

for Atari
Computers
(XL Compatible)

U.S.A. \$3.00
CANADA \$3.50

Antic[®]

The **ATARI[®]** Resource

SEPTEMBER 1984 VOLUME 3, NUMBER 5

COMPUTER GRAPHICS

—hot new products make
you an instant artist!

- ◆ Light Pen Magician, Steve Gibson
- 56 Atari Graphics Modes

HOW TO:

- Customize Your Keyboard
- ◆ Draw With 128 Atari Colors
- ◆ Fade Pictures In & Out
- ◆ Make Graphics Files Compatible

11 Programs Included In This Issue!



OUR STORIES LACK IMAGINATION.



Because Infocom's interactive fiction is designed to run on *your* imagination.

That's precisely why there's nothing more interesting, challenging or interactive than an Infocom disk—but only after you've put it in your computer.

Once it's in, you experience something akin to waking up inside a novel. You find yourself at the center of an exciting plot that continually challenges you with surprising twists, unique characters (many of whom possess extraor-

dinarily developed personalities) and original, logical, often hilarious puzzles. Communication is carried on in the same way as it is in a novel—in prose. And interaction is easy—you type in full English sentences.

But there is this key difference between our tales and conventional novels: Infocom's interactive fiction is active, never passive. The course of events is shaped by what you choose to do. And you enjoy enormous freedom in your choice of actions—you have hundreds, even thousands of alternatives at every step. In fact, an Infocom



interactive story is roughly the length of a short novel in content, but because you're actively engaged in the plot, your adventure can last for weeks and months.

Find out what it's like to get inside a story. Get one from Infocom. Because with Infocom's interactive fiction, there's room for you on every disk.



INFOCOM™

For you: Apple II, Macintosh, Atari, Commodore 64, CP/M 8*, DECmate, DEC Rainbow, DEC RT-11, HP 150 & 110, IBM PC* & PCjr*, KAY PRO II, MS-DOS 2.0*, NEC APC, NEC PC-8000, Osborne, TI Professional, TI 990/4A, Tandy 2000, TRS-80 Color Computer, TRS-80 Models I & II.

*Use the IBM PC version for your Compaq and the MS-DOS 2.0 version for your Wang, Mindset, Data General System 10, GRID and many others.



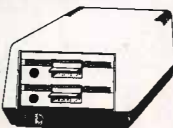
FOR
ALL
ATARI COMPUTERS

BEST SELLERS FROM THE PROGRAMMERS WORKSHOP

TWO DRIVES FOR THE PRICE OF ONE

\$469⁰⁰

THE
ASTRA
1620



MORE DISK DRIVE FOR YOUR MONEY ...

In fact, with the ASTRA 1620, you get two superb Disk Drives for the price of one. The ASTRA 1620 is Single or Double Density (software selectable) and completely compatible with ATARI DOS or OSA+DOS. When used as Double Density, the ASTRA 1620 has the same capacity as Four ATARI 810® Disk Drives.

★ Satisfaction Guaranteed ★

INCLUDED: at no extra charge

One Copy of Home Writer and One Copy of Smart DOS.

THE HOME WRITER \$39.00

The HOME WRITER is an easy to use word processor which includes a carefully selected group of functions that are at your disposal immediately. The functions are as follows: SAVE, LOAD, REVIEW, PRINT-OUT, or EDIT. All the popular editing features available on the ATARI Home Computer in direct programming mode are also available with HOME WRITER. You may also search for phrases or strings, load off of either disk or cassette, and number pages automatically. Unlike other small word processing programs, HOME WRITER does not wrap-around when at the end of a line. Right and left margin justification is available for any type parallel printer. 48K.

FILING SYSTEM \$39.00

FILING SYSTEM allows the user to configure any type of data file imaginable. Examples are recipe cards, mail lists, reminders for birthdays, check-ups, etc., complete inventories (home and business), personnel files, customer call-ups, price list, and much, much more. You may retrieve data using any field or combination of fields. Files also may be saved, sorted, and printed in a preset format that you configure. Uses either a single or a double density disk drive. Three preconfigured files are included - a Mailing List, a Price List, and a Household Inventory. 24K minimum. Now in double density.

THE PROGRAMMERS WORKSHOP

5230 Clark Ave., Suite 19

Lakewood, CA 90712

(213) 920-8809

DESK SET \$39.00

DESK SET is a perpetual calendar, an appointment calendar and also a card file. The perpetual calendar is a calendar of every month, past, present or future. The appointment calendar allows up to 15 entries to be made each day. The card file is a mail list program which holds up to 200 addresses. The printing format of card file includes continuous lists, labels or envelopes. Files can be printed; all the files from one file number to another; by zip code; by state or by selected files. DESK SET is an easy way to organize your life. 40K

FINANCIAL CALCULATOR \$29.00

The program answers virtually any questions concerning the cost of money, loans, and interest earned on savings, loans and investments. Plus, this program will give a complete interest earned table and amortization table. This program is a must for anyone serious about money. 32K.

FORECASTER \$29.00

Forecast future events based on past information. Forecast profits, costs, sales trends, prices, test scores, virtually anything. Edit, save on disk and test various elements to determine the outcome. FORECASTER is a powerful "what if" program - a must for business. 24K

STAT PLUS \$29.00

STAT PLUS is the most powerful statistic tool we have seen. Run sample space, mean, variance and standard deviation. Do probabilities using binomial, poisson or normal distribution. Also, do students' t-test, Mann-Whitney U test and Chi Square. Do linear regressions; may use 1-12 independent variables. Interact a sample from one module to another, edit, rank and print out. 24K min.

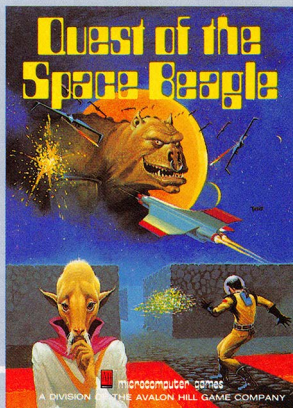
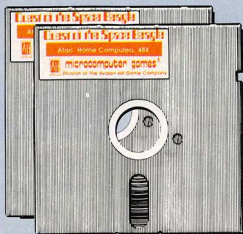
DISK FIX KIT \$29.00

It takes more than a speed adjustment to properly set up an Atari® 810 Disk Drive. Do it Right - Test Disk, Cleaner, Tools, Special Oil, Swabs and complete instructions.

TO ORDER: VISA/MasterCard, check or money order accepted. If charge, please include expiration date of card. Shipping and Handling software \$1.50, disk drive, \$10.00. California residents add sales tax. Phone or mail.

* ATARI is a registered trademark of Warner Communications

Quest of the Space Beagle



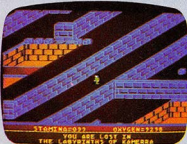
Scott Lamb's Interactive Space Fantasy Adventure

The sequel to JUPITER MISSION 1999®

When the government agents knocked on your door early one morning (at the beginning of **JUPITER MISSION 1999**) and rudely whisked you away in the starship Space Beagle, you had no idea of what was to follow. As the lone survivor of Jupiter Mission and the Earth's savior from an impending alien invasion, you unwittingly thought the worst was behind you. SLIM CHANCE! A mysterious beam has cast you into the nether reaches of space; cold, lifeless, forbidding. You long for the amenities of Mother Earth, which you had always taken for granted . . . until now!



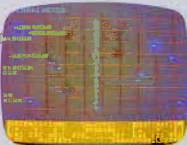
Space Battle Display



The Labyrinths of Kamerra



Hyperwarp Temporal Imbalance Sensor Grid



Galactic Starmap Display

THE QUEST OF THE SPACE BEAGLE: THREE ADVENTURES IN ONE!

■ Betried by the Faunians, a peaceful race being invaded by the evil Gentuzians, they have decided that YOU must launch a pre-emptive strike against the Gentuzian homeworld. You must command 10 Faunian robot fighters against the Gentuzian battle fleet which outnumbers you four to one! It won't be easy; you'll need the right tactics and all the skill and patience you can muster.

■ Assuming you are successful and conquer the Gentuzians, they will want you to become their Emperor. The only thing you want is to repair the Space Beagle and get back home. But they are insistent creatures; refuse the crown, and you can forget leaving. Reluctantly you accept and, to prove your claim, they drop you into the Labyrinth of Kamerra! Find your way out, and they'll let you go home as Emperor of Gentuza. No problem, you think, until you soon realize that Kamerra is a cruel maze deficient of adequate food and oxygen, yet aplenty with dangerous pits and "Ardillian Whipstingers."

■ SHOOT THE STARS! Fortunately, you are able to save your game in progress every step of the way in **QUEST OF THE SPACE BEAGLE**.

Your greatest challenge is about to begin. As you settle into the commander's chair of the Space Beagle, you set your sights for home! But which way? Before you spans 200,000,000 light years of Superclusters. On board is an authentic matrix computer calibrated to simulate the actual dimensions of the universe. You must identify the one Supercluster containing Sol, and hyperwarp from one end of space to another. Once you lock into the right Supercluster, you must find the Milky Way Galaxy, your assurance that Mother Earth is within reach, and home sweet home!

THE QUEST OF THE SPACE BEAGLE is ready to run on your Atari® Home Computer with 48K memory, one disk drive and joystick. \$35.00



microcomputer games®

A Division of The Avalon Hill Game Company
4517 HARFORD ROAD, BALTIMORE, MD 21214, 301-254-9200

FEATURES

- ATARI ART PRINTOUTS** by Josepha Haveman 96
Modern art on a dot matrix printer

- DRAWING FUN** by Elrhea M. Bigham 99
Sketch in nine colors **FREE SOFTWARE**

- ANTIC'S MODE 3** by Karl Wiegers 32
A special character mode **FREE SOFTWARE**

- COMPUTER GRAPHICS
PRODUCT SURVEY** by David Duberman 37
Unlocking the art inside you

- PRICE'S COLOR PICTURE PAINTER** by Philip Price 48
128 colors in every picture **FREE SOFTWARE**

- EASY GRAPHIC CONVERTER** by Charles Jackson 57
Mix and match graphics from four popular products **FREE SOFTWARE**

- FADER:
A CLASSY VIDEO "SLIDE SHOW"** by Joseph Grande 98
Featuring dot-by-dot "dissolves" between pictures **FREE SOFTWARE**

DEPARTMENTS

- STARTING OUT** **FREE SOFTWARE**
UNLOCKING THE 56 GRAPHICS MODES by Paul Chabot 13

- EDUCATION** **FREE SOFTWARE**
TELLING TIME IN PILOT by Richard Seltzer 16

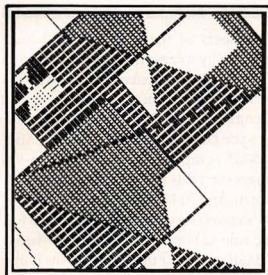
- COMMUNICATIONS**
NETWORKING NEWS by Michael Ciralo 21

- ASSEMBLY LANGUAGE** **FREE SOFTWARE**
ROTATE YOUR PLAYER by Larry Parker 64
COPYMATE by Mike Palmer 87

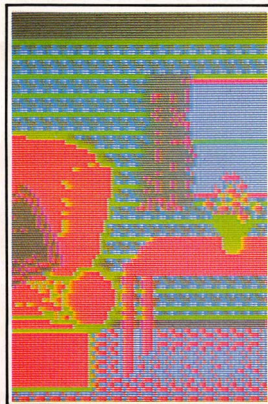
- TOOLBOX** **FREE SOFTWARE**
CUSTOMIZING BASIC KEY FUNCTIONS by Mike Fleischmann 66

- GAME OF THE MONTH** **FREE SOFTWARE**
OLYMPIC DASH by Jeffrey Stanton 70

- I/O BOARD _____ 6
HELP! _____ 10
ANTIC'S SOFTWARE LIBRARY _____ 56
NEW PRODUCTS _____ 54
PRODUCT REVIEWS _____ 76
MICROSCREENS _____ 78
LISTING CONVENTIONS _____ 85
ADVERTISER'S LIST _____ 94
SHOPPER'S GUIDE _____ 95



Dot matrix art page 96



Atari art page 37



Disk subscription offer page 50

Publisher
James Capparel

Editorial Department
Robert DeWitt, Managing Editor
David Duberman, Technical Editor
Jack Powell, Listings Editor
Michael Ciruolo, Staff Writer
Charles Jackson, Staff Writer
Melissa Rockliff, Editorial Coordinator

Contributing Editors
Carl Evans, Ken Harms,
David & Sandy Small, Jerry White
Antia Malini

Art Department
Marni Tapscoot, Art Director
Kyle Bogertman, Production Supervisor
Linda Tapscoot, Ad Production Coordinator
Patricia Foster, Production Assistant

Contributing Artist
Beatrice Benjamin

Cover Illustration
Kazuhiko Sano

Circulation Department
Les Torok, Manager
Peter Walsh, Shipping
Hun-sik Kim, Shipping
Juliana Hoffman, Subscriptions
Monica Burrell, Subscriptions

Accounting Department
V.J. Briggs, Manager
Sandra Jones, Accounting Clerk
Brenda Oliver, Accounts Receivable

Marketing
Gary Yost, Manager, Marketing Support
Steve Randall, Advertising Sales Director
Maria E. Chavez, Receptionist

General Offices (415) 957-0886
Advertising Sales (415) 661-3400
Credit Card Subscriptions
outside California (800) 225-1617 ext. 133
inside California (800) 772-3545 ext. 133
Subscription Problems (415) 957-0886

September 1984
Volume 3, Number 5
ANTIC—The ATARI Resource is published twice
times per year by Antic Publishing. Editorial
offices are located at 524 Second Street, San
Francisco, CA 94107. ISSN 0745-2527. Second
Class Postage paid at San Francisco, California and
additional mailing offices. POSTMASTER: Send
address change to Antic, 524 Second Street,
San Francisco, CA 94107.

Editorial submissions should include program
listing on disk or cassette, and text file on media
and paper if text was prepared with a word
processor. Media will be returned if self-addressed
stamped mailer is supplied. Antic assumes no
responsibility for unsolicited editorial material.

Antic is an independent periodical not affiliated
in any way with Atari, Inc. ATARI is a trademark
of Atari, Inc. All references to Atari products are
trademarked and should be so noted.

Antic is a registered
trademark of Antic Publishing, Inc.

Copyright © 1984 by Antic Publishing.
All Rights Reserved. Printed in USA.

i/o board

HANDLING YOUR RS-232

I have a serial RS-232 printer connected to the Atari 850 interface box. It works fine when I'm writing in BASIC, but when using software that expects a parallel printer port, of course it doesn't work. Is it possible to POKE the location where the printer handler, is, redirecting it to the location of the RS-232 handler? Where is the RS-232 handler kept?

Jim Riess
Sudbury, MA

The RS-232 handler isn't resident in the Atari OS—it must be loaded from disk: turn on the 850 interface, then boot from the Atari DOS Master Disk or from a disk containing the AUTORUN.SYS file (from the Master Disk). This loads the RS-232 handler and adds its address to the handler table. Then simply use the RS-232 port as another I/O channel. First, OPEN #1,8,0,"RI:," then use PRINT #1 or PUT #1 to send data to the port. Finally, CLOSE #1. Of course, this can only be used to modify BASIC programs that use the printer.

Modifying machine language programs that use printers, such as LJK's Letter Perfect requires extensive technical expertise and probably wouldn't be worth the trouble. As far as we know, the only commercial word processing program for the Atari using the RS-232 port is Atari's own Atariwriter. Choose SAVE from the main menu, then type RI: at the prompt for device and file name. If you use Atariwriter without a disk drive, the RS-232 handler is automatically booted if the 850 is turned on and connected before the computer is turned on.

—ANTIC ED

ANTIC AUTHORS

I am 14 years old and am the proud owner of an Atari 800. Is it possible for me to write an article for Antic and for you to then publish it?

Michael Plotnik
Brooklyn, NY

We always encourage readers, of all ages, to submit material for publication. Of course, we reserve the right to decide whether or not to use a submission. If you would like more information, please send a self-addressed stamped envelope to Antic, requesting our Author's Guide. —ANTIC ED

A VOTE FOR BASIC XL

The members of the Westmoreland Atari Computer Organization believe that BASIC XL, from Optimized Systems Software (OSS), is the best programming language for the Atari computer. We feel it is the ideal language to be built into the forthcoming Atari 1450 XLD computer. We have written letters suggesting this to James Morgan, Atari's chairman, and Bill Wilkinson of OSS. *Consumer Reports* recently rated Atari as its top choice among home computers, but blasted Atari BASIC as one of the main reasons home computers aren't taken more seriously. Atari is letting a golden opportunity slip by if it doesn't market BASIC XL as an extended BASIC.

George J. Adamson
Newsletter Editor
Westmoreland Atari
Computer Organization
North Huntingdon, PA

We agree that BASIC XL is an excellent version of BASIC. We'd like to point out, however, that Atari currently markets Microsoft BASIC II, a cartridge-based extended BASIC. By the way, George is a frequent contributor to Antic. —ANTIC ED

MORE FROM MORI

I have written a graphics program in mode 7, called "Three-Color Demo." I hope you enjoy this:

```
10 GRAPHICS 7+16:COLOR 1
20 FOR T=1 TO 159 STEP 5
30 PLOT T,0:DRAWTO 159,4
40:DRAWTO T,89:PLOT 159-T,
0:DRAWTO 0,44:DRAWTO 15
9-T,89
50 NEXT T
60 COLOR 2
70 FOR I=1 TO 30 STEP 3
80 PLOT 79-I,44:DRAWTO 7
9,74-I:DRAWTO 79-I,44:OR
AWTO 79,14+I:DRAWTO 79+I
,44
90 NEXT I
90 PLOT 79,0:DRAWTO 79,1
4:PLOT 79,89:DRAWTO 79,7
4:PLOT 0,44:DRAWTO 79,44
:PLOT 159,44:DRAWTO 79,4
4
```

i/o board

```
100 COLOR 3
110 FOR I=1 TO 89 STEP 2
120 PLOT I,0:DRAWTO 159,
I: DRAWTO 159-I,89: DRAWTO
0,89-I: DRAWTO I,0
130 PLOT 159-I,0: DRAWTO
0,I: DRAWTO I,89: DRAWTO 1
59,89-I: DRAWTO 159-I,0
140 NEXT I
150 REM ATARI LOGO MARK
160 COLOR 2
170 FOR I=0 TO 89
180 PLOT 0,I: DRAWTO 159,
I
190 NEXT I: COLOR 0
200 FOR I=30 TO 60 STEP
2
210 PLOT 68,I: DRAWTO 72,
I: PLOT 76,I: DRAWTO 78,I:
PLOT 82,I: DRAWTO 86,I
220 NEXT I
230 FOR I=60 TO 70 STEP
2: I=Q+2
240 PLOT 68-Q,I: DRAWTO 7
2-Q,I: PLOT 76,I: DRAWTO 7
8,I: PLOT 82+Q,I: DRAWTO 8
6+Q,I
250 NEXT I
260 GOTO 260
```

Masahiro Mori
Taichung, Taiwan

TRACE TROUBLE REVISITED

This is an answer to a question posed by Paul Mattia in June I/O Board, entitled "Trace Trouble." The problem has been documented by Bill Wilkinson of Optimized Systems Software. If you use the CPY#xxx instruction and try to trace the program using the Assembler/Editor cartridge in the debugger mode, the trace aborts. There is no solution for this problem. The best thing to do is not to use CPY#, but use CPX# instead. Try this: Instead of using CPY#\$10, use

```
CPY CNSTNT
CNSTNT.BYTE $10
```

This will solve the problem.
Robert Davis
Sheffner, FL

ATARI OVERSEAS

Prior to buying my new system (including computer, disk drive, interface module, printer, and color monitor) in Canada to use in Israel, many people, including Atari salesmen, said the system wouldn't work with Israel's 220-volt, 50-Hz electricity supply, (the same system used throughout Europe). I'm delighted to report that, with the use of a simple stepdown transformer (220 to 110 volts), my system works perfectly.

Mr. Euphraty
Netanya, Israel

Readers should note that Mr. Euphraty bought his monitor at the same time as the rest of his system. A computer manufactured for the North American market is not compatible with European standard of television signal transmission. —ANTIC ED

CASSETTE AUTO BOOT?

I'm building an alarm system and would like to have a fully automatic boot capability for my 48K Atari 400 and cassette drive, instead of having to leave the unit on and programmed. When nobody is home, there's no one to press the OffStart-Return sequence. Any help in this area?

Eddie Leach
Gainesville, FL

As far as we know, there's no way to automate booting an Atari cassette system. If there's nobody around to start the system, why not turn it on when you leave, for greater security? —ANTIC ED

KUDOS AND QUESTIONS

Hats off to the finest Atari-oriented magazine! The games are outstanding! Keep up the good work. Superb graphics are tops on the list, too.

Will Roadrace and GTIA Sketchpad work on the unexpanded (16K) Atari 600XL?

Milson Luce
Kenner, LA

Thanks for the kind words! We will continue to bring you the best games and graphics. Neither of the two programs you mentioned will work on the unexpanded 600 XL.

—ANTIC ED

ATARI SOLD TO TRAMIEL

Just as this issue of *Antic* was going to press, the news came that Atari's computer and videogame divisions were sold by Warner Communications to a new Hong Kong-based company headed by Jack Tramiel, the tough, hard-driving ex-president of Commodore computers.

Tramiel (pronounced tra-mel) was already operating Atari's Sunnyvale headquarters the day the announcement was made. He promptly issued a statement that his goal was to make Atari "number one—nothing less."

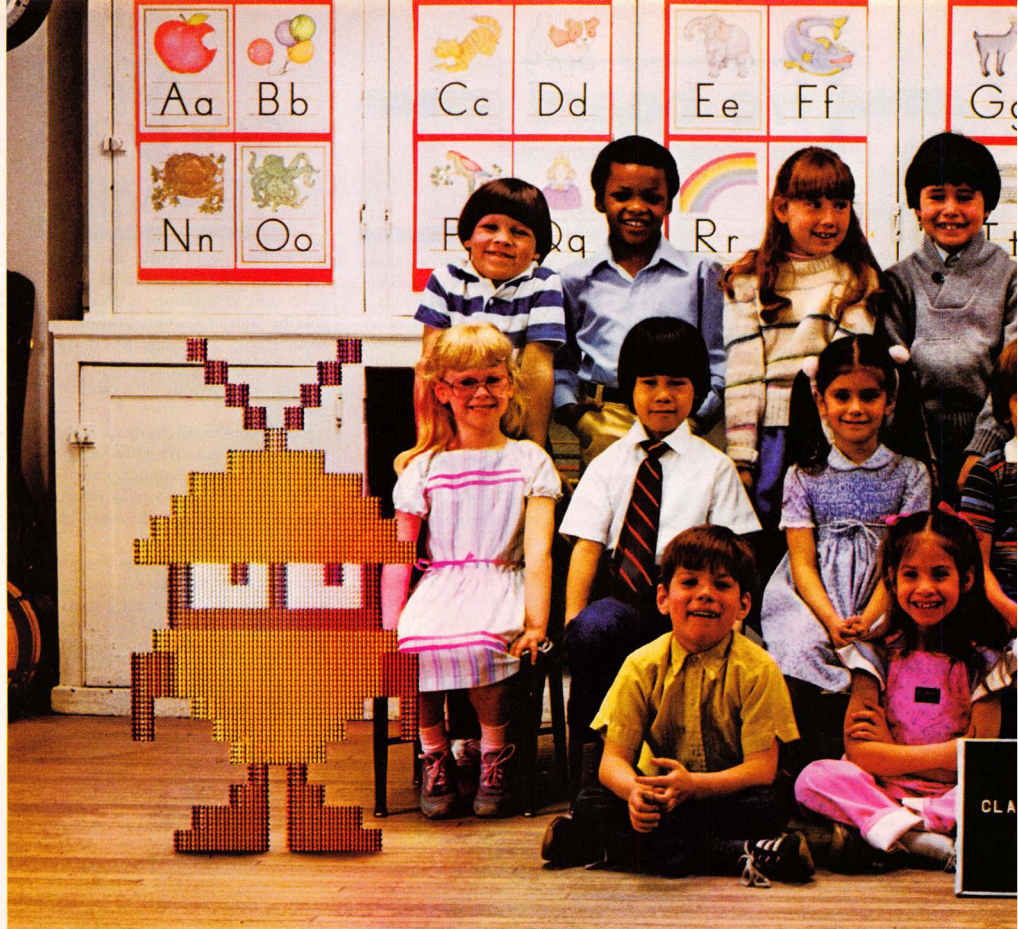
Talk like that must be taken seriously when it comes from Jack Tramiel—the man who sold more home computers than anybody else in history, and who is famous for consistently cutting prices below the competition.

Our sources tell us that Tramiel showed up in Sunnyvale with a complete plan for obtaining all components of the 800XL computer at lower cost. Now that Atari's overhead has been cut so drastically, *Antic* believes that the 800XL will be not only the best—but also the most affordable—64K computer on the market this Christmas.

We think the chances are good that over the next few months Atari will emerge as the Chrysler of high-tech, the biggest comeback story in the history of the computer industry.

Whatever happens, *Antic* will continue to be the Number One source of information and guidance for all Atari computer owners. We'll have a lot more details for you in our next issue. And we'll especially be looking for the latest news on how you can get any Atari customer service problems taken care of.

Finally, here's a call to APX program authors, all Atari software developers and third-party hardware vendors. If you're looking for a way to market your products directly, phone Gary Yost at *Antic* right away. We may be able to help you . . .



Modern times have create

We've cleverly disguised them as funny creatures from a computer game. But underneath the funny exterior is one of the most serious approaches to home education you've ever heard of.

INTRODUCING SPROUT™ SOFTWARE. GAMES THAT TEACH.

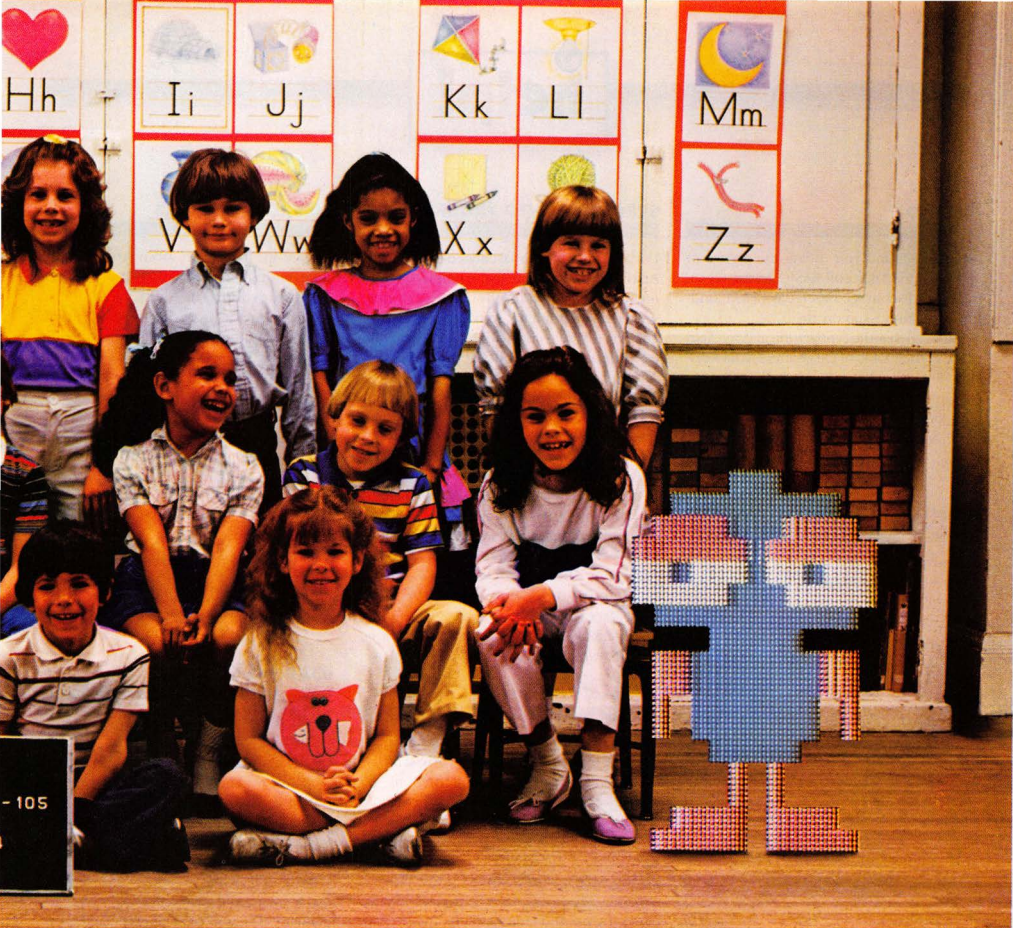
Your kid's new teachers are called Tink and Tonk. They come from Sprout. Software for kids 4 to 8.

The beauty of Sprout software is how

entertainment is balanced with a healthy dose of education.

While kids are having fun at home, they're actually reinforcing what they've learned at school. Things like the alphabet, spelling, vocabulary, counting, adding and pattern recognition.

You'll also like how Sprout prevents boredom. Our games grow up, instead of wear out. As kids get older, the game adjusts and gets harder. Because there are many



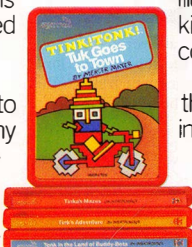
d a new breed of teachers.

variations and many decisions to make.

Knowing how to do all this isn't something Sprout learned overnight.

You see, we've got a hundred years of experience to lean on. (Our parent company is SFN, the country's #1 textbook publisher for elementary and high schools.)

We've also got the expe-



rience of Mercer Mayer, who has written or illustrated 80 children's books. He dazzles kids with ideas and pictures that keep them coming back for more.

With TINK!TONK!™ software, kids see that learning can be more fun than destroying space creatures.

sprout

Games that grow up. Instead of wear out.

Compatible with Atari®, Commodore®, Apple®, and IBM.®

help!

XL TYPO

I'm glad I found you. Being the owner of a 1200XL and Microsoft BASIC, I was becoming more discouraged each day before finding your June issue on the XLs.

I noticed that the typographical error Atari made in their table of OS changes from Revision B to the XL was copied (in Robert DeWitt's article on the evolution of the XL computers). The last hex address should be 03FB-03FC instead of 033FB-03FC.

John Tilton
Carlsbad, CA

MEMORY WINDOW

In your program "Memory Window," (April 1984), line 160 should read `...:MEM+255`. This will give the proper memory reading in the window. For example, page 0 resides in location 0-255, not 0-256.

Bill Travis
Salt Lake City, UT

ERRATA

In our review of Ultima I (Antic, July 1984), the author's name should have been Keith Valenza. We apologize for the error.

APX LIVES ON

Many readers have asked us how to get APX programs now that Atari has closed that division. Al Thomas, Manager of Sales and Manufacturing for APX tells us that twenty of the best APX programs, including EXCALIBUR, GETAWAY and AIARI PRINTER DRIVER, will continue to be sold. You can obtain a complete list of titles and a new order form by calling: (800) 672-1404 inside California, (800) 538-8543 outside California or by writing:

APX
c/o ATARI CUSTOMER SERVICE
1312 CROSSMAN AVENUE
SUNNYVALE, CA 94088

Al informs us that the turnover on APX orders is just 3-4 days using the new forms. If you use an old form from the catalogue to order a product no longer available, the turnover can take weeks!

SCROLLING INTO TROUBLE

I'm a student who is fascinated by what my Atari 400 can do, but I've stumbled onto a few problems. Specifically, I've had trouble setting up a horizontal-scrolling routine and creating my own character set. Any help you can offer would be most appreciated.

Richard Tan
Vancouver, B.C., Canada

Antic's publisher, James Capparelli, has written an article on scrolling that may help you. Entitled simply, "Scrolling," it appears in our recently-published anthology, The Best of Antic, Volume One.

Several articles that explain how to create your own character set have recently appeared in Antic. See "Odd Man Reforms" by John and Mary Harrison (Antic, page 36, December 1983) and "Character Graphics" by Chris Chabris (Antic, page 60, February 1984).—ANTIC ED

ANIMATING TANKS

In your June 1984 article "Use Basic to Animate," you stated that the Antic staff was unable to eliminate the instructions for Players 2 and 3 because the remaining tanks would not fire.

You cannot eliminate the entire line. The first item on the line must be retained. The listing below allows you to select either a two, three or four player game. It then disables the unused tanks and eliminates them from the screen.

Please keep up the good work. I learn something every time I type in one of your listings.

Charles Barker
Lawrenceburg, IN

SCROLL YOUR WAY TO THE TOP

There is a typographical error in the article "Scroll Your Way to the Top" (Antic, June 1984). In the last paragraph on page 44, the number 1586 should be 1536.

DISKREAD SECTORS

I typed in "Diskread" from Antic, March 1984, and found a small flaw. If you request the utility to display the "next" sector, it finds the next sector from information in the "pointer" in the last three bytes of the current sector. The sectors (360-368) that contain the VTOC (volume table of contents) and disk directory don't use this pointer, so attempting to display the next sector while displaying a directory sector won't work correctly.

I've made a change that corrects this problem. Insert the following line into the program:

```
215 IF NUM>359 AND NUM<369 THEN  
    NES=NUM+1:GOTO 250
```

Edward Aubitz
Bloomington, MN

LOADING GLOOP

Bravo to you and to Guy Aitchison for "Galactic Gloop" (Antic, February 1984)—it's one of the best games in BASIC I've ever seen. The song is great, and the graphics are out of this world!

I have a disk-based system, however, and I quickly got tired of typing in special commands each time I loaded the game, so I wrote this little program to ease the task. To use it, first SAVE or rename the game program as "GALACTIC." Then type in this program and SAVE it as "GLOOP." Then RUN "D:GLOOP".

Please print my full address, so that other readers who'd like to talk computers or swap programs can get in touch with me.

```
0 REM Pre-load initialization for  
  Galactic Gloop  
10 GRAPHICS 0:SETCOLOR 2,0,0  
20 ? :? :? "POKE 743,14:POKE 744,44:?"  
  ? :? "NEW":? :? "LOAD"  
  CHR$(34); "D:GALACTIC";CHR$(34)  
  ? :?  
30 ? "POKE 842,12:RUN"  
40 POSITION 2,0:POKE 842,13:STOP
```

Mike Wildridge
R.R. #1 Box 35A
Lawrenceburg, IN 47025



VA



INTRODUCING THE MOST EXCITING PART OF OWNING AN ATARI®

THE CONCORDE C-221 DISK DRIVE SYSTEMS

AT LAST, A TOTALLY NEW CONCEPT FOR ATARI DRIVES

Concorde introduces an exciting new concept in Atari compatible disk drive systems. A concept combining high quality and reliability, enhanced data storage accuracy, and a unique master/slave concept that provides an excellent value for the money.

Concorde's C-221M Master is a self contained disk drive unit, complete with a high quality disk drive, power supply, and disk operating system software. In addition to providing high accuracy and rapid retrieval of data storage, the C-221M can also support up to three Concorde C-221S Slave drives.

Concorde's C-221S Slave drives provide the same high accuracy, high quality, rapid retrieval data storage but at a reduced cost. This is achieved through reduction of duplicated parts between the master drive and its slaves.

The result? A fully Atari compatible disk drive system, giving you the versatility you need to use the most sophisticated programs for word processing, spreadsheets, databases, and even personal finance, with very economical upgrade capability.

EXCEPTIONAL DESIGN

The Concorde C-221 models were specifically designed to visually complement your Atari system. Sleek metal cases provide durability and rigidity not available with plastic. Large, easy to use controls have been simplified for ease of operation. Simple indicator lights provide essential data that you can use, not just extraneous information. And, in addition to being easy to use and looking great, we designed the C-221 series to take up less space than competitive models, meaning you'll have more valuable workspace available around your Atari system.

WE DIDN'T FORGET THE DETAILS

Every Concorde disk drive system is built with exacting attention to detail. The C-221 series is no exception. From initial design, through the manufacturing and testing processes, Concorde drives are expected to meet the most critical evaluation standards. That's why we use components like direct drive motors for better speed control than typical belt drives. Optical track zero sensors rather than mechanical stops for greater accuracy and longer head alignment life. Die cast



metal heads with glass bonded surfaces for greater reliability, and, every drive has its electronics fully burned-in for 48 hours to insure peak performance. All this, and more odds up to a drive that can provide up to ten times the reliability of some competitive drives. And that's not just a claim, we guarantee it.

THE BEST NEWS OF ALL

Anybody can make incredible advertising claims, but it's when you get the drive home and start using it that you really find out how good it is, and how much the claims are worth. At Concorde, we don't think you should put up with wild promises and lots of headaches.

We guarantee our drives. We guarantee compatibility. Our C-221 series uses a licensed Atari DOS for maximum software compatibility. The disk operating system is included with every C-221M unit, in both the single and double density versions, at no extra cost.

We guarantee trouble free operation, not for 90 or 120 days like some manufacturers, but for one full year. And, in the unlikely event your Concorde drive should develop a problem, we don't ask you to go through the runaround of trying to get it repaired. Simply return it to your authorized Concorde dealer. Show him your receipt, and he'll simply exchange your drive—over the counter—with no hassles—no charge.

HIGH PERFORMANCE AND SATISFACTION — NOT HIGH PRICE

After reading about the great new C-221 series Atari compatible drives from Concorde, you probably expect them to be high priced. But even with all these great features, and even with the great warranty, Concorde's C-221M Master is priced very competitively with other Atari compatible drives. And, the C-221S Slave units are priced even lower, for truly great values in additional storage capacity.

Check out the excitement. See your authorized Concorde dealer today, and experience the value of Concorde's C-221 series for yourself. Owning an Atari has never been so exciting!

CONCORDE PERIPHERAL SYSTEMS, INC.
23152 Verdugo Drive
Laguna Hills, CA 92653
(714) 859-2850

*Atari is a registered trademark of Atari, Inc.



UNLOCKING THE 56 GRAPHICS MODES

Instant exploration of Atari's display styles

by PAUL CHABOT

Why did you buy an Atari computer? The chances are good that, in addition to its other fine qualities, you were attracted by the unmatched ability to create computer color graphics.

Atari home computers are outstanding for graphics because they all feature, in addition to the 6502 central microprocessor, another chip called ANTIC (sound familiar?) that's dedicated solely to handling the Atari's video screen display.

The ANTIC chip can display data in 14 different formats, called *graphics modes*. The accompanying chart lists all 14, along with information about each. Some of these, such as Graphics 0, are text modes, which means that the data in memory must be represented as characters (numbers, letters, and symbols). Others, such as Graphics 7, tell the computer to display memory data as a picture.

In addition to the 14 ANTIC modes, there are three additional graphics modes that are controlled by yet another special chip, GTIA (George's Television Interface Adaptor). These are Graphics 9, 10, and 11. Here is what

SYNOPSIS

Introducing Atari's full range of graphics modes. With accompanying BASIC program that gives you instant display of all 56 modes. Runs on all Atari computers of all memory configurations. For Antic Disk subscribers: Type RUN "D:ALLMODES.BAS".

happens when you call up one of these GTIA modes in a program. The Atari first sets up a full screen display of Graphics 8, then alters memory location 623. If you call Graphics 9, then 64 is added to the contents of location 623. If you call Graphics 10, then 128 is added to this location. Calling Graphics 11 adds 192. The accompanying chart provides more details.

Thus, you see that GTIA has four states controlled by location 623, and accessible by the values 0, 64, 128, and 192. Each of ANTIC's 14 graphics modes can be altered by GTIA's four states — for a grand total of 56 modes. Of course, some of these modes are ugly

and others are simply useless. There are, however, many valuable modes.

The accompanying program sets up a sample text display, then allows you to view it in all 56 graphics modes. The display won't be recognizable in every graphics mode, but you'll get an instant demonstration of how the same data is interpreted in the different modes.

HOW TO USE THE PROGRAM

Type in the BASIC listing and test it with TYPO. SAVE an extra backup copy, then RUN it. It will produce a Graphics 2 screen display with a menu in the text window. Use the number keys [0]–[8] to change the display mode. Keys [A]–[E] produce additional modes that are supported directly by the XL series, but that require special programming to be used by 400/800 computers (see accompanying chart).

Press [G] to cycle GTIA through its four states. The [S] key changes the memory area that gets mapped to the screen. Feel free to roam around and watch your Atari think by typing in addresses such as 1536, 53760, 53960, 0,

continued on next page

and 40520. The [R] key gets you home again.

ALLMODES was created to demonstrate and explore the graphics capabilities of the Atari. Feel free to hit [BREAK] at any time and enter immediate-mode commands. For example, try POKEing various values directly into the color registers 704-712. If the GTIA isn't in its initial state, you'll have difficulty reading the text window. After using the immediate mode, type CONT [RETURN] to resume program execution. Typing [R] returns you to the menu.

SIZE CHANGES

Notice that besides changing the display, your selections cause the display area to shrink or expand. This is why it happens:

When you look at your video display, you're actually seeing a beam of electrons sweeping across the screen, left to right. Every time the beam reaches the right edge of the screen, it is turned off and moved down slightly, where it will sweep across the screen again. The result of each sweep on the screen is

called a *scan line*. The standard Atari full-screen display holds 192 scan lines and is re-drawn every 1/60 of a second.

An Atari display combines scan lines into *mode lines*, units of one to 16 scan lines — depending on which graphics modes you're using.

Graphics 2, the mode we started with, has 10 mode lines. Each of its mode lines contains 16 scan lines, for a total of 160 scan lines, which results in a fairly full screen. ALLMODES retains this format of 10 mode lines when it displays any of the 56 graphics modes. However, a graphics mode might contain as few as one scan line per mode line.

For more information on how to control the Atari video display, see "Display Lists Simplified" (Antic, Feb/Mar 1983).

GTIA

When called from BASIC, GTIA modes 9,10, and 11 use a configuration similar to Graphics 8 and use the same amount of screen memory. Because of the difference in pixel shape, however, there are 80 pixels per row in GTIA. These

three GTIA modes can be combined with the other modes by POKEing location 623 as follows:

GTIA 9 — POKE 623,64
GTIA 10 — POKE 623,128
GTIA 11 — POKE 623,192

COLOR ACCESS:

GTIA 9 — POKE hue into 712
Use BASIC COLOR command 0-15 for the shade.
GTIA 10 — POKE hues and intensities into 704-712
Use BASIC COLOR command 0-15 for the color.
GTIA 11 — POKE 712,0-14 for luminance. Use BASIC COLOR command 0-15 for hue.

NOTES:

* One color, two luminances
+ User determined. Please see the article in this issue "ANTIC'S MODE 3."

Paul Chabot is a professor of mathematics and computer science at California State University in Los Angeles.

ATARI GRAPHICS MODES AND SCREEN FORMATS

ANTIC MODE	BASIC MODE	MODE TYPE	BYTES/ LINE	COLUMNS	ROWS (SPLIT)	ROWS (FULL)	SCAN LINES/ MODE LINE	# OF COLORS	SCREEN RAM REQUIRED
2	GR.0	TEXT	40	40	—	24	8	1*	960
3	NONE	TEXT	40	40	—	+	10	1*	+
4	GR.12(XL)	TEXT	40	40	20	24	8	5	960
5	GR.13(XL)	TEXT	40	40	10	12	16	5	480
6	GR.1	TEXT	20	20	20	24	8	5	480
7	GR.2	TEXT	20	20	10	12	16	5	240
8	GR.3	GRAPH	10	40	20	24	8	4	240
9	GR.4	GRAPH	10	80	40	48	4	2	480
A	GR.5	GRAPH	20	80	40	48	4	4	960
B	GR.6	GRAPH	20	160	80	96	2	2	1920
C	GR.14(XL)	GRAPH	20	160	160	192	1	2	3840
D	GR.7	GRAPH	40	160	80	96	2	4	3840
E	GR.15(XL)	GRAPH	40	160	160	192	1	4	7680
F	GR.8	GRAPH	40	320	160	192	1	1*	7680

```

5 REM ALLMODES
6 REM BY PAUL CHABOT
7 REM ANTIC MAGAZINE
10 GOSUB 200
20 K=PEEK(764):IF K<64 THEN 40
30 FOR I=1536 TO 1575
32 POKE I,PEEK(53770):NEXT I
34 GOTO 20
40 POKE 764,255
50 REM LINKAGE
52 IF K=50 THEN M=2:GOSUB 100:REM ..0
54 IF K=31 THEN M=6:GOSUB 100:REM ..1
56 IF K=30 THEN M=7:GOSUB 100:REM ..2
58 IF K=26 THEN M=8:GOSUB 100:REM ..3
60 IF K=24 THEN M=9:GOSUB 100:REM ..4
62 IF K=29 THEN M=10:GOSUB 100:REM ..5
64 IF K=27 THEN M=11:GOSUB 100:REM ..6
66 IF K=51 THEN M=13:GOSUB 100:REM ..7
68 IF K=53 THEN M=15:GOSUB 100:REM ..8
70 IF K=63 THEN M=3:GOSUB 100:REM ..A
72 IF K=21 THEN M=4:GOSUB 100:REM ..8
74 IF K=18 THEN M=5:GOSUB 100:REM ..C
76 IF K=58 THEN M=12:GOSUB 100:REM ..D
78 IF K=42 THEN M=14:GOSUB 100:REM ..E
80 IF K=62 THEN GOSUB 120:REM .....S
82 IF K=40 THEN GOSUB 140:REM .....R
84 IF K=61 THEN GOSUB 150:REM .....G
90 GOTO 20
100 REM MODE CHANGE
102 POKE DL+3,64+M
104 FOR I=DL+6 TO DL+14
106 FOR W=0 TO 20:NEXT W
108 POKE I,M:NEXT I
110 RETURN
120 REM SCREEN AREA CHANGE
122 ? :? :? :? :POKE 656,0
124 ? "SCREEN AREA NOW BEGINS AT ":SA
126 ? :? "INPUT A NEW BEGIN ADDRESS"
128 INPUT SA
130 SH=INT(SA/256):SL=SA-256*SH
132 POKE DL+4,SL:POKE DL+5,SH
134 GOSUB 250:RETURN
140 REM RESTORE SCREEN
142 SL=PEEK(88):SH=PEEK(89)
143 POKE 623,0
144 SA=SL+256*SH
146 POKE DL+4,SL:POKE DL+5,SH
147 GOSUB 250
148 M=7:GOSUB 100:RETURN
150 REM GTIA MODES
152 I=PEEK(623)+64:POKE 712,48
154 IF I>255 THEN I=I-256
156 IF I>191 THEN POKE 712,8
158 POKE 623,I:RETURN
200 REM INITIALIZE
202 GRAPHICS 2

```

```

204 DL=PEEK(560)+256*PEEK(561)
206 SA=PEEK(88)+256*PEEK(89)
210 ? #6;" AAAAAAAAAAAAAAAAAA"
212 ? #6;" *****"
214 ? #6;" ++++++++"
216 ? #6;" | oIlmOdEs |"
218 ? #6;" | ++++++++"
220 ? #6;" | *****"
222 ? #6;" | BY"
224 ? #6;" | PAUL CHABOT"
226 ? #6;" | 1983"
228 ? #6;" | BBBBBBBBBBBBBBBBBBBB"
230 FOR I=0 TO 15:POKE 1616+I,I
232 POKE 1636+I,I:POKE 1656+I,I
234 POKE 1676+I,I:POKE 1696+I,I
236 POKE 1736+I,I:POKE 1756+I,I
238 NEXT I
240 POKE 712,48:POKE 704,12*16
242 POKE 705,6*16+6:POKE 706,15*16+4
244 POKE 707,166
250 REM MAIN MENU
252 ? :? :? :? :POKE 656,0:POKE 752,1
254 ? " B GR.0 A Antic3 E GR.7+
"
256 ? " 1 GR.1 B Antic4 G GTIA"
258 ? " 2 GR.2 C Antic5 S Scree
n Area"
260 ? " ... etc. D GR.6+ R Resto
re";
270 RETURN

```

TYPO TABLE

Variable checksum = 102215

Line	num	range	Code	Length
5	-	54	ZI	283
56	-	78	ZX	510
80	-	122	NL	290
124	-	147	BQ	299
148	-	212	KB	343
214	-	236	ZT	434
238	-	270	VM	382



TELLING



Easy educational program
—only 104 lines

SYNOPSIS

This is a simple and well-documented program to teach children to tell time using three levels of difficulty. Best of all, it's only 104 lines long and runs on all Atari computers. Antic Disk subscribers simply LOAD D:TIME.PLT [RETURN]. Now type RUN.

by RICHARD SELTZER

In "Turtle Sketch Pad" in the December 1983 *Antic*, it was interesting to see how to use PEEK and POKE-type commands in PILOT to get results similar to programs written in BASIC.

