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ANALOG

COMPUTING

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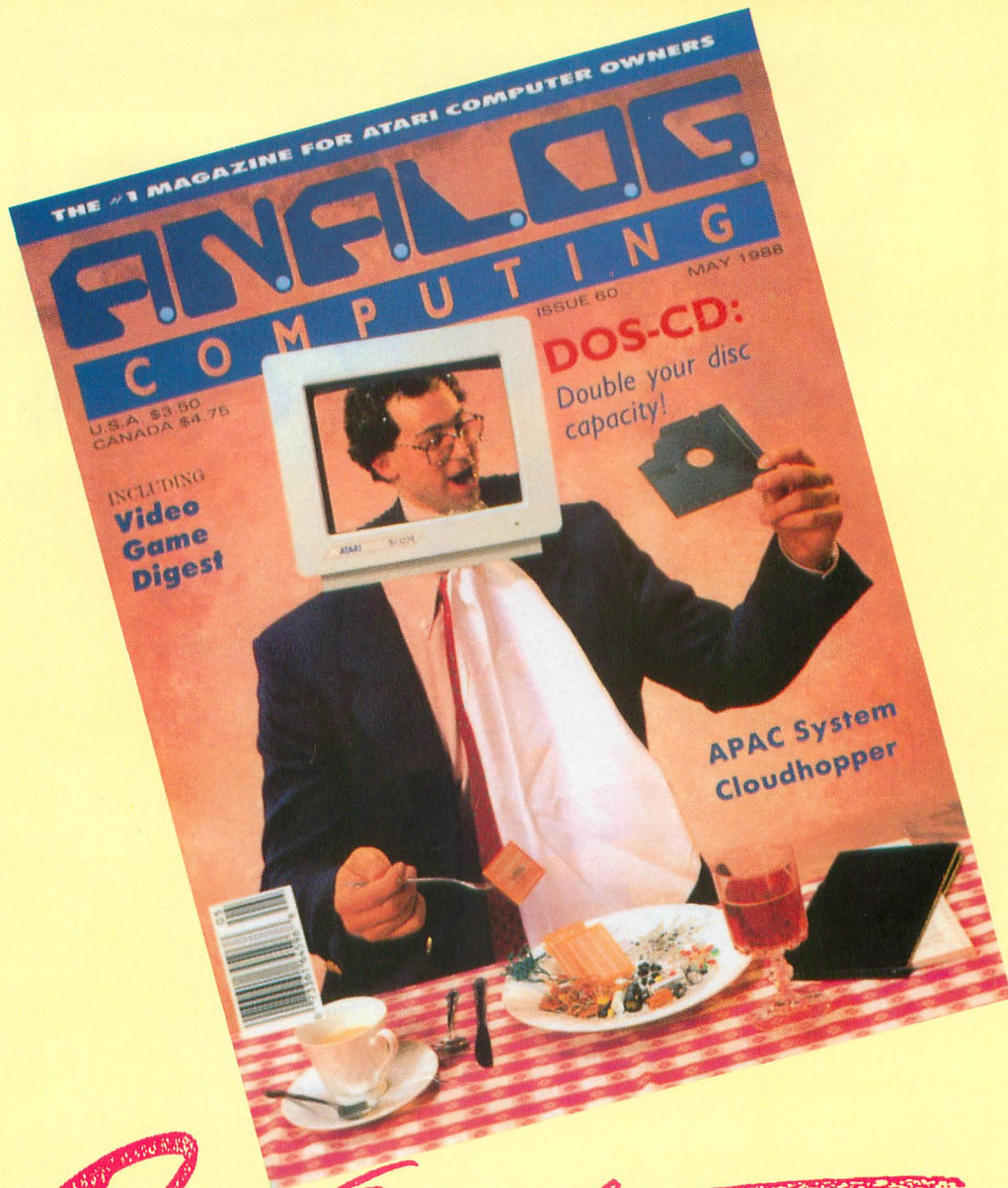
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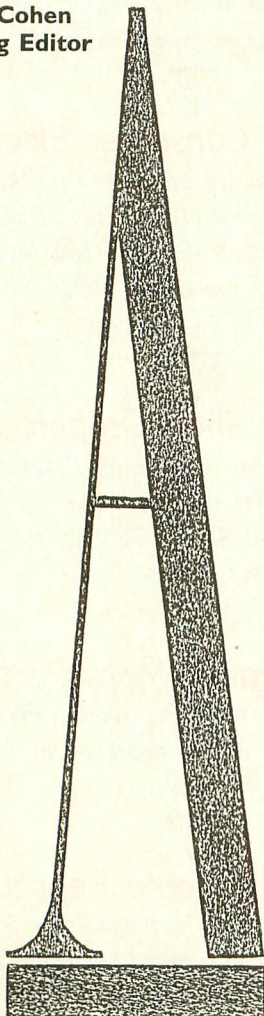
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by Frank Cohen
Contributing Editor



poet once said, "The place where optimism most flourishes is the lunatic asylum." Some may wonder if he could have been writing about the current state of affairs at Atari Corp. Plagued with DRAM memory-chip supply problems, lukewarm reception of the Mega ST, and an ever-decreasing number of U.S. retailers, Atari has a lot to be worried about. It has even taken a lot of pot shots this year from some of its most loyal friends, Atari user groups. Through all of the problems, the Tramiel Atari Corp. is optimistically projecting success and profits for the coming years.

Atari has a lot to offer, it has nicely filled out its high-end personal-computing line with the Mega ST, and offered a low-end XE Game system, which can inexpensively blossom into a home computer. It has always held its market with the VCS 2600 cartridge-based game system, and new VCS cartridges are still being developed for this seven-year-old machine.

In the middle of Atari's home-computing line is the XE/XL computer. Product offerings for the XE/XL have become sparse, since "Black '85," the year when most 8-bit software companies learned the meaning of the word "bankruptcy." The computer-buying public in the U.S. seemed to tire of the inexpensive 8-bit Atari 800 and the Commodore 64. It took the new 16-bit

systems—Macintosh, Atari ST, IBM PS/2 and Amiga—to return some of the excitement seen in the early '80s.

XE/XL owners will shortly see some amazing new developments. At last June's Consumer Electronics Show, Merrill Ward Company displayed its new *GEO* desktop system for the XE/XL. The system adds windowing, dialog boxes, drop-down menus and an integrated word processor and painting package to your XE/XL. Effectively, XE/XL owners will have a small version of GEM—the ST's visually driven operating system—for a tiny price.

Merrill Ward patterned its system after the *GEOS* operating system for the Commodore 64. In 1987, Commodore released *GEOS*, a visually driven operating system that offers some of the features found on the Macintosh; programs use windows and drop-down menus to communicate with the user. *GEOS* created an unexpected renaissance of interest and enthusiasm for the Commodore 64. Merrill Ward shows all the possibilities of doing the same thing for the Atari XE/XL computer.

With *GEO* comes the demand for larger memory and more disk storage. By chance, Atari recently began selling the new XF551 floppy disk drive for the XE/XL. The XF551 is a double-sided, double-density disk drive. *SpartaDOS X*, a special cartridge DOS from ICD Technologies, gives you full access to the XF551's high-capacity modes and makes disk operations quick and easy.

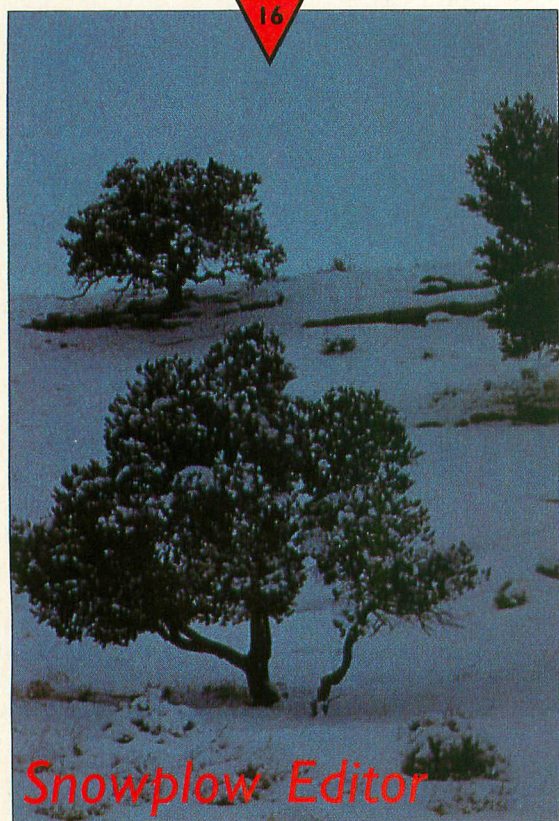
In June, the Japanese Ministry of International Trade announced that it would be easing up on self-imposed DRAM production quotas. This is good news for the American computer industry which is currently facing a memory-chip drought. Memory-expansion board manufacturers for the XE/XL project stronger sales with better DRAM supplies.

So maybe Atari Corp.'s optimism isn't so far off; the future really does look a little rosy.

(Quote from Havelock Ellis, *The Dance of Life*)

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BRYAN SCHAPEL

Production Director
DONNA HAHNER

Advertising
JE PUBLISHERS REPRESENTATIVE
(213) 467-2266
(For regional numbers, see map)

Advertising Production Director
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This does not apply to programs which specifically state that they are not public domain and, thus, are not for public distribution.

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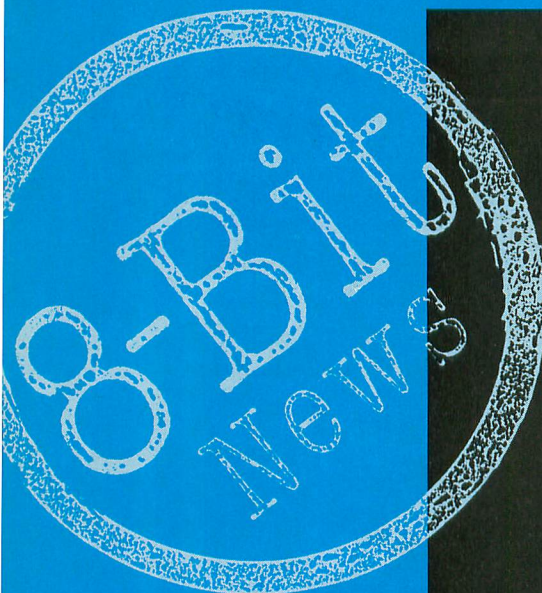
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Atari is following
Commodore's
recent revival of
the Commodore 64
after last year's
successful release of
the GEOS system.

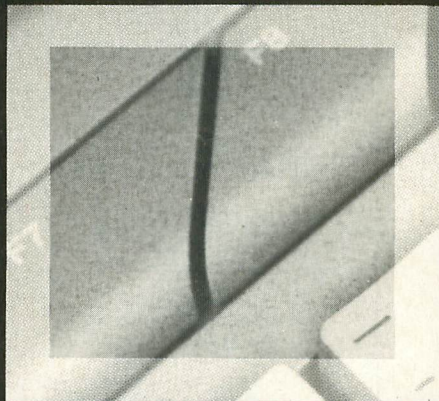
Educational Software Guide

Mindscape has published a *Guide To Selecting Educational Software*. The guide is available at no charge and covers user groups, child computer-literacy information, disabled children resources and product information. To receive a copy, send a self-addressed, stamped business size envelope to Mindscape. They also have institutional prices available for user groups and schools.

Educational Software Guide
Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062

GEM Desktop for your XE/XL!

Merrill Ward & Associates, Inc., announced the *Graphic Operating Environment* (GEO) at the June Consumer Electronics trade show. GEO is touted to bring the look and feel of the Atari ST's



GEM Desktop to the Atari XE/XL system. By plugging Merrill Ward's super-cartridge into your XE/XL, a stunning metamorphosis occurs. The windows, icons, dialog boxes and drop-down menus that are almost ordinary in the Macintosh and ST world will replace the normal XE/XL operating system. Just plug in an Atari ST Mouse, your normal joystick or use the keyboard, and start working with the *8-Bit Desktop!*

Shelby Merrill, Merrill Ward's president, calls the GEO super-cartridge the *ST Jr.* In addition to a word processor, drawing program, printer drivers, icon editor and a number of fonts, GEO supports full windowing functions for all of its compatible programs.

GEO has caught the attention of Atari



Corp., who is now negotiating a bundling agreement with Merrill Ward. Atari is following Commodore's recent revival of the Commodore 64 after last year's successful release of the GEOS system. GEOS does for the Commodore 64 what GEO does for the XE/XL.

GEO is expected to be priced around \$49.99 and should be available later this year. Merrill Ward is selling demonstration versions of GEO for \$5.

Merrill Ward & Associates, Inc.
255 North El Cielo Road, Suite 222
Palm Springs, CA 92262

October is Computer Learning Month

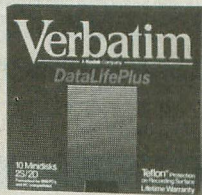
The nationwide computer and software awareness and public education product, *Computer Learning Month* (CLM), each year brings computer learning and awareness to businesspeople and consumers. This year Waldensoftware, a subsidiary of Waldenbooks stores, has joined the CLM project by distributing CLM posters and learning kits.

The CLM project has slowly been gathering momentum over the past years.

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This year more than 100 companies, publications, national organizations and schools are joining in the month-long push for computer awareness and education.

In addition to a poster, the CLM project will be distributing a university resource software guide, computer fair kit for retailers, CLM event kit, career book and a book on using computers and software in learning.

Computer Learning Month Project
P.O. Box 60967
Palo Alto, CA 94306-0967

Scrubbing your disks

Since Verbatim unveiled its new *DataLifePlus* diskettes last year, the company has been provoking some users to test drive the new 5 1/4-inch floppy disks through a crash course. Tests have included being splashed with Coca Cola, sprayed with window cleaner and even a trip through the dishwasher. After all of these tests, the *teflon* coating on the disk has kept its data. The disks cost a little more, but they seem to be worth it.

Verbatim
343 State Street
Rochester, NY 14650
(716) 724-5130

Synalc users support group

Synalc, one of the original spreadsheet programs for your XE/XL, is being actively supported by the Portland Atari Club, with the club offering many templates for use with *Synalc*. Last April, the club offered the *1987 Tax Template* which can be used to produce the numbers you would need to fill out the IRS 1040 tax return form. The *Tax Template* costs \$10, though the price drops to \$5 for club members.

Portland Atari Club
8-Bit Librarian
P.O. Box 1692
Beaverton, OR 97005

Amiga on the move

Irving Gould, CEO of Commodore Business Machines, has announced the *Amiga 2500* and *Amiga 3000*. Prototypes of the new machines were shown at the

CeBit show in Hannover, West Germany, last summer. The *Amiga 2500* comes with a 68020 CPU, while the *3000* comes with a 68030 CPU. Some new LSI custom chips are also being developed which will further enhance memory management, disk I/O and graphics. Gould did not mention any new prices, but he expects the machines to be out sometime this year.


The news was even more surprising to Commodore's employees. It seems that Gould did not mention to any of the *Amiga* product managers that he would be telling the world about the new *Amigas*. The news of the new machines should tell you something about the internal organization of Commodore and *Amiga*. At the spring National Computer Graphics Association (NCGA) show in Los Angeles, Commodore employees told the public that no announcements would be made about the new *Amigas*. They wouldn't even confirm they exist.

Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380
(215) 431-9100

XF551 Confusion!#@%

In April, Atari Corp. began shipping the new *Atari XF551* floppy disk drive. The new drive is a double-sided, double-density *smart* drive. Atari shipped *DOS 2.5* with the *XF551* as a temporary measure until their new *ADOS* disk operating system is ready. The problem is that *DOS 2.5* does not recognize the second side of a 5 1/4-inch floppy disk. So even though the box says "double-sided," the drive can only be used as a *single-sided* drive. This has caused a lot of confusion.

Until *ADOS* becomes available, there are some alternative disk operating systems for the XE/XL that *can* read the second side of the *XF551* drive. *SpartaDOS* is an ICD product which is available at all Atari XE/XL retail outlets. ICD will soon release *SpartaDOS X*, their new cartridge-based version, which will also work with the *XF551*.

Another alternative is called *MACH*. This *DOS* is available for free on DELPHI, CompuServe and GENIE. *MACH* supports both double-density and double-sided formats. It is also fairly compatible with Atari's *DOS*. 

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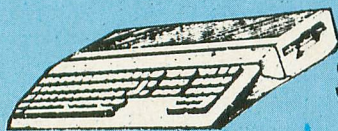
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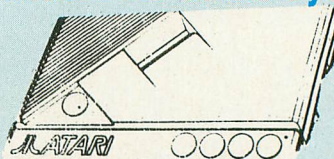
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Turbobase responds

In response to Steve Panak's review of *Turbobase* in the May issue of *ANALOG*: First, this review does a disservice to your readers because it is not factual. There are 15 errors in the ten-paragraph description. Curiously, most of the errors are negative. Already two customers have called thinking there was something wrong with their programs.

There is one factual statement: The manual is hard to "lug around." But we were kind of wondering, to where was he lugging it?

Secondly, it does us a disservice because he judges the task of implementation based on a fraction of the time required as listed in the manual, as we tell anyone who bothers to call. The median time to implement *Turbobase* is six weeks, and this hasn't stopped anyone from buying it. Judging by his grasp of the facts, Steve couldn't have spent six hours. To be honest, there have been a handful of disgruntled customers, who, like Steve (one was also a lawyer), expected it to be as simple as a game or home database. But there are also over 500 who are happy not to have to throw out their 8-bits to get business capability.

I refer Steve to any mall bookstore to see what a real PC business DBMS looks like, and see if he thinks the average non-expert could achieve a full integrated implementation tailored to the application in less than six weeks. Additionally, there are dozens of circumstances, not having to do with the software, that could have contributed to his problems. Since he never called—an instruction repeated 23 times in the documentation—we'll never know.

Lastly, the review does a disservice to the Atari community, with two paragraphs devoted to stereotyping the Atari as suitable only for games, rudimentary home database use, Christmas lists, recipes, etc. This is a slap in the face of us and our many friends in users groups who have worked long and hard to overcome the "Atari stigma." Factually speaking, the access of any of 50,000 inventory records in under one second is not "rudimentary."

—Steve Bolduc, President
Micromiser Software

I've always welcomed manufacturers and software developers correcting me if

and when I err in my analyses. And there's no doubt in this case I made a couple of errors. Unfortunately, Mr. Bolduc also erred by mistaking my opinions for facts and distorting what I said. I spent somewhere between six and ten hours looking at this program; regrettably, I could not have allotted it any more time. But based on the features in the tutorial, I declared



it to be the best choice for those desiring a powerful business database run on an 8-bit Atari. I still feel this is true.

But I continue to doubt the wisdom of running a business on anything but a PC or Macintosh (a statement I cringe at, being a loyal member the Atari community for the last six years), due to the fact that there is no product or configuration of "add-ons" on the market (considering the current cost of PC clones), which allow me to do this.

As far as this opinion doing a disservice to the Atari community, the suggestion that through my remarks I control the entire personal computer marketplace is, of course, ludicrous. If I had the power to wield such forces, I assure you that I would use it to pursue more personally gainful endeavors.

As for the implementation of a "real PC business DBMS" being impossible in less than six weeks, I need not visit my local bookstore to know it is possible, as I have done it. The program is called *Cornestone*, produced by Infocom, and anyone interested in sampling the software

of the future should check it out. While its intensive, and context sensitive help slows its performance somewhat (a problem easily overcome by using a 386 machine), it never ceases to amaze me how quickly my employees and colleagues learn to design new database structures and reports.

The future is simplicity, and the future is now, and I'll accept nothing less. Why should I spend six weeks designing a DB system when I can do it in six hours? To save money? Forsake simplicity and your bottom line will always be red.

—Steve Panak

Editor's note: The opinions of Steve Bolduc and Steve Panak are not necessarily those of ANALOG Computing; these letters were printed only in the spirit of fairness. Whether or not an Atari 8-bit computer may be used for a business use depends solely on the individual and the needs he may encounter when implementing such a system.

How do you use your computer?

Having just received Issue 62, July 1988, I am responding to the request in the editorial by Lee Pappas for information on uses of Atari

computers.

I am a great fan of the *MicroCheck* programs as published in your magazine and use it for personal records as well as one business account. I also use *SynCalc* for both personal and business uses. I make my own Income Tax calculator each year, as well as monthly ledger sheets, Federal Deposit calculations for Social Security and Income Tax withholding and accumulative tear-end reports. I also use *SynCalc* for calculating loan repayment schedules.

—Curtis W. Lacey
No. Fort Myers, FL

The staff of ANALOG Computing would like to thank everyone who responded to our request to let us know what you do with your machines. The information we've received clearly indicates that the Atari 8-bit computer is still being put to many good and productive uses. We received far too many letters to print here, but you can be sure that we read each letter we received and that we appreciate your taking the time to write.

A

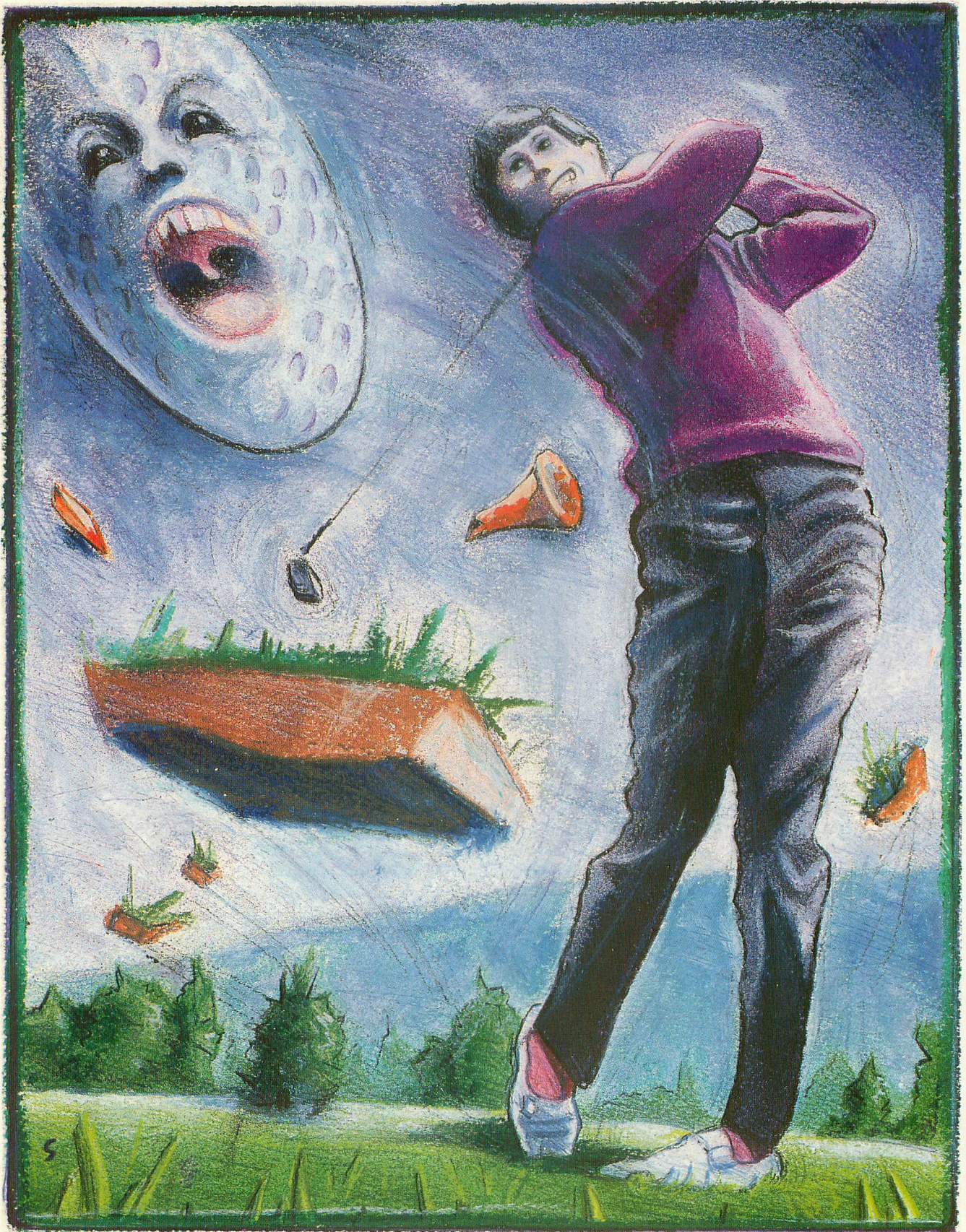


ILLUSTRATION BY STEVE STERLING

G A M E
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FAIRWAY 4

Challenge

by John T. Pape

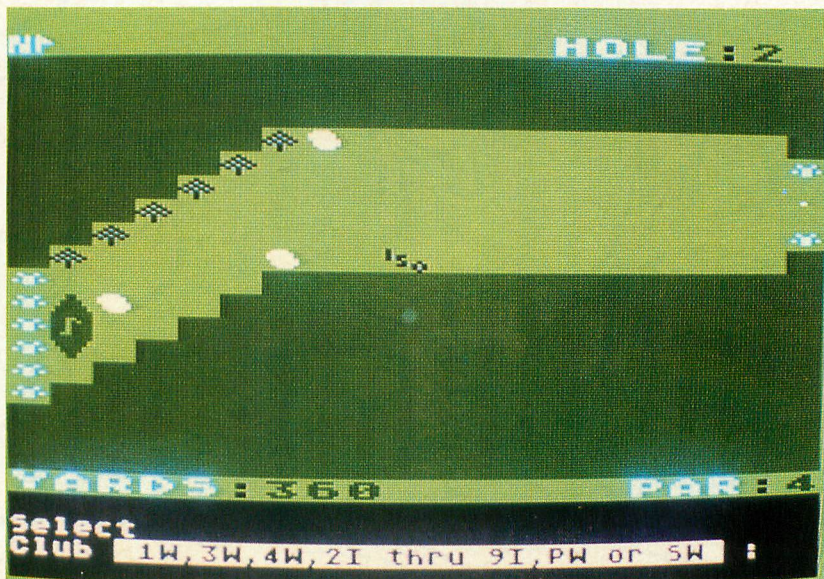
It takes a special breed of individual to withstand the frustrations that are a regular part of the game of golf. Indeed, it has been said that a golfer is a person, armed with a club, who goes around striking a small white object called a “%?-*”! Having been a golfer for some 20 years I can attest to this by recalling numerous incidents of ball cursing, club throwing and/or breakage, and stories of golfers who, upon deep-sixing one too many in the Tennessee River, emptied every ball in their bag, and in Three Stooges-like fashion proceeded to hit one after another into the nearest body of water or stand of trees. But on the other hand, the game must provide some degree of satisfaction, or it wouldn't be so hard to get a tee time on Saturday mornings. Hopefully, *Fairway Challenge* will evoke some of these same emotions from the armchair Atari golf enthusiast.

Playing the game

The course is a full 18 holes, complete with most of the hazards to be found on your favorite outdoor layout. Upon running the program, you will see the title screen, hear some appropriate “psych up” music and be informed of the next tee time. After program initialization, you will find yourself on the first tee. The computer will then ask you for your choice in clubs.

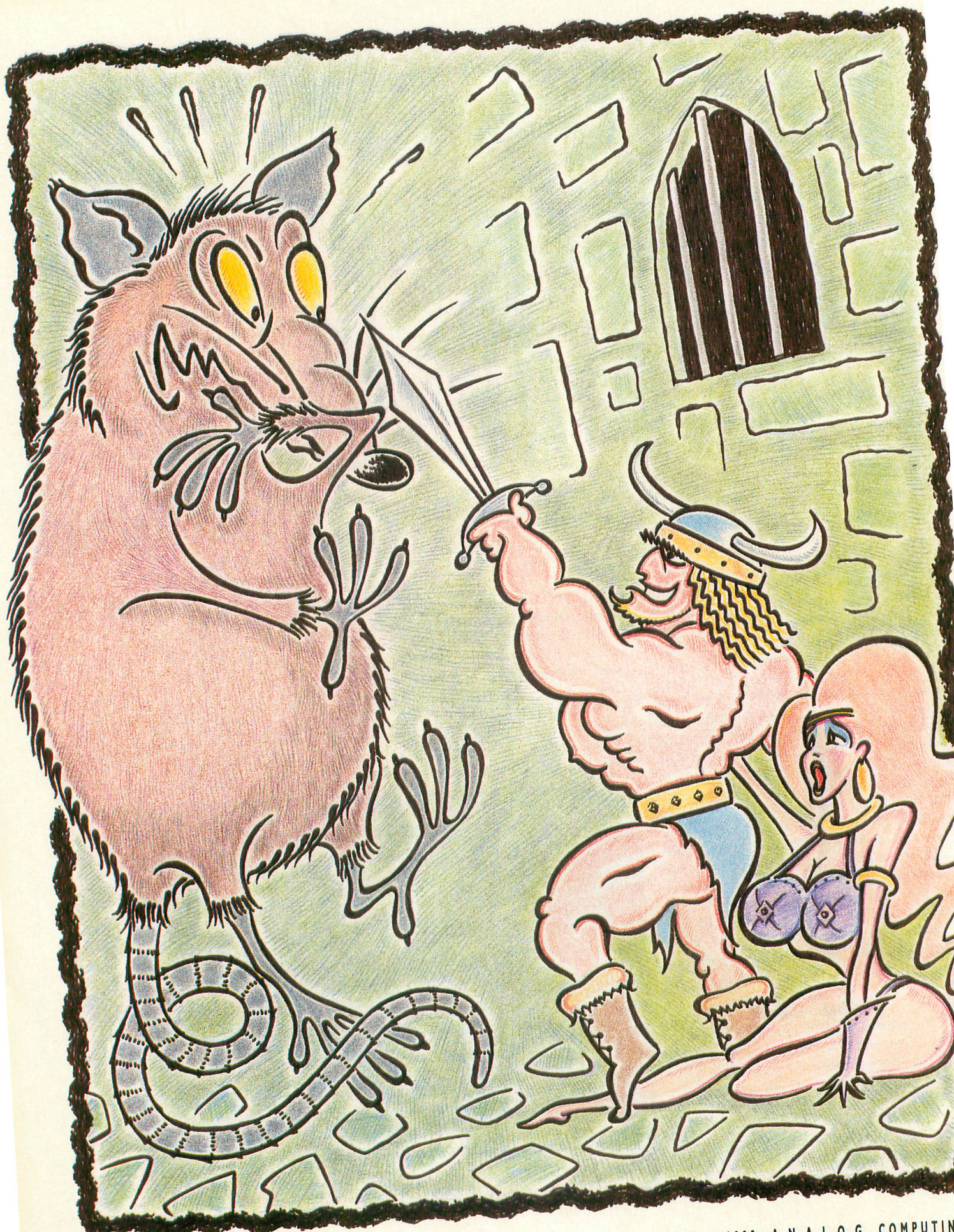
You are armed with the legal limit of 14, including the one, three and four woods, two through nine irons, pitching wedge, sand wedge and putter. Enter your selection by typing the two-letter abbreviation for the desired club followed by RETURN. For instance, the one wood would be IW, five iron 5I, sand wedge SW, and so on.

Next you will be asked to select the type



of swing you want: full, half or easy. Enter only the first letter of your choice and RETURN. Finally, you are asked for the

continued on page 48



The Slave Cellars

by Clayton Walnum

of Golgoloth

History on a Small Scale

It was many risings and fallings of the moon ago that I had a subscription to a magazine called *Softside*. It was the first magazine I ever read that covered Atari computers (there was no ANALOG Computing then, though it wasn't long in coming), and I read it with the same dedication a Bostonian feels toward the Red Sox. One of the best things about *Softside* was "The Adventure of the Month" club. For an incredibly low price (it amounted to a little over \$3 a month), members of this club received, monthly, a complete BASIC text adventure.

It was the "Adventure of the Month" club that got me hooked on text adventures, and as I was just learning to program at that time, it was natural that I should start to study the BASIC code that comprised each month's adventure.

At first, the programs were like alien creatures; they spoke a language incomprehensible to me and looked as strange as some visitor from the depths of space. But as I learned more about my computer, and as I spent more and more hours applying what I had learned, I slowly began to speak these creatures' language.

Finally, I sat down to write my first adventure game—a rescue-the-princess adventure titled *The Slave Cellars of Golgoloth* (TSCOG). It was a text adventure, of course, but it utilized some simple graphic and sound effects to add a little life to the

all-text format. After forcing—at gunpoint—several of my friends to play the game (getting someone to start an adventure is easy, but making them finish it requires all manner of begging, whining, threatening and bribing), I deemed it ready for the general public and uploaded it to CompuServe.

I waited for the verdict.

Within a week the number of messages I was receiving in E-mail and the Forum multiplied significantly. Some people wanted clues to the game, some people wanted to know whether there was going to be a sequel, and some people wanted to know when I was going to fix the bugs. (Ahem.) Whatever the reason for their contact, there was no doubt that a good many people were playing TSCOG. I watched the download count move into the hundreds, and at the same time I watched my CompuServe bill skyrocket as I spent more and more time online answering mail. But the \$100-a-month connect charges didn't bother me too much. You see, I was learning something that only someone who has sweated over a lengthy project knows: It feels great to have all that work appreciated. And it's a kind of circle. The more appreciation you receive, the harder you work at new projects.

It was around this time that I made my first sale to a magazine. The editor of the now defunct *Hi-Res* called me at work and told me he wanted to publish the dice

game I had sent him. I was thrilled to the marrow and started the long wait that every writer who is on his first sale is familiar with. The time between the sale and the actual publication is nothing less than eternity to the power of one billion.

I waited and waited and waited.

For five months I waited, and during that time not a single issue of *Hi-Res* was published. It was obvious to even a knucklehead like me that *Hi-Res* had gone bye-bye, and my first sale was a sale no longer. Sigh. (The program was eventually published in ANALOG #42 as *Atarzee*.)

But let's move back a couple of months. While I was waiting for *Hi-Res* to get into gear, and while I was answering all those requests for adventure clues, I was filling my free time with a new project. Having been entirely dissatisfied with every home checking program I had seen, I decided to write one for myself. Nothing fancy; just something that would do exactly what I wanted. No extra frills. I had tried to write a checking program once before, and had given it up as a project far too complicated for my meager programming skills, but this time I was determined. I had written a successful adventure game, right?

