious energy reserves, while a head-on collision with an enemy object destroys your craft completely and starts you back at the beginning of the course if any lives remain in reserve.

Positive and negative energy fields crop up at seemingly random intervals. These resemble oil slicks from a distance. Each time the player's craft touches a yellow positive energy field, a high tone sounds and the ship gains energy. Touching a green, negative field results in a low tone and a corresponding energy loss. If there's one major criticism that can be leveled against *Stealth*, it's that the two energy fields are so similar in color that it's nearly impossible to tell which fields are positive and which are negative, especially from a distance. It's frustrating to realize that you've just blasted a much-needed positive energy field out of the way, and worse still to mistakenly hit a negative field.

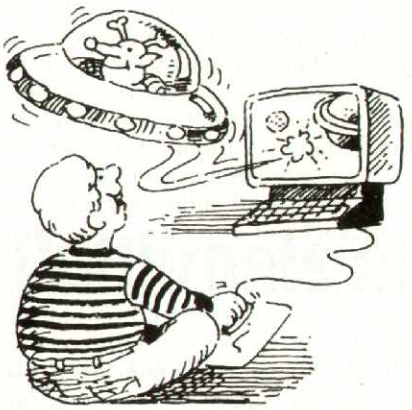
Flying speed is controlled by the player. A quick push on the joystick speeds the craft up to breakneck pack, while pulling back on it turns on the brakes in time to aim a course right over an energy field.

The final sequence at the gates of the Dark Tower itself is a bit disappointing. It just doesn't seem challenging enough to merit grand finale status. In *Stealth*, getting there is more than half the fun!

The graphics are generally quite good, with the aircraft depicted in colorful detail and a pretty horizon line in the distance. The Dark Tower is usually visible in the background, growing larger as the player blasts a path toward it. Enemy radar, bunkers, fighters, and the rest are colorful and easy to distinguish. Sound effects are good, and blend in nicely with the rest of the game.

Stealth is a pure and simple action game, with its emphasis on reflexes, joystick skill, and a careful trigger finger. There's no need to worry about complex strategies as long as you keep an eye on fuel supplies. Since each shot at an enemy costs fuel points it's not advisable to keep your finger on the trigger. Just wait for an enemy to pop up on the horizon, take aim, and fire.

Action fans in the market for a fast-paced test of skill will no doubt enjoy this airborne blast-em-up. While it doesn't offer complex strategies, sometimes all you need is a little action.



Flak

Reviewed by Bill Kunkel

Flak represents a type of computer game seen more and more infrequently in these days of "simulations" and "software experiences": an unabashed arcade style shoot-em-up. *Flak* is utterly devoid of strategic nuances. It operates on a primal, kill-or-be-killed level reminiscent of a supercharged action coin-op game. It's the sort of game that people play to see what comes next; it pretends at nothing more grandiose than providing quite a few hours of basic, action-filled gaming.

For all its limitations *Flak* is one of the most entertaining new games around.

Players begin with four aircraft, each armed and equipped with a sighting device a short distance from the craft's nose. A bonus ship is acquired for every 10,000 points scored. After selecting one of two difficulty levels, the first ship is launched down a long, white runway. The ships must thereafter be kept in the air, collecting points by obliterating ubiquitous anti-aircraft installations along the way. Not only does the player gain points this way, but direct hits also shut down the big ground guns and allow the jet to progress unimpeded along this northerly-scrolling gauntlet.

Like most arcade contests, *Flak* evokes its "gotta play" compulsion by creating in the player a fierce desire to reach the next of six distinctive ground installations. Action starts out over a serene-looking grassy plain where all hell breaks loose quite suddenly. The targets are a group of white ack-ack batteries, the larger featuring peekaboo roofing that slides open to reveal big guns. After surviving this challenge, the aircraft passes over a patch of trees into a real no-man's land: an installation protected by invisible gun implacements. The only way to take out these babies is to follow the cannonfire to its source, which is easier said than done, particularly with bombs and deadly debris flying in all directions.

Next are a pair of clustered, honeycomb-like fuel depots in sets of seven, followed by a second invisible gun deathtrap. Then a stretch of black buildings reminiscent of computer circuits, all armed to the teeth.

As this final scenario concludes, the player's ship passes over a patchwork of undefended boilerplate just prior to reaching the runway for round two.

Some of the graphics here are quite impressive, particularly the clustered silos and blue pipelines. Nonetheless, the appeal of games like this is fairly elusive. *Flak* is the sort of game that either grabs you or doesn't, depending upon what you are looking for in a game. Fans of high-action, reflex-challenging contests should find it right up their alley.

Flak *designed by A. Marsily, programmed by Y. Lempereur (Funsoft, disk, 48K required.)*

Whistler's Brother

Reviewed by Tracie Foreman

Its basic premise is cute, but this action game lacks the fine-tuned graphics and sound that can add spice to otherwise run-of-the-mill arcade-style games. While squared-off, monocolored graphics might have been the standard back in 1982, the visuals are not what you would expect. Broderbund has a reputation for taking solid but imperfect programs and giving them that final professional touch. So what happened?

The hero's job is to retrace the steps of his absentminded brother, who managed to lose a caseful of valuable tools on an archaeological expedition. Whistler's brother is so absorbed in his research that he wanders around aim-

lessly, oblivious to dangers like falling off platforms, flying arrows, and birds that bite. Whistler must not only collect as many tools as he can, but he also has to keep his brother close to his side and out of harm's way.

His errant brother can be called with a whistle, activated with the joystick button. By whistling at strategic moments, the hero can keep his brother near enough to hear the next call.

When both flashing tools on each level have been collected, Whistler can turn himself into a dervish, again with the help of the action button. The whirling form can wipe out enemies before they attack his brother, is protected from most of the dangers in the game, and can build bridges across gaps simply by moving over them. After successfully accomplishing a task —such as leading Whistler's brother safely to shore—the action proceeds to a new, more complicated screen.

Speed is of the essence, with storm clouds constantly collecting overhead. A storm in full force hurls deadly lightning down at the figures below, making it all the harder to complete the screen. One of the gamer's five lives is lost each time Whistler or his brother meets a grizzly fate.

The action may be cute, but it's still hard to believe that designer Louis Ewens copyrighted the game as recently as 1984. Whistler and his brother are adequately drawn, though most players probably won't know what the brother is doing without reading the instructions. The rest of the graphics are 1982 standard; a shame considering that Broderbund's other releases have a reputation for excellent visuals and animation. The sound track fares a bit better, with several perky tunes to represent whistles, and a convincing thunder effect.

The play-action itself is about what you'd expect from an average arcade game. It's entertaining, and there is some element of strategy, but there is nothing about the game that really makes you want to hit that RESET button. The screens aren't pretty or varied enough to provide incentive by themselves, and they aren't all that challenging to experienced joystick jockeys. With all the "cute" action games on the market, *Whistler's Brother* is just whistling in the dark.

Whistler's Brother *by Louis Ewens (Broderbund, disk, 32K required)*

Serpent Star

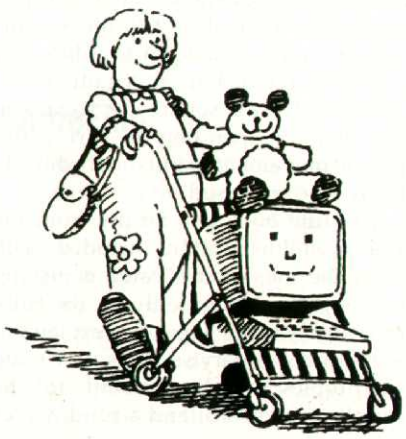
Reviewed by Arnie Katz

Mac Steele, the hero of *Mask of the Sun* (Broderbund) is back on the home screen with another electronic exploit. Last time, the intrepid explorer braved the mysteries of ancient Mayan pyramids. This new adventure sends the globe-trotter to Tibet to find some ancient scrolls and a titanic jewel, the Serpent Star, said to be worth $25 million smackers!

Ultrasoft, the design studio that created *Mask* as well as several adventures published by Trillium, thrusts the player directly into the plot with a special introductory sequence. A pre-set series of text-and-graphics screens establishes the setting and character motivation.

The Serpent Star is an illustrated adventure with some simple animated sequences. Brief text is displayed at the bottom of each picture. The vocabulary is extensive enough to handle most situations, though the program can't entirely free the player from those frustrating "guess the right word" sessions. The art work is simple, but attractive, and some of the animations are quite clever. A little less emphasis on watching the scenery go past while riding or walking down roads would be appreciated, however.

The story, as told by this introduction, involves a case that didn't turn out very well. The Tibetan government has confiscated a set of scrolls that archvillain Francisco Roboff had stolen from you some months past. Knowing that 10 of the 13 scrolls were kept in a locked case in the Potola, a palace located in Lhasa, Tibet's capital city, you break into the room, bust open the case with a sword taken from a nearby weapons display, and snatch the scrolls. When the guards set up a hue and cry, you hotfoot it out the main gate of the city.



Mac Steele's mission is to find the remaining three scrolls and the Serpent Star that holds the ancient city of Kara-Koram in timeless immortality.