But the real power and value of PILOT comes from its simplicity. Programs that stick to PILOT (without all the PEEKs and POKes) can be written and rejuggled right at the keyboard and can be understood at a glance.

In other words, for question and answer kinds of drills and exercises, teachers or parents can write programs in PILOT as easily as they might prepare worksheets or handouts. PILOT programs are a very do-it-yourself medium.

The following program illustrates the power and simplicity of PILOT with Turtle Graphics. I wrote it for my daughter Heather, age six, who wanted practice in telling time. It provides three levels of difficulty—hours alone, quarter hours, and five minute increments—all in just 104 short instructions.

PROGRAM NOTES

PILOT's TURN and TURNTO commands, using the 360 degrees of a circle, are well suited to drawing lines radiating from a center point, like the hands of a clock. For instance, for the hour hand, we pick a random number from 0 to 11 (line 170), set 0 equal to 12 (line 180). Then (in line 200)

we go to the center of the screen (0,0), and from the straight up position (TURNTO 0 in line 190) turn 30 degrees times the number of the hour and draw a line 15 units long (just a bit shorter than the minute hand, which we arbitrarily made 20 units long in line 190),

For the Quarter Hour version, we add an extra line (line 390) so the hour hand realistically moves ahead a quarter of 30 degrees (or 15/2) for each quarter hour beyond the hour. Similarly for the five minute version (line 590), the hour hand moves ahead a twelfth of 30 degrees (5/2) for each five minute increment beyond the hour.

Using the clock hands alone, without the numbers, made the games more interesting to play and also greatly simplified the programming.

Variables:

#H=the hour, a random number from 0 to 11

#Q=the quarter hour, a random number from 0 to 3

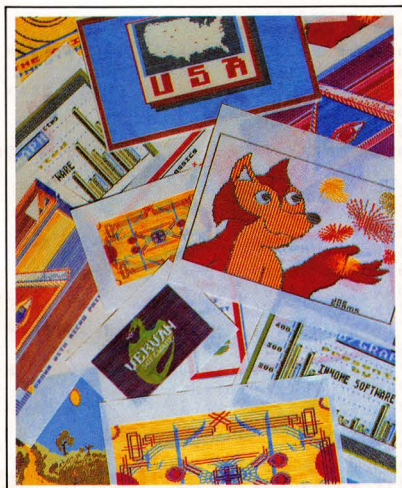
#M=the five minute increment, a random number from 0 to 11

continued on page 18

The Only Really Usable Color Printing System For All Atari Computers.



And many more. See below.



Koala Pad, Movie Maker, B/Graph, Atari Touch Tablet, Micro Painter, Music Construction Set, Fun With Art, Graphic Master, G. Chip Cookbook, Logo, Graph It and Infocom Adventures (plus others — see your dealer)

A rainbow of color and black and white too. That's what you'll get from our GP-700AT — the only printer you'll ever need for your Atari computer.

First the Color: Ours is the **ONLY** full-color printer that's supplied with exclusive "Rainbow"™ software to give color printouts from virtually all color graphics programs for your Atari computer. It connects directly to your Atari (no 850 interface required). Just plug it in and a whole wide world of printed color is instantly yours. Our "Rainbow" software converts your images from the Atari Touch Tablet, Koala Pad, Logo, and most other popular color graphics programs to fun color printouts on plain paper. We even include the "G. Chip Cookbook" free on disk so you can start color printing immediately.

Black and White Too: The GP-700AT is also a high quality dot matrix black and white printer. It has friction and tractor feed, makes multiple copies, and can do letters, invoices, labels, word processing and more.

The GP-700AT is priced at just \$599 — available at leading department and computer stores, everywhere.

For the outlet nearest you, phone 818-365-9521.

™"Rainbow" software by Computer E.A.S.E.

AXIOM[®]
AXIOM CORPORATION

1014 Griswold Avenue • San Fernando, CA 91340
Telephone: (818) 365-9521 • TWX: 910-496-1746

GP-Series Printers Built for Lasting Quality by SEIKOSHSHA.

TELLING TIME IN PILOT continued from page 16

#N=the quarter or the five minute increment translated to minutes

#R=the number of questions answered right

#T=the number of questions asked (a game is 12 questions)

In the five minute version, if the correct answer was 5:05, with the standard format of #H:#M the program would expect an answer of 5:5. So in line 660, we add a match of

#H:05, so the right answer is recognized as right. Also, when the answer is an exact hour, the natural inclination is to type just the number of the hour, without a colon and zeroes. Lines 460 and 670 make sure that that, too, will be accepted as a match.

Richard Seltzer is the author of two children's books, The Lizard of Oz and Now and Then and Other Tales from Ome. He lives in West Roxbury, Mass.

```

10 T:WHAT'S YOUR NAME?
20 A:$NAME
30 GR: CLEAR
40 *CIRCLE
50 GR: PEN RED; GOTO 0,0; TURNT0 #X; GO 25
60 C: #X=#X+1
70 J(#X<>360): *CIRCLE
80 *START
90 C: #R=0
100 C: #T=0
110 T: DO YOU WANT TO PLAY HOURS (H), Q
UARTER HOURS (Q) OR FIVE MINUTES (M)?
(TYPE H,Q, OR M)
120 A:
130 M:H,Q,M
140 JM: *HOUR, *QUARTER, *MINUTE
150 JN: *START
160 *HOUR
170 C: #H=?\12
180 C(#H=0): #H=12
190 GR: GOTO 0,0; TURNT0 0; PEN YELLOW; OR
AW 20
200 GR: GOTO 0,0; TURNT0 #H*30; DRAW 15
210 GR: PEN RED; GOTO 0,0
220 T:
230 T: WHAT TIME IS IT, $NAME? (JUST TY
PE THE HOUR)
240 A:
250 M: #H
260 C: #T=#T+1
270 TN: NO, IT'S REALLY #H. GOOD LUCK O
N THE NEXT ONE, $NAME.
280 PAN: 150
290 UY: *RIGHT
300 GR: GOTO 0,0; TURNT0 #H*30; PEN ERASE
; DRAW 15
310 J(#T<12): *HOUR
320 GR(#T=12): GOTO 0,0; TURNT0 0; PEN ER
ASE; DRAW 20
330 J(#T=12): *REPLAY
340 *QUARTER
350 C: #H=?\12
360 C(#H=0): #H=12
370 C: #Q=?\4
380 C: #M=15*#Q
390 GR: GOTO 0,0; TURNT0 #H*30; TURN #Q*(

```

```

15/2); PEN YELLOW; DRAW 15
400 GR: GOTO 0,0; TURNT0 #Q*90; DRAW 20
410 GR: PEN RED; GOTO 0,0
420 T:
430 T: WHAT TIME IS IT, $NAME? (USE THE
FORM 9:15, 10:30, ETC.)
440 A:
450 M: #H: #N
460 M(#Q=0): #H
470 C: #T=#T+1
480 UY: *RIGHT
490 UN: *ANSWER
500 GR: GOTO 0,0; TURNT0 #H*30; TURN #Q*(
15/2); PEN ERASE; DRAW 15
510 GR: GOTO 0,0; TURNT0 #Q*90; DRAW 20
520 J(#T<12): *QUARTER
530 J(#T=12): *REPLAY
540 *MINUTE
550 C: #H=?\12
560 C(#H=0): #H=12
570 C: #M=?\12
580 C: #N=#M*5
590 GR: GOTO 0,0; TURNT0 #H*30; TURN #M*(
5/2); PEN YELLOW; DRAW 15
600 GR: GOTO 0,0; TURNT0 #M*30; DRAW 20
610 GR: PEN RED; GOTO 0,0
620 T:
630 T: WHAT TIME IS IT, $NAME? (USE THE
FORM 5:25, 12:05, ETC.)
640 A:
650 M: #H: #N
660 M(#N=5): #H: 05
670 M(#N=0): #H
680 C: #T=#T+1
690 UY: *RIGHT
700 UN: *ANSWER
710 GR: GOTO 0,0; TURNT0 #H*30; TURN #M*(
5/2); PEN ERASE; DRAW 15
720 GR: GOTO 0,0; TURNT0 #M*30; DRAW 20
730 J(#T<12): *MINUTE
740 J(#T=12): *REPLAY
750 *RIGHT
760 T: RIGHT!
770 C: #R=#R+1
780 SO: 13
790 PA: 15
800 SO: 17

```

```

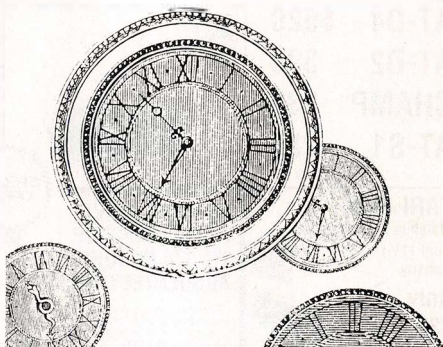
810 PA:15
820 SO:20
830 PA:15
840 SO:25
850 PA:30
860 SO:0
870 E:
880 *ANSWER
890 T(#N=0):NO, IT'S #H:00. GOOD LUCK
ON THE NEXT ONE, $NAME.
900 PA(#N=0):150
910 E(#N=0):
920 T(#N=5):NO, IT'S #H:05. GOOD LUCK
ON THE NEXT ONE, $NAME.
930 T(#N<>5):NO, IT'S #H:#N. GOOD LUCK
ON THE NEXT ONE, $NAME.
940 PA:150
950 E:
960 *REPLAY
970 T:VERY GOOD, $NAME. OUT OF 12, YOU
GOT #R RIGHT. WANT TO PLAY SOME MORE?
980 A:

```

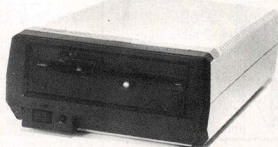
```

990 M:Y,YES
1000 JM:*START
1010 JN:*END
1020 *END
1030 T:GOODBYE, $NAME.
1040 E:

```



YOU CAN'T TELL A DISK DRIVE BY ITS COVER!!



WITH A **HAPPY ENHANCEMENT** INSTALLED THESE ARE
THE MOST POWERFUL DISK DRIVES FOR YOUR ATARI COMPUTER
WARP SPEED SOFTWARE DISK READING AND WRITING 500% FASTER

- HAPPY BACKUP** — Easy to use backup of even the most heavily protected disks
HAPPY COMPACTOR — Combines 8 disks into 1 disk with a menu
WARP SPEED DOS — Improved Atari DOS 2.0S with WARP SPEED reading & writing
SECTOR COPIER — Whole disk read, write and verify in 105 seconds
1050 ENHANCEMENT — Supports single, 1050 double, and true double density
810 ENHANCEMENT — Supports single density

SPECIAL SUGGESTED RETAIL PRICE: Get the **HAPPY ENHANCEMENT 810** or **1050** version with the **HAPPY BACKUP PROGRAM**, plus the multi drive **HAPPY BACKUP PROGRAM**, plus the **HAPPY COMPACTOR PROGRAM**, plus the **HAPPY DRIVE DOS**, plus the **HAPPY SECTOR COPY**, all with **WARP DRIVE SPEED**, including our diagnostic, a \$350.00 value for only \$249.95, for a limited time only! Price includes shipping by air mail to U.S.A. and Canada. Foreign orders add \$10.00 and send an international money order payable through a U.S.A. bank. California orders add \$16.25 state sales tax. Cashiers check or money order for immediate shipment from stock. Personal checks require 2-3 weeks to clear. Cash COD available by phone order and charges will be added. No credit card orders accepted. **ENHANCEMENTS** for other ATARI compatible drives coming soon, call for information. Specify 1050 or 810 **ENHANCEMENT**, all 1050s use the same **ENHANCEMENT**. Please specify H model for all 810 disk drives purchased new after February 1982, call for help in 810 **ENHANCEMENT** model selection. Dealers now throughout the world, call for the number of the dealer closest to you.

ATARI is a registered trademark of Atari Computer Inc.

HAPPY COMPUTERS, INC. • P. O. Box 1268 • Morgan Hill, California 95037 • (408) 779-3830

SEE
SPECIAL
OFFER
BELOW!

YOUR ATARI SOURCE!

No Penalty For Using Your Credit Cards!



COMPUTER PALACE

WE KNOW
ATARI!

TRAK DISK DRIVES

These drives are some of our best sellers. They all offer true double-density operation, are dependable and quiet. The AT-D4 is a double-sided drive that packs a whole lot of storage into a compact package (includes parallel printer port & print buffer). The AT-D2 is identical to the AT-D4, but is only a single-sided drive. The CHAMP is a stripped down version of the AT-D2 (without printer port, buffer, or LED readouts). The AT-S1 is a single-sided slave drive to use with any of the above drives.

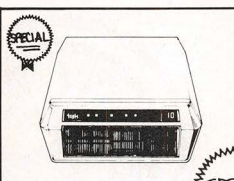
AT-D4 \$529

AT-D2 398

CHAMP 339

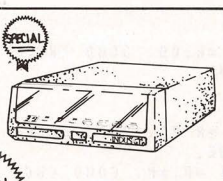
AT-S1 289

PLUS FRT.



INDUS GT DISK DRIVE

We recommend and sell more of these drives than any other. It offers true double-density, and is so quiet and dependable that you forget that you are using a disk-drive. A Beautiful Jet Black finish with flip-up smoked Plexiglass dust cover and LED readout make it a visual delight. Add to this, the FREE SOFTWARE (Word Processing, Spread-Sheet and Data-Base) and a Full One Year Warranty and you have a winner. Includes DSD-XL.



Only \$398

PLUS FRT.

- Double Density
- Free Software
- 1-Year Warranty

ATARI 1050

- Matches XL Computers
- Dual (1 1/2) Density

**Only
\$379**

PLUS FRT.



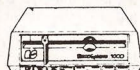
**BUY ANY DRIVE
AND RECEIVE UP
TO \$70 IN SOFTWARE
ABSOLUTELY FREE!***

* Subject to supplies on hand. We reserve the right to substitute programs of equivalent value should your choice be out of stock.

OFFER VALID FROM 7-1-84 to 9-30-84.

**CHOOSE ANY TWO (2)
OF THESE PROGRAMS
FREE WITH YOUR DRIVE
PURCHASE:**

- Repton • Wayout • Dr. Goodcode's Cavern • Pathfinder • Match Racer
- Vocabulary Builder 1 • Vocabulary Builder 2 • Pre-School IQ Builder 1 • Pre-School IQ Builder 2



RANA 1000

• Double Density \$349
• 1-Year Warranty PLUS FRT.



PERCOM 88-S1P

New Low Price!

- \$369 PLUS FRT
- Double Density
- Printer Port

PERCOM 40-S1

As above, but without printer port. **\$339 PLUS FRT.**

ATR-8000 Expander

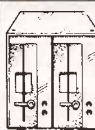


- 64K 280 computer
- Runs any combination of 5 1/4" and 8" drives in single or double density
- Built-in serial and parallel ports
- Built-in printer buffer

PLUS FRT.

64K CP/M model **\$539.00**
64K upgrade to 16K model **199.00**
MYDOS **29.95**

USE WITH RCP DRIVES AT RIGHT



RCP Add-On Drives

- Double Density
- Double-Sided

Perfect for use with the ATR-8000 (left), or with any other system that contains a drive controller.

RCP-100 SINGLE DRIVE **\$379 PLUS FRT.**
RCP-200 DOUBLE DRIVE **\$595 PLUS FRT.**

RC SYSTEMS 600XL Memory Upgrades

48K **\$79.95**
64K **99.95**



ATARI TOUCH TABLET



• Incl. program on Cartridge. **\$79.10 PLUS FRT.**



• Large dwg. surface (no dwg. prog.) **\$89.90 PLUS FRT.**



Koala Technologies
KOALA PAD
(incl. dwg. prog.)

16K Cart **\$99.90**
48K Disk **89.90 PLUS FRT.**

KOALA WARE SOFTWARE

Instant Programmer's Guide (48K D) **\$15.00**
Kadagrams Spelling (148K D) **35.19**
Spider Eater (48K D) **26.90**
Coloring Series I (48K D) **26.90**
Coloring Series II (48K D) **26.90**
LOGO Design Master (48K D) **35.10**

POWER PAO SOFTWARE

Leo's Electric Paintbrush (Cart.) **\$26.90**
Micro Illustrator (Cart.) **44.90**
Leonardo's LOGO (Cart.) **44.90**
Micro Maestro (Cart.) **26.90**
Logic Master (Cart.) **35.10**
Beziom (Cart.) **31.50**

OTHER GRAPHICS SOFTWARE

Graphics Master (48K D) **\$31.50**
Fun With Art (Cart.) **35.10**
Micropainter (48K D) **31.50**
Print Wieb (48K D) **26.95**
Movie Maker (48K D) **52.50**
Graphics Magician (48K D) **35.10**
Graphic Generator (162K D) **22.50**
Video Easel (Cart.) **21.50**
Paint (48K D) **35.10**

GRAPHICS BOOKS

Atari Sound & Graphics **\$10.95**
1st Book of Atari Graphics **12.95**
Atari Player-Missile Graphics **14.95**
Understanding Atari Graphics **15.95**
The Creative Atari **15.95**

FREE CATALOG

WITH ANY PURCHASE OR SEND
\$1.00 (REFUNDABLE WITH PURCHASE)

This is the most comprehensive Atari-Only reference catalog ever produced. It contains over 3000 software and hardware listings with illustrations and descriptions.

If you don't have our catalog, you're missing out!



COMPUTER PALACE

OPEN M-F 9-6 Sat 10-4 (Pacific Time)
2160 W. 11th Avenue Eugene, Oregon 97402



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 warranted 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.

NETWORKING NEWS

Reach out and download a BBS

by MICHAEL CIRAOLO

ATARI'S OWN BOARD FOR USERS GROUPS

Atari, Inc. operates a 24-hour bulletin board system (BBS) for users groups. The system gives user group officers with valid sign-ons total access, including 46 minutes of connect time and the ability to leave messages. Individuals without valid sign-ons can read mail, but can't leave messages. They are also limited to 15 minutes.

The BBS currently offers educational public domain software, according to system operator (sysop) Cassie Stahl. In the future, the board is likely to expand to include demonstrations of new products for downloading, as well as information about new Atari products.

This system uses an Atari 800, a 6 megabyte hard disk drive, a 300 baud Hayes Smartmodem, Atari 850 interface and 822 printer. The system runs with FOREM, a popular Atari bulletin board program that allows users to obtain limited access to the system without a password.

Sysop Stahl says she is available for chatting on this system during normal working hours, Pacific time. (408) 745-4263.

GRAPHIC TELECOMMUNICATIONS

There is no reason to limit your Atari's telecommunication capabilities to downloading or uploading text files and programs. If you have ever drawn a pic-

UPDATE

Here are several new Atari Bulletin Board Systems, plus a few old ones with new numbers.

California

Atari Users Group BBS 24 hours
(408) 745-4263
Modem Magazine 24 hours
(408) 289-8217

Canada

Atari Starship
(416) 622-7275

Illinois

Atari World
(312) 776-8173
Courtyard 24 hours
(312) 668-6272
Phamis 24 hours
(312) 448-6472
Valley Girl BBS 24 hours
(312) 747-4247

Indiana

Alien II Evening only
(219) 769-9025

New York

Action 885
(716) 235-3394

Texas

Atari the Great 24 hours
(512) 578-8033

ture on your Atari, you can send your picture file to a friend using a modem and the correct software.

Use AMODEM, a terminal program published in *Antic* in July, 1984 (Every-

body Needs AMODEM, page 21) to transmit picture files. You must be transmitting to a person who is also using AMODEM. Your friend must also have the same graphics program, you used to create your picture; without the same program, your friend will not be able to read the file you transmit. With the matching graphics software, your friend can read the file immediately.

Data sent over the phone lines can be garbled, improperly received or lost for various reasons. If the picture file your friend receives isn't identical, byte for byte, to the file you sent, the new file may not load. AMODEM has the ability to transmit files without losing or adding any extra bytes. This feature, called XMODEM protocol, requires that both the sending and receiving computers be running a terminal with XMODEM. The person transmitting should use the Upload feature, and the receiving person should use Receive.

NEW DIRECTIONS

Public Access Bulletin Board Systems are known as great sources of public domain software, of news and mail from fellow computer users, and of several varieties of games.

There are a few BBS's, however, which differ from the run-of-the-mill system, offering callers access to information not widely available on low-cost or no-cost telecommunication systems.

continued on next page

Meet the NEW Family

Now For
ALL
Atari Computers

DATASE

Erases two Eproms

DEALER INQUIRIES WELCOME
Plus \$2.50 Shipping & Handling
Arizona Residents Add 6% Tax

Send money order or check to:

WALLING CO.

4401 S. Juniper • Tempe, AZ 85282 • (602) 838-1277

STORE UP TO 96 K Twelve 8K Or Six 16K Blocks
Software Switched



APROMXL and SIX PACK use
2764 or 27128 eproms. Either
can be transparent or active
under program control

APROMXL
A general
purpose eprom
programmer.

Stored programs run at ROM speed.
Programs at 8K bytes/minute.

APROMXL with disk software, instruction book and Textool Zif socket	99.50
SIX PACK Specify I or II	34.95
SIX PACK With 1 socket ZIF	41.95
AMBI-XL Expander cartridge	
Restores right slot on XL's	24.95
DATASE	34.95
Eproms not included 2764	12.00

Makers of **Aprom.**

A New Data Storage System

communications

One such system is the Modem Magazine, operated by Bob and Cassie Stahl. (It's a bus driver's holiday for Cassie, the professional sysop of Atari's users group BBS.) This was the first system to be listed in the San Jose, California, phone book, challenging the phone company to start a new category.

Modem Magazine currently offers about 264K worth of text on a variety of subjects not normally found on a BBS, including agriculture and the original Jethro Tull, space, robotics, lasers, the environment, rhinoceros extinction, and computing in the Soviet Union.

Sysop Bob Stahl said he also hopes to move his 24-hour BBS in a more political direction, encouraging debate on the impending presidential election.

Stahl, who is looking for an older audience, said interest in his system is picking up; Modem Magazine gets between 50 and 100 calls each week, with a decline in the summer. The text files are slowly being discovered by callers, and a few people are systematically reading their way through the entire three disks of material.

In a more conventional vein, the Stahls will be bringing Avalon Hill board games to their system, with one person appointed judge and the multiple users normally found in such games.

The Stahl's system uses an Atari 800, an Atari 400 with 48K and eight Atari 810 disk drives. With an ATR 8000, the system may soon have C/PM capability. Modem Magazine uses two printers, the Atari 822 and 825, and a Hayes Smartmodem at 300 and 1200 baud.

The system, previously free to the public, now requires a \$12 per year fee. There is still limited public access, but the fee allows total access to the system. The fee is used to cover equipment costs. (408) 289-8217.



Synapse Demo Disk \$4

Preview the hottest games from Synapse for just \$4! The new self-running ATARI demo disk contains four of our most popular titles, and is available now by mail (48K required). Send your check or money order today!

Synapse
5221 Central Ave.
Richmond, CA 94804

Name _____ Age _____

Computer _____

Address _____

City _____ State _____ Zip _____

Phone _____

Please allow 3 to 4 weeks for delivery.
*\$5 outside the continental U.S.

ATARI is a registered trademark of Atari, Inc.

synapse

ANNOUNCING A MAJOR BREAKTHROUGH FOR ATARI COMPUTERS:



The Superbly Engineered Indus GT™ Disk Drive

The Critically Acclaimed Miles Accounting System II™

PLUG-IN BUSINESS/ ACCOUNTING POWER.

These state-of-the-art components
transform any Atari computer
into a powerful, productive business system.

Here's the Facts on just how

Go from 88K (or 127K) to an Astounding 180K!

Your Indus GT disk drive opens the door to a whole new world of previously untapped computing power. The fact is, the other parts of your Atari, microprocessor and memory, are identical to those of an Apple //e. All your Atari ever needed was more disk storage... and with Indus you've got it.

Compare Indus GT performance with other drives.

Housed in a sleek, compact cabinet, the Indus GT coordinates perfectly with your Atari computer. Reach track 39 in less than one second. Increase your Atari's transfer rate 400 percent using the exclusive Indus SychroMesh DataTransfer™ mode. Compare that to others' drives.



And while you're comparing, consider the built-in software that comes with every Indus GT: A comprehensive word processing package, an electronic spreadsheet, and a data base manager.

That adds up to formidable Atari performance at about half the price of an Apple; hardly a "games" machine!

EQUIVALENT SYSTEM PRICE COMPARISONS:

	ATARI	800XL	Apple	II/e	IBM	PC
Computer w/64K and 2 Disk Drives	1297	2445	2633			
Monitor with Interface and Cable	121	incl	680			
Printer Interface and Cable	134	120	205			
Printer	449	449	595			
TOTAL HARDWARE	1991	3014	4113			
General Ledger	145	395	595			
Accounts Receivable	145	395	595			
Accounts Payable	145	395	595			
Payroll		FREE!	395	595		
TOTAL SOFTWARE	435	1590	2380			
TOTAL PACKAGE	2426	4594	6493			

Based on Manufacturers Suggested Retail Price as of 4/84. Actual dealer price may vary.

Reliability. Convenience. Protection. Take them for granted with Indus.

A smart, smoked-glass dust cover, activated by air-drive. The AccuTouch™ push-button control system. These are just two of the extra operating innovations built into your Indus GT. These big steps beyond the ordinary assure hassle-free daily operation, and unusually long drive life.

Innovations in convenience abound. Automatic display of head-positioning; LED-lit Busy and Protect lights, and a two-digit LED register, only scratch the surface. And every Indus GT includes a rugged, molded PortaCase™ that doubles as an 80 disk library.



The Indus GT is also the perfect storage peripheral to power the incomparable, Miles Accounting System II.

Please send me information on Indus GT disk drives and the Miles Accounting System II business software.

YES NO

- ☐ I currently own an Atari. Model # _____
- ☐ I currently own a disk drive. Brand: _____
- ☐ I currently own Miles Accounting System II modules. They are: _____

YOUR NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

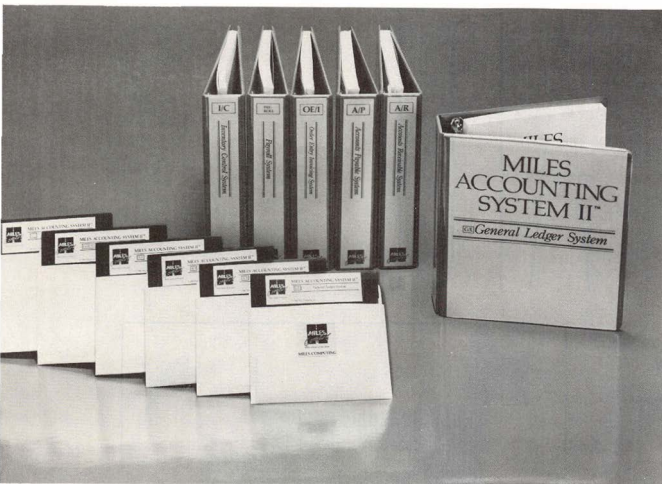
ZIP _____

INDUS

INDUS SYSTEMS

9304 Deering Avenue
Chatsworth, CA 91311
(818) 882-9600

effective your Atari can be:



The Finest Accounting System available for the Atari today.

The critics agree. Miles Accounting System II is not only the finest accounting system available for the Atari today, but it rivals any system available for other personal computers. And it's the other half of the astonishing new Atari business power package.

While part of the overall Accounting System, the Miles Payroll System is particularly esteemed. Here's what respected computer industry publications have to say about it:



"The performance of Miles Payroll system is excellent. It handles all its promised features quickly and easily. ...It is an easy-to-learn program that is very powerful."

—InfoWorld

"So much for the Atari's reputation of being a games-only machine."

—Desktop Computing

Take absolute, effortless Command of your firm's Accounting needs...

With one swift stroke.

There are six modules in the Miles Accounting System II. Each can function independently of the others. But when linked together they can transform your Atari from a mild-mannered games machine into a powerful, integrated business productivity tool.

Powerful but Simple.

For all of its versatility and sheer power, your "new" Atari system is utterly simple to use... even for beginners.

As ingenious as the Miles Accounting System II is, the true genius is that the programs have been written to enable virtually anyone to master them quickly. And the documentation is excellent; logical, clear and concise.

User support is guaranteed because Miles Computing is a company that cares about its customers. That is evidenced by their willingness to show you before you buy. With that in mind, drop by your local computer store and see our self-running demonstration of the Miles Accounting System II.



MILES COMPUTING INC.

7136 Haskell Avenue, Suite 300

Van Nuys, CA 91406

(818) 994-7901

Here's the Bottom Line:

Buying an Atari computer is the best move you can make. With an *Indus GT* and *Miles Accounting System II*, there aren't any computer systems that can equal its new price/performance.

Special Offer.

If you act quickly, you can select any three Miles Accounting System II modules, and get a fourth of your choice **absolutely FREE.**

Call today for more information, or mail the coupon in this ad.

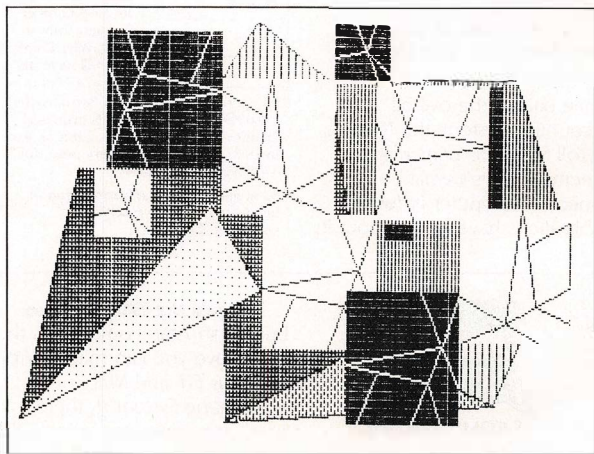
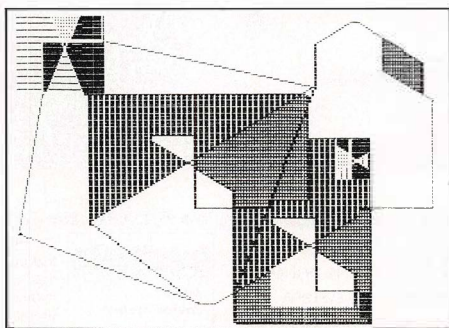
ATARI ART

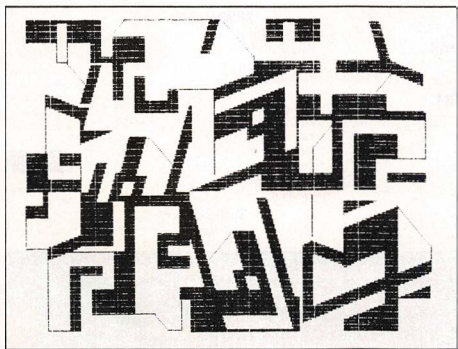
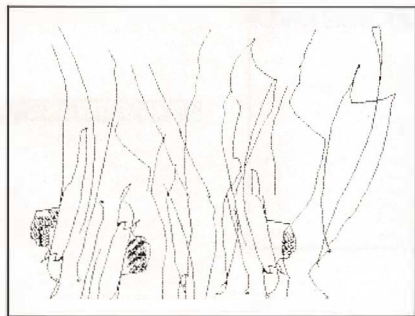
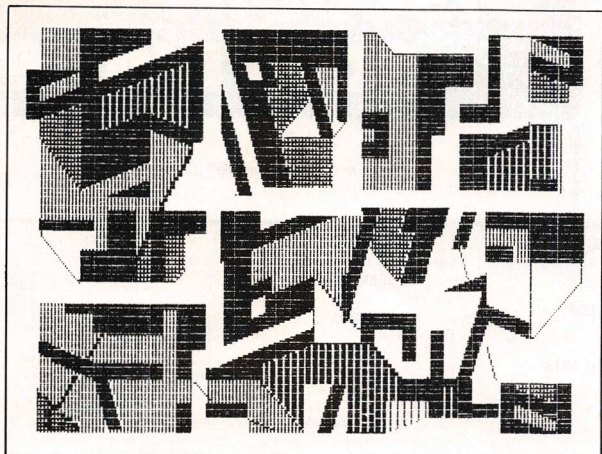
Modern art on a dot matrix printer

by JOSEPHA HAVEMAN

Computer art is usually identified with video screen displays. But dot matrix printers and color plotters can be effectively used by artists to produce computer generated pictures on paper. Unfortunately, only a few graphics software packages offer a built-in screen dump utility which would allow the artist to send the image currently on the screen directly to a printer. But if your favorite graphics program does not include this very important option, you can usually save the finished image to disk—from which the pictures can then be loaded into another program for dumping to a printer.

Because each graphics software package offers different drawing and painting features, many computer artists have several graphics programs around to provide a variety of features. Most high resolution Atari graphics programs allow only 4 colors on the screen at one time. Some programs offer the use of texture patterns, which provides an additional variety of picture options.





TEXTURE IN HARD COPY

For hard copy printout the texture patterns provide greater variety on paper than different screen colors do. An interesting problem here, is to compose pictures with the computer, viewed and edited on the CRT, while trying to predict how the printer will interpret each color, line and texture element. To accurately predict the effect takes considerable practice.


The best way to get to know these variations, is to create a test print for each software package and printer. Colors may print out with the same or similar textures in a black & white picture, making adjacent areas indistinguishable from one another. Suitable textures, rather than colors, must be programmed in such areas.

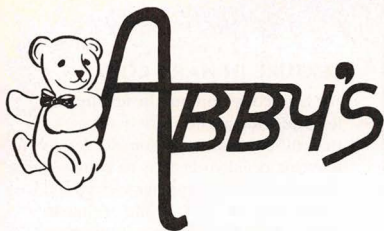
To get the most out of your Atari and your graphics printer, work with several compatible programs, using each for their best, or unique, features.

With the right programming and careful study and testing, excellent prints can be produced on dot matrix printers. True to its origin, this art bears the mechanical look of the medium in which it is produced. However, with the proper control of the printer's capabilities, a high quality can be maintained in the work. And these stylistic features become merely representative of the techniques of our era, not too different from those of medieval woodcuts 500 years ago.

Creative tools change with the times, as do the superficial appearances of artworks. The essence of art, however, remains pretty much the same.

Berkeley computer artist and photographer Josepha Haveman is an associate professor at California College of Arts and Crafts. She holds an Atari Fellowship Grant and this April exhibited computer prints at the Cory Gallery in San Francisco.

The pictures shown here were created on an Atari 800 and printed with a Gemini 15X. The artist uses the following compatible software at various stages of drawing and dumping an image: Micro Illustrator on KoalaPad, Micro Painter and Graphic Master. 



DISCOUNT SOFTWARE

SPECIAL

"Learn to Use Your Computer" (C)
with any purchase \$1
(specify 400 or 800)

SOFTWARE

ATARI

Assembler Editor (R)	\$ 49
Atari Basic (R)	\$ 29
Atari Logo (R)	\$ 79
Atari Macro Assembler (D)	\$ 69
Atari Microsoft II (D & R)	\$ 69
AtariWriter (R)	\$ 75
Dig Dug (R)	\$ 33
Donkey Kong Jr. (R)	\$ 35
Eastern Front (R)	\$ 33
Hangman (C)	\$ 7
Joust (R)	\$ 35
Jungle Hunt (R)	\$ 35
Kingdom (C)	\$ 35
MS PacMan (R)	\$ 35
Pengo (R)	\$ 35
Pilot (R)	\$ 69
Pole Position (R)	\$ 35
States & Capitals (C)	\$ 7
European Countries & Capitals (C)	\$ 7
Stock Analysis (D)	\$ 7
Bank Analysis (D)	\$ 7
Viscull (D)	\$169

NEW FROM ATARI

Atari Music I (D)	\$ 30
Atari Music II (D)	\$ 30
Atari Lab Math & Science (D)	\$ 60
SynCalc (D)	\$ 75
SynFile (D)	\$ 75
SynTrend (D)	\$ 75
The Home Manager Kit (D)	\$ 75

AVALON HILL

Guns at Ft. Defiance (C) (D)	\$ 21
Jupiter Mission (D)	\$ 32
North Atlantic Convoy (D)	\$ 16
Shootout at OK Galaxy (C) (D)	\$ 13
Tank Arcade (C)	\$ 12
Telengard (D)	\$ 23

BRODERBUND

AE (D)	\$ 17
Apple Panic (C) (D)	\$ 17
Bank Street Writer (D)	\$ 45
Choplifter (D)	\$ 19
Genetic Drift (C) (D)	\$ 17
Labyrinth (C) (D)	\$ 19
Lodestone (D)	\$ 29
Operation Whirlwind (D)	\$ 25
Serpentine (C)	\$ 17
Sesloft (D)	\$ 17
Sky Blazer (D)	\$ 15
Stellar Shuttle (C) (D)	\$ 15

CBS

K dos (D)	\$ 15
Krazy Antiks (R)	\$ 9
Krazy Knitters (R)	\$ 9
Krazy Shootout (R)	\$ 9
K star Patrol (R)	\$ 9
Success with Math (C) (D)	\$ 23

DATASOFT

Bruce Lee (C) (D)	\$ 29
Clowns & Balloons (C) (D)	\$ 15
Zaxxon (D)	\$ 11

DYNATECH

Codewriter (D)	\$ 75
Report Writer (D)	\$ 36

ELECTRONIC ARTS

Archon (D)	\$ 35
D Bug (D)	\$ 33
Hard Hat Mack (D)	\$ 35
M.U.L.E. (D)	\$ 35
Music Construction Set (D)	\$ 35
Pinball Construct. Set (D)	\$ 35

MUSE

Castle Wolfenstein (D)	\$ 17
------------------------	-------

PARKER BROS.

Q*bert (R)	\$ 35
------------	-------

RESTON

Moviemaker (D)	\$ 39
----------------	-------

ROCKLAN

Deluxe Invaders (D)	\$ 17
Gorf (D)	\$ 17
Wizards of War (D)	\$ 17

SIERRA ON-LINE

BC's Quest for Tires (D)	\$ 27
Crossfire (C) (D) (R)	\$ 17

SYNAPSE

Blue Max (C) (D)	\$ 29
Chicken (C) (D)	\$ 17
Dodge Racer (D)	\$ 17
Fort Apocalypse (C) (D)	\$ 27
Nautilus (C) (D)	\$ 17
Pharaoh's Curse (C) (D)	\$ 27
Protector II (C) (D)	\$ 17
Shamus (C) (D)	\$ 17
Slime (C) (D)	\$ 12

THORN-EMI

British Heritage 1, 2 (C)	\$ 7
European Scene 1, 2 (C)	\$ 7
Compute 4 Reversi (C)	\$ 7
Darts (C)	\$ 7
Dominoes (C)	\$ 7
Hickory Dicky (C)	\$ 7
Hungry Dumpty (C)	\$ 7
Kickback (C)	\$ 7
Owari/Bull & Cow (C)	\$ 7
Snooker (C)	\$ 7
Soccer (C)	\$ 7
Super Cubes (C)	\$ 7

ABBY'S SUPER BUYS

SOFTWARE

Alien Swarm (C) (D)	\$ 7	Pathfinder (D)	\$ 7
Andromeda (D)	\$ 7	Sentinel One (C)	\$ 7
Crypts of Terror (C) (D)	\$ 7	Canyon Climber (D & C)	\$11
Dr. Goodcode's Cavern (D)	\$ 7	Clam Jump (D or C)	\$11
Embarco (R)	\$ 7	Demon Attack (R)	\$11
Firebird (R)	\$ 7	Frogger (D)	\$11
Galactic Chase (C) (D)	\$ 7	Jobbreaker (C) (D) (R)	\$11
Gorn (C) (D)	\$ 7	Moon Shuttle (D & C)	\$11
Intruder (C) (D)	\$ 7	O'Riley's Mine (D & C)	\$11
Hockey (C) (D)	\$ 7	Pacific Coast Hwy (C) (D)	\$11
Soccer (C) (D)	\$ 7	Picnic Paranoia (C) (D) (R)	\$11
Kayos (C) (D)	\$ 7	Shooting Arcade (C) (D)	\$11
Match Racer (C) (D)	\$ 7	Slime (C) (D)	\$11

EPYX

Curse of Ra (C) (D)	\$ 17
Gateway to Alpha (R)	\$ 29
Temple of Aphrodite (C) (D)	\$ 31
Upper Reaches Alpha (C) (D)	\$ 17
Jumpman (D)	\$ 29
Jumpman Jr. (R)	\$ 29
Piripat (R)	\$ 29
Starfire Fire One (D)	\$ 29

GAMESTAR

Baja Buggies (D)	\$ 17
Star Bowl Football (C) (D)	\$ 17

INFOCOM

Deadline (D)	\$ 35
Enchanter (D)	\$ 39
Infidel (D)	\$ 39
Planetfall (D)	\$ 39
Sea Stalker (D)	\$ 39
Sorcerer (D)	\$ 39
Starcross (D)	\$ 39
Witness (D)	\$ 39
Zork I, II, III (D)	\$ 29

Golf (C)	\$ 17
Luna Lopper (D)	\$ 17
Marauder (D)	\$ 17
Mouskattack (D)	\$ 17
Oils Well (D)	\$ 29
Threshold (D)	\$ 17
Wall War (D)	\$ 17

SPINNAKER

Aerobics (D)	\$ 35
Alphabet 200 (R)	\$ 27
Delta Drawing (R)	\$ 29
Facebreaker (D)	\$ 27
Fraction Fever (R)	\$ 27
Grandma's House (D)	\$ 33
Kids on Keys (R)	\$ 27
Kinder Comp (D) (R)	\$ 22
Riddles & Rhymes (D)	\$ 20
Snooperettes II, III (D)	\$ 29
Story Machine (D)	\$ 20
Trans (D)	\$ 29

SUBLOGIC

Flight Simulator II (D)	\$ 39
-------------------------	-------

HARDWARE

Atari 1200 XL 64K computer (after rebate)	\$189
Atari 600 XL 16K computer	\$149
Atari 800 XL 64K computer	\$249
Atari 1450 XLD computer	\$249
Atari 1027 letter quality printer	\$279
Atari 1025 dot matrix printer	\$225
NEC 15 LQ letter qual w/tractor	\$499
NEC 8023 A N dot matrix printer	\$349
Delta 10 dot matrix printer	\$409
Rex 10 dot matrix printer	\$649
Epson RX 80 dot matrix printer	\$315
Atari 1050 disk drive	\$315
Trak AT D2 disk drive	\$369
Trak AT D4 352 disk drive	\$518
Indus GT disk d w/software	\$349
NEC 1201 green monitor w/sound	\$139
NEC 1205 amber w/sound	\$159
NEC 1215 color monitor	\$239
Sakata SC 100 color monitor	\$239
Amdisk Color 1x monitor	\$239
Alison Voice box (disk)	\$ 59
Kosla Touch Tablet (R or D)	\$ 69

DISKS

Walsh SSSD, Box of 10	\$ 17
Elephant SSSD, Box of 10	\$ 19
Elephant SSSD, Box of 10	\$ 24
Maxell SSSD, Box of 10	\$ 21

AD #5

(C) CASSETTE TAPE (D) DISK (R) ROM CARTRIDGE

AD #5

CALL TOLL FREE

Order Line 1-800-282-0333

M-F 10 a.m.-8 p.m. Eastern Time

Customer Service 1-513-879-9699

611 Cypress Drive, Fairborn, OH 45324

Prepaid orders over \$30 receive free shipping, UPS, continental US. No waiting period when paid by credit card, certified check, or money order. Add \$2 shipping and handling on orders under \$30. Add \$5 for COD orders. Hardware requires additional freight charges. Ohio residents add 5.5% sales tax. All items subject to availability and price change.

PLEASE CITE AD NUMBER WHEN ORDERING.

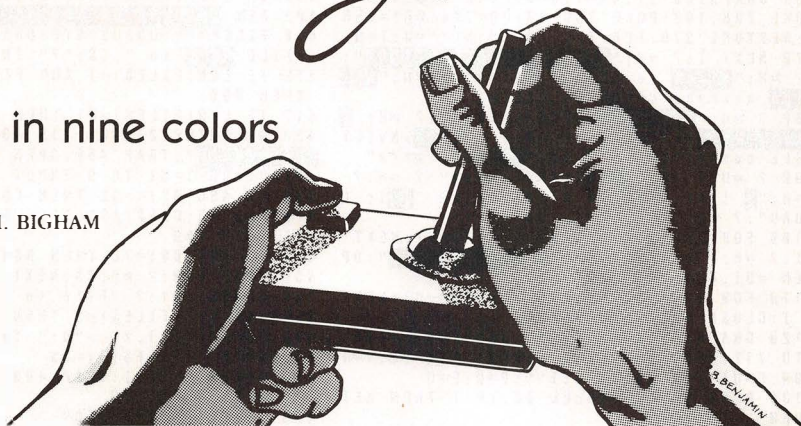


MasterCard

Drawing Fun

Sketch in nine colors

by ELRHEA M. BIGHAM



This Graphics 10 drawing program requires that your computer have the GTIA chip, which is likely if you purchased it after Jan. 1982. If you're in doubt, type in and RUN the following:

10 GRAPHICS 10
20 GOT 20

If the screen turns black, you have the GTIA chip. If the screen stays blue, you must have one installed by a service representative to use this program.