The program grew, and it wasn't long before I realized that maybe I might actually have something salable on my

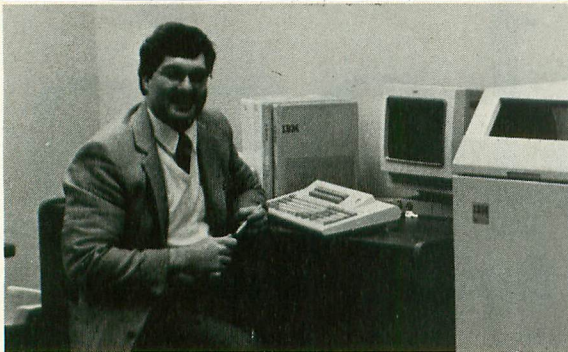
continued on page 54



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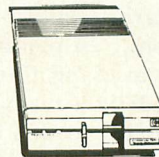


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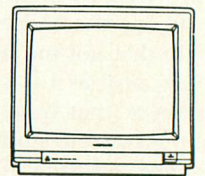


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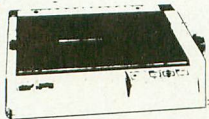
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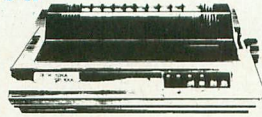
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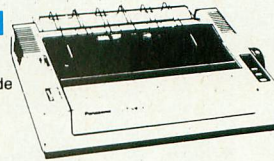
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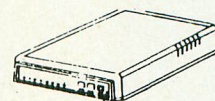
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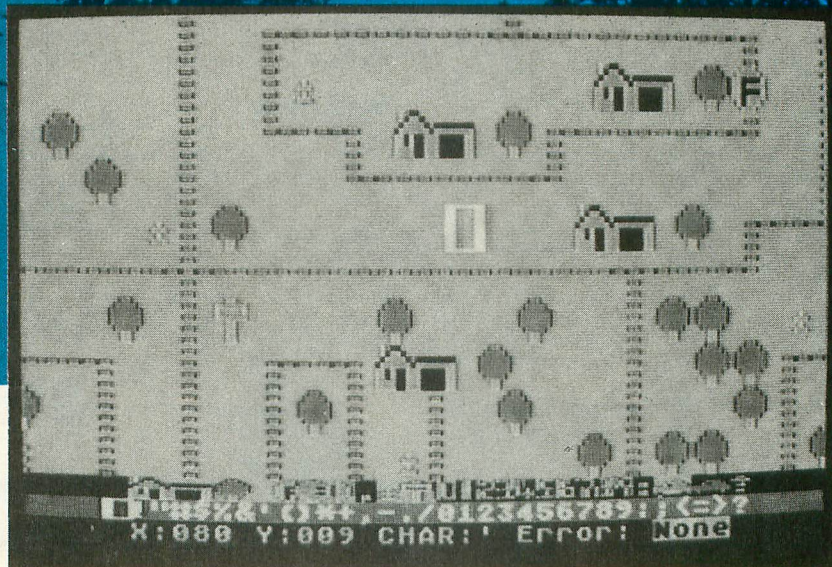
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Snowplow

Editor

by Barry Kolbe
and Bryan Schappel



When the editor has loaded, you will notice that the screen is divided into two main sections. There is the editing window (which comprises most of the screen) and the input/info area at the bottom of the screen.



continued on page 62

BASIC Editor II

ADDENDUM

Editor's note: The listings for Basic Editor II in the September '88 issue were inadvertently left out. Sorry about that. Here they are:

Listing 1. BASIC listing.

```

32600 IF FL THEN 32616
32602 DIM L$(115), S$(98), E$(69), A$(1): FL=1: S
TMTAB=PEEK(136)+PEEK(137)*256
32604 GRAPHICS 0: POKE 710, 0: P=0: ABR=0:
? "ALLOW ABBREVIATIONS": INPUT AS: IF A
S="Y" OR AS="y" THEN ABR=1
32606 B$(1)="": B$(115)="": B$(2)=B$
32616 OPEN #17, 4, 0, "E": L$="": GOSUB 3
2662: START=0
32618 POKE 766, 1: POKE 83, 39: POSITION 1
, 3: IF LEN(L$) < 3? THEN ? L$: GOTO 32624
32620 IF LEN(L$) < 7? THEN ? L$(1, 30): ?
L$(39, LEN(L$)): GOTO 32624
32622 ? L$(1, 30): ? L$(39, 76): ? L$(77, L
EN(L$))
32624 POKE 752, 0: POKE 766, 0: POKE 559, 3
4: POKE 82, 1: POKE 83, 38: POSITION 0, 10: ?
" ": INPUT #17: L$: POKE 766, 1
32626 IF (L$="p" OR L$="P") AND START=
0 THEN P=1: L$=""
32628 IF L$="E" OR L$="e" THEN E=1: POS
ITION 1, 10: ? S$: GOTO 32624
32630 IF L$="Q" OR L$="q" THEN 32630
32632 IF L$="" AND P=1 THEN 32686
32634 IF L$="" THEN 32624
32636 IF L$="H" OR L$="h" THEN GRAPHIC
S 0: ? "TYPE 'GOTO 32600' TO CONTINUE":
END
32638 IF L$(1, 1)="E" OR L$(1, 1)="e" TH
EN E=1: TRAP 32624: EL=VAL(L$(2)): POSITI
ON 1, 9: LIST EL: GOTO 32624
32640 S$=L$: TRAP 32624: N=VAL(L$)
32642 START=1: IF P AND NOT E THEN 326
52
32644 GOSUB 32674: IF NOT ABR OR P THE
N 32652
32646 POKE 766, 0: ? CHR$(125): POSITION
0, 3: L=VAL(L$): LIST L: ? ? "CONT": L$
=B$
32648 POSITION 0, 0: POKE 842, 13: STOP
32650 POKE 842, 12: A=USR(ADR(S$), ADR(L$
), 4): L=L$(1, A)
32652 CHKSUM=USR(ADR(H$), ADR(L$), LEN(L
$)): CHKSUM=CHKSUM+PEEK(1542)*65536
32654 CHK=CHKSUM-(INT(CHKSUM/676)*676)
: HI=INT(CHK/26): LO=CHK-(HI*26): C2$(1)=
CHR$(HI+65): C2$(2)=CHR$(LO+65)
32656 IF NOT P OR E THEN E=0: GOSUB 32
662: IF NOT P THEN 32660
32658 POKE 83, 39: POKE 752, 1: FOR N=3 TO
5: POSITION 1, N: ? B$(1, 38): POSITION 1
, N+7: ? B$(1, 38): NEXT N: POKE 83, 38
32660 POKE 766, 1: POKE 83, 38: POSITION 6
, 7: ? C2$: POKE 752, 0: GOTO 32610
32662 GOSUB 32702: POKE 766, 0: POKE 752,
1: ? "K": POKE 82, 1: DL=PEEK(560)+256*PEE
K(561)+4
32664 POKE DL-1, 70: POKE DL+2, 6: POKE DL
+3, 112: POKE DL+4, 112: POKE DL+5, 112: POK
E DL+13, 112: POKE DL+14, 112
32666 POKE DL+22, 112: POKE DL+23, 112: POK
E DL+24, 65: POKE DL+25, PEEK(560): POKE
DL+26, PEEK(561): POKE 83, 39
32668 POSITION 20, 0: ? " basic editor
"
32670 POSITION 0, 7: ? " basic editor
"
32672 POSITION 0, 1: ? " basic editor
"
32674 GRAPHICS 0: POKE 559, 0: POKE 766, 1
: POKE 82, 0: POKE 83, 39: POSITION 0, 3: ? L
$: ? ? ? ? "CONT": POSITION 0, 0
32676 POKE 842, 13: STOP
32678 POKE 842, 12: TRAP 32682: A=USR(ADR
(E$), VAL(L$)): IF A=4 THEN POP IGOTO 32
682
32680 RETURN
32682 GOSUB 32662: SOUND 0, 75, 10, 8: FOR
N=1 TO 20: NEXT N: SOUND 0, 0, 0: POSITIO
N 1, 3: ? "SYNTAX ERROR!": POKE 766, 1
32684 POKE 83, 38: POSITION 1, 10: ? S$: G
OTO 32624
32686 LINE=PEEK(STMTAB)+PEEK(STMTAB+1)
*256: IF LINE=32599 THEN 32690
32688 OFS=PEEK(STMTAB+2): STMTAB=STMTAB
+OFS: POSITION 1, 9: LIST LINE: GOTO 32624
32690 POKE 766, 0: POSITION 1, 10: ? "READ
Y TO QUIT": INPUT AS: IF AS="" THEN P
OSITION 1, 10: ? B$(1, 30): GOTO 32624
32692 GRAPHICS 0: ? ? ? ? ? ? ? ? ? ? ? ?
: FOR N=32638 TO 32674 STEP 2: ? ? ? ? ?
: ? ? "CONT": POSITION 0, 0
32696 POKE 842, 13: STOP
32698 POKE 842, 12: GRAPHICS 0: ? ? ? ? ?
: FOR N=32676 TO 32702 STEP 2: ? ? ? ? ?
: ? ? "POKE 842, 12": POSITION 0, 0

```

```

32700 POKE 842, 13: STOP
32702 POKE 16, 112: POKE 53774, 112: RETUR
N

```

CHECKSUM DATA. (see issue 39's Unicheck)

```

32600 DATA 6, 665, 923, 757, 809, 171, 225, 8
98, 532, 499, 910, 267, 912, 144, 735, 8453
32638 DATA 97, 358, 230, 693, 706, 878, 317,
127, 36, 597, 236, 258, 182, 430, 168, 5315
32668 DATA 864, 953, 472, 385, 887, 724, 72,
687, 908, 736, 625, 612, 672, 184, 891, 9672
32698 DATA 8, 856, 85, 949

```

Listing 2. BASIC listing.

```

10 DIM L$(120), M$(119), A$(1)
20 GRAPHICS 0: POKE 710, 0: ? "DISK OR CA
SSETTE": INPUT AS: IF AS<"C" AND AS<">
D" THEN 20
30 IF AS="C" THEN 50
40 ? "PLACE FORMATTED DISK IN DRIVE!":
? "THEN PRESS RETURN": INPUT L$: OPEN #1
, 8, 0, "D:ML.DAT": GOTO 60
50 ? ? ? "READY CASSETTE, PRESS RETURN"
: INPUT L$: OPEN #1, 8, 0, "C"
60 L$="32608 M$(1)="": L$(13)=CHR$(34)
70 N=119: GOSUB 130: L$(14)=M$(1, 50): L$
(LEN(L$)+1)=CHR$(34): ? M1: L$
80 L$(13)="32610 M$(59)="": L$(14)=CHR$(3
4): L$(15)=M$(59): L$(LEN(L$)+1)=CHR$(3
4): ? M1: L$
90 L$(13)="32612 S$="": L$(10)=CHR$(34)
100 M$="" : N=98: GOSUB 130: L$(11)=M$(1)
: L$(LEN(L$)+1)=CHR$(34): ? M1: L$
110 L$(13)="32614 S$="": L$(10)=CHR$(34)
120 M$="" : N=69: GOSUB 130: L$(11)=M$(1)
: L$(LEN(L$)+1)=CHR$(34): ? M1: L$: END
130 FOR N=1 TO NREAD A: M$(N)=CHR$(A)
: NEXT N: RETURN
140 DATA 104, 104, 133, 204, 104, 133, 203, 1
04, 104, 133, 205, 169, 0, 141, 3, 6, 141, 2, 6, 1
41, 4, 6, 141, 5, 6
150 DATA 141, 6, 6, 238, 3, 6, 32, 68, 218, 172
, 2, 6, 177, 203, 133, 212, 32, 170, 217, 32, 182
, 221, 32, 68, 218
160 DATA 173, 3, 6, 133, 212, 32, 170, 217, 32
, 219, 218, 32, 210, 217, 165, 212, 141, 0, 6, 16
5, 213, 141, 1, 6, 24
170 DATA 173, 0, 6, 109, 4, 6, 141, 4, 6, 173, 1
6, 8, 5, 6, 141, 5, 6, 13, 238, 6, 6, 238, 2
180 DATA 6, 172, 6, 196, 205, 208, 176, 173
, 4, 6, 133, 212, 173, 5, 6, 133, 213, 96
190 DATA 104, 104, 133, 204, 104, 133, 203, 1
04, 104, 141, 255, 6, 169, 0, 133, 213, 216, 165
, 88, 133, 205, 165, 89, 133, 206
200 DATA 174, 255, 6, 24, 165, 205, 105, 40, 1
33, 205, 144, 2, 230, 286, 202, 208, 242, 160, 0
, 177, 205, 201, 64, 144, 18
210 DATA 201, 96, 144, 19, 201, 128, 144, 18
, 201, 192, 144, 6, 201, 224, 144, 7, 176, 8, 24, 1
05, 32, 144, 3, 56, 233
220 DATA 64, 145, 203, 200, 192, 114, 240, 2,
208, 215, 177, 203, 201, 32, 208, 3, 136, 208, 2
47, 208, 32, 212, 96
230 DATA 104, 104, 141, 254, 6, 104, 141, 253
, 6, 169, 0, 133, 212, 165, 136, 133, 205, 1
65, 137, 133, 206, 160, 0, 177
240 DATA 205, 205, 253, 6, 208, 8, 200, 177, 2
05, 205, 254, 6, 240, 15, 160, 2, 177, 205, 24, 1
01, 205, 133, 205, 144, 228
250 DATA 230, 206, 176, 224, 160, 4, 177, 205
, 201, 55, 240, 4, 160, 0, 240, 0, 132, 212, 96

```

CHECKSUM DATA. (see issue 39's Unicheck)

```

10 DATA 203, 265, 465, 844, 294, 973, 652, 27
0, 978, 293, 278, 265, 35, 209, 381, 7639
50 DATA 355, 94, 254, 420, 935, 840, 588, 41
, 974, 564, 5435

```




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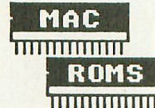


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WHAT'S NEW at CES

by Arthur Leyenberger

Whether you know it or not, electronics are as much a part of modern life as say, the telephone and television. Wait, telephones and televisions *are* electronics, and that proves the point. More and more, leisure-time activities consist of, in part, some form of electronics. Whether it's audio and video, home information, calculators, watches or telephone products, electronics touch each of our lives.

Consumer electronics today represents a \$32 billion industry. *The* place to see what's hot and what's not in the consumer electronics business is the semi-annual Consumer Electronics Show (CES). The summer CES held in Chicago, consists of over 730,000 square feet of exhibit space, nearly 1,400 exhibitors, approximately 100,000 attendees from over 70 countries and some 2,000 journalists. All of this takes place over the course of four days with the result being a look at what will appear at retail in the next six months.

This was the 22nd consecutive summer CES. Every year it seems to get bigger and better. And every year or so there seems to be a major new product or product

category that not only steals the show but is a revolutionary consumer product in its own right. The products shown at CES represent the forefront of technology, and oftentimes a hint at what's just over the technological/electronic horizon.

In the past there have been such product innovations as the compact disc, Super VHS video recorders, the pocket LCD TV, the Sony Walkman and many, many more. One company stands out as consistently presenting the most exciting, innovative products: Sony. This year was no different. The excitement in McCormick East was centered on Sony's two "Personal Video" products.

A consumer electronics breakthrough

Sony Corporation of America announced the availability of two portable video products designed for individual use. Called Personal Video, the products include the GV-8 Video Walkman TV/VCR combination unit and the EV-DT1 desktop video system. Both feature color TV screens and complete 8mm video recorders. A separate ultra-miniature color video camera (the CCD-



Can you use three-inch CDs?

The pocket-size D-88 is dedicated to the new three-inch CD format but will also play the standard five-inch CDs. The three-inch CD format, codeveloped by Sony Corporation and N. V. Philips, is based on the same digital encoding as conventional CDs and was announced late last year as a formal CD standard. Each disc can hold up to 20 minutes of digital music and is expected to retail for under \$6.

Unlike a conventional LP record which has a mechanical pickup that starts at the outermost part of the disk and travels inward on a spiral groove, a compact disc is read by a laser which starts at the innermost part of the disc and travels outward. Further, the laser reads the compact disc from the underside of the disc. Because of this arrangement, a compact disc player can read both standard five-inch discs as well as the new three-inch discs, theoretically.

True, all CD players can read either of these compact disc sizes but the theoretical part depends on the type of player. There are basically two types of CD players: spindle and drawer designs. On a spindle-type player, the CD rests on a spindle that protrudes through the hole in the middle of the CD. The drawer-type player holds the CD until the drawer is closed, and then it is lowered onto a spindle inside the machine. (A third type of player introduced in the early years of the CD format has a vertical, hinged door.)

The spindle-type CD player can play the three-inch CDs directly. A drawer-type CD player requires the use of an outer adapter ring that fits around the outside of the three-inch CD to give it the same diameter as a normal five-inch CD. The vertical door CD player also requires the use of the three-inch adapter ring. The adapter can be thought of as working in just the opposite fashion as the adapter needed to play a 45-rpm single on a stack-loading record player.

G1) can be used with either unit.

Sony previewed prototypes of these products one year ago when the company presented the concept of Personal Video—the ability to use a TV/VCR combination unit wherever the consumer happens to be, rather than at home or where the VCR is connected to a television. The introduction of 8mm video two years ago is what paved the way for products such as these. The introduction of these portable video products represent expansion of the 8mm format.

The GV-8 Video Walkman measures only five inches wide, eight inches high and a mere two and a half inches deep. I find it incredible that a complete video system fits within this size package. The unit has a three-inch (measured diagonally) color LCD screen with an active matrix system for superior sharpness, contrast and color purity. The screen appears brighter and is plainly viewable in sunlight due to a built-in backlight behind the screen.

The VCR component of the GV-8 is a full-featured unit that has high-speed search, a one-day/one-event timer for time-shifted recordings and a built-in TV tuner with full VHF and UHF channel reception. It also has a sleep timer that automatically turns off the unit after one hour. Although designed for personal use, the GV-8 can be connected to any TV monitor for large screen viewing. Also, the GV-8 has audio/video input and output connectors to allow connection to another VCR of any format. A linear time counter displays the tape position in hours, minutes and seconds.

The Sony Video Walkman is every bit as original and innovative as the Walkman was ten years ago. Despite its compact size and weight of only two and a half pounds, it has a high-quality video image and high-fidelity sound. The built-in speaker is said to be a high-performance model for improved sound. The GV-8 operates on either AC or DC and can use either rechargeable nickel-cadmium batteries or alkaline batteries when used with an optional external battery case.

The EV-DT1 desktop video system is slightly larger than the GV-8 Video Walkman. Taking up little more room than a telephone, the EV-DT1 is a complete video resource that can sit right on the desk. It has a five-inch high-performance Trinitron (r) color monitor and a full-featured 8mm VCR, complete with a seven-day/three-event timer and on-screen display for help in recording programs.

Although the EV-DT1 can be used at

A NEW KIND OF BUSINESS LETTER...

The personal video memo can now be made right at the desk with video equipment that takes up little desk space. From Sony, the EV-DT1 combination 8mm videocassette recorder-Trinitron® color monitor with 5-inch screen and ultra-miniature CCD-G1 color video camera allows executives to communicate with video on a one-to-one basis. The EV-DT1 full featured VCR includes a TV tuner and timer. It has a suggested retail price of \$1,700. The suggested retail price for the CCD-G1 is \$750. Both units are currently available.

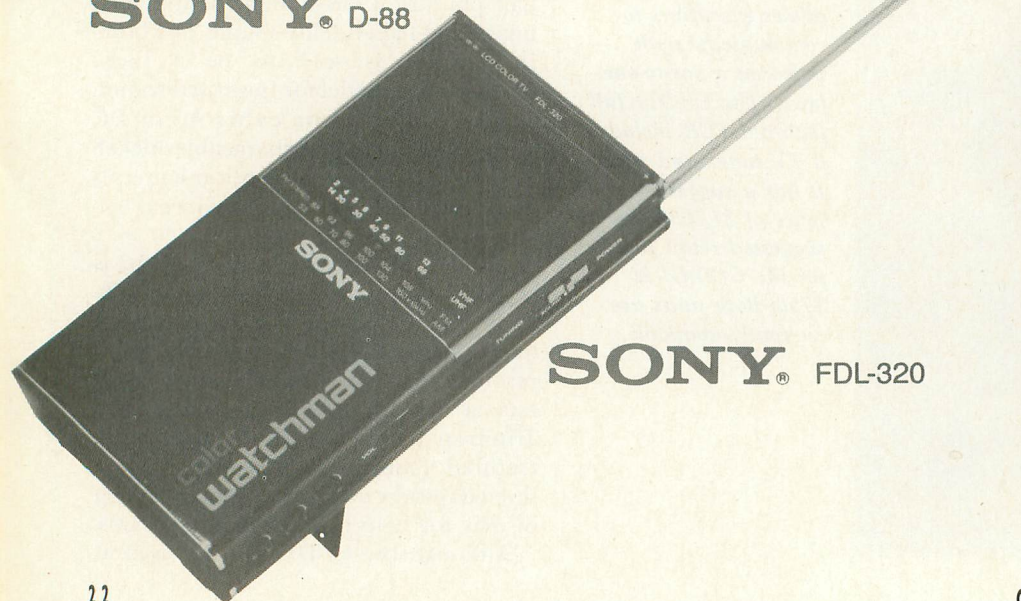




SONY.
GV-8 Video Walkman®



SONY. D-88



SONY. FDL-320

The great CD rip-off

There is some controversy surrounding the new three-inch compact-disc format. When it was first announced, the retail price was promised to be from \$3 to \$5 and that would not only include the disc but the CD-3 adapter as well. Since the CD-3s have started appearing in the last couple of months, it has been noticed that the price has somehow crept up to the "under \$6 retail," and few if any CD-3 titles include an adapter with the packaging.

When the CD-3 was announced, it was heralded as the replacement for the 45-rpm record. Apparently, teenagers are not buying CDs in the enormous quantities that the record companies would like, so this CD-3 format was concocted. It was reasoned that since a CD-3 would cost only one third the price of a standard CD, it would sell well with the younger crowd. Of course, another alternative was to have lowered the price of regular compact discs.

The recording industry made a promise to consumers when the CD format was launched in the early 1980s. They said that manufacturing capacity was limited and that led to the high price of compact discs. As soon as the manufacturing bottleneck was alleviated the price of CDs would fall to under \$10. Well, if you bought a CD recently, you know that most CDs still cost from \$15 to \$18. Yes, there are some budget CDs that sell for under \$10, but they are either reissued, old LPs (where the royalties have run out) or are classical/jazz works with unknown recording artists.

The compact-disc manufacturing bottleneck was alleviated almost two years ago, and still the prices have not retreated. Further, new improved manufacturing techniques have lowered the cost to produce a CD as well. So, the new CD-3 format is cheaper per disk but still has the same cost per song (four songs for \$6 or 12 songs for \$18).

What especially galls some people is that the cost of producing a three-inch CD is about the same as producing a five-inch CD. So why the new format? Sure, the CD-3s are cute, but is it worth the hassle to have to worry about adapter rings, packaging the little fellas and storing them in your CD library? For a retailer, the CD-3 represents another size and presents inventorying problems. And don't forget the confusion to the consumer who as yet has not embraced the compact disc format completely.

home or anywhere else, it may have its greatest use at the office. Since video is increasingly being used in business as a sales aid, training device and communications tool, this unit provides a means to more broadly disseminate information in the office environment. The combination of the EV-DT1 and the small color camera (CCD-G1) is a powerful video package.

The CCD-G1 camera offers simple one-button operation. A solid-state two-thirds-inch CCD (Charged-Coupled Device) image sensor, excellent color processing and low light sensitivity provide a quality picture. A built-in omni-directional microphone allows for high-fidelity sound simultaneously recorded with the picture. A three-zone Ready Focus (r) focusing system permits point-and-shoot operation of the unit. Other camera functions such as white balance and exposure control are automatic.

The Sony EV-DT1 video system is available at a suggested retail price of \$1,700. The CCD-G1 color camera retails for \$750, and the GV-8 Video Walkman will sell for \$1,300. All three products will be available by the time you read this. These video products from Sony are *hot*.

On the eve of the 50th anniversary of broadcast television Sony continues to make news. The Sony FDL-320 Color Watchman is a color version of their flat-screen pocket television which includes AM and stereo FM reception. The unit weighs only 14 ounces (including batteries), includes full VHF/UHF reception, and has a 2.7-inch backlit LCD screen. The FDL-320 can operate via AA batteries, AC through the supplied AC-D4 adapter or car battery with the optional car adapter cord. The Sony Color Watchman is available now for a retail price of \$600.

The other Sony innovation at this year's CES (you would think one was enough) is a new portable CD player designed specifically for the new CD-3 (three-inch) compact discs. Sony came out with the first portable CD player, the incredibly small D-5. Each of the last three years has seen still smaller and fuller featured models come from Sony. Now, with the introduction of the Sony D-88 Pocket Discman (tm), Sony has created the world's smallest CD player that weighs a mere 10.6 ounces and measures only $3\frac{3}{4}$ by $1\frac{1}{16}$ by $3\frac{3}{8}$ inches.

In addition to a supplied rechargeable battery that permits up to two hours of operation, the D-88 is supplied with an AC power adapter for use with regular house current. A carrying case, remote control and high-quality stereo headphones are also supplied with the unit.

WHAT'S NEW at CES

One of the important features of the new Sony unit is its five-inch CD compatibility. Although the D-88 is barely larger than the diameter of a three-inch CD, it can play standard-sized discs by means of a sliding optical pickup and two-position center spindle. However, when playing a five-inch CD, the D-88 is not quite as portable since the disc extends out beyond the edge of the player. Fortunately this does not pose a safety hazard and I can attest to having been able to easily stop the exposed, rotating disc with my fingers.

The Sony D-88 Pocket Discman (tm) will retail for \$360 and be available by the time you read this.

Where's DAT recorders

There should have been another breakthrough product being demonstrated by every audio manufacturer at the show: Digital Audio Tape (DAT). DAT was first shown over a year ago by several manufacturers, and they predicted that the new format decks would be available in stores by Christmas 1987. However, the recording industry threatened to sue any manufacturer who brought a DAT product to the U.S. market, and the continuing controversy has held up the introduction of the DAT decks in the US.

Fortunately, negotiations are taking place between the hardware manufacturers and recording industry. Many people feel that the issue should be resolved within the year. As of now, manufacturers are just waiting for the signal to introduce their products. DAT tape manufacturers also have warehouses full of tapes, waiting to be shipped. Currently DAT decks are available in Japan and other countries and can be purchased in the United States through the gray market. However, the decks are pricey, most selling for about \$2,000.

When DAT does arrive, it will eventually replace the cassette market just as CDs are overtaking the LP market but it will take time. Prerecorded cassettes and cassette decks are relatively inexpensive. It will be awhile before DAT decks are selling for \$300, but once they are, it will be time for a recording format change.

Calculators?

Calculators have not been news since they were first introduced 15 years ago. But there is one company that makes the finest calculators money can buy: Hewlett-Packard. These calculators don't compete with the kind that you buy for \$19.95 and throw away when they stop working. Hewlett-Packard calculators have been available in models for business, science, engineering and statistics since the early 1970s.

Several new models were introduced at CES this year. The HP-22S scientific calculator is an algebraic-entry machine designed for college students. It has a solve function that lets the student enter equations just as they are written in textbooks. Once the equation is entered, the student can solve for any variable without re-entering the equation.

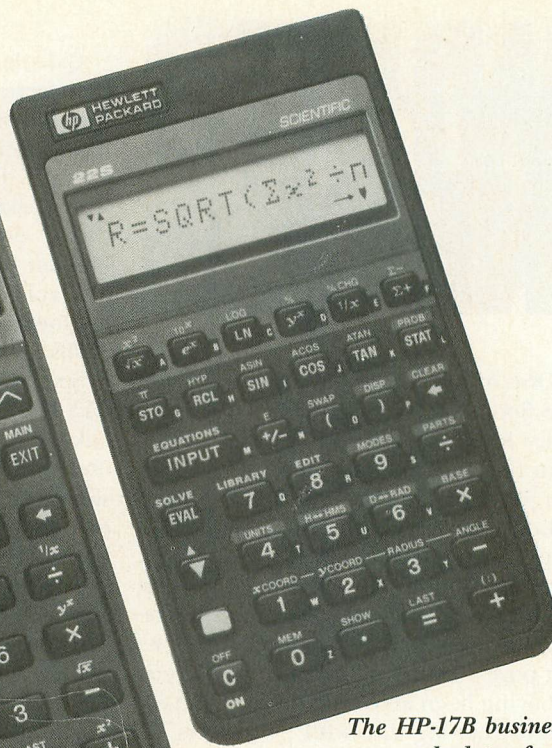
For instance, on most calculators, to solve for Z in the equation $(X+Y)/Z = Ax/B$, the equation must first be rewritten as $Z = (X+Y)/(Ax/B)$. Then, to solve for another variable such as Y, the equation has to be rewritten as $Y = Ax/BxZ - X$ and entered again. On the HP-22S, the equation needs to be entered only once, as $(X+Y)/Z = Ax/B$. Then the HP-22S prompts the user for values of the variables and solves for the missing one.

The HP-22S also has a library of 16 commonly used equations including roots of a quadratic equation, pressure of a fluid and kinetic energy. To make entering the equations easier, the HP-22S has an alphanumeric display that shows variables and messages instead of cryptic codes. The HP-22S retails for \$60.

The HP-32S uses Hewlett-Packard's own RPN (Reverse Polish Notation) and is a scientific calculator with all of the technical features that professionals and students need. Along with a complete set of math and science functions, it has an equation solver that solves for any variable once the equation is set equal to zero. In addition to the equation solver, the HP-32S has numeric integration and complex-number functions, as well as keystroke programming for solving repetitive problems.

The Hewlett-Packard HP-32S incorporates labeled variables for input and output and looping, as well as tests and flags for problems that require logical decision making. Another feature of this calculator is the use of menus for faster access to functions since they are grouped by category. The HP-32S retails for \$70 and is available now.

A third new HP calculator is the HP-17B Business Calculator. This is an algebraic-entry machine for business

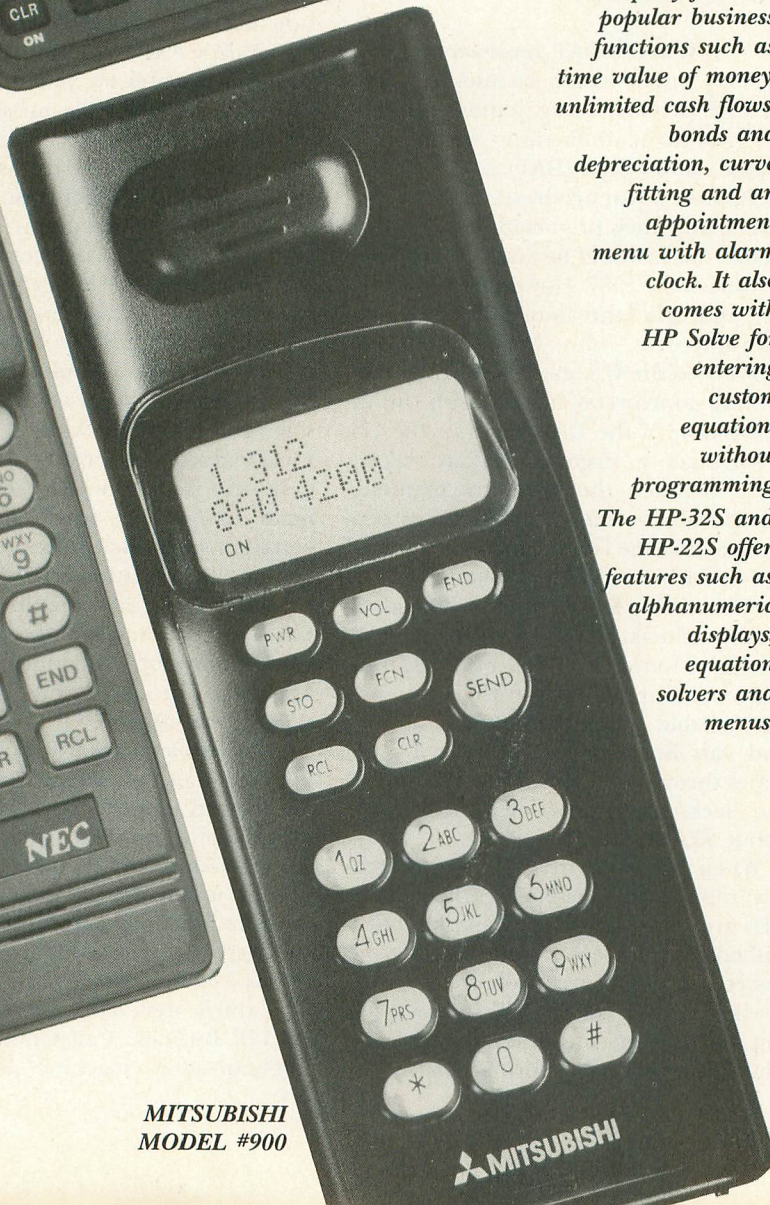


The HP-17B business calculator from Hewlett-Packard Company features popular business functions such as time value of money, unlimited cash flows, bonds and depreciation, curve fitting and an appointment menu with alarm clock. It also comes with HP Solve for entering custom equations without programming.

The HP-32S and HP-22S offer features such as alphanumeric displays, equation solvers and menus.



**NEC P910
CELLULAR
PORTABLE**



**MITSUBISHI
MODEL #900**

Why the fuss over DAT?

The recording industry is concerned that, since digital audiotape (DAT) can make near-perfect recordings of CDs, there will be large-scale piracy of CDs and millions of dollars in lost revenue. The hardware manufacturers, mostly Japanese, counter with an analogy to the LP and cassette markets. They say DAT is to CD what cassette is to LP: People make copies for their own use and that's fine.

Promoters of DAT say that the recording industry's opposition to DAT is much like their opposition to video-taping several years ago. Back then, entertainment companies fought against the right of individuals to use their VCR to copy broadcast program material. The recording/entertainment companies lost the case but later made fortunes on rented and purchased video. Many people feel if DAT was allowed to proceed, there would be plenty of money to be made by both hardware and software producers.

What is RPN?

We are all familiar with algebraic notation since this is how we initially learned to add, subtract, divide and multiply. To multiply two numbers, say 5 and 7, we would write $5 * 7$. In reverse Polish notation (RPN), the operator comes after the numbers. Therefore, we would write, $5 7 *$. It is called "Polish" notation after the Polish mathematician, Lukasiewicz. It is called "reverse" because, unlike Lukasiewicz's original logic, the operator comes last, not first.

On an algebraic entry calculator, the above example would be entered as $5 * 7 =$. When the equals sign is pressed, the answer would appear on the calculator's display. On an RPN calculator, the same problem would be entered as $5 <Enter> 7 *$. When the $7 *$ is entered, the answer would appear on the display.

The real advantage of RPN entry comes when the equations get more complicated. Take the equation $3 + (5 * 7)$. On an algebraic calculator, eight keystrokes would be required and the user would have to enter the equation exactly as shown, from left to right and with the parentheses. An RPN calculator would simplify the procedure. The user would enter seven keystrokes as follows: $3 <Enter> 5 <Enter> 7 * +$. In addition, the RPN user would see the intermediate results of $5 * 7$ before he got the final answer.

professionals and students that retails for \$110. It has HP Solve and menu-driven software with a two-line, 22-character liquid-crystal display. Functions include time value of money, amortization, cash flow analysis, bonds, depreciation, list-based statistics and forecasting, price and cost percent markup and appointment menu with alarm clock.

HP Solve uses words and symbols as variable names in equations entered by the user. The equations then can be solved for any variable in any order. For instance, the equation "Profit = Price - Costs" can be entered exactly as shown. Then, the equation can be solved for Profit, if Price and Costs are known; or for Price, if Profit and Costs are known, without arranging the order of the variables. This is an easy alternative to programming that gives the HP calculator user the option of doing "what if" calculations.

Cellular telephones

Cellular telephones appeared on the consumer electronics scene several years ago. Since its inception, there have been three types of cellular telephones: mobile, transportable and portable. Mobile cellular telephones are the type you see BMW and Mercedes drivers using while they sit in bumper-to-bumper traffic on the freeway. The units have the maximum power allowed by law and operate off of the cars electrical system with an antenna on the roof or rear window.

Transportable cellular telephones look like an army battalion radio set. There is a telephone-looking device parked atop a battery, with an antenna sticking up on one side. These units are heavy (the battery) and may or may not have the same output power as the mobile phones.

Portable cellular telephones are the ones that always interested me. These units are Walkie-Talkie look-alikes and allow the user to be in telephonic contact virtually wherever they may go. The portables typically have about one-third the output power of the mobile units, mainly due to the size of the internal battery. In fact, the big problem with these types of cellular phones has always been the lack of battery power.

Battery technology has not kept pace with the advances in other aspects of electronics. That's why a neat thing like a portable cellular phone only provided about a half an hour of talk time and about seven hours of standby. (The unit has to be on in order to receive a call.) Now, it seems that portable cellular phones have been improved, mainly in

WHAT'S NEW at CES

the battery (and therefore talk-time) department.

NEC America, Inc. has introduced the P9100 series of portable cellular telephones featuring dual telephone-number capability, alphanumeric display and expanded spectrum (to take advantage of the new 832-channel cellular systems which allow 25% more access to open channels). Two separate phone numbers in one phone eliminate the expense of roaming call charges. Roaming is where you are not in your own calling territory and therefore have to pay a surcharge for use of another serving area.

The NEC P9100 also features an alphanumeric display which allows the storage and display of both telephone numbers and the names associated with them. Up to 40 names and telephone numbers can be stored, displayed and automatically dialed from memory. The P9100 also has last number redial and a call duration timer.

The NEC P9100 offers 45 minutes of talk time and up to eight hours of standby (or 80 minutes of continuous talk time). When not in use, the P9100 offers 20 hours of continuous standby. The unit weighs 23 ounces and measures 2½ by 1½ by 7½ inches. Retail price is about \$1,000.

Mitsubishi was also showing a small and lightweight portable cellular telephone. Called the Model 900, the new product weighs only 19 ounces and measures 7.3 by 2.7 by 1.2 inches. The Mitsubishi is over 20% smaller than its nearest competitor. It offers a full 832-channel operation, dual telephone-number capability, an alphanumeric liquid-crystal display and a 100-number memory.

The most outstanding feature of the Model 900 is its one and a half hours of talk time and 13 hours of standby time in a package this small. The unit can be

recharged through a cigarette lighter accessory or through a desktop charger. Operating instructions appear right on the LCD screen and a scratch pad memory allows you to enter a number into the memory during a call and then speed dial that number by simply pressing one button when you complete the initial call. (Price of the Model 900 was unavailable at press time).

What ever happened to CD Video?

One year ago, at the 1987 CES, a dozen audio/video manufacturers, give or take a few, were cloistered together into a mammoth display amidst a mountain of hype. It is unusual for manufacturers to cooperate this much but this was the launch of a new audio/video format. We were promised 200 software titles, scores of players, and a delivery well in time for the 1987 madness called the Christmas buying season.

A year later, barely a word was mentioned about CD Video. The previous announcements (and hullabaloo) were all premature. Vendors were privately saying that the CDV technology would be a 1989 phenomenon—if it happened at all. The poor electronics consumer is getting bombarded with new audio and video formats. When you look at CD Video and the CD-3 disc, it seems that the hardware manufacturers have a little too much free time on their hands. Either that, or they are greedy.

Who needs CD Video? I don't, but it was supposed to be targeted for young teens. The story is getting a little old: "The teens won't buy CDs because they are too expensive. Rather than lower the price, let's invent a new format and give people less for less money. We'll make a killing on all the new hardware they have to buy. And, let's not lower the price on laserdiscs and videotapes; let's invent a new format. Yeah, give 'em a whole five minutes worth of video and a whopping 20 minutes of audio. And...yeah I like this...we'll make a killing on all that new hardware they gotta buy!"

Consumer electronics is a fascinating business to some people and a hobby to others. We all get a lot of satisfaction from having the high-quality audio and video systems that technology has made available to us. But the electronics consumer has to continually be wary of fads that are thrust upon them by an industry that continually demands to innovate and ultimately sell more hardware. Remember the EL-Cassette? How about Quadraphonic audio? Should the CD-3 and the CD Video discs be added to that list?



*Model
SH-R700
Intelligent
Remote Control
with changeable LCD*

WHAT'S NEW at CES

What is CD video?

PCD video is an optical playback medium that looks similar to a compact disc except that the five-inch CD video is gold colored to distinguish it from an audio CD. It offers 20 minutes of digital music and five minutes of regular, full-motion video on one side of a disc.

Optical discs have microscopically small depressions, or "pits" on their surfaces and are played back by means of a laser beam. These pits carry either the digital-audio information or the video-picture information. Reflections from the surface of the disc, corresponding to video- or digital-audio signals, are translated into sound and pictures that can be reproduced through your stereo system and watched on your TV.