Despite this flying start, the low level of excitement during the early going will displease many players. It's frustrating, after watching the introduction unreel at breakneck speed, to have to stop right outside Lhasa to buy provisions from a passing caravan. Since the camel train serves no other real purpose—and you can't obtain any useful information from the tradesman—the game would have benefitted by having Steele start with all necessary provisions. This part of the game is made all the more puzzling by the fact that Steele starts with some equipment like matches and a revolver. For Steele, that should be plenty!

These types of inconsistencies crop up frequently during the course of the adventure. The program is forever scolding the computerist for doing things like not getting off the horse before entering a building. Yet the adventurer automatically remounts the horse after crossing a rickety bridge elsewhere. Why doesn't the program *assume* that you dismount before entering a building? Hmmm.

Once the player buys supplies and gets into the adventure proper, there's quite a variety of encounters and situations to work through on the way to locating the fabulous gem. Ultrasoft's technical expertise still outshines the creativity of the content, but the gap is clearly narrowing. However, *The Serpent Star* is significantly more intriguing than its predecessor and is doubly welcome because its theme is not found in games of this type as frequently as science fiction and fantasy motifs.

The Serpent Star *designed by Ultrasoft (Broderbund, two double-sided disks, 48K required.)*

CONTINUED

Gulf Strike

Reviewed by Arnie Katz

The peace and safety of the world hangs by a slender thread. Any of today's 40 or 50 little wars carries the potential for escalation. The most frightening scenario is one in which the "super powers" are dragged into direct confrontation.

Gulf Strike, a one- or two-player simulation based on a non-electronic board game, pits the super powers against one another in the "unthinkable" confrontation. As the documentation explains, the overthrow of the Shah, the interminable Iran-Iraq war, the Soviet invasion of Afghanistan, and the U.S. development of its Rapid Deployment Force strategy are all ingredients poised to ignite the Persian Gulf region. This simulation covers a hypothetical war resulting from the area's worsening political instability. The U.S.S.R. and Iraq square off against highly mobile U.S. forces that are supporting Iran and its minor allies.

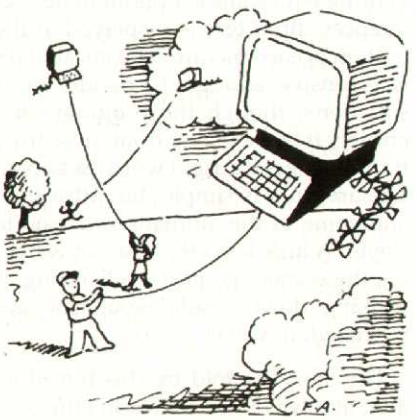
The battle is fought on a multi-screen map that covers the territory from the Tigris and Euphrates Rivers in the west to the eastern border of Iran, and from the southern half of the Caspian Sea to the northern coast of the Persian Gulf. Ground combat occurs primarily on Iranian soil with naval forces slugging it out in the Gulf. Even with joystick-activated scrolling, that's a lot of territory to monitor, so the publisher has included a full-color terrain map of the theater of operations.

This program is clearly intended for those who cut their gaming teeth on hex-map board war games. Even with the computer handling all combat resolution, and tracking the status of all participating units, don't start here if you're a relatively new recruit to military simulations. *Gulf Strike* explores a fluid, confused situation which leaves many real-life generals scratching their heads. Designer Winchell Chung has done everything in his power to make this intricately detailed war game play smoothly—the computer edition of *Gulf Strike* takes about half as long to play as the conventional version—but it still rates an "intermediate" level of playing complexity.

The U.S./Iran side begins the contest in possession of 21 Victory Point Squares (VPS), which must be defended against enemy attack. The battle ends after 25 game-turns have elapsed or when the U.S.S.R./Iraq side captures 9 VPS, or if the participants call it quits. If one side fulfills the victory conditions, the computer declares it the winner and calculates the degree of victory based on the number of enemy hit points eliminated, and bonuses relating to holding (U.S.) or capturing (U.S.S.R.) the vital squares.

The joystick controls all aspects of play. A commander simply positions the on-screen cursor over a group of friendly units and presses the action button to check status, alter formation, or dictate movement. A window located below the map displays vital statistics for units, and prompts the commander for orders. The player can move an entire group at one time if desired.

Each turn, equivalent to two days of actual warfare, proceeds in phases with prompts leading players through the routine. A press of the START key moves from one phase to the next.



Although the lines don't appear on the screen, the entire map is divided into 28-by-28 kilometer squares. When a general orders a unit to move, blue squares appear adjacent to it in every direction in which it can legally travel. Troops advance square by square in this manner, spending the turn's supply of movement points according to the terrain traversed.

The rule book is a far cry from the skimpy folders often included with even the most complicated computer strategy games. Not only are the rules thoroughly and logically explained, but supplementary sections delve into such topics as orders of battle for the countries involved, and a rundown of the weaponry expected to be used in a Persian Gulf war.

Gulf Strike is so plausible that it is educational as well as mentally stimulating. Anyone who delves into this absorbing "what if" scenario must come away with some sobering thoughts on the possible results of international brinksmanship, as well as the satisfaction derived from playing an excellent computer simulation.

Gulf Strike *(The Avalon Hill Game Company, disk, 48K required.)*

The Party Quiz Game

Reviewed by Joyce Worley

Trivia lovers have a treat in store with *PQ – The Party Quiz Game*. This fast-paced contest lets up to four players compete in a scramble for points, as the computer presents rapid-fire questions. Best of all, the game comes complete with four special "quick response" controllers so players can sit comfortably around the room instead of huddling over the console.

The controllers are super-easy to install. A double-ended connector cable plugs into the two joystick ports. The other end mates with an interface box that receives the four controllers. Each controller boasts about five feet of cord, and the interface connection has another six feet, so gamers can sit all the way across the room from the computer, and still enter their answers in comfort.

After choosing the number of players (1–4), the response time (3, 4, 5 or 10 seconds), and the number of rounds to make up a game (5, 8, 12, 16 or 20), the gamers select *competitive* or *social* play mode. In the competitive mode all players compete simultaneously to answer the question flashed on the screen, and the first correct response wins *all* the points. In social mode, all players can attempt a reply. All correct answers score, but the first to respond gets more points.

When some real trivia whizzes join in the game, *PQ* provides a way to even the odds. It handicaps expert players

CONTINUED ON 64

HomePak, a Multi-use Program from Batteries Included

by P.R. Adler

When Batteries Included made HomePak, the new word processing-data base-telecommunications program for Atari users, they took not just a user-friendly, but a user-intimate approach. They bundled three popular applications on one disk, wrote a good manual with some clever gimmicks (described below) and didn't copy protect the programs.

The $49.95 price is perhaps the friendliest we've seen so far for this computing power. The programs are not unlimited in features, but there are definitely enough for all home uses. Best of all, a great deal of thought has been devoted to structuring the programs along the thought patterns of the user.

The programs are all menu driven. The HomePak disk boots up to a screen that displays the titles of the three programs. When you choose HomeText, the word processor, you work with menus that control formatting, text moving, and file handling. In HomeFind, the database, there is one menu for creating merge files and another for file handling. In the telecommunications program, HomeTerm, there are separate menus for transmission and file handling. The three component programs are reviewed more thoroughly below.

HomeText

The HomeText program is HomePak's word processor. It offers all the usual features—automatic margins, block moving capability, search and replace, a choice of insert/replace modes and formatting commands such as right justification, headers and footers, and the ability to link files together for printout. This last feature is important since the maxium length of a HomeText file is quite short—6620 characters, which works out to only 3 single-spaced pages. This is enough for home use, but other competitive programs exist that offer more capacity. *AtariWriter*, for example, holds about 10 double-spaced pages.

HomeText's menus are accessed by pressing console keys on the Atari. Two of the menus just roll down over the text you are working on, which is disconcerting, but easily remedied by pressing RETURN. The HomeText commands are easy to use since most just require an input of Y or N. A carriage return will return you to your text from anywhere in the menus.

A particularly nice feature of HomeText is the way you can use it with information stored in HomeFind, the data base. You can merge one record at a time into your text from the data base file, which makes mass mailings easy. To merge data you use the Functions menu to name the HomeFind file you want to access, then use the Format menu to plant a HomeFind "token." The token reserves a blank space in your text for words that are inserted from the data base.

By planting tokens you can read one record after another into your document while printing.

HomeFind

HomeFind is HomePak's data base manager. It is the successor to *Whatsit*, one of the first personal computer data base programs. HomeFind is a relational database, which is very different from record-oriented data bases.

In record-oriented data bases a set of electronic file cards is stored on disk. The program formats, opens for data entry, and closes these records. For example, there might be a file called "customers," with names, addresses, salesmen and their commissions, and phone numbers in it. This data can be printed and sorted a variety of ways: by salesmen, by state, ZIP code, or whatever. However, the data in another file cannot be accessed without closing the current file and opening a new one.