Type in the program and SAVE a couple of copies for backup. Check it with TYPO, make any necessary corrections, plug in a joystick, and RUN it.

When the program starts, a screen of instructions appears. You can return to this screen at any time by pressing [CLEAR], but this also erases your picture. Press any key to start drawing. You can change the current drawing color by pressing the joystick button. Activate other commands with the following keys:

[J] — moves the cursor without drawing. Press the joystick fire button to start drawing again.

SYNOPSIS

Drawing Fun is a joystick drawing program that uses Graphics 10, a nine-color medium-resolution GTIA mode. The program requires BASIC and a joystick, and can use disk or cassette for storage. It runs on all Atari computers manufactured after Jan. 1982. The fill feature works somewhat differently with XL computers (sometimes fills left and right instead of right only). If this proves to be a problem, use Translator: Antic Disk Subscribers: Run "D.DRAWFUN.BAS."

[CLEAR] — erases the screen and returns to the menu of instructions.

[E] makes cursor an eraser. Press the fire button to return to drawing mode.

[TAB] — creates a special effect by rotating all eight colors through the Atari's color registers, something like a circular bucket brigade. Press [TAB] again to stop the effect and return all colors to their original state.

[C] — when you press this, the com-

puter will automatically continue all moves you initiate with the joystick—drawing is continuous. Press [C] again to stop the automatic drawing.

[F] — fills to the right. This function fills one line at a time to the right of the cursor. This works only over the background color (black). Press [F] again to turn the fill off.

[S] — save a drawing. First you're prompted for a file name. If you're using a disk, type in the full name, including "D1:". The program appends the extender ".PIC." If you just press [RETURN], the program displays the current disk directory. Cassette users, type C:, then press [RETURN].

[L] — load a saved drawing. This works similarly to Save, above. You needn't type in the .PIC extender when loading a file.

NOTE: When you enter the Save or Load section, the current picture is erased. You must reload it to continue working on it. If you activate one of these, but decide not to use it, type in at least two characters, beginning with a number. You'll be returned to the screen of instructions.

continued on next page

```

10 REM DRAWING FUN
20 REM BY ELRHEA M. BIGHAM
30 REM ANTIC MAGAZINE
40 DIM CS(4), CIO$(7), FILES(20), BS(17),
CIS$(30), S(35): CIO$="HVV, A=BUATHN?SUW
AAAAA": H=6: U1=1: U16=16
50 POKE 16,112: POKE 53774,112: IF DA TH
EN RETURN: REM DISABLE BREAK KEY
60 GRAPHICS 17: DA=1: H=6: POKE 710,134: P
OKE 708,198: POKE 709,88: QQ=764: QQ1=255
: RESTORE 370: FOR I=1 TO 35: S(I)=U: T=U
70 NEXT I: ? #H; "DRAWING INSTRUCTIONS":
? #H; "stick to DRAW with " : ? #H; "bu
ton changes COLOR": CLOSE #1
80 ? #H; "tab key MOVES color " : ? #H; "c
lear key to CLEAR": ? #H: ? #H; "i INVISI
BLE cursor": ? #H: ? #H; "e ERASE mode":
90 ? #H: ? #H; "c CONTINUE move": ? #H: ?
#H; "l line fill to RIGHT": ? #H; "i to L
DAD": ? #H: ? #H; "s to SAVE"
100 FOR I=U1 TO H: READ A: S(A)=U1: NEXT
I: ? #H: ? #H: ? #H: "PRESS ANY KEY": OP
EN #U1,4,U,"K": GET #U1,I
110 FOR I=U1 TO H: READ A: S(A)=U1: NEXT
I: CLOSE #U1: AL=U: SG=U1
120 GRAPHICS 10: RESTORE 390: FOR I=705
TO 712: READ A: POKE I,A: NEXT I: X=38: Y=1
00: C=U1: Z=U: COLOR C: I=U: F=U: E=U
130 POKE QQ,QQ1: GOSUB 50: IF T THEN RET
URN
140 POKE 77,U: S=PEEK(632): SG=PEEK(644)
: IF AL AND S=15 THEN S=AL: SG=R
150 IF AL AND S<>15 THEN AL=S: R=SG
160 Q=S(S): H=S(S+20): X=X+Q*((X<79 AND
Q=U1) OR (X>U AND Q=U1)): Y=Y+H*((Y<18
4 AND H=U1) OR (Y>U AND H=U1))
170 IF E THEN LOCATE X,Y,C: COLOR U1: PL
OT X,Y
180 IF SG=U THEN C=U1+C*(C<9): E=U: COLO
R C: IF I=U1 THEN I=U: C=B
190 IF I=U1 THEN PLOT X,Y: COLOR U1: PLO
T X,Y: GOTO 220
200 IF F THEN TRAP 200: POSITION X,Y: PO
KE 765,C: XIO 18,#6,12,0,"S:"
210 PLOT X,Y: COLOR U: PLOT X,Y: IF Z THE
N Y1=USR(ADR(CIS))
220 COLOR C: PLOT X,Y: A=PEEK(QQ): IF A=Q
Q1 THEN 140
230 POKE QQ,QQ1: IF A=44 AND Z=U THEN Z
=U1: A=QQ1
240 IF A=44 AND Z THEN Z=U: RESTORE 390
: FOR I=705 TO 712: READ J: POKE I,J: NEXT
I
250 IF A=13 THEN E=U1: F=U: I=U
260 IF A=0 THEN CS$="load": GOTO 410
270 IF A=62 THEN CS$="save": GOTO 410
280 IF A=56 AND F=U1 THEN F=U: A=QQ1
290 IF A=56 AND F=U THEN F=U1: E=U: I=U
300 IF A=42 THEN I=U1: E=U: F=U: B=C: C=U
310 IF A=54 OR A=118 THEN 60
320 IF A=18 AND AL THEN A=QQ1: AL=U: R=U
330 IF A=18 THEN AL=S: R=SG
340 PLOT X,Y: COLOR U: PLOT X,Y: IF Z THE
N Y1=USR(ADR(CIS))
350 COLOR C: PLOT X,Y: GOTO 140
360 REM JOYSTICK MOVE DATA
370 DATA 5,6,7,25,29,33,9,10,11,26,30,
34
380 REM GRAPHIC 10 COLOR DATA
390 DATA 6,36,70,102,132,166,226,42
400 REM LOADING OR SAVING A DRAWING
410 FILES$="": GOSUB 570: GRAPHICS 2: ? #6
: "FILE NAME to " : CS: "?": INPUT FILES
415 IF LEN(FILES)<3 AND FILES(1,1)="C"
THEN 500
417 IF LEN(FILES)>U1 THEN 470
420 GRAPHICS 2: POKE 710,130: ? #6; "FILE
DIRECTORY": TRAP 460: OPEN #U1,6,U,"D:*
.PIC": FOR I=U1 TO 9: INPUT #U1,BS
430 IF ASC(BS)<32 THEN FOR I=U1 TO LE
N(BS): ? #6; CHR$(ASC(BS(I,I))+128): ; NEX
T I: GOTO 460
440 IF ASC(8$)=32 THEN 8$=8$(2)
450 TRAP 460: ? #6; BS: NEXT I
460 CLOSE #U1: ? "File to " : CS: INPUT F
ILES: IF LEN(FILES)<2 THEN 420
470 IF FILES(1,2)<"D:" THEN BS=FILES:
FILES$=D: FILES(3)=BS
480 A=LEN(FILES): TRAP 490: IF FILES(A-3
)="PIC" THEN 500
490 FILES(A+1)="PIC"
500 TRAP 60: CLOSE #2: IF CS$="save" THEN
I=8: CMD=11: POKE 559,0: GOSUB 520: POKE
559,34: GOTO 120
510 CMD=7: T=1: GOSUB 120: I=4: GOSUB 520:
GOTO 140
520 OPEN #2,I,128,FILES$
530 J=STADR: GOSUB 560: POKE 868,B: POKE
869,A: J=BYTES: GOSUB 560: POKE 872,B: POK
E 873,A
540 POKE 866,CMD: ERROR=USR(ADR(CIO$),3
2)
550 ERROR=PEEK(867): CLOSE #2: RETURN
560 A=INT(J/256): B=INT(J-A*256): RETURN

570 POKE 764,255: CIO$="hhhhLV": BYTES=
7400: STADR=PEEK(88)+256*PEEK(89): RETUR
N

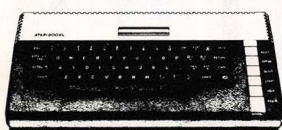
```

TYPO TABLE

Variable checksum = 621365

Line num	range	Code	Length
10	- 70	OK	532
80	- 140	PP	563
150	- 250	HN	532
260	- 370	LP	399
380	- 460	OI	533
470	- 560	QY	538
570	- 570	QO	84

Always the Lowest Prices on the Finest Quality at... COMPUTER CREATIONS



ATARI HOME COMPUTER

ATARI 600* Home Computer (16K RAM) CALL FOR
ATARI 800XL* Home Computer (64K RAM) UPDATED PRICES

DISK DRIVES

RANA 1000
TRAK ATD 2 (Single/Double Density/Parallel Int./4k buffer)
TRAK ATD4 (Dual Drive)
TRAK TURBO DOS
INDUS GT (Free Software)
ASTRA 1620
ATR - 8000
HAPPY ENHANCEMENT for Atari 810 and 1050 Disk Drives

CALL
FOR
UPDATED
PRICES

ATARI ADDITIONAL EQUIPMENT

ATARI 1010* Program Recorder
ATARI 1020* 40-Column Color Printer/Plotter
ATARI 1025* 80-Column Printer
ATARI 1027* Letter Quality Printer
ATARI 1030* Direct Connect Module
ATARI 1050* Disk Drive
CX77 ATARI Touch Table!***
*Screen Dump Program FREE!! with purchase of CX77

CALL
FOR
UPDATED
PRICES

HARDWARE COVERS

ATARI 1010 5.95
ATARI 1200 5.95
ATARI 1025 5.95
ATARI 800XL 5.95
ATARI 800XL 5.95
ATARI 1027 5.95
GEMINI 10X 5.95
GEMINI 15X 7.49
POWERTYPE 5.95
DELTA-15 7.49
RANA 1000 5.95
INDUS 5.95
TRAK 5.95

DISKETTE/CARTRIDGE/ CASSETTE FILES

Flip 'N' File 3.95
Flip 'N' File 15 6.95
Data Defender 16.99
Flip 'N' File/TheOriginal 19.95
Cassette 'N' Game File 14.95
Disk Bank 3.99
Library Case 1.99
Color Coder 13.99

RAM (MEMORY) BOARDS

Microbits 64K (600XL)
Expansion 129.00

ATARI LEARNING PHONE SYSTEMS

Access to Control Data's Plato Services Network
Over 6000 Educational Programs

SYSTEM I

Atari 1030 Module
& Learning
Phone Cartridge
\$159

SYSTEM II

Atari 850 Interface Module
& Learning Phone Cartridge
Anchor Mark XII Module
\$549

GENERIC DISKS AT FANTASTIC PRICES!!

Generic 100% Defect-Free/Guaranteed Mini-Floppy Disks

Diskettes (1 Box Minimum) - 10 Per Box	SS/SD	SS/DD	DS/DD
1 or 2 Boxes	15.49	15.99	19.99
3 - 9 Boxes	14.49	14.99	18.99
10+ Boxes	13.99	14.49	17.99
Bulk Diskettes with Sleeves - Price per Disk	SS/SD	SS/DD	DS/DD
10 - 29	1.45	1.49	1.89
30 - 99	1.35	1.39	1.79
100+	1.29	1.35	1.69

PRINTERS

GEMINI 10X (80 Column) 269.00
GEMINI 15X (136 Column) 399.00
DELTA 10 (80 Column) 419.00
RADIX 10 (80 Column) 639.00
RADIX 15 (136 Column) 749.00
POWERTYPE Daisywheel 379.00
EPSON RX-80 (80 Column) 339.00
EPSON RX-80 FT (80 Column) 469.00
EPSON FX-80 (80 Column) 555.00
EPSON FX-100 (136 Column) 749.00
SILVER-REED EXP 500 Daisywheel (80 Column) 399.00
OKIDATA 92P 449.00
EPSON RX100 (136 Column) 439.00

PRINTER INTERFACE CABLES

APE FACE 65.00
MPP-1150 Parallel Printer Interface 79.00
PARALLEL Printer Cable 30.00
PRINTER RIBBONS
GEMINI Printers (Black/Blue/Red/Purple) 3.00
EPSON Printers 6.95

MONITORS

Gonilla* Hi Res 12" Non-Glare Green Screen 89.00
Gonilla* Hi Res 12" Non-Glare Amber Screen 99.00
Sakata SC 100 Color Screen 239.00
Sakata Green Screen 99.00
Sakata Amber Screen 109.00
Monitor Cable 10.00

MODEMS

MPP-1000C Modem 129.00
Signalman Mark XII Modem 269.00

AUTHORIZED SERVICE CENTER

ATARI • TRAK
STAR MICRONICS (GEMINI)
Call for prices and services.

To order call TOLL FREE

1-800-824-7506

ORDER LINE ONLY

COMPUTER CREATIONS, Inc.

P.O. Box 292467 - Dayton, Ohio 45429

For information call: (513) 294-2002 (Or to order in Ohio)

Order Lines Open - 8:30 a.m. to 8:00 p.m. Mon.-Fri.; 10:00 a.m. to 4:00 p.m. Sat. (Eastern Standard Time). FREE Catalog with each order. Minimum \$10 per order. Prepaid Money Order - Free Shipping. MasterCard - Visa - C.O.D. (Add \$2.50). All orders add \$3.50 shipping and handling in Continental United States. Actual freight will be charged outside U.S. to include Canada, Alaska, Hawaii, Puerto Rico and A.P.O.'s. Prices are subject to change without notice. Call for update prices and availability of product. Ohio residents add 6% sales tax.

No extra charge
for MasterCard
or Visa

ANTIC MODE 3

A special character mode

by KARL WIEGERS

With the implementation of the new Operating System in the XL series of Atari computers, all of Atari's graphics and text modes but one are readily available to the user from BASIC. This is ANTIC Mode 3, a text mode that's similar to Graphics 0, but that allows special modifications to the character set.

A few of the concepts and terms used in this article may be unfamiliar to you. The *display list* is a set of instructions used by the ANTIC chip, the special graphics processor that constructs the screen display. See "Display Lists Simplified" (Antic, February/March 1983) for a detailed explanation of display lists and how they work.

A *scan line* is a single horizontal line traced by the electron beam on your television screen. Every 30th of a second, 525 scan lines are produced, forming a single screen image.

A *mode line* in Atari terminology is a group of scan lines (from 1 to 16, depending on the graphics mode) used as a unit by the display list. For instance, in Graphics 0, eight scan lines make up one mode line. See the Graphics Chart ("Unlocking the 56 Graphics Modes") in this issue for the number of scan lines required by different text and graphics modes.

Character graphics refers to the method normally used by the Atari

SYNOPSIS

Here's how to modify Atari's text mode to display video lowercase letters with real descenders (g, j, p, q, and y), and subscripts. The programs run on all Atari computers. Please note: the ANTIC referred to in this article is Atari's LSI chip, not your favorite magazine. Newer readers now know where our name came from. Antic Disk Subscribers: Run "D:HIDDEN.BAS"

Operating System to display alphanumeric characters on the screen. Read "Character Graphics" (Antic, February 1984) for further information.

Each character is composed of dots (pixels) in an 8-by-8 matrix. The dot pattern for each character is stored in eight consecutive bytes in ROM. The 128 characters that are the Atari character set occupy (128×8) 1024 bytes.

Here's a short program that will print out the Internal Character set (the ATASCII set).

The order in which the set is printed is the same order in which the computer's Read Only Memory stores the set.

```
10 PRINT "NUMBER";"CHARACTER"
20 FOR I=0 TO 63:PRINT
   I,CHR$(I+32):NEXT I
30 FOR I=64 TO 90:PRINT
```

```
I,CHR$(I-64):NEXT I
35 FOR I=91 TO 95:PRINT
   I,CHR$(27);CHR$(I-64):NEXT I
40 FOR I=96 TO 124:PRINT
   I,CHR$(I):NEXT I
50 FOR I=125 TO 127:PRINT
   I,CHR$(27);CHR$(I):NEXT I
```

In ANTIC 3, each mode line is ten scan lines high. Each character is still represented by eight bytes, and two scan lines normally appear as blanks below the character. Second, the last 32 characters in the set (lower case letters plus six special important characters) are displayed differently from the rest. The first two bytes of these 32 characters are displayed at the *bottom* of the character, and the two blank lines appear at the top. This allows us to redefine some of these characters to have lower-case descenders (the "tails" of letters, g, j, p, q, y extend two dots below the bottom of other letters).

STEP BY STEP

First, modify the display list. Each mode line of ANTIC 3 has ten scan lines. Our ANTIC 3 screen will have 20 lines of text on the screen. The program in Listing 1 sets up the ANTIC 3 display list.

When you RUN Listing 1, the screen will flash and a rectangular cursor will appear. The Operating System is set up for ANTIC 2, so it tries to display 24 lines. Since we've set up our new display

list to show 30 lines, the bottom four lines of the display are invisible. Press [RESET] to return to the normal display before rerunning the program.

Type some letters. Capital letters, numbers and graphic symbols look fine. Now type some lowercase letters. All the tall lowercase letters (b, d, f, h, i, j, k, l, t) are cut off; the tops of the letters are displayed as dots at the bottom of the letters. Here's why:

Figure 1A shows the dot pattern for a normal uppercase 'Y' in ANTIC Mode 2. Figure 1B shows the 'Y' in ANTIC 3. The two extra scan lines appear as blank lines below the character. Figure 2A shows the pattern for a lowercase 't', and 2B shows its ANTIC 3 representation. Note that dots in the top two rows of the normal character have been moved to the bottom of the character in ANTIC 3. This happens with all characters with ATASCII codes between 96 and 127.

We can't use the standard character set in ANTIC 3 because of this. One possible solution is to redraw each character one line lower within its 8-by-10 matrix. The entire set must be copied into RAM first.

Figure 3 illustrates the necessary steps. Shift the eight bytes in the character down by one, and move the last byte to the top of the character. When ANTIC 3 displays the character, it displays the first two bytes last, so the vertically shifted characters will look fine. Listing 2 contains a machine-language subroutine that transfers the character set to RAM and performs the modification quickly. Merge Listing 2 with Listing 1 to combine the ANTIC 3 display list with the shifted characters.

Here's how to merge the two listings:

1. LOAD or type in Listing 1 and LIST it to disk or cassette.
2. Verify with TYPO.
3. LOAD or type in Listing 2.
4. Use the ENTER command to load (and merge) Listing 1.
5. Use SAVE to store the combined program.
6. If you don't see 'READY' after running the combined program, press [RESET] and RUN again.

We're now ready to redefine some characters to give the lowercase descenders mentioned earlier. We can

repair the comma and the semicolon at the same time.

Make a less squashed-looking 'y' by changing it to the dot pattern in figures 4A and 4B. This illustrates lowercase descenders; ANTIC 3 gives such characters a more pleasing appearance than does the usual text mode.

Listing 3 gives descenders to all the appropriate characters, and repairs the comma and semicolon. Merge this with the program from Listings 1 and 2. You now have a complete, working text display for ANTIC Mode 3.

A USEFUL APPLICATION

If we wish to write chemical or mathematical formulae, we need to use symbols as subscripts. Let's use ANTIC 3's special display features to create some subscript number characters.

The ATASCII character set has six rarely used characters whose codes are: 96 ([CTRL][.]); 123 ([CTRL][,]); 124 ([SHIFT][=]); 125; 126; and 127. In this example, we'll replace character 96 with the dot pattern for a subscript '2', 123 with subscript '3', and 124 with subscript '4' (Figures 5A and 5B). Type in Listing 4 and merge with your evolving program. Press [RESET], and RUN the program. Now, whenever you press [CTRL][-], you should get a subscript '2', and so on. Try writing the chemical formula for potassium phosphate with these keystrokes:

[K] [CTRL][.] [P] [O] [SHIFT][=]

See if you can type other formulae, like silver carbonate, Ag_2CO_3 ; sodium acetate, $\text{NaC}_2\text{H}_3\text{O}_2$; aluminum sulfate, $\text{Al}_2(\text{SO}_4)_3$. This may be the first chemistry you've seen coming out of your Atari computer, but it's just one application of ANTIC Mode 3. (If you come up with any other interesting uses for this mode, send them to Antic. If they're good, we'll publish them.)

As always, this is just a start. ANTIC 3 can be used for super/subscripts, footnotes, and vowel markings for foreign languages. Special character sets can be printed out using screen dump programs.

Karl E. Wieggers, Ph.D., is a research chemist for Eastman Kodak and an Atari hobbyist. He writes for a number of computer publications.

continued on next page

figure 1A

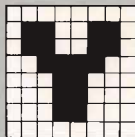


figure 1B

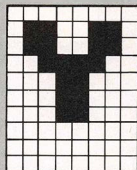


figure 2A

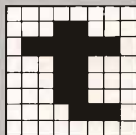


figure 2B

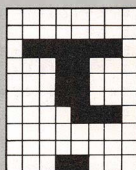


figure 4A

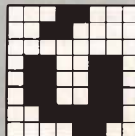
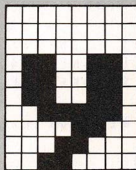


figure 4B



one
character
in
ROM

byte 0
" 1
" 2
" 3
" 4
" 5
" 6
" 7



byte 7
" 0
" 1
" 2
" 3
" 4
" 5
" 6

one
character
in
RAM

figure 3

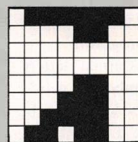


figure 5A

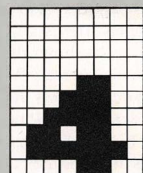


figure 5B

Listing 1

```

30 GRAPHICS 0
40 REM Turn off TV display
50 POKE 559,0
60 REM Find start of display list
70 OL=PEEK(560)+256*PEEK(561)
80 REM Modify display list to ANTIC mode 3
90 POKE DL+3,67
100 FOR I=6 TO 24:POKE OL+I,3:NEXT I
110 POKE DL+25,65
120 POKE DL+26,PEEK(DL+30)
130 POKE OL+27,PEEK(DL+31)
400 REM Turn on TV display
410 POKE 559,34

```

Listing 2

```

10 REM Reserve 4 pages of RAM for character set
20 MEM=PEEK(106)-4:POKE 106,MEM-1:RAMSTART=256*MEM
140 REM Load ML routine
150 FOR I=1 TO 35:READ A:POKE 1535+I,A:NEXT I
160 DATA 104,160,255,162,7,177,203,72,136,177,203,200,145,205
170 DATA 136,202,200,246,104,145,205,136,192
180 DATA 255,200,233,198,206,198,204,198,207,208,223,96
190 REM Initialize work variables for character set transfer to RAM
200 POKE 203,0:POKE 204,227
210 POKE 205,0:POKE 206,MEM+3:POKE 207,4
220 REM Call ML routine to move character set
230 A=USR(1536)
380 REM Turn on new character set
390 POKE 756,MEM

```

Listing 3

```

240 FOR J=1 TO 7:READ OFFSET:OFFSET=OFFSET*8
250 FOR I=0 TO 7:READ A:POKE RAMSTART+I+OFFSET,A:NEXT I:NEXT J
260 REM comma,semicolon,g,i,p,q,y
280 DATA 12,0,0,0,0,0,24,24,48
290 DATA 27,0,0,24,24,0,24,24,48
300 DATA 103,102,60,0,62,102,102,62,6
310 DATA 106,6,60,6,0,31,6,6,6
320 DATA 112,96,240,0,124,102,102,124,96
330 DATA 113,6,15,0,62,102,102,62,6
340 DATA 121,24,48,0,102,102,102,62,12

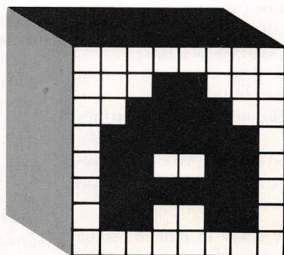
```

Listing 4

```

240 FOR J=1 TO 10:READ OFFSET:OFFSET=OFFSET*8
270 REM CTRL-,CTRL-,Shift-=
350 DATA 96,48,120,0,0,60,102,12,24
360 DATA 123,102,60,0,0,126,12,24,12
370 DATA 124,126,12,0,0,12,28,60,108

```





For years they said it couldn't be done... IMPOSSIBLE they claimed!

THE "IMPOSSIBLE!"



Backup any (or almost any) disk you own with an **UNMODIFIED** disk drive (works with ANY disk drive!)

HERE'S THE STORY!

Computer Software Services has developed a radically new **DISK BACKUP** program that **does not** require a disk drive modification. Instead of making clones of **PROTECTED** disks, the **"IMPOSSIBLE!"** reads the original program and re-writes it in a totally **UNPROTECTED** format!

THE HONEST TRUTH!

How good is THE "IMPOSSIBLE"??? It's **EXCELLENT!!** We have made backup copies of our Dimension X, Rainbow Walker, Encounter, Archon, Mule, Blue Max and hundreds of other fine programs! Since there are over 3000 programs available for Atari computers, we make no claims that it will backup all existing or future programs (but it's sure looking good now!). We will try to provide updates if and when necessary.

SATELLITE PROGRAMS AVAILABLE SOON!

Once you own THE "IMPOSSIBLE!", separate satellite programs will become available that will **COMPACT** your "IMPOSSIBLE!" backups into DOS files so you can store several programs all on the **SAME DISK** (and are compatible with **ANY** disk drive!)

A second satellite program will convert **PROTECTED** cassettes into **DISK** files (allowing you to store several programs all on the same disk!)

REQUIREMENTS!

Atari computer with 48K or more, THE "IMPOSSIBLE!" (4K STATIC RAM pack and disk), and ANY Atari compatible disk drive.

Mastercard-Visa-Money
Order or Cashiers Check.
Phone orders:
(716) 467-9326.

Atari is a TM of Atari Inc. The
"IMPOSSIBLE!" is a TM of
Computer Software Services
(division of S.C.S.D., Inc.)

**COMPUTER SOFTWARE
SERVICES
P.O. Box 17660
Rochester, New York 14617**



The "PILL" is the most advanced CARTRIDGE BACKUP device available in the **WORLD** today and is now selling in 21 different countries! Insist on the original... insist on THE PILL!

THE "PILL!"



WORKS WITH ANY ATARI COMPUTER HAVING 48K or more (400/800/1200XL/600XL/800XL) Saves cartridges to disk OR cassette! Works with **DOUBLE DENSITY** drives for even greater storage capacity! No installation required.

The "PILL" allows you to store the contents of cartridges designed for any Atari computer onto disk or cassette (up to twenty 8K programs or ten 16K programs each with file names on a single disk!) simply and instantly!

The "PILL" allows you to select and **EXECUTE** any of the stored **CARTRIDGE** programs with equal ease and simplicity!

- Transfers your cartridges to disk or cassette.
- Stores up to 20 programs on a single disk (requires only 7 seconds for 8K programs or 14 seconds for 16K programs).
- Allows you to **EXECUTE** and run programs which were transferred to disk or cassette.
- All files can be transferred using standard DOS.
- Free software is included with the purchase of THE "PILL" containing several useful utility routines.
- **DOUBLE DENSITY** menu.
- Works with ALL Atari computers (please specify).
- Available with **DISK** or **CASSETTE** (please specify).
- Immediate delivery!

DISTRIBUTOR/DEALER inquiries welcome.

Mastercard-Visa-Money
Order or Cashiers Check.
Phone orders: **(716) 467-9326.**
Atari is a TM of Atari Inc. The
"PILL" is a TM of Computer
Software Services (division of
S.C.S.D., Inc.)

Send \$69.95 plus \$4 shipping and handling (N.Y.S. residents please add 7% for sales tax) to:
**COMPUTER SOFTWARE
SERVICES
P.O. Box 17660
Rochester, New York 14617**



Vastly **SUPERIOR** to any translation programs available! FOR ATARI 1200XL/600XL/800XL with 64K.

THE XL "FIX!"



The Atari XL series computers represent power, sophistication, and flexibility virtually unrivalled in today's Home Computer Market.

With "approximately" 30-40% of existing software being "incompatible", a real, and serious problem exists. Because of this we have developed THE XL "FIX!"

ADVANTAGES over cheaper "translation products":

1. The XL "FIX!" is capable of fixing more software... an estimated **30% more software!**
2. The XL "FIX!" is available in **DISK** or **CASSETTE** versions.
3. Either XL "FIX!" version fixes ALL THREE types of software (Disk - Cassette - and Cartridges!).
4. The XL "FIX!" adds **OVER 4K** of usable RAM to your computer (anyone using Data bases or Word processors will really appreciate this feature!)
5. You never have to hold the **OPTION** button down on 600XL or 800XL computers!
6. **VERY IMPORTANT!** You need to load the XL "FIX!" only **once**, you can **change** disks, cassettes, or cartridges without rebooting the XL "FIX!" each time!

The XL "FIX!"... another **SUPERIOR** product!! **64K required!**

DISTRIBUTOR/DEALER inquiries welcome.

Mastercard-Visa-Money
Order or Cashiers Check.
Phone orders:
(716) 467-9326.
Atari is a TM of Atari Inc. The
XL "FIX!" is a TM of Computer
Software Services (division of
S.C.S.D., Inc.)

Send \$49.95 plus \$4 shipping and handling (N.Y.S. residents please add 7% for sales tax) to:
**COMPUTER SOFTWARE
SERVICES
P.O. Box 17660
Rochester, New York 14617**



THREE NEW PRODUCTS! THE "SUPER PILL!"



Exactly the same as the **WORLD'S** leading cartridge backup device, **THE PILL**, except it's even simpler to operate, it's **SWITCHLESS!** Excellent for families having young children. Totally eliminates opening computer doors and switches. **THE "SUPER PILL"** is the most advanced state of the **CARTRIDGE BACKUP** device available today. It is totally compatible with all Atari computers and all programs backed up by the original "PILL!" Only \$79.95 plus \$4 shipping and handling.

THE "PROTECTOR/SILENCER!"

The **"PROTECTOR"** is a disk and hardware modification (no soldering) for Atari 810, 1050, and Indus G1 disk drives that will allow you to write true **BAD SECTORS** wherever you wish (not to be confused with ridiculous speed control or tape jerking schemes)! **Powerful** disk program finds hidden directories, scrambles existing directories, lost maps, hex conversions, disk dups, and much more!
The **"SILENCER!"** quiets your drive tremendously (eliminates the **LOUD** grinding noise when you read a bad sector). **PLUS!** it allows you to **WRITE TO BOTH SIDES** of any disk **WITHOUT** cutting or notching the disk! Both for only \$49.95 plus \$4 shipping and handling.

THE "COMPANION!"

An amazing device that will enhance the capabilities of the **XL "FIX!"** or Atari Translator. It will allow you to **de-select BASIC** (no more need to hold the **OPTION** button while loading programs on the 600XL's and 800XL's), and it will allow you to **de-select the DIAGNOSTICS** (no more bad loads because of the **DIAGNOSTICS** jumping into the middle of your program load routine!). Installation is simple (10 minutes) and requires **NO** soldering! Only \$29.95 plus \$4 shipping and handling.

DISTRIBUTOR/DEALER inquiries welcome.

Our other fine products include THE "PILL!", XL "FIX!", "IMPOSSIBLE!", "METAMORPHOSIS", and "REMOIE!"

Mastercard-Visa-Money
Order or Cashiers Check
Phone orders:
(716) 467-9326.
Atari is a TM of Atari Inc. The
"METAMORPHOSIS" is a TM
of Computer Software
Services (division of S.C.S.D.,
Inc.)

**COMPUTER SOFTWARE
SERVICES
P.O. Box 17660
Rochester, New York 14617**

QUESTRON

Live the Fantasy and the Adventure.

**ATARI®
& APPLE®**
versions now
showing at a com-
puter/software or
game store near you.
COMMODORE 64™
version coming
soon!

STRATEGIC SIMULATIONS INC. PRESENTS A FANTASY ADVENTURE GAME: QUESTRON™
ONE OF THE FINEST CHAPTERS IN THE NEVER-ENDING SAGA OF THE BATTLE BETWEEN GOOD AND EVIL

Starting YOU as THE HERO • MESRON, THE GOOD WIZARD • MANTOR, THE EVIL SORCEROR
AND HIS HORDES OF HERO-CRUNCHING MONSTERS • Written and directed by CHARLES DOUGHERTY

On 48K disk for your Apple® II with Apple-
soft ROM card, Apple II+, IIe, or Apple III.
Also for Atari® home computers.



PG

THIS GAME RATED POSITIVELY GREAT.

Ideal for Fantasy Adventurers of all ages.

APPLE & ATARI are trademarks of Apple Computer, Inc. and Atari, Inc., respectively.

STRATEGIC SIMULATIONS INC.

COMMODORE 64 is a trademark of Commodore Electronics, Ltd.

If there are no convenient stores near you, VISA & Mastercard holders
can order direct by calling 800-227-1617, ext. 335 (toll free). In Califor-
nia, call 800-772-3545, ext. 335. QUESTRON™ goes for \$49.95, plus \$2.00
for shipping and handling.

To order by mail, send your check to: STRATEGIC SIMULATIONS INC.,
883 Sterlin Road, Bldg. A-200, Mountain View, CA 94043. (California
residents, please add 6.5% sales tax.) All our games carry a "14-day satis-
faction or your money back" guarantee.

WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES.

COMPUTER GRAPHICS

PRODUCT SURVEY

Unlocking the art inside you

by DAVID DUBERMAN

The computer's incredible power as a tool for artistic creativity was once only available to adept programmers and dedicated number crunchers. Times have changed. Today, low-cost visual arts hardware and software make the Atari—with its unequalled graphics potential—the perfect tool for a serious artist or an inventive computer novice.

With the products described in this survey, you can easily produce effects similar to what used to be available only on \$10,000 graphics systems. You can use your computer to draw pictures or cartoons, design a letterhead for your stationery, make your own personal greeting cards.

You can create video games and elaborate video animation without complex programming. You can take advantage of graphics applications for professions or hobbies as diverse as weaving, landscape architecture or astrology.

Let's take a look at the affordable, easy-to-use tools for computer graphics . . .

GRAPHIC TABLETS

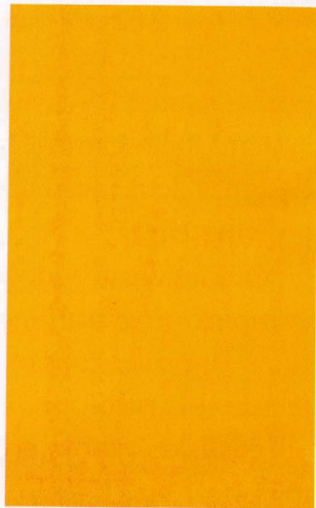


BROOKESE by Kyle Bogertman
Atari Touch Tablet w/ Micro Illustrator
(Atari Artist)

U

ntil recently, most graphics programs for the Atari used the joystick for drawing on the screen. Now, Atari owners can choose between three touch tablets. Touch tablets have flat pressure-sensitive surfaces. When you draw on these with a stylus, your movements are registered on the screen.

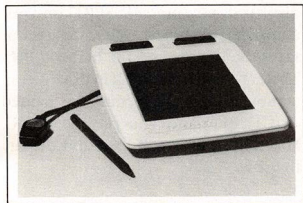
Two of these, the KoalaPad and the Atari Touch Tablet, are similar. The third, the PowerPad, works on a different principle and is much larger.





ATARI TOUCH TABLET

The Atari Touch Tablet, (\$89.95 — all prices in this survey are suggested retail) measures 9 3/8 inches wide by 7 3/4 inches high by about 1 inch thick, the size of an average hardcover book. The drawing surface is 6 1/2 inches wide by 5 inches high — about the same height-width ratio as the standard Atari graphics screen. A cable permanently attached to the back connects the touch tablet to joystick Port One, and there is a jack in the rear for plugging in the accompanying stylus. The Atari tablet's stylus is the only one that has a button built in, which is a real convenience. There are also two buttons on the tablet, located on either side of the drawing surface. All three buttons select options from the drawing program. The tablet comes with the Atari Artist drawing program on a cartridge. Atari Artist is the same program as Micro Illustrator, which is discussed below.



KOALAPAD TOUCH TABLET

The KoalaPad (Koala Technologies, \$125), which was designed to be used by a number of different computers, is similar to the Atari tablet. It's noticeably smaller though, measuring 6 3/8 inches wide, 8 inches high, and the thickness tapers from 1 3/4 inches at the rear down to 1/4 inches square. The tablet can be held comfortably by an adult in one hand, leaving the other available for drawing. A cable at the rear connects to the joystick port. There's no place to connect or store the stylus, though, so

it could easily get lost. The KoalaPad comes with the Micro Illustrator drawing program on diskette. Also available from Koala are several software packages for the tablet, including Spider Eater, a musical educational game, and Coloring Series 1, an electronic "coloring book" of geometric patterns.

POWER PAD

The PowerPad is covered fully in a separate review adjoining this survey. No software accompanies the PowerPad, but several programs, including Micro Illustrator, are available for use with it.

COMPARE AND CONTRAST

All three touch tablets use a version of Micro Illustrator, an excellent drawing program. Functional differences among the tablets when using Micro Illustrator are minimal. You can draw with your finger, but most people prefer using the stylus. If you only intend to use Micro Illustrator with your tablet, the choice narrows down to deciding which size tablet is most comfortable for you (and possibly your children).

If you want to do more with a touch tablet, however, other criteria come into play. Touch tablets can, for example, be used as controllers, similar to joysticks and paddles. The PowerPad is particularly well-suited for use as an alternative to the keyboard for children because it can sense multiple contacts on its surface. The other two can sense only one contact at a time. Thus, if you touch one point on the KoalaPad or the Atari tablet, then while holding the first, touch another, the second contact won't register. The PowerPad can sense simultaneous contacts, and can, for example, be used as a piano keyboard. Indeed,

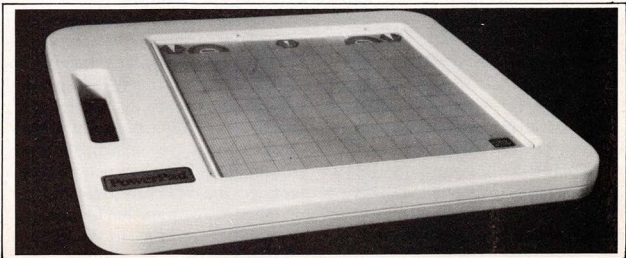
PowerPad's manufacturer, Chalk Board, markets such a package, called Micro Maestro.

Also available for the PowerPad is the Programming Kit for BASIC. If you want to write a program that uses PowerPad as a controller, this package should tell you all you need to know. The KoalaPad documentation contains minimal information on programming for the touch tablet, but you can buy a book called the *KoalaPad Touch Tablet Programmer's Guide* for further information. The Atari Touch Tablet documentation describes only how to use the tablet in conjunction with the accompanying graphics program.

The drawing surfaces differ slightly from pad to pad. The KoalaPad's surface is a small square of finely-textured hard black plastic. It's smooth enough to draw quickly on, yet provides enough friction for slower detail work, and appears to be quite durable.

The Atari Touch Tablet's drawing surface is a sheet of thin, shiny black plastic, covered by a removable sheet of transparent plastic. Atari recommends that you leave the plastic overlay in to avoid damaging the actual surface. The overlay can also be used to hold down drawings for tracing. The pad is just a bit too large and heavy to hand hold comfortably; it should be placed on your lap, a desktop or tabletop.

The PowerPad is much larger than the other two. You can't hold it in your hands, a smaller children may have a hard time holding it in their laps. The drawing surface is a permanently attached thin sheet of plastic. However, all software for the PowerPad comes with special overlays that customize the tablet for each application.



POWER PAD

Chalk Board Inc.
3772 Pleasantdale Rd.
Atlanta, GA 30340
(404) 496-0101
\$99.95 — hardware

Reviewed by David Plotkin

The **PowerPad** is Chalkboard's new graphics tablet. With its combination of features, reasonable price, friendly support, and wide range of software, it would be an excellent addition to your hardware.

The first thing you notice about the PowerPad is that it's big: it measures 17 inches by 14 inches, with a drawing surface 12 inches square. It is easier to draw on than the smaller surfaces of other tablets.

The PowerPad uses 14,400 tiny digital switches to read where pressure is applied to the pad. There are 10×10 per inch. Unlike the surfaces of other pads, the PowerPad has no problem resolving simultaneous multiple inputs. This ability allows the PowerPad to be used as much more than just a graphics tablet: it becomes a flexible input device.

If you've done a little arithmetic, you may be wondering about the PowerPad's resolution. Ten switches per inch by 12 inches equals 120 points, or pixels — not even as high resolutions as Graphics 7! However, it's possible to design a program using the Atari's highest-resolution screen, by "software stretching" of the resolution.

The version of Micro Illustrator (\$49.45) for the PowerPad has a special feature called "Scale" that uses "software stretching" to let you draw pixel by pixel, even though the tablet's resolution isn't as high as Micro Illustrator's.

Hardware isn't of much use without software, but the PowerPad doesn't come with any. However, Chalkboard offers several programs in cartridges requiring 32K of RAM.

Leo's Llectric Paintbrush (\$29.95) is a drawing program for children. They can paint in medium resolution, and use special commands like MOVE and FILL.

The program is easy to use, but is limited to a few of the Atari's colors, and lacks advanced features. You can save and load pictures with a disk drive.

Micro Maestro (\$29.95) is a piano keyboard overlay program for the PowerPad. This is *fun*. The overlay also shows a musical staff, and you can play notes by pressing on either the staff or the piano keys. When you play a note, its letter name, key location, and staff position are shown on the screen, giving the program strong educational value. You can play four-note chords, and record and play back your songs. Sounds pretty good!

The Programmers Kit (\$24.95) provides extensive technical information about the PowerPad. The manual tells you how to read PowerPad's switches, with demonstrations, utility routines in BASIC and machine language, and a technical discussion of the pad's operation. This lets you design your own programs, or adapt existing programs for use with the tablet.

A fifth program, Logic Games (\$39.95), involves matching symbols and numbers. Also available is Bearjam (\$39.95), an educational game that's supposed to help prepare children for reading, (we will review these in future issues).

Chalkboard has a toll-free number for answering customers' questions, and when I called, they were friendly and helpful. The company has plans to release more software for the tablet, possibly including powerful graphics utilities. I highly recommend the PowerPad to all budding computer artists of any age, and especially to families with children. It's easy and fun for kids to use — and too big to ever lose!

MICRO ILLUSTRATOR

There is a version of Micro Illustrator for all three tablets, (there is no single manufacturer or price for the various versions of Micro Illustrator).

This graphics program lets you draw in Graphics 7 1/2, the Atari's highest resolution four-color mode, the same mode used by Micro-Painter (Datasoft). Micro Illustrator uses an icon menu, in which all the program's different functions are depicted graphically. The program's different modes include Draw (doodle), Point (control single pixels), and Line, (draw straight lines). You can also draw boxes and circles (outlined or filled), and create a sunburst effect with the "rays" function. You can draw with "mirroring," magnify your drawing for fine detail work, fill areas with colors and patterns, and save and load images from disk. You can change color, size and shape of your "brush," and you can create a magical "rolling rainbow" effect. When combined with a touch tablet's ease of use, Micro Illustrator makes creative graphic expression with a computer as natural as taking a bath.

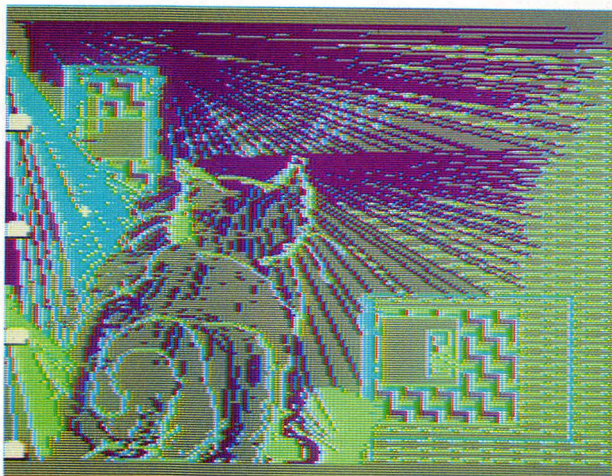
Micro Illustrator uses a compressed format for file storage that's incompatible with other drawing programs. *But you can also use the "standard" Micro-Painter format.* If, when the picture is displayed, you press [INSERT] on your computer keyboard, Micro Illustrator saves the picture as a file named "PICTURE." If you have a disk in drive I containing a standard-format file named "PICTURE," and you press [CLEAR], Micro Illustrator will load and display that file.

TOUCH TABLET LOADER

New from Atari Customer Service as a FREE listing booklet is John Clark's very useful utility program, Touch Tablet Loader. This lets you insert into your own programs any picture made with the touch tablets and software previously mentioned, as well as compatible products. You can also learn how to write programs that enable you to use your touch tablet as a controller.

For your Free Demopac, simply write to Atari Customer Service. Address is at the end of this survey.

LIGHT PENS



RAINCAT by Patricia Foster
Atari Light Pen with AtariGraphics

A

light pen is a type of pointing de-

vice for computers. Despite its name, the light pen does not produce light, but contains a light-sensitive cell at its tip to detect the presence or absence of light. A light pen also can convey its position on a screen to the computer.

In graphics applications, light pens are used to draw directly on the monitor screen. There is no abstraction between the drawing process and the production of the drawing; it's more

STEVE GIBSON: CREATOR OF ATARIGRAPHICS

Story behind the powerful new light pen software

by NAT FRIEDLAND, Antic Editor

Steve Gibson, the president and main resource of Gibson Laboratories in Irvine, California said he'd been up till 6 a.m. working on his next light pen software package. Possibly he felt he needed to burn the sunrise oil to come up with something as good as his brand-new AtariGraphics cartridge software — which now comes bundled with the Atari Light Pen.