There are really three types of CD video discs. Laserdiscs have been around for almost ten years and are 12 inches in diameter. These discs contain full-length feature films and pop, classical and operatic recordings. Up to two hours of music and video can be contained on a 12-inch CDV (one hour on each side). Eight-inch laserdiscs have been available for about five years and can contain a total of 40 minutes of program material (20 minutes on each side.)

A special player is required to play these CD video discs. A laserdisc player has always been able to play eight- and twelve-inch discs but cannot play the five-inch CDVs. Likewise, a compact disc player cannot play a five-inch CDV and get the video portion of the program. A new player is required to see the five minutes of video programming on these CDVs. A new type of player called a "combi-player" will be able to play all three CDV discs as well as normal CDs.

Other products

Technics was showing an interesting "intelligent" A/V (audio/video) remote control unit. The SH-R700 is said to help overcome the problem of having a handful of separate remote control units for your stereo, VCR and TV. The unit offers a total of 144 commands, each of which is accessed by pressing a touch-sensitive LCD display on the top of the remote control. The top panel has an alphanumeric read-out with five faces that change to match the component in operation. This keeps the number of keys to a minimum and simplifies the operations.

Forty-six of the commands are fixed and reserved for Technics audio and video equipment. The other 98 functions are capable of "learning" the major commands of most infrared remotes for a CD player (28 learning functions) TV (22 learning functions), VCR (23 learning functions), and optional unit such as another tape deck (25 learning functions). To program the Technics Remote, the unit is placed in the desired mode, a key to be learned is pressed, the other remote control is placed head-to-head with the Technics unit and the magic happens.

The Technics SH-R700 is available now and retails for \$200.

Here's a unique item. In fact, it is from Unique Products, Inc. The Early Warning (tm) Radiation Detector continuously monitors the atmosphere in a person's home or office and will sound an alarm if it detects a dangerous level of radiation. The company states that this is the first major breakthrough in radiation detection since the Geiger counter was invented in the 1930s.

The Unique Products Radiation Detector is meant to protect you against an accident at a nuclear power plant. It is also meant for people who live near any of the other 200 or more reactors across the country, military bases, armament facto-

ries and nuclear waste dumps. The unit can operate for over a year on one nine-volt battery and has a retail price of \$130.

Here's a somewhat unusual product. The Mail-Call by San Francisco Seamaster is the world's only solar-powered mail-call alert. It is meant to overcome the problem of making trips to your mailbox to find that the mail has not yet arrived. Going back and forth to your mailbox is time consuming, wastes energy and most importantly is frustrating.

Mail-Call eliminates this stressful situation by alerting you the instant your mail arrives with a short audible noise followed by a flashing light signal. A solar transmitter sends a wireless signal day or night from your mailbox to an AC receiver located in the comfort of your own home. It has a range of 1,000 feet, uses advanced electronics and has 1,024 easily adjusted, personal security codes (you wouldn't want your neighbor to know when *your* mail arrived). The Mail-Call is available right now for only \$100.

Companies mentioned in this article:

Hewlett-Packard Company
Inquires Manager
1000 N.E. Circle Blvd.
Corvallis, OR 97330

Mitsubishi International Corporation
Communication Equipment
Sales Division
879 Supreme Drive
Bensenville, IL 60106
(312) 860-4200

NEC America, Inc.
Mobile Radio Division
4910 W. Rosecrans Ave.
Hawthorne, CA 90250
(213) 973-2071

San Francisco Seamaster
P.O. Box 1531
Mercer Island, WA 98040
(206) 236-2022

Sony Corporation of America
9 West 57th Street
New York, NY 10019
(212) 418-9427

Technics
One Panasonic
Secaucus, NJ 07094
(201) 348-7000

Unique Products
2228 S. El Camino Real #175
San Mateo, CA 94403
(415) 595-6998

G R A P H I C S

ADVANCED PRINT SHOP GRAPHICS EDITOR

by Robert Plotkin

4 8 K d i s k
o r c a s s e t t e

As most of the Atari community already knows, *Print Shop* by Broderbund is an excellent graphics utility with many practical uses. This does not mean, though, that it cannot be improved upon. The ability to include predefined graphic images in your own greeting cards, signs, letterheads, etc., is useful, but the graphic editor used by the *Print Shop* to create these images is not a very good one. It offers only the most elementary functions, and even filling in a simple shape can be a tedious process. For this reason I present to you the *Advanced Print Shop Graphic Editor* (APSGE), written in ACTION!, which picks up where Broderbund left off.

The Graphic Editor contains many new features, including:

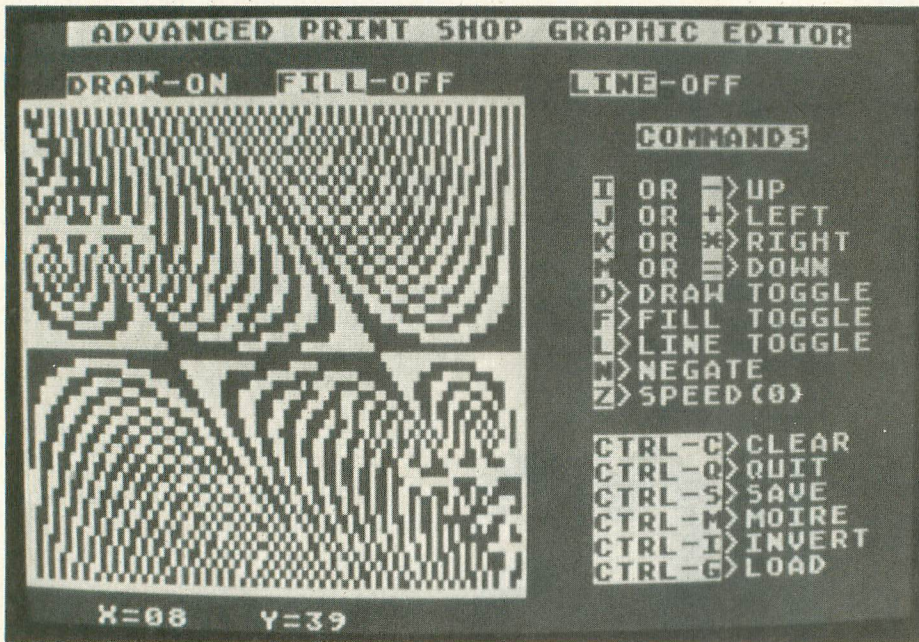
- Solid fill which will fill *any* shape instantly.
- Textured (checkerboard) fill for shading.
- Continuous line (Drawto) mode for easy outlining of shapes.
- Ray line mode in which all lines originate from a common point.
- Joystick or keyboard control.
- Variable cursor speed.
- Inversion and negatives of graphics can be produced with one-key commands.
- Completely compatible with *Print Shop* file format. The program will save to and load from disks created with the *Print Shop*.

The program is large and was broken into two smaller programs. The main program is called *.ADVPEDIT.ACT*, and the second program is called *.PSHOPIO.ACT*.

Typing it in

Type in Listing 1 and write it to disk with the filename *.ADVPEDIT.ACT* from the editor with the CTRL-SHIFTW command. Clear the editor, and type in Listing 2. Write it to *the same disk* with the filename *.PSHOPIO.ACT* with the CTRL-SHIFTW command. Now clear the editor and enter the monitor by typing CTRL-SHIFTM.

Compile the two programs by typing `COMPILE"D:ADVPEDIT.ACT"`. Now create a binary file version of the program by typing `WRITE"D:ADVPEDIT.AML"`. Now whenever you want to use the program go to the DOS menu and load *ADVPEDIT.AML* with the Binary Load option. (The ACTION! cartridge must be in place.) The program will load and run automatically.



To see Fill mode in action, draw a square of any size with Draw mode on. Position the cursor anywhere inside the square, and type F to turn fill mode on.

Step by step through the program

After the program is loaded the main screen will appear. On the left side is the graphics editing area. Underneath it are the current X- and Y-coordinates of the cursor. On the right side of the screen is a list of all commands. On top of the editing area is a status line, which indicates whether Draw mode is on or off, what Fill mode (OFF, PURE or CHECKER) is currently in use, as well as what Line mode (OFF, CONTINUOUS or RAY) is in use.

Drawing: Move the joystick, and the cursor will move within the editing area. The arrow keys may also be used to control the cursor, as well as the I,J,K and M keys as in Print Shop. Press the joystick button, and move around to draw. Type D to turn draw mode off. This will enable you to erase and correct mistakes.

Fill Mode: To see Fill mode in action, draw a square of any size with Draw mode on. Position the cursor anywhere inside the square, and type F to turn fill mode on. Now press the joystick button and Presto! the square is filled in. Now move outside of the square into a blank area, and type F again, to enter "Checker" mode. Press the joystick button, and the area will be filled with a checkboard pattern.

This function can fill any shape of any size. There is only one small limitation. The Checker fill cannot fill passageways that are only one pixel wide. Also, selecting either fill mode will automatically turn Line mode off. If at any time you try to fill in a shape and nothing happens, type D to switch the current Draw mode and try again. The fill subroutine is a modified version of the one presented in Graphics 10/7 Painter in Analog #16.

Line Mode: First clear the screen by typing CTRL-C, followed by RETURN. Make sure that Draw mode is on, and type L to turn Line mode to Continuous. Press the joystick button, move the cursor to any other point on the screen, and press the button again. A line will be drawn between the two points. Continue moving the cursor and pressing the joystick button, and more lines will be drawn.

Now clear the graphic as described above, and type L to turn Line mode to RAY. Press the joystick button once to select a point of origin. From now on every time you press the button, a line will be drawn from the point of origin. Selecting Line mode will automatically turn Fill mode off.

Negating graphics: To change a graphic to its negative image, type *N*. All points that are on will be turned off, and all points that are off will be turned on.

Changing cursor speed: The cursor speed is originally set to 0, the fastest speed. To change this speed, type *Z* and enter a number from zero to nine.

Clearing the graphic: To erase the graphic you are working on, type CTRL-C. The program will respond with "<RETURN> TO CLEAR GRAPHIC AREA." To clear the graphic, type RETURN. Press any other key to continue editing.

Inverting graphics: Type CTRL-I to invert the graphic you are working on. Type CTRL-I again to return it to normal.

Creating a moire pattern: Type CTRL-M and you will be asked which moire pattern you wish to create (either 1 or 2). These patterns can be changed easily by adding STEP values to the loops in the MOIRE() procedure of the main program.

Loading and saving graphics: APSGE can use any Print Shop graphics disk. Do not try to save or load graphics that are on the Print Shop master disk. Type CTRL-G and you will be asked for a filename to load, with

a maximum of 15 characters. Press RETURN for a directory of the disk. The program will notify you if a disk error occurs or if the disk is not of Print Shop format. Press ESCAPE to exit.

Type CTRL-S to save a graphic. Remember that if you enter a filename of a graphic that already exists on the disk, the old file will be written over. You will also be notified if the disk is full. If this happens the graphic will not be completely saved, so use another disk.

Exiting the program: Type CTRL-Q to exit the program. The program will respond with "Y TO QUIT PROGRAM." Type *Y* to quit, or any other key to continue editing.

LISTING 1: ACTION!

```

;ADVANCED PRINT SHOP GRAPHIC EDITOR
;MAIN PROGRAM
;D:ADUPEDIT.ACT
;by ROBERT PLOTKIN
;COPYRIGHT 1988 BY ANALOG COMPUTING
;
;      CHECKSUM DATA
; [00 BB 45 B1 6D 66 30 56
; F0 E7 76 B4 87 24 DB 46
; 6E 9F 7B B0 7A FC 70 FD
; 27 0B E4 04 93 B2 91 7E
; 55 9B C3 43 DA 96 BE 73
; F6 DC AC AE 2F 21 8A 1
;
BYTE I,J,K,CNTOLD,CNTNEW,A,C,CON,
COLOVER,BITE,BIT,XD,YD,TEXTURE,
GX,GY,RX,RY,DRAW,LMODE,PN,LNUM
BYTE ARRAY XB1($100),YB1($100),
XB2($100),YB2($100),GRPH(572),
SCREEN,
SQ=[128 64 32 16 8 4 2 1],
DIGIT="00"
CARD SPEED=[0]

PROC MYERR(BYTE ERR) RETURN
;Ignore BREAK key

BYTE FUNC GRAPHIC(BYTE X,Y)
BYTE ARRAY MASK=
[128 64 32 16 8 4 2 1]
RETURN(GRPH(Y*11+X RSH 3)
RSH(7!(X&7))&1)

PROC PGRAPHIC(BYTE X,Y,VAL)
BYTE ARRAY MASK=[127 191 223 239 247
251 253 254]
BITE=X&7
GRPH(Y*11+X RSH 3)==&MASK(BITE)%
VAL LSH(7!BITE)
RETURN

PROC GRVALS(BYTE X,Y)
RX=X LSH 1 RY=24+3*Y
RETURN

PROC PLOT8(BYTE X BYTE Y)
BYTE POINTER POS
BYTE ARRAY MASK=[127 191 223 239 247
251 253 254]
POS=SCREEN+Y*40+X RSH 3 BITE=X&7
POS^=&MASK(BITE)%COLOR LSH (7!BITE)
RETURN

PROC PLOTG(BYTE X,Y)
GRVALS(X,Y)
PLOT8(RX,RY) PLOT8(RX+1,RY)
PLOT8(RX,RY+1) PLOT8(RX+1,RY+1)
PLOT8(RX,RY+2) PLOT8(RX+1,RY+2)
RETURN

PROC PLOTG(BYTE X,Y,VAL)
PLOTG(X,Y) PGRAPHIC(X,Y,VAL)
RETURN

PROC PUT8(BYTE X,Y,CHR)
BYTE INV
BYTE POINTER POS,CHPOS
POS=SCREEN+Y*320+X
INV=CHR&128 CHR==&127
IF INV=128 THEN INV=255 FI
IF CHR>31 AND CHR<96 THEN CHR==--32
ELSEIF CHR<32 THEN CHR==+64 FI
CHPOS=57344+CHR*8
FOR I=0 TO 7 DO
POS^=CHPOS^!INV POS==+40 CHPOS==+1
OD
RETURN

PROC PRINT8(BYTE X,Y
BYTE ARRAY WORD)
FOR J=1 TO WORD(0) DO
PUT8(X+J-1,Y,WORD(J))
OD
RETURN

PROC KEEP(BYTE TX,TY)
IF TX=88 OR TX=255 OR
TY=52 OR TY=255 THEN RETURN
FI
IF GRAPHIC(TX,TY)#COLOVER THEN
IF TEXTURE=2 THEN
IF GRAPHIC(TX-XD,TY)=COLOVER AND
GRAPHIC(TX,TY-YD)=COLOVER THEN
RETURN
FI
FI
PLOTG(TX,TY,COLOR!1)
XB2(CNTNEW)=TX YB2(CNTNEW)=TY
CNTNEW==+1
FI
RETURN

PROC FILL()
BYTE ARRAY XDIR=[1 255 0 0],
YDIR=[0 0 1 255],
XDIR2=[1 1 255 255],
YDIR2=[255 1 1 255]
;Diamond Fill Subroutine
;From ANALOG #16, February 1984
;Translated to ACTION! by
;Robert Plotkin
XB1(0)=GX YB1(0)=GY
IF GRAPHIC(GX,GY)=COLOVER THEN
RETURN
FI PLOTG(GX,GY,COLOVER)
CNTOLD=1
DO CNTNEW=0
FOR I=1 TO CNTOLD DO
FOR J=0 TO 3 DO
IF TEXTURE=2 THEN

```



```

XD=XDIR2(J) YD=YDIR2(J)
ELSE XD=XDIR(J) YD=YDIR(J)
FI KEEP(XB1(I-1)+XD,YB1(I-1)+YD)
OD
OD CNTOLD=CNTEW
IF CNTOLD=0 THEN EXIT FI
MOVEBLOCK(YB1,YB2,CNTOLD)
MOVEBLOCK(XB1,XB2,CNTOLD)
OD
RETURN

```

```

PROC CLEARSCREEN()
ZERO(SCREEN,7680)
RETURN

```

```

PROC SGRAPHIC()
BYTE MASK,L
CARD GPOS,SPOS
GPOS=0 SPOS=960
FOR I=0 TO 51 DO
  FOR J=0 TO 10 DO MASK=128
    FOR K=0 TO 1 DO BIT=0 BITE=0
      FOR L=0 TO 3 DO
        IF (MASK&GRPH(GPOS))=0 THEN
          BITE==%50(BIT)%50(BIT+1)
          FI BIT==+2 MASK==RSH 1
        OD
        SCREEN(SPOS)=BITE
        SCREEN(SPOS+40)=BITE
        SCREEN(SPOS+80)=BITE SPOS==+1
      OD GPOS==+1
    OD SPOS==+98
  OD
RETURN

```

```

PROC MAKENUM(BYTE NUM)
IF NUM<10 THEN
  DIGIT(1)=0 ELSE
  DIGIT(1)=NUM/10
FI DIGIT(2)=NUM MOD 10
RETURN

```

```

PROC SDIGIT(BYTE X)
PUT8(X,23,DIGIT(1)+48)
PUT8(X+1,23,DIGIT(2)+48)
RETURN

```

```

PROC SHOWXY()
MAKENUM(GX) SDIGIT(5)
MAKENUM(GY) SDIGIT(12)
RETURN

```

```

PROC CLEARSLINE()
FOR J=0 TO 39 DO PUT8(J,2,32) OD
RETURN

```

```

PROC SHOWSPECS()
CARD ARRAY DON(2),FON(3),LON(3)
DON(0)="OFF" DON(1)="ON"
FON(0)="OFF" FON(1)="PURE"
FON(2)="CHECKER"
LON(0)="OFF"
LON(1)="CONTINUOUS"
LON(2)="RAY"
PRINT8(7,2,DON(DRAW))
PRINT8(16,2,FON(TEXTURE))
PRINT8(29,2,LON(LMODE))
RETURN

```

```

PROC INITVALS()
GX=44 GY=25 TEXTURE=0 DRAW=1 C=0
CON=0 LMODE=0
RETURN

```

```

PROC CLEARGRAPHIC()
ZERO(GRPH,572) INITVALS()
RETURN

```

```

PROC STATLINE()
PRINT8(2,2,"DRAW- FILL- ")
PRINT8(24,2,"LINE- ")
RETURN

```

```

PROC PCMD(BYTE ARRAY TEXT)
PRINT8(25,LNUM,TEXT) LNUM==+1
RETURN

```

```

PROC DRAWSCREEN()
GRAPHICS(24) SCREEN=PEEK(88)
SGRAPHIC() PRINT8(2,0,

```

```

" ADVANCED PRINT SHOP GRAPHIC EDITOR"
) STATLINE()
PRINT8(27,4,"COMMANDS") LNUM=6
PCMD("↑ OR ↵>UP") PCMD("← OR ↻>LEFT")
PCMD("→ OR ↷>RIGHT")
PCMD("↓ OR ↴>DOWN")
PCMD("D>DRAW TOGGLE")
PCMD("F>FILL TOGGLE")
PCMD("L>LINE TOGGLE")
PCMD("N>NEGATE")
PCMD("Z>SPEED( )") PCMD(" ")
PCMD("CTRL-C>CLEAR")
PCMD("CTRL-Q>QUIT")
PCMD("CTRL-S>SAVE")
PCMD("CTRL-M>MOIRE")
PCMD("CTRL-I>INVERT")
PCMD("CTRL-G>LOAD")
PUT8(33,14,(SPEED/750)+48)
PRINT8(3,23,"X=") PRINT8(10,23,"Y=")
SHOWXY() SHOWSPECS()
RETURN

```

```

INCLUDE"D:PSHOPIO.ACT"
;GET SAVE&LOAD ROUTINES

```

```

PROC LINE(BYTE X1,Y1,X2,Y2)
;Drawto subroutine
;From SPLASH IN ACTION!
;ANTIC Volume 3, Number 4 April 1985
BYTE X,Y,XF,YF
INT A,B,T,DX,DY
PLOTG(X1,Y1,DRAW) PLOTG(X2,Y2,DRAW)
IF X2>X1 THEN DX=X2-X1 XF=0
ELSE DX=X1-X2 XF=1
FI
IF Y2>Y1 THEN DY=Y2-Y1 YF=0
ELSE DY=Y1-Y2 YF=1
FI
IF DX<2 AND DY<2 THEN RETURN FI
X=X1 Y=Y1
IF DX>DY THEN
  A=DY+DY T=A-DX B=T-DX
  FOR I=2 TO DX DO
    IF XF=0 THEN X==+1 ELSE X==-1 FI
    IF T<0 THEN T==+A
    ELSE T==+B
    IF YF=0 THEN Y==+1 ELSE Y==-1 FI
    FI PLOTG(X,Y,DRAW)
  OD
ELSE
  A=DX+DX T=A-DY B=T-DY
  FOR I=2 TO DY DO
    IF YF=0 THEN Y==+1 ELSE Y==-1 FI
    IF T<0 THEN T==+A
    ELSE T==+B
    IF XF=0 THEN X==+1 ELSE X==-1 FI
    FI PLOTG(X,Y,DRAW)
  OD
FI
RETURN

```

```

PROC NEGATE()
CARD GPOS
FOR GPOS=0 TO 571 DO GRPH(GPOS)==!255
OD SGRAPHIC()
RETURN

```

```

PROC INVERT()
BYTE ARRAY TLINE(11)
CARD POS1,POS2
FOR I=0 TO 25 DO
  POS1=GRPH+I*11 POS2=GRPH+(51-I)*11
  MOVEBLOCK(TLINE,POS1,11)
  MOVEBLOCK(POS1,POS2,11)
  MOVEBLOCK(POS2,TLINE,11)
OD SGRAPHIC()
RETURN

```

```

PROC CNGCOLOR()
DRAW=C C==!1 COLOR=C
RETURN

```

```

PROC MLINE(BYTE X,Y)
LINE(44,25,X,Y) CNGCOLOR()
RETURN

```

```

PROC MOIRE(BYTE MNUM)
BYTE TXY,TEMPD
TEMPD=DRAW

```



```

IF MNUM=1 THEN
FOR TXY=0 TO 87 DO LINE(0,0,TXY,51)
CNGCOLOR() OD
FOR TXY=0 TO 87 DO LINE(87,51,TXY,0)
CNGCOLOR() OD
ELSE
FOR TXY=0 TO 87 DO MLINE(TXY,51) OD
FOR TXY=0 TO 51 DO MLINE(87,TXY) OD
FOR TXY=0 TO 87 DO MLINE(TXY,0) OD
FOR TXY=0 TO 51 DO MLINE(0,TXY) OD
FI DRAW=TEMPD C=DRAW!1
RETURN

```

```

PROC MAIN()
BYTE ST,MASK,KEY=764,MOVE
BYTE ARRAY XDIR=[0 0 255 1],
YDIR=[255 1 0 0],XP(2),YP(2),
MKEY1='I'-'='+'*'],
MKEY2='I'-'M'-'J'-'K']
CARD SCNT=[0]
DRAWSCREEN() KEY=255
DO CON==!1 COLOR=CON PLOTG(GX,GY)
IF STRIG(0)=0 THEN
IF LMODE THEN XP(PN)=GX YP(PN)=GY
IF PN THEN COLOR=C
LINE(XP(0),YP(0),GX,GY)
IF LMODE=1 THEN XP(0)=GX YP(0)=GY
FI
FI PN==X1
ELSEIF TEXTURE=0 THEN COLOR=C
PLOTG(GX,GY,DRAW)
ELSE COLOR=C COLOVER=DRAW FILL()
FI
FI ST=STICK(0) MOVE=0
IF KEY=255 THEN A=0 ELSE A=GETD(1)
FI
IF ST#15 OR A#0 THEN
FOR SCNT=0 TO SPEED DO OD
COLOR=GRAPHIC(GX,GY)!1 PLOTG(GX,GY)
MASK=1
FOR I=0 TO 3 DO
IF (ST&MASK)=0 OR
A=MKEY1(I) OR A=MKEY2(I) THEN
GX==+XDIR(I) GY==+YDIR(I) MOVE=1
FI MASK==LSH 1
OD
IF GY=255 THEN GY=51 FI
IF GY=52 THEN GY=0 FI
IF GX=255 THEN GX=87 FI
IF GX=88 THEN GX=0 FI
SHOWXY()
FI
IF A='F THEN
TEXTURE==+1 LMODE=0
IF TEXTURE=3 THEN TEXTURE=0 FI
ELSEIF A='D THEN
DRAW==!1 C==!1
ELSEIF A='J THEN ;CTRL-C
CLEARSLINE() PRINT8(2,2,
"⟨RETURN⟩ TO CLEAR GRAPHIC AREA")
A=GETD(1)
IF A=155 THEN CLEARGRAPHIC()
SGRAPHIC() SHOWXY()
FI
ELSEIF A='P THEN ;CTRL-Q
CLEARSLINE() PRINT8(2,2,
" 'Q' TO QUIT PROGRAM")
A=GETD(1)
IF A='Y THEN EXIT FI
ELSEIF A='L THEN
LMODE==+1 IF LMODE=3 THEN LMODE=0
FI
PN=0 TEXTURE=0
ELSEIF A='N THEN NEGATE()
ELSEIF A='M THEN ;CTRL-M
CLEARSLINE() PRINT8(2,2,
"WHICH PATTERN(1 OR 2)?" )
A=GETD(1)-48
IF A=1 OR A=2 THEN MOIRE(A) FI
ELSEIF A='I THEN INVERT() ;CTRL-I
ELSEIF A='Z THEN
CLEARSLINE()
PRINT8(6,2,"CURSOR SPEED")
A=GETD(1)
IF A>'0 AND A<'9 THEN
SPEED=(A-48)*750 PUT8(33,14,A)
FI
ELSEIF A='\' THEN LOAD() ;CTRL-G
ELSEIF A='+' THEN SAVE() ;CTRL-S

```

```

FI
IF MOVE=0 AND A#0 THEN
STATLINE() SHOWSPECS()
FI
OD
RETURN

```

```

PROC RESET=58484()
;Leave program by warmstart

```

```

PROC SETUP()
CLOSE(1) OPEN(1,"K:",4,0) ERROR=MYERR
CLEARGRAPHIC() MAIN() RESET()
RETURN

```

LISTING 2: ACTION!

```

;ADVANCED PRINT SHOP GRAPHIC EDITOR
;PRINT SHOP I/O SUBROUTINES
;D:PSHOPIO.ACT
;by ROBERT PLOTKIN
; COPYRIGHT 1988 BY ANALOG COMPUTING
;

```

```

; CHECKSUM DATA
;E0 CE 39 4E 5E 3E 3D CB
; CF 0F 25 FB 7A 77 B8 B2
; C4 5C B2 CA 8C 84 95 41
; 1D 98 A6 22 B8 1

```

MODULE

```

BYTE KIND,PSFLAG,NAMENUM,EOPF,FOUND,
HKIND,STATUS=771,CB,CM,NLEN
BYTE ARRAY BUFF(128),VTBUFF(128),
PSHOP(0)="PRINT SHOP:CLK!J",
FILE(32),NAME(32)
CARD CURRDS,LASTDS,5SEC,NXSEC,C5
BYTE POINTER NAMEP=NAME

```

```
PROC SIO=$E453()
```

```

PROC GKEY()
POSITION(3,23) PRINT
("PRESS ANY KEY TO CONTINUE")
A=GETD(1)
RETURN

```

```

PROC SIOERR()
POSITION(12,4)
PRINT("→Disk Error←") GKEY()
RETURN

```

```

PROC DOSIO(BYTE CMD,CARD ADR,SNUM)
CARD SECBUF=772,SECNUM=778
POKE(770,CMD) SECBUF=ADR SECNUM=SNUM
POKE(769,1)
SIO() IF STATUS#1 THEN SIOERR() FI
RETURN

```

```

PROC GETSECTOR(CARD SNUM,BUFADR)
DOSIO('R,BUFADR,SNUM)
RETURN

```

```

PROC PUTSECTOR(CARD SNUM,BUFADR)
DOSIO('P,BUFADR,SNUM)
RETURN

```

```

BYTE FUNC COMPARE(BYTE ARRAY S1,S2)
BYTE LOOP,FLAG
FLAG=1
FOR LOOP=0 TO 15 DO
IF S1(LOOP)#S2(LOOP) THEN FLAG=0
FI
OD
RETURN(FLAG)

```

```

PROC WHICH()
BYTE BNUM,BIT
GETSECTOR(361,VTBUFF)
IF STATUS=1 THEN
PSFLAG=COMPARE(PSHOP+1,VTBUFF)
IF PSFLAG=1 THEN
LASTDS=361 BNUM=16 BIT=128
DO
IF (VTBUFF(BNUM)&BIT)=0 OR BNUM=31
THEN EXIT
FI BIT==R5H 1 LASTDS==+1
IF BIT=0 THEN BIT=128 BNUM==+1 FI

```



```

OD
IF LASTDS=361 THEN LASTDS=362 FI
ELSE POSITION(5,4) PRINT(
"THIS IS NOT A PRINT SHOP DISK!")
GKEY()
FI
FI
RETURN

```

```

PROC OPENDIR()
CURRDS=362 EOPF=0 NAMENUM=0
GETSECTOR(362,BUFF)
RETURN

```

```

PROC GETNAME()
DO
MOVEBLOCK(NAME,BUFF+NAMENUM,32)
NAMENUM==+32
IF NAMENUM=128 THEN NAMENUM=0
CURRDS==+1 GETSECTOR(CURRDS,BUFF)
FI KIND=NAME(18)
IF CURRDS>LASTDS THEN EOPF=1 FI
UNTIL NAMEP^#0 AND KIND=0 OR EOPF=1
OD
RETURN

```

```

PROC PSFIND(BYTE ARRAY CNAME)
FOUND=0
DO GETNAME()
IF COMPARE(NAME,CNAME)=1 THEN
SSEC=PEEK(CNAME+16) FOUND=1 EXIT
FI IF EOPF=1 THEN EXIT FI
OD
RETURN

```

```

PROC PSLOAD()
BYTE POINTER POS
BYTE COUNT
WHICH() IF PSFLAG=0 THEN RETURN FI
IF STATUS=1 THEN
OPENDIR() PSFIND(FILE)
IF FOUND=0 AND STATUS=1 THEN
POSITION(8,4) PRINT(
"--->File Not Found<---") GKEY()
FI
FI
IF FOUND=1 AND STATUS=1 THEN POS=GRPH
FOR COUNT=0 TO 4 DO
GETSECTOR(SSEC,POS)
SSEC=PEEK(POS+126) POS==+126
OD
FI
RETURN

```

```

PROC DALLOC(CARD SECNUM)
BYTE BNUM,MASK,BIT
A=SECNUM-362 BNUM=A RSH 3
BIT=A-BNUM LSH 3 MASK=5Q(BIT)
VTBUFF(BNUM+16)==%MASK
RETURN

```

```

PROC ALLOC(CARD SECNUM)
BYTE BNUM,MASK,BIT
BNUM=SECNUM RSH 3
BIT=SECNUM-BNUM LSH 3 MASK=5Q(BIT)
VTBUFF(BNUM+32)==%MASK
RETURN

```

```

CARD FUNC GETSSEC()
DO
IF (VTBUFF(CB)&CM)=0 THEN RETURN(CS)
FI CS==+1 CM==RSH 1
IF CM=0 THEN CM=128 CB==+1 FI
UNTIL CS=720
OD
RETURN(0)

```

```

PROC DFULL()
POSITION(5,4) PRINT
("--->Disk Full-Save Incomplete<---")
GKEY()
RETURN

```

```

PROC PSSAVE()
CARD NXSEC
BYTE POINTER POS
CARD POINTER POS2
CM=64 CS=1 CB=32
WHICH() IF PSFLAG=0 THEN RETURN FI

```

```

OPENDIR() PSFIND(FILE)
IF FOUND=0 THEN
GETSECTOR(LASTDS,BUFF)
GETSECTOR(361,VTBUFF) NAMENUM=0
DO
IF BUFF(NAMENUM)=0 THEN EXIT FI
IF NAMENUM=128 THEN LASTDS==+1 EXIT
FI NAMENUM==+32
OD DALLOC(LASTDS)
IF NAMENUM=128 THEN ZERO(BUFF,128)
NAMENUM=0 FI
MOVEBLOCK(BUFF+NAMENUM,FILE,16)
NAMENUM==+16 SSEC=GETSSEC()
IF SSEC=0 THEN DFULL() RETURN FI
POKEC(BUFF+NAMENUM,SSEC) NAMENUM==+2
BUFF(NAMENUM)=0 BUFF(NAMENUM+1)='X'
BUFF(NAMENUM+2)=60 BUFF(NAMENUM+3)=2
PUTSECTOR(LASTDS,BUFF)
FI
POS=GRPH POS2=BUFF+126
FOR I=1 TO 5 DO ALLOC(SSEC)
MOVEBLOCK(BUFF,POS,126)
NXSEC=GETSSEC()
IF NXSEC=0 THEN DFULL() EXIT FI
POS2^=NXSEC PUTSECTOR(SSEC,BUFF)
SSEC=NXSEC POS==+126
OD PUTSECTOR(361,VTBUFF)
RETURN

```

```

PROC DIR()
BYTE LM=82,LINE=84
PUT(125) LM=12 POSITION(12,0) WHICH()
IF PSFLAG=0 THEN RETURN FI OPENDIR()
DO GETNAME()
IF KIND=0 AND NAMEP^#0 THEN
FOR K=0 TO 15 DO PUT(NAME(K)) OD
PUTE()
FI
IF EOPF=1 OR STATUS#1 THEN EXIT FI
IF LINE=23 THEN GKEY() PUT(125) FI
OD GKEY()
RETURN

```

```

PROC GETFILE()
BYTE LOOP
NLEN=0
DO A=GETD(1)
IF A=27 THEN NLEN=255 EXIT
ELSEIF A=155 THEN PUT(A)
IF NLEN=0 THEN DIR() FI EXIT
ELSEIF A=126 THEN
IF NLEN#0 THEN PUT(A) NLEN==--1 FI
ELSEIF NLEN#15 THEN
PUT(A) FILE(NLEN)=A NLEN==+1
FI
OD
FOR LOOP=NLEN TO 15 DO
FILE(LOOP)=32
OD
RETURN

```

```

PROC INFILE(BYTE LTYPE)
DO PUT(125) POKE(82,2)
POSITION(13,0)
IF LTYPE='L' THEN
PRINT("LOAD")
ELSE PRINT("SAVE")
FI PRINT("GRAPHIC")
POSITION(2,10) PRINT(
"TYPE IN NAME OF GRAPHIC OR")
PRINT(
("PRESS <RETURN> FOR GRAPHIC LIST")
PRINT("<ESC> TO EXIT") PUT('))
GETFILE()
UNTIL NLEN#0
OD
RETURN

```

```

PROC LOAD()
GRAPHICS(0) INFILE('L)
IF NLEN#255 THEN PSLOAD() FI
DRAWSCREEN()
RETURN

```

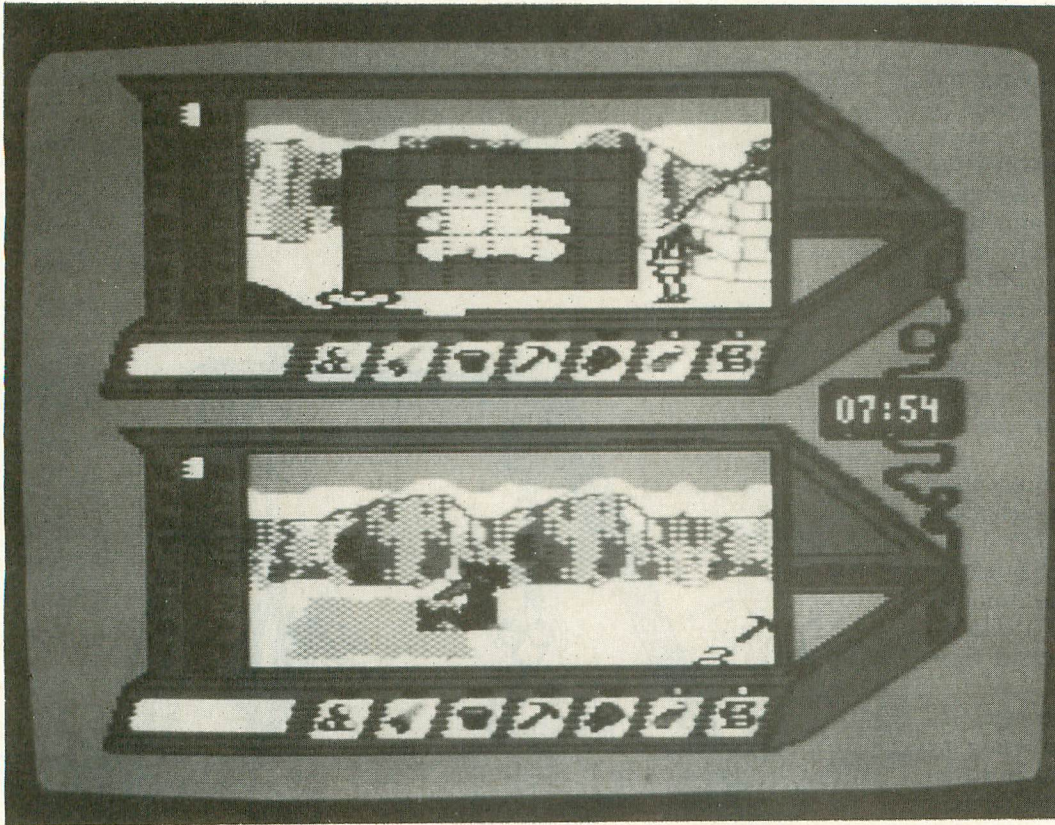
```

PROC SAVE()
GRAPHICS(0) INFILE('S)
IF NLEN#255 THEN PSSAVE() FI
DRAWSCREEN()
RETURN

```

A

R E V I E W



Arctic Antics, Spy vs. Spy III
Maxx Out Series
Software by First Star Software
Distributed by Epyx
P. O. Box 5367
Redwood City, CA 94063
(415) 366-0606
48K disk, \$14.95

Reviewed by Matthew J.W. Ratcliff

Arctic Antics is the third installment of the entertaining "Spy vs. Spy" game series. In this rendition, the white and black spies have been shipwrecked and stranded on an iceberg. You must outwit your human or computer opponent by gathering a Punch Card, Gyroscope, Fuel Canister and Launch Briefcase. If you make it this far, without being frozen to death by your opponent's dastardly traps, you can locate the launch site and make your way off the overgrown popsicle in a one-man rocket ship, before the blizzard begins.