HomeFind does not maintain any files or records. It works on the Subject-Tag-Object system. This can be thought of as the person, his desire, and the object of his desire. Since there are no structured files, there are no restrictions on the way data can be accessed, and there are only two restrictions on the way data is entered. All entries must have a subject, a tag, and an object or list of objects, and the subject and tag must include apostrophes. For example, when drawing up a Christmas list, you only have to type in "Susan's present's a scarf," "Nancy's present's a shirt," "Gwendolyn's present's a scarf," and so on. Then, you can type in any of the girls' names and find out what they're getting, or the word "scarf" to see whose getting a scarf, or the word "present," for the whole list.

This format makes organized data entry unnecessary. You can enter a Christmas list, accounts payable, or addresses of your friends at the same sitting, as the ideas occur to you. If you enter different types of data on the same person, you can access all the relevant information just by typing their name. If you repeat tags, the program prompts you with cheerful, conversational comments. You can make changes easily, and lists of objects are no problem. "Objects" refers to object of the subject and "tag" is the entry in HomeFind. Anything at all can be an

CONTINUED

object. HomeFind does not read its entries, it just moves them around.

Lists comprise the merge files mentioned above. Once the user gets the hang of them, they are easy to create and use. Again, two menus must be accessed to create a merge file, and the user must switch disks. It is here that the problems with HomeFind, and HomePak in particular, become apparent.

Error Handling

The dark side of HomePak comes out when you use peripherals with HomeFind. It is user fair-weather friendly. If you make a disk handling mistake error codes are displayed on the screen with no explanation. Neither the program nor the manual explains common errors that can occur when you remove the disk before the drive stops whirring, or if you send a print command to a turned off printer. Nowhere in the documentation is there an appendix listing the disk error codes. Having such an appendix would be most helpful. Not having an appendix, or any sort of clue as to what went wrong, can make using HomePak's advanced features frustrating.

In HomeFind, the most serious error you can make is inserting a new disk without going through the protocol required. Not only will you lose your data, you will destroy the data on the disk permanently. But the manual is explicit on this point!

Most errors arise when you use the more advanced features of the word processor. Print previewing long files is the worst offender.

HomeTerm

The third program in HomePak is HomeTerm, the telecommunications program. All computers need a program like this to run with their modems, and HomeTerm is not a bad one. As in the rest of HomePak, the emphasis is on the user's basic needs, with some nice touches thrown in.

HomeTerm will work with Atari, Hayes, and MPP modems. For uploading and downloading files, HomeTerm handles ASCII, ATASCII, and XMODEM protocol. It has a 7000-character buffer, and boasts a file editing menu you can use while you are hooked up. The functions menu lets you customize the terminal for different modem models.

One very useful feature of HomeTerm is its offline text editor—a window that appears at the bottom of the screen where you can edit your communications *before* you send them. The window will hold up to 120 characters, and send the text through the modem when you press RETURN. Another useful feature is the storable macros. These are combinations of keystrokes that you store on a data disk to enable you to dial and sign on to a distant terminal with just one keystroke. With a bit of fancy usage you can store as many as 700 keystrokes. The macro waits for prompts from the distant terminal.

Documentation

The HomePak manual is clever. It is a top-bound spiral book; the back cover fits into a slot in the packaging and folds up to form a stand that holds the book upright. This makes it very easy to keep the book open while you work with the programs, and lets you easily flip to your area of interest. This is necessary, since the documentation is extremely terse.

The organization of HomePak's menu screen functions is something that the user must take out of context. Often, the function indicated is part of a menu that is accessed by a console key that has not been explicitly stated by the manual. In other words, all the information is there, but it is not plainly stated. There are no reference cards, but the three programs all have "quick reference guides."

HomePak is aimed at beginners. If a beginner reads the manual from the beginning, takes notes, and follows all the instruction carefully, he or she can use HomeText and HomeFind almost immediately.

The HomeTerm section is very well done, and is ideal for someone who is new to telecommunications. Technical concepts such as duplex, baud rate are well explained. The manual's appendix on CompuServe's Atari SIG (Special Interest Group) is an excellent touch. Perhaps with the help of friends on the SIG, the new user can get enough tips to use HomePak to its fullest.

HomePak is a very reasonably priced package with most of the features a home user will ever need. If a beginner buys HomePak, and takes the time to learn all of its functions, he or she could end up with a very good working knowledge of not only the use of HomeText, HomeFind, and HomeTerm, but the sets of principles of file handling, text editing, and telecommunications.

Party Quiz Game

CONTINUED FROM 62

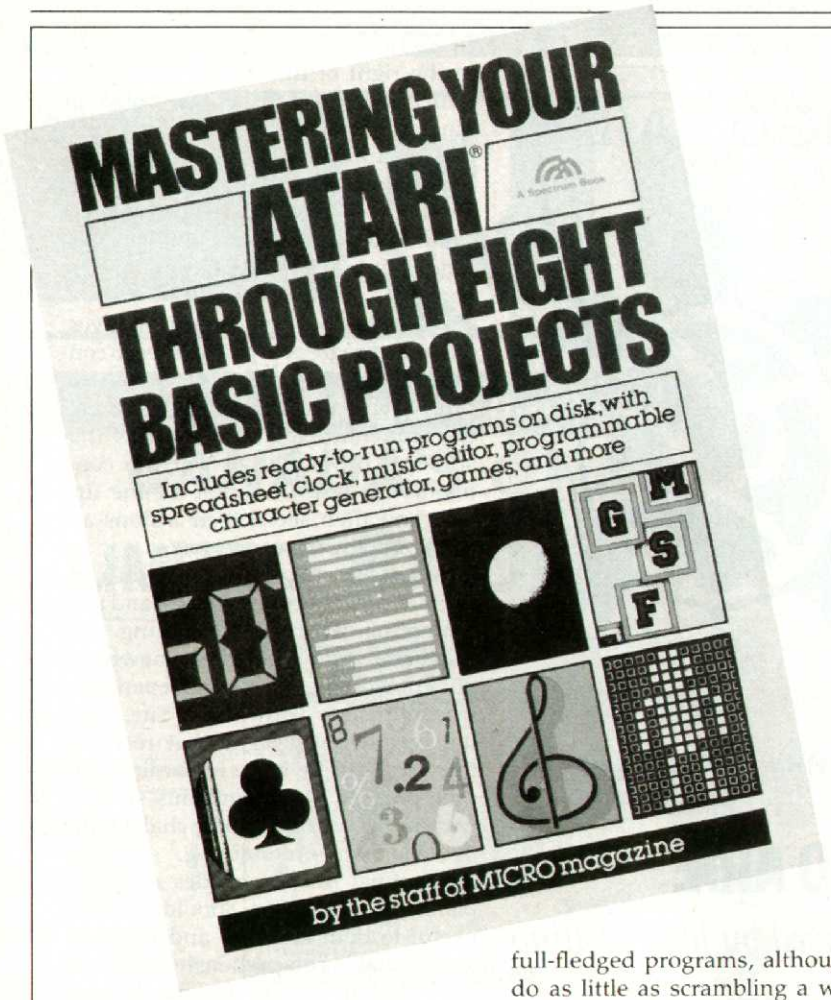
by allowing them only half the response time of the other players.

Each round consists of ten multiple choice questions. A countdown-bar across the bottom of the screen shows how much time is left for each question, and displays the points for correct replies. The faster the response, the higher the point total won—multiple choice questions count down from 1000 points, and true/false "stumpers" start at 500 points. Players select the correct response by pressing the appropriate key on the controller, then the computer displays the correct answer and takes care of tallying the score. Special *Lightning Bonus Rounds* 4, 7, 11, 15, and 19 feature a high speed bombardment of questions during which the computer gives each player in rotation 20 seconds to answer up to ten questions.

Every two rounds, the computer prepares a report card displaying each player's score, with a cryptic comment on how well that player has done. At the end of the game, a *Dean's List* records the initials of the top ten scorers in that play session.

PQ comes with the controllers, all necessary connector cables, and two disks that contain the program plus roughly 2500 questions. The game is a real party maker; the ease of play lends itself to social occasions (where larger groups can compete in teams), and the *Quick Response Controllers* add to the fun by ending the problem of keyboard typing errors.

PQ—The Party Quiz Game, *includes Controllers (Suncom, two disks, 32K required.)*



Two New Books

Reviewed by David Duberman

If you are like many Atari home computer users, you bought your computer because it's so versatile. After you use it to write a letter or an essay, you can relax and have fun with a video game or improve your mind with an educational program—all on the same machine. But that's by no means all your Atari computer can do. Your computer's potential is limited only by your imagination and your mastery of the machine. Atari computers are the friendliest and most flexible home computers available, so it's nice to see new books that take advantage of this fact to present a wealth of new and interesting programming ideas and applications.

101 Programming Surprises and Tricks for Your Atari Computer

101 Programming Surprises and Tricks for your Atari Computer by David L. Heiserman actually does contain 101 full-fledged programs, although some do as little as scrambling a word you type into the computer. Packing so many programs into 196 pages leaves little leeway for complexity, but short as they are, most of the programs pose a certain charm. Many users will consider the fun they provide a nice enhancement to other computer uses, and may even learn a clever trick or two for incorporation into future efforts.