Gibson's AtariGraphics is described in detail in the survey of computer-art tools featured in this issue. The bottom line is that this light pen software is a computer graphics classic on the level of Micro Illustrator or Micro-Painter. For ease of use and variety of elaborate color patterns built-in, AtariGraphics ranks at the very top. It also has valuable unique features, such as enabling you to "fill over" existing patterns inside shapes you've already set up in your picture. Even the Macintosh won't do this.

Known as the light pen programmer par excellence, Steve Gibson first became an industry star with his Apple Computer light pen software.

A JOY TO WORK WITH

"The Atari computer was a joy to work with, compared to the Apple," said Gibson. "The Apple is full of what I call 'Wozni-isms'. That's all the crazy and weird things Steve Wozniak did in order to squeeze color into his early machines. The even bits and odd bits stand for different colors, every seventh bit is keyed to a color family. Working with this stuff is a horrible nightmare."

He discovered other not-widely-known advantages in doing professional programming with the Atari. "The good news is that Atari has absolutely phenomenal documentation on hand. You can get virtually a 100 percent accurate

map of memory locations or ANTIC chip display list functions in the manufacturer's hardware manuals. It pinpoints what you need to do to make precise color changes at precise scan lines.

"It's also not too shabby to have Atari's palette of 128 colors to select from," he added.

Gibson used the Atari's hardware capabilities to suggest some of the new features he could incorporate into his emerging software design.

"I get excited by the graphics potential of microcomputers," he said. "But eventually I realized that what really turns me on is coming up with unique and powerful user interfaces — ways to make it easier than ever for people to get more out of their computers."

One of the AtariGraphics interfaces he's most pleased with is the sliding menu "index cards." He said, "The illusion of the familiar is a powerful trick for getting people into easily operating the software."

NO KEYBOARD COMMANDS

"What I set out to do in AtariGraphics was a light pen tour de force," said Gibson. "I wanted to make a graphics program with absolutely NO keyboard commands."

As a result, the Atari keyboard is always in text mode. What this means is you can enter text anywhere on the screen, simply by pointing to a position with your light pen and starting to type.

Possibly the most unique interface in AtariGraphics is the light-pen "eraser emulation" Gibson created. "I've never seen anything else like it," he said. "Since I wanted to avoid any keyboard commands, I was very pleased when I realized that the Atari would allow programming of a 'cancel' interpretation just by shaking the light pen from side

to side over the screen area you want to erase."

As befits a light pen specialist, Gibson has faint praise for the highly popular touch tablets. "Touch tablets can't be beaten for accurate tracing of illustrations," he said. "But I still think light pens are unbeatable as a direct graphics interface device, as well as for making icon menu selections effortlessly."

THE VIDEO EASEL

Gibson seems to have a very strong vision of future artists sitting on stools in front of easels, making light pen strokes on video monitors positioned where their blank canvases used to be.

The programming of AtariGraphics took him only three months of entering code — following a month of nothing but planning and research. He is now committed, through a contract with Koala, to program light pens for one or perhaps two other popular computers. "After Atari, I'm finding myself a little burnt out with new graphics projects," he said. "I mean, how many lines of rubber banding code can you write?"

Gibson was raised just north of Silicon Valley in San Mateo. He dropped out of the University of California at Berkeley after 18 months and started working for high tech start-up companies.

He financed the start of Gibson Laboratories by doing several years of consulting for medical electronics companies in Southern California. He designed and programmed 3-D medical graphics displays that were widely used in cardiology.

What the future holds for Steve Gibson (as soon as he finishes his light pen commitments) is an exploration of creating more active user interfaces for computer telecommunications. "I don't see why your home computer has to function like a dumb terminal when you're on line with a bulletin board or a telecommunications information service," he said. "I think that at the very least, you should be able to store your menus in advance and flash them up on-screen to work right along with the remote computer, instead of waiting for all the time-consuming scrolling through every option."

LIGHT PENS

continued from page 41
flexible than drawing on a physical surface. However, because most monitor screens are vertical, drawing requires an unnatural position. Also, prolonged proximity to a color TV screen, which may be a common circumstance with light pens used in the home, may cause discomfort or health problems.

ATARI LIGHT PEN WITH ATARIGRAPHICS

Most light pens are physically similar to one another. The Atari Light Pen (\$99.95) is a good example. Made of smooth black plastic, it's about the size and shape of a ballpoint pen. It contains an on/off switch activated by pushing the pen's tip against a flat surface.

What's special about this pen is the software. Steve Gibson's AtariGraphics cartridge software is a stunning realization of the Atari computer's graphic capabilities. The program's four pop-up icon menus let you choose drawing mode (box, circle, line, and parallelogram), color, mirroring (vertically, horizontally, and fourway), and pattern fill, among others. You can choose from 2,880 patterns and you can fill any pattern over with another pattern, something most other graphics programs won't let you do. You can also do unique "smear" effects and erase directly on the screen.

AtariGraphics is easily the most impressive drawing program we've seen at Antic in recent memory. (See the *interview with Steve Gibson in this issue.*) AtariGraphics works in as little as 16K RAM and can use cassette or disk for file storage. AtariGraphics files are incompatible with other drawing programs.

EDUMATE LIGHT PEN

The Edumate Light Pen (Futurehouse, \$34.95), is the simplest light pen covered here, because it lacks a built-in switch. You activate this pen by pressing the [START] key on the computer console. Made of red plastic, the light pen resembles a Bic ballpoint attached to a coiled cord. The Edumate pen's main advantage is price: at \$34.95 list, it's the least expensive hardware/software package in this survey. The pen comes with a disk containing six programs. Peripheral Vision (\$39.95 or

\$59.95 with light pen) is Futurehouse's new graphics program for their Edumate light pen. The program was still under development when this survey was completed, so we were only able to review a preliminary version.

Unlike any other graphics utility in the survey, Peripheral Vision uses a GTIA mode, Graphics 11. This gives you 16 colors of the same brightness in a screen whose resolution is 80 pixels horizontally by about 168 vertically. A strip at the screen's bottom displays an icon menu, and your selection of colors is arrayed across the top of the screen.

The icon menu's Fill feature resembles a water tap flowing into a bucket, and Zoom looks like a microscope. You can save and load pictures with a disk drive. And there's a feature to let you print out your creations directly, which wasn't ready for testing yet. You can doodle, or draw single lines, consecutive lines, triangles, circles, and rectangles. Use the keyboard to place text anywhere in the picture.

Other functions let you move or copy parts of a picture to another part, fill enclosed areas with solid colors or a limited palette of textures, and draw with mirroring. The documentation describes how to use pictures made with Peripheral Vision in your own programs.

The tradeoff with this program is that you can use more colors than with most others, but the resolution is lower. Actually, the vertical resolution is high, but with only 80 pixels across the screen's width, this mode's pixels have an odd shape — wide and flat. Nevertheless, you can draw in this mode creatively.

Futurehouse also makes a line of educational software that includes titles such as Alphabet Construction Set (learn to draw letters of the alphabet), Computer Crayons (an electronic coloring book), and Little Red Riding Hood, a computerized story book for young children.

TECH-SKETCH LIGHT PEN

The Tech-Sketch pen is available in two versions: the \$39.95 version includes some BASIC programs on disk, and the \$69.95 version comes with Micro Illustrator. The pen is composed of plastic and metal, and appears sturdier than

other pens. There's a small white button to activate the pen located in the shaft's side near the tip. The pen is easier to use than the Edumate, but not as easy as the Atari Light Pen.

McPEN

McPen (Madison Computer, \$49) is the newest light pen for Ataris, and is the largest pen in this survey. The pen itself is made of sturdy beige plastic and has a rather wide barrel. It plugs into a control panel with a coiled cord. The control panel, which measures 5 inches square by 1 1/2 inches high, has a dial for sensitivity and a red LED, and a receptacle for the pen. Installation instructions for the pen and panel are included on a label attached to the bottom of the panel — a considerate feature.

McPen doesn't have a built-in switch. Accompanying software uses the space bar to turn the pen on and off. Included with the pen is a disk containing four BASIC programs: Tic Tac Toe; QB graphics, a limited drawing program; a menu program; and Ballon, a Player/Missile graphics demonstration. Madison Computer also offers additional software for the pen — titles so far are "McPen Learning Series" and "Coloring Book," with more to come. Antic didn't have the opportunity to review these packages yet.

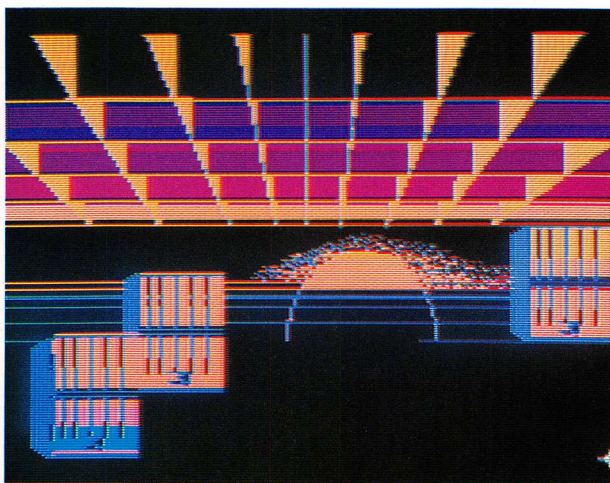
We did, however, try McPen with programs for other light pens, including Tech-Sketch's version of Micro Illustrator and the AtariGraphics cartridge. Unfortunately, the pen didn't work very well with either program. This is the only instance of a light pen being incompatible with software from other companies.

SUMMARY

Although the light pens covered in this survey are more similar than different, the accompanying software varies significantly. If you choose to buy a light pen, be guided by the level of sophistication you require in a drawing program. Try to get a demonstration of the pen and program. Also, keep in mind that software manufactured for use with a certain light pen works equally well with most other light pens, with the exception of McPen.

continued on next page

GRAPHIC JOYSTICK SOFTWARE



FINAL 7 by Linda Tapscott
Fun With Art



Before the introduction of the KoalaPad, most graphics software for the Atari used the joystick for drawing. Many of these programs are still available. Drawing with a joystick is somewhat awkward, but you can achieve impressive results with practice. We'll cover the major joystick graphics programs in approximate order of the date of release.



MICROPAINTER

This is the granddaddy of graphics programs for the Atari. When **Antic** had a cover art contest for readers in 1983, 90% of the entries were with this program. Micro-Painter (Datasoft, \$34.95) lets you doodle, draw lines, and fill areas with limited patterns in Atari's high-resolution four-color mode, Graphics 7 1/2. Micro-Painter's storage format for picture files has come to represent a standard for Atari graphics files. Almost all printer dump programs for Atari, including Micro Illustrator, will work with this file storage format.

GRAPHICS MASTER

Graphics Master (Datasoft, \$34.95) is described by its makers as a tool for creating, manipulating, and editing images for graphic layouts and designs. You can use the joystick to draw, or you can have the program draw shapes for you, including lines, circles, and polygons of three to nine sides.

You can create a window that picks up images, manipulates them (you can "rotate" an image in the window 90 degrees) and relocates them on the screen. The contents of the window can be laid over or under an existing image, for special effects. You can flip between two drawing screens, transfer images between the two, add text, and zoom in for fine detail work.

Graphics Master uses Graphics 8, the Atari's one-color high-resolution mode. But you can add color by "artifactualing," an effect that's explained well in the documentation. There is also a program that lets you use images from other programs with Graphics Master, and vice-versa. Although they use different graphics modes, you can transfer images between Graphics Master and Micro-Painter. Graphics Master is the only tool in this survey that includes a printer dump for its images.

PAINT

Originally from Reston Publishing and now marketing by Atari, Paint (\$39.95) is a remarkably versatile drawing program. There's a simplified version that's well suited for young children, but SuperPaint is the program's showpiece. A row of "pots" along the bottom of the screen lets you paint with any of four

colors and six patterns. You can change the colors and the patterns, and you have hundreds from which to choose. All commands are explained with a help feature. You can also "zoom" in for magnified detail work. Paint uses Graphics 7, a medium-resolution four-color mode. One of Paint's nicest features is the accompanying 147-page book, of which approximately two-thirds is an interesting discussion of computers, art, and computer graphics. Paint is available only on disk, and files from Paint are not compatible with other programs. (See review of Paint in **Antic**, January 1984.)

PM ANIMATOR

Player/Missile graphics is a special feature of the Atari that lets you move several objects about the screen display without disturbing the background. PM Animator (Tronix, \$44.95) lets you create animation sequences for use in your own BASIC programs. The documentation is extensive enough so that someone with no knowledge of P/M graphics programming can use the software with little difficulty. Player/Missile graphics are technically not related to the graphics discussed in the rest of this survey, so it's no surprise that files from this program can't be used by other programs. (See review of PM Animator in **Antic**, July, 1983).

MOVIE MAKER

Movie Maker (Reston, \$60) is a computerized animation studio. You can create "movies" up to 300 frames and then add music and sound. It's similar to PM Animator in that you're drawing objects, combining them in sequences and moving the animated objects about the screen. However, Movie Maker is entirely self-contained, you can't use the animations in your own program. Also, Movie Maker doesn't use P/M graphics; all images are drawn in Graphics 7. (See review of Movie Maker in **Antic**, April 1984).

FUN WITH ART

Fun With Art is a joystick drawing program with many bells and whistles. It uses 7 1/2, as does Micro-Painter, but that's where the similarity ends. First, you can easily change any or all colors

at every other scan line (a scan line is a thin horizontal line on your video screen). Because two scan lines are drawn every 1/60th of a second and go together to form the screen image, it is a simple matter to use all 128 of Atari's colors in one picture.

Also, you can load two pictures and transfer parts between them. You can move parts of one picture around. Fun With Art is a cartridge requiring 32K RAM; it can store pictures on disk or cassette. Files from Fun With Art are not compatible with other programs. However, the documentation does describe how to use the pictures in your own programs. (See review in **Antic**, February, 1984).

SCREEN MAKER

This is a tool for programmers who wish to create impressive graphics for games or other applications, but who have yet to delve into the mysteries of the display list, a mini-program used by the ANTIC chip in the Atari to display information on screen. Atari has several different graphics modes, most of which cannot be displayed simultaneously, or mixed on the screen. This can be a problem if you want to display text and graphics together. Screen Maker (Atari Learning Systems, \$34.95) lets you custom design a screen, combining as many as 15 different graphics modes, and then writes a subroutine that creates the screen. You can then use this subroutine in your own program. (See review in **Antic**, March 1984).

PLAYER MAKER

Described as a companion utility to ScreenMaker, PlayerMaker (Atari Learning Systems, \$34.95) lets you design images to be used with Player/Missile graphics. You use a joystick to "sculpt" a player, pixel by pixel. You can create up to four players, and combine pairs for more detailed three-color players. Once you've drawn the players, the software writes a subroutine for use in your own program. There is no provision for animation of players.

continued on next page

GRAPHICS MAGICIAN

Graphics Magician (Penguin, \$39.95), recently converted for the Atari, has been popular on Apple computers for some time. It's an ideal tool for those who need to store a lot of graphic information in a minimum of disk space. Possible applications include graphics adventures and educational programs that use visual material. The program lets you use the joystick to draw four colors in Graphics 7 1/2. You can doodle, draw lines, and fill areas with one of a wide selection of textures. You can also change the size and shape of your "brush," change the basic colors at will, and add text. On-line help is available if you get confused.

It's common in graphics adventures to have "objects" that appear and disappear from the screen while background remains intact, possibly as a result of being picked up or dropped by the adventurer. Graphics Magician lets you draw these "objects" and store them as separate files. Extensive instructions for using Graphics Magician files in your own programs are included. Antic will review this excellent product in the near future.

VISUALIZER

Maximus's new "graphics management system" is called Visualizer (\$49.95).

Subtitled "electronic slide creator/projector," the program's functions are divided into two parts: creating "slides" and showing them. For the game-oriented, there's also a jigsaw game that scrambles your picture, then lets you use the joystick to move the pieces to their proper positions. A printout feature lets you produce a permanent copy of your pictures with Epson and C. Itoh-type printers.

To create slides, you use a joystick to draw in Graphics 7, Atari's medium-resolution four-color mode. You can doodle with brushes of different sizes or automatically create circles, ovals, rectangles, and straight lines. Fill enclosed areas with solids or patterns (made by combining two colors), and add text. The program comes with three fancy "fonts," or character sets, to spiff up text in the picture, and you can mix style options for a total of 24 different styles in each font. You can design your own font too. You can save and load slides with a disk drive, and a special feature lets you combine two slides by "merging" them for experimentation and special effects.

There are some fairly simple animation effects. One-color, two-color, and three-color switching involve changing the contents of the three color registers used for drawing shapes and lines. There are three different ways to add the

by-now-familiar Atari moving rainbow effect to your pictures.

The slide show part of the program is almost as powerful as the drawing part. You can select an assortment of slides and arrange them into any order. There's an auto timer routine to advance the slides automatically. If you have an Atari 410 or 1010 program recorder, you can add a synchronized narrative soundtrack! (You will also need a stereo cassette recorder or deck and a data cable for connecting the recorder to the computer.) The program comes with a sample narrated slide show that describes Visualizer.

The documentation is more complete than that for most such programs. There are suggestions for creating better slides, and a list of interesting projects for parents and children. There are detailed instructions for setting up a system to record synchronized narrative tapes. Programmers will learn how to use the pictures in their own program. If you don't mind the medium resolution of Graphics 7, you'll find this to be a powerful and versatile package.



GREEN VASE by Marni Tapscott
Paint

AND MORE

ATARI 1020 COLOR PRINTER

The Atari 1020 Color Printer (\$299) is actually a plotter. It uses four pens to draw on a 4 1/2-inch wide strip of paper. Plotters have been around for some time, but this is the first plotter that works directly with Atari computers.

A color plotter is an enormously versatile graphics tool. You can make four color screen dumps (graphics printouts) of pictures drawn with most graphics programs. You can also write programs to control the plotter directly. A couple of samples are included with the 1020 documentation.

Text can be printed in four colors, in four directions (forward and backward, vertically and horizontally), and in different sizes. You can even print text in 80 columns—the characters are tiny, but well-formed and quite legible.

The 1020 documentation provides adequate information for programming the plotter. Commands are presented in BASIC syntax, but it's easy to convert these to other languages. Among the graphics functions are commands to return the pen to HOME position, change pen color, draw from coordinates 0,0 to any X-Y position, initialize (call the current pen position 0,0), and relative draw (a combination of the last two). There's also move and relative move, for changing the pen's position without drawing. And you can command the plotter to set up X and/or Y axes for graphing.

SCREEN PRINT SOFTWARE

Screen Print Software is the new program from Atari that does color screen dumps to the Atari 1020 plotter. You can

get full-color printouts of your creations from AtariGraphics, AtariArtist, Micro Illustrator, Micro-Painter, Paint, or any other program that uses Graphics 7, 7 1/2, or 8. Atari started packing Screen Print Software with all 1020 Plotters shipped as of July, 1984. If you've bought a plotter that didn't include this software, you can obtain it for a minimal fee (not determined at this writing) by writing to Atari Customer Support, which is listed at the end of this survey.

SUMMING UP

As you can see, graphics tools for Atari computers are many and varied. How to choose? Well, we hope that the information in this survey will help you get started. If you'd like to see how a program works, but can't get an in-store demonstration, consider visiting (or joining, or starting) a local users group. You'll probably find someone who owns the product you're interested in. And don't forget — Antic is always looking for dynamite images for our Microscreens section, and we pay cash!

ATARI, INC. and ATARI LEARNING SYSTEMS

(Screen Maker, Player Maker, Paint, AtariGraphics, Atari Light Pen, Atari Touch Tablet, 1020 Color Plotter)

Atari Customer Service
1312 Crossman Ave.
P.O. Box 61657
Sunnyvale, CA 94086
(408) 745-2000

CHALK BOARD, INC.

(Power Pad)
3772 Pleasantdale Rd.
Atlanta, GA 30389
(404) 496-0101
(800) 241-3989 (from outside GA)

DATA SOFT, INC.

(Micro Painter)
9421 Winnetka Ave.
Chatsworth, CA 91311
(818) 701-5161

EPYX

(Fun With Art)
1043 Kiel Court
Sunnyvale, CA 94089
(408) 745-0700

FUTUREHOUSE

(Edumate Light Pen)
P.O. Box 3470
Chapel Hill, NC 27514
(919) 967-0861

KOALA TECHNOLOGIES CORP.

(KoalaPad)
3100 Patrick Henry Dr.
Santa Clara, CA 95050
(408) 986-8866

MADISON COMPUTER

(McPen)
1825 Monroe St.
Madison, WI 53711
(608) 255-5522

PENGUIN SOFTWARE

(Graphics Magician)
830 4th Ave.
P.O. Box 311
Geneva, IL 60134
(312) 232-1984

RESTON PUBLISHING GROUP

(Moviemaker)
11480 Sunset Hills Rd.
Reston, VA 22090
(800) 336-0338

TECH SKETCH INC.

(Tech Sketch Light Pen)
26 Just Rd.
Fairfield, NJ 07006
(800) 526-5214
(201) 227-7724 (in NJ)

TRONIX

(PM Animator)
8295 South La Cienega Blvd.
Inglewood, CA 90301
(213) 215-0529





SYNOPSIS

This program lets you change all four colors on every scan line in pictures drawn with most graphics programs that use Mode E, Atari's high-resolution four-color mode. It works on all Atari computers, but requires a disk drive. Antic Disk Subscribers: Remove BASIC. From DOS, Type L[RETURN] then type PAINTER.EXE.

STEP 2: COLORING

Plug a joystick into Port 1. Press the fire button while pushing forward or backward on the stick to position the arrows on either side of the screen. Release the button and move the joystick from side to side to select the color, move forward and backward to change a color's intensity. Note that you're in point mode (see the line at the top of the screen); this means that you will color one line at a time.

If you have trouble seeing the thin horizontal line's color, look at the top of the screen to see the color changes is a wider area. If you want to color larger areas, press [ESC], then [SELECT] to switch to brush mode, and push the stick forward and backward to paint large areas with the currently selected color. Press [ESC], then [SELECT] again to return to point mode.

You've been painting with tools like your KoalaPad or Micro-Painter for some time now, and you've pushed the programs to the limit. You're tired of having only four colors available! What can you do?

Fortunately, here's Philip Price's Color Picture Painter, a program allowing you to systematically replace all four colors in each scan line of your pictures—with any of the 128 colors available on the Atari. (Scan lines are the horizontal lines traced by the electron beam of your picture tube. Each scan line represents a fraction of a picture you have created on your Atari.)

Price's Painter loads an uncompressed Mode E file, (called Mode 7½ on older 400s and 800s or Graphics Mode 15 on the XL computers), and then allows you to choose from 16 colors and eight degrees of brightness for each of the four colors used in the original drawing. You use the joystick to color one scan line at a time, or to color entire vertical bands at once.

When you are finished the painter stores the original picture and the four color "pots" that you've created. The five files are separate, and are combined only when you run the painter program.

Price's painter works with files created by Micro-Painter, and Micro-Illustrator, (available with the KoalaPad, Atari's Touch Tablet, Tech Sketch's Lightpen and Chalkboard's PowerPad). Incidentally, if you are using the Touch Tablet, you will need to save your initial file in the uncompressed 62 sector mode by hitting the [INSERT] key while the picture is on your monitor. The file will be named "PICTURE" and you will need to go into DOS and rename the file

"FILENAME.PIC".

It's easy to get started coloring . . .

STEP 1: STARTING

Painter is a machine language program that's produced by the BASIC program accompanying this article. Type in the listing, and SAVE an extra backup copy. Next, RUN this program. The screen will go dark for several minutes so the computer can read the data faster. If you made a typing error, the program will stop and display the number of a line you need to retype correctly—so TYPO isn't needed. When the screen turns blue again, press [RETURN] to write the machine language program named PAINTER.EXE to disk.

Remove your BASIC cartridge (XL owners press [OPTION] while booting DOS) before using Painter. Load PAINTER.EXE from DOS with menu option L. If you wish to have the program load automatically upon booting, use DOS menu option E to rename the file to AUTORUN.SYS, and make sure DOS.SYS exists on the disk.

When painter starts, you will be asked which file to load. The file disk must be in drive 1, and the filename extender must be .PIC. Don't use backspace or cursor controls, since the program will only accept a maximum of eight keystrokes before going to the graphics screen. Use DOS to rename files if necessary. Type in the name of the file you had previously created with, say, Micro-Painter. After the picture loads, you'll see it on screen with the default colors, the colors used in your original drawing. If you didn't use all four colors when making your original, some pots will be black, but they can be colored with Painter.

STEP 3: BACKGROUND AND FOREGROUND

You have a palette of four pots, based on the four colors of your original file. The palette is the field of colors in a given pot, without the structured picture. To change the pot whose colors you're modifying, press [SELECT]. To switch back and forth between the picture and the palette, press [OPTION].

You can review the colors you're using without seeing the picture by switching to the palette, then using [SELECT] to move through the four pots.

STEP 4: SAVING

Press the [START] key to save the pots, but not the picture file. According to Philip Price, the program occasionally locks up when you press [START], necessitating rebooting. The program saves four files representing the four pots. Checking your disk directory, you'll see them called FILENAME.P0, .P1, .P2, and .P3, with FILENAME

replaced by the filename you originally typed in. If you have the original file and the four pots on the same disk, and don't change any filenames, the next time you load the picture into Painter, the four pots will also be loaded.

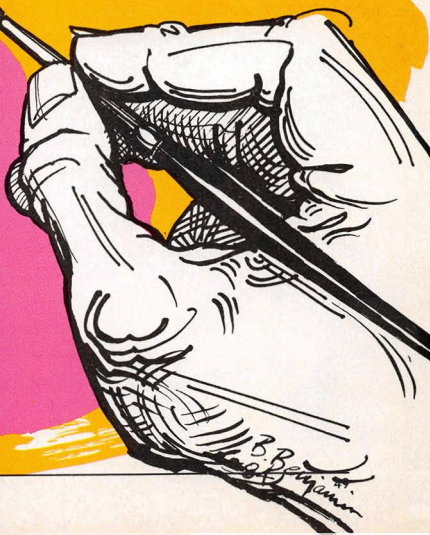
If you wish to work on a different picture, you must reload the entire program and start again from the beginning.

*Philip Price taught himself programming while serving at sea with the US Navy. He took his discharge in Hawaii and worked near Hilo as a computer technician. Now he's teamed with Gary Gilbertson and their major new graphics adventure game, **The Alternate Reality Series** is due for release by Marsten Systems this fall.*

continued on page 51

PRICE'S COLOR PICTURE PAINTER

by PHILIP PRICE



FINALLY, ANTIC FULL STRENGTH!

MAGAZINE + DISK

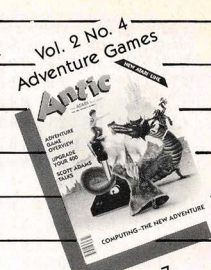
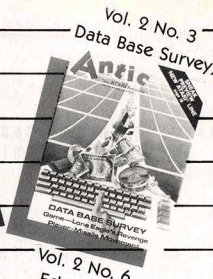
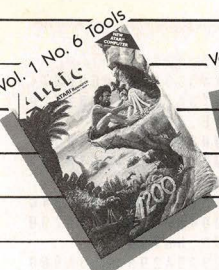
NO MORE TYPING long, complex listings. Now . . . you can IMMEDIATELY start using all the great programs in your copy of Antic every month. New **ANTIC DISK SUBSCRIPTION**: 12 issues of the best-selling Atari magazine—each with a high-quality disk containing every software listing in the issue **READY TO RUN!**



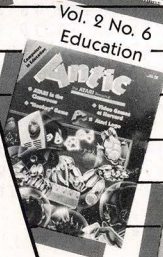
Save \$55! Send us the subscription card with your payment of \$99.95 now—for a big 37% discount off the \$12.95 newstand price. For convenient billing to your Visa or Mastercard, just phone toll-free 800-227-1617 (in California 800-772-3545).

MONEY-BACK GUARANTEE: YOU CAN'T LOSE!

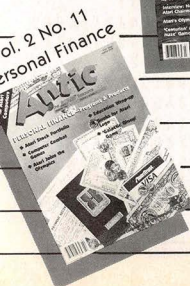
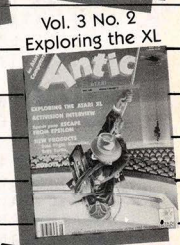
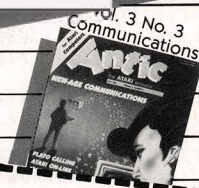
**FULL MEGABYTE DISK
LIBRARY OF ANTIC SOFTWARE!**



**THEY'RE
GOING
FAST!!**



Limited numbers of ANTIC's
back issues are still available!
Get them while they last!
Mail your order today!



- ☐ Vol. 1 No. 5
☐ Vol. 1 No. 6
☐ Vol. 2 No. 1
☐ Vol. 2 No. 2
☐ Vol. 2 No. 3
☐ Vol. 2 No. 4
☐ Vol. 2 No. 5
☐ Vol. 2 No. 6
☐ Vol. 2 No. 7
☐ Vol. 2 No. 8
☐ Vol. 2 No. 9
☐ Vol. 2 No. 10
☐ Vol. 2 No. 11
☐ Vol. 2 No. 12
☐ Vol. 3 No. 1
☐ Vol. 3 No. 2
☐ Vol. 3 No. 3

Back issues @ \$ _____ each. Total \$ _____

Name _____ please print

Address _____

City _____

State _____

Account # _____ Zip _____

Name _____ please print

Signature _____ Expiration Date _____

☐ Visa ☐ MasterCard

Allow 8 weeks for delivery

ANTIC® Publishing Inc. 524 Second Street San Francisco, CA 94107

```

10 REM PRICE'S PAINTER
20 REM BY PHILIP PRICE
30 REM ANTIC MAGAZINE
40 DIM H$(2),ARRAY$(96),HOLD$(3500),HE
XS(23),FILES(20):HEX$="@ABCDEFGHJ####
##JKLMND":CASS=0:Q=1
60 TRAP 500
70 ? "PLEASE WAIT...":FOR D=1 TO 500
:NEXT D:POKE 559,0
130 RESTORE 2000:FOR LINE=2000 TO 2530
STEP 10:GOSUB 140:NEXT LINE:GOTO 190
140 READ ARRAY$,LSUM:FOR NUM=1 TO LEN
(ARRAY$) STEP 2:HS=ARRAY$(HNUM,HNUM+1)
150 D=0:FOR I=1 TO 2:D=D*16+ASC(HEX$(A
SC(H$(I))-47))-64:NEXT I
155 SUM=SUM+(ASC(H$(1,1))+ASC(H$(2,2)
)):HOLD$(Q,Q)=CHR$(D):Q=Q+1:NEXT HNUM
160 CL=PEEK(183)+PEEK(184)*256:IF CL<>
LINE THEN POKE 559,34:"LINE ";LINE;"
IS MISSING.":END
170 IF LSUM<>SUM THEN 500
180 RETURN
190 POKE 559,34:"PRESS <RETURN> TO
SAVE THE FILE.":INPUT HS
200 CLOSE #1:OPEN #1,8,"D:PAINTER.EX
E":IOCB=848:POKE IOCB+2,11
210 ADDRESS=ADR(HOLD$):ADHI=INT(ADDRESS
/256):ADLO=ADDRESS-ADHI*256
220 BYTES=LEN(HOLD$):NUMHI=INT(BYTES/2
56):NUMLO=BYTES-NUMHI*256
230 POKE IOCB+4,ADLO:POKE IOCB+5,ADHI:
POKE IOCB+8,NUMLO:POKE IOCB+9,NUMHI
240 X=USR(ADR("hnhhlllv"),16)
250 CLOSE #1:"ALL DONE.":END
500 TRAP 40000:POKE 559,34:"PRESS 00AD
DATA AT LINE #":LINE=END
2000 DATA FFF00560956006070C2F056004E
020695668564E0030CB56C657410056101112
131415161718192122232425,4823
2010 DATA 2629F04A4A4A4A80DCE5660290F
AA8DC65660306F7400100000230F2200041010
00002C696E65000410100000,9719
2020 DATA 306F696E74000306966374757265
306F696E742272757368696374757265616C65
74746548800AD04AD0160801A,14640
2030 DATA 09A9F08D1700A908001800A94E8D
0002A9578D0102684488A48A28F800AD48DC4
60800AD48D16008084618D17,19796
2040 DATA 00B044628D18D080046080D1AD0CA
D0E2A92E8D0002A9578D010268AA684044313A
202020202020202020202020,24710
2050 DATA 2044313A20202020202020202020
20202044313A202020202020202020202020
44313A202020202020202020,29198
2060 DATA 2020202044313A2020C757C25820
2020202020202020202057566C36F60652074
6F205068696C6970209507269,33933
2070 DATA 63652773204D756C74692D436F6C
6F72204472617765722E202020202843293139
3834205068696C6970205072,38752
2080 DATA 6963659898417661696C61626C65
2066726F6D20414E54494320606167617A696E

```

```

652E980898506C6561736520,43722
2090 DATA 456E746572207468652050696374
757265206E616D652E9844313A202020202020
2020205049431E1E1E1E1E1E,48572
2100 DATA 1E1E1E1E1E1E003488A2A90485F0
A96085F1A25EA90E9D0A569D6C56CA10F7A200
A90C9D42302056E4A200A903,53667
2110 DATA 9D4203A90C9D403A9009D48034C
A058453A9A98D04403A9589D45032056E4A200
A9089D4203A9D2C3588E599D,58790
2120 DATA 4403A9579D4503A9A29D4803A900
9D49032056E4A9008D0360A210A9009D4203A9
049D4A03A9009D48034CF358,63772
2130 DATA 483AA9F19D4403A9589D45032056
E4A210A9079D4203A9029D4403A9609D4503A9
019D4803A9009D49032056E4,68753
2140 DATA A200A0089D4203A9029D4403A960
9D4503A9019D4803A9009D49032056E4AE0360
AD02609D95579D85579DA557,73759
2150 DATA 9D85579DC557C998F008EE0360E8
E00990A3A210A90C9D42032056E4AE0360A92E
9D95579D85579DA5579D8557,78905
2160 DATA 9DC557A9509D96579D86579DA657
9D86579DC657A9499D9757A943909857A9989D
99579D089579DA9579D089579D,84148
2170 DATA C957A9309D8757A9319DA757A932
9D8757A9339DC757A929D0888F598A5A579DA8
579D88579DC857A200A90C9D,89374
2180 DATA 42032056E4A210A9039D4203A904
9D4A03A9009D4803A9929D4403A9579D450320
56E4A210A9079D4203A9009D,94331
2190 DATA 4403A9209D4503A9009D4803A90F
9D49032056E4A210A9079D4203A9009D4403A9
309D4503A9009D4803A90F9D,99306
2200 DATA 49032056E4A210A9079D4203A974
9D4403A9589D4503A9049D4803A9009D490320
56E4A210A90C9D42032056E4,104252
2210 DATA A2BFAD74589D0460AD75589D460
AD76589D08461AD77589D4462CAE0FDF0E3A210
A9039D4203A9049D4A03A900,109412
2220 DATA 9D4803A9029D4403A9579D450320
56E4A210A9079D4203A9049D4403A9609D4503
A9C09D4803A9009D49032056,114386
2230 DATA E4A210A90C9D42032056E4A2885A
865810A9039D4203A9049D4A03A9009D4803A9
A29D4403A9579D45032056E4,119429
2240 DATA A210A9079D4203A9049D4403A960
9D4503A9C09D4803A9009D49032056E4A210A9
0C9D42032056E4A210A9039D,124419
2250 DATA 4203A9049D4A03A9009D4803A982
9D4403A9579D45032056E4A210A9079D4203A9
849D4403A9619D4503A9C09D,129431
2260 DATA 4803A9009D49032056E4A210A90C
9D42032056E4A210A9039D4203A9049D4A03A9
009D4803A9C29D4403A9579D,134420
2270 DATA 45032056E4A210A9079D4203A944
9D4403A9629D4503A9C09D4803A9009D490320
56E4A210A90C9D42032056E4,139369
2280 DATA A9008D048D202F02800D04A9008D
3002A9568D3102A92E8D0020578D0102A90D
8D0ED4A93E8D2F02A9038758,144471
2290 DATA B25C8D1D00A9508D07D4A9008D04

```

```
F46805F49F085F4A5F420DE,211593
2420 DATA 56BDFC56A5F4C2E9568DDF56A514
2908F0FAA1542908D08FA4CE858ADF0C2C91C0D
2CA9008D08D20DF0C2A204AD,216848
2430 DATA 555CA9F80555CF00CB0D1057900A
57CA10FF74CB45E8D1857900A57CA10FF74CB45E
AD525C18690129038D525FCF0,222077
2440 DATA 1CC9D962923F08BA94485F0A96285
F14C805EA98485F0A96185F14C805EA90485F0
A96805F14C805EA9C485F08A9,227189
2450 DATA 6085F1A9C38ED535CA8B1F085F4
A90805F2A94085F3CAE525C8D565CA210A00091
F28C0808D0F9C6F3FAE0000D,232344
2460 DATA F0A85EA65FAE525C8DCE568DF456
AD1FD02902F0F9A9085DF0C24CE858A908D2F
028D00D4A9408D0E04A51429,237611
2470 DATA 02F0FAA51429D2D0F0AA210A9039D
4203A9089D4A03A9009D4B03A9829D4403A957
9D45032056E4A210A9089D42,242639
2480 DATA 03A90049D403A9609D4503A9C09D
4803A9009D049032056E4A210A90C9D42032056
E4A210A9039D4203A9089D04A,247615
2490 DATA 03A9009D4803A9A29D4403A9579D
45032056E4A210A9089D4203A9C49D4403A960
9D4503A9C09D04803A9009D049,252641
2500 DATA 032056E4A210A90C9D42032056E4
A210A9039D4203A9089D4A03A9009D4803A982
9D4403A9579D45032056E4A2,257619
2510 DATA 10A9089D4203A9849D04403A9619D
4503A9C09D04803A9009D49032056E4A210A9A7
5F0600C9D42032056E4A210,262590
2520 DATA A939D4203A9089D4A03A9009D48
03A9C29D4403A9579D45032056E4A210A9089D
4203A944D04403A9629D4503,267599
2530 DATA A9C09D4B03A9009D49032056E4A2
10A90C9D42032056E4A9C08D0E04A93CE8D2F02
4CE85E8002E1027858,272342
```

The **ATARI**® Resource

- 53

new products

GRAPHICS MAGICIAN PICTURE PAINTER

(graphics program)
Penguin Software
830 4th Ave.
P.O. Box 311
Geneva, IL 60134
(312) 232-1984
diskette — 48K — \$39.95

Hundreds of pictures can be stored on a disk and, literally, thousands of colors are available when using the Graphics Magician Picture Painter. Full use of the 128 colors on the Atari, including blending of them, enables you to get those many shades. Text may also be added to pictures, and the various brushes allow the user to add detail and shading to creations. And, when you want to recall art from your own programs, this package lets you do that too.

THE COLOR SHARPENER CABLE

(peripheral)
Bytes and Pieces
550 N. 68th St.
Wauwatosa, WI 53213
(414) 785-1100
\$24.95
add \$2.00 for shipping and handling

The Color Sharpener is said to drastically increase the color intensity on color monitors. Using a 5-pin din plug which attaches to the monitor, it augments the intensity of the luminous part of the signal, thereby offering a substantially sharper picture. Satisfaction is guaranteed, or your money will be refunded. Dealer inquiries are invited.

ROME AND THE BARBARIANS

(game)
KREntek software
P.O. Box 3372
Kansas City, MO 66103
cassette and diskette — 32K — \$35.00

The year is 400 A.D., and half a dozen tribes of barbarians are simultaneously invading the Roman Empire. As the supreme military commander, you initiate defense strategies which, when combined with the chaotic activities of the barbarians, insure that no two games are alike. Played on a scrolling map of Western Europe, your final challenge is—who else?—Attila and his Huns.

Return the favor. When you call a manufacturer or supplier about a product you've seen advertised or otherwise mentioned in ANTIC, please tell them so. This will help us to continue to bring you the latest information about products that will make your Atari computer an even more valuable investment in the future. —ANTIC ED

50 MISSION CRUSH

(game)
Strategic Simulations, Inc.
883 Stierlin Rd., Bldg. A-200
Mountain View, CA 94043
(415) 964-1353
diskette — 40K — \$39.95

As the commander of a B-17, you must deftly maneuver your way through fifty life-threatening raids over France and Germany. It is your responsibility to hand-pick your crew, determine your plane's bomb/fuel ratio, and select the cruising altitude. After each mission, you will be evaluated and awarded points by the computer, on the basis of various criteria. Survive all fifty missions and make it to Brigadier General, and SSI will honor you with a Certificate of Achievement.

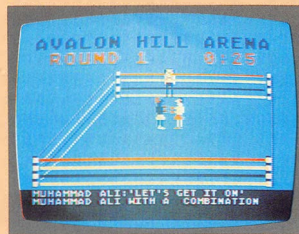
PHYSICS EXAMPLES I

(educational program)
Conduit
The University of Iowa
Oakdale Campus
Iowa City, IA 52242
(319) 353-5789
diskette — 48K — \$60.00
additional user's notes — \$3.00
additional copy of software — \$10.00

For secondary and college levels, this package of four programs covers topics in introductory mechanics and is suitable for individual student use or classroom demonstration. Each program simulates an experiment and allows students to vary parameters to see how they affect the results. The 37 pages of User's Notes included in the package introduce the concepts simulated in each program and provide students with a series of exercises. This program is made only for the Atari 800.

COMPUTER TITLEBOUT

(games)
Microcomputer Games, Inc.
4517 Harford Rd.
Baltimore, MD 21214
(301) 254-9200
diskette — 48K — \$30.00



If you're a professional boxing fan who wants to test the "Raging Bull" within, Computer Titlebout will give you the opportunity to slug it out with the best. This game contains in-depth statistics on over 300 famous fighters, past and present, and allows you to either recreate their own well-known bouts or dream up some matches that should have happened, but never did.

SKYWYTER

(educational program)
Atari, Inc.
1265 Borregas Ave.
P.O. Box 427
Sunnyvale, CA 94086
(408) 745-2000
cartridge — 16K — \$39.95

Young people, ages 6-14, can improve their word-comprehension skills and increase their vocabulary by playing Skywyter, just one of the games in the new Atari Learning Software line. As word-filled clouds drift through the sky, a player must ensnare them with a plane and connect them to form compound words. A colorful city-scape screen, charming music, and plenty of challenges inspire learning, and, if level eight is mastered, the player receives a special award of merit.

new products

600XL MEMORY EXPANSION MODULES

RC Systems, Inc.
121 W. Winesap Rd.
Bothell, WA 98012
(206) 771-6883
32K model, AM2 — \$79.00
48K model, AM1 — \$99.00

These memory modules plug directly into the back of the Atari 600XL computer, increasing the computer's total read/write memory capacity to 32K or a full 48K. Automatically recognized by BASIC and machine language programs, they will not conflict with program cartridges.

ATARI AUTOMATIC STATION SWITCHER

(peripheral)
Micro Systems Support
Suite 101, Lincoln Savings Bldg.
16325 SW. Boones Ferry Rd.
Lake Oswego, OR 97034
(503) 635-5659
\$214.00 — includes package of four standard-length cables

Fully automatic, the Atari Automatic Station Switcher can speedily network four computer systems to one set of peripherals. By connecting four stations to a disk drive and printer, the user gains the economy of sharing expensive peripherals without wasting time on awkward manual switching. The space-saving system is obviously perfect for small offices or classroom situations.

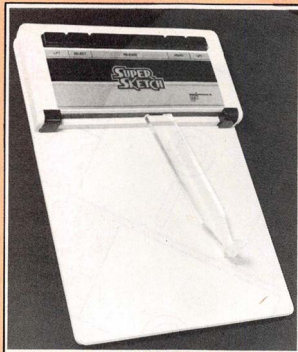
NUBASIC

(programming utility)
Galasa Software
16835 Algonquin St., Suite 199
Huntington Beach, CA 92649
(213) 836-7000
diskette — 16K — \$19.95

Nubasic, compatible with the 400, 800, 600XL, and 800XL computers, is a 3K binary program which is co-resident with BASIC. It provides many new and useful direct-mode commands, and binary disk files can be loaded from BASIC (a function which is especially useful for loading short machine-language routines into page 6). Advantages are: low cost and memory requirement, no need for a right-cartridge slot, combination of function keys, and detailed documentation.

SUPER SKETCH

(graphics tablet)
Personal Peripherals Inc.
Merrick Park
930 North Beltline, Suite 120
Irving, TX 75061
(214) 790-1440
\$49.95



The graphics tablet, Super Sketch, allows users to easily create exciting computer graphics in color. By simply moving the stylus control as you would a pencil, Super Sketch will reproduce the movement on the screen. Brilliant colors can be "painted" in with the push of a button. The manufacturer claims that it is easier to use than keyboard controls, does more than joysticks, paddle and mouse controllers, and is less expensive than touch pad products. Its own software cartridge is included in the package.

FROM SCRATCH

(application program)
HomeSpun Software
9 Peter's Path
E. Setauket, NY 11733
(516) 689-7163
cassette — 16K or 48K
diskette — 48K
\$24.95

Sometimes it takes longer to find a recipe than to cook it. From Scratch!, the recipe-filing system, will organize your favorite dishes, as well as print out shopping lists for the necessary ingredients. Also, recipes can be quickly found for leftovers, and yield conversions can be made easily.

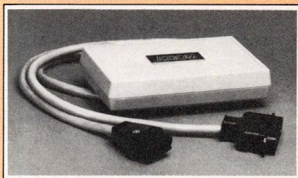
ASSEMBLY LANGUAGE TUTOR

(educational program)
Microlaser Software Inc.
Box F
Mendon, NY 14506
(716) 624-9318
\$49.95

Assembly Language Tutor, is designed to provide machine language programmers with well-documented, actual-working source code specifically for Atari computers. Learn how to do I/O, graphics, scrolling, display list interrupts, floating point, player/missiles, plot and draw, and much more. The tutorial also possesses a BASIC to Assembler conversion program which will convert most BASIC statements to Assembler source code. Two disks and documentation are included.

PARALLAX-AT

(printer interface)
Axiom Corporation
1014 Griswold Ave.
San Fernando, CA 91340
(213) 365-9521
\$99.00



ParallAx-AT is a compact expansion interface that connects any parallel-input printer to any Atari computer and operates just like the Atari 850 Interface, but without the serial ports. This interface is compatible with all Atari software designed to run with a standard parallel-input printer. Also, the open socket on the ParallaxAT can be used for "daisy-chaining" other Atari peripherals such as cartridges and disk drives. Cables and connectors are provided.