Epyx and First Star Software deliver the same winning formula for this Spy vs. Spy

adventure with a new setting. The screen is split top and bottom. Each spy adventures about the island, viewing it through his "trapulator." When the spies meet in the same area of the display, only one half of the screen is active while they have a snowball fight, or hightail it out of there for less hostile surroundings.


The trapulator is a display window through which you control your spy and view his surroundings. At the bottom of the trapulator window is a series of seven icons that can be used in playing the game. To the far left of this area is a small box where items required to launch the rocket are displayed as you acquire them.

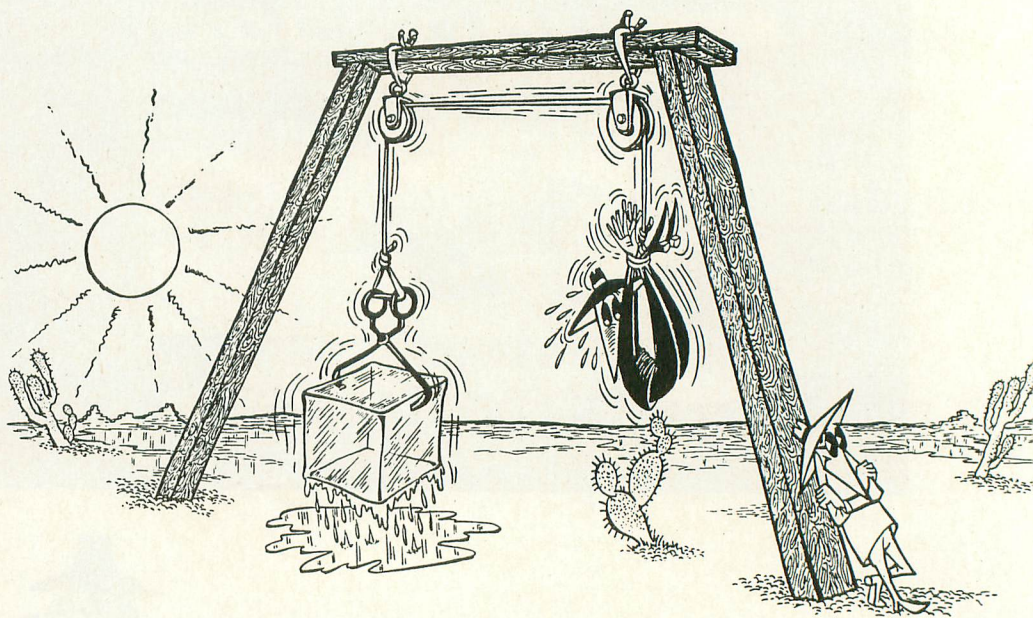
From the menu, one of seven different islands may be chosen, just to keep things interesting. You may select either a computer or human opponent. The launch site may be shown or hidden, making this one more item to find before you can blast off the island.

Once the game begins, you must collect all the essential items to the launch. Only one of these items may be carried at a time, unless you find the launch briefcase, which can hold the other items. You may drop an item and booby trap it with dynamite to keep the opposing spy from retrieving it.

An ice pick may be used to crack icicles over tunnels so that the opposing spy will be konked on the head when he attempts to follow you. A saw can be used to cut holes in the ice, or a water bucket may be used to make a very slick spot to trip up your opponent. Snow shoes can be used to get you across deep snow. A map may also be selected from the trapulator, which will display an overhead view of the island, framing your current location with a flashing box. You can also hide dynamite, wait for the opposing spy to get near it, and then detonate it long distance, if you have the detonator in your possession.

The chilling booby traps have a cumulative effect on your body temperature, shown as a thermometer to the left of your trapulator. If your temperature drops to zero, your portion of the game ends. There are igloos on the iceberg, with fires inside for warming back up.

The graphics and sound effects are superb, as always in the Spy vs. Spy series. It is an excellent, affordable two-player game. Playing against the computer can be entertaining for a while, good practice for those neighborhood game tournaments. First Star Software has done an excellent job of bring the *Mad Magazine* classic Spy vs. Spy comics to life in Arctic Antics. 



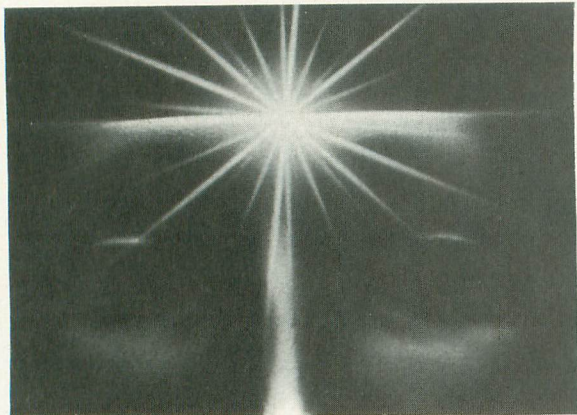
© Mad Magazine

T U T O R I A L

Master Memory Map

by
Robin
Sherer

Part III



Easy, isn't it? Well, not quite. First

of all, the first 800 bytes after

RAMTOP aren't really safe.

Master Memory Map

How to read the Memory Map

Beginning Users—Read the text that is printed in bold type only. These memory locations will be the easiest for you to use and usually don't involve assembly language.

Advanced users—Read everything! Many areas of memory are not of any practical use, but you can learn a lot about how a computer works by reading the boring parts.

OLDROW
90 005A

OLDROW is the last row the graphics cursor was on. It gets its value from ROWCRS (84). DRAWTO and the FILL command (XIO 18) use it to determine their starting row.

OLDCOL
91,92 005B,005C

The last column the graphics cursor was on. Guess where this one gets its value from? You got it, COLCRS (85,86). It gets used the same way as OLDROW does.

OLDCHR
93 005D

When you move the cursor all over the screen, isn't it nice how it doesn't erase

characters as it goes over them? Thank this guy for that; OLDCHR holds the value of the character under the cursor so it can be put back when the cursor moves on.

OLDADR
94,95 005E, 005F

OLDCHR is great, but the OS has to know where to put it (no suggestions, thank you). OLDADR is the address in screen memory of the current cursor location and is used to help restore the character under the cursor.

NEWROW
96 0060

Out with the old and in with the new! This is the row that DRAWTO and FILL will draw to or fill to. It is initialized to the value in ROWCRS (84).

NEWCOL
97,98 0061,0062

Same as the preceding except this is the column to draw or fill to and is initialized to the value in COLCRS (85,86).

LOGCOL
99 0063

More cursor position stuff, this time for the benefit of the display handler. LOGCOL tells the position of the cursor within the current logical line. It is equal to the number of rows the logical line has filled so far times 40, plus the current value of COLCRS. Since a logical line can fill up to three rows, this gives LOGCOL a range of 0 to 119.

See BUFCNT (107) for the character length of the logical line.

ADDRESS
100, 101 0064,0065

A temporary storage location used by the display handler for so many things that it made my mind spin and I forgot what they were.

MLTTMP
102,103 0066,0067

More temporary storage, with aliases OPNTMP and TOADR.

SAVADR
104,105 0068,0069

Also known as FRMADR. Also used for temporary storage. Also not significant enough to explain (look at the OS listing if, for some reason, you really care).

As you probably guessed, this points to the top of RAM. It gets its value from TRAMSZ (6) during the powerup operation, as does RAMSIZ (740). Big deal, right? Wrong.

If you're doing custom character sets, player/missile graphics, or anything else where you need a fairly large amount of memory that is safe from BASIC and the OS, RAMTOP is going to save your tush. You see, the OS doesn't care if RAMTOP isn't really the top of memory, so you can change its value and make the OS think that the top of memory is lower than it really is. Then you can go ahead and use the extra locations between RAMTOP and RAMSIZ for whatever you want. It's done something like this:

1. Decide how many pages of memory you want to protect. Remember that a page is 256 bytes (RAMTOP is in terms of pages).
2. POKE RAMTOP with the value in RAMSIZ minus the number of pages.
3. Do a GRAPHICS call. If you don't, your "protected" memory will be in the middle of the screen memory. The GRAPHICS call moves the screen below the new RAMTOP.
4. The locations from RAMTOP (time 256 remember) to RAMSIZ (times 256, minus 1) are now your very own.

Easy, isn't it? Well, not quite. First of all, the first 800 bytes after RAMTOP aren't really safe. The OS scrolls the text window as if it were an entire GRAPHICS zero screen (this saves having to write a special routine for the text window). This means that the OS tries to scroll 20 rows (times 40 bytes per row) after RAMTOP. This is fine normally, because there is no more RAM after RAMTOP that would get messed up. Unfortunately, when you have moved RAMTOP, your RAM is in jeopardy. The first 800 bytes of it, that is. The solution, if you're using a graphics mode with a text window, is just to protect four more pages than you need, and not use the first 1024 (to be safe) after RAMTOP. If you're not using a text window, you still have to protect an extra page, because the first 64 bytes aren't safe for other reasons.

You also have to be careful that the new RAMTOP isn't less than MEMTOP (741,742), since MEMTOP points to the top of your program area.

Lastly, because of the 4K boundary

problem mentioned under SAVMSC (88,89), you should move RAMTOP by at least 16 pages (16*256 = 4K) if you're using graphics mode seven or higher.

You can also use MEMLO (743) to protect a different part of memory.

First of all, there is a very simple reason to "protect" an area of memory. If you POKE numbers into memory that currently has nothing in it, then run your program, you may find your data changed when you go to use it. The reason is that BASIC has to move things around as it works. The only way to be sure you have a completely safe area is to move the pointer (106) down so BASIC thinks the top of memory is lower than it really is.

BUFCNT
107 006B

This keeps count of the number of characters currently in the logical line.

BUFSTR
108,109 006C,006D

The starting address (in terms of row and column) of the current logical line buffer. It is initialized to the values in ROWCRS and COLCRS when the line is started.

BITMSK
110 006E

The display handler uses BITMSK to mask off bits during the bit-mapping process. What? For those of you not into machine language, a dot on the screen (in the graphics modes, not the text modes) is represented in memory by two bits (one bit in graphics mode eight). So, since two bits are only part of a byte, the OS has to have a way of changing bits without changing the other parts of the byte. The process it uses is called "masking," and uses the AND and ORing assembly language commands to clear and set individual bits respectively. See a book on assembly language for a more detailed explanation of these two commands. Bit mapping, by the way, refers to the whole process of manipulating the bits to come up with the desired graphics.

SHFAMT
111 006F

Masking (explained in the previous location description) can be a pain in the byte (sorry). The problem is not in the actual ANDing and ORing, but rather in getting the bits ready to be masked into the byte or dealing with them after they've

been masked out. Think about it for a second. In graphics mode eight, for example, each bit represents a dot on the screen (called a "pixel"). That means that once you mask out the bit you're interested in, there are eight possible positions it could be in. You obviously don't want to have to write the code to deal with eight different cases. Well, Atari didn't either, so they came up with SHFAMT. SHFAMT is used to shift the bits to the right, one bit at a time, until the bits you are interested in are all the way over to the right (right justified). It's easier to deal with them there. Once you're done having your way with them, SHFAMT helps you get them back to their proper places.

OK, we've got a cute explanation, but what's really going on? SHFAMT initially gets the value in DMASK (672), which is used to mask out the desired pixels. SHFAMT is then shifted to the right (LSR) one bit. If a bit hasn't fallen out of the byte in the process (the carry flag is clear), the masked-out bits are also shifted to the right one bit and the whole thing is repeated. If a bit did fall out, then the masked-out bits are right justified. To get the bits back to their proper position, SHFAMT is restored to the value in DMASK and the same thing happens except this time the masked-out bits are shifted to the left (ASL) one bit at a time (SHFAMT is still shifted to the right though). Then the bits are ready to be masked back into the display byte.

This is a very important and powerful process to understand if you're doing your own bit mapping. Check your OS listing and DMASK for more details.

ROWAC
112,113 0070,0071

ROWAC, along with COLAC (next), are essentially graphic work-spaces, used primarily in the "what point do we plot next?" process. ROWAC, of course, is used in the row calculations.

COLAC
114,115 0072,0073

Used in column calculations for point plotting. See ROWAC.

ENDPT
116,117 0074,0075

ENDPT is initialized to either the value in DELTAR (118) or the one in DELTAC (119,120), depending on which is larger (it gets the larger of the two). It is then used to figure out when the final row or

Master Memory Map

If you are programming in machine language and not using a cartridge, all 128 bytes here are probably free for your use. Check your assembler's manual.

column in the line we're drawing has been reached.

DELTAR
118 0076

DELTAR is the absolute value of the difference between OLDROW (90) and NEWROW (96). In other words, it's the number of rows we're going to be drawing across.

DELTAC
119,120 0077,0078

The number of columns we're going to be drawing across. Determined by subtracting OLDROW (91,92) from NEWROW (97,98) and taking the absolute value.

ROWINC
121 0079

When the OS computed DELTAR above, it took the absolute value of the result of NEWROW minus OLDROW. The sign of this result, however, is also important to us because it tells the direction we'll be drawing in. ROWINC is one if the sign was negative (we'll be drawing up), and 255, (which also equals minus one in two's complement arithmetic) if it was positive (we'll be drawing down).

COLINC
122 007A

If NEWROW minus OLDROW is negative (we'll be drawing left), COLINC is set to one. If it's positive (we'll be drawing right), COLINC is set to 255.

Note that together DELTAR, DELTAC, ROWINC and COLINC define the slope of the line to be drawn.

SWPFLG
123 007B

If you're using a split-screen mode, it's easier for the OS to print to the text window if it has all the cursor information for it in locations 84 to 95. But it also has to remember the cursor information for the main part of the screen, so what it does is swap the two. SWPFLG equals zero if they haven't been swapped, 255 if they have.

The text window information is kept in locations 656 and 667.

HOLDCH
124 007C

A character that has been typed in from the keyboard goes here so the OS can check out just what kind of charac-

ter it really is (CTRL, SHIFT, etc.)

INSDAT
125 007D

More display handler temporary storage. I'll even tell you what it's used for: it holds the character under the cursor and is used for end of line detection. Wasn't that exciting?

COUNTR
126,127 007E,007F

Well, here we are back at drawing a line. COUNTR tells how many points have to be plotted before the line is finished. It starts off with the same value as ENDPT (116,117). Then, every time a point is plotted on the line, it gets decremented by one. When it gets all the way down to zero, the line is finished and we can all go home.

The remaining zero page locations (128 to 255) are used by BASIC, with some free for your use. The breakdown looks something like Figure 8.

| | | |
|---------|-----------------|------------------------------------|
| 128-145 | (\$0080-\$0091) | BASIC program pointers |
| 146-202 | (\$0092-\$00CA) | Various BASIC locations |
| 203-209 | (\$00CB-\$00D1) | Free for your use |
| 210-211 | (\$00D2-\$00D3) | Reserved for use by BASIC |
| 212-255 | (\$00D4-\$00FF) | Used for floating-point arithmetic |

FIGURE 8. Location 128-255 breakdown

If you're using a language other than BASIC, check its instruction manual to find out which of these locations it uses.

If you are programming in machine language and not using a cartridge, all 128 bytes here are probably free for your use. Check your assembler's manual.

LOMEM
128,129 0080,0081

LOMEM points to the beginning of the RAM available for BASIC programs (in other words the end of the OS RAM). It gets the same value as MEMLO (743,744) initially and every time the BASIC "NEW" command is used. Although this implies that its value can differ from that of MEMLO, this doesn't seem to be the case. The only difference between LOMEM and MEMLO appears to be that BASIC uses LOMEM while the OS uses MEMLO.

The first 256 bytes after LOMEM are used as a buffer by BASIC for the tokenization process. Tokenization refers to the

process of taking your program and scrunching it up so it takes up as little space as possible. Essentially, each command and variable is replaced with a number (called a "token"). That way, it only takes one byte to store a command, rather than one byte for each letter in the command (this is an extremely simplified description; see *De Re Atari* for a complete play-by-play). Note that the SAVE command saves the program in tokenized form, while LIST saves it just the way you typed it in. That's why a SAVEd program will be shorter than a LISTed one. Incidentally, if you SAVE a program, the values in locations 128 to 141 are saved along with the program.

BASIC also uses the buffer as a stack to evaluate expressions ($8 + 2$ is an expression), in which case it calls it ARGOPS. See RUNSTK (142,143) for a description of stacks.

```
VNTP
130,131      0082,0083
```

This points to the table where the variable names are kept. The variable names are stored in the order they were typed (which is not the same as the order the program uses them) in ATASCII. To mark the end of a variable name (so you know when the next one starts), the last character of each variable (a letter or digit for regular variables, a "\$" for string variables and a "(" for arrays) is stored in inverse video (add 128 to the ATASCII value of the character). Enough talk, here's an example of how to print the variable list:

```
100 VNTP=PEEK(130)+PEEK(
131)*256
110 VNTD=PEEK(132)+PEEK(
133)*256
120 FOR LP=VNTP TO VNTD-
1
130 CH=PEEK(LP)
140 IF CH>127 THEN PRINT
CHR$(CH-128); " "; GOTO
160
150 PRINT CHR$(CH);
160 NEXT LP
```

VNTD (next location), of course, holds the address of the end of the variable name table (plus one).

There are a few other useful things you should know about the variable name table. First of all, if you used any variables while you were writing your program (including those used in the immediate mode) but don't use them now that the program is done, they're still in the table taking up space. In order to get rid of it, you must LIST your program to disk or cassette, type NEW and then ENTER the program back in (this has the effect of

typing in the final version of the program from scratch).

Second, you can have up to 128 different variables in your program. When BASIC tokenizes the program (see LOMEM), it replaces each variable name with a number equal to the position of the variable in the name table plus 128 (128 if it's the first variable in the table, 129 if it's the second and so forth). This saves a lot of memory.

Third and last, there's a neat trick you can use to make your program look like garbage when it's listed. All you have to do is change all your variable names to a RETURN character. This will protect your programs from being looked at by others. The following routine will do it for you. You can't get things back to normal, so make sure you have an original version of your program saved before you try this:

```
30000 VNTP=PEEK(130)+PEEK(
131)*256
30010 VNTD=PEEK(132)+PEEK(
133)*256
30020 FOR LP=VNTP TO VNTD
30030 POKE LP,155
30040 NEXT LP
```

```
VNTD
132,133      0084,0085
```

The address of the first byte after the end of the variable name table.

```
VVTP
134,135      0086,0087
```

Now we know where the variable names are stored, and we're about to find out where the variable values are stored. VVTP, you see, points to the variable value table (we'll call it the VVT).

The Atari has three different kinds of variables. There are the scalars (like X, HI, and FUNSTUFF), the arrays (like JULY (4) and SWEET (16,2)), and the strings (like MONEY\$). Each of these has a different representation in the VVT, but they all take up eight bytes per variable. Let's take a look at how those bytes are used:

The first byte tells what kind of variable it is. Scalars get a 0, arrays a 65, and strings a 129. Actually, if you forgot to DIMension the array or scalar in the program (shame on you), you can knock one off the preceding value given above.

The second byte tells what variable name we're talking about here. It's the position of the variable in the variable name table (0 for the first variable, 1 for the second, and so on up to a maximum of 127).

If we're dealing with a scalar, the re-

maining six bytes give its value in Binary Coded Decimal (BCD). I suspect a quick explanation is necessary here. BCD, as the name implies, is a way of storing a decimal number in binary. Everything alright so far? Good. Atari doesn't seem to follow the standard 6502 BCD format, so I'll give the Atari breakdown. The first byte is the exponent; 64 means 0, 63 means minus 2 (65 for plus 2, 66 for plus 4) and so forth. Add 128 if the value of the variable is negative. The second byte gives the two decimal digits to the left of the decimal point in BCD, the upper nibble gives one digit, the lower nibble gives a second). The last four bytes give the eight digits to the right of the decimal point. If this makes no sense to you, look up BCD in any introductory book on machine language programming. It probably still won't make sense.

Back to the VVT. If the variable isn't a scalar (after the preceding description, pray that it isn't), then the third and fourth bytes give an offset into the string/array area (see STARP [140,141]). This offset points to the beginning of the data for that variable (relative to the beginning of the string/array area, of course).

If it's an array we're dealing with, the fifth and sixth bytes give the first dimension, and the seventh and eighth give the second. No BCD here, just plain old binary. In case you're wondering what I'm talking about, a dimension is the number(s) plus one you use in BASIC's DIM statement. For example, the first dimension in DIM A(5,7) is six, and the second is eight. The reason that one is added is because A(0,0) is a valid array element and, therefore, the array in our example is actually six elements by eight, not five by seven.

If it's not an array (and it wasn't a scalar), then it must be a string. In that case the fifth and sixth bytes give its current length and the seventh and eighth its DIMensioned length (up to 32767). Note that the value of VVTP will change everytime a new variable is added.

```
STMTAB
136,137      0088,0089
```

The variable names and their values are all set, now where's the program? STMTAB tells you just that. It holds the address of the statement table, which is just a fancy name for your tokenized program (plus the last line you typed in without a line number, called the "immediate mode line").

The statement table contains each of

the tokenized lines, one after the other. As I mentioned earlier, you should see *De Re Atari* for a complete description of the tokenization process (which takes place in a buffer pointed to by LOMEM [128,129]). I will, however, fill you in on a few useful tidbits of information.

The first two bytes of each tokenized line give you the line number (in binary). The immediate mode line has a line number of 32768. The third byte tells you the number of bytes from the beginning of this line to the beginning of the next line. The fourth byte tells you the number of bytes from the start of the line to the start of the next statement (in case you use the ":" to put more than one statement on a line), and that's all you'll get out of me.

Try the following to tell you how many lines you have in your program:

```
30000 STMTAB=PEEK(136)+PEEK(137)*256
30010 LINES=0
30020 LINENO=PEEK(STMTAB)+PEEK(STMTAB+1)*256
30030 IF LINENO=30000 THEN PRINT "Your program has ";LINES;" lines." :END
30040 LINES=LINES+1
30050 STMTAB=STMTAB+PEEK(STMTAB+2)
30060 GOTO 30020
```

STMCUR
138,139 008A,008B

STMCUR is a pointer into the statement, which BASIC relies on when it needs to refer to particular tokens while processing a line in the statement table. When a program isn't running, and BASIC is just sitting around, it points to the beginning of the immediate mode line.

Try the following to create a program that can't be LOADED, only RUN:

```
32767 POKE PEEK(138)+PEEK(139)*256+2,0:SAVE "D:RUNONLY":NEW
```

You can use any filename, of course (and can substitute "C:" for "D:" if you're using cassette). Make sure this is the last statement in your program. If you want, you can include the routine for changing variable names (see VNTP [130,131]) right before this line to further protect your program.

To use the routine, GOTO 32767. Then RUN "D:RUNONLY" or RUN "C:RUNONLY" (substitute your filename for RUNONLY).

STARP
140,141 008C,008D

STARP holds the address of the

string/array area, which is where all the string characters and array values are stored (see VVTP [134,135] to find out how to determine where each variable is within this area). It also points to the end of your BASIC program, which should hint to you that its value will change as your program changes.

Array values are stored in six-byte BCD form (see VVTP [134,135]), while strings use one byte per character. If you DIMension an array such as A(x), where x is the number of elements in the array, then it will take up x*6 bytes in the string/array area, regardless of how many of the elements you use. The same goes for strings. If you DIMension ANS\$(y), then y bytes will always be reserved for it in the string/array area, even if you never use it. For this reason, you should be careful when DIMensioning variables and should also make sure that all unused variables are removed from the final version of your program (see VNTP [130,131]).

A few bits of miscellanea. The beginning address in the string/array area of the data for a string is the same as the address you get with the ADR function. More importantly, there is a way you can save a lot of memory using STARP. Here's the scoop.

A lot of times our programs have strings or arrays in them that always get initialized to the same lengths and values. It may be a string that holds a redefined character set or a machine language routine, for example. Anyway, somewhere in your program you have an initialization routine and the data for the string or array, right? Well, you just found out that the data is also stored in the string/array area. That means that it's in memory twice (the other time is in the tokenized program listing). That's very bad, and I'm going to show you how to do something about it.

As mentioned, STARP also points to the end of your BASIC program. What happens if we change STARP so that it points to the end of the data for the strings/arrays in question? BASIC will think it's part of the program, which means we can SAVE that part of the string/array area with the program! And that means no more need for initialization, we can get rid of the initialization part of the program. Here's an example of how to do it:

```
99 GOTO 200:REM You should
GOTO 100 the first time t
hrough
100 DIM TEST$(32)
110 TEST$="We'll save this
with the program"
120 STARP=PEEK(140)+PEEK(1
```

```
41)*256
130 NWSTARP=STARP+32
140 HIGH=INT(NWSTARP/256):
LOW=NWSTARP-256*HIGH
150 POKE 140,LOW:POKE 141,
HIGH
160 SAVE "D:TEST"
170 STOP
200 STARP=PEEK(140)+PEEK(1
41)*256
210 NWSTARP=STARP-32
220 HIGH=INT(NWSTARP/256):L
OW=NWSTARP-256*HIGH
230 POKE 140,LOW:POKE 141,H
IGH
240 POKE 142,LOW:POKE 143,H
IGH
250 POKE 144,LOW:POKE 145,H
IGH
260 DIM TEST$(32)
270 TEST$(32,32)="M"
280 PRINT TEST$
290 STOP
```

You're probably wondering how to use this monstrosity, so I'll be a nice guy and tell you. There are two basic parts to it. The first, lines 100 to 170, initialize the string, move STARP to the end of the string, and save everything to disk (you can use C: as well). You could alternately get rid of these lines right before you save the program, because they won't be necessary any more. The second part, from line 200 on, restores STARP and a few other locations that were affected, redimensions the string and sets the last character so that BASIC knows how long the string is. Now we can print TEST\$ and verify that it was indeed saved with the program!

Ok, now how do you adapt this to your own program? First of all, make sure the strings/arrays you want to save are the first variables you use in the program (use VNTP to get rid of unused variables). DIMension and initialize them (you can use a GOSUB to the initialization; it doesn't have to be at the beginning of the program). Now figure out how much memory they take up: one byte for each character, six for each array element. Add this to the current value in STARP and store the new value back in STARP. Stop the program. Get rid of the part of the program that did all of the preceding stuff (including the part for initializing). Add lines 200 to 270 at the beginning of the program (making the appropriate changes in lines 210, 260, and 270) and then save it to disk. That's it.

One last tidbit. There is a quick, easy, little known way of filling a string variable with the same character. It works because of the way BASIC is written. Try this:

```
100 DIM FILL$(800)
110 FILL$(1)="F"
120 FILL$(800)="F"
130 FILL$(2)=FILL$
140 PRINT FILL$
```


off your modem and check out the Atari Group's databases for some interesting new programs. After all, you wouldn't want to waste that disk space—and there's literally something for everyone among the megabytes of files in the Atari Users' Group's databases!

But how, you may ask, do I find what interests me among all those files? That's certainly a legitimate question, and one which brings us to the main topic of this installment of the column: finding items in a database.

I know there are many of you who have not done much downloading because you find it difficult to locate items in the databases. Well, it's easy—believe me. All that's required is a little understanding of how the databases are set up—and how to use DELPHI's powerful database Search function.

Database structure

Before we get into searching databases, you need to understand how the Atari Users' Groups database area is organized. The database area is divided into 11 separate databases, each of which covers a separate topic. Before you can search a database, you have to select a database *topic*.

Each database contains a number of *items* (sometimes called entries or groups), each of which may contain one or more files. (We'll take a closer look at items after we select a database topic.)

Selecting a database topic

Obviously, the first step in finding a particular item or type of item is to select the proper database topic. (You would not, for instance, look for games in the Telecommunications database.) I'll use the Games & Entertainment database for my example, since I've already used an example from that database.

To select the Games & Entertainment database, type DATABASE (or, just DA) at the Atari User's Group's menu to select "Databases," like this:

```
ANALOG's ATARI SIG Menu:
Announcements      Set Preferences
Conference          Shopping Service
Databases           ST-Log
Entry Log           Topic Descriptions
Forum (Messages)   Who's Here
MAIL (Electronic)  Workspace
Member Directory   Help
Poll               Exit
Request Free Upload
TOPIC>What do you want to do? DA
```

You'll see the "Databases Available" menu. At the "Which topic?" prompt, type GAMES to select the Games & Entertainment topic.

```
<<< ANALOG Databases >>>
Databases Available Menu:
General Interests      Recent Arrivals
Games & Entertainment  Reviews & News
Telecommunications    Current Issue
Utilities              Home use
Sight & Sound
Education
TOPIC>Which topic? GAMES
```

The next thing you'll see (assuming you are running with full menu display) is the database menu:

```
Games & Entertainment Menu:
Directory of Groups   Set Topic
Read (and Download)  Submit
Search (by Keyword)  Workspace
Narrow search        Help
Hidden search        Exit
DBASES:Gam) (Dir, Read, Set, Exit)
```

This menu is the same for each database topic. The only differences are in the header and prompt line, which serve to identify the current topic.

(Note: You can take a "shortcut" to any database by typing DA followed by the name of the database and *then* pressing RETURN. Thus, to get to the Games & Entertainment database topic, type DA GAME.)

The database directory

Once you're in the topic of your choice, you can view the directory of items with the DIR command (simply press RETURN to enter the command by default). You'll see a listing of the items in the current database topic in this format:

```
Directory of All Items:
KISMET                PROG 28-MAY ALANRAY
MAD LIBS CONSTRUCTION SET  PROG 8-MAY CUSHMAN
CLOUDBOPPER          PROG 3-MAY ANALOG4
TROLL WAR 11        PROG 6-APR ANALOG2
THE WIZARD PART 1   PROG 6-APR ANALOG2
CASTAWAY            PROG 6-APR ANALOG2
ROBBY INCIDENT      PROG 6-APR ANALOG2
UPHARD             PROG 5-APR ANALOG4
LABYRINTH           PROG 5-APR ANALOG4
THE WIZARD, PART 2  PROG 5-APR ANALOG4
DEAD END 1         PROG 28-FEB DOOT
DRAGON QUEST        PROG 26-JAN ATARICOP
ENGLISH CAVELORD    DATA 21-JAN HVLEE
STUD POKER          PROG 8-JAN ATARICOP
RACE IN SPACE       PROG 28-DEC ANALOG2
BLUE THUNDER        PROG 4-DEC ATARICOP
SPECIAL DELIVERY   PROG 13-NOV ATARICOP
WIZARD-PUZZLER      PROG 18-NOV ANALOG2
AIR ATTACK           PROG 18-NOV ANALOG2
WORD SCRAMBLE       PROG 10-NOV ANALOG2
Here?>
```

(Note: I entered *N* at the "More?" prompt; a full listing of the files in the database would take up a lot of pages in this magazine.)

The directory presents each item's name in the first column. The item name is usually descriptive of the file or files it contains, as in the case of MAD LIB CONSTRUCTION SET.

The second column identifies the file type. MAD LIB CONSTRUCTION SET happens to be a program, so it's identified as such by the phrase PROG. The date the file was placed in the database and the username of the person who submitted it ("8-MAY" and "CUSHMAN" in this case) follow.

Descriptions

Every database item has a description similar to the one shown below.

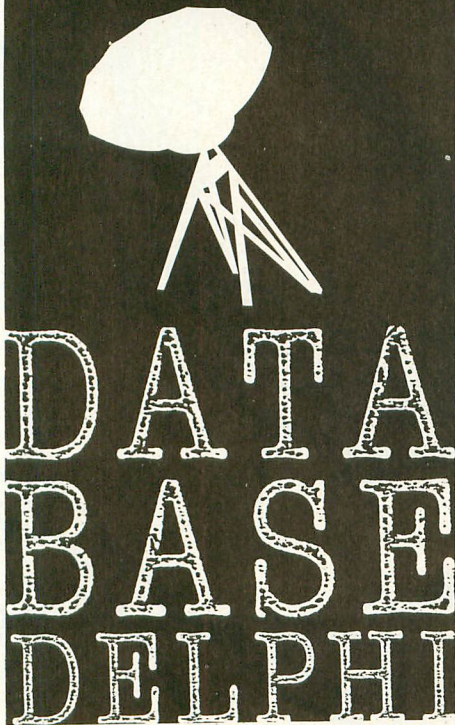
```
Name: RACE IN SPACE
Type: PROGRAM
Date: 28-DEC-1987 17:52 by ANALOG2

Race in Space is a two-player machine language game where you and a friend (enemy) race through a moving asteroid field. Game options can be customized to 128 variations. Written by Charles Bachand (ANALOG2) for the November 1984 issue of ANALOG Computing. The MAC/65 source code files are ARC'd to save space.

Keywords: ARCADE, ML, TWO-PLAYER, BACHAND, ANALOG.TXT, ANALOG COMPUTING, NOV.'84, #24, 8-BIT, MAC/65, ARC

Contents:
1 BINARY LOAD FILE (Size: 4107 Count: 35)
2 MAC/65 SOURCE CODE - ARC'ED (Size: 27824 Count: 7)

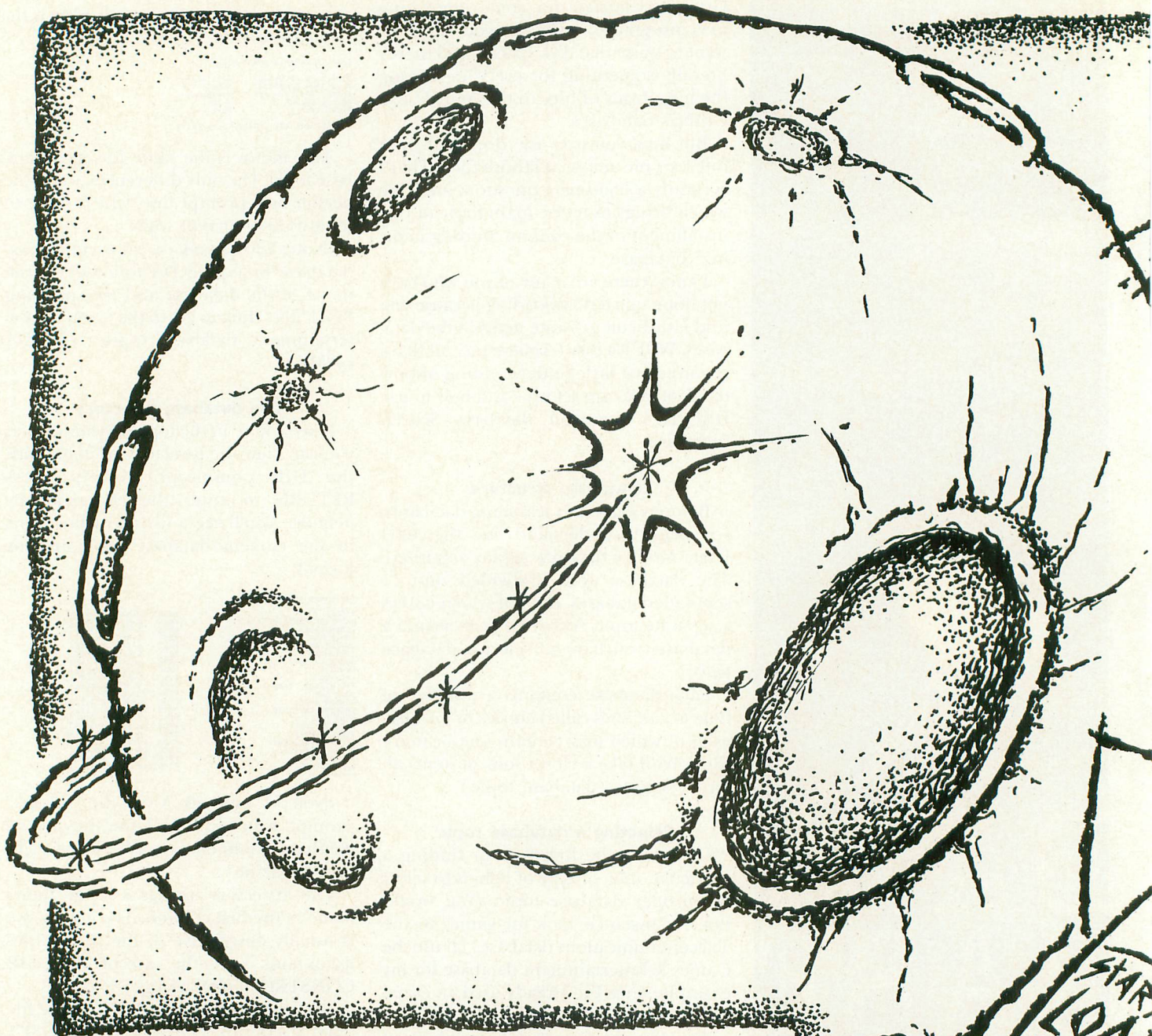
ACTION) (Next, Down, Xn, List)
```



by Michael A. Banks

(KZIN)

For most of us, October means cooler weather and an earlier sunset, which in turn means an end to most outdoor activities. So what do you do during these long, cool evenings? Catch up on your computing, of course! Try out some new programming techniques. Sort through your disks, delete the old files and free up some space and, while you're at it, dust



Make the DELPHI connection

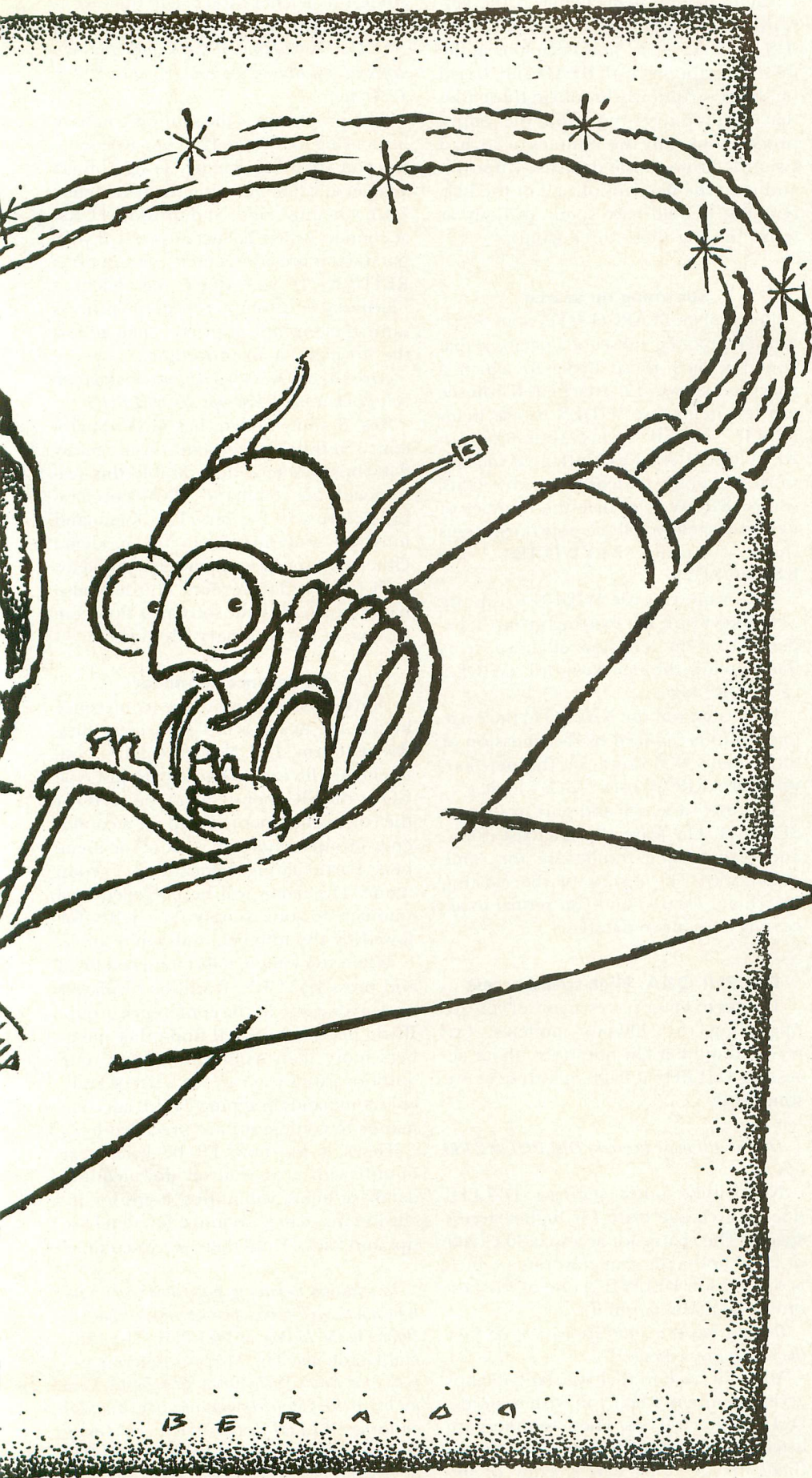
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The item description tells you the type and sizes of files involved, as well as the date the item was placed in the database and other information. The main body of the item description contains a detailed description and a list of keywords (more on those in a minute).