One good thing about short programs is that they are easy to type in and debug. And when they're well written, as are most of these, they can pack a lot of fun into just one or two kilobytes of program space. Here are a few sample titles: *Dungeon Character Generator* creates armies of characters for fantasy role-players. *Surrogate Cusser*, a much-needed tool in combatting computer frustration, delivers such pithy epithets as "jerk" and "moron" to a named enemy or to no one in particular. And for a tool no city editor should be without, *Headline Generator* cooks up such items as "Mouse Beats Up House" and "Elephant Shoots Self." You can even enter lists of your own words for the computer to play with.

Some programs are variations on preceding listings, as in *Blackjack* and *Fair Blackjack*, *Russian Roulette* and *Fair Russian Roulette*, *Roach Race* and *Roach Race Plus*. Some programs are pretty dumb, such as *Adventure Revisited* in which you have no choice but to die as soon as you start. Use of fancy graphics in most programs is minimal, which helps keep the length down.

101 Programming Surprises and Tricks . . . is 98% program listings. Explanatory text is kept to an absolute minimum, which implies that the book is intended primarily for those who have achieved more than a passing familiarity with the BASIC language. Fortunately, the programs are short and straightforward and don't use any machine language, so they are relatively easy to analyze and understand. Instead of documenting the programs, the author has added a light, entertaining touch by printing short whimsical quotations at the top of each listing. The quote for the chase game *Wumpus* is Elmer Fudd's classic "Stand still you wascal wabbit!," while Bugs Bunny himself gets to speak for the sequel, *Super Wumpus* "Eh-h-h. Catch me if you can!" Other quotations range in nature from the ridiculous to the sublime, and many are sure to make you chuckle. The book costs $11.50, and you can send for a $21 diskette, containing all of the programs in machine-readable form.

Mastering Your Atari™ Through Eight BASIC Projects

Mastering Your Atari™ Through Eight BASIC Projects, published by the late MICRO magazine, is a horse of an entirely different color. Instead of overwhelming the reader with programs, this book takes a methodical tutorial approach that is better suited for begin-

CONTINUED

ners and those wishing to learn more about different applications and how they work. Programs include *Micro Calc*, a mini-spreadsheet; *Master*, a one-or-two-player version of the classic guessing game *Master Mind*; and *Atari Clock*, a full-screen digital timepiece. There's also *Word Detective*, in which you try to determine the computer's rule for accepting or rejecting words and *Sorting*, which includes graphic and practical demonstrations of various methods of sorting lists. *Breakup* is a version of Steve Wozniak's classic *Breakout* game, playable with paddles or the keyboard, and *Atari Player* is a nifty "keyboard-organ" program that lets you edit your tunes note-by-note, and save and load them with a disk drive. Last but not least, *Programmable Characters* shows you how to exploit Atari computer's redefinable character set for full graphic flexibility.

A disk containing all eight programs is included to spare the reader the time-consuming chore of entering and correcting them. Each program merits its own chapter, which starts out with instructions for using the program. Following this is a section on programming concepts explaining the various techniques employed. Specific examples from the program are pointed out. You don't have to refer to the full listing at the end of the chapter for these; thankfully, the relevant program lines are reprinted in the text. Next, a line-by-line program description or "take-apart" is provided for those who want to know exactly how the program works every step of the way. However, this doesn't extend to the machine-language routines used to move the Player-Missile Graphics in *Breakup*.

Mastering your Atari . . . is an excellent book for those who have taken a beginning BASIC course, have typed in some programs, and are curious to learn how they work. Despite a few minor errors, such as spelling the word mnemonics "New Monics" in a discussion of machine language, overall quality of both the text and programs is very high. The additional editorial space permitted by the book format (compared to magazine articles) has been well utilized by the authors, who provide extensive pictorial and chart information to supplement the text. We highly recommend this book for those readers who require a stepping stone from beginning to intermediate BASIC programming.

LOGO AIDE

Reviewed by Joan Delfino

Teachers, take note! At last there's a practical, well-organized, and creative computer book designed for classroom use. *Logo Aide* by Barry Hoglund is an excellent guide for teaching computer programming to elementary school children. Using Logo's colorful turtle graphics and simple commands, this book has a wide range of application for children from kindergarten through eighth grade.

Aspiring programmers will find a wealth of material to stimulate their creativity. *Logo Aide* consists of seven phases, or chapters. The initial chapters of the book are geared to beginners, particularly students in the primary grades. Phases one and two introduce Logo's primitives—simple commands designed to reinforce the basic concepts of computer programming. These primitives are ideal for young children. Students learn to view the screen from the turtle's vantage point as they direct it around the screen. They find, for example, that the right turn command results in the turtle's turning to its right, not necessarily to the right of the screen. The screen dimensions soon become obvious when the turtle takes too many "steps" and disappears. The author stresses the importance of allowing students ample time to experiment with simple commands, as *Logo Aide* builds on the fundamental primitives throughout the book.

When they have mastered primitives, students progress to phase three to contend with multiple turtles. As this may cause considerable confusion among the students, Hoglund suggests that students physically act out the commands they have written for the turtles, and then see if their actions are duplicated by the computer.

Successive chapters address the concepts of procedures, variables, and programming. Enthusiastic, young programmers can test their newly-acquired skills by using several variables in conjunction with loops. The rotating, geometric designs that result at this level can be quite rewarding. My nine-year-old son found this section, with its 3-D designs, to be challenging as well as very entertaining.

The final phase includes a project planning guide that should be very useful to both students and teachers. The format is comprehensive and concise. Students in grades four through eight will find it very helpful when designing their own computer graphics.

Logo Aide has a number of academically oriented features that will appeal to teachers. Each chapter has a detailed teaching guide with practical suggestions for enhancing the learning experience at all levels. Interesting exercises are included to reinforce the conceptual material of each chapter. Primitives and commands are printed in large, boldface type—ideal for duplication. Hoglund, a former teacher, recognizes the advantages of hand-outs for students, and so he gives teachers the right to copy the material for their classroom use.

Teachers and students will thoroughly enjoy using *Logo Aide* as a resource book in their computer classrooms. It will enable students to develop their computer skills in fun-filled and interesting ways and it will give them the confidence to stretch their "wings" in new and exciting directions.

Logo Aide *is available from August Publications, P.O. Box 67, San Rafael, CA 94915, or call (415) 454-7772.*

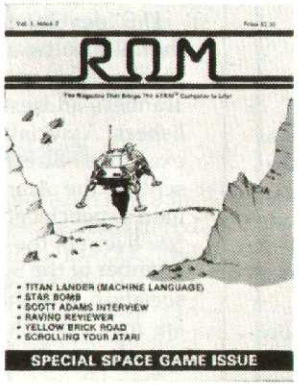
ROM

The Magazine That Brings The ATARI™ Computer to Life!

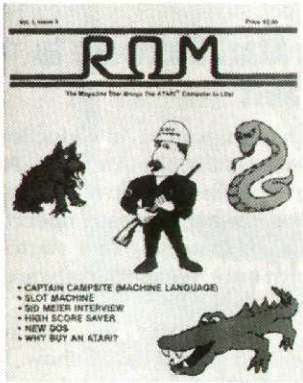
CANADA'S ONLY ATARI MAGAZINE

LIMITED *BACK ISSUES* AVAILABLE!!

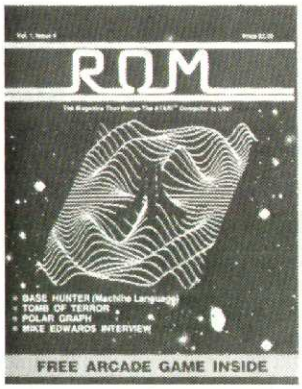
1



2

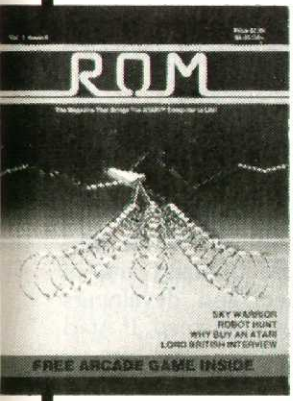


3

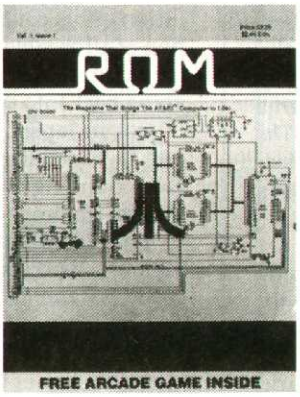


4

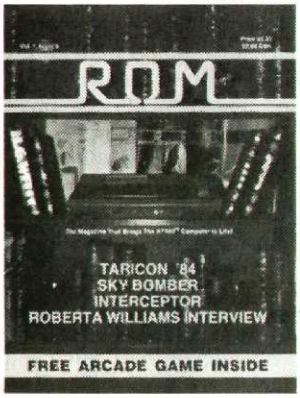
5



6

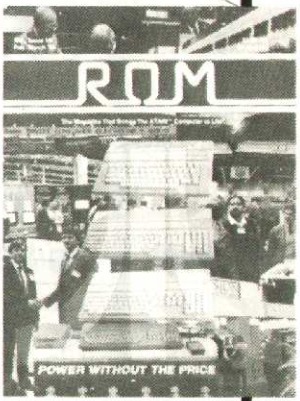


7



8

9



10

PLEASE MAKE CHEQUES OR MONEY ORDERS
PAYABLE IN U.S. FUNDS TO: **ROM MAGAZINE**
ISSUE #1 IS $5.00 ISSUES 2 TO 10 ARE $4.00 EACH