New Products notices are compiled by the Antic staff from information provided by the products' manufacturers. Antic welcomes such submissions, but assumes no responsibility for the accuracy of these notices or the performance of the products listed.



NOW ON CASSETTE!

Antic's
The ATARI Resource

SOFTWARE LIBRARY

ANTIC GAMES DISK #1

1. CHICKEN: a great game from Antic Vol.1, No.1*
2. HANGMAN: the traditional word game
3. CREATION: 4. REVERSE 5. MONOPOLY*
6. LUNAR LANDER 7. ZONEX: hidden color patterns
8. CLEWISO: detective adventure

ANTIC GAMES DISK #2

1. DEATHSTAR* 2. BLACKJACK
3. CIVIL WAR: a strategic simulation
4. ARTILLERY 5. WUMPUS: text adventure

ANTIC GAMES DISK #3

1. PETALS 2. SHOWDOWN*
3. PROG: from Antic Vol.1, No.3 4. DRAW
5. RUSS ZERO 6. COLLISI
7. SPEED DEMON, and more

ANTIC GAMES DISK #4

1. VULTURES: Stan Ocker
2. CASTLE HEXAGON: also by Ocker
3. ADVENTURE: the remainder of the disk contains an adventure game which you can play or modify to write your own adventure games.

ANTIC GAMES DISK #5

1. BATS: Stan Ockers, once again*
2. STELLAR DEFENSE 3. MASTERMIND
3. HAMMURABI: the classic simulation 4. SLALOM
5. COUCH: analyze yourself 6. ACEYBUCY & MORE

ANTIC GRAPHICS DEMO #1

1. SPIDER: from ANTIC Vol.1, No.3
2. RAINBOW 3. HORSES 4. ATARI logo 5. OXYGEN
6. SPIRAL 7. PRETTY 8. MESSAGE and more

ANTIC MUSIC DISK #1

- Requires Music Composer Cartridge
1. PRELUDE 2. JOPLIN 3. IN MY LIFE 4. STAR TREK
 5. DAISY 6. GREENSLEEVES
 7. YELLOW SUBMARINE, and many more

ANTIC GR. & SO. DEMO #1

1. GRAPHIC 2. DRAW 3. RAINBOW 4. TUNE RITE
5. ETCH SKETCH 6. BABY PRO SOUND and more

ANTIC UTILITY DISK #3

1. DISASSEMBLER: from ANTIC Vol. 2, No. 1
2. TINY TEXT: from ANTIC Vol.1, No. 6
3. GTA TEXT WINDOW: from ANTIC Vol. 2, No. 1
4. LABEL: click label on Epson
5. SET UP PRINTER: sets up MX50 for Visicalc

ANTIC UTILITY DISK #2

1. BUBBLE SORT: from ANTIC Vol. 1, No. 4
2. TYPPO: from ANTIC Vol. 1, No. 3
3. HOME INVENTORY
4. REMEMBER 5. COMPARE: listings for differences
6. MODEM 7. RT CLOCK and more

ANTIC UTILITY DISK #1

1. DOC: program allows you to accompany programs with separate documentation on disk
2. MICROASSEMBLER: allows you to create USR routines-assembler, more
3. NUM: automatic line numbering utility in BASIC
4. HEATEST: runs without BASIC cartridge, to test all memory
5. PRINTNOP: connect parallel printer from jacks 3 & 4

ANTIC PHOTO GRAPHICS

1. DIGITIZED PHOTOS

*Not included in cassette version.

Antic delivers Atari with its library of public domain software. These disks and cassettes contain non-copyrighted material from Atari users across the U.S. Presently we have 12 disks and 4 cassettes.

These programs are sold as is. Their usefulness may depend on your expertise. No documentation is included except in the programs. They may also contain programming quirks that require some modification, however all products do perform. Contents may vary slightly from that described due to unforeseen circumstances, but each disk and cassette is filled with useful programs. At only \$10.00 each, plus \$1.50 for shipping and handling, this is an extraordinary value!

Send check or money order and product coupon to:

ANTIC'S SOFTWARE LIBRARY
524 SECOND ST.
SAN FRANCISCO, CA 94107

Or use the business reply envelope in this issue. Allow four weeks for delivery.

	CASSETTE	DISK
GAMES #1	<input type="checkbox"/>	<input type="checkbox"/>
GAMES #2	<input type="checkbox"/>	<input type="checkbox"/>
GAMES #3	<input type="checkbox"/>	<input type="checkbox"/>
GAMES #4	<input type="checkbox"/>	<input type="checkbox"/>
GAMES #5	<input type="checkbox"/>	<input type="checkbox"/>
GRAPHICS DEMO #1	<input type="checkbox"/>	<input type="checkbox"/>
PHOTO GRAPHICS	<input type="checkbox"/>	<input type="checkbox"/>
UTILITY #1	<input type="checkbox"/>	<input type="checkbox"/>
UTILITY #2	<input type="checkbox"/>	<input type="checkbox"/>
UTILITY #3	<input type="checkbox"/>	<input type="checkbox"/>
GRAPHIC & SOUND #1	<input type="checkbox"/>	<input type="checkbox"/>
MUSIC #1	<input type="checkbox"/>	<input type="checkbox"/>

_____ DISKS

_____ CASSETTES @ \$10 each= \$ _____

CA res. add 6 1/2% sales tax _____

+ \$1.50 shipping & handling \$ _____

TOTAL \$ _____

Make checks payable to ANTIC PUBLISHING
PLEASE PRINT

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

NEW
ANTIC MUSIC DISK #2
Does not require Music Cartridge
1. HARMONIA 2. PIANO
3. STAIRWAYS 4. YOUNG & THE
RESTLESS 5. M.A.S.H.
6. CHOPSTIX

NEW
ANTIC GAMES DISK #6
1. IMPROVED LUNAR LANDER
2. SUPER WIMPUS SAM, requires
S.A.M. cartridge 3. MOONBASE
4. GRAVITY 5. PIG
6. FISH
7. DEFENSE



Mix and match graphics from four popular products

by CHARLES JACKSON
Antic Staff Writer

Have you ever wished you could use Micro Painter to create backgrounds and shapes for your Movie Maker files?

Are you looking for a graphics utility program that lets you draw with your lightpen and joystick and KoalaPad and Power Pad?

Have you ever wanted to use Fun With Art drawing functions with your Micro Illustrator pictures? If such possibilities arouse your curiosity and creativity, graphics conversion utilities are for you.

Graphics conversion programs modify your pictures files so they may be used with other drawing programs. Such a program, for example, might accept a Micro Illustrator picture file and use it to make a compatible Fun With Art picture file. This BASIC program converts picture files created by Micro Illustrator (Tech-Sketch, Chalkboard, and Koala), Micro Painter (Datasoft), Movie Maker (Reston), and Fun With Art (Epyx).

SYNOPSIS

This program, which converts picture files between different drawing software products, requires BASIC, a disk drive, and a minimum of 32K RAM. It runs on all Atari computers. Antic disk subscribers RUN "D:CONVERT.BAS".

HOW TO USE THE GRAPHICS CONVERTER

Type in Graphics Converter, check it with TYPO, and SAVE an extra copy for backup.

The computer will prompt you for the type and name of your source file (the file you want to convert). Type in the correct number from the menu, [RETURN], then type the filename. Don't type [D]:, just the filename. Next, the computer will ask you the same two questions about your output file (the file you're converting into).

When you've answered all four questions, the computer will spend between three and six minutes creating a converted file and storing it in disk memory. The program will NOT alter or erase your original picture file if you specify a name for the output file that's different from the input file. When the computer is through, it will print the name of the converted file on the screen.

Note that there are two ways to store and retrieve Micro Illustrator picture files: using its built-in STORAGE routines, and pressing the [CLEAR] and [INSERT] keys. When creating a Micro Illustrator picture for the converter, never use the menu's storage selection! To save such a picture properly in compatible standard mode, make sure your picture is on the screen, then press the [INSERT] key. Your drawing will be stored in a file called "PICTURE." To retrieve a picture saved this way, remove the menu from the screen and press the [CLEAR] key.

Pictures converted to Micro Illustrator
continued on next page

should always be given the filename "PICTURE."

HOW IT WORKS

The program uses a two-step conversion process. First, your original picture file is converted to Micro-Painter format (if it's not already in that form), and stored on the disk as a temporary file called "TEMP." Micro-Painter picture files are 7684 bytes long—7680 bytes outline the picture and four bytes define background and playfield colors. These "color" bytes are always the last four bytes in a Micro-Painter file. They don't exist in a Micro Illustrator file saved by pressing [INSERT], so in this case this program uses the default colors of red, green, blue, and black for the background.

Finally, the program converts the Micro-Painter file into a compatible output file, adds all appropriate file headers, footers and flags, and erases the temporary file.

MOVIE MAKER APPLICATIONS:

You can easily create colorful backgrounds for your Movie Maker animations with the aid of the converter. It is just as easy to create Movie Maker SHAPE files. Draw your shape with one of the above graphics programs and convert it to a Movie Maker BACKGROUND file. Boot the Movie Maker

disk and use Movie Maker's built-in editing functions to copy your shape from the BACKGROUND screen to the SHAPE screen.

First load the converted file as a Background. Go to Compose, then press [ESC] to see the background. Use [W] to form a window, and [B] and the joystick to enlarge the window to cover about one fifth of the screen. Don't make it bigger, or you won't be able to use the Duplicate function properly. Position the window, then press [D] to duplicate. Then press [ESC] to get back to the Shape screen, then press the joystick button to deposit the image in the same place. Press [ESC] again, press the space bar to clear the window, move the window to an adjacent section of the background, and continue in this fashion until you've moved the entire picture, or as much of it as you want to use on the Shape page. If you don't move the joystick when going from the background to the Shape page, you'll wind up with an exact duplicate of the background on the Shape page.

EXPANDING THE CONVERTER

Experienced programmers can expand this converter utility to accept many more types of picture files. After deciding what type of file you'd like to add, you must discover how that type of file is put together. Run DOS's COPY func-

tion to print the picture file to the screen, or use a disk utility to examine the composition of the file. Some important questions to keep in mind include: Does the file use a header, such as Fun With Art files? Does it use footers, like Micro-Painter files? How are color registers saved? Is your picture saved in full form, like Micro Illustrator files stored with the [INSERT] key? Is it saved in compacted form, like conventionally saved Micro Illustrator files?

Once you've figured out the file's structure, write a BASIC routine to change your file to Micro-Painter format, and a routine to change it back. Your routines should be similar to the routines you'll see in the converter program. When you're done, ENTER your routines on top of the converter program.

Now, compose three short routines to use the Micro Illustrator, Movie Maker and Fun With Art conversion routines, and add them to the converter. Model the two-line routines after the routine in lines 570-580. Finally, increase NUM by one at line 180 and add the starting line numbers of your new routine to the computed GOSUB at line 440.

The Graphics Converter unlocks the door to a wider spectrum of uses for your graphics software, and is an invaluable brush in any electronic paintbox.

```
10 REM GRAPHICS CONVERTER
20 REM BY CHARLES JACKSON
30 REM ANTIC MAGAZINE
40 FOR N=78 TO 66 STEP -1:POKE 710,N:P
OKE 712,N:POKE 709,268-N:FOR Y=1 TO 14
:NEXT Y:NEXT N
50 DIM IN$(11),IN1$(13),OUT$(11),OUT1$
(13),HOLD$(13),Q$(1),COLREG(4)
60 ? " *** GRAPHICS CONVERTER *** "
: ?
70 POKE 710,66:POKE 712,66:POKE 709,20
80 ? "(1) Micro Illustrator"
90 ? " (Tech-Sketch, Koala, "
100 ? " Chalkboard)": ?
110 ? "(2) Micro Painter"
120 ? " (Datascop)": ?
130 ? "(3) Moviemaker"
140 ? " (Reston)": ?
150 ? "(4) Fun with Art"
160 ? " (Epyx)": ?
170 REM NUM = Number of types
```

```
180 NUM=4:TIM=6
190 ? : ? "Type of source file (1-4) " ;
: INPUT TY1: ?
200 IF TY1>NUM THEN 190
210 ? " Filename " ; : INPUT IN$: ?
220 IN1$=" " : OUT1$=" "
230 IN1$(1,2)="0":IN1$(3,13)=IN$
240 ? "Type of desired file (1-4) " ; : I
NPUT TY2: ?
250 IF TY2>NUM THEN 240
260 IF TY1<>TY2 THEN 280
270 ? "NEEDLESS CONVERSION":FOR
O=1 TO 500:NEXT O:GOTO 60
280 IF TY2<>1 THEN 340
290 TIM=3.5
300 POKE 709,96:POKE 710,108:POKE 712,
108: ? "Micro Illustrator files
must be named 'PICTURE'"
310 ? : ? "Press 'Y' to name the output
file." : INPUT Q$
320 IF Q$<>"Y" THEN 60
```

```

330 OUT$="PICTURE":L=7:POKE 710,66:POKE
E 712,66:POKE 709,202:GOTO 360
340 ? " Destination filename"? "
      (No ext.):INPUT OUT$:L=LEN(OUT$
):?
350 IF TYP2=3 AND L>7 THEN 340
360 OUT1$(1,2)="0":OUT1$(3,L+2)=OUT$
370 IF TYP2<>3 THEN 390
380 OUT1$(L+3,L+6)=".BKG":GOTO 390
390 TYPE=NUM*TYPI+TYP2
400 ? " Please stand by . . ."
410 ? " ? "(Approximate conversion"
420 ? " time: ";TIM;" minutes)"
430 REM BRANCH TO CONVERSION ROUTINES
440 ON (TYPE-(NUM+1)) GOSUB 510,560,59
0,720,0,620,1100,860,770,0,890,1040,92
0,1070
450 ? " Still working . . ."
460 IF (TYPI=2) OR (TYP2=2) THEN 1350
470 REM DELETE TEMP. FILE
480 OPEN #3,12,0,"D:TEMP"
490 X10 33,#3,0,0,"D:TEMP":CLOSE #3
500 GOTO 1350
510 REM Micro Illustrator to Micro Pai
nter
520 OPEN #1,4,0,IN1$:OPEN #2,0,0,OUT1$
530 FOR X=1 TO 7680:GET #1,M:PUT #2,M:
NEXT X
540 PUT #2,12:PUT #2,40:PUT #2,202:PUT
#2,150
550 CLOSE #1:CLOSE #2:RETURN
560 REM Micro Illustrator to Movie Mak
er
570 HOLOS$=OUT1$:OUT1$="D:TEMP":GOSUB 5
10
580 IN1$=OUT1$:OUT1$=HOLOS$:GOTO 620
590 REM Micro Illustrator to Fun With
Art
600 HOLOS$=OUT1$:OUT1$="D:TEMP":GOSUB 5
10
610 IN1$=OUT1$:OUT1$=HOLOS$:GOTO 1100
620 REM Micro Painter to Movie Maker
630 OPEN #1,4,0,IN1$:OPEN #2,0,0,OUT1$
640 COUNT=0:POKE 710,66
650 TRAP 710
660 FOR X=1 TO 40:GET #1,M:PUT #2,M:CO
UNT=COUNT+1
670 IF COUNT=3844 THEN 700
680 NEXT X
690 FOR X=1 TO 40:GET #1,M:NEXT X:GOTO
650
700 FOR X=1 TO 30:PUT #2,0:NEXT X:PUT
#2,106
710 TRAP 40000:CLOSE #1:CLOSE #2:RETUR
N
720 REM Micro Painter to Micro Illustr
ator
730 OPEN #1,4,0,IN1$:OPEN #2,0,0,OUT1$
740 FOR X=1 TO 7680:GET #1,M:PUT #2,M:
NEXT X
750 CLOSE #1:CLOSE #2
760 RETURN

```

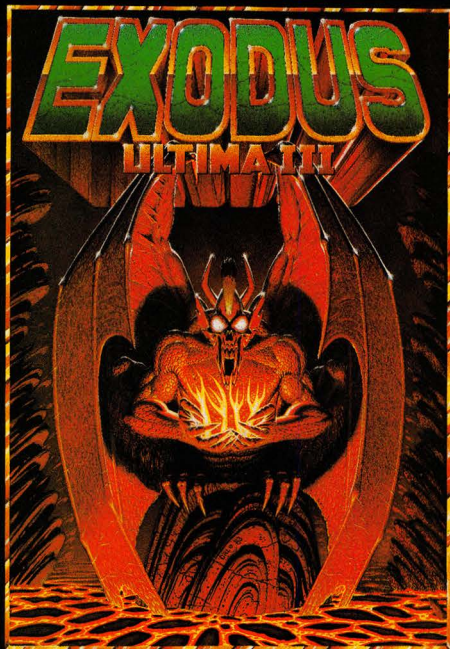
```

770 REM Movie Maker to Micro Painter
780 OPEN #1,4,0,IN1$:OPEN #2,0,0,OUT1$
790 DIM T(40)
000 K=0
810 FOR X=1 TO 96
820 FOR Y=1 TO 40:GET #1,M:PUT #2,M:(T
Y)=M:NEXT Y
830 FOR Y=1 TO 40:PUT #2,T(Y):NEXT Y:N
EXT X
840 FOR Y=1 TO 4:GET #1,M:PUT #2,M:NEX
T Y
850 TRAP 40000:CLOSE #1:CLOSE #2:RETUR
N
860 REM Movie Maker to Micro Illustrat
or
870 HOLOS$=OUT1$:OUT1$="D:TEMP":GOSUB 7
70
880 IN1$=OUT1$:OUT1$=HOLOS$:GOTO 720
890 REM Movie Maker to Fun with Art
900 HOLOS$=OUT1$:OUT1$="D:TEMP":GOSUB 7
70
910 IN1$=OUT1$:OUT1$=HOLOS$:GOTO 1100
920 REM Fun With Art to Micro Painter
930 OPEN #1,4,0,IN1$:OPEN #2,0,0,OUT1$
940 GET #1,M:GET #1,M
950 FOR X=1 TO 4:GET #1,M:COLREG(X)=M:
NEXT X
960 FOR X=1 TO 256:GET #1,M:NEXT X
970 FOR X=1 TO 7696
980 GET #1,M
990 IF X>4000 AND X<4097 THEN 1010
1000 PUT #2,M
1010 NEXT X
1020 FOR X=1 TO 4:PUT #2,COLREG(X):NEX
T X
1030 CLOSE #1:CLOSE #2:RETURN
1040 REM Fun with Art to Micro Illustr
ator
1050 HOLOS$=OUT1$:OUT1$="D:TEMP":GOSUB
920
1060 IN1$=OUT1$:OUT1$=HOLOS$:GOTO 720
1070 REM Fun with Art to Movie Maker
1080 HOLOS$=OUT1$:OUT1$="D:TEMP":GOSUB
920
1090 IN1$=OUT1$:OUT1$=HOLOS$:GOTO 620
1100 REM Micro Painter to Fun with Art
1110 OPEN #1,4,0,IN1$:OPEN #2,0,0,OUT1
$
1120 FOR X=1 TO 262:READ N:PUT #2,N:NEX
T X
1130 FOR X=1 TO 7696
1140 IF X>4000 AND X<4097 THEN PUT #2,
0:GOTO 1160
1150 GET #1,M:PUT #2,M
1160 NEXT X
1170 PUT #2,0:PUT #2,0
1180 FOR X=1 TO 4:GET #1,M:COLREG(X)=M
:NEXT X
1190 CLOSE #1:CLOSE #2:OPEN #2,12,0,OU
T1$
1200 PUT #2,254:PUT #2,254

```

continued on next page

"A LIVING TAPESTRY . . ."



"The world of Ultima III can only be compared to a living tapestry — complex and beautiful . . . This is the best fantasy game in computing. Indeed, it is one of the best fantasy worlds in which to live. Lord British is a veritable JRR Tolkien of the keyboard." — Popular Mechanics

"Exodus: Ultima III, with a superior plot to match its superior gaming system, is a great game. It upgrades the market; in several ways it sets new standards for fantasy gaming state of the art." — Softline

"Exodus: Ultima III is Lord British's magnum opus — so far. It's fun and exciting to play and constantly intriguing. And the ending is marvelously unexpected and not a bit disappointing — except that it is the ending, and as with a good book, you'll probably wish there were more." — Softalk

Available on: Apple, Atari, Com64, IBM



ORIGIN
SYSTEMS INC.

1545 OSGOOD ST., #7 NORTH ANDOVER, MA 01845

(617) 681-0609

Apple, Atari, Com64, and IBM are trademarks of Apple Inc., Atari Inc., Commodore Business Machines, and IBM, respectively.
Ultima and Lord British are trademarks of Richard Garriott. Copyright 1984 by Origin Systems, Inc.

HOW TO TURN ON YOUR ATARI

IT'S EASY. All you need is Antic, the Atari Resource.

Every month, Antic is full of things that'll help you make the most of your Atari.

Like home banking programs for keeping track of income and outgo.

Educational programs so you can keep up with the kids.

Communications programs that'll not only let you keep up with the Jones, but talk to them as well.

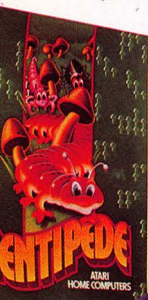
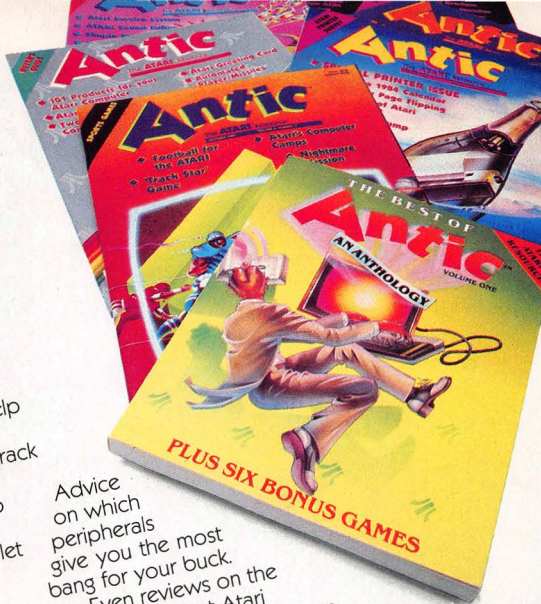
Plus useful utilities programs and computer languages that'll help you make your computing easier and more ingenious.

There are also games that'll make time fly.

Advice on which peripherals give you the most bang for your buck.

Even reviews on the latest and greatest Atari computers, software, and game machines.

And now Antic brings you three more ways to make your Atari useful. Namely, the Best of Antic Anthology. Antic Software, reasonably priced, of course. And the brand new, hot-off-the-presses Antic T-shirts, rumored to protect the wearer from cosmic dust, dragon's breath and electro-magnetic interference...



JUST THE RIGHT VOLUME

The Best of Antic Anthology covers the most popular programs and articles from our first year of publication.

Good-for-something utilities, step-by-step tutorials, plus hold-on-to-your-joystick games, including six new Atari arcade games created specially for Antic.

If you have an Atari computer, this is one book that's got you covered.

SOFTWARE AT A PRICE THAT'S NOT HARD TO TAKE

This is just part of Antic's library of public domain software, including five disks crammed-full with games like Bats, Chicken, Speed Demon, Slalom, and the ever-popular, fun-for-the-whole-family, Vultures.

You can get as many as eight of these little beauties on each disk or cassette, for as little as \$10, plus shipping and handling. That \$10 is not a typographical error, it really does say \$10.

They couldn't be more inexpensive if you wrote them yourself.

SHOW YOUR TRUE COLORS

And there's no more colorful way to do that than with an Antic T-shirt.

They're available in a variety of adult sizes and colors, some of which are even and in nature.

They're made of comfortable cotton and with the Antic logo emblazoned across the chest, they immediately identify you as someone in possession of superior taste, intelligence and breeding. They also look nice as a sweater.

DEAR ANTIC: PLEASE RUSH ME THE FOLLOWING ITEMS. HURRY!

ANTIC PUBLIC DOMAIN SOFTWARE LIBRARY (\$10 each + \$1.50 postage and handling)

☐ **THE ANTIC ANTHOLOGY**, Volume One (\$12.95 + \$1.50 postage and handling)

Please indicate whether you prefer **DISK** or **CASSETTE** formats

☐ **ANTIC GAMES DISK #1** ☐ disk ☐ cassette

1. CHICKEN: a great game from Antic Vol.1, No.1*
2. HANGMAN: the traditional word game
3. CREATION 4. REVERSE 5. MONOPOLY*
6. LUNAR LANDER 7. ZONEX: hidden color patterns
8. CLEWISO: detective adventure

☐ **ANTIC GAMES DISK #2** ☐ disk ☐ cassette

1. DEATHSTAR* 2. BLACKJACK
3. CIVIL WAR: a strategic simulation
4. ARTILLERY 7. WHUMPUS: text adventure

☐ **ANTIC GAMES DISK #3** ☐ disk ☐ cassette

1. PETALS 2. SHOWDOWN*
3. FROG: from Antic Vol.1, No.3 4. DRAW
5. PLUS ZERO 6. COLLISI
7. SPEED DEMON, and more

☐ **ANTIC GAMES DISK #4** ☐ disk (not available on cassette)

1. VULTURES: Skin Ocker
2. CASTLE HEXAGON: also by Ocker
3. ADVENTURE: the remainder of the disk contains an adventure game which you can play or modify to write your own adventure games.

☐ **ANTIC GAMES DISK #5** ☐ disk ☐ cassette

1. BATS: Skin Ocker's, once again*
2. STELLAR DEFENSE 3. MASTERMIND
3. HAMMURABI: the classic simulation 5. SLALOM
6. COUCH: analyze yourself 8. ACEYDUCY & MORE

*Not included in cassette version.

ANTIC T-SHIRTS: PLEASE SPECIFY SIZE, COLOR & STYLE (\$10.00 + \$1.50 postage and handling)

☐ black ☐ white ☐ gold ☐ red ☐ green ☐ dark blue

MEN'S ☐ small ☐ medium ☐ large ☐ X-large
WOMEN'S ☐ small ☐ medium ☐ large ☐ X-large

CALL TOLL-FREE, (800) 227-1617, Ext. 133.
In California, (800) 722-3545, Ext. 133.

NAME

ADDRESS

CITY STATE ZIP

ANTIC Publishing, 524 Second St., San Francisco, CA 94107

Antic
The ATARI Resource

ANTIC is an independent monthly publication for ATARI owners and users. ATARI is a registered trademark of Atari, Inc.



ROTATE YOUR PLAYER

Special effects with machine language

by LARRY PARKER

SYNOPSIS

This article demonstrates some of machine language's special capabilities. Listing 1 requires BASIC; listing 2 requires the Assembler Editor cartridge. The second listing is a routine to be called from BASIC—it does not run on its own. Both programs run on all Atari computers.

Player/Missile graphics are easy to use. Their flexibility and versatility allow you to experiment and create interesting effects. The following program gives the effect of a ball in P/M rolling right or left.

Type in and SAVE the first listing. RUNning the program shows you a smiling face which you can move with the joystick. As the face moves left or right, it appears to be rolling.

The key to this effect is the machine language program stored in ROT\$. To call it, a USR command must be executed as follows:

A = USR(ML,ADR,NUM,DIR)

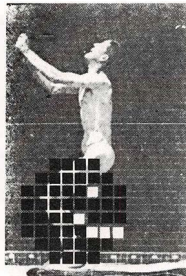
where ML is the address of the routine, ADR is the address to rotate, NUM is the number of bytes to rotate, and DIR is the direction to rotate (0 = left, 1 = right). The machine language routine itself is quite simple. Its source code is in Listing two and is documented.

Use the following steps to produce a rolling effect:

1. Shift every bit in each byte you want to rotate;
2. Check the carry bit;
3. If the carry bit is a 1, set bit 7 if shifting right, or set bit 0 if shifting left.

These steps cause each bit to move left or right and wrap around.

Note that in the USR call (LINE 450), the second parameter is offset by 2 (P0+2), so the top two bytes of the face are not rotated. If they are, the face will not appear to roll. To see this, change the +2 in LINE 450 to a +0 and RUN the



program. The result shows that the routine has some restrictions. In order to completely produce the illusion of rotation, the portion to rotate must be eight bits wide.

This is just one of the many special results produced by Player/Missile graphics. After experimenting with them, you can produce your own special effects.

Larry Parker entered the College of Engineering at the University of Michigan last year. In the past several years, he has written and sold several dozen programs in BASIC, using machine language routines.

Listing 1

```

10 REM ANTIC MAGAZINE
20 REM PLAYER MISSILE ROTATOR
30 REM BY LARRY PARKER
40 REM
70 REM READ MACHINE LANGUAGE DATA
80 REM INTO ROT$
100 DIM ROT$(60)
110 FOR I=1 TO 57:READ A:ROT$(I,I)=CHR
$(A):NEXT I
120 DATA 104,104,133,204,104,133,203
130 DATA 104,104,133,205,104,104,133

```

```

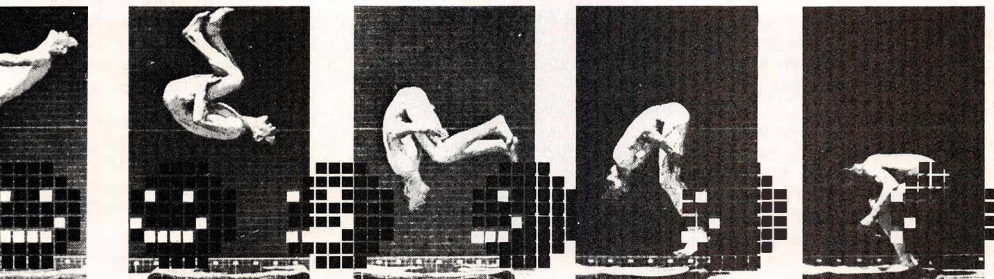
140 DATA 206,160,0,24,165,206,208
150 DATA 11,177,203,10,144,14,24
160 DATA 105,1,24,144,8,177,203
170 DATA 74,144,3,24,105,128,145
180 DATA 203,200,196,205,208,225,96
200 REM PLAYER MISSILE SETUP
220 RAM=PEEK(106):POKE 106,RAM-8:GRAPH
ICS 0:POKE 752,1:
230 U=PEEK(106):X=120
240 POKE 704,14
250 POKE 54279,U
260 PM=256*U
270 FOR I=PM+512 TO PM+640:POKE I,0:WE
XT I
280 P0=PM+512+80
290 RESTORE 360

```

```

300 FOR I=P0 TO P0+7
310 READ A
320 POKE I,A
330 NEXT I
340 POKE 559,46:POKE 53277,3
350 POKE 53248,X
360 DATA 60,126,219,255,189,195,126,60
380 REM ROTATE PLAYER
400 S=STICK(0)
410 IF S=7 THEN DIR=1:X=X+1:GOTO 440
420 IF S=11 THEN DIR=0:X=X-1:GOTO 440
430 GOTO 400
440 POKE 53248,X
450 A=USR(ADR(ROT$),P0+2,4,DIR)
460 FOR D=1 TO 3:NEXT D
470 GOTO 400

```



Listing 2

```

0 *=$600
20 ;
30 ; -----
40 ; A=USR(ML,AOR,# BYTES,DIRECTION)
50 ;
60 ; ROTATES DATA LEFT OR RIGHT
70 ;
80 ; -----
90 ;
0100 ADR = $CB
0110 BYTES = $CD
0120 DIR = $CE
0130 PLA ; IGNORE
0140 PLA ; GET HI BYTE OF
ADDRESS
0150 STA ADR+1
0160 PLA ; GET LO BYTE OF
ADDRESS
0170 STA ADR
0180 PLA ; IGNORE
0190 PLA ; GET NUMBER OF B
YTES
0200 STA BYTES
0210 PLA ; IGNORE
0220 PLA ; GET DIRECTION

```

```

0230 STA DIR
0240 ;
0250 LOY #0
0260 LOOP CLC
0270 LOA DIR
0280 BNE RIGHT ; RIGHT IF A 1
0290 ;
0300 LEFT LOA (ADR),Y
0310 ASL A ; SHIFT LEFT
0320 BCC STORE ; NO CARRY BIT
0330 CLC
0340 ADC #1 ; SET BIT 0
0350 CLC
0360 BCC STORE
0370 RIGHT LOA (ADR),Y
0380 LSR A ; SHIFT RIGHT
0390 BCC STORE ; NO CARRY BIT
0400 CLC
0410 AOC #128 ; SET BIT 7
0420 STORE STA (ADR),Y
0430 INY
0440 CPY BYTES ; DONE?
0450 BNE LOOP ; NO
0460 RTS ; YES- RETURN TO
BASIC

```

CUSTOMIZING BASIC KEY FUNCTIONS

A shortcut to program typing

by MIKE FLEISCHMANN

How many times have you typed 'AS(LEN(AS)+1)=', or 'COLOR 1', or 'SAVE "D:", until you thought your fingers were going to fall off? Wouldn't it be nice if you could just press one key. . . ?

If you've done much programming in ATARI BASIC, you've encountered the finger cramping, shift key workout more than once. In fact if you're like me, you have found yourself wishing that ATARI had assigned function keys to save some typing.

Well they didn't. So one night just after I had finished my 43rd 'AS(LEN(AS)+1)=', I decided to do something about it. The following autorun program allows you to use the [CTRL] key and one other key to generate complete BASIC commands. In this program, the [CTRL] key and any other key can be used to print entire BASIC functions. If you assign the 'LIST "P:"' command to the [4] key, for example, every time you type [CTRL][4] the 'LIST "P:"' command will appear on the screen.

It's easy to assign any BASIC command to any key. You can assign commands to their keys in lines 20000-29999 in the BASIC program. When making these assignments, you must follow a few simple rules:

1. Change only the string data between lines 20000 and 29999.
2. The last command string must be '@@@@@@'.
3. Every assignment must follow this pattern:
(KEY)(COMMAND)[:COMMAND: . . . :COMMAND](@)
(KEY) is any key, A-Z, 0-9.
(COMMAND) is the command you want the key to produce.
[:COMMAND: . . . :COMMAND] are any additional commands (optional).
(@) is an end-of-command marker.

SYNOPSIS

A devilishly clever technique for setting up two-keystroke "function-key" abbreviations that'll enter repeats of lengthy commands into your program. The BASIC listing requires a disk drive, and runs on all Atari computers of all memory configurations. Antic Disk Subscribers Run "D:BASICKEY.BAS"

4. Use 'V' symbols instead of commas in your command strings. The program will read them as commas.
5. The maximum length of any command string is 128 bytes.

EXAMPLE: Let's say we want the '4' key to generate 'PRINT "Answer Yes or No":INPUT AS', instead of 'LIST "P:"'. The BASIC data statement we need to change is in line 20150. Change line 20150 from:

```
20150 DATA 4LIST "P:"@,5LIST "D:@
to:
```

```
20150 DATA 4PRINT "Answer Yes or No":INPUT AS@,5LIST
"D:@
```

The '4' key is changed.

CREATING THE AUTORUN FILE

Once you've made the key assignments, you must create the AUTORUN.SYS file. With a formatted disk (with the DOS.SYS and DUP.SYS files) at hand, RUN the program.

The program will ask you if you want a hard copy of your command set, just in case your memory needs refreshing once in a while. Type [Y] for "yes," [N] for "no". After the program has read your command set, it will ask you to place your formatted disk in drive #1. Do so. Press [RETURN] to create and store the AUTORUN.SYS file on the disk. Now, SAVE our KEY FUNCTION program to the disk as a backup, if you haven't already done so. To run the AUTORUN.SYS file, turn the ATARI off and then on again. The program will automatically load and patiently wait for you. Test the program by pressing the [CTRL] key while typing a key to which you have assigned a command. If it works, your command will appear on the screen. If a command didn't appear, check the data statements.

HELPFUL HINTS:

1. Don't assign anything to the [I] key, it will disable the [CTRL] [I] screen freeze.
2. Always press the [RESET] key before going to DOS. To recover the function keys after going to DOS, you must reboot.
3. Never use 'NEW' in a multiple command statement. Anything after it will be ignored.

A sample data set is included to allow you to experiment. The [CTRL] [O] command is a short routine that converts a hex digit to decimal.

HOW IT WORKS:

The BASIC program builder is a fairly straightforward disk output routine with the following "tricks":

1. In line 10000, the first 6 bytes are the binary file load header.
2. In the data statements between 10000 and 19999, values 500 and 501 are flags to tell the program where to put

- the end address of the assembly program and key data.
3. Line 30040 is the append data you need to make ATARI DOS think the file is an auto execute file.

The function key program starts by loading below the DOSSYS program area and then shifting the MEMIO and APPMHI pointers to the end of the key data. Then the program puts its keyboard handler address into the jump vector at VKEYBD(\$209) and saves the old jump vector in its own jump location. (A positive side effect of this is that the program only uses the exact amount of memory it needs.) Then the program returns to BASIC.

When a key is pressed, the interrupt jumps to the function program. There, its value is checked to see if the [CTRL] key is pressed. If not, the program continues through the normal keyboard handler. When the [CTRL] key is pressed, the key character is converted to ASCII and compared with the command table. If a match is found, the command is sent to the screen and an 'RTI' (Return from Interrupt) is effected. If no match is found, the registers are restored and processing continues through the normal handler.

```
50 REM BASIC 2 KEY CREATE PROGRAM
60 REM BY MIKE FLEISCHMANN
70 REM ANTIC MAGAZINE
100 DIM S$(128),A$(1)
110 ? "NAME":? " BASIC 2 KEY CREATE PR
OGRAM"
120 ? " THE OBJECT CODE IS IN AUTORUN
FMT"
130 ? :? "DO YOU WANT THE COMMANDS TO
BE PRINTED"
140 INPUT A$
150 IF A$="Y" THEN FLAG=1:REM FLAG=1 -
>SEND TO P: FLAG=0 -> SEND TO SCREEN
160 REM
170 REM Need to find out how long the
ML program is. So we count
180 REM the bytes in the data statemen
ts.
190 READ D
200 IF D<0 THEN 220:REM The -1 is a te
rminator
210 CT=CT+1:GOTO 190
220 READ S$:REM Now we count the # of
bytes in the commands
230 CT=CT+LEN(S$)
240 IF S$(1,1)="/" THEN 310:REM Lookin
g for the 5 '/' signs at end
250 REM Since we have to read the comm
ands anyway may as well print
260 REM them out in readable form. Not
e: leave '/' sign so
```

```
270 REM we know if there are any blank
s at the end of command.
280 IF FLAG<1 THEN PRINT " CTRL ";S$(
1,1);" = ";S$(2)
290 IF FLAG=1 THEN LPRINT " CTRL ";S$(
1,1);" = ";S$(2)
300 GOTO 220
310 CT=CT+7424-6:REM Add in starting a
ddr. of ML code - the header
320 REM for a ML boot file.
330 CTH=INT(CT/256):CTL=CT-CTH*256:REM
Compute the low and high
340 REM Now wait for the user.
350 ? "Press return when the disk you
want "
360 ? " is in drive 1 ":INPUT A$
370 OPEN #3,8,0,"D:AUTORUN.SYS":REM Ge
t ready to output.
380 RESTORE :REM Set pointer to top of
data.
390 READ D
400 IF D<0 THEN 460:REM Look for -1
410 REM 500 & 501 are flags to tell pr
gm where to put end addr.
420 IF D=500 THEN D=CTL
430 IF D=501 THEN D=CTH
440 PUT #3,D
450 GOTO 390
460 REM ML program output. Now we outp
ut the command set.
```

continued on next page

```

470 READ SS
480 FOR I=1 TO LEN(SS):REM Output string byte by byte.
490 D=ASC(SS(I,I))
500 IF D=ASC("\") THEN D=ASC(",")
510 PUT #3,D
520 NEXT I
530 IF SS(1,2)="@" THEN 550:REM Look for the 5 '@' signs.
540 GOTO 470
550 REM The program & data set are out. Now output the autoloader appendage.
560 FOR I=1 TO 7:READ D:PUT #3,D:NEXT I
570 CLOSE #3:STOP:REM DONE
10000 REM
10010 REM Below is the data for the machine language program.
10020 REM DO NOT MODIFY!!!!!!
10030 REM
10040 DATA 255,255,0,29,500,501,234,160,1,173,8,2,153,182,29,200,173,9,2,153,182,29,169,44,141,8,2,169,29
10050 DATA 141,9,2,169,500,141,231,2,24,105,112,169,501,141,232,2,105,1,133,15,96,88,142,192,29,140,193
10060 DATA 29,173,9,2,10,72,41,128,208,4,104,24,144,113,169,3,133,245,169,30,133,246,104,41,63,170,189
10070 DATA 195,29,201,255,240,94,133,247,160,0,177,245,197,247,240,24,201,64,240,0,200,177,245,201,64
10080 DATA 208,249,200,24,152,101,245,133,245,144,228,230,246,208,224,230,245,208,2,230,246,174,22,228
10090 DATA 172,23,228,232,208,1,200,142,187,29,140,188,29,160,0,177,245,201,64,240,13,140,194,29,32,186
10100 DATA 29,172,194,29,200,24,144,237,169,0,133,77,169,48,141,43,2,174,192,29,172,193,29,104,64,174
10110 DATA 192,29,172,193,29,76,0,80,0,76,0,80,69,58,155,0,0,76,74,59,255,255,75,43,42,79,255,80,85
10120 DATA 255,73,45,61,86,255,67,255,255,66,88,90,52,255,51,54,27,53,50,49,44,32,46,78,255,77,47,255
10130 DATA 82,255,69,89,255,84,87,81,57,255,48,55,255,56,60,62,70,72,68,255,255,71,83,65,-1
20000 REM
20010 REM BELOW IS THE COMMAND TABLE
20020 REM THE FORMAT OF THE TABLE IS
20030 REM (KEY) (COMMAND):COMMAND:...:COMMAND(@) WHERE THE
20040 REM '@' SYMBOL IS THE TERMINATOR

```

```

20050 REM The set must end with 5 '@' signs.
20060 REM Only capital letters and numbers can be used!!! for (KEY)
20070 REM
20080 REM
20090 REM
20100 DATA ACOLOR @,CCHR$(@,DDATA @,FFOR @,GGOTO @
20110 DATA HGDSUB @,IINPUT @,JDRAWTO @,KGRAPHICS @,LLIST @
20120 DATA MLPRINT @,NNEXT @,OPADDLE(@,PPLDT @,QPOS. @
20130 DATA RRETURN @,SSD. @,TTHEN @,UR EAD @,VSE. @,WSTICK(@
20140 DATA XSTRIG(@,YSTR$(@,ZLOAD "D:@,3SAVE "D:@
20150 DATA 4LIST "P:"@,5LIST "D:@
20160 DATA 0DEC=(HEX$(I\I)<="9")*(ASC(HEX$(I\I))-48)+(HEX$(I\I)>="A")*(ASC(HEX$(I\I))-55)@
20170 DATA GENTER "D:@,@@@@@
30000 REM
30010 REM
30020 REM
30030 REM Below is the appendage for a n autoren file.
30040 DATA 0,224,2,225,2,0,29

```

TYPO TABLE

Variable checksum = 132884

Line num	range	Code	Length
50	- 180	ET	423
190	- 290	KZ	527
300	- 410	EC	483
420	- 530	HP	313
540	- 10060	XQ	541
10070	- 10120	IH	580
10130	- 20100	TD	411
20110	- 30040	RG	427

ADULT PARTY GAMES

From PARTLY SOFT comes a new use for your computer.

"Add spice to your Atari Computer" • "The games you'll love to lose"

BODY PARTS

For 2 players, this game is ideal for you and your wife or that special friend. Search behind over 100 doors to find enough body parts to build your body. But watch out for the hazards along the way. Remember for 2 consenting adults.

HARD DAY AT THE OFFICE

For 2 to 8 players, roam through the office trying to earn enough pay to buy your way with the player of your choice. 5 different screens, and with every game, the winning score varies. You're never sure when you'll win and those surprise bonus points will make you laugh and cry. As much fun for 2 players as it is for 8.

ATARI 32K DISK

\$24.95

Add \$3.00 postage and handling.

\$29.95

PARTLY SOFT SOFTWARE

P.O. Box 3025 • Millani, HI 96789

Hawaii residents add 4% sales tax.

Get Serious, Go Ape With An

APE • FACE™

Parallel Printer Interface For Atari® Computers



Model XLP

Atari 400/800
Atari 600XL/800XL

Model 12XLP

Atari 1200XL

\$89⁹⁵ At the dealer
you trust most.



ape-Face makes it easy to expand your Atari Computer—so you can do more than play games! Choose any Centronics standard parallel printer to enhance your system, like Epson, Gemini, or C. Itoh.



ape-Faces are complete with cables and are friendly with all Atari hardware and software. Easy connection through the serial peripheral port makes installation a snap.

Only APE tested quality products receive the Stomp of Approval.

A Product of
DIGITAL DEVICES
Corporation



430 Tenth Street
Suite N 205
Atlanta, GA 30318
(404) 872-4430
(800) 554-4898



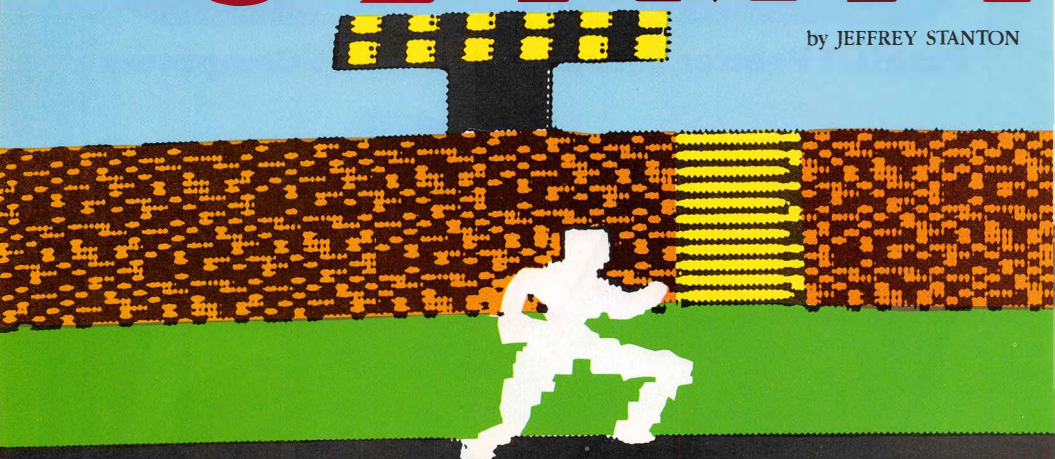
**STOMP OF
APPROVAL**

©1984 Digital Devices
Corporation

ATARI IS A REGISTERED TRADEMARK OF ATARI, INC.