To read an item's description, type READ followed by the first few letters of the item's name at the database prompt (in this case, you would type READ RACE).

Once you have read an item's description, you'll see an ACTION prompt. It is at this prompt that you can download the item (about which I'll tell you more next month).

Those are the basics of database structure. Now, let's look at the process of finding items in the database.

Browse or search?

If you're not looking for anything in particular, or just want to see the newest items in a database, you can browse the directory. If you see something you like, type READ followed by the item name to read its description. However, browsing can be a time-consuming process, and not very rewarding if you are looking for a certain type of file. After all, there are a lot of files in the Atari databases.

Fortunately, there's a faster and more definite way to find what you're seeking. It's called a "keyword search."

Keywords

Keywords are identifying labels (in the form of words, naturally) attached to each database item. Selected by the database manager and/or the person who submitted a file, keywords allude to the type of file an item contains, as well as its use, features, applications, etc.

For example, a text adventure game written in BASIC and set on the Moon might contain the keywords BASIC, TEXT, ADVENTURE, MOON, LUNAR, and SPACE. Similarly, a review of a parallel printer in another database might use the keywords PRINTER, REVIEW, DOTMATRIX, PARALLEL and the printer's brand name. If either file was archived (compressed), it might contain the keyword ARC as well.

Performing a keyword search

The key, if you will, to finding a particular file is searching for it not by title or name, but by the keywords that you would expect to find attached to it. If, for example, you wanted to find a game or games that involve outer space and require a

joystick, you would use the keywords SPACE and JOYSTICK.

Here's a sample of the search process using those keywords, along with the keyword GRAPHICS.

First, I type SEARCH at a database name prompt, followed by the keyword SPACE. All items in the database with that keyword are organized into a temporary subset database that contains only those items to which the keyword SPACE is attached.

```
DBASES:Gan> (Dir, Read, Set, Exit) SEARCH SPACE
Starting a new search.
SPACE: 3 found.
DIRECTORY, READ, WIDEN, and NARROW will now operate on the selected items.
```

As indicated by the above report, DELPHI has found three items in the Games & Entertainment database with SPACE as a keyword. It has created a "mini-database" that contains only those three items. At this point, I could view a directory of the selected items, read descriptions and/or download items. But I'm not finished with the search yet; I've not specified the keyword JOYSTICK.

Besides which, I've changed my mind. This is a pretty small group, so I'll ease up on my limitation by adding the keyword GRAPHICS to the search in such a manner that all files that contain the keyword SPACE or GRAPHICS are included.

This is done with the WIDEN command, thus:

```
DBASES:Gan> (Dir, Read, Set, Exit) WIDEN
Which keyword (? for help): GRAPHICS
GRAPHICS: 6 found.
9 found so far.
```

The new report tells me that DELPHI has found six items containing the keyword GRAPHICS, which it adds to those containing SPACE for a total of nine items (WIDEN adds items).

However, I still want a game that uses a joystick, so I'll add the limitation that any item with the keyword SPACE or GRAPHICS must also contain the keyword JOYSTICK to be a part of the database subset. This is done with the NARROW command, which will select only items containing the existing keywords and JOYSTICK. (The net effect is that items are taken away.)

```
DBASES:Gan> (Dir, Read, Set, Exit) NARROW
Which keyword (? for help): JOYSTICK
JOYSTICK: 12 found.
3 found so far.
```

This report tells me that a total of twelve items containing JOYSTICK were found. However, only three contain SPACE or GRAPHICS and JOYSTICK. When I check the directory, I find:

```
Directory of Selected Items:
DEATHZONE          PROG 17-OCT  ANALOG2
BLAST!             PROG 22-JUN  ANALOG2
THE CLASH OF KINGS  PROG 27-MAY  ANALOG2
```

Each of these items contains the keywords SPACE and JOYSTICK or GRAPHICS and JOYSTICK. Now I can look at the item descriptions with READ and, based on the descriptions, download those files that seem interesting. And the entire process took only two minutes or so; had I simply browsed the database directory and read the descriptions all of the likely items, I could have spent an hour or more finding these three games.

Summing up search

Remember: SEARCH <keyword> creates a temporary subset of a database that contains only those items to which a specified keyword is attached. If you see too few items, use WIDEN to add items (you'll see all items that contain KEYWORD1 or KEYWORD2). If the keyword you enter returns too many items, use NARROW to reduce the number of items selected (you'll see only those items that contain KEYWORD1 and KEYWORD2).

Each time you use WIDEN to specify a new keyword, the existing group is expanded by the addition of those items that contain the new keyword. (WIDEN uses "OR" logic.)

Each time you use NARROW, the existing group is reduced by the omission of those items that don't use the new keyword. (NARROW uses "AND" logic.)

To "reset" a search and start fresh, type SEARCH. Or, leave the database topic, and return. The results are the same either way: The results of the existing search are cleared and you return to accessing the entire database.

DELPHI Q&A: High-speed access

Thanks to lower prices, many of you are upgrading to 2400-bps modems. I've received quite a few questions about accessing DELPHI at 2400 bps, so here are some tips:

Does it cost more to access DELPHI at 2400 bps?

No. Unlike other services, DELPHI does not charge extra for higher access speeds. The charge for access at 300, 1200, or 2400 bps is the same low rate—which is one reason DELPHI is one of the best online bargains around.

If I upgrade to a 2400-bps modem, do I use the same access number?

You will have to dial special 2400-bps access numbers when you wish to access DELPHI at 2400 bps. These numbers are listed in the back of *DELPHI: The Official Guide*. If you don't have a copy of the

guide, call Telenet's voice help number at 800-TELENET, or Tymnet at 800-336-0149.

Q Does connecting at 2400 bps require a different procedure than connecting at 300 or 1200 bps?

The procedure is the same as you have been using for 300 or 1200 bps access, unless you are using Telenet. To sign on via Telenet at 2400 bps using the parameters 7/E/1, you must enter and press RETURN at connect (when Telenet answers). If your parameters are 8/N/1, enter D and press RETURN. If you don't see Telenet's "Terminal =" prompt, repeat the process until the prompt appears. Then follow the normal log-on procedure.

Are there any other special considerations involved in using 2400 bps on DELPHI?

Yes, if your modem has MNP (Microcom Network Protocol)—and many 2400-bps modems do—disable this feature with the command AT&M0, preferably before you log on. (This command must be sent directly to the modem.) Otherwise, you may experience problems with binary file transfers. You may also have to turn off your software's flow control as an aid to binary file transfer.

Conference reminder

Don't miss the real-time conference held in the Atari Users' Group every Tuesday at 10 p.m., EST. New to real-time conferencing? It's easy to participate. Just type CO at the SIG menu, then type WHO at the conference menu. You'll see a conference group name, with a list of the members participating beneath the group name. The name will be preceded by a number; to join, simply type JOIN followed by the number, and you're in!

When you want to talk, type a comment and press RETURN. It will be displayed to everyone else in the conference group. If you need help, you'll find other members more than willing to answer your questions, and you can see a list of available commands by typing /HELP (all commands in conference are preceded by /).

That's it for now. I'll be back next month with a tutorial on downloading database items, submitting items for inclusion in a database, and a few database tips and tricks. Until then, see you online!

In addition to having published science fiction novels and books on rocketry, Michael A. Banks is the author of DELPHI: The Official Guide and The Modem Reference—both from Brady Books/Simon & Schuster. Look for his articles on telecommunications and tips on using DELPHI in the Atari Users' Group databases. You can contact Banks on DELPHI by sending E-mail to membername KZIN. ☐



The recently introduced Action Set™ consists of a control deck, two joypad controllers, the Zappers® light gun, and a revolutionary game pak that includes two popular Nintendo® software titles—Super Mario Bros.® and Duck Hunt®. The Action Set lists for \$119.95.

Without a doubt, the video-game industry holds the Consumer Electronics Show close to their heart. The show—held in Las Vegas in the winter and in Chicago in the summer—gives manufacturers the opportunity to display their wares for trade and press representatives. At the show is displayed most anything you could imagine in electronics gear. Among the hundreds of diversified booths, there could be found closed-caption decoders for TVs, hand-held VCR/TV combos and counterfeit dollar detectors, along with other countless gadgetry.

I had the pleasure of visiting the most recent Chicago show, held June 4-7, 1988, and believe me, the attendance was impressive; over 93,000 people were on hand the first day to swarm around the latest in audio, video, software and other goods. CES is a testament to how much electronics have permeated our society.

The video-game industry hasn't for some time experienced as big a turn-out as the 1988 Summer CES provided them. Given the shake-and-break market the industry experienced in the early-to-mid-'80s, "caution" was a key word. But the recent revitalization—created by the successes of the Nintendo and Sega systems, Atari's reintroduction of a streamlined 2600, as well as their 7800 and XE Game System releases—has pumped the industry to a boil for a second time. Though not quite up to the level of the previous peak in 1982 of \$3 billion in video-game revenue, the projected \$2.3

billion for 1988 is showing the rebirth's success.

Nintendo

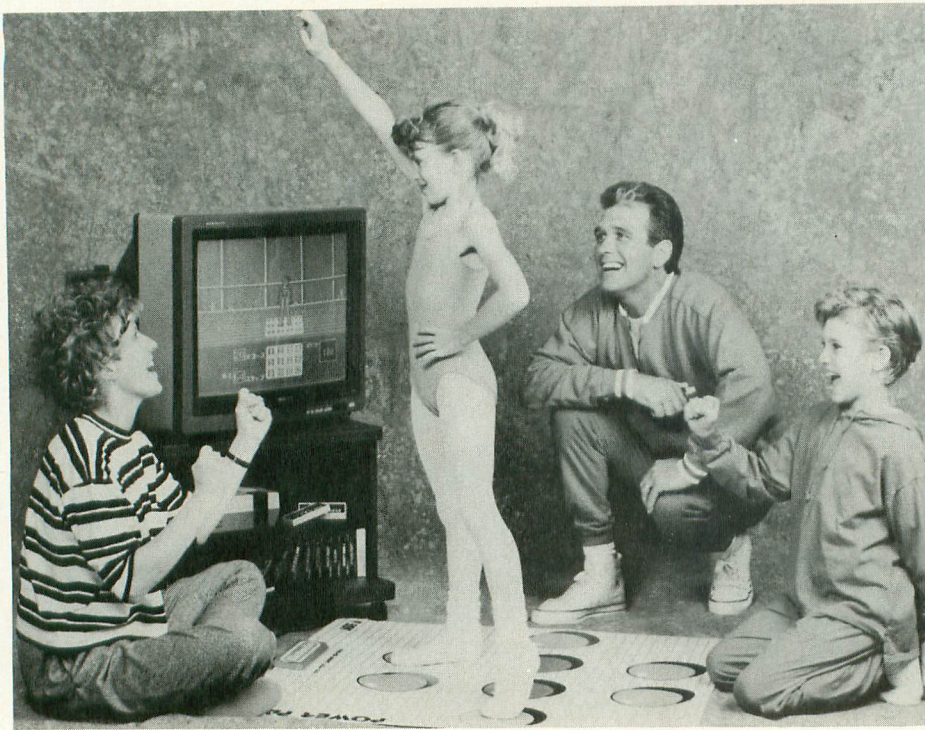
Biggest and most impressive of all was the Nintendo booth, a full 20,000 square feet in size, filled to the brim with playable machines, each displaying one of the more than 90 titles brought out for their NES (Nintendo Entertainment System) console. This not only demonstrated Nintendo's own product but that of other supporters as well, as their booth was packed with most of their 30 software licensees. Familiar software development houses like Activision, Broderbund and Mindscape headed up the field. Coin-op manufacturing companies like Konami, Taito and Data East were hawking some of the arcade hits that have been ported over to the NES. This activity was reminiscent of five short years ago, when seemingly everyone clamored to bring titles out for the 2600.

Looking through Nintendo's list of licensees, already existing third-party software or software planned for release by the end of 1988 should number over 150 titles. That's in addition to the nearly 30 titles Nintendo has or will have out in-house.

That paints a rosy picture, but all is not as optimistic as it may seem. Most of the Nintendo-related developmental representatives I met with put a disclaimer after all their product announcements:

Consumer Electronics Show: Video Game Report

by Andy Eddy



Power Pad

“...depending on the chip shortage...” The computer chip market is deeply embroiled in a poor supply situation. For that reason, many of the developers have their hands bound, in spite of the number of orders that dealers have placed. With certain cartridges selling over a million units, the demand is there, but supply can't keep up. It's expected that much of this will be alleviated by the end of the year, but no one is being too recklessly optimistic—many companies have moved off estimates of product releases until as late as the first quarter of 1989 just to be safe.

As if that wasn't enough of a damper, Nintendo also has its own policy in place to limit licensees to five new titles a year, though some companies are being allowed to create other product lines (under a different name) to circumvent that; Konami's Ultra line is an example of this. Aside from that restriction, Nintendo controls all aspects of final cartridge production, from materials (like chip allocations) to approval of software and gameplay quality; they put their “stamp” on every product released for their consoles. With that policy, third-party companies rely on Nintendo for their already-fragile release schedules. From a marketing aspect, this is intended to keep the quality up and pace the sales somewhat. Even with those limits, screens on the show floor were alive with variety; though in most cases prototypes were all

that could be shown.

Among the many titles being aired out were some familiar names from the “Atari” era. Activision, for example, was displaying *Super Pitfall* and *Ghostbusters*. Pitfall Harry, in particular, was aided by an increased graphic capability, due in part to the 52 color palette on the NES.

Acclaim was showing a bunch of cartridges, such as *Tiger-Heli* and *Rambo*. Andre The Giant brought his hulking 7-foot, 500-pound frame into their booth to sign autographs and promote their upcoming wrestling contest.

Data East, an arcade heavy, took complimentary pictures of showgoers alongside *Robocop* to publicize the game of the same name which they hope to have released by October. Robocop will accompany the many titles they already offer, such as *Burgertime*, as well as other games they plan to release. Among those is *Rampage*, a popular arcade game where you play monsters destroying a city, a turnaround from the usual good-guy-gets-the-bad-guy theme.

Not a surprise, arcade classics and movie themes were very common in the Nintendo area. Taito was showing some popular conversions like *Elevator Action*, *Operation Wolf* and *Bubble Bobble*. Other coin-op titles that are or will be on the NES are *Xevious* (Bandai), *Spy Hunter* (Sunsoft), *Gauntlet* and *Pac-man* (Tengen).

Aside from the previously mentioned Robocop, Rambo and Ghostbusters,

movie clones are garnering a large part of the NES library. LJN Toys was showing clips of the animated/human-action film, *Who Framed Roger Rabbit?*, which was tentatively set for a March 1989 release as an NES cart. LJN also has plans to release *Friday the 13th* and *A Nightmare on Elm Street* as games. Other film crossovers include *Willow* (Capcom) and *Platoon* (Sunsoft).

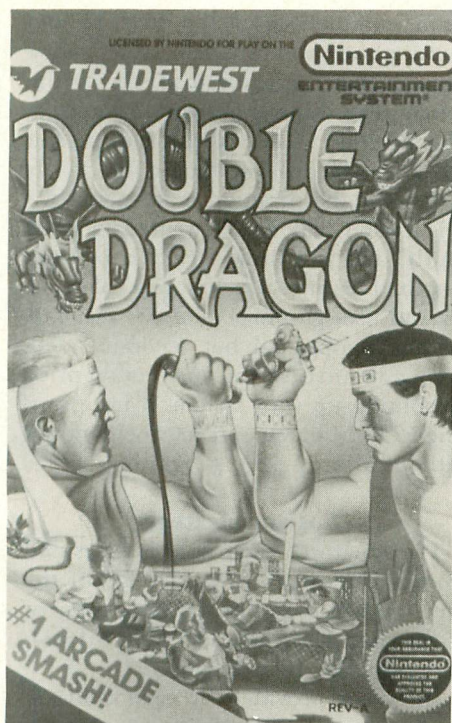
Nintendo was also showing a hardware addition to their basic system. Called the *Power Pad*, this input device looks like a Twister board and takes the place of the controllers to let the player use his feet to make things happen on the screen. By the time you read this, they will have a system configuration called the *Power Set* on store shelves, which will include the main console, two standard hand controllers, the *Zapper* light gun, and a game cartridge with *Duck Hunt*, *Super Mario Bros.* and *World Class Track Meet* on it. The latter game will integrate the Power Pad, forcing the user(s) to step and jump on the numbered dots on the Pad to make the on-screen character compete in the 100-yard dash, hurdles and long jump, among other events.

Two other Power Pad-compatible titles were being shown: *Dance Aerobics*, an exercise program, and *Super Team Games*, a compendium of obstacle course competitions. Nintendo hired a group of attractive, energetic “players” to show off these three cartridges, encouraging any willing members of the crowd to slip off their shoes and participate. I speak from personal experience when I say that interactive gaming has never had as big an emphasis on *action* since the introduction of the *Amiga Joyboard*, long before Amiga was a computer brand.

Sega

The Sega booth was smaller in comparison to the Nintendo area, but not much reduced in activity. They placed two sit-down *Thunder Blade* arcade games at the entrance to draw showgoers into their booth. The helicopter shoot-'em-up has the player's cockpit seat moving opposite the joystick movement to simulate the craft's in-flight momentum, and it kept lines of people waiting for a chance to play.

Once inside the booth, Sega had a stacked-screen advertisement running which scanned through some of the titles available on their machine and *attacked* the viewer's senses with booming sound and flashy graphics. The visuals toggled between appearing on single screens or combined on all screens in a gigantic



Nintendo's *Double Dragon*

panorama. The sound level made it hard to miss the show's beginning most anywhere in the surrounding area.

Sega also had their share of celebrity endorsement. Retired baseball great Reggie Jackson was on hand Sunday and Chicago Bear running back Walter Payton was in the booth on Monday to push the games that carry their names: *Reggie Jackson Baseball* and *Walter Payton Football*.

But video games, not stars, were the focus. Machines were set up all around the booth, playable by anyone who strolled by. A separate, darkened room was set up for demonstrations of the *SegaScope 3-D Glasses*, a \$60 dollar peripheral for the Sega Video Game System and compatible software.

The glasses, unlike the red/blue glasses of old, feature liquid crystal lenses that alternate left-opaque then right-opaque in synchronization with the changing images on the screen to trick your brain into thinking it is seeing a three-dimensional image. It's similar to the technique used in a View-Master slide viewer, where each eye is presented with a slightly different scene. The benefits to this over other 3-D techniques is in the creation of multicolor animation; the downside is slight: perceptible and distracting flicker in a lit room, thus the darkened playing area. Regardless, in most cases, the effect is amazing. Some of the games on display that required the 3-D glasses were *Space Harrier 3-D*, an arcade action contest, and

Maze Hunter 3-D, a scrolling maze adventure.

The other Sega games were grouped by their genre: for example, "Family" games, such as the Mah-Jongg-like board contest *Shanghai* and the perennial *Monopoly*; "Action" games like the *Black Belt* karate sortie and the put-you-in-the-driver's-seat *World Grand Prix*; and "Arcade" battles like *Choplifter*, *Double Dragon* (one of the only games that appear on the Nintendo and Sega consoles), *After-Burner* (a four-megabit cartridge) and the already-noted *Thunder Blade* arcade game, converted to a two-megabit cart.

Also in attendance on Sega's bandwagon was Parker Brothers, who is the first third-party producer of Sega-compatible cartridges. They have a couple of computer game conversions (*Where In The World Is Carmen Sandiego?* and *King's Quest—Quest for The Crown*) as part of their "Text Adventure Action Games" series.

Atari

Not one to be left out in the cold, Atari had their forces in place to challenge Nintendo and Sega, though at this point Nintendo seems well out of reach. With their "Winning Package" booth, they were hoping to regain the popularity they achieved in the late-70s and early-80s with their 2600 game. With an installed base of over 25-million units, they figure that many people packed them away in their closets and will be just as happy to unpack them again with the new generation of games. For example, Activision is bringing out new 2600 titles, such as *River Raid II*, *Tomcat—The F-14 Fighter Simulator* and *Pete Rose Baseball*.

The Atari booth, which was smartly located right off the escalator leading to the video game show floor, had its exterior walls covered with 2600, 7800 and XEGS (XE Game System) boxes with numbers on them. Pretty "Atari-ettes" were holding regular contests, similar to Concentration, where showgoers attempted to match what was behind the boxes and win T-shirts, cameras and game systems (of course).

Inside their enclosure, Atari had kids in promotional T-shirts and sales reps plugging lots of software—many familiar names from the past. They plan to release 45 new titles during the last half of 1988 for their three consoles. Atari hopes that old favorites like *Necromancer*, *Food Fight*, *Xevious*, *Robotron 2084*, *One-on-One Basketball*, *Impossible Mission* and *Lode Runner* will draw arcadiacs back to their machines. Their catalog also mentions major companies like Electronic Arts, Taito, Williams

Electronics, LucasFilm and Strategic Simulations as software supporters.

Atari was also previewing their series of athletic celebrity TV advertisements, just the tip of the iceberg in their slated media promotions. Washington Redskins QB Doug Williams, Cardinals shortstop Ozzie Smith and basketball's Atlanta Hawks' Spud Webb will assist Atari with their related sweepstakes, with prize winners vying for World Series, Super Bowl or NBA Championship series tickets. Williams and Webb were at CES to sign autographs also.

The most surprising announcement was the signing of an agreement between Axlon and Atari for "an unspecified number" of video games (though some put the total around 20 for the next year). On the surface it doesn't seem too earth-shattering until you discover that Axlon's chairman is none other than Atari's founder, Nolan Bushnell. When Bushnell sold Atari to Warner Communications in 1976, he was restricted by a stipulation that prevented his doing video-game-related works for a period of time, a period which has long since past.

Atari also announced the signing of Montgomery Ward, Sears, Ace Hardware, True Value Hardware and Musicland as part of their distribution network. That coupled with the fact that their name is already recognizable with regards to game products—something that many have stated has damaged the efforts of their computer persona—will help them sell game machines.

Third-party peripherals

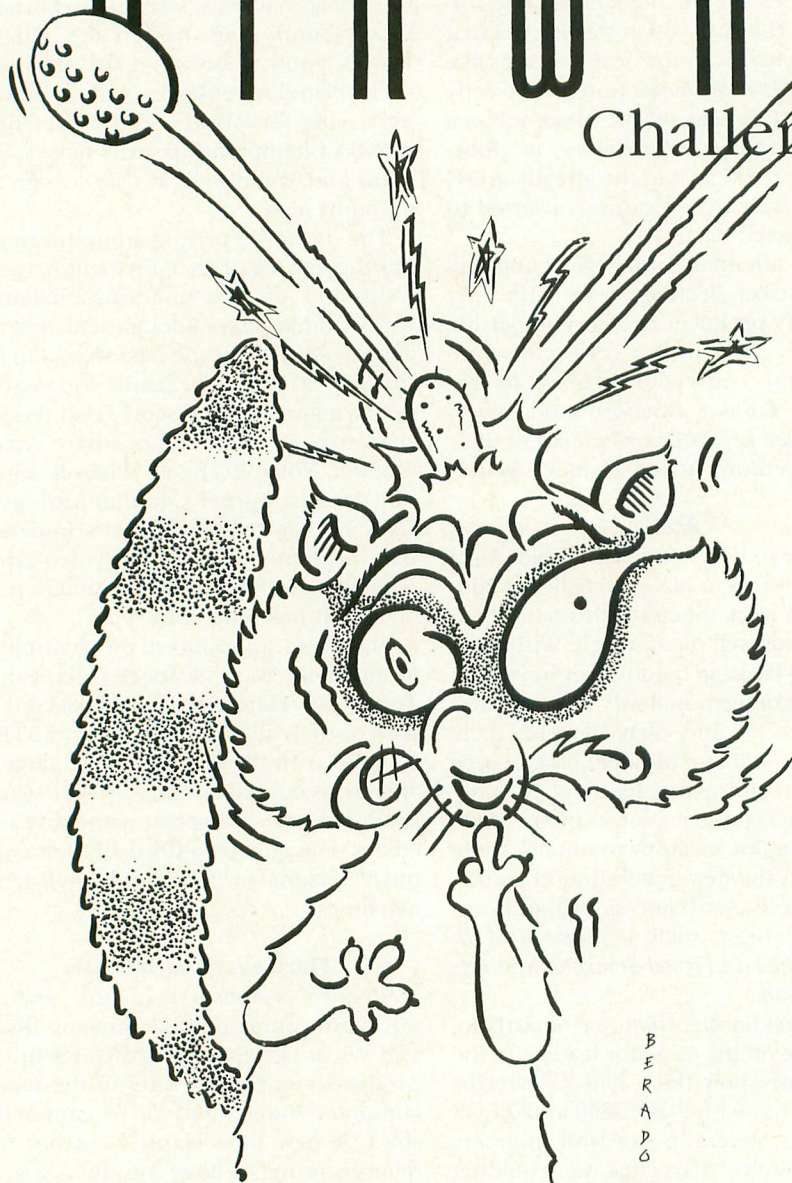
Already established in the joystick world are companies like Suncom, Kraft and Wico. They had booths chock-full of products compatible with all the major computer brands and video game consoles. A new face, Happ Controls, was demonstrating a large product line of joysticks, developed from their roots in arcade controllers. Wico was showing their entire line of products, as well as their new joystick, very similar to Epyx's *500XJ Joystick*. Wico's stick features a comfortable, ergonomic shape that fits well in the palm of your hand, in addition to a having a rubberized coating to prevent slippage.

A newer name in the joystick market is the New-Jersey-based company, Beeshu. They were showing their *Zinger* (for the Nintendo), *Hot Stuff* (for the Atari and Commodore) and *Viper* (for Sega) lines of pastel-colored joysticks. The best development from their camp was the *Ultimate Superstick*, a remote wireless joystick with

continued on page 76

FAIRWAY 4

Challenge



B
E
R
A
D
O

continued from page 11

direction in which you wish to hit your shot. The choices are north, south, east, west, northeast, northwest, southeast and southwest. Again, enter only the one- or two-letter designation, and RETURN.

After your Atari digests these inputs, it will give you a chance to change your selections. Type either *Y* or *N*. This procedure will be repeated until you have landed on the green. The screen will then change to a close-up view of the putting surface, and you will be asked to select the strength of your putting stroke. Enter a number from one to 20 and RETURN. After putting the ball into the cup, you will

be shown your scorecard and given the option of continuing on to the next tee or quitting. Upon completion of play you will be asked if you would like a print-out of your scorecard. You can then use scissors to cut the card out for saving.

About the program

The program creates and updates a file containing the course record, so be sure to make a back-up copy of the program before running it. The first thing the program does is check for a file on the disk named *D:RECORD.DAT*. If it does not find the file, the program will create one

upon completion of the first 18-hole round played and update it as necessary. Be sure that the game disk storing the course record file is not write protected. The program will work with cassette, but the course record will remain intact only as long as the program is in memory.

Fairway Challenge is written in Atari BASIC and is a little over 27K bytes in length. It features a redesigned character set and uses graphics modes 0 and 1. A printer is optional but recommended. Remember to turn your printer on prior to booting up your system, if necessary. The 52 REM statements may be removed without affecting the program.

Tips and strategy

The length of each hole is measured from the tee to the front edge of the green, down the approximate center of the fairway. There are also 150-yard markers provided for reference.

Distances provided by each club are fairly representative of the average player's game. The following table gives the approximate distances for each club:

| | |
|---------|------------|
| 1 Wood | —240 yards |
| 3 Wood | —220 yards |
| 4 Wood | —200 yards |
| 2 Iron | —190 yards |
| 3 Iron | —180 yards |
| 4 Iron | —170 yards |
| 5 Iron | —160 yards |
| 6 Iron | —150 yards |
| 7 Iron | —140 yards |
| 8 Iron | —130 yards |
| 9 Iron | —120 yards |
| P Wedge | —110 yards |
| S Wedge | —100 yards |

The above yardages are based on a full swing. A half swing will give $\frac{1}{2}$, an easy swing $\frac{1}{3}$. However, as any golfer can tell you, the shot length of a club can vary on any given shot. How many times have you hit what felt and looked like a perfect shot, only to see it fall short of, or fly completely over the hole. Fairway Challenge provides this same human element in its calculation of the distance to be yielded by each club on each shot. Likewise, how many weekend golfers hit it straight down the middle of the fairway on every shot? I've seen a lot of golf and I can tell you, not many! Therefore, a hook/slice factor is also figured into each shot. As a rule, the shorter the shot, the truer it will fly.

Avoid the hazards as they can cost you strokes. The rough is extremely deep and lost balls are not uncommon. Getting out is no easy feat either. Hitting into the trees can lead to a stymied lie. Straying into the

bushes can leave you with an unplayable shot. Traps will frequently turn your normally reliable sand wedge into an unpredictable monster. In addition, the screen edges are out of bounds, and as in real golf, the penalty is stroke and distance.

Once the player has acquired a "feel" for the greens, getting down in two putts should pose no problems. From extremely long distances, however, three putting is a definite possibility.

In summary, the highest premium should be placed on accuracy and proper club selection. Leaving the ball in a good position for the next shot is all important.

The par fours are not long, and as the player will soon find out, it is best to leave the one wood in the bag on many of them. The par fives are all reachable in two, with the exception being the 600-yard 13th hole, but it will take two well thought-out (and extremely lucky) shots. Most of the time, gambling will cost you more than you bargained for. The par threes are long but fair, with a nice trophy going to anybody lucky enough to make a hole in one.

Conclusion

Fairway Challenge has been written to simulate a day in the life of the average

weekend golfer. Based on years of playing and observing, I think it will provide you with all you need to satisfy your craving to play on those days when you just can't get out to the course. That is, all except the Tennessee River, where you just might want to toss your computer after a particularly frustrating round!

John Pape attended the University of Alabama where he majored in economics. He is a quality-control process inspector for Chrysler Corp. He has been programming his 800XL for several years and is interested in learning Pascal, Action!, C, LOGO and assembly language. He is married, with two children.