MAIL TO: **ROM MAGAZINE**
BOX 160, MAPLE RIDGE, B.C.
CANADA V2X 7G1

PLEASE CIRCLE ISSUES REQUESTED 1 2 3 4 5 6 7 8 9 10

ENCLOSED IS MY CHEQUE/MONEY ORDER FOR $_____

NAME _____

ADDRESS _____

CITY _____ PROV/STATE _____ POST/ZIP CODE _____

Atari Wins Big at CES

CONTINUED FROM 80

Mr. and Mrs. Steven Jones, owners of DeBug Bytes computers in Indiana, Pennsylvania, were delighted with the exhibit. "I've always thought Atari had good products but I'm impressed with what they've brought out now." The Jones' were pleased at the amount of software shown for the 800XL, and XEs. "I think Atari is wise to get an image of more than a computer games company," he said.

Don't Forget those Peripherals!

The new computers were supported by a full line of quality low-cost printers and monitors. Eventually, Atari intends to market them for other manufacturers' PC's. Russ Wetmore of Batteries Included, who wrote *HomePak*, mentioned the new 80-column monitor (at $150) as a welcome new arrival to the field. The new printers had their admirers, too. Marty Katz, a freelance photographer, snapped an interesting photo. "There were a bunch of guys from Olivetti gathered around the color printer," he said. "They were all pointing at it and wringing their hands."

A Look at the Atari Booth

The booth was set up in a square with a wide traffic lane running diagonally through it. In the left corner of the square, two walls of over 60 video monitors showed programs in action while demonstrators put various Atari models through their paces. The right corner was glassed off and divided into two separate rooms, one for the ST machines, and one completely lined with software for the XE line.

Four pavilions were placed in the middle of the traffic lane, one each for the 65XE, 130XE, 520ST and 130ST, complete with informative brochures and peripherals. Another information station stood behind the video wall. Two additional outside walls displayed Atari 2600s in action, and AtariSoft's software.

No Demo-Itis!

"Demo-itis" is symptomatic of two of Murphy's Laws: "Bugs emerge fast when someone else is watching," and, "the severity of the bugs is in direct proportion to the importance of the people watching the demonstration." The whole world was watching Atari at this CES. Trade shows are notorious for making new machines crash, but ST and XE reliability proved to be excellent. The machines were up from 8:00 a.m. to 6:00 p.m. each day, and not a single bug appeared. Seven bug-free STs were brought to the show, and seven bug-free STs came back.

From Atari Software to AtariSoft

Another important introduction at the show was the *new* AtariSoft. AtariSoft now publishes software for Atari machines, a wider scope of operations than the *old* AtariSoft that started in 1983 and only released software for other brands of computers.

The new AtariSoft brought more than fun and games to the show. Four productivity programs and three educational programs were introduced at CES! *AtariWriter Plus, Silent Butler, Atari Proofreader,* and *Infinity* were among the new line of business and productivity software. The educational programs introduced included *Music Painter, The Learning Phone,* and *AtariLab Light Module*. Hundreds of existing programs were also showcased in the XE room, on the software "wall."

AtariSoft personnel had their hands full at the show, making contact with developers who wanted to write software. "I've never had such a good show for business," said Sigmund Hartmann, president of AtariSoft. "We've spoken to jillions of people."

Software developers were excited about the STs. "We feel that they are very interesting machines," said Robert Botch, Director of Marketing for Epyx software. "All our programmers have seen the hardware and they are breathlessly awaiting the chance to write new software." Ken Wasch, Executive Director of the Software Publisher's Association, dubbed the ST "a winner." He predicted a very healthy developer and software publisher response.

There were two reasons for this large response: the power and price of the ST machines and renewed faith in 8-bit Atari products. According to Bob Lindsey, a creative director for Epyx, "The ST products are for all those folks who have been waiting for and wanting a "Mac" type computer (Apple's Macintosh computer). Atari's pricing and the machine's capabilities have opened up this market."

"I have been getting tremendous response from developers outside the U.S. who are interested in writing software for the 800XL and the 65XE," said Atari's Hartmann after the show.

Reaching Out to Developers

U.S. developer interest was so high that 400 software developers and 100 press representatives attended Jack Tramiel's address to the Software Publishers Association (SPA). The SPA's executive director, Ken Wasch, described the Atari booth and its chairman's speech before his organization as *"the* event of the Winter CES." Atari is a member of the Software Publishers Association, and the other members, who are major developers of programs, responded positively to the address.

Tramiel first described his activities since he left Commodore and the evolution of his concepts of a new generation of affordable technology. He let the crowd in on the real reason for his going back into the computer business. "I was in Japan," he said, "and everyone I was talking to was smiling. They were thinking 'now Jack's out of computers, it's time to go into the U.S.'"

"Jack Tramiel's enthusiasm was contagious," Wasch said. "A broad range of software publishers and developers want the machines to succeed. If Atari fulfills Jack's promises, and pre-releases machines to these software publishers, I think they'd be crazy not to take the bait."

The Changing Image

An important turning point for Atari took place at this January's CES. Confidence in the future was restored. R. Barry Shatwell, advertising director for Timeworks, a software company that publishes *The Money Manager,* the *Electronic Checkbook,* and the *Data Manager,* summed it up. "The Atari booth had more traffic than any other booth, and

there was an aura of 'hmm, these are going to do it.'"

20-hour Shifts and a Visit from Santa Claus

Cutting-edge technology may *look* like magic, but a lot of hard work went into producing all the new models. A company observer stated: "I would say good night to some of these guys on my way home and then they would say good night to me as I came back from lunch the next day. Then they'd be in by 6:00 that evening."

Atari employees were behind the new machines all the way. "We had a Christmas party," said Sam Tramiel, the president of Atari. "Santa Claus made me sit on his lap and asked me what I wanted for Christmas. I told him 'I want GEM in color.' Sure enough, the next day, GEM came up in color."

International Splash

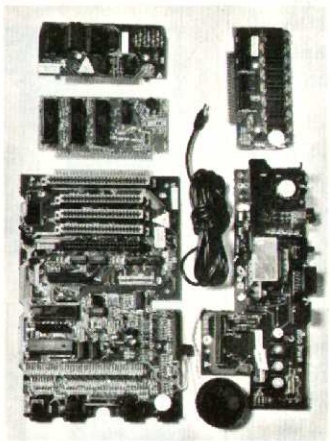
Representatives from Atari's five international subsidiaries, headquartered in Germany, France, Italy, the U.K. and Holland were enthusiastic about Atari's new products and CES display. "In Atari Europe we have a games image. I think that this exhibition was the first step to gain credibility," said Irma Obersteiner, Business Manager for Atari Germany. Massimo Ruossi, the European General Manager, was even more positive. "I think Hanover [the Hanover Industrial Fair held in Germany in April] will be just like this," he said.

So Much in Six Months

Domestic and foreign retailers and distributors expressed surprise at what the new Atari had accomplished. Claude Nahum, director of Atari's international distribution, spoke to buyers and distributors from 18 countries, including Spain, Greece, Kuwait, Indonesia, Scandinavia, and several Latin American countries.

"They all came to see what was happening with Atari and the new line of product," Nahum said. "These people had done business with the company before, and were amazed at what was accomplished in 6 months. Now they've seen that the new Atari and new Atari product line are for real! Now *their* biggest frustration is waiting to get their hands on it."

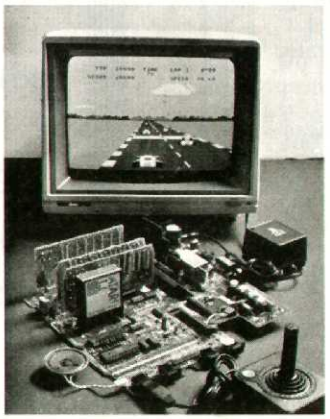
SPARE PARTS FOR YOUR ATARI



Replacement Printed Circuit Boards (PCB) w/parts
800 Main ... $25 400 Main ... $20 810 side $50
800 Power ... $5 400 Power ... $4 810 side w/DS. $75
CPU w/GTIA. $20 16K RAM ... $20 810 Analog .. $20
Used CPU .. $15 10K OS ..... $15 810 Power ... $25
Power Paks 800/810 ..... $20 ea 800 XL ..... $30 ea
Limited quantity used 800 cases & cast shields $40 ea
Hard to find Integrated Circuits $5. each
On CPU: GTIA, ANTIC, CTIA, CPU 6502, CPU 6511
On 10K OS: Math ROM 399B, OS ROMs 499B & 599B
On 800/400 Main: Pokey, 6520 PIA
On 810 & 850: MPU 6507, PIA 6532, RAM 6810, ROM C

B&C computervisions (408) 554-0666

3400 El Camino Real, #1, Santa Clara, CA 95051
Hours: Tuesday-Friday 10am-7pm/Sat. 10am-5pm
Terms: Calif. Res. add 7% sales tax. Add $5. for shipping. We ship UPS COD, Prepaid or MC/Visa ($75. min.). No orders under $20.