OLYMPI

by JEFFREY STANTON



SYNOPSIS

This simulation of the 100-yard dash is Antic's first machine language action game. The BASIC language listings create the machine language program. It's a two-player game requiring two joysticks, and runs on all Atari computers and all memory configurations. Antic Disk Subscribers: From DOS Type L [RETURN] then type DASH.EXE.

Are you an armchair athlete? Has all the excitement over the Summer Olympics in Los Angeles got your blood pumping in the competitive spirit? Well, thanks to Jeffrey Stanton and Antic, you can now take part in a video 100-yard dash with two independently scrolling screens — and become the Olympic Atari champion of your block!

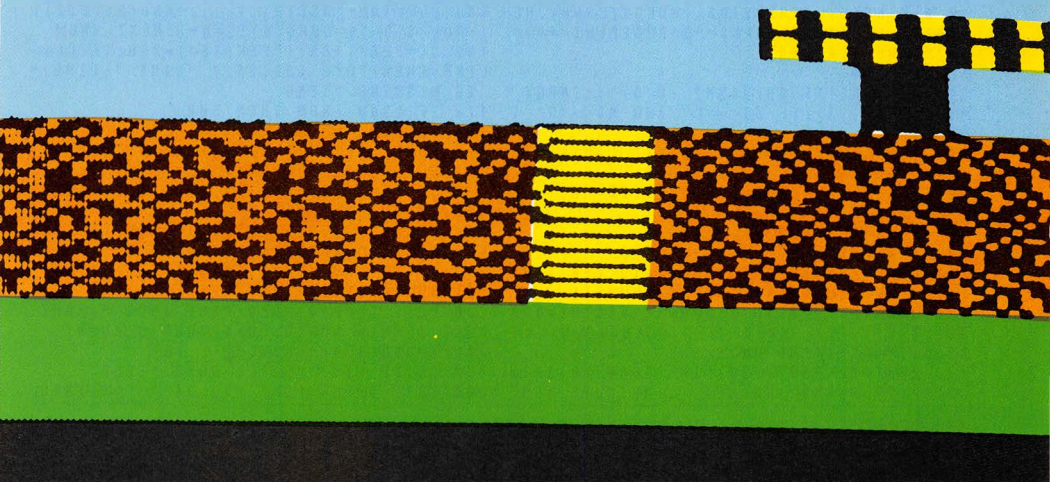
To use Olympic Dash, follow these instructions:

1. Type in Listing 1.
2. Check it with TYPO.
3. Delete the lines containing TYPO before saving the final copy.
4. SAVE a copy.
5. Type NEW to clear computer memory.
6. Type in Listing 2. There's no TYPO program for Listing 2 because all the data in Listing 2 is checked by Listing 1 as it reads the data and stores it in memory.
7. Use the LIST command to store Listing 2 (i.e. LIST "C:" or LIST "D:LIST2.LST").
8. LOAD Listing 1.
9. ENTER Listing 2 to merge the two.
10. RUN the program.
11. The program asks whether you're using cassette or disk. If you're using cassette, type [C] and [RETURN], and the program will generate a boot cassette. If you're using disk, type [D] and [RETURN]. The program will produce a binary

DOS file named DASH.EXE.

12. After you respond to the first prompt, the screen will go black (for faster processing) for a few minutes while the program reads data and places it in a string. If the program encounters any bad data, which probably means you've made a typing error, the screen color returns to blue and the program prints a message telling you which line contains the bad data. Correct your error and RUN the program again. (Pay attention to commas, periods, and spaces.)
13. While you're waiting for the data to be read, cassette users place a blank cassette in the recorder and press Record and Play. Disk users should make sure there's a DOS disk with at least 28 free sectors in your drive.
14. When the screen color returns to blue, you'll see a prompt to press [RETURN] to save the file. Cassette

C D A S H



users must press [RETURN] twice; once at the prompt, and once after the computer beeps twice. Do so, and the file will be stored.

15. To load the machine language cassette, rewind the tape, press [PLAY] and turn off your computer. It's not necessary to remove the BASIC cartridge. Then, while the computer is off, press [START] and hold it down while turning on the computer. Then press [RETURN] to load the tape. When the program has loaded, it will automatically begin.
16. To load from disk, go to the DOS menu, and use option L to load DASH.EXE. The program automatically starts upon loading.
17. If you wish to have the program load and run automatically upon booting the disk, rename the game program to AUTORUN.SYS and make sure that DOS.SYS exists on the disk.

HOW TO PLAY THE GAME

Playing Olympic Dash is easy. A word of precaution: This game is a joystick buster! If you have any choice, use your old Atari joysticks to play—they'll work fine, and present less of a problem if they break.

To play, plug two joysticks into Ports 1 and 2. Player 1 is represented on the top half of the screen, and Player 2 is on the bottom. Press [SELECT] to choose the speed of the race; fast or slow (shown in the upper right corner of the screen). Press [START] to begin the race. Watch the upper right corner for the traditional starter's cry of "On your mark . . . , Get set . . . , " and listen for the pistol shot when "Go" appears. Then start moving your joysticks from side to side (not up and down) as fast as possible. The faster you wiggle the stick, the faster your player runs. The first to cross the finish line is the winner. Total running time for both players

is constantly displayed. If another player isn't handy, try to beat your own best time.

Jeffrey Stanton has a Bachelor's and a Master's degree in mechanical engineering from Rensselaer Polytechnic Institute. In 1979, he bought an Apple computer and began designing and writing video games, but he soon switched over to Atari computers because of their superior graphics capabilities. He is co-editor of The Book of Atari Software and co-author of a new book, Atari Graphics and Game Design, both from The Book Company, Los Angeles, California.

continued on next page

game of the month

Listing 1

```
10 REM OLYMPIC DASH
20 REM BY JEFFREY STANTON
30 REM ANTIC MAGAZINE
40 DIM HS(2),ARRAYS(96),HOLDS(3500),HE
XS(23),FILES(20):HEX$="@ABCDEFGHIJ####
##JKLMNO":CASS=0
50 TRAP 60
60 ? "CASSETTE OR DISK? (C/D)":INPUT
HS:HS=HS(1,1):IF HS<>"C" AND HS<>"D" T
HEN 60
70 TRAP 500:?"PLEASE WAIT...":FOR D
=1 TO 200:NEXT D:POKE 559,0
80 IF HS="C" THEN CASS=5:FILES="C":CM
D=128:GOTO 100
90 FILES="D:DASH.EXE":CMD=0
100 RESTORE 1990+CASS:Q=1
110 READ ARRAYS:FOR HNUM=1 TO LEN(ARRA
YS) STEP 2:HS=ARRAYS(HNUM,HNUM+1)
120 D=0:FOR I=1 TO 2:D=0*16+ASC(HEX$(A
SC(H$(I))-47))-64:NEXT I:HOLD$(Q,Q)=CH
RS(D):D=Q+1:NEXT HNUM
130 RESTORE 2000:FOR LINE=2000 TO 270
STEP 10:GOSUB 140:NEXT LINE:GOTO 190
```

```
140 READ ARRAYS,LSUM:FOR HNUM=1 TO LEN
(ARRAYS) STEP 2:HS=ARRAYS(HNUM,HNUM+1)
150 D=0:FOR I=1 TO 2:D=0*16+ASC(HEX$(A
SC(H$(I))-47))-64:NEXT I
155 SUM=SUM+(ASC(H$(1,1))+ASC(H$(2,2)
)):HOLD$(Q,Q)=CHR$(D):Q=Q+1:NEXT HNUM
160 CL=PEEK(183)+PEEK(184)*256:IF CL<>
LINE THEN POKE 559,34:"LINE ";LINE;"
IS MISSING.":ENO
170 IF LSUM<>SUM THEN 500
180 RETURN
190 POKE 559,34:"PRESS <RETURN> TO
SAVE THE FILE.":INPUT HS
200 CLOSE #1:OPEN #1,8,CMD,FILES:IOCB=
848:POKE IOCB+2,11
210 ADDRESS=AOR(HOLD$):ADHI=INT(ADRES
S/256):AOL0=ADDRESS-ADHI*256
220 BYTES=LEN(HOLD$):NUMHI=INT(BYTES/2
56):NUMLO=BYTES-NUMHI*256
230 POKE IOCB+4,AOL0:POKE IOCB+5,ADHI:
POKE IOCB+8,NUMLO:POKE IOCB+9,NUMHI
240 X=USR(AOR("hhhhLVd"),16)
250 CLOSE #1:"ALL DONE.":ENO
500 TRAP 40000:POKE 559,34:"BAD
```

INTRODUCING

the NEW ASTRA 2001

Double Density Double Disc Drive

- ☐ More Reliable
- ☐ Quieter Operation
- ☐ Faster Read Write
- ☐ More Capacity (360K Bytes)
- ☐ Easier Data Read

**ALL THIS WRAPPED UP
IN ONE ATTRACTIVE UNIT**



ASTRA SYSTEMS INC.

2500 S. FAIRVIEW, UNIT L

SANTA ANA, CA 92704

Call (213) 804-1475 for your nearest dealer.

DATA AT LINE #":LINE:END
 1990 DATA FFFF001D8C2A
 1995 DATA 001CEE1C0000A9008D4402A9FF85
 084C0F23

TYPO TABLE

Variable checksum = 720999

Line num	range	Code	Length
10	— 120	GK	613
130	— 200	GR	535
210	— 1995	QL	336

Listing 2

2000 DATA 0000000000010306040404060200
 01010303030206060C0C1830F0C08000000000
 00000000003070C0C0808080, 4554
 2010 DATA 000101030303030303FFFE808000
 000000000000000000010306060202030101
 0101014363F39F0F06000000, 9125
 2020 DATA 000000000000000000000000010101
 0101010100000000000081C1713000000000
 000000000000000000000001, 13493
 2030 DATA 0302060602020200000000000000
 01010101000000010101000000000000030705
 00004070701010103030307, 17934
 2040 DATA 06060406060C1838103000000000
 000000000000000000000000000000000000
 000000000000000000000000, 22325
 2050 DATA 0000000000000000000000000000
 0000000000000000000000000000000000707
 707060E0F0F0F8E8E0F0C0C, 26912
 2060 DATA 0E0F0F881C0E0703010101010000
 000000000070707060E0F0F0F8E8E0C4C6C2E0
 F0F89C9E0703010100000000, 31790
 2070 DATA 00000000007070707060E0E0F0F0
 F0F0D0D0D0F0F0F0000181C0C0C0C0C0C0C0C
 0C06000070707060E0E0F0F, 36712
 2080 DATA F0F0F0F8E8C8C8E0E0E0606070F0
 F07060606060607000007070706060E0F0F0
 F0F8E8E0C2F0F8F0C6666266, 41793
 2090 DATA FCF86060C0C808080C0000707070
 7060E0E0F1F8FE0C0C0C0F0C9F9F07010303
 0206060C0C060000000000, 46747
 2100 DATA 0000000000000000000000000000
 000000000000000000000000000000000000
 000000000000000000000000, 51067
 2110 DATA 0000000000000000000000000000
 000000000000000000000000000000000000
 00000000000080808080C0C0, 55457
 2120 DATA C0E0000000000000000000000000
 00000000000000000000008080C0C060503000
 000000000000000000000000, 59885
 2130 DATA 0000000000000000000000000000

000000000000000000000000000000000000
 000000000000000000000000, 64205
 2140 DATA 0000000000000000000000000000
 000000000000000000000000000000000000
 000000000000000000000000, 68525
 2150 DATA 0000000000000000000000000000
 0000000000000000000000000000000000204060
 80A00020406080A000204060, 72955
 2160 DATA 80A0000000000000000000000000
 000000000000000000000000000000000000
 000000000000000000000000, 77300
 2170 DATA 00000070707040600354214355600
 3456003356003256003156003056002F56002E
 56002056002C56002B0C63C35, 81978
 2180 DATA 5600345600335600325600315600
 3056002F56002E56002D56002C56002B465035
 41902A000000002F2C392030, 86681
 2190 DATA 2923002435212C0000000000253625
 2E34000000111010002D253425320024213328
 000000000000000000000000, 91205
 2200 DATA 0000000000000000000302C213925320011
 000000000010100E10100000302C2139253200
 12000000000010100E101000, 95682
 2210 DATA 002F2E000392F3532002021322800
 0000272534000332534000000000000000272F00
 000000000026212C33250033, 100275
 2220 DATA 342132343C1E19140F0809080706
 050403030202020202000000000000000000
 000090909090909090707070606, 104859
 2230 DATA 0606050505050504030305050404
 040403030306050505050403030010001110
 001210001310001410001510, 109328
 2240 DATA 0016100017100018100019100011
 10100002030507081012131517182022232527
 283032333537384042434547, 113863
 2250 DATA 48052535555555560626365676870
 7273757778802838587889092939597980000
 000000000000000000000000, 118750
 2260 DATA FFFFFF5A11A5DA246B54A561A458
 ACD2684B85666666666666666666666666666
 00FF18181818181818184259, 123864
 2270 DATA 204A454646524559205354414E54
 4F4E33252C25233400332C2F370033252C2523
 340D26213334003032253333, 128633
 2280 DATA 0000333421323400000000000000
 0000000000000420201020101010101010101
 0100010101010101000000, 133009
 2290 DATA 01000100001000010000100010001
 000001000100010000010000010001000000
 010000000100000001000001, 137347
 2300 DATA 0000000100000000010000000001
 000000000100000000000100000000000000
 000000010000000000010000, 141675
 2310 DATA 0000000001000000000000000000
 0000000001000000000000000000000000302
 03030403040400000103060A, 146052

continued on next page

game of the month

```

2320 DATA 0F151C24002D000000003892949698
4700000000058000000000740000000000000000
0000000000000000000000000000000000000000
150560
2330 DATA 00000000000000000000000000000000
0000000000000000000000000000000000000000
0000000000000000000000000000000000000000
154880
2340 DATA 00000000000000000000000000000000
0000000000000000000000000000000000000000
0000000000000000000000000000000000000000
0000000000000000000000000000000000000000
A9008044024C74E4A200B0000, 159523
2350 DATA 209D992AE8E004ED0F5A9908D3002
A92A803102A9388007D4A9038D10D0A93E8D2F
02A9018D6F02A9008000000000000000000000
164662
2360 DATA 0C8DC002A94E8DC6228D0C7228D0F0
228D0F1228D000A9301869258D0CE228D0622A9
881869258D0CF228D0722A900, 169794
2370 DATA 8D09D0A90C8D0C102A9568DC8228D0
C9228D0100A9301869258D00228D0822A98818
69258D01228D0922A900800A, 174901
2380 DATA 00A90C8D0C202A95E8DC228D0CB22
8D0E00A9301869258D002228D0A22A988186925
8D03228D0B22A90085C0A938, 180052
2390 DATA 85C1A90098A200891C0C8D0F0B6C1
CAD0F6A90085F85FCA93885FFA9085F0A202
A00081FC91FEC8D0F9E6F0E6, 185370
2400 DATA FFCAD0F2A000898521990038C8C0
3990F5A9388D0F402A90085F6A92885F7A00098
A20A91F6C8D0F0B6F7CADA0F6, 190580
2410 DATA A000800E20990035C8C06490F5A2
05A0008927219D002B8C8B927219D002B8C8B
927219D002B8C8C8A18690C, 195630
2420 DATA AAE0A900D20042AA000089D2138
E92099AA2B8C8C01290F2A9E68D0002A9278D01
02A9C00D0E04A9008D0E238D, 200755
2430 DATA 02238D0E228D0E1228D06228D0722
8D0E228D0E228D0EA228D0EB228D0E228D0E3228D
EC228D0E228D0F6228D0F7228D, 205977
2440 DATA F8228D0F922A90F8DFA228D0F822A9
AE8D0F228D0F3228D0C23A9018D00238D01238D
0A238D0823A9008D0E228D0F, 211183
2450 DATA 22A9288D0C402A9C68D0C502A97A8D
C602A9468D0C702A9008D0C80220042820492820
8E2A907A227A073205CE4A9, 216228
2460 DATA 080514A514D0FC4C5125AD1FD0C9
06F050AD1FD0C905D0F2AD0E23F01EA000B90B
21992E358810F7A90080E23, 221381
2470 DATA A008891E219900C218810F74C6C25
A008890CF21992E358810F7A9018D0E23A00889
1521990C218810F7A9008514, 226412
2480 DATA A514D0FC4C2025A00889E721992E
358810F7A900854D0A9008514A514D0FCAD1FD0
C906D0F9A9008514A514C978, 231534
2490 DATA 00FAA008898220992E358810F7A9
008514ADE0220D0ADE122D028A514C95AD0F0
A008898E20992E358810F7A9, 236676
2500 DATA 080514ADE0220D0ADE122D009A5
14C95AD0F04C3626A000B9D620992E358810F7

```

```

A2018D0E22F00FFED022FEF0, 241833
2510 DATA 22FEF022FEF022FEF022CA30034C
ED25200428204928208E28A9008514A514C9C0
00FAA9058D0E228D0F22A94E, 246965
2520 DATA 8D0F0228D0F122200428204928208E
284C7725A00889CA20992E358810F7A9108D00
23A90085148D00823A20138A9, 251937
2530 DATA 0FED0F9228D0F8228D00023F06E8CE0
2289E2209DEE229DE4228D0E22D0034C627FE
DE228D0E22C906D0005A9009D, 257175
2540 DATA DE22200428204928208E28A9009D
00239DE222FEF022FEF022FEF022FEF022FEF0
22D0F222904E388D0F022D0F2, 262321
2550 DATA 229D0F4228D0E022C91090068CE022
4CBF68CE22889A229D0F228D0F229D0F228D0
F022D0F2229D0200CFE228900, 267535
2560 DATA 229D0F22187D0F8229D0F822C90890
0C388D0F822E9089D0F822FE622FE22FE22FE22
D0E222D0DE4229005A9019D00, 272753
2570 DATA 238D0F622C9A00005A9009D0E2238
A90FED0F8228D0FA228D0F622C98C000A9009D0A
23AD0C2310038E0C23C3A003, 277894
2580 DATA 4C5826266D029AD03230015F008A9
0A8D05C358D62354C5227A90A8D048358D4E35AD
0C23300AAD1F0C0906D0034C, 282986
2590 DATA 2323A9008D0323AD0323C9010003
4C4D264C6627A9018D0323A2012F0F228D0F022
9C6228D00001869089D0C822, 287953
2600 DATA 8D01001869089D0CA228D02D0CA30
034C7A27AD0F6228D0B52A8D082A8D0FA2ABDCA2A
8DA92A8DA62A8D0A32A8D0A2A, 293220
2610 DATA 8D09D0A0F7228D062A8D0C2A8D00
2A8DCD2A8D0CA2A8D0C72A8D0C42A8D0C12A8D0E2A
ADF228D04D428D0F0294C62E4, 298588
2620 DATA 48ADF0228D04D4AD0C7228D0AD48D
0000AD0C9228D010AD0C8228D02D0684AD0CE22
85F2A938186908485F385F5AC, 303802
2630 DATA DE2289C0F1F85F0A91085F1ADD622
85F420D328AD0C2285F285F38A186908485F385F5
ACDF2289C0F1F85F0A91085F1, 309026
2640 DATA ADD72285F42D032860ADD02285F2
A93818690585F385F5ACDE2289C61F85F0A91E
85F1ADD082285F42D0328AD01, 314212
2650 DATA 2285F2A93818690585F385F5ACDF
2289C61F85F0A91E85F1ADD92285F42D032860
ADD22285F2A93818690685F3, 319348
2660 DATA 85F5ACDF2289C61F85F0A91F85F1
ADD0A2285F42D0328AD032285F2A93818690685
F385F5ACDF2289C61F85F0A9, 324626
2670 DATA 1F85F1ADD82285F42D032860A000
A90091F4C8C02090F9A00001F091F2A5F2C8C0
2090F5A5F285F4600B0D029, 329710
2680 DATA 0CC9C0D00A9919D0E22A9009D0EA
229DE228D07802290AD0158D0E22D010FEE022
A9009D0E6229D0E822A9019D0E, 334889
2690 DATA 228D078022908D0158D0E22D010FE

```

game of the month

E022A9000DE6229DEA22A9010DE822FECC228C
E022890021DDEC22F00028000, 340044
2700 DATA BDE022F003DEE022A9009DEC228D
E022C914900A9139DE022A9029DEC2260F8A5
14C93C900D18AD082369018D, 345169
2710 DATA 0823A9008514A88948218D0923AD
08234A4A4A09108D0423AD082329F09108D
0523AD09234A4A4A09108D, 350140
2720 DATA 0623AD092329F09108D0723D8AD
0A23F018AD04238D4935AD05238D4A35AD0623
8D4C35AD07238D4035AD0923, 355198
2730 DATA F018AD04238D5D35AD05238D5E35
AD06238D6035AD07238D613560AD0023F00ECE
0D23AD00238D01D2A9008D00, 360290
2740 DATA D260A00A90199002D99002EC800
F7A000A94299002F990031C8A94399002F9900
31C8D0ECA00A943990030C8, 365261
2750 DATA A942990030C8D0F2A000A9819900
32990033990034C8D0F2A006A9C599002F9900
3099003198186909A8C0F900, 370183
2760 DATA ECA004A9009900329818690EA8C0
F090F2A003A904990033C8990033C899003398
18690C8C0F090EA009A9C6, 375220
2770 DATA 99002C60E002E1020F2300, 37639
5



DISK DRIVE SPECIALS

- **PERCOM** AT88-SPP SS/DD with parallel printer interface \$329.95 (with printer purchase) \$319.95
- **INDUS GT-SS/DD** \$349.95 w/sread sheet, database, word processor
- **MATSUSHITA** DS/DD Disk Drive \$164.95 (\$159.95 in QTY of 2 or more)
- **ATARI** 1050 Disk Drive \$299.95 (Double Density enhancement) (\$ CALL)

ATR 8000 (16K) or (64K W/CPM) (\$ CALL)
256K CO-POWER 88 W/M3 DOS \$439.95

APE • FACE™ WITH ANY PRINTER **\$59.95**

PANASONIC 1091 PRINTER \$349.95
120 CPS W/NEAR LETTER QUALITY

300/1200 BAUD MODEM \$299.95
W/SOFTWARE & CABLE



10 SS / DD Disks in Plastic Library Case
Life Long Diskettes **\$17.95**
5 1/4" Double Density (Bulk) \$1.39 ea.

CALL FOR FREE ATARI SOFTWARE CATALOG

BITS & BYTES OF ELECTRONICS

1-800-241-5119

In Georgia Call (404) 395-1000

* Atari is a registered trademark of Atari Inc.

**BE A
PREFERRED
CUSTOMER!**
when
you buy
Atari® software.

ATARI
Languages
Games
Business
Educational
Graphics
Utilities

- ▲ **PREFERRED CUSTOMERS...** have over 2,000 software items to choose from.
- ▲ **PREFERRED CUSTOMERS...** get at least 25% off all titles (and often more!).
- ▲ **PREFERRED CUSTOMERS...** buy from people who specialize in ATARI® exclusively.
- ▲ **PREFERRED CUSTOMERS...** receive prompt, knowledgeable service.
- ▲ **PREFERRED CUSTOMERS...** receive 8 pg. newspapers 9 times a year filled with critiques, special tips, and classified ads for new and used equipment.
- ▲ **PREFERRED CUSTOMERS...** receive our 80 pg. catalog and 20 pg. pricebook.
- ▲ **PREFERRED CUSTOMERS...** receive consistent low prices and good knowledgeable service.
- ▲ **PREFERRED CUSTOMERS...**

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 _____

Computer Model _____ ☐ Disk ☐ Tape

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 \$15.00 per year

▲ Atari - Trademark of Warner Communications Co.

product reviews

RAINBOW WALKER

Synapse Software
5221 Central Ave.
Richmond, CA 94804
(415) 527-7751
\$34.95, 32K — disk
\$34.95, 32K — cassette

Reviewed by Andrew Bell

Rainbow Walker, Synapse Software's latest arcade-style game, joins the company's previous games as one of the most imaginative, graphically stimulating and playable games on the market.

The story is colorful. Once, in a mythical land, a merciless meanie stole all the colors from the rainbow. Wearing magic shoes, brave Cedrick tries to restore the colors piecemeal by hopping from square to square on the dulled rainbow. Wherever he lands, Cedrick leaves a patch of color; hopefully the arc will be returned to its original colors.

Unfortunately for Cedrick, there are some monochromatic-minded creatures who materialize to undo his work. Wherever these creatures land, color disappears.

You control Cedrick by using the joystick to hop in eight directions; pressing the fire button, you can take two-square giant steps. When you color an entire rainbow you advance to the next level. There are 20 levels, each progressively harder, with a surprise if you make it to the top level.

As you move up, the rainbows' shapes become more complex, and new, more aggressive antagonists appear. Fortunately, after each round you can supplement your stock of extra lives by playing the bonus screen, a set of three squares that move first slowly, then faster and faster. The longer you can keep Cedrick on the squares, the more lives you earn. *(This is a great way to test your reflexes and acquired skill. —ANTIC ED)*

Rainbow Walker excels graphically. The rainbow is shown in unique perspective, cutting the horizontal plane at the bottom of the screen and arching

back to the horizon. This is a three-quarter look down at the bow's floor-like tiles. When Cedrick reaches the bottom of the screen and hops forward, the tiles scroll back and a new set of squares comes into view. Hopping toward the top of the screen, Cedrick shrinks in the distance, making the image appear three dimensional.

Rainbow Walker's sound complements the game without becoming obnoxious. The many sound effects are so well meshed with the action that they contribute to the game's overall high quality of play.

The game is hard to play at first, but after a little experience and some determined effort, you will be able to advance to higher levels and improve your scores. Rainbow Walker has ample action and surprises, making it challenging to even the most sophisticated game player. If you're looking for gold, you won't have to go to the end of the rainbow to find it in this game.

THE SEVEN CITIES OF GOLD

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
\$40.00, 48K — disk

Reviewed by Sandra Carlisle

The Seven Cities of Gold is a role playing simulation of the 16th Century Spanish discovery and conquest of the New World. You are a Spanish conquistador leading an expedition through unexplored dangers in search of treasure and glory.

You may face complete panic when you're out of food and goods and can't find your way back to your ships. If you discover and enter a village, you find yourself surrounded by natives. At first you feel frightened — there are so many, crowding too closely.

The subtlety of this game becomes

especially apparent when you must deal with the natives. There is no common language. How do you communicate with a totally alien culture? You can slaughter and plunder, try trickery or treachery, trade for your most pressing needs, or even try to convert the natives and establish missions. These many variables give the game its authenticity, flavor, and challenge.

As you move about, the detailed terrain scrolls by you, demonstrating the game's excellent graphics and animation.

Your expedition is financed by the king, including four ships and their crews, soldiers, food and trading goods.

The strategy and challenge of this one-person arcade-style game are evident as you explore unknown territory.

Seven Cities is highly realistic as a historical and geographical simulation.

If you defeat or trade with the natives, you may have many native bearers. They not only help carry supplies and gold, but also help to locate other villages and gold mines. Your expedition can move at different speeds on land, and much faster on rivers.

Seven Cities has three playing levels. At any level above novice, you must contend with storms at sea, native ambushes, food spoilage, ship wrecks, and even with the disappearance of your ships. Also, the native villages are hidden and can be located only by stopping to look for a "sign." The higher the level, the more realistic the play.

Considering the size of this game (the "game" map alone occupies 65K of disk memory — 2,800 screens!), I was amazed by the speed of the play. I never had to wait for the drive to load the next

product reviews

map portion. Ozark Softscape, the designers, developed a technique to load new portions of the scrolling map without interrupting the play of the game.

The "Random World" generator is an impressive feature of the game. This will create (and write to a disk) as many unique "New Worlds" as you want (all with 2,800 screens), each with different shaped land masses, swamps, villages, mountains, and so on. This sophisticated technique follows established geological rules of plate tectonics and consults a cultural dissemination model for its work. You can even make copies of your unique world and exchange them with your friends for "competitive" play.

Upon your return, you can go to the Outfitters Shop to outfit more ships for future expeditions. You can also visit the Royal Palace to receive recognition for your success, or you can view the game map, or drop into the Pub to save the game.

Since Seven Cities is highly realistic as a historical and geographical simulation, it can be used quite easily as an educational tool. There is no set solution, nor is there a single puzzle to solve.

Best of all, the concepts of entertainment and education are totally integrated. Seven Cities will undoubtedly be a strong contender for game of the year in 1984.

PITFALL!

Activision, Inc.
2350 Bayshore Frontage Road
Mountain View, CA 94043
(415) 960-0410
\$34.95, 8K — cartridge

Reviewed by Ellen Keyt

Deep in the jungle, far away from technologized, urbanized civilization, lives (for a short time at least), Pitfall Harry. This daring jungle explorer has fearlessly entered the dense foliage in search of the fabled treasure concealed within. Leaping over alligators, rolling logs, scorpions and snakes, he spots his first

goal, a gold bar. He runs across the clearing to retrieve it, only to fall to his demise in a huge tar pit.

This may be the most common scenario in one of the most popular games from Activision. Originally written by David Crane for the VCS, this fast action game has finally been released for Atari computers. Every detail featured in the VCS version has been reproduced and as far as graphics are concerned enhanced. Details are very lifelike: Pitfall Harry lopez across the screen in long, easy strides; the scorpion's pincers clutch at Pitfall Harry; barrels roll realistically across the screen, and a vine swings in a smooth, unbroken arc. The animation of all the assorted creatures is excellent, and the joystick responds instantly, preventing "Slip of the Wrist" deaths.

Almost everything about Pitfall is precise and perfect. Although there is usually plenty of time to finish a game, the absence of a pause is annoying. The graphics are 3-D and very realistic, but the game would be improved greatly if the player were allowed to move in and out of the third dimension. In addition, I miss a choice of difficulty function, and, since the game was not designed to eat up quarters at a video arcade, the twenty-minute time limit is entirely unnecessary. In spite of these faults, Pitfall is still exciting, and will greatly please the young arcaders who have long been waiting for the game's release.

DROL

Broderbund Software
17 Paul Dr.
San Rafael, CA 94903
(415) 479-1170
\$39.95, 48K — disk

Reviewed by Brian Ho Fung

Drol is an original, addictive, arcade-style game with beautiful graphics. The game takes you to the underground dream world of Drol, where you must rescue a small family and its pets

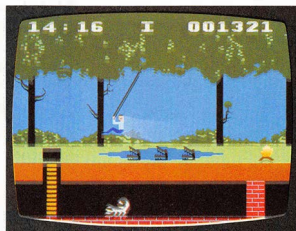
continued on page 80



RAINBOW WALKER



SEVEN CITIES OF GOLD

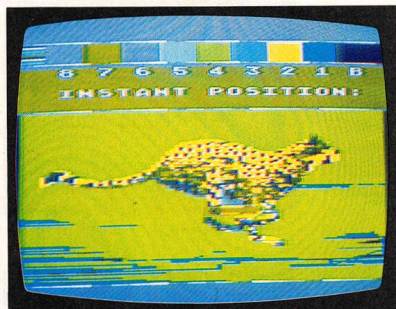


PITFALL!



DROL

microscreens



Cheetah



Stagecoach



Atarian

Here's an extra-big bonus MICROSCREEN section for *Antic*'s 1984 Graphics issue. We're happy for the opportunity to print more than our usual amount of the outstanding pictures we get from our readers.

George R. Bradford (Cheetah, Stagecoach) is a Canadian commercial artist. He places a transparent overlay on his video screen and then makes computer images using either Micro-Painter or Keystroke Artist, a joystick graphics program which appeared in *Antic* August 1983. Mr. Bradford is 51 and says he "just hates to let the young folks have all the fun."

Dorit Tabak of Manhattan (Atarian) is an art student who has owned her Atari 800 for only six months. She made this Picasso-like portrait using a KoalaPad with Micro Illustrator and "a little help from Graphic Master."

microscreens

Jeff McFall (Voyage) lives in Columbus, Indiana and created this South Seas nightscape with Micro Illustrator on KoalaPad.



Voyage

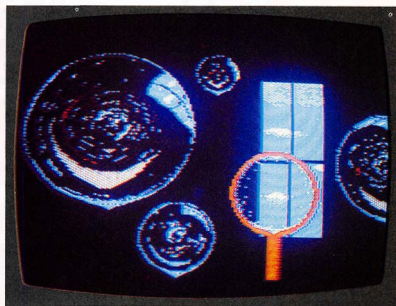
Armand Deveno (Red Balloons, Bubbles) creates his precise and colorful illustrations with KoalaPad and Micro Illustrator. He lives in Springfield, Mass.



Red Balloons

You can create an outstanding picture on your Atari even if you've never been able to draw a straight line before. With the latest under-\$100 touch tablets, light pens and drawing software anybody can now express their artistic visions via computer. You'll also receive fine results using the graphics programs published in **Antic**, such as Keystroke Artist (August 1983) and this current issue's Price's Color Picture Painter and Easy Graphics Converter.

You get an Antic T-shirt if we publish your computer art on the Microscreens page. Send pictures to Antic on disk, along with loading instructions plus a short note telling about yourself and which graphics tools you use . . . also include your two choices of T-shirt size and color.



Bubbles

product reviews

trapped in the fantasy world by an evil witchdoctor's curse.

You are equipped with an anti-gravity rescue suit and an unlimited supply of reality pellets. Drol has three missions: rescue a wandering girl and her jet-propelled pet lizard; save her propeller-

beaned brother and his pet crocodile; and liberate the kids' mother, who is bound with rope on Drol's bottom floor.

Your hero, controlled by the joystick, travels through continuously scrolling multi-levelled corridors seeking captives and trying to avoid a host of dangers—

giant scorpions, monsters, flying turkeys and a killer vacuum cleaner. When you find a captive, you simply touch it to rescue it.

Your hero starts with five lives. Completing three missions, one round, earns you an extra life. Each time your hero dies, he must start from the top corridor. This can be frustrating, especially on the third mission where each corridor is separated by only one or two trapdoors placed far away from each other. Each new round provides faster and deadlier monsters—some of which must be shot repeatedly before they die.

Drol is an exceptionally well-programmed game. It has staying power and a limitless challenge. It can be paused; you can view the high scores while playing, and high scores can be saved to the disk. Drol's one drawback—the long time it takes to load each successive mission—is offset by the game's beautiful animation, smooth-scrolling graphics and non-stop action. Droll will delight players of all ages and will challenge even skilled game players.

CARRIER FORCE

Strategic Simulations, Inc.
883 Stierlin Road, Building A-200
Mountain View, CA 94043-1983
(800) 772-3546
\$59.95, 40K — disk

Reviewed by Christine A. Lunardini

Historic accounts of great World War II naval battles need little embellishment to emphasize their drama. The stakes were enormous in both theaters of the war, but the outcome for the American forces was nowhere so uncertain as it was in the Pacific in 1942. With **Carrier Force**, Strategic Simulations, Inc., has recreated four major battles of the Pacific (Midway, Santa Cruz, the Solomons, and the Coral Sea), with all the tension, excitement, complexity, and uncertainty that accompanied the actual conflicts between the American fleet and the Imperial Japanese Navy.

Carrier Force simulations are very realistic. Gary Grigsby and his creative

Just **\$89** to...

Connect Any Parallel-Input Printer to Your Atari Computer



WORKS WITH ALL ATARI COMPUTERS (INCLUDING XL SERIES) • WORKS WITH ALL PARALLEL-INPUT PRINTERS • WORKS WITH ALL SOFTWARE • HIGHEST QUALITY, LOWEST COST • TWO YEAR WARRANTY

You no longer have to settle for Atari's bulky, expensive 850 Interface Module when for just \$89 you can connect any parallel-input printer to any Atari computer using Axiom's ParallAx-AT printer interface.

We even supply the cables and connectors. A 36-pin connector plugs into the printer while a 13-pin Atari connector plugs into any open socket on your Atari computer. The open socket on the ParallAx-AT can be used for "daisy-chaining" other Atari peripherals.

Our ParallAx-AT is compatible with all software designed to run with a standard parallel-input printer.

The \$89 ParallAx-AT printer interface is available at leading department, discount and computer stores.

For the Outlet Nearest You, Call 818/365-9521

AXIOM
AXIOM CORPORATION

1014 Griswold Ave. • San Fernando, CA 91340 • 818/365-9521 • TWX: 910-496-1746

product reviews

team accounted for virtually every piece of equipment on both sides. As fleet commander of either the U.S. Navy or the IJN, your first duty is to find the opposing fleet. Then you must determine the most effective way to disperse the ships in your command. These include carriers, destroyers, tankers, escorts, and submarines. Aircraft, ranging from B-26 heavy bombers, and F4F fighters to minimally-armed reconnaissance planes, also must be strategically deployed. How many should you place on aircraft carriers and runways? And how far from shore can a strike force proceed before you risk the danger of having to ditch, thus losing valuable men and planes?

Such decisions continually must be made throughout the game. As com-

Carrier Force has recreated four major battles of the Pacific with all the tension, excitement, complexity, and uncertainty that accompanied the actual conflicts.

mander, you are given current and detailed weather and fleet information. You know the location, heading, strength, readiness, damage, armament, and base capability of each fleet task force, reconnaissance plane, and strike force. Task force size, location, and the enemy's attack plan are the unknown factors adding to the realistic tension as you develop your strategies, launch your strike forces, and cross your fingers.

In addition to fleet information, the program features a high-resolution scrolling map with the appropriate island configuration for each scenario. As task forces are sighted, they are represented on the map by colored symbols. As in real sea chases, a task force located during one search can change direction or disappear under thick cloud cover. You know it is somewhere in the area,

but where? Meanwhile, your radar report indicates an approaching strike force of approximately 150 planes headed for one of your bases. Your next set of orders may well decide the battle.

Carrier Force is an advanced strategy game that is easy to play. The only real frustration I found was with the game's documentation. It is very poorly organized, making it difficult to use effectively during game play. It is also poorly edited. For example, the game's list of abbreviations, which is potentially helpful, is incomplete and is not alphabetized. You must read through the entire list to locate the term you are seeking. Though the game comes with two laminated map boards which are quite handy for tracking both fleets, a similar card summarizing important play information (i.e., aircraft capability, pilot endurance, base operation limits, etc.), was not included. Once you have mastered the play techniques, however, these are minor inconveniences in an otherwise excellent game.

NATO COMMANDER

MicroProse
10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151

\$34.95, 48K — disk
\$34.95, 48K — cassette

Reviewed by Edward Bever

Right now, nine Warsaw Pact armies confront nine NATO corps in central Europe. Even in these tense times, experts see little chance of nuclear war, but if one were to start, it would probably start here. You're in the hot seat; you're the NATO commander.

As the game begins, Soviet divisions attack Berlin and roll across the West German border. Urgent reports of fighting start coming in. You must set the missions of air wings and deploy ground troops while the enemy moves relentlessly forward. Your units also move automatically once you tell them where to go; play proceeds at a continuous pace.

Eastern Block units will attack when they come in contact with your troops, while you must carefully plot your own attacks. Your knowledge of the enemy's location is limited, and you must keep track of six variables simultaneously, scrolling across a board the size of four screens.

Overhead, the Allied air forces struggle for domination of the skies. If they succeed before Russian tanks break through, the invasion can probably be halted and peace restored. In any case, the fight will be dirty with chemical and conventional warfare.

This simulation puts you in command of the most dangerous military operation in history.

The nuclear genie may remain in its bottle, but then again, it may not. Both sides have tactical nukes. What will the Russians do if they meet exceptionally fierce resistance? What will we do if our air power cannot come through in time, as the Soviets close on our nuclear depots? What would you do?

NATO Commander lets you find out. Although the program does not always execute flawlessly, the game is exciting and exacting. The simulation puts you in command of the most dangerous military operation in history.

UNIVERSE

Omnitrend Software
P.O. Box 3
West Simsbury, CT 06092
(203) 658-6917
\$89.95, 48K — 1 or 2 disk drives

Reviewed by Harvey Bernstein

In the past, role-playing games have been confined largely to the fantasy world of orcs, trolls, demons, and the like, with not much attention given to

continued on next page

product reviews

the hard-core science fiction fan. Good news, fellow rocket-rangers! Omnitrend's **Universe** has arrived.

This game takes place some time after man's colonization of a galaxy called the Local Group. All contact with Earth has stopped. At the same time evidence has appeared which hints of the existence of an alien artifact, believed to be a hyperspace booster. As a citizen of the Local Group, you must find this mysterious booster and use it to find out what's happened to the people on Earth.

Rather than beginning the game by endowing your character (or yourself) with characteristics, such as strength and dexterity, you borrow 300,000 credits from the Central Bank of Axia (your starting point). With this money you go on to purchase equipment for

first is that Omnitrend has set up a bulletin board that players can access for help. The nitty-gritty action happens after four years of game time play so players can learn the game's fine points before the action gets hot.

Universe does, however, have some serious flaws. It requires a LOT of disk swapping with a one-drive system. The programmers have included a handler for a second drive in the new revision, available now. Also, the game is too slow.

Omnitrend's Universe is a good game that could have been outstanding with a little more polishing. But if you are in the market for a science-fiction strategy game that has more depth than the average adventure, and that will take several months to complete, then Universe is the ideal addition to your game library.

The appendixes supplement the index by listing subroutines alphabetically and by line number. They also list assembly language routines, application programs, and demonstration programs for each chapter.

The first four chapters of this book cover programming techniques such as USB subroutines and memory management. This information is logically necessary for implementation of the routines found in later chapters. Chapters five through fifteen contain hundreds of subroutines, tricks, and concepts. The presentation avoids technical manual computer jargon, and uses clearly defined charts and demonstrations. The novice assembler programmer will benefit from the commented source code listings, yet a knowledge of

Good news, fellow rocket-rangers! Omnitrend's Universe has arrived.

mining, trade, or piracy, all of which you use as a means of survival while on your quest. You quickly find that the easiest way to make money with the least amount of risk is trade and passenger transport. You buy goods and pick up passengers on one planet, and deliver them to a planet of lesser sophistication. As you increase your wealth, you upgrade your equipment and explore the outer reaches of the Local Group, all the while searching for the missing booster.

Many facets of Universe make it a remarkable game, but the main one is its sheer depth of gameplay. Universe is the first Atari game to come on four disks. Included with them is documentation of over 80 pages! The folks at Omnitrend tell me the game takes well over 100 hours to complete, making it one of the better values around. Another

ATARI BASIC FASTER AND BETTER

by Carl M. Evans

I J G, Inc.

1953 W. 11th Street

Upland, CA 91786

(714) 946-5805

\$19.95

Reviewed by Jerry White

Atari BASIC Faster and Better is a 300-page wealth of information. I recommend it highly to those who use BASIC beyond the beginner level. It is a useful addition to the libraries of both the hacker and advanced programmer.

This book contains more subroutine and demonstration program listings than any other book currently available for Atari computers. The BASIC and machine language subroutines are designed to be easily incorporated within the reader's programs. All subroutines and demo programs are also available separately on diskette.

The printing is top quality and easy to read. The book includes a detailed table of contents, which, along with an index, makes it an excellent reference.

This book contains more subroutine and demonstration program listings than any other book currently available for Atari computers.

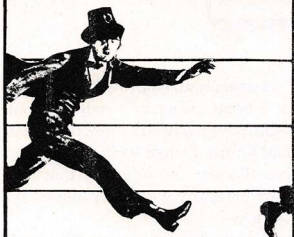
machine language is not needed to use these routines in your BASIC programs.

Some of the topics covered include string manipulation, date and time subroutines, Boolean logic, formatting data entry, display tricks, sound effects, disk utilities, and much much more. The book also contains the most detailed explanation of Atari's error codes that I've ever seen.

If you write BASIC programs on your Atari computer, you will want to keep **Atari BASIC Faster and Better** near your keyboard. This is one book that will not wind up sitting on a shelf, gathering dust.

(Note: IJG has provided ANTIC with a number of these books, which we are selling for \$15.95. We will accept your cheque, or you can charge it to your MasterCard or VISA.—ANTIC ED)

MOVING?



DON'T FORGET US!

New Address:

Name _____
Address _____
City _____
State _____
Zip _____

Place current address label here.



Fill in coupon
and mail to:
Antic Publishing
524 2nd St.
San Francisco,
CA. 94107

product reviews

ADVANCED PROGRAMMING TECHNIQUES FOR YOUR ATARI

by Linda M. Schreiber
Tab Books, Inc.
Blue Ridge Summit, PA 17214
\$14.50
\$24.95, 32K — sample program disk

Reviewed by Matthew Ratcliff

Here is a book for the experienced Atari BASIC programmer. It will teach you how to use all of those special commands you've never quite been able to master. **Advanced Programming Techniques For Your Atari** covers some topics we have seen many times, such as Player/Missile graphics and character-set editing. But many other techniques are explained that have rarely been addressed in print. The author presents her subjects in detail, and gives many sample programs, including assembly language routines called by USR commands. Complete explanations of all programs are straightforward and easy to follow.

The book can be purchased with a Sample Programs Disk, and with all 62 sample routines just a LOAD away, you will find yourself learning much more quickly than if you had to type all that code and debug it. A few complete programs are presented as well, including a character-set editor.

Some assembly language routines are used, and the "source code" is provided. But if you wish to eventually make the jump to AL, this book will not help you much. Although the USR routines work nicely, the comments in the source code are cryptic. The comments tell you exactly what the AL command is doing, without giving you a clue to its purpose. Compare the two listings below. Both will result in the same "object code" (the bytes that the machine operates on), but which is easier to understand?

SAMPLE #1
(typical for this book)

```
LDA #0      ;LOAD THE  
            ;ACCUMULATOR WITH  
            ;THE NUMBER ZERO  
STA 77      ;STORE THE  
            ;ACCUMULATOR AT  
            ;LOCATION 77
```

SAMPLE #2

```
ATRACT=77 ; ATTRACT MODE  
            ;MEMORY LOCATION  
LDA #0      ; A VALUE OF 0 STORED  
            ; HERE  
STA ATRACT ; RESETS THE ATTRACT  
            ;MODE (POKE 77,0)
```

There are things in this book that I have only seen in *De Re Atari*, which is a bit on the technical side for those not familiar with AL. One of the major advantages of this book over magazines covering similar information, is that it consistently uses the same programming technique throughout. This is a real plus, provided you like the author's style. Her BASIC code is well structured and commented.

Some of the more interesting subjects covered include a Vertical Blank Interrupt routine that plays music continuously, even after the BASIC program has stopped, and sample code on page flipping. Below is a quick rundown on the book's table of contents.