LISTING 1: BASIC

```

UA 10 REM *****
AZ 20 REM * FAIRWAY CHALLENGE *
LK 30 REM * BY J. T. PAPE *
OR 40 REM * COPYRIGHT 1988 *
DL 50 REM * BY ANALOG COMPUTING *
UO 55 REM *****
BO 56 REM
VB 60 REM ****RECORD DATA****
DA 70 GOSUB 1500:TRAP 80:POKE 65,0:OPEN #
1,4,0,"D:RECORD.DAT":GET #1,CR:GOTO 90
YI 80 CR=999
LP 90 CLOSE #1
VZ 100 GOSUB 4360
OJ 110 REM ****MAIN LOOP****
YJ 120 GRAPHICS 1:POKE 708,179:POKE 709,1
5:POKE 710,0:POKE 711,140:POKE 712,199
LW 130 GOSUB 1500:POKE 756,152
VK 140 HOLE=HOLE+1:SHOT=0
RT 150 COLOR 33:FOR F=1 TO 18:PLOT 0,F:DR
AWT0 19,F:NEXT F
YJ 160 ON HOLE GOSUB 1520,1600,1690,1770,
1860,1940,2010,2090,2170,2250,2320,239
0,2470,2550,2630,2700,2780,2860
UW 170 COLOR 96:PLOT X,Y
KI 180 HE=INT(RND(0)*5)-2:HS=(RND(0)-0.49
9)/2:Q=INT(RND(0)*2):PROVX=X:PROVY=Y:P
ROVZ=Z
SP 190 COLOR 254:PLOT 0,0:POSITION 13,0:?
#6;"hole":HOLE
XB 200 POSITION 0,19:? #6;"yards":YARDS:
POSITION 15,19:? #6;"par":PAR
SP 210 TRAP 210:GOSUB 730:? "club 1W,3W,
4W,2I thru 9I,PW or SW ";;GOSUB 500:
IF R$="" THEN 210
GG 220 CLUB$=R$:GOSUB 1060
VM 230 TRAP 230:GOSUB 730:? "swing Full,
Half or Easy ";;GOSUB 500:IF R$="" T
HEN 230
WR 240 SWING$=R$:GOSUB 1280
IE 250 TRAP 250:GOSUB 730:? "direction N
,S,E,W,NE,NW,SE or SW ";;GOSUB 500:I
F R$="" THEN 250
AE 260 D$=R$:GOSUB 1340
RD 270 ? "K
";
MR 280 ? " | ";CLUB$;" | ";SWING$;" | ";D$;" | "
";
PK 290 ? "
";
MC 300 GOSUB 740:? " Corre
ct?";GOSUB 750:SL=0
QT 310 GOSUB 620:TRAP 390:X=X+0.5:Y=Y+0.5
GN 320 FOR F=1 TO DIST
MM 330 GOSUB 860:IF (IY)>=19 OR IY<=0) THE
N 390
WA 340 LOCATE IX,IY,Z:COLOR 96:PLOT IX,IY
:FOR J=1 TO 10:NEXT J:COLOR Z:PLOT IX,
IY:NEXT F
WR 350 LOCATE IX,IY,Z:GOSUB 980
AC 360 FOR I=1 TO 5:COLOR 96:GOSUB 720:PL
OT IX,IY:GOSUB 720:COLOR Z:PLOT IX,IY
NEXT I
OA 370 GOSUB 720:COLOR 96:PLOT IX,IY:GOSUB
B 430
YV 380 COLOR PROVZ:PLOT PROVX,PROVY:SHOT=
SHOT+1:GOTO 410
MZ 390 FOR F=15 TO 0 STEP -1:SOUND 0,25,6
,F:NEXT F:SOUND 0,0,0,0
WX 400 ? "Out of Bounds"? "PENALTY: St
roke and Distance":SHOT=SHOT+2:IX=PROV
X:IY=PROVY:Z=PROVZ:COLOR 96:PLOT IX,IY
AR 410 X=IX:Y=IY:FOR F=1 TO 1000:NEXT F:G
OTO 180
RP 420 REM ****TROUBLE****
PL 430 TL=INT(RND(0)*5)
IU 440 IF Z=33 THEN ? "KDeep Rough":IF TL
=0 OR TL=4 THEN ? "LOST BALL: Lose On
e Stroke":SHOT=SHOT+1
UB 450 IF Z=165 THEN ? "KIn the Trees":IF
TL=0 OR TL=4 THEN ? "STYMIED: Lose O
ne Stroke":SHOT=SHOT+1
BW 460 IF Z=132 THEN ? "KIn the Bushes":I
F TL=0 OR TL=4 THEN ? "UNPLAYABLE LIE
: Lose One Stroke":SHOT=SHOT+1
VC 470 IF Z=8 THEN ? "KSand Trap":IF TL=0
OR TL=4 THEN SL=1:? "BURIED LIE: Mus
t Use Sand Wedge"
ZQ 480 RETURN
CB 490 REM ****INPUT ROUTINE****
QW 500 POKE 764,255:CLOSE #2:OPEN #2,4,0,
"K:"
BA 510 R$=""
GJ 520 GET #2,KEY:IF KEY=155 THEN 600
EG 530 IF KEY=126 THEN R$=""GOTO 600
EL 540 IF KEY>=128 THEN KEY=KEY-128
BD 550 IF PEEK(702)=0 AND KEY>=96 THEN KE
Y=KEY-32
KE 560 IF (KEY)>47 AND KEY<58) OR (KEY)>64
AND KEY<91) THEN 580
NX 570 GOTO 510
TG 580 KEY$=CHR$(KEY)
SW 590 R$(LEN(R$)+1)=KEY$:? KEY$;GOTO 52
0
EQ 600 POKE 702,64:POKE 694,0:CLOSE #2:RE
TURN
UN 610 REM ****SWING ROUTINE****
TR 620 COLOR 28:PLOT X,Y
MR 630 FOR F=1 TO 400:NEXT F
VK 640 COLOR 30:PLOT X,Y:GOSUB 720
QX 650 COLOR 3:PLOT X,Y:GOSUB 720:GOSUB 7
20
WR 660 COLOR 30:PLOT X,Y:GOSUB 720:SOUND
0,0,0,1
GT 670 COLOR 28:PLOT X,Y:GOSUB 720:FOR I=
15 TO 0 STEP -7.5:SOUND 0,4,8,I:NEXT I
EM 680 COLOR 6:PLOT X,Y:GOSUB 720
SF 690 COLOR 124:PLOT X,Y:GOSUB 720
ZD 700 RETURN
UA 710 REM ****MISC ROUTINES****
ZH 720 FOR F=1 TO 25:NEXT F:RETURN
TV 730 ? "KSelect"
CH 740 FOR F=9 TO 0 STEP -0.3:SOUND 0,77,

```



```

14,F:NEXT F:5000,0,0,0:RETURN
WX 750 POKE 764,255
CN 760 IF PEEK(764)=35 THEN POP :GOTO 210
NO 770 IF PEEK(764)=43 THEN 800
QY 780 GOTO 760
UB 790 REM ****CUMULATIVE SCORE****
WY 800 ? "K+Lying: ";SHOT:? "Total: ";
YJ 810 IF DIFF=0 THEN ? "even"
IC 820 IF DIFF<0 THEN ? DIFF;" over"
PI 830 IF DIFF<0 THEN ? ABS(DIFF);" under
"
DD 840 FOR F=1 TO 500:NEXT F: ? "K":RETURN
DU 850 REM ****INCREMENT BALL****
AH 860 IF D$="N" THEN Y=Y-1:X=X+H5
EZ 870 IF D$="W" THEN X=X-1:Y=Y+H5
UZ 880 IF D$="E" THEN X=X+1:Y=Y+H5
BB 890 IF D$="S" THEN Y=Y+1:X=X+H5
PT 900 IF D$="SW" THEN Y=Y+1:X=X-1
EN 910 IF D$="SE" THEN Y=Y+1:X=X+1
PL 920 IF D$="NW" THEN Y=Y-1:X=X-1
EF 930 IF D$="NE" THEN Y=Y-1:X=X+1
KC 940 IF (D$="NW" OR D$="NE" OR D$="SW"
OR D$="SE") AND Q=0 THEN X=X+H5
RJ 950 IF (D$="NW" OR D$="NE" OR D$="SW"
OR D$="SE") AND Q=1 THEN Y=Y+H5
ZB 960 IX=INT(X):IY=INT(Y):RETURN
YS 970 REM ****WHERE IS IT****
YB 980 IF Z=91 OR Z=47 OR Z=61 OR Z=59 OR
Z=43 THEN SHOT=SHOT+1:POP :GOTO 2940
WL 990 IF Z=32 THEN SOUND 0,255,3,15
MU 1000 IF Z=33 THEN FOR F=0 TO 15 STEP 5
:5000 0,F/6,7,F*2:NEXT F
PD 1010 IF Z=8 THEN FOR F=0 TO 15 STEP 2.
5:5000 0,20,8,F:NEXT F
WL 1020 IF Z=132 THEN FOR F=15 TO 0 STEP
-1:5000 0,F*F,F,F*3:NEXT F
EH 1030 IF Z=165 THEN FOR F=15 TO 0 STEP
-7.5:5000 0,33,10,F:NEXT F
XM 1040 SOUND 0,0,0:RETURN
GW 1050 REM ****INITIALIZE CLUB DATA****
HC 1060 IF CLUB$="1W" OR CLUB$="3W" OR CL
UB$="4W" OR CLUB$="2I" OR CLUB$="3I" O
R CLUB$="4I" THEN 1100
HP 1070 IF CLUB$="5I" OR CLUB$="6I" OR CL
UB$="7I" OR CLUB$="8I" OR CLUB$="9I" O
R CLUB$="PW" THEN 1100
JS 1080 IF CLUB$="5W" THEN 1110
YZ 1090 POP :GOTO 210
AQ 1100 IF SL=1 AND CLUB$<>"SW" THEN GOSU
B 470:POP :GOTO 410
AC 1110 IF CLUB$="1W" THEN CLUB$=" 1 Wo
od
":DIST=12+HE
JP 1120 IF CLUB$="3W" THEN CLUB$=" 3 Wo
od
":DIST=11+HE/2:H5=H5/1.3
OV 1130 IF CLUB$="4W" THEN CLUB$=" 4 Wo
od
":DIST=10+HE/2:H5=H5/1.5
JE 1140 IF CLUB$="2I" THEN CLUB$=" 2 Ir
on
":DIST=9.7+HE/3:H5=H5/1.6
ZX 1150 IF CLUB$="3I" THEN CLUB$=" 3 Ir
on
":DIST=9+HE/3:H5=H5/1.7
QP 1160 IF CLUB$="4I" THEN CLUB$=" 4 Ir
on
":DIST=8.7+HE/3:H5=H5/1.8
HE 1170 IF CLUB$="5I" THEN CLUB$=" 5 Ir
on
":DIST=8+HE/3:H5=H5/1.9
QI 1180 IF CLUB$="6I" THEN CLUB$=" 6 Ir
on
":DIST=7.7+HE/3:H5=H5/2
RN 1190 IF CLUB$="7I" THEN CLUB$=" 7 Ir
on
":DIST=7+HE/3:H5=H5/2.1
GT 1200 IF CLUB$="8I" THEN CLUB$=" 8 Ir
on
":DIST=6.7+HE/3:H5=H5/2.2
XS 1210 IF CLUB$="9I" THEN CLUB$=" 9 Ir
on
":DIST=6+HE/3:H5=H5/2.3
CO 1220 IF CLUB$="PW" THEN CLUB$="Pitch W
edge
":DIST=5.7+HE/3:H5=H5/2.4
NE 1230 IF CLUB$="SW" THEN CLUB$=" Sand W
edge
":IF SL=0 THEN DIST=5+HE/3:H5=H5/
2.5
RL 1240 IF SL=1 THEN DIST=5+HE
US 1250 IF Z=33 THEN DIST=DIST/(1+INT(RND
(0)*3))
AV 1260 RETURN
FS 1270 REM ****INITIALIZE SWING STRENGTH
****
KB 1280 IF SWING$="F" OR SWING$="H" OR SW
ING$="E" THEN 1300
AL 1290 POP :GOTO 230
IA 1300 IF SWING$="H" THEN SWING$=" Ha
lf
":DIST=DIST/2:RETURN
RV 1310 IF SWING$="E" THEN SWING$=" Ea

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SY ":DIST=DIST/3:RETURN
GV 1320 SWING$=" Full ":RETURN
GO 1330 REM ****INITIALIZE DIRECTION DATA
****
PK 1340 IF D$="N" OR D$="S" OR D$="E" OR
D$="W" THEN 1370
PL 1350 IF D$="NE" OR D$="NW" OR D$="SE"
OR D$="SW" THEN 1370
BM 1360 POP :GOTO 250
DE 1370 IF D$="E" THEN DD$=" East "
:RESTORE 4810
TI 1380 IF D$="NE" THEN DD$=" North East
":RESTORE 4950
WC 1390 IF D$="SW" THEN DD$=" South West
":RESTORE 5020
YL 1400 IF D$="W" THEN DD$=" West "
:RESTORE 4880
FF 1410 IF D$="NW" THEN DD$=" North West
":RESTORE 4950
GT 1420 IF D$="N" THEN DD$=" North "
:RESTORE 4950
IW 1430 IF D$="SE" THEN DD$=" South East
":RESTORE 5020
YB 1440 IF D$="S" THEN DD$=" South "
:RESTORE 5020
JB 1450 READ NUM:IF NUM=-1 THEN RETURN
EA 1460 NUM=NUM*8
ZO 1470 FOR LOOP=0 TO 7:READ BYTE:POKE CH
+NUM+LOOP,BYTE
WD 1480 NEXT LOOP
SG 1490 GOTO 1450
TK 1500 POKE 16,64:POKE 53774,64:POKE 752
,1:POKE 77,0:POKE 702,64:POKE 731,255:
POKE 694,0:RETURN
YW 1510 REM ****HOLE 1****
OV 1520 YARDS=380:PAR=4:X=0:Y=9
UF 1530 COLOR 32:FOR F=6 TO 13:PLOT 1,F:D
RAWTO 19,F:NEXT F:PLOT 0,10
AX 1540 COLOR 132:PLOT 0,8:PLOT 0,11:COLO
R 170:PLOT 11,13
FX 1550 COLOR 61:PLOT 19,10:COLOR 43:PLOT
19,9:COLOR 59:PLOT 19,8
WX 1560 COLOR 8:PLOT 19,7:PLOT 18,10:PLOT
19,11:PLOT 12,6:PLOT 11,7:PLOT 11,12:
PLOT 12,13
BL 1570 COLOR 165:PLOT 18,7:PLOT 19,6:PLO
T 18,11:PLOT 18,13:PLOT 19,12
BH 1580 RETURN
AN 1590 REM ****HOLE 2****
YG 1600 YARDS=360:PAR=4:X=19:Y=6
IU 1610 COLOR 32:FOR F=4 TO 9:PLOT 19,F:D
RAWTO 6,F:DRAWTO 0,F+6:NEXT F
CW 1620 COLOR 33:PLOT 19,4:PLOT 19,9:COLO
R 170:PLOT 9,9
OZ 1630 COLOR 132:PLOT 19,5:PLOT 19,8:PLO
T 0,10:DRAWTO 0,15
IA 1640 COLOR 59:PLOT 1,11:COLOR 43:PLOT
1,12:COLOR 61:PLOT 1,13
ID 1650 COLOR 165:PLOT 1,9:DRAWTO 6,4
ZK 1660 COLOR 8:PLOT 2,11:PLOT 7,4:PLOT 6
,9
BG 1670 RETURN
BF 1680 REM ****HOLE 3****
VF 1690 YARDS=160:PAR=3:X=14:Y=14
UW 1700 COLOR 32:FOR F=4 TO 11:PLOT 5,F:D
RAWTO 14,F+4:NEXT F
VY 1710 COLOR 43:PLOT 6,6:COLOR 47:PLOT 7
,6:COLOR 61:PLOT 6,7
IX 1720 COLOR 132:PLOT 14,13:PLOT 13,15
JP 1730 COLOR 165:PLOT 14,12:DRAWTO 14,8:
DRAWTO 13,8:PLOT 6,4:DRAWTO 5,4:DRAWTO
5,8
YJ 1740 COLOR 8:PLOT 6,5:PLOT 7,5:PLOT 6,
8
BC 1750 RETURN
BU 1760 REM ****HOLE 4****
YS 1770 YARDS=540:PAR=5:X=19:Y=5
UW 1780 COLOR 32:FOR F=3 TO 17:PLOT 1,F:D
RAWTO 4,F:NEXT F:FOR F=2 TO 8:PLOT 5,F
:DRAWTO 18,F:NEXT F:PLOT 19,6
XN 1790 COLOR 91:PLOT 1,16:COLOR 59:PLOT
2,15:COLOR 43:PLOT 2,16:COLOR 61:PLOT
2,17:COLOR 47:PLOT 3,16
KM 1800 COLOR 165:PLOT 1,2:DRAWTO 18,2:PL
OT 4,12:PLOT 1,15:PLOT 3,17:DRAWTO 4,1
7
PR 1810 COLOR 132:PLOT 19,4:PLOT 19,7:PLO
T 1,17
DN 1820 COLOR 8:PLOT 1,9:PLOT 7,8:PLOT 3,

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15:PLOT 4,16
 IR 1830 COLOR 170:PLOT 1,7
 BB 1840 RETURN
 CM 1850 REM *****HOLE 5*****
 IB 1860 YARDS=320:PAR=4:X=1:Y=4
 YM 1870 COLOR 32:FOR F=4 TO 10:PLOT 1,F:D
 RAWTO 18,F+5:NEXT F
 AD 1880 COLOR 59:PLOT 17,10:COLOR 43:PLOT
 17,11:COLOR 61:PLOT 17,12
 WL 1890 COLOR 165:PLOT 17,9:DRAWTO 18,9:D
 RAWTO 18,15:DRAWTO 17,15:PLOT 16,8:DR
 WTO 13,8:PLOT 16,14:DRAWTO 13,14
 DZ 1900 COLOR 132:PLOT 2,4:PLOT 1,6:COLOR
 170:PLOT 9,6
 LM 1910 COLOR 8:PLOT 9,12:PLOT 16,12:PLOT
 17,13
 AX 1920 RETURN
 DB 1930 REM *****HOLE 6*****
 XD 1940 PAR=3:YARDS=180:X=15:Y=9
 PQ 1950 COLOR 32:FOR F=7 TO 12:PLOT 4,F:D
 RAWTO 15,F:NEXT F
 NN 1960 COLOR 59:PLOT 5,8:COLOR 91:PLOT 4
 ,9:COLOR 43:PLOT 5,9:COLOR 61:PLOT 5,1
 0:COLOR 47:PLOT 6,9
 TQ 1970 COLOR 33:PLOT 4,7:PLOT 4,12:PLOT
 15,7:PLOT 15,12:COLOR 8:PLOT 6,8:PLOT
 6,11
 BT 1980 COLOR 132:PLOT 15,8:PLOT 15,11:CO
 LOR 165:PLOT 4,8:PLOT 5,7:PLOT 4,10:PL
 OT 5,11:PLOT 6,12
 BS 1990 RETURN
 CU 2000 REM *****HOLE 7*****
 BH 2010 YARDS=360:PAR=4:X=19:Y=9
 JF 2020 COLOR 32:FOR F=8 TO 11:PLOT 8,F:D
 RAWTO 19,F:NEXT F:FOR F=7 TO 12:PLOT 0
 ,F:DRAWTO 7,F:NEXT F
 FD 2030 COLOR 132:PLOT 19,8:PLOT 19,11:CO
 LOR 33:PLOT 0,7:PLOT 0,12
 UY 2040 COLOR 59:PLOT 1,8:COLOR 43:PLOT 1
 ,9:COLOR 61:PLOT 1,10
 WU 2050 COLOR 170:PLOT 9,11:COLOR 8:PLOT
 1,7:PLOT 7,7:PLOT 2,8:PLOT 1,11:PLOT 7
 ,12
 BO 2060 COLOR 165:PLOT 2,7:PLOT 0,8:DRAWT
 O 0,11:PLOT 2,11:PLOT 1,12
 AV 2070 RETURN
 EL 2080 REM *****HOLE 8*****
 UV 2090 PAR=5:YARDS=580:X=17:Y=3
 SE 2100 COLOR 32:FOR F=2 TO 17:PLOT 1,F:D
 RAWTO 3,F:PLOT 16,F:DRAWTO 18,F:NEXT F
 :FOR F=10 TO 17:PLOT 4,F:DRAWTO 15,F
 EF 2105 NEXT F
 YA 2110 COLOR 33:PLOT 1,17:PLOT 18,17:COL
 OR 132:PLOT 16,3:PLOT 18,3:PLOT 1,16:P
 LOT 2,17:PLOT 17,17:PLOT 18,16
 VU 2120 COLOR 59:PLOT 2,3:COLOR 91:PLOT 1
 ,4:COLOR 43:PLOT 2,4:COLOR 47:PLOT 3,4
 :COLOR 61:PLOT 2,5
 UO 2130 COLOR 8:PLOT 1,6:PLOT 3,3:PLOT 3,
 5:PLOT 8,12:DRAWTO 10,10
 SG 2140 COLOR 165:PLOT 1,2:DRAWTO 3,2:PL
 O 16,2:DRAWTO 18,2:PLOT 1,3:PLOT 1,5:C
 LOR 170:PLOT 1,13
 AR 2150 RETURN
 FA 2160 REM *****HOLE 9*****
 UE 2170 YARDS=300:PAR=4:X=9:Y=17
 LQ 2180 COLOR 32:FOR F=7 TO 12:PLOT F,1:D
 RAWTO F,17:NEXT F
 FK 2190 COLOR 165:PLOT 7,1:DRAWTO 12,1:DR
 AWTO 12,17:PLOT 11,16:PLOT 11,17:COLOR
 33:PLOT 7,17:PLOT 12,17
 DM 2200 COLOR 91:PLOT 8,2:COLOR 43:PLOT 9
 ,2:COLOR 47:PLOT 10,2
 JM 2210 COLOR 8:PLOT 7,2:PLOT 11,2:PLOT 8
 ,3:PLOT 10,3
 QT 2220 COLOR 132:PLOT 8,17:PLOT 10,17:CO
 LOR 170:PLOT 7,10
 AN 2230 RETURN
 QK 2240 REM *****HOLE 10*****
 KT 2250 YARDS=320:PAR=4:X=1:Y=7
 EE 2260 COLOR 32:FOR F=6 TO 9:PLOT 1,F:DR
 AWTO 18,F:NEXT F:FOR F=10 TO 13:PLOT 1
 3,F:DRAWTO 18,F:NEXT F
 EI 2270 COLOR 59:PLOT 17,11:COLOR 91:PLOT
 16,12:COLOR 43:PLOT 17,12
 YI 2280 COLOR 8:PLOT 14,6:PLOT 13,10:PLOT
 16,11:PLOT 18,12:PLOT 17,13:COLOR 170
 :PLOT 9,6
 DL 2290 COLOR 132:PLOT 1,6:PLOT 1,9:COLOR

165:PLOT 17,6:PLOT 18,6:PLOT 18,7:PLO
 T 13,12:PLOT 13,13:PLOT 14,13
 AG 2300 RETURN
 QX 2310 REM *****HOLE 11*****
 BQ 2320 YARDS=360:PAR=4:X=19:Y=9
 GS 2330 COLOR 32:FOR F=7 TO 12:PLOT 0,F:D
 RAWTO 18,F:NEXT F:PLOT 19,10
 QI 2340 COLOR 165:PLOT 18,7:DRAWTO 0,7:DR
 AWTO 0,12:DRAWTO 18,12:COLOR 170:PLOT
 9,12
 VH 2350 COLOR 59:PLOT 1,8:COLOR 43:PLOT 1
 ,9:COLOR 61:PLOT 1,10
 OP 2360 COLOR 132:PLOT 19,8:PLOT 19,11:CO
 LOR 8:PLOT 7,8:PLOT 2,10:PLOT 1,11
 BB 2370 RETURN
 SM 2380 REM *****HOLE 12*****
 XS 2390 YARDS=160:X=9:Y=14:PAR=3
 MA 2400 COLOR 32:FOR F=5 TO 14:PLOT 7,F:D
 RAWTO 11,F:NEXT F
 WR 2410 COLOR 33:PLOT 7,5:PLOT 11,5:PLOT
 7,14:PLOT 11,14
 WM 2420 COLOR 91:PLOT 8,6:COLOR 43:PLOT 9
 ,6:COLOR 47:PLOT 10,6
 VB 2430 COLOR 132:PLOT 8,14:PLOT 10,14:PL
 OT 8,5:PLOT 10,5:PLOT 7,6:PLOT 11,6
 XW 2440 COLOR 8:PLOT 8,7:PLOT 10,7:PLOT 9
 ,5
 AX 2450 RETURN
 TC 2460 REM *****HOLE 13*****
 GX 2470 YARDS=600:PAR=5:X=1:Y=2
 JE 2480 COLOR 32:FOR F=2 TO 7:PLOT 0,F:DR
 AWTO 2,F:PLOT 17,F+10:DRAWTO 19,F+10:P
 LOT 0,F+5:DRAWTO 19,F+5:NEXT F
 HS 2490 COLOR 165:PLOT 0,4:DRAWTO 0,12:PL
 OT 19,7:DRAWTO 19,17
 NZ 2500 COLOR 132:PLOT 0,3:PLOT 2,2:COLOR
 170:PLOT 16,7
 BS 2510 COLOR 59:PLOT 18,15:COLOR 91:PLOT
 17,16:COLOR 43:PLOT 18,16:COLOR 47:PL
 OT 19,16:COLOR 61:PLOT 18,17
 HA 2520 COLOR 8:PLOT 17,15:PLOT 19,15:PLO
 T 17,17:PLOT 9,11:PLOT 8,12:PLOT 10,12
 AT 2530 RETURN
 TS 2540 REM *****HOLE 14*****
 JP 2550 PAR=4:YARDS=300:X=9:Y=2
 NI 2560 COLOR 32:FOR F=8 TO 11:PLOT F,1:D
 RAWTO F,18:NEXT F
 RW 2570 COLOR 132:PLOT 8,2:PLOT 10,2:COLO
 R 170:PLOT 11,9
 IA 2580 COLOR 165:PLOT 8,1:DRAWTO 11,1:DR
 AWTO 11,3:PLOT 8,16:DRAWTO 8,18:DRAWTO
 11,18
 BE 2590 COLOR 91:PLOT 9,17:COLOR 43:PLOT
 10,17:COLOR 47:PLOT 11,17
 HM 2600 COLOR 8:PLOT 8,15:PLOT 9,16:PLOT
 11,16
 AP 2610 RETURN
 UI 2620 REM *****HOLE 15*****
 LV 2630 PAR=3:YARDS=220:X=3:Y=9
 UF 2640 COLOR 32:FOR F=4 TO 15:PLOT F,7:D
 RAWTO F,12:NEXT F:PLOT 3,10
 VH 2650 COLOR 132:PLOT 3,8:PLOT 3,11:COLO
 R 8:PLOT 15,7:PLOT 16,10:PLOT 15,11
 CC 2660 COLOR 59:PLOT 15,8:COLOR 91:PLOT
 14,9:COLOR 43:PLOT 15,9:COLOR 47:PLOT
 16,9:COLOR 61:PLOT 15,10
 XO 2670 COLOR 165:PLOT 14,7:PLOT 16,8:PLO
 T 15,12:PLOT 14,11:PLOT 16,11
 BK 2680 RETURN
 UX 2690 REM *****HOLE 16*****
 TV 2700 PAR=4:YARDS=340:X=18:Y=5
 IG 2710 COLOR 32:FOR F=9 TO 14:PLOT 0,F:D
 RAWTO 19,F-4:NEXT F
 VR 2720 COLOR 132:PLOT 17,5:PLOT 18,7:PLO
 T 2,14:COLOR 170:PLOT 9,7
 DE 2730 COLOR 59:PLOT 1,10:COLOR 43:PLOT
 1,11:COLOR 61:PLOT 1,12
 VK 2740 COLOR 165:PLOT 0,9:DRAWTO 0,14:PL
 OT 19,5:DRAWTO 19,10
 RE 2750 COLOR 8:PLOT 1,9:PLOT 2,12:PLOT 1
 ,13:PLOT 10,12
 BG 2760 RETURN
 WN 2770 REM *****HOLE 17*****
 OX 2780 PAR=5:YARDS=560:X=1:Y=15
 YN 2790 COLOR 32:FOR F=8 TO 11:PLOT F,2:D
 RAWTO F,17:NEXT F:FOR F=1 TO 7:PLOT F,
 14:DRAWTO F,17:PLOT F+11,2
 BF 2795 DRAWTO F+11,5:NEXT F
 KT 2800 COLOR 132:PLOT 1,14:PLOT 1,17:COL


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OR 170:PLOT 9,2
NV 2810 COLOR 59:PLOT 17,2:COLOR 43:PLOT
17,3:COLOR 61:PLOT 17,4
TR 2820 COLOR 165:PLOT 12,5:DRAWTO 18,5:D
RAWTO 18,2:PLOT 8,2:DRAWTO 8,13:PLOT 1
1,16:PLOT 10,17:PLOT 11,17
PG 2830 COLOR 8:PLOT 16,2:PLOT 16,4:PLOT
18,3:PLOT 11,5:DRAWTO 11,7
BC 2840 RETURN
XD 2850 REM ****HOLE 18****
K5 2860 PAR=4:YARD5=380:X=0:Y=5
OK 2870 COLOR 32:FOR F=9 TO 15:PLOT 0,F-5
:DRAWTO 9,F:PLOT 10,F:DRAWTO 19,F-5:NE
XT F
RG 2880 COLOR 59:PLOT 19,6:COLOR 43:PLOT
19,7:COLOR 61:PLOT 19,8
MA 2890 COLOR 132:PLOT 0,4:PLOT 0,7:DRAWTO
0 0,10:COLOR 178:PLOT 11,14
LC 2900 COLOR 8:PLOT 8,14:PLOT 19,5:PLOT
18,6:PLOT 19,9
GI 2910 COLOR 165:PLOT 9,9:DRAWTO 10,9:PL
OT 17,6:PLOT 18,5:PLOT 19,4:PLOT 18,11
:PLOT 19,10
AY 2920 RETURN
LX 2930 REM ****GREEN****
MC 2940 GRAPHICS 1:POKE 708,199:POKE 709,
15:POKE 710,0:POKE 711,140:POKE 712,17
9
WB 2950 GOSUB 1500:POKE 756,152
OO 2960 CX=INT(RND(0)*17):CY=11:X=INT(RND
(0)*20):Y=CY:IF CX<3 THEN 2960
MN 2970 COLOR 129:PLOT 0,0:DRAWTO 19,0
NP 2980 COLOR 253:PLOT 0,1:DRAWTO 19,1
DT 2990 COLOR 165:PLOT 0,3:DRAWTO 19,3:PL
OT 0,4:DRAWTO 19,4
IK 3000 COLOR 33:PLOT 0,5:DRAWTO 19,5:PLO
T 0,6:DRAWTO 19,6:PLOT 0,7:DRAWTO 19,7
PR 3010 PLOT 0,8:DRAWTO 6,8:PLOT 13,8:DRA
WTO 19,8:PLOT 0,9:DRAWTO 2,9:PLOT 17,9
:DRAWTO 19,9
VO 3020 PLOT 0,16:DRAWTO 19,16:PLOT 0,17:
DRAWTO 19,17:PLOT 0,18:DRAWTO 19,18
YR 3030 PLOT 0,14:DRAWTO 2,14:PLOT 17,14:
DRAWTO 19,14:PLOT 0,15:DRAWTO 6,15:PLO
T 13,15:DRAWTO 19,15
RI 3040 COLOR 173:PLOT CX,CY
YK 3050 POSITION 0,19:?"#6:"Green";HOLE:
POSITION 15,19:?"#6:"Par";PAR
AU 3060 FOR F=1 TO 100:NEXT F:IF X=CX THE
N 3330
VI 3070 COLOR 96:PLOT X,Y:SOUND 0,255,3,1
5:SOUND 0,0,0
SW 3080 FOR F=1 TO 50:NEXT F
VK 3090 TRAP 3090:GOSUB 730:?"Putting 5t
roke MIN 1 to 20 MAX !";GOSUB 500:I
F R$="" THEN 3090
SI 3100 STROKE=VAL(R$)
FH 3110 IF STROKE<1 OR STROKE>20 THEN 309
0
JC 3120 DEV1=INT(RND(0)*7)-3:DEV2=INT(RND
(0)*5)-2:GOSUB 800
MH 3130 IF ABS(CX-X)>12 THEN STROKE=STROK
E+DEV1:GOTO 3150
TJ 3140 IF ABS(CX-X)>2 THEN STROKE=STROKE
+DEV2
EV 3150 IF X>CX THEN GOSUB 3400:W=1
GB 3160 IF X<CX THEN GOSUB 3430:W=0
BZ 3170 FOR F=15 TO 0 STEP -1:SOUND 0,12,
14,F:NEXT F
DK 3180 FOR F=1 TO STROKE
CZ 3190 IF W=1 THEN X=X-1
ZZ 3200 IF W=0 THEN X=X+1
MH 3210 IF X<0 THEN X=0:F=STROKE
FM 3220 IF X>19 THEN X=19:F=STROKE
UP 3230 LOCATE X,Y,Z:COLOR 96:PLOT X,Y:FO
R J=1 TO 10:NEXT J:COLOR Z:PLOT X,Y
EA 3240 NEXT F
IJ 3250 COLOR 96:PLOT X,Y:COLOR 169:PLOT
CX,CY
RA 3260 IF X<>CX THEN FOR F=1 TO 200:NEXT
F:COLOR 32:PLOT PX,PY:SHOT=SHOT+1:GOT
O 3080
ET 3270 FOR J=1 TO 20
YS 3280 FOR F=8 TO 0 STEP -4
WT 3290 SOUND 0,40,14,F:NEXT F
QU 3300 FOR I=1 TO 150 STEP J*5:NEXT I:NE
XT J:SOUND 0,0,0
NF 3310 SHOT=SHOT+1:Z=32:GOTO 3460

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SS 3320 REM ****NO PUTT****
HW 3330 IF Q=0 THEN NPX=X-1
GQ 3340 IF Q=1 THEN NPX=X+1
NU 3350 COLOR 96:PLOT NPX,Y:SOUND 0,255,3
,15:SOUND 0,0,0
IF 3360 FOR F=1 TO 35:NEXT F:DRAWTO CX,CY
:COLOR 32:PLOT NPX,Y:FOR F=0 TO 1:NEXT
F
DM 3370 COLOR 173:PLOT CX,CY:FOR F=15 TO
0 STEP -5:SOUND 0,33,8,F:NEXT F
NW 3380 FOR F=1 TO 250:NEXT F:Z=32:GOTO 3
460
CM 3390 REM ****NEST PUTT****
DK 3400 PX=X:PY=Y:COLOR 169:PLOT CX,CY
GN 3410 COLOR 127:PLOT X,Y:FOR F=1 TO 200
:NEXT F:COLOR 14:PLOT X,Y:GOSUB 720:CO
LOR 127:PLOT X,Y:RETURN
PT 3420 REM ****EAST PUTT****
DT 3430 PX=X:PY=Y:COLOR 169:PLOT CX,CY
VQ 3440 COLOR 2:PLOT X,Y:FOR F=1 TO 200:N
EXT F:COLOR 7:PLOT X,Y:GOSUB 720:COLOR
2:PLOT X,Y:RETURN
GP 3450 REM ****SCORECARD****
MX 3460 IF SHOT=1 THEN GOSUB 3960
DZ 3470 DIFF=DIFF+(SHOT-PAR):IF HOLE=18 A
ND 72+DIFF<CR THEN GOSUB 4110
SY 3480 GRAPHICS 0:POKE 709,0:POKE 710,40
:POKE 712,PEEK(710):GOSUB 1500
II 3490 IF HOLE<10 THEN OUT$(POS,POS+1)=5
TR$(SHOT):POS=POS+3
UQ 3500 IF HOLE>9 THEN IN$(POS,POS+1)=5TR
$(SHOT):POS=POS+3
BS 3510 IF HOLE=9 THEN FSCR=36+DIFF:OUT$(
POS,POS+2)=5TR$(FSCR):POS=2
IZ 3520 IF HOLE=18 THEN IN$(POS,POS+2)=5T
R$(72+DIFF)-FSCR
VI 3530 ? "+-----+";
MR 3540 ? " | SCORECARD
|";
RD 3550 ? " |-----
|";
ML 3560 ? " | HOLE | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
8 | 9 | OUT |";
IC 3570 ? " |-----|-----|-----|-----|-----|
|";
PB 3580 ? " | PAR | 4 | 4 | 3 | 5 | 4 | 3 | 4 |
5 | 4 | 36 |";
II 3590 ? " |-----|-----|-----|-----|-----|
|";
BM 3600 ? " | SCORE ";OUT$;
QT 3610 ? " |-----
|";
WW 3620 ? " | U.S.G.A. RULES GOVERN P
LAY
|";
QZ 3630 ? " |-----
|";
MR 3640 ? " | HOLE | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
17 | 18 | IN |";
HY 3650 ? " |-----|-----|-----|-----|-----|
|";
OX 3660 ? " | PAR | 4 | 4 | 3 | 5 | 4 | 3 | 4 |
5 | 4 | 36 |";
IE 3670 ? " |-----|-----|-----|-----|-----|
|";
ZD 3680 ? " | SCORE ";IN$;
UJ 3690 ? " |-----
|";
ZV 3700 ? " | NAME DATE
TOTAL |";
LU 3710 ? " +-----+";
DF 3720 IF HOLE<>18 THEN 3900
UA 3730 IF HOLE=18 THEN POSITION 36,17:?"
72+DIFF:IF 72+DIFF=CR THEN POSITION 25
,1:?"COURSE RECORD!"
QD 3740 POSITION 0,21:?"HARDCOPY OF SCOR
ECARD?
":POKE 764,255
:GOSUB 740
UV 3750 IF PEEK(764)=43 THEN 3780
WS 3760 IF PEEK(764)=35 THEN 3870
UO 3770 GOTO 3750
DP 3780 TRAP 3740:POSITION 0,21:?"READY
PRINTER AND RETURN":POKE 764,255:GOSUB
740
NC 3790 IF PEEK(764)<>12 THEN 3790
KH 3800 REM ****SCREEN DUMP****
OU 3810 CLOSE #5:OPEN #5.8,0,"P":?" #5

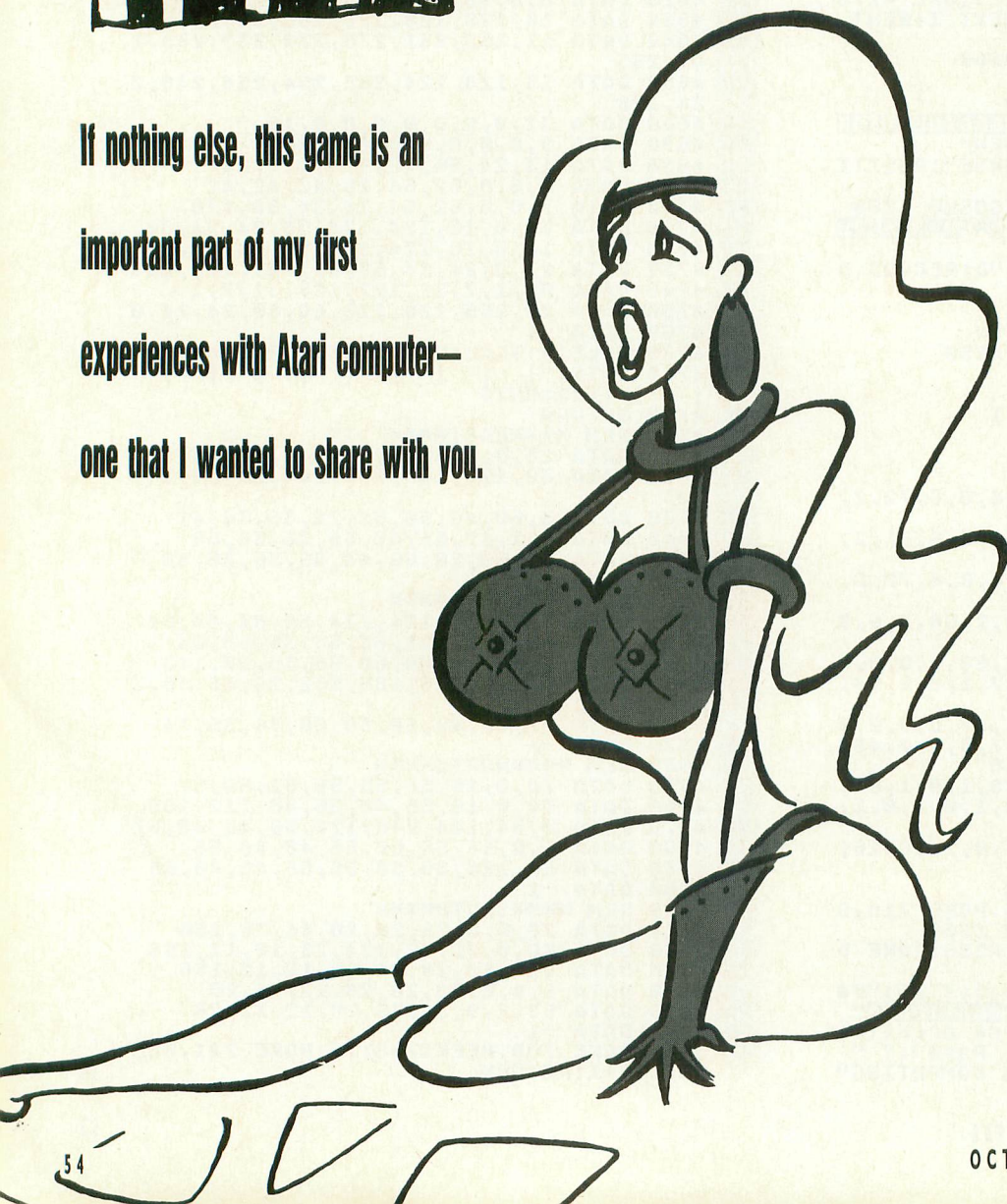
```


Slave Cellars

continued from page 13



If nothing else, this game is an important part of my first experiences with Atari computer—one that I wanted to share with you.



hands. One afternoon I was leafing through the latest Atari Program Exchange catalog (remember APX?), when I noticed that a home-finance program was conspicuously missing from their products. I immediately sent for their author's guidelines and got to work on the manual for *MicroCheck*.