800 PCB Sets Main, CPU, 10K OS, Power & RAM $70 Less RAM chips $55

810 PCB Set w/side, DS, Power, Analog $100
810 Drive Mechanisms Tandon or MPI $80
Special "De Re Atari" $15
Field Service Manuals 800/400, 800XL or 810 $25. ea
For 1050 or 1200XL $20 ea For 410 or 835 $15. ea
Diagnostic Cartridges Computer or Disk $25. ea
Happy Upgrades, 800, 800XL, 810, 1050, 1030 $CALL
Books, Modems, Monitors, Printers, Joysticks $CALL
Aventure International Gold Series $40.
Software by SSI, OSS, Synapse, LJK, Ataris ETC.
Atari 800/400 Technical Reference Notes $20.
Pilot, Basic, Microsoft II, Assembler Manuals $5. ea

SPARE PARTS FOR YOUR ATARI

CONTINUED FROM 5
adds italics.) If you write in a foreign language, you should be pleased to know that both the XMM801 and SMM804 offer the Atari international character set.

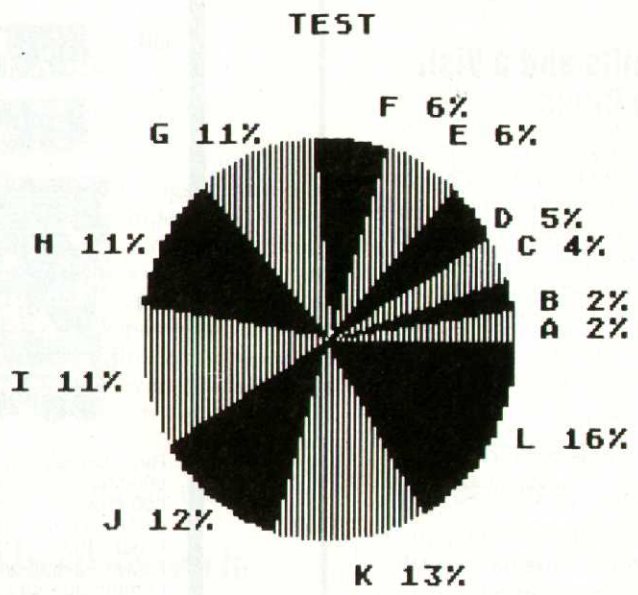
Column width is programmable up to 132 print positions across, meaning that you can print up to 132 characters on a single line. The page length is variable, and so is the spacing between printed lines.

Among the other features of these two printers is a fully-featured, straightforward control panel with three indicators (Power; No paper—to alert you when the paper is out—and On Line) and three functions: On Line, to switch the printer on- and off-line; Line Feed, to advance the paper a line at a time; and Form Feed, to advance the paper an entire page length. The Form Feed button is especially handy for bringing your completed work out of the printer.

Both printers possess full dot-addressable graphics capability. The XMM801 has two graphics modes: normal-density (480 dot columns across) and high-density (960 horizontal dot columns). The normal-density graphics mode is Epson-compatible. With the right software, you can transfer designs and pictures from the computer's video display screen to the printer. Or you can create programs that generate graphics directly from the printer.

The SMM804's graphics function was uniquely designed with the ST Computers' hi-res graphics capability in mind. The printer's graphics mode prints a fantastically dense 1280 dot columns across (same as the Apple Imagewriter but at less than half the price). The graphics package included with the ST Computers enables a direct transfer of images, pictures and designs to the SMM804.

The XMM801 is compatible with the *AtariWriter* word processor, as well as all other applications programs that support Atari 8-bit computers and printers. The SMM804 has been designed for Epson-compatability (except the graphics mode), and therefore supports major word processing programs that run on the Atari ST or IBM and compatible Personal Computers and feature an Epson (virtually an industry standard) printer driver.



An XMM801 graphics screen dump.

Courier 10

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789!"#$%&'@()<>-=*+
;/.,_|^\:?][~}{~¢¬

Boldface

Underlining

$E=mc^2$

H_2O

Variable Print Pitch

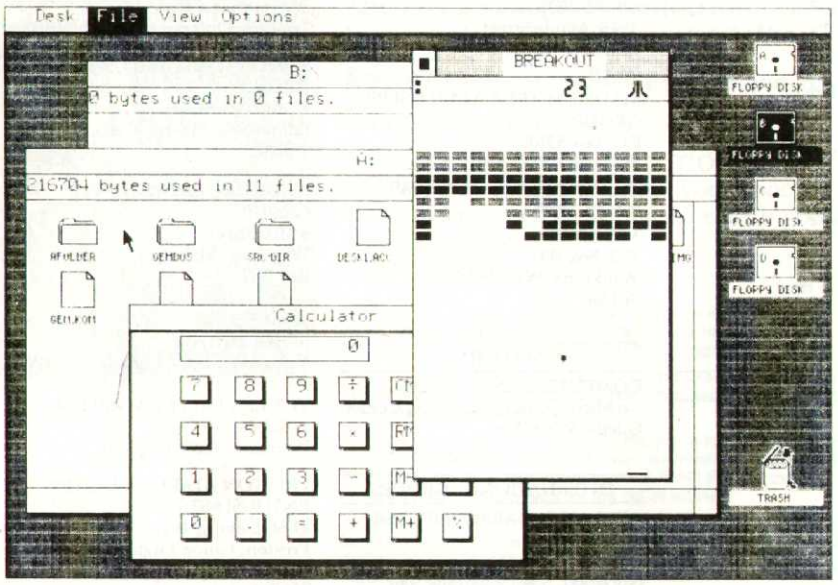
The XDM121 and SDM124—letter perfect.

The Atari XTM201 and XTC201 Dot Matrix Thermal Transfer Printers

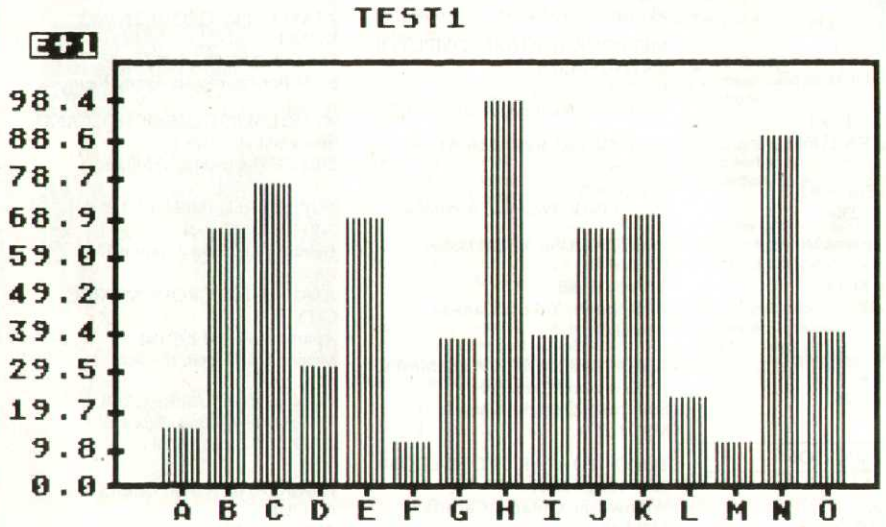
Both the XTC201 and the XTM201 are for use with the Atari 8-bit computers. As far as the hardware goes, the printers are nearly identical. The difference is that the XTM is a monochrome printer, whereas the XTC can print in color.

They each take up incredibly little desk space. Very cute!

The printers employ the latest in thermal printing technology. The print head consists of eight film resistor nibs. The nibs heat spots on the ribbon, thus melting and transferring those spots onto the paper. You can use either plain paper or thermal paper, which is a nice option since thermal paper is both expensive and sometimes hard to find.



You can transfer ST Computer graphics directly to the SMM804.



An XMM801 graphics printout.

(For plain paper, Xerox 4024 or an equivalent is recommended because of its smooth surface.) They each feed single-sheets and have ribbon-end and paper-out sensors.

Using plain paper, the printers employ a small ribbon cassette. The XTC201, for color printing, uses a color ribbon cassette. The color cassette is composed of three colors: yellow, cyan, and magenta. Combinations of these three, using multiple passes of the print head, produce a rainbow of other colors.

Again, the software support is excellent. The printers have been engineered for compatability with *AtariWriter*, as well as with applications programs for use with Atari 8-bit computers and printers.

The normal-density graphics mode is Epson-compatible, so any screen-dump program that dumps to an Epson printer in normal-density graphics (and works with an Atari 8-bit computer) will work with the XTM201 (and XTC201).

Both printers print at 20 characters per second, which isn't going to break any printing speed records. Nonetheless, for the person desiring good print quality at a bargain price, the XTM201 is the right machine.