- Number Systems
- The Display List
- Graphics
- Animation
- Inside BASIC
- Strings
- Display List Interrupts
- Scrolling
- Page Flipping
- Sound Generators
- The Keyboard
- The Screen Editor
- Disk Use
- Cassette Use

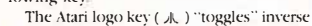
This book will certainly help you put into code many of those nifty programs that have been just too tough to tackle before.





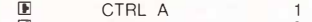
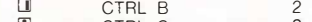

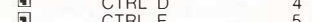
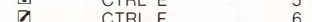

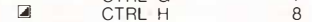
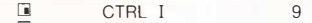
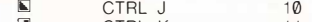
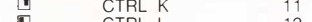
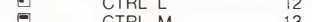
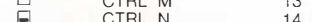
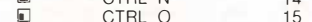
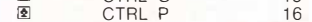


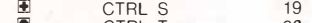
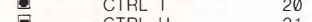
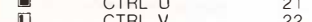
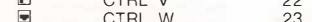
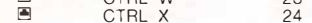

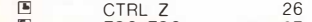

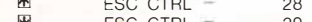
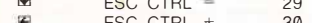
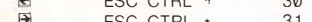






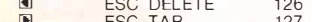
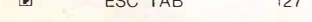



listing conventions

Table Information

Our custom font listings represent each ATASCII character as it appears on the video screen. You generate some characters by a single keystroke, for example, the regular alphabet. Others require a combination or sequence of keystrokes. In this table, ESC means *press and release* the escape key before pressing another key. CTRL or SHIFT means *press and hold* the control or shift key while simultaneously pressing the following key.













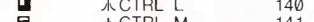

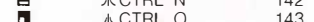
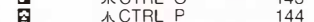





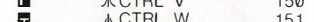
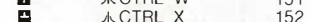
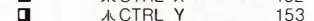

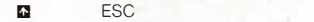
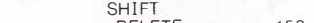



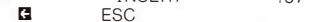



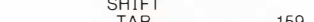










The Atari logo key () "toggles" inverse video for all alphanumeric and punctuation characters. Press the logo key once to turn

NORMAL VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	CTRL 	0
	CTRL A	1
	CTRL B	2
	CTRL C	3
	CTRL D	4
	CTRL E	5
	CTRL F	6
	CTRL G	7
	CTRL H	8
	CTRL I	9
	CTRL J	10
	CTRL K	11
	CTRL L	12
	CTRL M	13
	CTRL N	14
	CTRL O	15
	CTRL P	16
	CTRL Q	17
	CTRL R	18
	CTRL S	19
	CTRL T	20
	CTRL U	21
	CTRL V	22
	CTRL W	23
	CTRL X	24
	CTRL Y	25
	CTRL Z	26
	ESC ESC	27
	ESC CTRL -	28
	ESC CTRL =	29
	ESC CTRL +	30
	ESC CTRL *	31
	CTRL .	96
	CTRL ;	123
	SHIFT =	124
	ESC	
	SHIFT CLEAR	125
	ESC DELETE	126
	ESC TAB	127

it on; press again to turn it off. In the XL line there is no logo key; inverse video is controlled by the Reverse Video Mode key. Decimal values are given as reference, and correspond to the CHR\$ values often used in BASIC listings.

INVERSE VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	⌘ CTRL 	128
	⌘ CTRL B	129
	⌘ CTRL C	130
	⌘ CTRL D	131
	⌘ CTRL E	132
	⌘ CTRL F	133
	⌘ CTRL G	134
	⌘ CTRL H	135
	⌘ CTRL I	136
	⌘ CTRL J	137
	⌘ CTRL K	138
	⌘ CTRL L	139
	⌘ CTRL M	140
	⌘ CTRL N	141
	⌘ CTRL O	142
	⌘ CTRL P	143
	⌘ CTRL Q	144
	⌘ CTRL R	145
	⌘ CTRL S	146
	⌘ CTRL T	147
	⌘ CTRL U	148
	⌘ CTRL V	149
	⌘ CTRL W	150
	⌘ CTRL X	151
	⌘ CTRL Y	152
	⌘ CTRL Z	153
	ESC	154
	SHIFT DELETE	156
	ESC	
	SHIFT INSERT	157
	ESC	
	CTRL TAB	158
	ESC	
	SHIFT TAB	159
	⌘ CTRL 	224
	⌘ CTRL 	251
	⌘ SHIFT =	252
	ESC CTRL 2	253
	ESC	
	CTRL DELETE	254
	ESC	
	CTRL INSERT	255

Antic
The ATARI Magazine

SEEKS AUTHORS

for

BOOKS

SOFTWARE

MAGAZINE ARTICLES

Flat rate
or Royalty

Prompt
Response

For details, send
self-addressed
stamped envelope to:

AUTHOR INFO

c/o ANTIC

524 Second Street
San Francisco, CA
94107

WHAT'S BETTER THAN SPEED READING?

SPEED LEARNING

(SPEED PLUS COMPREHENSION)

Speed Learning is replacing speed reading. It's easy to learn . . . lasts a lifetime . . . applies to everything you read . . . and is the only accredited course with the option of continuing education units.

Do you have too much to read and too little time to read it? Do you mentally pronounce each word as you read? Do you frequently have to go back and reread words or whole paragraphs you just finished reading? Do you have trouble concentrating? Do you quickly forget most of what you read?

If you answer "yes" to any of these questions—then here at last is the practical help you've been waiting for. Whether you read for business or pleasure, school or college, you will build exceptional skills from this major breakthrough in effective reading, created by Dr. Russell Stauffer at the University of Delaware.

Not just "speed reading"—but speed reading-thinking-understanding-remembering-and-learning

The new *Speed Learning Program* shows you step-by-step how to increase your reading skill and speed, so you understand more, remember more and use more of everything you read. The typical remark made by the 200,000 slow readers who completed the *Speed Learning Program* was: "Why didn't someone teach me this a long time ago?" They were no longer held back by the lack of skills and poor reading habits. They could read almost as fast as they could think.

What makes Speed Learning so successful?

The new *Speed Learning Program* does not offer you a rehash of the usual eyeglasses, timing devices, costly gadgets you've probably heard about in connection with speed reading courses or even tried and found ineffective.

In just a few spare minutes a day of easy reading and exciting listening, you discover an entirely new way to read and think—a radical departure from anything you have ever seen or heard about.

Research shows that reading is 95% thinking and only 5% eye movement. Yet most of today's speed reading programs spend their time teaching you rapid eye movement (5% of the problem) and ignore the most important part (95%) thinking. In brief, *Speed Learning* gives you what speed reading can't.

Imagine the new freedom you'll have when you learn how to dash through all types of reading material at least twice as fast as you do now, and with greater comprehension. Think of being able to get on top of the avalanche of newspapers, magazines and correspondence you have to read . . . finishing a stimulating book and retaining facts and details more clearly and with greater accuracy than ever before.

Listen-and-learn at your own pace

This is a practical, easy-to-learn program that will work for you—no matter how slow a reader you think you are now. The *Speed Learning Program* is scientifically planned to get you started quickly . . . to help you in spare minutes a day. It brings you a "teacher-on-cassettes" who guides you, instructs, encourages you, explaining material as you read. Interesting items taken from *Time Magazine*, *Business*

Week, *Wall Street Journal*, *Family Circle*, *N.Y. Times* and many others, make the program stimulating, easy and fun . . . and so much more effective.

Executives, students, professional people, men and women in all walks of life from 15 to 70 have benefited from this program. *Speed Learning* is a fully accredited course . . . costing only 1/5 the price of less effective speed reading classroom courses. Now you can examine the same, easy, practical and proven methods at home . . . in spare time . . . without risking a penny.

Examine Speed Learning FREE for 15 days

You will be thrilled at how quickly this program will begin to develop new thinking and reading skills. After listening to just one cassette and reading the preface you will quickly see how you can achieve increases in both the speed at which you read and in the amount you understand and remember.

You must be delighted with what you see or you pay nothing. Examine this remarkable program for 15 days. If, at the end of that time you are not convinced that you would like to master *Speed Learning*, simply return the program and owe nothing. See the coupon for low price and convenient credit terms.

Special Student Edition

Super Reading Jr. improves schoolwork and grades for ages 11 to 17. Check the coupon for low price.

Note: Many companies and government agencies have tuition assistance plans for employees providing full or partial payment.

In most cases, the entire cost of your *Speed Learning Program* is Tax Deductible.



Special Professional Editions . . .

Now it's easy to stay ahead in your work-related reading. *Speed Learning* is the first speed and comprehension course to focus on the specific reading demands of professionals. The Special Editions have been developed with leading professional societies and publications. Once you've mastered the basic techniques, you'll advance to a workbook which contains reading material and exercises taken from professional publications in your specific field.

Special Editions are available for:

Data Processing, Finance/Accounting, Medicine, Science/Engineering, Management. Be sure to check the appropriate coupon box for the special edition you want.

Continuing Education/Professional Accreditation

The National Management Association, the world's largest association of professional managers, awards CEU's for completion. *Speed Learning* is also offered internationally to members of professional associations for credit. Details are included with your program.

learn
INCORPORATED

Dept. VA-01, 113 Gaither Drive, Mount Laurel, NJ 08054

YES! Please send the materials checked below:

- ☐ Standard Speed Learning program @ \$99.95 plus \$5 postage and handling
☐ Special Edition Speed Learning program @ \$125 plus \$5 postage and handling (check one below):
☐ Medical ☐ Data Processing ☐ Science/Engineering ☐ Management ☐ Finance/Accounting
☐ Check the method of payment below: ☐ NJ Residents add 6% sales tax
☐ Check or money order enclosed
☐ Charge my credit card:

☐ Visa ☐ Master Card ☐ American Express
 Card # _____ Exp. Date _____

I understand that I may examine the materials for 15 days. At the end of that time, if I am not delighted in every way I may return them for a full refund. No questions asked.

Name _____

Address _____

City _____ State _____ Zip _____

Signature _____

Special Student Edition Super Reading Jr.

For ages 11 to 17. Workbook plus 2 cassettes only \$39.95 plus \$3 postage and handling.
☐ Check here to order

— Outside USA add \$10 per item — Airmail extra —

COPY MATE

A fast, easy disk-sector copier

by MIKE PALMER

COPYMATE is a utility program that copies disks. It boots (loads itself) in three seconds and is ready for immediate use. The program is initialized with a set of pre-defined options that are displayed on the screen. You can change these default settings with the **BASIC** customizer program in Listing 2.

To create the working version of **COPYMATE**, type Listing 1 into the **Assembler Editor** or **MAC/65** and assemble it to disk with the command **ASM,, #D:COPYMATE.OBJ**. Next, enter **DOS** and use menu option **L** to load **COPYMATE.OBJ**. (Before entering **DOS**, **XL** owners should boot **Translator** while pressing **[OPTION]** to disable **BASIC**.) As the file loads, hold down **[OPTION]** to run the routine that creates the boot file. Insert a newly-formatted blank disk into Drive 1 and press **[RETURN]**. In a few seconds, a working version of **COPYMATE** will be created and then booted automatically.

To load an existing version of **COPYMATE**, turn off your computer and remove all cartridges. (**XL** owners should boot **Translator** while holding down **[OPTION]** to disable **BASIC**.) Now put the **COPYMATE** disk in Drive 1 and turn on the computer (**XL** owners press **[SELECT]**).

Before starting a copy, you can change any of the displayed options with a single keystroke. Press **[S]** or **[D]** to switch the source or destination drive number between 1 and 2, **[F]** to choose a formatting option, and **[W]** to turn Write Verification on and off.

COPYMATE displays a "map" of the source (original) disk on the screen. Each of the 720 dots initially displayed represent one sector (128 bytes) of the disk. If a sector contains data, the dot is replaced by a larger dot; if the sector can't be read, a question mark replaces the dot. When the sector is empty, the original dot remains. A line at the bottom of the screen indicates (in hexadecimal) the number of the sector

SYNOPSIS

This self-booting disk-copy program copies an entire disk in two passes with 48K (or more) RAM, but works in as little as 16K. The main program listing is written in assembly language, and requires OSS's MAC/65 or the Atari Assembler Editor cartridge. With Atari XL machines, the Translator disk is required to run the machine-language program generated from the assembled listing. Antic disk subscribers: follow directions in article.

being read or written.

COPYMATE does not copy blank sectors. You can copy your source disk in one pass if it is less than half full. To produce an exact copy, however, the destination disk must be formatted first. Results are unpredictable when this is not done.

When **COPYMATE** encounters a disk read error, it will retry the sector involved for up to 15 seconds before proceeding to the next one. If you know a sector is bad, move **COPYMATE** to the next sector by pressing **[BREAK]**. When reading a series of bad sectors, wait at least 15 seconds between presses of

[BREAK] or you may miss a sector.

If you're not using the **Translator** disk, you can press **[RESET]** at any time to abort a copy and return to the initial menu of options. Press **[SELECT]** during a read operation to skip the rest of the disk and start writing what's been read to the destination disk. If you're copying a **DOS** disk, do not press **[SELECT]** until the disk **VTOC** and directory (sectors \$168 to \$170) have been read. Otherwise, you won't be able to access the files on the disk.

You can use the **[OPTION]** key to make multiple copies of a disk with a single disk drive. You can also do this with a two-drive setup, but only if the source disk is less than half full (one-pass copy). Since you'll be switching half-copied disks, and there are no special prompts, you must keep track of each step of the operation.

First, set up for a one-drive copy. Insert the source disk and press **[START]**. When "INSERT DESTINATION DISK" appears, insert the first destination disk and press **[START]**. When "INSERT SOURCE DISK" or "COPY COMPLETE" appears, press **[OPTION]** to indicate that the data that's been read is to be written again. Then insert the second destina-

continued on next page

tion disk, and press [START]. Repeat the last two steps for each additional copy, and then repeat the entire process until all copies have been completed.

CUSTOMIZING COPYMATE

Listing 2 is a BASIC program (CUSTOMIZER) that sets COPYMATE parameters to your specifications. Type in Listing 2, check it with TYPO, and SAVE a copy as a backup. RUN the program and put the COPYMATE boot disk in Drive 1. (Use your backup copy of COPYMATE, in case there's a typing error in the CUSTOMIZER program.) Press [RETURN] and answer each question. The range of responses for each parameter is shown in square brackets; the current setting appears under the cursor. To accept the current setting for any parameter, press [RETURN]. After the final question, the new options will be written to the boot disk. Remember to

remove the BASIC cartridge before you boot COPYMATE.

When using CUSTOMIZER, you must specify the make of the drive to be used. With one exception, Atari-compatible drives write zeros to a disk during the formatting operation. The exception is the Percom drive, which writes a pattern of \$1A (hex) to the disk. For COPYMATE to determine whether a sector is empty or not, it must know if the disk was formatted on a Percom drive. If this option isn't set correctly, COPYMATE will work, but it won't skip blank sectors.

Mike Palmer is a software systems analyst (he designs operating systems) for a flight simulator firm in Quebec, Canada. He has owned his Atari 800 for 18 months, and programs primarily in assembly language. Mike is trying to start an Atari Users' Group in his area.

Listing 1

```

0100 .OPT NO LIST
0110 .TAB 11,15,31
0120 .TITLE "COPYMATE 1.4 03/21/
0130
0140
0150 COPYMATE 1.4
0160 BY MIKE PALMER
0170 ANTIC MAGAZINE
0180
0190
0200 PAGE ZERO
0210
0220
0230 SOURCE DRIVE
0240 DESTINATION DRIVE
0250 NUMBER OF DRIVES
0260
0270
0280
0290 SOURCE DRIVE
0300 DESTINATION DRIVE
0310 NUMBER OF DRIVES
0320
0330
0340
0350
0360
0370
0380
0390
0400
0410
0420
0430
0440
0450
0460
0470
0480
0490
0500
0510
0520
0530
0540
0550
0560
0570
0580
0590
0600
0610
0620
0630
0640
0650
0660
0670
0680
0690
0700
0710
0720
0730
0740
0750
0760
0770
0780
0790
0800
0810
0820
0830
0840
0850
0860
0870
0880
0890
0900
0910
0920
0930
0940
0950
0960
0970
0980
0990
1000
1010
1020
1030
1040
1050
1060
1070
1080
1090
1100
1110
1120
1130
1140
1150
1160
1170
1180
1190
1200
1210
1220
1230
1240
1250
1260
1270
1280
1290
1300
1310
1320
1330
1340
1350
1360
1370
1380
1390
1400
1410
1420
1430
1440
1450
1460
1470
1480
1490
1500
1510
1520
1530
1540
1550
1560
1570
1580
1590
1600
1610
1620
1630
1640
1650
1660
1670
1680
1690
1700
1710
1720
1730
1740
1750
1760
1770
1780
1790
1800
1810
1820
1830
1840
1850
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
2110
2120
2130
2140
2150
2160
2170
2180
2190
2200
2210
2220
2230
2240
2250
2260
2270
2280
2290
2300
2310
2320
2330
2340
2350
2360
2370
2380
2390
2400
2410
2420
2430
2440
2450
2460
2470
2480
2490
2500
2510
2520
2530
2540
2550
2560
2570
2580
2590
2600
2610
2620
2630
2640
2650
2660
2670
2680
2690
2700
2710
2720
2730
2740
2750
2760
2770
2780
2790
2800
2810
2820
2830
2840
2850
2860
2870
2880
2890
2900
2910
2920
2930
2940
2950
2960
2970
2980
2990
3000
3010
3020
3030
3040
3050
3060
3070
3080
3090
3100
3110
3120
3130
3140
3150
3160
3170
3180
3190
3200
3210
3220
3230
3240
3250
3260
3270
3280
3290
3300
3310
3320
3330
3340
3350
3360
3370
3380
3390
3400
3410
3420
3430
3440
3450
3460
3470
3480
3490
3500
3510
3520
3530
3540
3550
3560
3570
3580
3590
3600
3610
3620
3630
3640
3650
3660
3670
3680
3690
3700
3710
3720
3730
3740
3750
3760
3770
3780
3790
3800
3810
3820
3830
3840
3850
3860
3870
3880
3890
3900
3910
3920
3930
3940
3950
3960
3970
3980
3990
4000
4010
4020
4030
4040
4050
4060
4070
4080
4090
4100
4110
4120
4130
4140
4150
4160
4170
4180
4190
4200
4210
4220
4230
4240
4250
4260
4270
4280
4290
4300
4310
4320
4330
4340
4350
4360
4370
4380
4390
4400
4410
4420
4430
4440
4450
4460
4470
4480
4490
4500
4510
4520
4530
4540
4550
4560
4570
4580
4590
4600
4610
4620
4630
4640
4650
4660
4670
4680
4690
4700
4710
4720
4730
4740
4750
4760
4770
4780
4790
4800
4810
4820
4830
4840
4850
4860
4870
4880
4890
4900
4910
4920
4930
4940
4950
4960
4970
4980
4990
5000
5010
5020
5030
5040
5050
5060
5070
5080
5090
5100
5110
5120
5130
5140
5150
5160
5170
5180
5190
5200
5210
5220
5230
5240
5250
5260
5270
5280
5290
5300
5310
5320
5330
5340
5350
5360
5370
5380
5390
5400
5410
5420
5430
5440
5450
5460
5470
5480
5490
5500
5510
5520
5530
5540
5550
5560
5570
5580
5590
5600
5610
5620
5630
5640
5650
5660
5670
5680
5690
5700
5710
5720
5730
5740
5750
5760
5770
5780
5790
5800
5810
5820
5830
5840
5850
5860
5870
5880
5890
5900
5910
5920
5930
5940
5950
5960
5970
5980
5990
6000
6010
6020
6030
6040
6050
6060
6070
6080
6090
6100
6110
6120
6130
6140
6150
6160
6170
6180
6190
6200
6210
6220
6230
6240
6250
6260
6270
6280
6290
6300
6310
6320
6330
6340
6350
6360
6370
6380
6390
6400
6410
6420
6430
6440
6450
6460
6470
6480
6490
6500
6510
6520
6530
6540
6550
6560
6570
6580
6590
6600
6610
6620
6630
6640
6650
6660
6670
6680
6690
6700
6710
6720
6730
6740
6750
6760
6770
6780
6790
6800
6810
6820
6830
6840
6850
6860
6870
6880
6890
6900
6910
6920
6930
6940
6950
6960
6970
6980
6990
7000
7010
7020
7030
7040
7050
7060
7070
7080
7090
7100
7110
7120
7130
7140
7150
7160
7170
7180
7190
7200
7210
7220
7230
7240
7250
7260
7270
7280
7290
7300
7310
7320
7330
7340
7350
7360
7370
7380
7390
7400
7410
7420
7430
7440
7450
7460
7470
7480
7490
7500
7510
7520
7530
7540
7550
7560
7570
7580
7590
7600
7610
7620
7630
7640
7650
7660
7670
7680
7690
7700
7710
7720
7730
7740
7750
7760
7770
7780
7790
7800
7810
7820
7830
7840
7850
7860
7870
7880
7890
7900
7910
7920
7930
7940
7950
7960
7970
7980
7990
8000
8010
8020
8030
8040
8050
8060
8070
8080
8090
8100
8110
8120
8130
8140
8150
8160
8170
8180
8190
8200
8210
8220
8230
8240
8250
8260
8270
8280
8290
8300
8310
8320
8330
8340
8350
8360
8370
8380
8390
8400
8410
8420
8430
8440
8450
8460
8470
8480
8490
8500
8510
8520
8530
8540
8550
8560
8570
8580
8590
8600
8610
8620
8630
8640
8650
8660
8670
8680
8690
8700
8710
8720
8730
8740
8750
8760
8770
8780
8790
8800
8810
8820
8830
8840
8850
8860
8870
8880
8890
8900
8910
8920
8930
8940
8950
8960
8970
8980
8990
9000
9010
9020
9030
9040
9050
9060
9070
9080
9090
9100
9110
9120
9130
9140
9150
9160
9170
9180
9190
9200
9210
9220
9230
9240
9250
9260
9270
9280
9290
9300
9310
9320
9330
9340
9350
9360
9370
9380
9390
9400
9410
9420
9430
9440
9450
9460
9470
9480
9490
9500
9510
9520
9530
9540
9550
9560
9570
9580
9590
9600
9610
9620
9630
9640
9650
9660
9670
9680
9690
9700
9710
9720
9730
9740
9750
9760
9770
9780
9790
9800
9810
9820
9830
9840
9850
9860
9870
9880
9890
9900
9910
9920
9930
9940
9950
9960
9970
9980
9990

```

```

1450 : *****
1460 : * USER DEFINITION TABLE *
1470 : *****
1480 :
1490 DEFSRC .BYTE $01 SOURCE DRIVE =
1500 DEFOST .BYTE $02 DESTINATION DRIVE
1510 DEFFMT .BYTE $00 FORMATTING $00=0
1520 DEFFVY .BYTE $50 WHITE VERIFY $50
1530 DEFOST .BYTE $02 NUMBER OF DRIVES
1540 FMTCHR .BYTE $00 ATARI=$00 PERCOM
1550 :
1560 DENSITY .WORD $00 CURRENTLY SINGLE
1570 : DENSITY ONLY
1580 :
1590 : BOOT INITIALIZATION
1600 : *****
1610 :
1620 BOONIT LDA TRAMS5 ANY CARTRIDGES
1630 ORA TSDAT PLUGGED IN ?
1640 BEQ BOONAK
1650 LDX =CRMSG&255 TELL USER TO
1660 LDX =CRMSG/256 REMOVE IT
1670 JSR PRINT
1680 BOODIE JMP BOODIE HANG AROUND
1690 :
1700 BOONAK LDA CONSL MAKE BOOT DISK?
1710 CMP =OPTNKEY
1720 BNE BOOST NO
1730 JMP MAKER YES
1740 :
1750 BOOST LDA =RUNNIT&255 SET UP RES
1760 : ET
1770 STA DOSVEC KEY VECTORS
1780 STA DOSINI
1790 LDA =RUNNIT/256
1800 STA DOSVEC+1
1810 STA DOSINI-1
1820 :
1830 LDA =0 INIT POINTER
1840 STA SECSAV SAVERS
1850 STA SECSAV+1
1860 STA BUFSAV
1870 STA BUFSAV+1
1880 :
1890 SET-UP USING USER DEFINITION
1900 : TABLE
1910 :
1920 LDA DEFSRC SOURCE DRIVE
1930 STA SRCORV
1940 CLC
1950 ADC =530
1960 STA OPTS
1970 LDA DEFOST DESTINATION DRIVE
1980 STA OSTORV
1990 :
2000 STA AOC =530
2010 STA OPTO
2020 LDA NORIVE TOTAL # DRIVES
2030 STA NUMORV
2040 INC NUMORV
2050 LDA FMTCHR FORMAT CHARACTER
2060 STA FMTTYP
2070 LDA DENSIT DISK DENSITY
2080 STA SECSIZ
2090 LDA DENSIT+1
2100 STA SECSIZ+1
2110 :
2120 LDA =0 SET UP 'ON'
2130 STA ONMSG AND 'OFF' MSGS
2140 :
2150 LDA =0
2160 STA ONMSG+1
2170 STA OFFMSG
2180 :
2190 LDA =F
2200 STA OFFMSG+1
2210 STA OFFMSG+2
2220 :
2230 LDX =OPTV-OPTMS3 WRITE
2240 LDA =PUTVER VERIFICATION
2250 CMP DEFFVY
2260 :
2270 BNE BOOVOF
2280 BOOVON STA WRTMOO
2290 LDX =0
2300 BEQ BOOVFY (JMP)
2310 BOOVOF LDA =PUTSEC
2320 STA WRTMOO
2330 LDX =3
2340 BOOVFY JSR BOOUPD
2350 :
2360 LDX =OPTF-OPTMS3 FORMAT
2370 LDA =0N DESTINATION
2380 CMP DEFFMT
2390 BNE BOOFOF
2400 BOOFOF STA FMTFLG
2410 LDX =0
2420 BEQ BOOFMT (JMP)
2430 BOOFOF LDA =0
2440 STA FMTFLG
2450 LDX =3
2460 BOOFMT JSR BOOUPD
2470 :
2480 LDA SAVMSG FIX SCREEN WRITE
2490 CLC ADDRESSES FOR
2500 ALD MEMORY SIZES
2510 STA SECPIX-2 OTHER THAN 40K
2520 STA SECPIX-5
2530 STA SECPIX+8
2540 :
2550 BOOEPL LDA DRVBYT IS THIS A BOOT
2560 :
2570 BEQ BOOONON
2580 JMP WAMSV NO - DO STS RESET
2590 BOOONON RTS YES - INIT DONE
2600 :
2610 BOOUPD LDA ONMSG,X UPDATE ON/OFF
2620 STA OPTMS3,Y MESSAGES
2630 LDA ONMSG+1,X
2640 STA OPTMS3+1,Y
2650 LDA ONMSG+2,X
2660 STA OPTMS3+2,Y
2670 BOOEND RTS
2680 :
2690 CRMSG .BYTE "PLEASE REMO
2700 VE ALL CARTRIDGES"
2710 .BYTE " AND T
2720 HEN RE-BOOT",50
2730 .PAGE
2740 ORIGINZ =3350 MAIN CODE ORIGIN
2750 :
2760 : RUN INITIALIZATION
2770 : *****
2780 :
2790 RUNNIT LDA =0 SET LEFT &
2800 STA LMARGN RIGHT MARGIN
2810 LDA =31 TO ASSIST IN
2820 STA RMARGN MSG OUTPUT
2830 :
2840 LDA =504 STANDARD
2850 STA BORDER SCREEN COLOR
2860 :
2870 LDA =0 ZERO OUT
2880 LDA RUNZRO STA OUNIT,X DISK DCB
2890 :
2900 OEX
2910 BNE RUNZRO
2920 :
2930 LDA =DISKID UNIT ID = DISK
2940 STA OBUSID
2950 INC OSECLD FIRST SEC = 1
2960 :
2970 LDX =HORMSG&255 0/P COPYMATE
2980 LDX =HORMSG/256 HEADER MSG
2990 JSR PRINT
3000 :
3010 : OPTION CHANGER
3020 : *****
3030 :
3040 OPTCHG LDA =7 RESET TO OPTION
3050 STA ROWCRS DISPLAY AREA
3060 :
3070 LDX =OPTMS1&255 DISPLAY
3080 STA OPTMS1/256 CURRENT
3090 JSR PRINT OPTIONS
3100 LDX =OPTMS2&255
3110 LDX =OPTMS2/256
3120 :
3130 JSR PRINT
3140 LDX =OPTMS3&255
3150 LDY =OPTMS3/256
3160 :
3170 LDA =GETDAT DATA DIRECTION
3180 STA OSTATS
3190 JSR INSEIZ "INSERT" MSG
3200 LDA =DRKINH INHIBIT BREAK KEY
3210 STA IROEN
3220 STA POKMSK
3230 :
3240 OPTLUP LDA CONSL STANLY PRESSED
3250 CMP =STRTKY YET ?
3260 BNE OPTKEY
3270 BEQ VTOWIT GO!
3280 :
3290 OPTKEY LDA CH CHANGE OPTIONS?
3300 CMP =SKEY SOURCE DISK
3310 BEQ OPTSRC
3320 CMP =OKEY SURVEILLANCE DISK
3330 BEQ OPTDST
3340 CMP =FKEY FORMAT
3350 BEQ OPTFMT
3360 CMP =VKEY VERIFY
3370 BEQ OPTVVF
3380 CMP =WKEY VERIFY
3390 BNE OPTLUP
3400 :
3410 : CHANGE VERIFY OPTION
3420 OPTVLF LDY =OPTV-OPTMS3 MSG OFFSE
3430 :
3440 LDA =PUTVER
3450 CMP WRTMOO VERIFY ON?
3460 BEQ OPTVOF
3470 OPTVOF STA WRTMOO TURN VFY ON
3480 LDX =0 ON MSG
3490 BEQ OPTUPO (JMP)
3500 OPTUPO LDA =PUTSEC
3510 STA WRTMOO TURN VFY OFF
3520 LDX =3 SELECT OFF MSG
3530 BNE OPTUPO (JMP)
3540 :
3550 : CHANGE FORMAT OPTION
3560 OPTFMT LDY =OPTF-OPTMS3 MSG OFFSE
3570 :
3580 LDA =0N
3590 CMP FMTFLG FORMAT ON?
3600 BEQ OPTFOF
3610 OPTFOF STA FMTFLG TURN FMT ON
3620 LDX =0 ON MSG
3630 BEQ OPTUPO (JMP)
3640 OPTFOF DEC FMTFLG TURN FMT OFF
3650 LDX =3 OFF MSG
3660 :
3670 : CHANGE OPTION MESSAGES
3680 :
3690 OPTUPO LDA ONMSG,X X=FROM OFFSET
3700 STA OPTMS3,Y Y=TO OFFSET
3710 LDA ONMSG+1,X
3720 STA OPTMS3+1,Y
3730 LDA ONMSG+2,X
3740 STA OPTMS3+2,Y
3750 BNE OPTCLK (JMP)
3760 :
3770 : CHANGE DRIVE OPTIONS
3780 :
3790 OPTSRC LDX =0 SET UP TO
3800 LDY =0 CHANGE SRC
3810 BEQ OPTVR (JMP)
3820 OPTVR LDX =1 SET UP TO
3830 LDY =OPTO-OPTS CHANGE DEST
3840 OPTVR INC SRCORV,X
3850 LDA SRCORV,X
3860 CMP NUMORV
3870 BCC OPTLT
3880 LDA =1 RESET TO 1
3890 STA SRCORV,X
3900 CLC
3910 OPTLT ADC =530
3920 STA OPTS,Y UPDATE MSG
3930 :

```

continued on next page

assembly language

```

3920 :
3930 OPTCLK LDA =SFF CLEAR KEY
3940 STA CH PRESS
3950 OPTEND JMP OPTCHG
3960 :
3970 : SCREEN VTDC INITIALIZATION
3980 : -----
3990 :
4000 VTOTN1 LDA =SCVTDC VTDC SCR N OFFS
4010 :
4020 STA VTDC
4030 STA VTDC1
4040 LDA SAVMSG
4050 STA VTDC-1
4060 LDA #3 LOOP 3 TIMES
4070 LDA =EMPTY
4080 VTOLP1 LOY =0 INIT 1000 BYTES
4090 VTOLP2 STA (VTDC1),Y EACH PASS
4100 INY
4110 BNE VTOLP2
4120 INC VTDC1-1
4130 DEX
4140 BNE VTOLP1
4150 :
4160 : COPY DISK
4170 : =====
4180 :
4190 : GET BLOCK OF SECTORS
4200 : -----
4210 :
4220 GET LDA SRCORV
4230 STA UNIT
4240 LDA =GETSEC
4250 STA OCONNO
4260 LDA DSECLD NO MSG ON
4270 CMP #1 FIRST PASS
4280 BEQ GET.1
4290 JSR INSECT ; "INSERT" MSG
4300 JSR WAIT1 WAIT FOR COI
4310 :
4320 GET.0 LDA =LOAD SAVE START
4330 STA SECSAV SEC = AND VTDC
4340 LDA DSECHI POINTER FOR
4350 STA SECSAV+1 WRITE BACK OUT
4360 LDA VTDC TO DISK LATER
4370 STA VIOSAV
4380 LDA VTDC-1
4390 STA VIOSAV+1
4400 :
4410 LDA =REDSMSG+255;"READING" MSG
4420 LDA =REDSMSG/256
4430 JSR PASNIT PASS INIT
4440 :
4450 GET.1 LDA CONSOLE SELECT KEY
4460 CMP =SELKEY PRESSED?
4470 BEQ PUT SKIP READING
4480 :
4490 LDA =GETDAT SET DATA DIR
4500 JSR SECTIO GET A SECTOR
4510 BPL GET.2 NO ERROR
4520 :
4530 TYA RE-TRY UNIT
4540 AND =SFF ERR 500 (BRK)
4550 BNE GET.1 OR 500 (DONE)
4560 LDA =BAD SHOW BAD
4570 BNE GET.5 (JMP)
4580 :
4590 GET.2 LOY DCNTLO
4600 :
4610 GET.3 LDA (BUFFER),Y ANY DATA IN
4620 CMP FMTSTV THIS SECTOR
4630 BNE GET.4 YES
4640 DEY
4650 BPL GET.3 KEEP LOOKING
4660 LDA =EMPTY NO
4670 BNE GET.5 (JMP)
4680 GET.4 JSR INCBUF INC BUFFER POINT
4690 :
4700 LDA =DATA
4710 GET.5 LOY =0
4720 STA (VTDC),Y STORE SECTOR STA
4730 JSR INCSEC INC OTHER POINTER
4740 :
4750 BCC GET.1 GET NEXT SECTOR

```

```

4760 :
4770 : PUT BLOCK OF SECTORS
4780 : -----
4790 :
4800 PUT LDA OSTRV DESTINATION DRV
4810 STA UNIT
4820 LDA =PUTDAT SET DATA DIR
4830 STA OSTATS
4840 JSR INSECT ; "INSERT" MSG
4850 JSR WAIT1 WAIT FOR COI
4860 :
4870 PUT.1 JSR FMTOST
4880 :
4890 LDA SECSAV RESET
4900 STA OSECLD SECTOR & VTDC
4910 LDA SECSAV+1 POINTERS FOR
4920 STA OSECHI WRITING SECTORS
4930 LDA VIOSAV
4940 STA VTDC
4950 LDA VIOSAV+1
4960 STA VTDC-1
4970 LDA =WRITMSG+255;"WRITING"
4980 LOY =WRITMSG/256
4990 JSR PASNIT
5000 LDA WRTMOD WITH OR WITHOUT V
5010 :
5020 STA OCONNO
5030 :
5040 PUT.2 LOY =0 DATA IN THIS SEC?
5050 LDA (VTDC),Y
5060 AND =SEU
5070 BEQ PUT.4 NO - NOTHING TO D
5080 :
5090 LDA =PUTDAT SET DATA DIR
5100 JSR SECTIO PUT A SECTOR
5110 BPL PUT.3
5120 :
5130 LDA =WRITMSG+255;"WRITE ERROR"
5140 LOY =WRITMSG/256
5150 JSR CHKOST "CHECK DEST"
5160 LDA SECSAV RE-TRY ON
5170 CPX #1 1ST PASS ONLY
5180 BNE PUT.2A
5190 LDA SECSAV+1
5200 BEQ PUT.1
5210 :
5220 PUT.2A JMP (DOSVEC) ABORT COPY
5230 :
5240 PUT.3 LDA =DATA
5250 LOY =0
5260 STA (VTDC),Y
5270 :
5280 JSR INCBUF INCREMENT
5290 PUT.4 JSR INCSEC POINTERS
5300 :
5310 BCC PUT.2 PUT NEXT SECTOR
5320 :
5330 BEQ DONE COPY COMPLETE?
5340 JMP GET NO
5350 :
5360 : COPY DONE
5370 : =====
5380 :
5390 DONE LDA =DNEMSG+255;"DONE"
5400 LOY =DNEMSG/256
5410 JSR PRINTW
5420 JSR WAIT
5430 JMP (DOSVEC) NEXT COPY
5440 :
5450 : SUBROUTINES
5460 : =====
5470 :
5480 : DISK INSERT MESSAGES
5490 : =====
5500 :
5510 INSERT1 LDA SRCORV 2 DRIVES ?
5520 CMP OSTRV
5530 BNE INSENO NO MSG
5540 INSERT2 LDA SRCORV 2 DRIVES ?
5550 CMP OSTRV
5560 BNE INSENO
5570 INSENO LDA OSTATS READ OR WRITE?
5580 BPL INSSRC WRT=VE READ=VE
5590 INSENO LOY =DNEMSG+255;"INSERT"
5600 LOY =DNEMSG/256 DESTINATION"

```

```

5610 BNE INSPRT (JMP)
5620 INSSRC LOY =SRCMSG+255;"INSERT"
5630 LOY =SRCMSG/256 SOURCE DISK"
5640 BNE INSPRT (JMP)
5650 INSENO LOY =BOTMSG+255;"INSERT"
5660 LOY =BOTMSG/256 BOTH DISKS"
5670 INSENO JSR PRINTW
5680 INSENO LOY =TPSMMSG+255;"THEN PRES"
5690 :
5700 LOY =TPSMMSG/256 START"
5710 JSR PRINTW
5720 INSENO RTS
5730 :
5740 : PASS INITIALIZATION
5750 : -----
5760 PASNIT JSR PRINTW O/P MSG
5770 :
5780 LDA =BUFROT+255 INIT TO START
5790 STA OBUFLO OF BUFFER
5800 STA BUFFER
5810 LDA =BUFROT/256
5820 STA OBUFI
5830 STA BUFFER-1
5840 :
5850 PASEPL STA ATTRACT ATTRACT MODE OF
5860 :
5870 LDA =BRKENA ENABLE BREAK KEY
5880 STA IROEN
5890 :
5900 PASEND RTS
5910 :
5920 : INCREMENT POINTERS
5930 : -----
5940 INCBUF LDA BUFFER INC BUFFER
5950 CLC POINTERS BY
5960 ADC SECISZ SECTOR SIZE
5970 STA OBUFI
5980 :
5990 LDA BUFFER-1
6000 ADC SECISZ-1
6010 STA OBUFI
6020 STA BUFFER-1
6030 :
6040 : IF WE HAVE REACHED THE COD
6050 :
6060 : SECTION OF MEMORY - SKIP I
6070 :
6080 CMP =ORIGN2/256
6090 BNE INCRITS
6100 LDA =ORIGN2/256+5
6110 STA BUFFER-1
6120 STA OBUFI
6130 LDA =0
6140 STA BUFFER
6150 INCRITS RTS
6160 :
6170 INCSEC LDA OSECLD LAST
6180 LOY =LSTSEC+255 SECTOR ?
6190 BNE INC.2
6200 LOY OSECHI
6210 CPX =LSTSEC/256
6220 BEQ INCEND
6230 :
6240 INC.2 INC DSECLD INCREMENT SECTOR
6250 BNE INC.3 AND VTDC POINTERS
6260 INC DSECHI
6270 INC.3 INC VTDC
6280 BNE INC.4
6290 INC VTDC-1
6300 :
6310 INC.4 LDA BUFFER-1
6320 CMP SAVMSG BUFFER FULL?
6330 BCC INCENO NO
6340 LDA =1 SHOW BUFFER FULL
6350 INCENO RTS
6360 :
6370 : WAIT FOR START KEY PRESS
6380 : =====
6390 :
6400 WAIT1 LDA SRCORV 2 DRIVES ?
6410 CMP OSTRV
6420 BNE WAITNO
6430 :

```

```

6440 WAIT LDA =BRKINH INHIBIT BREAK KE
Y
6450 STA IRQEN DURING THE WAIT
6460 STA PDKMSK
6470
6480 LDA CONSOLE
6490 CPX =STARTKEY START KEY?
6500 BEQ WAITNO
6510 CPX =OPTNKY OPTION KEY?
6520 BNE WAIT
6530
6540 PLA LOSE RETURN ADDR
6550 PLA OPTION =
6560 JMP PUT REPEAT COPY
6570 WAITNO RTS
6580
6590 "CHECK DESTINATION"
6600
6610 CHKST JSR PRINTW O/P ERROR MSG
6620 LDA =CHKMSG&255;"CHECK DEST"
6630 LOY =CHKMSG/256
6640 JSR PRINTW
6650 JSR INSTRT "START"
6660 JSR WAIT WAIT FOR GO
6670 CHKEND RTS
6680
6690 SECTOR 1/0
6700
6710
6720
6730 SECTID STA DSTATS DATA DIRECTION
6740 LDA =TIMOUT
6750 STA OTIMLO
6760 LDA SECSIZ
6770 STA DCNTLO
6780
6790 LDA =POINT POINT TO CURRENT
6800 LOY =0 SECTOR IN THE
6810 LDA (VIOC),Y SCREEN VIOC
6820
6830 LDA DSECLD WRITE SECTOR
6840 JSR HEXSCR NUMBER TO THE
6850 SECIFX STX SCNSC-3 SCREEN
6860 STX SCNSC-2
6870 LDA DSECHI
6880 JSR HEXSCR
6890 STA SCNSC-1
6900
6910 JSR SIOV DO THE 1/0
6920 SHOEND RTS
6930
6940 CONVERT HEX TO SCREEN CODE
6950
6960 A=HEX -> X=LSB Y=MSB
6970
6980 HEXSCR PHA SAVE =
6990 LSR A GET MSB
7000 LSR A
7010 LSR A
7020 LSR A
7030 JSR HEX1 CONV SCH CODE
7040 TAY RETURN IN Y
7050 PLA
7060 AND =50F GET LSB
7070 JSR HEX1 CONV SCH CODE
7080 TAX RETURN IN X
7090 RTS
7100
7110 HEX1 CMP =50A BETWEEN 8&9?
7120 BCC HEX2
7130 CLC NO A-F
7140 ADC =507 "A"=521
7150 HEX2 ADC =510 "0"=510
7160 HEXEND RTS
7170
7180 SCREEN PRINT
7190
7200
7210 PRINTW LDA =4 WINDOW ON
7220 STA BOTSCH
7230 PRINT STX CRSINH INHIBIT CURSOR
7240 JSR PUTLIN
7250 LDA =24
7260 STA BOTSCH WINDOW OFF
7270 FRIEND RTS
7280
7290 FORMAT DESTINATION
7300
7310
7320 FMTOST LDY FMTFLG FORMAT ?
7330 BEQ FOREND
7340 LDA SECSAV FORMAT ON FIRST
7350 CPX =1 PASS ONLY
7360 BNE FOREND
7370 LDA SECSAV-1
7380 BNE FOREND
7390
7400 LDA =FMTOSK
7410 STA DCOMMD
7420 LDA =TIMFMT
7430 STA OTIMLO
7440 LDA =GETDAT
7450 STA DSTATS
7460 LDA =SCB DUMP BAD SECTORS
7470 STA DBUFHI
7480 LDY =FMTMSG&255;"FORMATTING"
7490 LDY =FMTMSG/256
7500 JSR PRINTW
7510
7520 JSR SIOV GO DO IT
7530 BPL FOREND OK
7540
7550 LDY =FMTMSG&255;"FORMAT ERR"
7560 LDY =FMTMSG/256
7570 JSR CHKST "CHECK QEST"
7580 BEQ FMTOST JMP RE-TRY
7590
7600 FOREND RTS
7610
7620 MESSAGE BASE
7630
7640
7650 NORMSG .BYTE "K COPYMATE 1.4
"
7660 .BYTE " BY MIKE PALMER"
7670 OPTMS1 .BYTE "4-SOURCE DRIVE ....
"
7680 OPTS .BYTE "2",508
7690 OPTMS2 .BYTE "4-DESTINATION DRIVE
"
7700 OPTD .BYTE "2",508
7710 OPTMS3 .BYTE "4-FORMAT DESTINATION
"
7720 OPTF .BYTE "???",508
7730 OPTMS4 .BYTE "4-WRITE VERIFICATION
"
7740 OPTV .BYTE "???",508
7750 ONMSG .BYTE "4-COPY COMPLETE
"
7760 .BYTE "4-PRESS ST RT"
7770 FMTMSG .BYTE "4-FORMATTING"
7780
7790 FERMMSG .BYTE "4-FORMATTING ERR
OR",508
7800 WERMMSG .BYTE "4-WRITE ERROR
",508
7810 CHKMSG .BYTE "4-CHECK DESTINATION
",508
7820 WRTMSG .BYTE "4-WRITING SECTOR"
7830
7840 OSTMMSG .BYTE "4-INSERT DESTINATIO
N DISK",508
7850 SRCMSG .BYTE "4-INSERT SOURCE D
ISK",508
7860 BOTMSG .BYTE "4-INSERT BOTH DI
SKS",508
7870 TPSMSG .BYTE "4-THEN PRESS STAR
T",508
7880
7890 .PAGE
7900
7910 BOOT DISK MAKER
7920
7930
7940 MAKER LDA =534 RED WARNING
7950 STA BACKGR SCREEN COLOR
7960 STA BORDER
7970 LDA =2 LEFT MARGIN=2
7980 STA LMARGN
7990
8000 LOX =MAKMSG&255;"MAKER"
8010 LOY =MAKMSG/256 MESSAGE
8020 JSR PRINT
8030
8040 MAKETW LDA CH WAIT FOR
8050 CMP =RTNKEY RETURN KEY?
8060 BNE MAKETW
8070
8080 LDA =0
8090 LOX =50A CLEAR OUT
8100 MAKETW STA DUNIT,X DISK DCB
8110 DEX
8120 BNE MAKEZR
8130
8140 LDA =DISKID SET UP THE DCB
8150 STA DBUSID
8160 LDA =1
8170 STA DUNIT
8180 INC DSECLD
8190 LDA =ORIGIN&255
8200 STA DBUFLO
8210 LDA =ORIGIN/256
8220 STA DBUFHI
8230 LDA =580
8240 STA DCNTLO
8250 LDA =PUTVER
8260 STA DCOMMD
8270 LDA =TIMOUT
8280 STA OTIMLO
8290
8300 MAKEIO LDA =PUTDAT WRITE COPYMATE
8310 STA DSTATS
8320 JSR SIOV
8330 RMI MAKER TRY AGAIN ON ERRO
R
8340 LDA DBUFLO
8350 CLC
8360 ADC =580
8370 STA DBUFLO
8380 LDA DBUFHI
8390 ADC =580
8400 STA DBUFHI
8410
8420 CMP =END/256-1 ALL DONE?
8430 BEQ MAKEON
8440 INC DSECLD
8450 JMP MAKEIO
8460
8470 MAKEON JMP COLDSV COLD START
8480
8490 MAKMSG .BYTE "K COPYMATE 1.4 - 8
DOT DISK MAKER
8500 .BYTE " INSERT A NEWLY FORMAT
TED DISK INTO "
8510 .BYTE " DRIVE ONE - THEN
PRESS RETURN
8520 END .BYTE 508
8530 =50229 LOAD & GO ADDRESS
8540 .WORD BOOIT
8550 .OPT NO LIST