At just about the exact moment that *MicroCheck* was ready to submit, I learned that Atari had discontinued APX. It seemed that all my efforts at making some money with programming were doomed to failure. First *Hi-Res* and now APX. Feeling as gloomy as a thunderstorm, I logged onto CompuServe.

And waiting for me in the Forum was a message from some guy named Charles Bachand. Charles was from—*Gasp!*—ANALOG Computing!

To my disbelief, we discussed the possibility of TSCOG being published in ANALOG. In fact, we actually started to do some small modifications to bring down the amount of memory required to run the program. But for one reason or another, that project fell by the wayside—probably because *MicroCheck* was now in Charlie Bachand's hands.

About a week after I sent *MicroCheck*, I got a message from Charlie. "I turned the program over to the editor with a great big 'Yes!' scrawled on the envelope," he said. For the second time, I had made my first sale.

But *MicroCheck* isn't what's important here. (Sorry about that.) What's important (to me, anyway) is the role that TSCOG played in the making of that sale, and how it started the sequence of events that would eventually lead to my working full-time at ANALOG. I often wonder whether, if I hadn't bothered to upload TSCOG to CompuServe, I'd still be working at the industrial X-ray lab I was buried in for 13 years.

Since that time, TSCOG has been downloaded from CompuServe many thousands of times, and heavens only knows how many times from other networks and BBSs. Still, many people don't have access to the networks, and there's thousands of you out there who have never seen TSCOG. So here it is, where it almost ended up four years ago, in the pages of ANALOG Computing. Though ANALOG has changed a great deal lately, TSCOG, except for a couple of minor adjustments, has not.

I'll admit right up front that the program has some rough edges, that it's not as carefully programmed as some of my later adventures such as *Nightshade* or *One for the Road*. TSCOG is, after all, my first

adventure game. However, I think you'll find it enjoyable, just as many others have over the years. If nothing else, this game is an important part of my first experiences with Atari computers—one that I wanted to share with you.

Playing a text adventure game

Like most simple text adventure games, you communicate with TSCOG by typing two-word commands in an verb/noun format (for example, OPEN DOOR). There are a few exceptions to this format, however. All directional commands should be abbreviated to one letter (N, S, E, W, U or D). To move north, for instance, you would simply type *N* and press Return. There are also times when TSCOG will accept one-word responses. You'll discover these as you play.

One command that you'll want to use before trying anything "dangerous" is SAVE GAME. Saving your position in the game allows you to continue where you left off should your character be killed. You should also save your game when you're finished with a session, so you can pick up where you left off when you're ready to play again.

Next month, watch for *Nimral's Grace*, the sequel to TSCOG.

The hint department

The following adventure hints have been encoded by a forward cycling of the alphabet. That is, the letter *A* has been changed to *B*, the letter *B* has been changed to *C* and so on. To use the hints, find the question that applies to your problem, and decode the first hint in the list following the question. If, after decoding the first hint, you're still stuck, decode the next. The last hint in the list is the solution.

What's the parrot for?

- 1) If't wfsz ubmlbujwf.
- 2) If't ifbse tpnf jousftujoh uijoht.
- 3) Ublf ijn xjui zpv. Ifmm ibwf b ijou gps zpv.

What's with the wounded soldier?

- 1) If xbt bu uif cbuumf.
- 2) If tbx xibu ibqqfofe.

- 3) Ubml up ijn up hfu bo bewfouvsf ijou.

What's the statue for?

- 1) Eje zpv mppl bu ju?
- 2) Eje zpv sfbe uif qmbrvf?
- 3) Usz qsbzjoh.

How do I get across the lake?

- 1) Zpv dbo'u txjn.
- 2) Zpv offe b cpbu.
- 3) Sfnfncfs uif tubuvf?
- 4) Qsbz gps b cpbu.

How do I get into the castle?

- 1) Zpv dbo'u hfu qbtu uif hvbse.
- 2) Hp bspvoe cddl.
- 3) Npwf uif tsvct.
- 4) Pqfo uif tfdsfu epps.

How do I get into the secret door?

- 1) Eje zpv ifbs xibu uif qbsspu tbje?
- 2) Uif bsspx bmxzt ijut bu uif tbnf ifjhiu.
- 3) Loffm, dsbxm ps tuppq.

How do I open all the wooden doors?

- 1) Hp up uif hvbsesppn.
- 2) Ljmm uif hvbse.
- 3) Mppl bu uif hvbse.
- 4) Mppl bu uif bsnp.
- 5) Zpv offe uif lfz.

How do I get away from the guard in the guardroom?

- 1) Zpv dbo'u.
- 2) Zpv offe b xfbqpo.
- 3) Sfnfncfs uif tubuvf?
- 4) Qsbz gps b txpse.
- 5) Buubdl uif hvbse.

What's the small chest for?

- 1) Iju ju xjui b ibnnsf.
- 2) Ju usbotqpsut zpv up bopuigs sppn.
- 3) Ju tfsuft op sfbm qvsqptf.

What's the portrait for?

- 1) Ju't ibohjoh mpptf po uif xbm.
- 2) Nbzef uifsft tpmfuijoh cfjoe ju.
- 3) Npwf ju.
- 4) Qsftt uif cvuupo.

How can I open the trunk?

- 1) Eje zpv mppl bu ju?
- 2) Uibu tjmufsz tuvvgg mpplt nbhjdkm.
- 3) Espq uif nbhjd evtu po ju.

What's the glass rod for?

- 1) Zov'sf hpjoh up offe mihiu.
- 2) Ju't tjnjms up b xboe.
- 3) Xbuf ju.

How do I get past the huge door?

- 1) Zpv offe up cf bcmf up sfbdi uif iboemf.
- 2) Eje zpv tff b tuppmm?
- 3) Tuboe po uif tuppmm.

How do I get into the cells?

- 1) Zpv offe uif sjhiu lfzt.
- 2) Hfu uif lfzt jo uif lfzspnn.

How do I deal with the guy in the keyroom?

- 1) If pomz efbmt xjui hvbset.
- 2) Zpv ibuf up mppl mjlf b hvbse.
- 3) Xfbs b hvbse't ifmfnu.

What do I do about the dwarf?

- 1) Zpv ibuf up ljmm ijn.
- 2) Zpv offe b tqfdjbm zfbqpo.
- 3) Sfbe uif mbcfm po uif nbd.

What do I do about the giant rat?

- 1) Zpv ibuf up ljmm ijn.
- 2) Zpv offe b tqfdjbm zfbqpo.
- 3) Sfbe uif mbcfm po uif mbodf.

How do I get into the last cell?

- 1) Zpv offe up pqfo uif epps xjuipvu vtjoh b lfz.
- 2) Zpv offe b tqfdjbm zfbqpo.
- 3) Sfbe uif mbcfm po uif byf.
- 4) Tnbt uif epps, pg dpvstf.

How do I get the princess out?

- 1) Uifse't b tfdsfu uvoofm.
- 2) Ju't ijeefo voefs uif sbu't oft.
- 3) Xifo jo uif uvoofm, xbuf uif hmbtt spe.
- 4) Uif XBOE PG GJSF xjmm cvso bxbz uif uvppfm epps.

How do I win?

- 1) Zpv nvtu dsptt uif mblf xjui uif qsjodftt.

LISTING 1: M/L EDITOR DATA

```
KF 0 REM BY CLAYTON WALNUM
PJ 1 REM LAST REV. 7/8/84
FQ 2 REM (MINOR ADJUSTMENTS ON 5/9/88)
AT 5 SZ=23:ITMS=48:VB5=27:N0=0:N1=1:N2=2:
N3=3:N4=4:N5=5:N6=6:N7=7:N8=8:N9=9:N10
=10:DIM Z$(N1):DIM U$(SZ):GOTO 10000
SP 10 GOTO RM+N9
WB 15 ? "AT THE CAMP":W=42:N=44:GOTO 320
JP 16 ? "IN A TENT":W=N6:GOTO 320
```

```
TD 18 ? "IN A DARK PASSAGE":S=68:GOTO 320
NZ 20 ? "IN A CLEARING":E=44:S=42:N=15:GO
TO 320
AL 22 ? "ON A BEACH":E=40:GOTO 320
KQ 23 ? "AT THE CASTLE GATES":E=16:N=24:S
=30:GOTO 320
LS 24 ? "IN A MEADOW":S=11:E=17:GOTO 320
KG 25 ? CW$:W=14:N=18:GOTO 320
GF 26 ? "IN A MEADOW":S=44:W=15:GOTO 320
OK 27 ? CW$:W=19:S=16:GOTO 320
```



```

AV 28 ? CW$:E=18:GOTO 320
SE 29 ? H$:N=19:5=21:GOTO 320
LK 30 ? H$:N=20:5=22:W=50:E=52:GOTO 320
UM 31 ? H$:N=21:5=23:W=26:E=48:GOTO 320
VH 32 ? H$:N=22:5=24:W=46:E=28:GOTO 320
QT 33 ? H$:N=23:5=14:GOTO 320
LK 35 ? "IN A GUARDROOM":E=22:GOTO 320
WL 37 ? "IN A SMALL DINING ROOM":W=23:GOT
O 320
YB 39 ? "ON A BEACH":N=14:W=56:GOTO 320
BL 40 ? "IN A SHORT HALL":U=53:E=32:N=33:
5=35:GOTO 320
UG 41 ? "IN A SHORT HALL":N=34:5=36:W=31:
GOTO 320
NL 42 ? "IN A WEAPONS ROOM":5=31:GOTO 320
NF 43 ? "IN A MAGICIAN'S WORKSHOP":5=32:G
OTO 320
TH 44 ? "IN A GUARDROOM":N=31:GOTO 320
OG 45 ? "IN A KEY ROOM":N=32:GOTO 320
MM 49 ? F$:W=13:E=42:GOTO 320
WE 50 ? T$:D=40:GOTO 320
TA 51 ? F$:W=40:E=6:N=11:GOTO 320
XG 52 ? T$:D=42:GOTO 320
SI 53 ? F$:W=11:5=44:N=17:GOTO 320
YI 54 ? T$:D=44:GOTO 320
YE 55 ? WD$:E=23:GOTO 320
XM 56 ? "IN A TOOL ROOM":E=23:GOTO 320
ET 57 ? WD$:W=22:GOTO 320
VC 58 ? "IN A PLACE OF WORSHIP":W=22:GOTO
320
XM 59 ? WD$:E=21:GOTO 320
RK 60 ? "IN A SUPPLY ROOM":E=21:GOTO 320
DV 61 ? WD$:W=21:GOTO 320
SP 62 ? "IN A SMALL ROOM":W=21:GOTO 320
PM 65 ? "ON A BEACH":W=56:E=30:5=56:N=14:
GOTO 320
CE 69 ? SC$:W=32:E=61:GOTO 320
CP 70 ? SC$:W=60:E=62:GOTO 320
DW 71 ? SC$:W=61:E=63:GOTO 320
FD 72 ? SC$:W=62:E=64:GOTO 320
GK 73 ? SC$:W=63:E=65:GOTO 320
GG 74 ? SC$:W=64:GOTO 320
ZQ 75 ? CE$:5=60:GOTO 320
AF 76 ? CE$:5=61:GOTO 320
AU 77 ? CE$:5=62:GOTO 320
BJ 78 ? CE$:5=63:GOTO 320
BY 79 ? CE$:5=64:GOTO 320
BU 80 ? CE$:5=65:GOTO 320
HY 199 REM *****INITIALIZE*****
XL 200 DIM IT$(ITMS*5Z),I(ITMS),D(N6),VB$(
VB5*3),C(N10),V(VB5),5Z$(5Z),A$(20),B
$(20),IN$(50),H$(5Z),C$(20)
TQ 201 DIM O(6),D$(3):FOR X=N1 TO N6:O(X)
=N0:NEXT X:G1=N1:G2=N1:G3=N1:KEY=N0:P1
=N0:WZ=N0:TR=N0:CA=N0:5L=N0:TN=N0
SD 202 RM=N6:KN=N0:KE=N0:GHP=N0:E1=N0:F=N
0:DW=N1:RT=N1:5W=N0:BT=N0:5R=N1:D5=N0:
NO=N0:DR=N0
PY 204 DIM CL$(15),G$(13),CW$(22),H$(17),
WD$(20),F$(13),T$(9),5C$(20),CE$(9)
ZJ 205 FOR X=1 TO 5Z:5Z$(X,X)="":NEXT X:
CL$="CELOPEN CELL":G$="GUADEAD GUARD"
CA 207 FOR A=N1 TO N10:C(A)=N0:NEXT A
MN 210 FOR A=N1 TO ITMS:IT$(A*5Z-5Z+N1,A*
5Z)=5Z$:READ X$:IT$(A*5Z-5Z+N1,A*5Z)=X
$:READ X:I(A)=X:NEXT A
WE 215 READ VB$:FOR A=7 TO VB5:READ X:V(A
)=X:NEXT A
SF 216 CW$="BESIDE THE CASTLE WALL":H$="I
N A LONG HALLWAY":F$="IN THE FOREST"
EG 217 T$="IN A TREE":5C$="IN THE SLAVE C
ELLARS":CE$="IN A CELL":WD$="FACING A
WOODEN DOOR"
VK 220 ? :? "DO YOU WANT TO RESTORE AN OL
D GAME":INPUT Z$:IF Z$="Y" THEN GOSUB
11000
CU 299 REM *****DIRECTION*****
LM 300 TRAP 300:N=N0:W=N0:5=N0:E=N0:D=N0:
U=N0:GRAPHICS N0:POKE 710,144:POKE 709
,N10:FL=N0
SM 301 IF RM=42 OR RM=40 OR RM=44 THEN I(
18)=-RM
HA 302 IF RM=13 AND I(20)=-N1 THEN 13000
MR 305 POKE 752,N1:? "YOU'RE ":GOTO N10
PF 319 REM *****PRE-DIRECTION HERE*****
GO 320 IF RM=13 THEN ? :? "There is a lar
ge lake here."
TA 322 IF RM=13 THEN ? "On the other side
of the lake you see a castle."

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QK 323 IF RM=32 THEN ? :? "There's a huge
wooden door":? "to the east."
PB 324 IF RM=32 OR RM=9 THEN 5L=N0
AK 325 IF RM=60 OR RM=12 THEN 5L=N1
EL 326 IF 5L THEN FL=N1:FOR X=N1 TO N6:IF
O(X) AND RM=X+59 THEN I(45)=-RM
WO 327 IF FL THEN NEXT X:FL=N0
EF 329 IF RM=32 AND E1=N1 THEN E=60
KH 330 IF RM=N9 AND NO=N1 THEN N=56
HL 360 IF N+W+E+5+U+D>N0 THEN ? :? "SOME
EXIT$":FOR X=N1 TO N6:D(X)=N0:NEXT X
IG 365 IF W>N0 THEN ? "West":D(1)=W
OD 366 IF N>N0 THEN ? "North":D(2)=N
PA 367 IF E>N0 THEN ? "East":D(3)=E
GC 368 IF S>N0 THEN ? "South":D(4)=S
WF 369 IF U>N0 THEN ? "Up":D(5)=U
ZS 370 IF D>N0 THEN ? "Down":D(6)=D
CW 380 ?
OD 382 ? :C=N0
DM 390 FOR B=N1 TO ITMS:IF ABS(I(B))=RM T
HEN C=C+N1:GOTO 392
HF 391 NEXT B:? :GOTO 403
V5 392 IF C=N1 THEN ? "Visible Items:"
RI 400 ? " ":IT$(B*5Z-5Z+N4,B*5Z):GOTO 39
1
KL 403 IF (RM=26 OR RM=35) AND I(33)<>-N1
THEN GOSUB 6400:GOTO 6000
UR 404 IF G2 AND RM=26 THEN GHP=N4:HP=N6:
GOSUB 6450:GOTO 450
AZ 405 IF G3 AND RM=35 THEN GHP=N6:HP=9:G
OSUB 6450:GOTO 450
EM 410 REM *****DESCRIPTIONS HERE*****
YX 412 IF I(3)=-N1 AND CA=N0 THEN P=INT(R
ND(N0)*15)+N1:IF P=N1 THEN ? "Parrot s
ays, ";CHR$(34);"BBBBBBBBAAAAAKKK!!!"
US 413 IF P=N1 THEN ? "Don't forget to kn
eel when you open":? "it, Bilgor.":CHR
$(34):?
LG 414 IF KEY>N0 THEN 419
ZA 415 IF RM=36 AND I(37)=-N2 THEN FL=N1:
? "A man behind a counter asks: 'What
key do you want?'"
DM 416 IF FL THEN ? "Enter Number:":INPU
T KEY:IF KEY>N6 OR KEY<N1 THEN ? :? "S
orry, no such key.":GOTO 415
DN 417 IF FL AND KEY=N6 THEN ? :? "That o
ne was misplaced.":KEY=N0:GOTO 450
DC 418 IF FL THEN I(23)=RM:GOTO 300
RS 419 REM
BO 420 IF RM=36 THEN ? "There's a man sta
nding":? "behind a counter.":GOTO 450
FB 450 SOUND N0,N0,N0,N0:C=N0:FL=N0
ZU 454 REM *****INPUT*****
KX 455 POKE 752,N0:? :? "What will you do
":INPUT IN$:POKE 752,N1:? :IF IN$="LO
OK" THEN 300
AZ 456 IF RM=11 AND IN$="PRAY" AND BT=N1
AND 5W=N1 THEN ? "Nothing happens.":GO
TO 450
SB 457 IF RM=31 AND IN$="U" AND I(20)=-N1
THEN ? "The door's closed and locked!
":GOTO 450
EF 458 IF RM=11 AND IN$="PRAY" THEN GOSUB
6200:? "A voice says, ";CHR$(34);"Ask
and receive":CHR$(34);":GOTO 6100
SX 460 IF RM=49 AND IN$="PRAY" THEN ? CHR
$(34);"How dare you defile this room,
infidel! DIE!!!":CHR$(34):FL=N1
PY 461 IF FL THEN GOSUB 6200:GOTO 6000
UM 462 IF RM=14 AND IN$="N" THEN GOSUB 64
00:GOTO 6000
DT 463 IF RM=67 AND DW AND F=N0 AND IN$="
5" THEN FL=N1:IF I(13)=-N1 THEN GHP=N3
:HP=N5:GOSUB 6450:GOTO 450
JD 465 IF FL THEN GOSUB 6499:GOTO 6000
G5 466 IF RM=68 AND RT AND F=N0 AND IN$="
5" THEN FL=N1:IF I(14)=-N1 THEN GHP=3:
HP=5:GOSUB 6450:GOTO 450
IK 467 IF FL THEN GOSUB 6498:GOTO 6000
OF 468 IF IN$="SAVE GAME" THEN GOSUB 1200
0:GOTO 300
FW 470 FOR B=N1 TO N6:IF LEN(IN$)=N1 AND
IN$=VB$(B*N3-N2,B*N3-N2) THEN 474
CD 472 NEXT B:GOTO 500
TR 474 IF F THEN ? "Your opponent blocks
your escape!":GOTO 450
MI 475 IF D(B)<>N0 THEN RM=D(B):GOTO 300
FU 490 ? "No such direction":GOTO 450
SJ 500 IF IN$<>"I" THEN 520

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WA 510 ? "K":? "INVENTORY":? :? "You are
carrying":FOR K=N1 TO N10:IF C(K)=N0
THEN 515
OL 512 ? " ";IT$(C(K)*5Z-5Z+N4,C(K)*5Z)
YE 515 NEXT K:IF I(37)=-N2 THEN ? :? "You
are wearing":? "Guard's Helmet"
KM 518 ? :? :GOTO 450
NA 520 REM *****EXTRA*****
5B 521 IF RM=19 AND (IN$="KNEEL" OR IN$="
CRAWL" OR IN$="STOOP") THEN KN=N1:GOTO
5050
TX 530 FOR B=N7 TO VB5:IF IN$(N1,N3)=VB$(
B*N3-N2,B*N3) THEN 600
DY 535 NEXT B
GG 540 ? "I don't understand ";CHR$(34);I
N$:CHR$(34);":":GOTO 450
EO 600 FOR K=N1 TO LEN(IN$):IF IN$(K,K)<
" " THEN NEXT K:?"HUH?":GOTO 450
FB 605 A$=IN$(K+N1,LEN(IN$))
EB 607 IF LEN(A$)<N3 THEN A$(LEN(A$)+N1)=
" ":GOTO 607
QS 608 B$=A$(N1,N3)
RJ 610 ON V(B) GOTO 611,680,750,765,800,8
20,880,975,995,1000,1021,1030,660,1040
DM 611 IF KE THEN I(21)=-N1:GOTO 5050
RA 615 REM *****EXTRA GETS HERE*****
QO 616 IF RM=33 AND (B$="LAN" OR B$="MAC"
OR B$="AXE") THEN FL=N1:IF WZ THEN ?
"You may carry only one.":GOTO 450
JD 617 IF FL THEN WZ=N1
XJ 618 IF RM=67 AND DW AND B$="KEY" THEN
IN$="S":GOTO 463
IA 619 IF RM=26 AND I(37)=N0 AND F=N0 AND
B$="HEL" THEN I(37)=RM:GOTO 640
OF 620 IF RM=26 AND I(21)=N0 AND F=N0 AND
B$="KEY" THEN I(21)=RM:GOTO 640
AE 640 FOR J=N1 TO ITM5:IF B$=IT$(J*5Z-5Z
+N1,J*5Z-5Z+N3) AND RM=AB5(I(J)) THEN
645
GR 641 NEXT J
CA 642 ? "I don't see a ";CHR$(34);B$;CHR
$(34);":":GOTO 450
IE 645 IF I(J)<N0 THEN ? "You can't carry
that!":GOTO 450
TF 646 FOR K=N1 TO N10:IF C(K)=N0 THEN C(
K)=J:I(J)=-N1:GOTO 5050
VQ 647 NEXT K:?"You can't carry anymore.
":IF FL THEN WZ=N0
PY 648 GOTO 450
BI 659 REM *****TALK*****
JD 660 IF RM=66 AND B$="MAN" THEN FL=N1:?"
THE MAN SAYS: There's a secret
passage from the cellars, but watch"
YM 661 IF FL THEN ? "out for the rats!":G
OTO 450
BA 662 IF SR=N1 AND RM=17 AND B$="SOL" TH
EN FL=N1:?"THE SOLDIER SAYS: 'GASP
...They...they"
DF 663 IF FL THEN ? "took everything...GA
SP...You must save the princess...
but...but..."
DP 664 IF FL THEN ? "for Nimral's sake, d
on't go without a weapon...You would
n't last...you..."
MU 665 IF FL THEN ? "And then he died.":?
:IT$(691,713)="SOLDEAD SOLDIER ":SR
=N0:GOTO 450
OA 666 IF RM=36 AND I(37)<-N2 AND B$="MA
N" THEN ? "THE MAN SAYS: Get out! Onl
y guards are allowed here.":GOTO 450
BY 667 IF (I(3)=-N1 AND B$="PAR") OR (I(
3)=RM AND B$="PAR") THEN ? "The parrot
says: 'BBBBBAAAAAABBBBBB!":GOTO 450
IZ 669 IF RM=14 AND B$="GUA" THEN ? "Get
out of here! We don't like your kind
.":GOTO 450
NF 678 GOTO 1050
NB 679 REM *****DROP*****
MA 680 IF RM=35 AND I(N9)=-N1 AND B$="DUS
" THEN ? "On the trunk":D5=N1:GOTO 450
OB 681 IF B$="MAC" OR B$="LAN" OR B$="AXE
" THEN WZ=N0
ET 682 IF RM=71 AND I(32)=-N1 AND B$="CLO
" THEN FL=N1
PT 683 IF FL THEN ? "The girl gets dresse
d...much to your disappointme
nt.":I(19)=N0:I(20)=71:GOSUB 6520
NV 684 IF FL THEN I(32)=N0:GOSUB 14000:GO
TO 300

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```

TN 685 IF RM=36 AND KEY<>N0 AND I(23)=-N1
AND B$="KEY" THEN KEY=N0
ND 686 IF I(37)=-N2 AND B$="HEL" THEN I(3
7)=-N1:I(37)=RM:GOTO 300
OS 687 IF RM<>36 AND KEY<>N0 AND B$="KEY"
THEN ? "Not here!":GOTO 450
VY 705 FOR J=N1 TO ITM5:IF B$=IT$(J*5Z-5Z
+N1,J*5Z-5Z+N3) THEN IF I(J)=-N1 THEN
710
HC 707 NEXT J
FT 709 ? "You don't have it.":GOTO 450
CB 710 FOR K=N1 TO N10:IF C(K)=J THEN 712
NA 711 NEXT K:GOTO 709
KL 712 I(J)=RM:C(K)=N0:IF RM=36 AND B$="K
EY" THEN I(J)=N0
NP 713 IF FL THEN I(32)=N0
NW 714 GOTO 5050
HC 749 REM *****READ*****
RC 750 REM
MQ 751 IF RM=11 AND (B$="WRI" OR B$="PLA"
) THEN ? "Prayer and good deeds are th
e sincerest form of worship"
VD 752 IF RM=11 AND (B$="WRI" OR B$="PLA"
) THEN GOTO 450
IH 753 IF B$="PAP" AND I(22)=-N1 THEN ? :
? "Somebody help, please! They've take
n me prisoner and are going":FL=N1
OS 754 IF FL THEN ? "to make me The Keepe
r's personal slave. I will take m
y "
KF 755 IF FL THEN ? "own life before I wi
ll submit to that.":? :? "
Shala":GOTO 450
VS 756 IF I(13)=-N1 AND B$="LAB" THEN ? "
Effective against dwarves":GOTO 450
QW 757 IF I(14)=-N1 AND B$="LAB" THEN ? "
Effective against rats":GOTO 450
MK 758 IF I(15)=-N1 AND B$="LAB" THEN ? "
Effective against certain doors.":GOTO
450
MU 759 IF RM=49 AND B$="PLA" THEN ? "Pray
er and evil deeds are the":? "sinceres
t form of worship":GOTO 450
MP 763 GOTO 1050
HE 764 REM *****LOOK*****
RE 765 IF (RM=11 OR RM=49) AND B$="STA" T
HEN ? "There's a plaque with writing o
n it.":GOTO 450
DS 766 IF RM=14 AND B$="GUA" THEN ? "He l
ooks big and mean!":GOTO 450
KN 767 IF RM=26 AND G2=N0 AND B$="GUA" TH
EN FL=N1:?"He's wearing leather armor
":IF I(37) THEN 450
LO 768 IF FL THEN ? "and a helmet.":GOTO
450
AI 769 IF (RM=20 OR I(22)=-N1) AND B$="PA
P" THEN ? "There's writing on it.":GOT
O 450
XR 770 IF RM=19 AND IT$(579,581)="OPE" AN
D B$="D00" THEN ? "Booby-trapped! A cr
ossbow's":? "aimed at you!":GOTO 450
RV 771 IF (RM=33 OR I(13)=-1 OR I(14)=-1
OR I(15)=-N1) AND (B$="LAN" OR B$="MAC
" OR B$="AXE") THEN 791
OQ 772 IF SL AND B$="CEL" THEN ? "The doo
r is closed and locked.":GOTO 450
OK 773 IF (RM=45 OR I(3)=-N1) AND B$="PAR
" THEN ? "It's green.":GOTO 450
GN 774 IF RM=53 AND B$="POR" THEN ? "It's
just a portrait.":GOTO 450
TB 775 IF RM=26 AND G2=N0 AND B$="ARM" AN
D NOT I(21) THEN ? "There's a pocket
with":? "a blue key in it.":GOTO 450
WN 776 IF RM=35 AND B$="TRU" THEN FL=N1:I
F TR=N1 AND I(11)=N0 THEN I(11)=RM:GOT
O 300
JG 777 IF FL THEN ? "There's a silvery po
wder on the lid.":GOTO 450
PG 778 IF RM=17 AND B$="SOL" AND SR=N1 TH
EN ? "He's trying to speak.":GOTO 450
GV 779 IF RM=71 AND B$="GIR" AND I(19)=-7
1 THEN ? "Shame on you!":GOTO 450
JV 781 IF RM=13 AND B$="CAS" THEN ? "The
flag of the Golgoth Slavers is flyi
ng above the front gate.":GOTO 450
RR 783 REM
RU 784 REM
XH 785 IF (I(32)=-N1 OR I(32)=RM) AND B$=
"CLO" THEN ? "They look very expensive

```



```

.:GOTO 450
CU 786 IF (I(N10)=-N1 OR I(N10)=RM) AND B
   $="CHE" THEN ? "It looks magical.":GOT
   O 450
RJ 790 ? "You see nothing of interest":GO
   TO 450
SI 791 ? "There's a label.":GOTO 450
TC 799 REM *****PUSH*****
QT 800 REM
WD 801 IF RM=53 AND I(25)=-53 AND B$="BUT
   " THEN I(26)=-53:GOTO 5050
CY 802 IF RM=32 AND B$="BUT" THEN ? "You
   just pressed the alarm!":? "A guard c
   ome s running!":FL=N1:GHP=N6:HP=N9
KC 803 IF FL THEN FOR X=N1 TO N8:50UND N0
   ,70,12,N8:FOR X1=N1 TO 50:NEXT X1:50UN
   D N0,N0,N0,N0:FOR X1=N1 TO 25:NEXT X1
PG 804 IF FL THEN NEXT X:GOSUB 6450:GOTO
   450
MV 818 GOTO 1050
MX 819 REM *****GO*****
IR 820 IF RM=N6 AND B$="TEN" THEN RM=7:GO
   TO 300
MD 822 IF RM=13 AND (B$="LAK" OR B$="WAT"
   OR B$="CA5") THEN ? "You don't swim v
   ery well":GOTO 450
FX 823 IF KN AND RM=19 AND B$="DOO" THEN
   ? "An arrow whizzes over your head":RM
   =20:GOSUB 6520:CA=N1:KN=N0:GOTO 300
HP 824 IF RM=19 AND B$="DOO" THEN ? "The
   door is booby trapped!":? "An arrow bu
   ries itself in your chest!":GOTO 6000
UR 825 IF RM=46 OR RM=48 OR RM=50 OR RM=5
   2 THEN FL=N1:IF I(21)=-N1 THEN RM=RM+N
   1: ? "The key unlocked the door"
WR 826 IF FL THEN ? "The door is locked."
   :GOTO 450
KD 827 IF RM=30 AND B$="BOA" THEN ? "You
   cross the lake":RM=13:I(34)=-13:GOSUB
   6520:GOTO 300
KL 828 IF RM=13 AND I(34)=-13 AND B$="BOA
   " THEN FL=N1:RM=30:I(34)=-30
VL 829 IF FL THEN ? "You get in the boat
   and":? "cross the lake":GOSUB 6520:GOT
   O 300
ZQ 830 IF RM=53 AND I(26)=-53 AND B$="DOO
   " THEN RM=31:GOTO 300
FO 831 IF 5L AND I(45)=-RM AND (B$="DOO"
   OR B$="CEL") THEN RM=RM+N6:GOTO 300
TN 832 IF 5L AND (B$="DOO" OR B$="CEL") T
   HEN ? "The door is locked tight.":GOTO
   450
IV 833 IF RM=68 AND TN AND B$="TUN" THEN
   RM=9:GOTO 300
WF 834 IF RM=N9 AND NO=N1 THEN RM=56:GOTO
   300
MD 840 GOTO 1050
GS 879 REM *****CLIMB*****
XO 880 IF (RM=42 OR RM=40 OR RM=44) AND B
   $="TRE" THEN RM=RM+N1:GOTO 300
NL 898 GOTO 1050
AL 974 REM *****FIGHT*****
OL 975 IF (RM=32 OR RM=26 OR RM=35) AND B
   $="GUA" AND GHP>N0 THEN FL=N1
MB 976 IF (RM=68 OR RM=67) AND (B$="RAT"
   OR B$="DWA") AND GHP>N0 THEN FL=N1
GF 977 IF FL THEN GOSUB 15000:IF Z<3 THEN
   ? "You hit him!":GHP=GHP-N1:IF GHP<N1
   THEN ? :? "He's dead!":F=N0:GOTO 980
ZA 979 IF FL THEN 985
PX 980 IF FL AND RM=32 THEN I(47)=-RM:GOS
   UB 6520:GOTO 300
CE 981 IF FL AND RM=26 THEN IT$(162,184)=
   G$:G2=N0:GOSUB 6520:GOTO 300
JU 982 IF FL AND RM=67 THEN IT$(369,391)=
   "DWADEAD DWARF":DW=N0:GOSUB 6520:GOTO
   300
OI 983 IF FL AND RM=35 THEN IT$(346,368)=
   G$:G3=N0:GOSUB 6520:GOTO 300
BC 984 IF FL AND RM=68 THEN IT$(1036,1058
   )="RATDEAD GIANT RAT":RT=N0:GOSUB 6520
   :GOTO 300
NO 985 IF FL AND Z>N2 THEN ? "You missed"
   :Z=N0:GOSUB 6450:GOTO 450
OQ 987 IF FL THEN GOSUB 6450:GOTO 450
MX 993 GOTO 1050
YX 994 REM *****MOVE*****
OZ 995 IF RM=19 AND B$="SHR" THEN I(26)=-
   19:GOTO 300

```

```

QL 996 IF RM=53 AND B$="POR" THEN I(25)=-
   53:GOTO 5050
IA 997 IF RM=68 AND B$="NES" THEN FL=N1:I
   F RT THEN IN$="5":GOTO 466
SI 998 IF FL THEN I(44)=-68:TN=N1:GOTO 50
   50
MP 999 GOTO 1050
RK 1000 FOR 5=N1 TO N6:IF 5+59=RM THEN FL
   =N1:POP :GOTO 1002
IZ 1001 NEXT 5
GX 1002 IF FL AND KEY=5 AND I(23)=-N1 THE
   N I(45)=-5+59:O(5)=N1: ? "The key unl
   ocks the door.":GOSUB 6520:GOTO 300
VQ 1003 IF FL THEN ? "You don't have the
   key.":GOTO 450
HY 1010 IF RM=19 AND B$="DOO" THEN IT$(57
   6,598)="DOOOPEN DOOR ":GOTO 300
ZQ 1011 IF (RM=50 OR RM=52 OR RM=48 OR RM
   =46) AND B$="DOO" THEN FL=N1:IF I(21)<
   >-N1 THEN ? "It's locked.":GOTO 450
ZI 1012 IF FL THEN ? "The key unlocked th
   e door.":RM=RM+N1:GOSUB 6520:GOTO 300
TK 1014 IF RM=35 AND D5=N1 AND B$="TRU" T
   HEN IT$(645,667)="TRUOPEN TRUNK":TR=N1
   :GOTO 300
LR 1015 IF RM=32 AND B$="DOO" THEN FL=N1:
   IF I(30)<>RM THEN ? "The handle's too
   high.":GOTO 450
ET 1016 IF FL AND I(30)=RM THEN ? "You st
   and on the stool!":? "and open the door
   .":E1=N1:GOSUB 6520:GOTO 300
QO 1019 GOTO 1050
KA 1020 REM *****SMASH*****
YY 1021 IF I(24)=-N1 AND (I(24)=-N1 OR (R
   M=28 AND I(24)=28)) AND B$="CHE" THEN
   IT$(208,230)="CHESMASHED CHEST":FL=N1
VN 1022 IF FL THEN ? :? "There's a burst
   of light from the chest, and...":F
   OR X=14 TO 0 STEP -1:SETCOLOR 2,0,X
QG 1023 IF FL THEN FOR X1=N1 TO 5:NEXT X1
   :NEXT X:FOR X1=N1 TO 500:NEXT X1:RM=IN
   T(RND(N0)*66)+N6
BL 1024 IF FL THEN TRAP 6550:IF RM>60 THE
   N 5L=N1:GOTO 300
OS 1025 IF FL THEN 5L=N0:GOTO 300
EZ 1026 IF RM=65 AND I(15)=-N1 AND B$="DO
   O" THEN O(6)=N1: ? "The door is smashed
   in!":GOTO 5100
QN 1028 GOTO 1050
RJ 1029 REM *****WEAR*****
QA 1030 IF I(37)=-N1 AND B$="HEL" THEN K3
   =37:GOTO 1100
PO 1031 GOTO 1050
BE 1039 REM *****WAVE*****
RT 1040 IF I(11)=-1 AND B$="WAN" THEN FL=
   1: ? "There's a burst of flame.":IF RM=
   9 AND DR=0 THEN ? "A door burns away!"
LF 1041 IF FL AND RM=N9 AND DR=N0 THEN NO
   =N1:DR=N1:GOSUB 6520:GOTO 300
WX 1042 IF FL THEN GOTO 450
II 1045 IF I(48)=-N1 AND B$="ROD" THEN FL
   =N1: ? "The rod starts glowing."
BS 1046 IF FL AND RM=N9 AND DR=N1 THEN ?
   "There's a burned wooden door.":GOTO 1
   048
DP 1047 IF FL AND RM=N9 THEN ? "You see a
   wooden door to the north."
OW 1048 IF FL THEN FOR X=N1 TO 200:NEXT X
   : ? "The rod stops glowing.":GOTO 450
VI 1050 ? "Nice try, but you can't do tha
   t.":GOTO 450
XW 1099 REM *****CHANGES*****
WY 1100 FOR K2=N1 TO N10:IF C(K2)=K3 THEN
   C(K2)=N0:I(K3)=-N2
HB 1115 NEXT K2:K3=N0:GOTO 5050
AK 2000 DATA TENTENT,-6,MANOLD MAN,-66,PA
   RPARROT,45,STASTATUE OF NIMRAL,-11,GUA
   GUARD,-14,SHRSHRUBS,-19
MO 2010 DATA PORPORTRAIT ON THE WALL,-53,
   GUAGUARD,-26,DUSMAGIC DUST,34,CHESMALL
   CHEST,28,WANWAND OF FIRE,0
LW 2020 DATA STASTATUE OF GOLGOLOTH,-49,M
   ACMACE,33,LANLANCE,33,AXEAXE,33,GUAGUA
   RD,-35,DWAEVIL DWARF,-67
BL 2030 DATA TRETREES,0,GIRNAKED GIRL,-71
   ,PRIPRINCESS SHALA,0,BLUBBLUE KEY,0,PAP
   PIECE OF PAPER,7,KEYKEY,0
ZG 2040 DATA HAMHAMMER,47,BUTBUTTON,0,DOO
   SECRET DOOR,0,NESHUGE RAT'S NEST,-68,B

```


U T I L I T Y

M/L Editor

For use in machine language entry.

by Clayton Walnum

M/L Editor provides an easy method to enter our machine-language listings. It won't allow you to skip lines or enter bad data. For convenience, you may enter listings in multiple sittings. When you're through typing a listing with M/L Editor, you'll have a complete, runnable object file on your disk.