The XTC, at its rock bottom price, is the most impressive color printer I've seen to date. In my opinion (and I know printers), the XTC's color quality has the low-priced ink-jet printers beat hands down. There is virtually no contest.

The Atari STC504 Thermal Transfer Color Graphics Printer

The Atari STC504 Printer is a thermal transfer printer that is fast (50 characters per second) and can print monochrome (black) or color characters and images.

The printer accepts single sheets of thermal paper or plain paper (Xerox 4024 or equivalent). The machine has both ribbon-end and paper-out sensors.

The STC504 is fully featured, providing an incredible assortment of fonts, print styles, and formatting functions. Pica and elite, bold print, underlining, and subscripts and superscripts are all there. Five line spacing options, including one variable in increments of 1/144 inch, maximize the printer's versatility. International characters are also featured.

The graphics mode is high-density, complementing the hi-res ST screen format. With the ST graphics package, you can transfer color (or monochrome) graphic images directly from the ST computer. A whopping 16 colors are available to you using the ST graphics dump. The color quality is, without qualification, excellent.

As with the other 16-bit printers, the STC504 has been engineered for compatibility with major word processing programs. Low-priced and fully-featured, it's the machine to buy for those desiring both all-around performance and remarkable color graphics capability.

CONTINUED FROM 57

SOUTH CAROLINA

GREENVILLE REGIONAL ATARI COMP ENTHUS
508 Butler Spring Road
Greenville, SC 29615

ATARI MICRO COMPUTER USERS' GROUP
201-B Robinhood Circle
Union, SC 29379

MIDLANDS ATARI COMPUTER CLUB
1525 Bull Street
Columbia, SC 29201

SHAW A.C.E.
585-B White Oak Street
Shaw AFB, SC 29152

TENNESSEE

EAST TENNESSEE A.U.G.
2029 Bloomingdale Park
Kingsport, TN 37660

INDEPENDENT SOCIETY OF ATARI ENTHUS
Rt 1, Bradley Creek Rd., Box
Milton, TN 37118

TEXAS

MIDLAND MICROCOMPUTER ASSOCIATION
4400 Humble Avenue
Midland, TX 79703

COMMAND CONSOLE
Rm W-1132, Jester Center West
Austin, TX 78784

AUSTIN A.C.E.
8207 Briarwood Lane
Austin, TX 78758
1st Thur.

SAN MARCOS ATARI COMPUTER CLUB
113 N. Johnson Avenue
San Marcos, TX 78666

CORPUS CHRISTI COMPUTER CLUB
801 Orleans Drive
Corpus Christi, TX 78418

ALAMO AREA ATARI USERS' ASSOCIATION
3646-B Fredricksburg Road
San Antonio, TX 78201
2nd Thur.

RANDOLF AREA ATARI USERS' GROUP
PO. Box 2611
Universal City, TX 78148

PASADENA ATARI COMPUTER CLUB
3312 Hays
Pasadena, TX 77503

WOODLANDS ATARI COMP. ORGANIZATION
2443 Ripplewood
Conroe, TX 77384

W.A.U.G.
622 Cherrybank
Houston, TX 77079

COMPUTRONIX ATARI FAMILY ENTHUSIAST
8502 Apothecary Lane
Houston, TX 77064

HOUSTON A.C.E.
P.O. Box 66412
Houston, TX 77006

HEART OF TEXAS A.C.E.
81005-2 Travis Avenue
West Fort Hood, TX 76544

TEMPLE A.C.E.
3202 Las Cruces Drive
Temple, TX 76502

10PM (PROGRAMMING MASTERS)
P.O. Box 92924
Southlake, TX 76092

DAL-ACE
4033 Southwestern Blvd.
Dallas, TX 75225
2nd Sat.

UTAH

A.C.E. OF SALT LAKE
484 East 6360 South
Murray, UT 84107
Last Thur.

VIRGINIA

FARMVILLE ATARI COMPUTER GROUP
1305 Gilliam Drive
Farmville, VA 23901

G.R.A.S.P.
8720 Courthouse Road
Chesterfield, VA 23832
2nd/4th Thur

PENINSULA ATARI COMP ENTHUS OF VA
1212 N. King Street #37
Hampton, VA 23669

SOUTHSIDE TIDEWATER ATARIT.U.S.
4836 Honeygrove Road
Virginia Beach, VA 23455

FAIRFAX A.C.E.
2665 Arlington Drive #202
Alexandria, VA 22306

NOVATARI (Current Notes)
5 clubs
122 N. Johnson Road
Sterling, VA 22170
2nd Sunday

W.A.C.U.G. (Woodbridge)
15817 Vista Drive
Dumfries, VA 22026

WASHINGTON

A2 D2
4075 Tami Street
Richland, WA 99352

SPOKANE ATARI USERS' GROUP
E. 7312 Sharp
Spokane, WA 99206

SEATTLE PUGET SOUND A.C.E.
2206 Aqua Vista Court NW
Gig Harbor, WA 98335

BELLEVUE/REDMOND A.C.E.
c/o James Adams P.O. Box 6341
Bellevue, WA 98008

WISCONSIN

OSHKOSH ATARI USERS' GROUP
1418 Indigo Drive
Oshkosh, WI 54901

PACKERLAND ATARI COMPUTER USERS' SOC.
339 S. Maple Street
Kimberly, WI 54136
1st Sat.

MADISON AREA ATARI USERS GROUP
P.O. Box 53705
Madison, WI 53705
3rd Tuesday, IMC, West High School, Mad.

MILATARI
P.O. Box 1191
Waukesha, WI 53187-1191
3rd Sat.

WYOMING

COMPUTERS ANONYMOUS
c/o Micro Center, Southview Center
Gilette, WY 82716

INTERNATIONAL GROUPS

ADELAIDE ATARI COMPUTER CLUB
P.O. Box 333
Norwood, S.A., Australia 5067

ATARI COMPUTER ENTHUSIASTS (N.S.W.)
G.P.O. Box 4514
Sidney, N.S.W., Australia 2001

DOWN UNDER ATARI USERS' GROUP
10 Ruthwell
Montrose, Tasmania, Australia

MELBOURNE ATARI COMPUTER ENTHUSIASTS
Box 246
Northcote, Victoria, Australia 3070

WESTERN AUSTRALIA ATARI USERS
3 Highbury
Florest Park, Western, Australia

WHITEHOUSE ATARI USERS GROUP
52 Pelly Road
Whitehorse, Yukon, Canada
Y1A 4M1

TORONTO ATARI PROGRAMMERS
10 Markwood Crescent
Etobicoke, Ontario, Canada
M9C 1L2

TORONTO ATARI FEDERATION
5647 Yonge Street
Willowdale, Ontario, Canada
M2M 4E

TAPE
1 Saint Clair Ave. East #606
Toronto, Ontario, Canada M4T 2V7

S.A.S.G.
#9-835 4th Ave. North
Saskatoon, Sasketchewan, Canada
S7K 2N3

PROGRAMMER'S WORKSHOP
2566 Steeple Court
Port Coquitlam, B.C., Canada
V3E 1K5

NATIONAL CAPITOL ATARI USERS
577 East Lortie
Gatineau, Québec, Canada
Y1A 4M1

LONDON ATARI USERS GROUP
38 Southview Place
London, Ontario, Canada N6J 1S2

EDMONTON ATARI USERS GROUP
13304 118th Street
Edmonton, Alberta, Canada
T5E 5L5

ATARI RAILER COMPUTER GROUP
8 McCurdy
Winnipeg, Manitoba, Canada
R2V 3B2

ABACUS
61 East 23rd Ave.
Vancouver, B.C., Canada V5V 1W8

THE LEA VALLEY ATARI USERS
1 Globe Court
Wormley, Herts, England

PRESTON ATARI COMPUTER ENTHUSIASTS
41 St. Salburg Ave.
Preston, Lancs, England

PAGE 6
P.O. Box 54
Stafford, England ST16 1DR

U.K. ATARI COMPUTER OWNERS CLUB
P.O. Box 3
Rayleigh, Essex, England

ATARI USERS GROUP HONG KONG
Flat C-3, 231F Rhine Court
82-84 Bonham Road, Hong Kong

ATARI USERS CLUB OF HOLLAND
Strawinskylaan 26
2102 CP Heemstede, Holland

FUJI ATARI USERS GROUP
3-10-2 Sakuragawa
Itabashi-Ku, Tokyo, Japan 174

ATARI USERS GROUP MEXICO CITY
Apartado Postal 105-160
Mexico D.F., 11560, Mexico

BONN ATARI USERS GROUP
US Embassy, Bonn, Box 425
APO, NYC, NY 09080

AUCKLAND ATARI USERS GROUP
24 Sequoia Place
Mairangi Bay, Auckland 1,
New Zealand

ATARI USERS GROUP —WELLINGTON
Box 16011
Wellington, New Zealand

ATARI COMPUTER ELITES SINGAPORE
Blk-3, 335-K, Syed Alwi Road
Singapore, 0820

ATARI USERS GROUP OF BANGKOK
18 Soi Reang Prayoung, Pradipat Rd.
Bangkok, 10400, Thailand

"THE BEST 1984 MICROCOMPUTER SOFTWARE"

...Classroom Computer Learning Magazine

CLASSROOM COMPUTER LEARNING SOFTWARE AWARD WINNER

There are dozens of reasons to buy an ATARI Computer. And the ATARILAB™ Starter Set is just one. Not merely because it was selected by teachers, software developers, and instructional media designers as the most outstanding educational software in 1984... but also because ATARILAB exemplifies Atari's dedication to perfection. From state-of-the-art affordable computer systems to beneficial software, Atari is quickly being regarded as the first in the class!