```

Listing 2

```

10 REM COPYMATE 1.4 CUSTOMIZER
20 REM BY MIKE PALMER
30 REM ANTIC MAGAZINE
40 DIM AS(128),BS(1),FMS(1),VFYS(1),D
RVS(1)

```

continued on next page

assembly language

```

50 OPEN #1,4,0,"E":POKE 710,148:POKE
712,148:POKE 82,0:POKE 752,1
60 AS=" ":AS(128)=" ":AS(2)=AS
70 OSKWR=AOR("HLS"):REM SECTOR 1/0 R
OUTLINE
80 PRINT " " COPYMATE 1.4 CUSTOM
USER
90 PRINT " " INSERT COPYMATE
1.4 BOOT DISK"
100 PRINT " " INTO DRIVE #1 - THEN PRE
SS RETURN;
110 INPUT #1,8$
120 REM READ 1ST SECTOR OFF THE DISK
130 BUFFAD=AOR(AS)
140 SEC=1:DCOM=82:DDIR=64
150 GOSUB 790:REM SET UP DISK N.
160 X=USR(DSKWRT):REM RE SECTOR
170 IF PEEK(771)=1 THEN 210
180 ? " " ERROR IN READING FROM D
RIVE ONE"
190 ? " " CHECK IT OUT -- THEN RE-
RUN"
200 END
210 REM ASK FOR NEW PARAMETERS
220 ? " "ENTER REQUIRED DEFAULTS - CURR
ENT VALUES"
230 ? " " ARE SHOWN UNDER THE CURSOR
AND MAY"
240 ? " " BE ENTERED SIMPLY BY PRESSING
RETURN
250 POKE 752,0
260 TRAP 260
270 ? " " NUMBER OF DRIVES ON SYSTEM ?
[1-8] :";ASC(AS(13));";
280 INPUT #1,NDRIVE
290 IF NDRIVE<1 OR NDRIVE>8 THEN 260
300 IF NDRIVE=1 THEN SOURCE=1:DESTIN=1
:GOTO 390
310 TRAP 310
320 ? " " SOURCE DISK DRIVE ..... ?
[1-";NDRIVE;"] :";ASC(AS(9));";
330 INPUT #1,SOURCE
340 IF SOURCE>NDRIVE OR SOURCE<1 THEN
310
350 TRAP 350
360 ? " " DESTINATION DISK DRIVE ... ?
[1-";NDRIVE;"] :";ASC(AS(10));";
370 INPUT #1,DESTIN
380 IF DESTIN>NDRIVE OR DESTIN<1 THEN
350
390 TRAP 390
400 IF ASC(AS(11))=0 THEN FMTS="N"
410 IF ASC(AS(11))=1 THEN FMTS="Y"
420 ? " " FORMAT DESTINATION DISK .. ?
[Y/N] :";FMTS;";
430 INPUT #1,FMTS

```

```

440 IF FMTS<>"N" AND FMTS<>"Y" THEN 39
0
450 TRAP 450
460 IF ASC(AS(12))=80 THEN VFYS="N"
470 IF ASC(AS(12))=87 THEN VFYS="Y"
480 ? " " WRITE WITH VERIFICATION .. ?
[Y/N] :";VFYS;";
490 INPUT #1,VFYS
500 IF VFYS<>"N" AND VFYS<>"Y" THEN 45
0
510 TRAP 510
520 IF ASC(AS(14))=0 THEN ORVS="A"
530 IF ASC(AS(14))=26 THEN ORVS="P"
540 ? " " ATARI OR PERCOM DRIVES ... ?
[A/P] :";ORVS;";
550 INPUT #1,DRVS
560 IF DRVS<>"A" AND DRVS<>"P" THEN 51
0
570 REM SET UP NEW VALUES
580 AS(9)=CHRS(SOURCE)
590 AS(10)=CHRS(DESTIN)
600 AS(13)=CHRS(NDRIVE)
610 IF FMTS="N" THEN AS(11)=CHRS(0)
620 IF FMTS="Y" THEN AS(11)=CHRS(1)
630 IF VFYS="N" THEN AS(12)=CHRS(80)
640 IF VFYS="Y" THEN AS(12)=CHRS(87)
650 IF DRVS="A" THEN AS(14)=CHRS(0)
660 IF DRVS="P" THEN AS(14)=CHRS(26)
670 REM WRITE 1ST SECTOR BACK TO DISK
680 SEC=1:DCOM=87:DDIR=128
690 GOSUB 790:REM SET UP DISK DCB
700 X=USR(DSKWRT):REM WRITE SECTOR
710 POKE 752,1
720 IF PEEK(771)=1 THEN 760
730 ? " " ERROR IN WRITING TO DR
IVE ONE"
740 ? " " CHECK IT OUT -- THEN PRESS ■
RETURN
750 INPUT #1,8$:GOTO 690
760 ? " " COPYMATE 1.4 CUSTOMIZATION
COMPLETE
770 ? " " REMOVE BASIC CART BEFORE RE-
BOOTING":? :?
780 END
790 REM DISK DCB SET UP SUBROUTINE
800 POKE 768,49:REM DEVICE = DISK
810 POKE 769,1:REM UNIT = 1
820 POKE 770,DCOM:REM COMMAND
830 POKE 771,DDIR:REM DIRECTION
840 AH=INT(BUFFAD/256)
850 AL=BUFFAD-AH*256
860 POKE 772,AL:REM BUFFER ADDRESS LO
870 POKE 773,AH:REM BUFFER ADDRESS HI
880 POKE 774,7:REM TIMEOUT IN SECS
890 POKE 776,128:REM TRANSFER COUNT LO
900 POKE 777,0:REM TRANSFER COUNT HI

```

assembly language

910 POKE 778, SEC: REM SECTOR NUMBER LO
920 POKE 779, 0: REM SECTOR NUMBER HT
930 RETURN

TYPO TABLE

Variable checksum = 465015

Line	num	range	Code	Length
10	-	120	SO	506
130	-	240	HT	420
250	-	360	QU	404
370	-	480	TI	356
490	-	600	MF	304
610	-	720	TH	395
730	-	840	TV	397
850	-	930	DT	290



ATARI HARDWARE

ORIGINAL FACTORY PARTS FOR 800/400, 810
UPGRADE TO GITA, 48K AND
REV. "B" OPERATING SYSTEM
CUSTOM 810 DISK DRIVES \$265.00

INTEGRATED CIRCUITS FOR 800/400

GITA Chip	upgrade with instructions	\$11.50
10K rev. "B" O.S. Upgrade	3 chip rom set with instructions	\$12.50
Poker Chip	CO12394	\$5.50
Anic Chip	CO12296	\$5.00
2K Main Rom	CO12399	\$3.50

MODULES/CIRCUIT BOARDS COMPLETE

16K Ram Memory Module		
CX85	\$24.50	
800 10K Rev. "B" O.S. Module		\$18.50
800/400 CPU Board with GITA		\$24.50
800 Main Board	\$28.50	
400 Main Board	\$26.50	
400 Main Board W/O IC'S	\$8.50	
800 Power Supply Board	\$10.50	
810 Data Separator Board		
upgrade with instructions	\$25.00	
810 Side Board W/O Sep. & 1771	\$43.50	
800 Rear Power Board	\$24.50	
810 Analog Board	\$19.00	

AMERICAN TV Mail Order Address
15338 Inverness St., San Leandro, CA 94579
Phone 415-352-3787, Retail Store
1988 Washington Ave., San Leandro, CA 94577

Terms: We accept money orders, personal checks or COD. VISA/MasterCard OK on orders over \$25.00. No personal checks on COD.

Shipping: \$4.00 Shipping and handling on orders under \$50.00. Add \$2.00 for COD orders. CA res. include 6.12% sales tax.

Prices subject to change without notice. We reserve the right to limit quantities.

Much More! Send SASE for free price list.

*Atari is a registered trademark of Atari, Inc.

BOARD SETS. BUILD YOUR OWN COMPUTER, DISK DRIVE

800	OK	\$72.50
800	48K	\$135.00
400	OK	\$52.50
810 Board Set		\$110.00

All Boards Complete With IC's Etc. 800
Computer Board Sets Include: Free Subsystem
Keyboards and Instructions.

MISC.

810 Rear Board/Analog Board Upgrade		
800/400 CPU Board with GITA		\$37.50
Editor Assembler	\$35.00	
Basic Cartridge W/O Case, Manual	\$23.50	
Cartridge Circuit Boards	\$4.00	
Non-Atari Cartridge Boards	\$2.00	
800/400 Repair Manual	\$39.95	

Software Discounters of America

S.D. of A.

For Orders Only 1-800-225-SOFT
Inquires and PA. 412-361-5291

ACCESS					
Beach Head (D)	\$23	Sorcerer (D)	\$33	Kids on Keys (R)	\$21
ACTIVISION		Starcross (D)	\$25	Kidwiter (D)	\$23
Decathlon (R)	\$25	Suspended (D)	\$33	Kindercomp (R)	\$18
Keystone Kaplers (R)	\$25	Witness (D)	\$33	Most Amazing Thing	
Pitfall (R)	\$25	Zork I, II, or III (D)	\$25	(D)	\$25
River Raid (R)	\$25	LJK		Snooper Troops 1 (D)	\$25
ARTWORK				Snooper Troops 2 (D)	\$25
Bridge 4.0 (T or D)	\$16	Data Perfect (D)	\$67	Story Machine (R)	\$25
Grindytown (D)	\$19	Letter Perfect (D)	\$55	Trains (D)	\$25
Hodge Podge (T or D)	\$19	MICROPROSE		SSI	
Monkeymath (T or D)	\$18	Heatcat Ace (D)	\$19	Battle for Normandy	
Monkeymath (D)	\$25	Nato Commander (D)	\$23	(D)	\$25
Strip Poker (D)	\$21	Solo Flight (D)	\$23	Broadsides (D)	\$25
AVALON HILL		Splitfire Ace (D)	\$19	Carrier Force (D)	\$39
Jupiter 1999 (D)	\$35	MUSE		Combat Leader (D)	\$25
Legionnaire (D)	\$25	Castle Wolfenstein		Cosmic Balance (D)	\$25
Space Cowboy (D)	\$16	(D)	\$19	Cosmic Balance II (D)	\$25
Telenguard (D)	\$21	OSS		Epidemic (D)	\$21
BIG 5		(Precision Software		50 Mission Crusade (D)	\$25
Miner 2049'er (R)	\$27	Tools)		Fortress (D)	\$21
BRODERBUND		Action (R)	\$57	Knights of Desert (D)	\$25
AE (D)	\$23	Basic XL (R)	\$57	Queston (D)	\$33
Arcade Machine (D)	\$37	DOSXL (D)	\$21	Rails West (D)	\$25
Bank St. Writer (D)	\$43	MAC 65 (R)	\$57	Tigers in the Snow (D)	\$25
Droi (D)	\$23	Write Tool (R)	\$33	War in Russia (D)	\$33
Loderunner (D)	\$21	ORIGIN		SYNAPSE	
Mask of the Sun (D)	\$25	Caverns of Calisto (D)	\$22	Alley Cat (T or D)	\$21
Space Change (R)	\$23	Ultimate (D)	\$39	Blue Max (T or D)	\$21
CBS		PDI		Dimension X (T or D)	\$21
Math Series (call)		Analogies (T or D)	\$18	Encounter (T or D)	\$21
CONTINENTAL		Preschool One	\$18	Ft. Apocalypse	
Home Accountant (D)	\$47	(T or D)	\$18	(T or D)	\$21
Atari Users		Preschool Two	\$18	Necromancer (T or D)	\$21
Encyclopedia	\$13	(T or D)	\$18	Pharaoh's Curse	
Book-Atari		Reading Comprehension	\$18	(T or D)	\$21
Software '84	\$13	(T or D)	\$18	Rainbow Walker	
DATASOFT		Vocabulary One	\$18	(T or D)	\$21
Bruce Lee (T/D)	\$23	(T or D)	\$18	Shamus Case II	
Dallas Quest (D)	\$23	Vocabulary Two	\$18	(T or D)	\$21
Genesis (T/D)	\$19	(T or D)	\$18	Zepplin (T or D)	\$21
Letter Wizard (D)	\$33	PARKER BROS.		TRON X	
Micropainter (D)	\$33	Frogger (R)	\$29	Chatterbee (D)	\$25
Ptoyan (T/D)	\$19	Pokey (R)	\$33	Pokersam (D)	\$16
Spell Wizard (D)	\$33	Q-Bert (R)	\$33	S.A.M. (D)	\$39
Zaxxon (D)	\$25	SCARBOROUGH			
DESNWARE		Masterlype (R or D)	\$25	ACCESSORIES	
Create Creator (D)	\$19	Songwriter (D)	\$25	Alien Group	
Main Maze (D)	\$25	SEGA		Voice Box	call
Spellcorder (D)	\$25	Buck Rogers (R)	\$25	Ape Face Print, Int.	\$59
Trap A-Zoid (D)	\$25	Congo Bongo (R)	\$25	BASF SS, DD	\$17.8x
EPYX		Star Trek (R)	\$25	Compuserve Starter Kit	
Course of Rai (T or D)	\$13	SIERRA-ON-LINE			
Fun w/Art (R)	\$25	Dark Crystal (D)	\$25	Disk Case (Holds 50916	\$25
Gateway to Apshei (R)	\$25	Frogger (T or D)	\$23	Disk Drive Cleaner	\$9
Jumpman (T or D)	\$25	Homework (D)	\$43	Dust Covers	
Pistop (R)	\$25	Oil's Well (D)	\$19	All Models	6
Puzzle Panic (D)	\$23	Quest For Tires (D)	\$23	Full Size Replacement	
Summer Games (D)	\$25	Ultima I (D)	\$39	Keyboard for Atari 400	\$59
Temple of Apshei		Ultima II (D)	\$39	Indus GT Disk Drive	call
(T or D)	\$25	Ulysses (D)	\$23	MPP100 Microbits	\$125
FIRST STAR		Wizard & Princess (D)	\$21	Modem	\$125
Astro Chase (T or D)	\$19	Wiz Type (D)	\$23	Mosaic 48K	call
Boulder Dash (T or D)	\$19	SPINNAKER		Mosaic 64K	call
Filp Flop (T or D)	\$19	Adventure Creator (R)	\$25	Rana 1000 w/DOS	call
HARCOURT, BRACE & JOVANOVIĆ (R)	\$25	Aegean Voyage (R)	\$25	Sakala 13	\$239
Computer SAT (D)	\$59	Aerobics (D)	\$25	Surge Protector w/	
INFOCOM		Alphabet Zoo (R)	\$21	5 Outlets	\$39
Deadline (D)	\$33	Costmic Life (R)	\$25	Verbatim Disks	\$13
Enchanter (D)	\$33	Delta Drawing (R)	\$25	Wico B&B Handle	\$19
Intidel (D)	\$33	Facemaker (R)	\$21	Wico Three Way	\$23
Planetfall (D)	\$33	Fraction Fever (R)	\$21	Wico Trackball	\$29
Sea Stalker (D)	\$25	Grandma's House (D)	\$21		
		Hey Diddle Diddle	\$19		
		Wico Trackball	\$29		

P.O. Box 278 — Dept. AT • Wildwood, PA 15091

Ordering and Terms: Orders with cash or money order shipped immediately. Personal company checks allow 30 days clearance. NO C.O.D. VISA/MasterCard accepted with no additional charge for orders shipped to continental U.S.A. Shipping Continental U.S.A. — Orders under \$100 add \$3. free shipping on orders over \$100. PA residents add 6% sales tax. AK, HI, PR/APO — add \$5 on all orders. INTERNATIONAL — add \$10 or 15% or order whichever is greater. Unacceptable merchandise will be replaced with same merchandise — NO CREDITS. Returns must have authorization number 412-361-5291. Prices subject to change without notice.

Antic

The ATARI® Resource

SEEKS AUTHORS for BOOKS • SOFTWARE MAGAZINE ARTICLES

Antic especially wants to see creative, unusual application programs for the Atari—anything from astronomy and air traffic control to weather forecasting and zoology . . .

Flat Rate or Royalty Prompt Response

For details, send self-addressed stamped envelope to: **AUTHOR INFO**, c/o Antic, 524 Second Street, San Francisco, CA 94107

Put a Monkey Wrench into your ATARI 800 or XL

Cut your programming time from hours to seconds, and have 33 direct mode commands and functions. All at your finger tips and all made easy by the MONKEY WRENCH II.

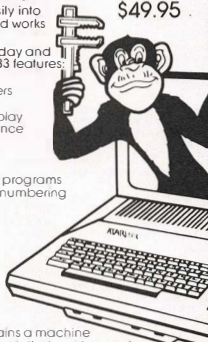
The MONKEY WRENCH II plugs easily into the cartridge slot of your ATARI and works with the ATARI BASIC.

Order your MONKEY WRENCH II today and enjoy the conveniences of these 33 features:

- Line numbering
- Renumbering basic line numbers
- Deletion of line numbers
- Variable and current value display
- Location of every string occurrence
- String exchange
- Move lines
- Copy lines
- Up and down scrolling of basic programs
- Special line formats and page numbering
- Disk directory display
- Margins change
- Home key functions
- Cursor exchange
- Upper case lock
- Hex conversion
- Decimal conversion
- Machine language monitor
- DOS functions
- Function keys

The MONKEY WRENCH II also contains a machine language monitor with 16 commands that can be used to interact with the powerful features of the 6502 microprocessor.

\$49.95



MAE

An easy to use but powerful Macro Assembler/Editor. Includes M.L. Monitor, Word Processor and more. **The Best for Less!**
Now Only \$59.95.

(For use with ATARI 800 or XL and Disk Drive.)

Eastern House

3239 Linda Dr.
Winston-Salem, N.C. 27106
(919) 924-2889 (919) 748-8446

ADVERTISERS

ABBY'S HOUSE OF DISCOUNT SOFTWARE . . .	28
ADVANCED INTERFACE DEVICES	83
ALLEN MACROWARE	60
AMERICAN TV	93
AMTYPE	96
ANTIC, INC.	50,51,56
ASTRA SYSTEMS	72
ATARI INC.	BC
AVALON HILL GAME CO.	4
AXIOM	17,80
BITS & BYTES	75
BROOKTRONICS	96
COMPUCAT	96
COMPUCLUB	75
COMPUTER CREATIONS	31
COMPUTER GAMES PLUS	96
COMPUTER MANAGEMENT CORP.	95
COMPUTER PALACE	20
COMPUTER SOFTWARE SERVICE	35
CONCORDE PERIPHERALS	12
DIGITAL DEVICES	69
DOVESTAR	95
d:VINCISOFT	95
EASTERN HOUSE	94
GALASA SOFTWARE	95
HAPPY COMPUTERS	19
HARDCORE SOFTWARE	95
INFOCOM	2
KRENTAK SOFTWARE	95
LOTS A BYTES	96
MILES COMPUTING	23-25
MINDSCAPE, INC.	8-9
ORIGIN SYSTEMS	61
PARTLYSOFT SOFTWARE	68
PROGRAMMERS WORKSHOP	3
RC SYSTEMS	95
SOFTWARE DISCOUNTERS OF AMERICA	93
SOUTHERN SOFTWARE	95
SSI	36
STEWART ELECTRONICS	96
SUBLOGIC	99
SYNAPSE	22
TINY TEK	95
WALLING CO.	22
YELLOW HAMMER	11

This is provided as a convenience and as a courtesy to advertisers. ANTIC does not guarantee accuracy or comprehensiveness.

SHOPPER'S GUIDE

600XL 64K EXPANSION

- Upgrades the 600XL to 64K of RAM
- Compatible with Translator disk
- Will not interfere with program cartridges
- Automatically utilized by BASIC
- Ultra compact — extends only 3/4" behind the computer
- In stock for immediate delivery — Model AM64 \$119.95

Tape interfaces
starting from \$19.95

Write for details

Order By Phone — Any Time

800-227-1617 TOLL FREE

In California 800-772-3545

Please ask for extension 595-A

(ORDERS ONLY PLEASE!)

(206) 771-6883

Inquiries after 4 p.m. PST

RC Systems, Inc.

121 W. Winesap Rd.

Bothell, WA 98012



RAM for ATARI*

Tiny Tek, Inc. Memory Boards are fully assembled, tested, and guaranteed.

48K/52K Memory Board \$89.95

For ATARI 400
52K Addressable Memory
Easy to Install

32K Memory Board \$54.95

For ATARI 400 or 800

16K Memory Board \$39.95

For ATARI 800

BUILD YOUR OWN MEMORY

48K/52K Board (No Comp.) \$30.00

32K Board (No Comp.) \$20.00

16K Board (No Comp.) \$ 9.00

48K/52K Complete Kit \$75.00

32K Complete Kit \$45.00

16K Complete Kit \$30.00

Add \$2 Shipping & Handling

Visa & MasterCard Accepted

*ATARI is a trademark of Atari, Inc.

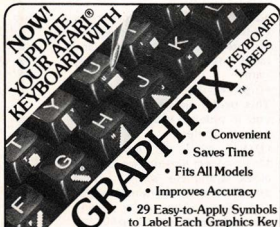
Dealer Inquiries Welcome

Tiny Tek, Inc.

Route 1, Box 795

Quinlan, TX 75474

214-447-3025



- Convenient

- Saves Time

- Fits All Models

- Improves Accuracy

- 29 Easy-to-ApPLY Symbols to Label Each Graphics Key

Mylar-Coated for Long Durability

In Stock Now — Shipped Within 24 Hours

100% Money Back Guarantee!

TO ORDER send \$5.95 check or money order

(Texas residents add 5% sales tax) to:

DOVESTAR CREATIVE CONCEPTS

P.O. Box 2109, Dept. 1084, Nederland, Texas 77627

(409) 727-5978 (No collect calls, please)

DEALER INQUIRIES RECOMMENDED!

Attn: TMI of Amer. Inc.

GIVE YOUR COMPUTER A SET TODAY!

Attention Atari 810 owners

THE "CHIP"

with Archiver/Editor Software 810

Automatic Disk Backup

\$99.95 Post Paid

Available soon for 1050 and

Percom Drives

HAPPY 810

ENHANCEMENT

\$199.95 Post Paid

Includes Warp Drive Package

ARCHIVER/EDITOR

"HAPPY VERSION"

Runs on Disk Drives with Happy 810

Enhancement; makes Happy Drives

compatible with The "Chip"

\$39.95 Post Paid

Call or write for free brochure

Southern Software

A division of Southern Supply Co.

1879 Ruffner Road,

Birmingham, Alabama 35210

Phone 205-956-0986

Prices subject to change without notice.



THOUGHT & SPEECH RECOGNITION

CAN BE YOUR EXPERIENCE INSTANTLY !!!

JUST DIRECTLY CONNECT THE FAZER INTO YOUR ATARI!!

EASY AS THAT !!! TRY IT!

FAZE INTO YOUR COMPUTER WITH OUR NEW, AMAZING

PERIPHERAL. YOU'LL BE BLOWN AWAY !!!

AVAILABLE FOR ALL THE ATARI COMPUTERS.

COMMODORE 64, VIC 20, AND OTHERS

SPEECH PACKAGE \$89.95

THOUGHT PACKAGE \$119.95

WHOLE THING

440 MAIN STREET LAUREL MD 20607

(206) 792-2100 (206) 953-7373

(800-752-8348)

continued on next page

ANNOUNCING

NAPOLEON AT WATERLOO

ARE YOU READY FOR A CHALLENGE? THIS DETAILED STRATEGY GAME PUTS YOU IN COMMAND IN NAPOLEON'S FAMOUS BATTLE AGAINST WELLINGTON. FEATURES FULL SCROLLING MAP OF BATTLEFIELD. PLAYER - MISSILES. CRISP GRAPHICS. GREAT SOUND EFFECTS. 100% MACHINE LANGUAGE.

ROME AND THE BARBARIANS

FOR SERIOUS GAMERS! IN THIS FAST MOVING STRATEGY GAME, ROMES FACED WITH ATTACKERS ON ALL SIDES. CAN YOU SAVE THE ROMANS IN ONE OF THE MOST CHALLENGING EVENTS IN HISTORY? UNBELIEVABLE MAP OF EUROPE, SMOOTH SCROLLING. PLAYER-MISSILES. 100% MACHINE LANGUAGE.

32K DISK/TAPE \$348.5*

SEND CHECK OR MONEY ORDER TO:

KREN TEK SOFTWARE P.O. Box 3372,

KANSAS CITY, KS 66103

FOR MORE INFO SEND SELF ADDRESSED

STAMPED ENVELOPE

*ADD \$2.00 SHIPPING, KANSAS RESIDENTS ADD 3%

SALES TAX

NUBASIC

by GALASA Software

- 15 NEW DIRECT-MODE COMMANDS
- 6 PRE-PROGRAMMED KEYS
- WORKS WITH ATARI BASIC
- FEATURING
- DOS FUNCTIONS FROM BASIC
- AUTO LINE NUMBERING
- DELETE A RANGE OF LINES
- RENUMBER LINES AND REFERENCES
- DISPLAY, XREF, XCHG, VARIABLES
- USER BUFFER, PROGRAMMABLE KEY
- LOAD BINARY FILES FROM BASIC
- 100% MACHINE LANGUAGE (3K)
- SIMPLE TO USE, REASONABLY PRICED

ONLY \$19.95

(+\$2 Shipping & Handling)

GALASA Software

16835 Algonquin St., Suite 199

Huntington Beach, CA 92649

Requires: Atari, 16K, BASIC, disk, DOS 2.0

Please specify version: 400/800 or 600/800XL

Atari TM of Atari, Inc. CA residents add 6%

BridgePro®

Play Bridge by yourself — your computer plays the other hands.

- Easy to learn — illegal bids and plays prevented
- Cards dealt randomly — millions of different hands possible
- Fast machine language speed
- 2-player game options
- Complete Contract Bridge scoring
- Bidding "help" feature for beginners
- QUIT and AUTO FINISH features
- May repeat hands, if desired
- Option to receive the best hand
- Play "duplicate" with a friend
- Demonstration feature

Atari® (min. 40K) — Disk \$35 (C.O.D. add \$2)

California residents add 6.5% tax

Computer Management Corporation

2424 Exbourne Court

Walnut Creek, CA 94596

(415) 930-8075 Visa/MC accepted

COMPUTER MAGAZINE PROGRAMS TYPED

AND MAILED ON DISK

FROM ONLY \$8.25 PER MONTH

Including disk and postage

WE TYPE FOR:

C64 ★ ATARI ★ APPLE

We are a typing service. Price includes all the programs from 3 top magazines for your computer. Programs are typed, run tested, and mailed to you on disk as soon as possible each month.

AMTPE CORPORATION

7 DAYS TOLL FREE

1 (800) 521-3200

SHOPPER'S GUIDE

continued from page 95

WE HAD A TOUGH DECISION

WAS our E2 to use, **all computer** 4-Dsketchpad a game, a toy, an adventure or just another graphics whizbang. And what name would stimulate the imagination and desire of those who would appreciate and enjoy such a remarkable tool.

AFTER days of divebombling buildings, ships and tanks of our own design ... lifting off, orbiting and descending upon whole planets of our own design ... and swooping past and about cars, planes and starships of ... you guessed it ... **our own design**, we had our answer:

STAR.P.A.D.

(Space Time Adventure Recorder with Perspective in All Dimensions)

ONLY STAR.P.A.D. lets you actually see through the eyes of your computer to simultaneously draw on all 3 XYZ planes. No separate coordinate calculations required — the computer does it all! Then STAR.P.A.D. lets you study, analyze and delight amidst 3-D or 4-D images of your design from any stationary or programmed moving or joystick controlled angle.

DISK & MANUAL: Only \$4.95 for Atari/Commodore 64, 4141 Murrayhill Rd., Charlotte, NC 28209.

VISA and Mastercard Accepted
YOU DON'T JUST DRAW WITH A
S.T.A.R.P.A.D. ... YOU RIDE ONE!

COMPUTACAT

The Online Catalog of Computers and Software
Our Prices are **WHOLESALE + 10%**

Samples!!!

ATARI 850 INTERFACE — \$220

Computacat — \$183

RANA 1000 DISK DRIVE — \$449

Computacat — \$308

INDUS GT DISK DRIVE — \$449

Computacat — \$325

We support the complete ATARI and COMMODORE product lines. Ask for our free price list!

(408) 353-1836

Instant shipping (or as fast as we can). Mastercard & Visa accepted (no extra charges). Shipping & handling add 5%. California customers add 6.5% sales tax. Order by phone (Mon — Fri, 10 am — 5 pm PST). Order by modem (daily 6 pm — 9 am) from our online TeleCatalog.

Prices subject to change without notice.

COMPUTACAT

24500 Glenwood Hwy., Los Gatos, CA 95030

Hardcore Software presents

STAR SEARCH

You simply enter any time, date and location in the world and **Star-Search** accurately plots the corresponding night sky. Use a cursor window to ask for information about any of the hundreds of stars, planets and constellations. Great learning tool. Lots of fun. For any 48K Atari with joystick. Only \$29.95 + \$2.00 shipping. Specify disk or cassette. Send check or money order to:

HARDCORE SOFTWARE

P.O. Box 522, Neo Andover, MA 01845
(617) 628-6767

The Best For Less

INDUS GT \$349.95

—GUARANTEED LOWEST PRICES—

DAISY WHEEL PRINTER **\$399.95**

APE FACE PRINTER INTERFACE **\$59.95**

ULTIMA III **\$39.95**

FLIGHT SIMULATOR II **\$39.95**

JUPITER MISSION **\$39.95**

UNIVERSE **\$69.95**

SPACE COWBOY **\$19.95**

BROADSIDES **\$29.95**

SEVEN CITIES OF GOLD **\$34.95**

SEASTALKER (Infocom) **\$34.95**

Please add \$2.50 shipping (\$4.50 outside USA)
California residents add 6%.

COMPUTER GAMES +

Box 6144
ORANGE CA 92667
(714) 639-6189

AT LAST!

A nationwide public domain copy service! Some of the best programs ever written for the Atari are in the Public Domain. But you would spend HOURS downloading by phone (if you have a modem), WEEKS waiting for a user-group Disk of the Month (if you are a club member), or a month between issues of your favorite Atari magazines, and still not find the quality, quantity, or selection that **LotsaBytes** provides on each disk.

Our Master Library contains thousands of the latest and "classic" programs that we have gathered from user-group disk libraries, the most popular Bulletin Board Systems, and the public domain pages of your favorite Atari magazines. Only the finest are selected and copied with as many as 25 different programs per disk, and then made available to you at the unbelievable **LOW PRICE OF JUST \$7.95 each**.

*DISK #1 — 25 Game programs on two full disk sides. Selections include most of the latest and most desirable "arcade" quality games. **\$7.95**

*DISK #2 — 25 Utility programs. This useful assortment will help you to unleash the full power of your computer. **\$7.95**

*DISK #3 — 25 Advanced Musicsystem files on two full disk sides. Complete with a public domain Player program. Now you can listen to your Atari playing many of your favorite "top 40" and classics. **\$7.95**

★ ★ FREE BONUS ★ ★

With your order for any three (3) disks we will send you your choice of either:

1. ATARI XL TRANSLATOR DISK that enables XL owners to use most 400/800 software — **FREE** or

2. An all-different Advanced Musicsystem disk with the Player program — **FREE!**

LotsaBytes is pleased to also present a fine commercial program by special arrangements with Lee Actor, the author of the Award Winning Advanced Musicsystem. The all new, machine language, improved Advanced Musicsystem II. Specify 16K cassette or 24K disk. Full instructions. Originally \$29.95. **LotsaBytes price only \$14.95.**

FULL 100% replacement guarantee. Any disks found to be defective will be replaced free and we will also refund your return postage.

All orders are shipped by First Class U.S. Mail. Add \$1.50 per order shipping and handling. International add 15% U.S. funds only. California residents add 6% sales tax. Checks or Money Orders only. Sorry, no C.O.D. Please allow two weeks for personal checks to clear.

LOTSABYTES

15445 Ventura Blvd., Suite 10G
Sherman Oaks, CA 91413

Atari is the registered trademark of Atari, Inc.

THE FUTURE NOW!

AMDEK

3" Cartridge disk

AM DC I single drive 475 ppd

AM DC II dual drive 625 ppd

INDUS

INDUS GT 50/DD 359 ppd

SCM

L-1000 - Bir-Dir Par-Ser

daisywheel 479 ppd

Write for more info - Amdek Software list

All new SCM dot matrix printers

STEWART ELECTRONICS

P.O. Box 155

Mullin, TX 76864

TX add 4%

```

10 REM MICRO FADER
20 REM BY JOSEPH GRANDE
30 REM ANTIC MAGAZINE
40 DIM HS(2), ARRAYS(96), HOLDS(1200), HE
XS(23), FILES(20): HEX$=" @ABCDEFGHIJ####
##JKLMNO: CASS=0: Q=1
70 ? "PLEASE WAIT...": FOR D=1 TO 500
: NEXT D: POKE 559,0
130 RESTORE 2000: FOR LINE=2000 TO 2250
STEP 10: GOSUB 140: NEXT LINE: GOTO 190
140 READ ARRAYS, LSUM: FOR HNUM=1 TO LEN
(ARRAYS) STEP 2: HS=ARRAYS(HNUM,HNUM+1)
150 D=0: FOR I=1 TO 2: D=D*16+ASC(HEX$(A
SC(HS(I))-47))-64: NEXT I
155 SUM=SUM+(ASC(HS(1,1))+ASC(HS(2,2)))
: HOLDS(Q,Q)=CHRS(D): Q=Q+1: NEXT HNUM
160 CL=PEEK(183)+PEEK(184)*256: IF CL<>
LINE THEN POKE 559,34: ? "LINE "; LINE; "
IS MISSING.": ENO
170 IF LSUM<>SUM THEN POKE 559,34: ? "
BAD DATA AT LINE #"; LINE: ENO
180 RETURN
190 POKE 559,34: ? "PRESS <RETURN> TO
SAVE THE FILE.": INPUT HS
200 CLOSE #1: OPEN #1,0,"D:FADER.EXE"
: IOC8=848: POKE IOC8+2,11
210 ADDRESS=ADR(HOLDS): ADHI=INT(ADDRES
S/256): ALO=ADDRESS-ADHI*256
220 BYTES=LEN(HOLDS): NUMHI=INT(BYTES/2
56): NUMLO=BYTES-NUMHI*256
230 POKE IOC8+4, ALO: POKE IOC8+5, ADHI:
POKE IOC8+8, NUMLO: POKE IOC8+9, NUMHI
240 X=USR(AOR("hhhh3lv"),16)
250 CLOSE #1: ? "ALL DONE.": ENO
2000 DATA FFFF002E1028421001E61228DCC
1E0ECC1E0ECC1E0ECC1E0ECC1E08DCC1E2003
1EAECC1EA90C9D42039D4203,5255
2010 DATA 4C861E858068AA60A86885816885
83688582688DCC1E98488A48A000A900806722
8180998004C998D0034C581E,10322
2020 DATA C93AD005A9018D6722C84C21EAD
6722C900F0034C841EA9448D8004A93A8D8104
A000A2028180900004C998D0,15371
2030 DATA 034C841E8C84C731E20031AECC
1EA5829D4A03A5839D4803A9809D4A03A9049D
4503A9039D42034C861E8DCA,20504
2040 DATA 1E68AA68A8688DCC1E98488A4860
20564AECC1E8D43038D6622980C900000160
4C74E4008582A90748055229,25578
2050 DATA 30491018690C48A582290F48A91E
48A9E94CED1E533A980020241E6085868AA68
A868858198488A48AECC1EA9,30674
2060 DATA 009D4803A9019D4903A5809D4403
A5819D4503A9059D420320861EA0008180C998
D0034C2C1FC84C1F1FC8A900,35707
2070 DATA 918060858068AA68A86885816885
8498488A48A9FF8585A5840A800546854C481F
AD0AD22585C584F00280F5A0,40769
2080 DATA 009180608D6C22A9448D6E22A93A
8D6F22A2038D6E22C9200034C811FE8E008F0
034CG1F8AC90809034CA0D1F,45901

```

```

2090 DATA AD78229D6F22AD079229D7022AD7A
229D7122A92E9D6E22A5989D722A5009D7322
4CCE1FAD7A228D7822AD7922,51071
2100 DATA 8D7A22AD78228D7922A92E8D7822
A5988D7C22A5008D7D22608D6D22A91F48A9FA
20A61EAECCE1EAD6D229D4203,56275
2110 DATA A5589D4403A5599D4503A9049D48
03A91F9D49034C861E608D6C22A91820CD1E20
3A20AD30028580AD31028581,61296
2120 DATA A003A94E9180A006A90E9180C8C0
63D0F7A94E9180C8C88180C90FF0034C3920
A90E9180C84C282060AD08D4,66398
2130 DATA C95F00034C472204C3A2060010840
02108004208D6C22A2008A9D8622E8D0F9A900
8D8322A9FEC0832280034C9D,71406
2140 DATA 20AD832249FF488D8622AD852248
A92248A98520321FAA08D8622A86848A8D8622
AE85229D862268AA989D8622,76516
2150 DATA 83224C6B120608D6C22A5588580
8582A9008D822A907C0822280034C3D21AE82
22A9008D8322A9FEC0832280,81553
2160 DATA 034C08208A48AE83228C862268AA
203E21EE83224C0E208A48A2FF8C862268AA20
3E21AD6622C97FF00590034C,86686
2170 DATA 3721AD8222C902F0034C0421A001
81808D402AD8222C903F0034C1521A0028180
8D0502AD8222C904F0034C26,91631
2180 DATA 21A00381808D6C02AD8222C905F0
034C3721A00081808D0C02EE82224C20608D
6C22AD64228581AD65228583,96631
2190 DATA A9008D8422A91D08D42280034C83
2181803D4820C900F0034C70218D482049F31
824C722111829182E681E603,101595
2200 DATA E88A207AAEE84224C5021602050
20A9078D632220F81FA5598D6522AD652238E9
208D6422AD64228559A9018D,106613
2210 DATA 6222A90148A90648A90048A92148
A9884C8F212A2E4D4943980020241EA9012000
1EA9018D822AD6222C08222,111590
2220 DATA 80034CE521A92248A96E20F11EE
82224C0C21A90120101EAD6E22C9200812060
1FA90148A90448A90048A922,116614
2230 DATA 48A96E20241EA90120001EAD6422
8559AD632220CF1F209E20A90120101EA90085
408513A513C90890034C4722,121552
2240 DATA AD1F020901C9000003204722AD1F
D02902C90000032053224C322AD6222186901
8D62224C721AD1F020901C9,126506
2250 DATA 00D0032047224C5322,127445

```

FADER A CLASSY VIDEO "SLIDE SHOW"

Featuring dot-by-dot "dissolves" between pictures

by JOSEPH P. GRANDE

If you use Micro-Painter or another file-compatible program to draw pictures with your Atari, you would probably like being able to have a video slide-show presentation. FADER does more than simply read your pictures from a disk and display them one at a time. When FADER changes pictures, it produces a dot-by-dot "dissolve" from one picture to the next. This impressive effect is unique to computer graphics — movie film couldn't duplicate it.

HOW TO USE THE PROGRAM

Type in the program and save an extra copy as a back-up. Next, RUN this program. The screen will go dark for several minutes so the computer can read the data faster. If you made a typing error, the program will stop and display the number of the line you need to retype correctly, so no TYPO is needed. You'll then be prompted to insert the disk on which the machine language file "FADER.EXE" is to be written. Do so, and then press [RETURN]. FADER.EXE is your master version and should be archived on a disk with other utility programs.

Follow the following step-by-step instructions to create your "slide-show"

SYNOPSIS

You get a unique dot-by-dot "fade" effect with this "slide show" of picture files compatible with Micro-Painter format. The program requires a minimum of 48K RAM plus a disk drive, and runs on all Atari computers. If you're typing in the listing that creates this machine language file, insert your BASIC cartridge. For Antic Disk Subscribers — just follow the numbered instructions below:

disk:

1. Format a blank disk, then use DOS menu option H to write DOS files.
2. To save room on the disk, delete DUPSYS.
3. Use DOS menu option O (or C with two-drives systems) to transfer a copy of FADER.EXE to the prepared disk.
4. Use DOS menu option E to rename FADER.EXE to AUTORUN.SYS.
5. Use DOS to copy your picture files to the slide-show disk. Copy them in the exact order in which you want them to display. Use option E to rename them so all the picture files extenders are .MIC.
6. This disk can now be booted, and

will automatically display all your pictures in sequence. Remove all cartridges before booting. 600XL and 800XL owners press [OPTION] while booting.

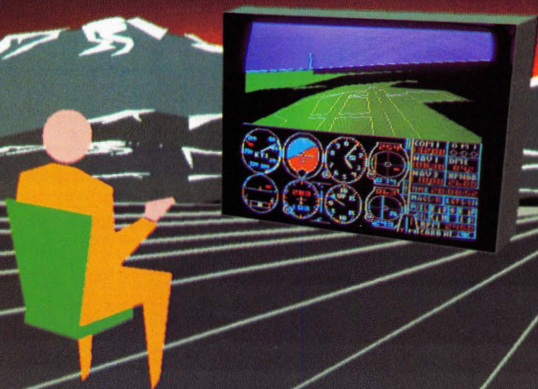
7. FADER loads a new picture about every 30 seconds. To load and display the next picture sooner than that, press [START]. After the last picture on the disk displays, FADER loads the first one again, and so on.
8. You can change disks if you do it quickly as soon as a picture has loaded. The new disk should have more picture files, all renamed with the .MIC extender. FADER will start with the next file on the disk. That is, if FADER has just loaded the second .MIC file on one disk, and you remove that one and insert another with, say, five .MIC files, FADER will next load the third .MIC file on the new disk. After it displays the last file, it will recycle to the first.

*Joseph P. Grande of Sunland in Southern California has been a programmer for over 20 years. He says he also became a graphic artist three years ago when he purchased an Atari. He has published a pre-school math learning game, **Monkey Up A Tree**.*

continued on page 97

Flight Simulator II

For
Atari computers
with 48K memory



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

See your dealer . . .

or write or call for more information. For direct orders please add \$1.50 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.

Order Line: 800/637-4983

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

DISCOVER COMPUTERS WITH ATARI.



**Atari® presents the
five greatest advances
in the creative arts
since someone put
72 crayons in one box.**

What would Cezanne say to an electronic orange? Surely Van Gogh would go for some flowers painted in phosphors (those glowing things in your TV screen). And you bet Beethoven would be blown away by a computer synthesized symphony.

Too bad. They were all born too early. But luckily you weren't. Because Atari makes several home computer products to help you create all these things and more.

First, there's ATARI Paint® the program that turns the joystick you already own into a computerized paintbrush that helps you explore the fascinating world of computer art.

Get the magic touch with Atari Touch Tablet.

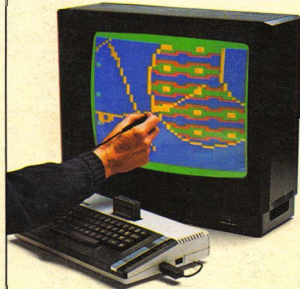


The ATARI Touch Tablet with Atari-Artist™ software cartridge turns your TV into a magic palette of 128 dazzling colors.

The Touch Tablet works a little like an electronic slate. Hook it into any ATARI Computer and what you draw on the tablet will instantly appear on your TV screen. You can draw on the Touch Tablet with the unique electronic stylus that comes with it—or even with your finger.

And all the on-screen commands that control your Touch Tablet are labelled with simple sym-

bols as well as words. So everyone from preschoolers to grandparents can create without going near the keyboard.



Atari Light Pen lets you write right on the screen.

ATARI Light Pen with Atari-Graphics™ software cartridge is among the best tools available for teaching hands-on computer creativity. To draw circles, rectangles, or simply fool around with freehand sketching, just press the pen to your TV screen and VOILA...A trail of sparkling color follows it.

You can fill in your sketches with one or more of 128 colors. Or choose from over 2,800 patterns.

Roll over Beethoven, AtariMusic is here.

Sure, Beethoven took music lessons. But even he didn't get the head start you'll get with AtariMusic™ I or AtariMusic™ II. And once you understand the

basics you'll be ready to move up to ATARI Music Composer® and create original compositions in four part harmony!

All of these programs were designed to get the best from your ATARI Computer, including the ATARI 800XL™ or the less expensive ATARI 600XL™. Both machines give you unsurpassed Atari graphics and four sound channels. And whether you're painting with light or composing at the computer keyboard, you can store your creation on the ATARI 1010™ Program Recorder or the more sophisticated 1050™ Disk Drive.

And if all that doesn't convince you that our new programs are a giant step beyond crayons, consider this: the kids will never write on the wall with a computer.

*SuperBoots™ Software developed by Capital Children's Museum, Washington, D.C. licensed by Reston Publishing Company, Inc. © 1982 Reston Publishing Company, Inc. All Rights Reserved.



**DISCOVER
WHAT YOU AND
ATARI
CAN DO.**

© 1984 Atari Inc. All Rights Reserved. A Warner Communications Company

Our goal is to preserve classic video game magazines so that they are not lost permanently.

**People interested in helping out in any capacity,
please visit us at www.retromags.com.**

No profit is made from these scans, nor do we offer anything available from the publishers themselves.

If you come across anyone selling releases from this site, please do not support them and do let us know.

Thank you!