Developed by Dickenson College for Atari, this incredible educational kit will help all computer enthusiasts—young or old—gain fascinating insights into the mysteries of science.

The STARTER KIT comes with everything you need, including it's own electronic thermometer and sensor to send temperature readings directly to your ATARI Computer. There are no limits to the exciting discoveries you can make with your ATARILAB Starter Set. And you can grow with it.

Build your own award-winning Atari educational library from pre-school skill-building software, to college course subjects.

Your ATARI Computer System is a lifetime investment.

ATARI®

Power Without the Price™

Kings of the Atari Diamond

Computerized Baseball for Everyone

by Arnie Katz and Bill Kunkel

Winter's icy blasts can't chill the enthusiasm of true baseball fans. This winter, hibernating grandstand managers were busy casting a critical eye over their favorite team's past performance and speculating about the fortunes of the home club in the campaign to come. That day is here. It's spring, and time to "play ball!"

Playing electronic baseball is another way roundball partisans keep their love affair with our national pastime alive throughout the year. Baseball simulations have come a long way since Atari published *Home Run* for the Atari 2600 game machine. Whether you prefer the thrills of an action contest, or the mental challenge of a statistical replay, a new wealth of baseball programs is waiting in the dugout to turn your Atari computer into your personal stadium.

Action baseball games depend primarily on the hand-eye skills of the participants. That is, whether the batter dribbles a grounder, or blasts one off the wall, depends on how skillfully the defensive manager controls the pitch, and on the timing of the person directing the batter.

Statistical replay games aren't played in "real time." They stress choosing the right strategies, rather than executing them. Each computerized athlete is mathematically modeled to reflect his real-life previous-season record. Complex formulas determine whether a batter strokes a homer or strikes out. Factors governing the outcome include the hurler's mastery of a particular pitch, the hitter's batting average and power rating, and the positioning and ability of the fielders.

Baseball by Inhome Software

The only choice for those without disk drives, is *Baseball* (Inhome Software, 1983, cartridge, 16K required). Although it has numerous "special touches," *Baseball* shows its age like a veteran catcher with arthritic knees. Not only is it somewhat unfair to expect a 16K program to equal a 48K one, but sports games really have improved in the two

CONTINUED

Congratulations.

You've just purchased the best personal computer on the market at the very best price. Now what are you going to do with it? Program? Write papers? Manage data? Play games? Maybe all of the above?

You'll want to dig into the latest news and information about your equipment, explore new ways to use your system, and discover how to expand it. And you'll be curious about what the rest of the world does with Atari computers.

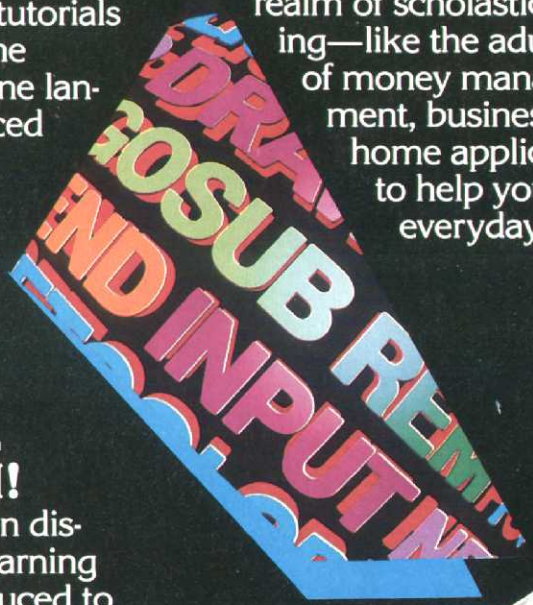
Naturally, the best place to get information is from the source. Information uncovered around the globe and around the block. That's us. *Atari Explorer* magazine. An exciting expedition into the fascinating realm of computers. And we want you to join. Your Ticket is the attached coupon.

DISCOVER YOUR GIFT FOR EXOTIC LANGUAGES —LIKE BASIC, LOGO, AND ASSEMBLER!

We'll teach you how to *really* use Atari computer languages. From tutorials for beginners to the nuances of machine languages for advanced computerists. *Six* issues of tutorials for less than the price of *one* computer book.

GET A REAL EDUCATION!

Preschoolers can discover the fun of learning while being introduced to basic skills. The *Explorer* features a section of do-it-yourself games and programs for parent-child interaction. We'll also explore educational benefits outside the realm of scholastic learning—like the adult world of money management, business, and home applications to help you with everyday life.

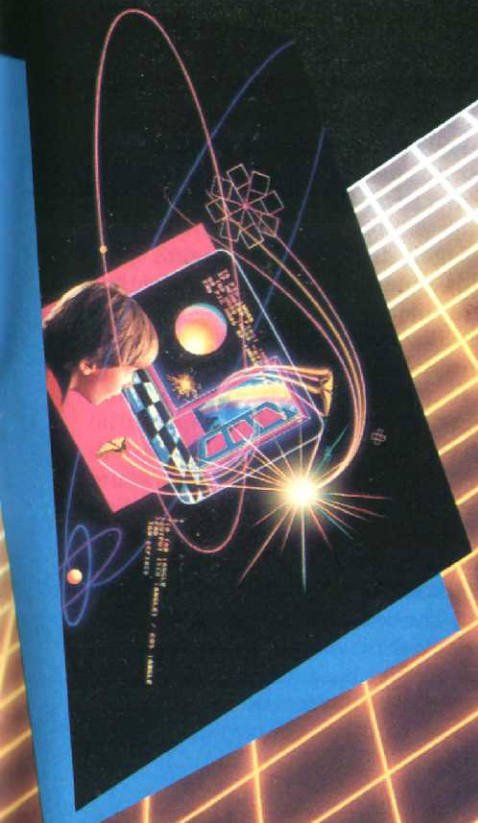


PLAY ALONG WITH US!

Atari has worldclass game software. The *Explorer* will show you how to win at your favorite video games with insider strategies and tips—and we'll give you sneak previews of the hottest new Atari game software. We'll even teach you how to make your *own* arcade games with tutorials from our own game-designing experts. *Atari Explorer* is an adventure into the world of computers for business, education, and entertainment.

It will keep you at the leading edge of computer technology. And the *Explorer* doesn't just cover the serious stuff. We also feature the human side of computing—real people using their computers for some very interesting projects.

So whether you want to perform reconnaisance on your computer's memory banks or recall your Aunt Maggie's cherry pie recipe, you'll want to explore our pages.



Yes! enter my subscription to the ATARI® EXPLORER™:

☐ 6 issues...$15.00* ☐ 18 issues...$39.95* save 25%

Name_____

Address_____

City_____

State_____ Zip_____

☐ Payment Enclosed ☐ MasterCard ☐ Visa

Acct. No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Expiration Date_____

Signature_____

*This rate limited to USA and its Possessions. Canadian subscriptions, add $5 for postage and handling, overseas add $10.00/6 issues; $30.00/18 issues.

Payments due in U.S. funds. Place your payment & order form into an envelope & address to:
Atari Explorer, P.O. Box 3427
Sunnyvale, CA 94088-3427 DE03

A New Angle on Personal Computing

The incredible Atari 130XE™ System

ATARI's 130XE Personal Computer. Under its hood is technology so new, that it is able to deliver 131,072 bytes of Random Access Memory for less than you ever imagined! In fact, it's now the most affordable, value-packed PC you can own.

The 130XE lets you choose from 256 colors in 11 different graphic modes. It has 4 independent sound voices extending beyond 3½ octaves. From its comfortable typewriter keyboard you'll be able to access the built-in Basic programming language. Even more important than its versatile serial I/O port and its total compatibility with all Atari peripherals...is its ease of understanding. You're in command from the moment you hook it up.

The powerful 130XE is not alone. Its new disk drive with Atari DOS 2.5 adds enhanced density storage capacity. There are printers to meet your every need, including color graphics, letter quality and high-speed dot matrix equipment.

Expand your system with a telecommunications modem, a fine resolution monitor, light pens, touch tablets, joysticks, and more. Plus thousands of professional business, educational and entertainment software to work with.

You wouldn't expect less from an ATARI WORLD-CLASS COMPUTER — except price...and the 130XE complete with drive, printer and power-to-spare is less than $500!

Available at fine retailers from coast to coast.

ATARI EXPLORER
P.O. Box 3427
Sunnyvale, CA 94088-3427

Address Correction Requested

ATARI®
Power Without the Price™