There is one hitch: It's for disk users only. My apologies to those with cassette systems.

Listing 1 is M/L Editor's BASIC listing. Type it in and, when it's free of typos, save a copy to disk, then run it.

On a first run, you'll be asked if you're starting a new listing or continuing from a previously saved point. Press S to start, or C to continue.

You'll then be asked for a filename. If you're starting a new listing, type in the filename you want to save the program under, then press RETURN. If there's already a file by that name on the disk, you'll be asked if you wish to delete it. Press Y to delete the file, or N to enter a new filename.

If you're continuing a file, type in the name you gave the file when you started it. If the program can't find the file, you'll get an error message and be prompted for another filename. Otherwise, M/L Editor will calculate where you left off, then go on to the data entry screen.

Each machine-language program in ANALOG Computing is represented by a list of BASIC data statements. Every line contains 16 bytes, plus a checksum. Only the numbers following the word DATA need to be considered.

M/L Editor will display, at the top of the screen, the number of the line you're currently working on. As you go through the line, you'll be prompted for each entry. Simply type the number and press RETURN. If you press RETURN without a number, the default is the last value entered.

This feature provides a quick way to

type in lines with repetitions of the same number. As an added convenience, the editor will not respond to the letter keys (except Q for "quit"). You must either enter a number or press RETURN.

When you finish a line, M/L Editor will compare the entries' checksums with the magazine's checksum. If they match, the screen will clear, and you may go on to the next line.

If the checksums *don't* match, you'll hear a buzzing sound. The screen will turn red, and the cursor will be placed back at the first byte of data. Compare the magazine listing byte by byte with your entries. If a number is correct, press RETURN.

If you find an error, make the correction. When all data is valid, the screen will return to gray, and you'll be allowed to begin the next line.

Make sure you leave your disk in the drive while typing. The data is saved continuously.

You may stop at any time (except when you have a red screen) by entering the letter Q for byte #1. The file will be closed, and the program will return you to BASIC. When you've completed a file, exit M/L Editor in the same way.

When you've finished typing a program, the file you've created will be ready to run. In most cases, it should be loaded from DOS via the L option. Some programs may have special loading instructions; be sure to check the program's article.

If you want the program to run automatically when you boot the disk, simply name the file AUTORUN.SYS (make sure you have DOS on the disk.).

The two-letter checksum code preceding the line numbers here is *not* a part of the BASIC program. For more information, see the "BASIC Editor II" in issue 47.

LISTING 1: BASIC LISTING

```
AZ 10 DIM BF(16),NS(4),AS(1),BS(1),FS(15)
LF 11 DIM MODS(4)
BN 20 LINE=1000:RETRN=155:BACKSP=126:CHKS
UM=0:EDIT=0
GO 30 GOSUB 450:POSITION 10,6:?"Start or
  Continue?":GOSUB 500:?"CHR$(A)
ZG 40 POSITION 10,8:?"FILENAME":INPUT F
S:POKE 752,1:?" "
FE 50 IF LEN(F)<3 THEN POSITION 20,10:?"
  "GOTO 40
MF 60 IF FS(1,2)<"D:" THEN F1$="D":F1$(
3)=FS:GOTO 80
KL 70 F1$=FS
TN 80 IF CHR$(A)="5" THEN 120
FD 90 TRAP 430:OPEN H2,4,0,F1$:TRAP 110
HQ 100 FOR K=1 TO 16:GET H2,A:NEXT K:LINE
=LINE+10:GOTO 100
WH 110 CLOSE H2:OPEN H2,9,0,F1$:GOTO 170
UT 120 TRAP 450:OPEN H2,4,0,F1$:GOSUB 440
:POSITION 10,10:?"FILE ALREADY EXISTS
!":POKE 752,0
ZU 130 POSITION 10,12:?"ERASE IT?":GOS
UB 500:POKE 752,1:?"CHR$(A)
UH 140 IF CHR$(A)="n" OR CHR$(A)="N" THEN
CLOSE H2:GOTO 30
QG 150 IF CHR$(A)<"Y" AND CHR$(A)<"y" T
HEN 130
BH 160 CLOSE H2:OPEN H2,8,0,F1$
IE 170 GOSUB 450:POSITION 10,1:?"NON ON
LINE":LINE:CHKSUM=0
GH 180 L1=3:FOR K=1 TO 16:POSITION 13*(K
10)+12*(K-9),K*2:POKE 752,0:?"BYTE H"
:K:?"":GOSUB 310
KH 190 IF EDIT AND L=0 THEN BYTE=BF(K):GO
TO 210
FY 200 BYTE=VAL(NS)
OZ 201 MODS=NS
BU 210 POSITION 22,K*2:?"BYTE:" "
YZ 220 BF(K)=BYTE:CHKSUM=CHKSUM+BYTE*H:IF
CHKSUM>9999 THEN CHKSUM=CHKSUM-10000
H5 230 NEXT K:CHKSUM=CHKSUM+LINE:IF CHKSU
M>9999 THEN CHKSUM=CHKSUM-10000
IG 240 POSITION 12,K*2:POKE 752,0:?"CHEC
KSUM:":L1=4:GOSUB 310
EH 250 IF EDIT AND L=0 THEN 270
QH 260 C=VAL(NS)
SY 270 POSITION 22,K*2:?"C:?" "
IL 280 IF C=CHKSUM THEN 300
DI 290 GOSUB 440:EDIT=1:CHKSUM=0:GOTO 180
LW 300 FOR K=1 TO 16:PUT H2,BF(K):NEXT K:
LINE=LINE+10:EDIT=0:GOTO 170
F 310 L=0
KZ 320 GOSUB 500:IF (A=ASC("Q")) OR A=ASC(
"q")) AND K=1 AND NOT EDIT THEN 420
PO 330 IF A<>RETRN AND A<>BACKSP AND (A<4
0 OR A>57) THEN 320
DX 331 IF A=RETRN AND NS="" THEN NS=MODS
TD 335 IF A=RETRN AND L=0 AND K=1 THEN 35
0
JR 340 IF ((A=RETRN AND NOT EDIT) OR A=B
ACKSP) AND L=0 THEN 320
DH 350 IF A=RETRN THEN POKE 752,1:?"":R
ETURN
GG 360 IF A<>BACKSP THEN 400
SA 370 IF L>1 THEN NS=NS(1,L-1):GOTO 390
AS 380 NS=""
RE 390 ?"CHR$(BACKSP):L=L-1:GOTO 320
BB 400 L=L+1:IF L>1 THEN A=RETRN:GOTO 35
0
HX 410 NS(L)=CHR$(A):?"CHR$(A):":GOTO 320
KN 420 GRAPHICS 0:END
YT 430 GOSUB 440:POSITION 10,10:?"NO SUC
H FILE":FOR K=1 TO 1000:NEXT X:CLOSE
H2:GOTO 30
FD 440 POKE 710,48:SOUND 0,100,12,8:FOR K
=1 TO 50:NEXT K:SOUND 0,0,0,0:RETURN
MY 450 GRAPHICS 23:POKE 16,112:POKE 53774
,112:POKE 559,0:POKE 710,4
XR 460 DL=PEEK(560)+256*PEEK(561)+4:POKE
DL-1,70:POKE DL+2,6
HW 470 FOR K=3 TO 39 STEP 2:POKE DL+K,2:N
EXT X:FOR K=4 TO 40 STEP 2:POKE DL+K,0
:NEXT X
ZH 480 POKE DL+41,65:POKE DL+42,PEEK(560)
:POKE DL+43,PEEK(561):POKE 87,0
AC 490 POSITION 2,0:?"Analog M/L editor":
POKE 559,34:RETURN
HZ 500 OPEN H1,4,0,"K":GET H1,A:CLOSE H1
:RETURN
```


R E V I E W

Computing Across America
by **Steven K. Roberts**
Learned Information, Inc.
347 pages, 1988
\$9.95, paperback
\$14.95, hardcover

Reviewed by Michael A. Banks

If Steve Roberts is not a familiar name, it's not for lack of publicity. Roberts has appeared on local, regional and national television scores of times, and he's been written up in magazines ranging from *Popular Science* to *Writer's Digest* to *Time*—as well as many computer magazines.

But I won't leave you frowning in confusion. Steve Roberts is the guy who, in 1983, took off on a bicycling trip across America. But his wasn't just any bicycle, and this wasn't just any trip. The bicycle was a 220-pound recumbent cycle (one in which the rider pedals from a position not unlike lying in a lounge chair). Equipped with dedicated computer and ham radio equipment, a portable computer and solar cells to power the whole thing. Roberts' "Winnebiko," as he dubbed it, was to serve as his home and office for the next 15,000 miles.

The trip itself was an experiment—a breakaway to a new lifestyle—and as much a means as an end. It's an experiment with a techno-nomad lifestyle made possible by personal computers and telecommunications; an experiment that is the precursor of more than a few things in our technological future.

As you might expect, the trip (which continues today with a more advanced vehicle) has been more than interesting; so interesting, in fact, that Steve Roberts has written a book about it. *Computing Across America* is Steve Roberts' chronicle of

15,000 miles of America, as seen from the seat of a high-tech, computerized bicycle.

When I began reading this book, I expected to see a diary-type recording of events of Roberts' high-tech cycle trip across America, spiced with details about his custom-made recumbent bicycle, ham gear and computers. Well, I found all that in the book, but that was just the beginning, because Roberts didn't stop with just narrating his experiences. In sharing his experiences (more shown to the reader than told), he provides a fascinating picture of the land he traveled and the people he encountered.

Those of you who followed his first round of reports on CompuServe, or who are following the second round on GENie, will of course be familiar with Roberts' style and technique. Believe me, though, this book is not a simple collection of the on-line chronicles of days past. Some of the content will be familiar, but Roberts has worked to link chapters and events in such a way as to provide a whole that is indeed greater than the sum of its parts.

While the majority of the book is a chronicling of events, it's by no means mere description. Roberts uses all the writer's tools—description, narration, dialogue and even a little suspense now and then, to paint a memorable picture of life in America as viewed from four feet above the ground. To frame the picture, he's used philosophy, techo-talk and personal flashbacks. And, interestingly enough, Roberts manages to show us America—the parts of it through which he's pedaled (Midwest to Key West to the Old West and beyond)—without coloring it overly much with his personality.

Roberts also creates a picture of Roberts, an intensely personal picture that holds no punches. We see flashes of

temper, lust, realizations of shortcomings and abilities, and much, much more. I don't doubt that most readers—honest readers—will find a bit of themselves in all this.

This isn't a book for those who don't like four-letter words. Roberts, to drag out the worn-down phrase of the '60s and '70s, tells it like it is. Indeed. From his facing of his own weaknesses and past mistakes, to revealing personal interludes that would please the most candid voyeur, he is candid and mostly tasteful.

Roberts' style is superb—perfect for this kind of book, melding as it does factual detail with human emotions in such ways as to make both equally interesting. And Roberts doesn't force you through the book; instead, he opens the story and invites you in for coffee.

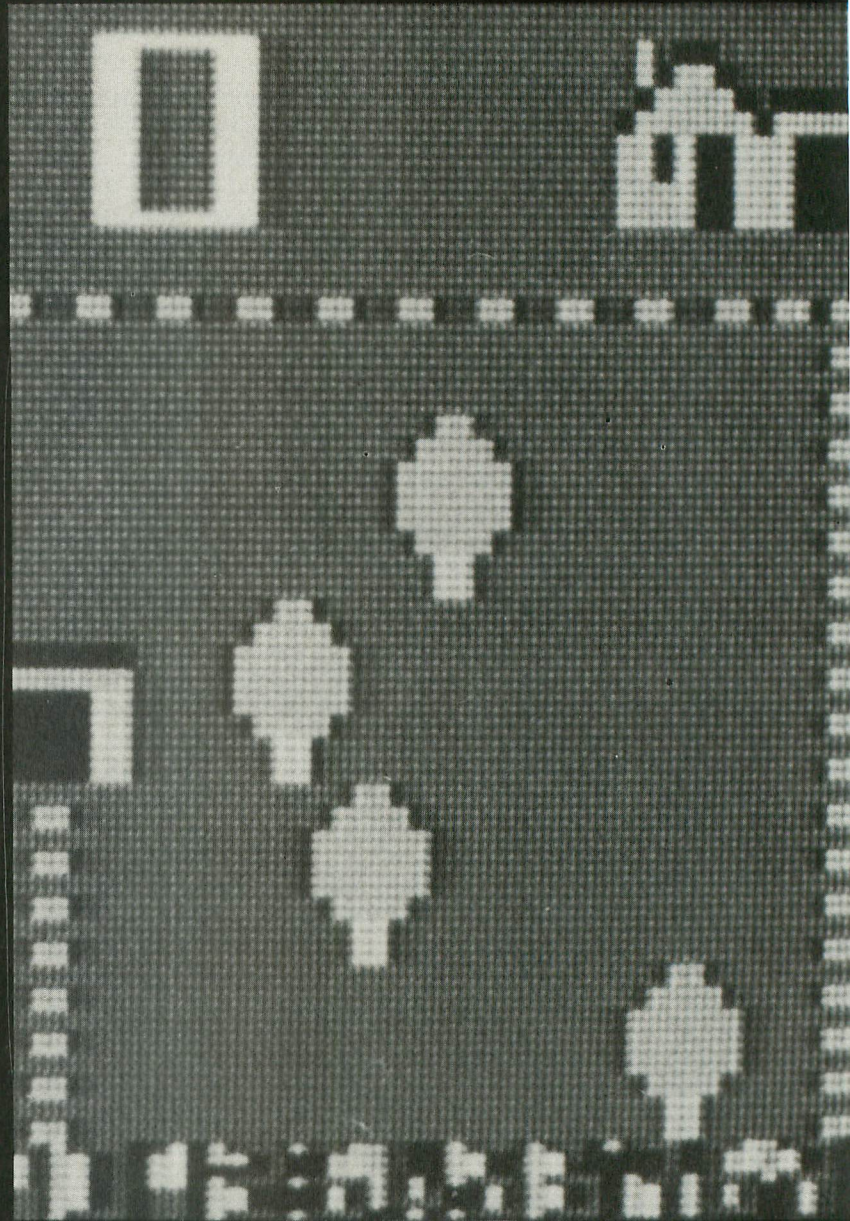
All of this is not to say that the details of Roberts' computers, ham gear and vehicle are de-emphasized. There is technological detail galore, both in terms of what the equipment is and how he uses it, throughout the book. A special appendix contains itemized technical specs and drawings of the bike and its high-tech equipment. In sum, there's so much technical detail here that the book could serve as a primer on the leading edge of personal computer technology as it applies to mobile, cottage-industry business.

Roberts stole quite a chunk of my writing time the week after I bought his book. And that's the best compliment I can give any writer. Recommended.

Copies of *Computing Across America* are available from the author by mail for the cover price (specify whether you want soft- or hardcover) plus \$2.00 for shipping and handling. Write: *Computing Across America*, 1306 Ridgeway Avenue, New Albany, IN 47150.

SNOWPLOW

Editor



**These screens may be arranged in any order on a disk to
add levels to the game. And what is even better,
you get to design them yourself!**



The *Snowplow Editor* (SE) is a scrolling-screen editor used to design new screens for the game *Snowplow* which was published in last month's ANALOG. These screens may be arranged in any order on a disk to add levels to the game. And what is even better, you get to design them yourself!

First type in Listing 1 using the M/L Editor found elsewhere in this issue. To run SE follow the instructions in your DOS manual on loading a binary file.

When the editor has loaded, you will notice that the screen is divided into two main sections. There is the editing window (which comprises most of the screen) and the input/info area at the bottom of the screen. The following commands may be entered simply by pressing the appropriate key:

- K — choose character
- C — change color register
- M — define memory block
- X — xerox memory block
- P — change cursor luminance
- B — block fill
- H — home cursor
- F — load a font
- L — load saved screen
- S — save screen
- D — draw line mode
- T — define a key

In addition to these commands are two others that are accessed by pressing CONTROL along with the appropriate key:

- CNTL-H — home and clear
- CNTL-< — clear memory

An explanation of all the commands follows.

Choose a character (K): This allows you to choose the character that you will draw

with. When you press this key you may move the character cursor at the bottom of the screen on top of the character you wish to use. When you have made your choice, press fire. Move the stick up and down to see a different line of characters and move left or right to choose a character on that line. All plots, draws, block fills, etc., will use this character until another one is selected.

Change the color registers (C): Hit a key, 0 through 4, to select the register to be altered. Use the joystick to select the hue and luminance. Press fire to exit.

Define a block of memory (M): This is used later in the Copy mode to rubber-stamp a rectangular region of the screen anywhere on the map. You may only define an area of 10 by 10. This is done by moving the cursor to the upper left-hand corner of the rectangle and pressing fire. Then move to the lower right-hand corner and press fire again.

Xerox a defined block (X): This allows you to rubber-stamp your predefined memory block anywhere on the screen. Just move the cursor to the upper-left corner of where you want your block copied and press fire. This is an excellent way to make lots of houses or trees.

Change cursor luminance (P): This changes the luminance of the cursor on the map. This is very useful on light backgrounds. Pressing this key toggles the cursor back and forth between light and dark.

Block fill (B): This allows you to fill a large area of the screen with one character. Simply select the upper left corner and the lower right corner of the rectangle, and it will be filled with the current character.

Home the cursor (H): This key will move the cursor to the screen position 0,0.

Home and clear (CNTL-H): This moves the cursor to position 0,0 and clears the

You may save your masterpiece by entering a legal

DOS filename at the prompt.

screen. Use this only if you are positive that you want to erase your map; it is quite permanent.

Clear memory (CNTL-<): This is the same as the previous command; however, you are asked if you are certain about the erasure.

Load a font (F): This allows you to load in the character set that you will be drawing with. To extract the character set from the Snowplow game object file, simply use this small BASIC program. Make sure that you have the correct filename in Line 10. You may use any character set with this editor. Please note that you must load a character set before the editor will function properly.

```
10 OPEN #1,4,0,"D:SNOW"  
20 FOR I=1 TO 21:GET #1,  
A:NEXT I  
30 OPEN #2,8,0,"D:FONT"  
40 FOR I=1 TO 1024  
50 GET #1,A:PUT #2,A  
60 NEXT I  
70 END
```

Load a screen (L): This allows you to load in a previously created screen into the

editor. Simply supply the filename and press RETURN. The screen is loaded and the one in memory is erased. Pressing ESCAPE will exit.

Save a screen (S): You may save your masterpiece by entering a legal DOS filename at the prompt. To allow this screen to be used by Snowplow, it must be named SMAP.???, where the question marks stand for any legal DOS filename extension. Each saved screen is about 23 sectors long (single density).

Draw a straight line (D): This allows you to enter draw mode, in which you may draw lines either left to right or up to down. Press fire at the beginning of the line, move the cursor, and fire at the end of the line. This uses the last selected character from K.

Define a key (T): Use the cursor to select a character; then hit a key (I through O) to register it. Anytime thereafter just hit the appropriate key to recall that character.

Snowplow Editor hints

Road characters must be placed

horizontally in pairs, with the left always on an even X-coordinate (watch the text window). Roads must always be two characters wide. There must always be road characters placed at position X = 10 and Y = 4, since this is where the dozer begins. Use only the road characters that have a snow background. This starts with a and is every other one from there on in.

You may place up to six fuel (X-coordinate must be even) containers on the map. Again these are two characters wide. You are allowed a maximum of four bonus cars. The bonus cars must be placed on the road at an even X position. It would look best to put them on horizontal stretches. In the front, use the first set of car figures. The second set is used by the program for roads that have been cleared of snow. The first X position that can be used is X = 4. The first four spaces are used by ANTIC as a buffer for fine scrolling horizontally.

Enjoy making new levels for Snowplow. We hope you get a great deal of fun from this program.

Snowplow

LISTING 1: M/L EDITOR DATA

```
1000 DATA 255,255,128,127,169,127,112,  
112,112,69,0,144,69,128,144,69,5323  
1010 DATA 0,145,69,128,145,69,0,146,69,  
128,146,69,0,147,69,128,3802  
1020 DATA 147,69,0,148,69,128,148,196,
```

```
0,139,130,130,2,65,128,127,4882  
1030 DATA 0,48,250,58,76,38,48,72,169,  
224,141,9,212,169,10,141,6576  
1040 DATA 23,208,138,72,166,168,189,54,  
50,141,24,208,169,0,141,26,5122
```


1050 DATA 208,141,10,212,230,168,104,1
70,104,64,160,50,185,128,127,153,9150
1060 DATA 192,127,136,16,247,32,50,51,
32,136,52,32,170,53,32,117,2071
1070 DATA 49,32,213,49,32,247,49,32,7,
50,169,6,160,187,162,48,4649
1080 DATA 32,92,228,169,127,141,49,2,1
69,128,141,48,2,32,115,50,2423
1090 DATA 32,89,50,32,60,53,32,75,51,1
73,120,2,201,15,240,9,3120
1100 DATA 32,209,48,32,216,48,76,101,4
8,173,252,2,32,225,58,144,6228
1110 DATA 248,201,255,240,47,162,255,1
42,252,2,160,14,217,251,54,240,2814
1120 DATA 5,136,16,248,48,30,152,10,17
0,189,221,54,141,165,48,189,8387
1130 DATA 222,54,141,166,48,32,125,52,
32,255,255,32,125,52,32,60,4090
1140 DATA 53,76,117,48,173,132,2,208,1
76,32,182,50,76,101,48,160,5411
1150 DATA 4,185,196,2,153,22,208,136,1
6,247,169,128,141,9,212,200,9909
1160 DATA 132,168,76,95,228,201,7,208,
14,76,126,49,32,43,50,32,1435
1170 DATA 60,53,169,0,133,77,96,201,11
,208,3,76,167,49,201,14,4470
1180 DATA 208,30,165,146,240,14,198,14
6,198,148,165,136,56,233,16,133,9432
1190 DATA 136,76,91,49,165,145,240,7,1
98,145,198,148,32,13,51,96,5463
1200 DATA 201,13,208,34,165,146,201,9,
240,14,230,146,230,148,165,136,1662
1210 DATA 24,105,16,133,136,76,253,48,
165,145,201,9,240,225,230,145,2609
1220 DATA 32,230,50,230,148,96,201,6,2
08,6,32,126,49,76,238,48,5388
1230 DATA 201,5,208,6,32,126,49,76,16,
49,201,10,208,6,32,167,2861
1240 DATA 49,76,238,48,201,9,208,6,32,
167,49,32,16,49,96,32,637
1250 DATA 117,49,32,104,49,165,136,133
,135,76,27,50,169,0,164,135,4917
1260 DATA 162,15,145,169,200,202,16,25
0,96,169,132,133,170,169,0,133,9193
1270 DATA 169,96,165,143,201,39,208,18
,169,1,133,151,165,144,201,88,8927
1280 DATA 240,7,230,144,230,147,32,210
,50,96,230,143,230,147,165,133,2043
1290 DATA 24,105,4,133,133,165,133,141
,0,208,96,165,143,240,14,198,9495
1300 DATA 143,165,133,56,233,4,133,133
,198,147,76,161,49,165,144,240,547
1310 DATA 216,198,144,198,147,169,255,
133,151,76,210,50,134,128,169,12,9034
1320 DATA 157,66,3,32,86,228,166,128,9
6,169,62,141,47,2,169,1,3848
1330 DATA 141,111,2,169,3,141,29,208,1
69,128,141,7,212,169,108,141,8537
1340 DATA 192,2,169,0,141,8,208,141,9,
208,96,169,132,133,170,169,9457
1350 DATA 0,133,169,160,0,145,169,200,
208,251,96,160,32,132,136,132,190
1360 DATA 135,32,117,49,32,27,50,169,4
6,141,0,208,133,133,96,164,6105
1370 DATA 135,162,0,189,65,50,145,169,
232,200,224,16,208,245,96,162,2487
1380 DATA 0,134,20,166,20,224,4,208,25
0,96,146,66,4,48,48,48,3328
1390 DATA 32,64,0,32,96,255,195,195,19
5,195,195,195,195,195,195,6113
1400 DATA 195,195,195,195,255,252,198,
198,198,198,198,252,166,142,232,88
65
1410 DATA 138,10,10,10,10,10,170,202,1
38,160,31,153,44,139,153,4,4450
1420 DATA 139,202,138,136,16,245,96,16
0,25,169,0,153,142,0,136,16,4316
1430 DATA 250,160,0,152,141,10,59,169,
144,141,46,59,185,10,59,24,2872
1440 DATA 105,128,153,11,59,185,46,59,
105,0,153,47,59,200,192,33,4670
1450 DATA 208,234,32,130,55,169,128,14
1,244,2,169,192,141,14,212,169,347
1460 DATA 48,141,1,2,169,3,141,0,2,96,
166,148,189,10,59,133,3841
1470 DATA 171,189,46,59,133,172,165,14
9,164,147,145,171,96,169,127,133,677
1480 DATA 172,169,132,133,171,96,32,20
1,50,160,0,177,171,24,101,151,6845

1490 DATA 145,171,200,200,200,192,30,2
08,242,96,160,0,185,136,127,153,963
1500 DATA 133,127,185,135,127,153,132,
127,200,200,200,192,27,208,237,173,436
5
1510 DATA 156,127,24,105,128,141,159,1
27,173,157,127,105,0,141,160,127,8217
1520 DATA 96,160,27,185,129,127,153,13
2,127,185,130,127,153,133,127,136,170
1530 DATA 136,136,208,239,173,132,127,
56,233,128,141,132,127,173,133,127,112
4
1540 DATA 233,0,141,133,127,96,169,144
,133,170,169,0,133,169,162,9,7699
1550 DATA 160,255,145,169,136,192,255,
208,249,230,170,202,16,242,96,160,5043
1560 DATA 255,169,0,200,153,0,133,192,
255,208,248,160,200,162,0,189,3100
1570 DATA 81,50,153,0,133,200,232,224,
8,208,244,169,63,141,1,208,491
1580 DATA 133,134,169,77,141,193,2,96,
162,38,169,52,32,18,52,173,3978
1590 DATA 120,2,201,15,208,3,76,232,51
,201,7,208,24,165,150,201,8953
1600 DATA 31,240,10,230,150,165,134,24
,105,4,76,176,51,169,0,133,5021
1610 DATA 150,169,63,208,15,201,11,208
,27,165,150,240,15,198,150,165,421
1620 DATA 134,56,233,4,133,134,141,1,2
08,76,12,52,169,31,133,150,5459
1630 DATA 169,187,208,240,201,14,208,1
8,165,142,240,8,198,142,32,89,8553
1640 DATA 50,76,12,52,169,3,133,142,20
8,244,201,13,208,14,230,142,317
1650 DATA 165,142,201,4,208,232,169,0,
133,142,240,226,173,132,2,208,1757
1660 DATA 34,32,98,54,32,43,50,173,132
,2,240,251,166,142,232,138,1114
1670 DATA 10,10,10,10,10,24,101,150,56
,233,32,133,149,76,43,50,3099
1680 DATA 32,43,50,76,123,51,134,169,1
33,170,160,255,200,177,169,153,3241
1690 DATA 122,139,16,248,41,127,153,12
2,139,96,35,104,111,111,115,101,6326
1700 DATA 0,99,104,97,114,97,99,116,10
1,242,35,111,108,111,114,0,5085
1710 DATA 114,101,103,105,115,116,101,
114,0,16,13,148,36,114,97,119,3147
1720 DATA 0,109,111,100,229,34,108,111
,99,107,0,102,105,108,236,44,5970
1730 DATA 111,97,100,105,110,103,0,102
,111,110,244,36,101,102,105,110,6030
1740 DATA 101,0,98,108,111,99,235,35,1
11,112,121,0,98,108,111,99,5126
1750 DATA 235,160,39,169,0,153,120,139
,136,16,250,96,160,160,169,0,8109
1760 DATA 153,0,139,136,192,255,208,24
8,96,162,54,169,52,32,18,52,6136
1770 DATA 173,252,2,162,255,201,255,24
0,247,201,28,240,12,160,4,217,2636
1780 DATA 50,53,240,9,136,16,248,48,23
1,142,252,2,96,185,55,53,7394
1790 DATA 133,132,32,125,52,162,123,16
9,56,32,18,52,32,52,56,164,2482
1800 DATA 132,185,196,2,72,41,240,133,
129,104,41,15,133,130,173,120,7144
1810 DATA 2,201,7,208,10,165,129,24,10
5,16,133,129,76,24,53,201,4653
1820 DATA 11,208,10,165,129,56,233,16,
133,129,76,24,53,201,14,208,6329
1830 DATA 13,230,130,230,130,165,130,4
1,15,133,130,76,24,53,201,13,4575
1840 DATA 208,25,198,130,198,130,165,1
30,41,15,133,130,165,129,5,130,6825
1850 DATA 164,132,153,196,2,32,52,56,3
2,43,50,173,132,2,208,174,5527
1860 DATA 173,132,2,208,251,96,50,31,3
0,26,24,0,1,2,3,4,6508
1870 DATA 165,147,162,10,32,98,53,165,
148,162,16,32,98,53,164,148,5650
1880 DATA 32,219,53,164,147,177,171,14
1,102,139,160,3,185,163,55,153,9351
1890 DATA 111,139,136,16,247,96,133,21
2,169,0,133,213,138,72,32,170,8731
1900 DATA 217,32,230,216,160,2,169,48,
153,57,50,136,16,250,160,255,431
1910 DATA 200,177,243,16,251,41,127,14
5,243,200,152,73,3,41,3,170,6920
1920 DATA 160,0,177,243,157,57,50,200,

232,224,3,208,245,160,3,104,651
1930 DATA 170,185,57,50,41,31,157,80,1
39,202,136,16,244,96,160,39,7470
1940 DATA 169,0,153,80,139,136,16,250,
160,24,185,194,53,153,85,139,8884
1950 DATA 136,16,247,76,60,53,56,26,16
,16,16,0,57,26,16,16,6462
1960 DATA 16,0,35,40,33,50,26,0,0,37,1
14,114,111,114,26,185,2269
1970 DATA 10,59,133,171,185,46,59,133,
172,96,169,255,133,141,169,52,356
1980 DATA 162,72,32,18,52,32,152,54,17
6,32,165,137,197,138,240,32,8370
1990 DATA 165,139,197,140,208,20,165,1
38,197,137,176,8,72,165,137,133,9607
2000 DATA 138,104,133,137,32,79,54,76,
241,53,169,255,141,252,2,96,9458
2010 DATA 165,140,197,139,240,244,176,
8,72,165,139,133,140,104,133,139,480
2020 DATA 32,50,54,76,22,54,164,140,32
,219,53,164,137,165,149,145,8995
2030 DATA 171,198,140,164,140,196,139,
208,239,32,219,53,164,137,165,149,2611
2040 DATA 145,171,96,164,139,32,219,53
,164,138,165,149,145,171,136,196,2229
2050 DATA 137,208,249,145,171,96,169,0
,141,31,208,96,169,255,133,141,1581
2060 DATA 169,52,162,81,32,18,52,32,15
2,54,144,1,96,165,138,197,6315
2070 DATA 137,240,249,144,247,165,140,
197,139,240,241,144,239,230,140,32,576
0
2080 DATA 79,54,230,139,165,139,197,14
0,208,245,240,224,169,255,133,141,7339
2090 DATA 173,252,2,201,28,208,7,169,2
55,141,252,2,56,96,173,120,9454
2100 DATA 2,201,15,240,6,32,209,48,32,
216,48,173,132,2,208,224,9078
2110 DATA 32,98,54,173,132,2,240,251,2
30,141,164,141,165,147,153,137,3218
2120 DATA 0,165,148,153,139,0,165,141,
201,1,240,3,76,156,54,24,5345
2130 DATA 96,116,51,149,52,230,53,10,5
5,104,54,19,55,148,56,251,5298
2140 DATA 56,10,57,48,57,155,57,163,57
,183,57,20,58,148,58,5,2483
2150 DATA 18,58,10,21,56,0,62,47,182,1
85,57,37,22,45,173,192,4630
2160 DATA 2,73,14,141,192,2,96,162,91,
169,52,32,18,52,32,188,3769
2170 DATA 55,144,1,96,162,16,32,200,49
,169,3,157,66,3,169,58,4041
2180 DATA 157,69,3,169,249,157,68,3,16
9,0,157,75,3,169,4,157,4972
2190 DATA 74,3,32,86,228,16,5,132,129,
76,112,55,169,7,157,66,4556
2200 DATA 3,169,128,157,69,3,169,0,157
,68,3,169,4,157,73,3,2646
2210 DATA 169,0,157,72,3,32,86,228,132
,129,48,8,162,16,32,200,4883
2220 DATA 49,76,86,53,162,16,32,200,49
,32,68,218,165,129,162,34,6671
2230 DATA 32,98,53,76,170,55,162,32,32
,200,49,169,3,157,66,3,3621
2240 DATA 169,55,157,69,3,169,167,157,
68,3,169,0,157,75,3,169,5061
2250 DATA 4,157,74,3,76,86,228,174,239
,238,229,75,58,155,169,0,95
2260 DATA 162,32,157,72,3,157,73,3,169
,7,157,66,3,76,86,228,4888
2270 DATA 160,0,152,153,138,139,200,19
2,13,208,248,169,36,141,136,139,1617
2280 DATA 169,26,141,137,139,162,0,134
,130,169,63,157,138,139,169,0,7923
2290 DATA 141,182,2,169,64,141,190,2,3
2,170,55,166,130,201,27,208,8811
2300 DATA 2,56,96,201,155,240,60,41,12
7,201,32,144,218,201,126,208,2568
2310 DATA 15,224,0,240,210,202,169,0,1
57,138,139,157,139,240,199,3921
2320 DATA 201,96,240,195,201,123,176,1
91,224,13,240,187,72,157,251,58,3573
2330 DATA 42,42,42,42,41,3,168,104,41,
159,25,61,50,157,138,139,5089
2340 DATA 232,208,164,157,251,58,24,96
,164,132,185,113,56,141,131,139,9725
2350 DATA 185,118,56,141,132,139,185,1
96,2,72,41,240,74,74,74,6221
2360 DATA 32,92,56,141,139,139,104,41,

15,32,92,56,141,147,139,96,5544
2370 DATA 170,189,97,56,96,16,17,18,19
,20,21,22,23,24,25,33,6676
2380 DATA 34,35,36,37,38,16,16,17,17,1
7,24,25,16,17,18,0,4877
2390 DATA 35,111,108,111,114,26,0,23,0
,0,0,40,117,101,26,4,8194
2400 DATA 0,0,0,44,117,109,26,132,169,
4,133,129,169,7,133,131,6011
2410 DATA 169,57,162,87,32,18,52,32,18
8,55,144,1,96,162,16,32,2521
2420 DATA 200,49,165,129,157,74,3,169,
3,157,66,3,169,58,157,69,5158
2430 DATA 3,169,249,157,68,3,169,0,157
,75,3,32,86,228,16,5,2897
2440 DATA 132,129,76,112,55,162,16,169
,144,157,69,3,169,0,157,68,5518
2450 DATA 3,169,0,157,72,3,169,10,157,
73,3,165,131,157,66,3,4155
2460 DATA 32,86,228,132,129,48,219,162
,16,32,200,49,76,86,53,169,6581
2470 DATA 8,133,129,169,11,133,131,169
,57,162,99,76,160,56,169,57,7374
2480 DATA 162,133,32,18,52,32,64,57,17
6,25,104,104,32,171,57,169,5027
2490 DATA 0,141,0,208,141,1,208,169,6,
160,95,162,228,32,92,228,206
2500 DATA 76,116,228,96,169,57,162,110
,32,18,52,32,64,57,176,3,2819
2510 DATA 32,50,51,96,173,252,2,162,25
5,201,35,240,9,201,43,208,1340
2520 DATA 243,142,252,2,24,96,142,252,
2,56,96,44,111,97,100,105,5660
2530 DATA 110,103,0,102,105,108,229,51
,97,118,105,110,103,0,102,105,5515
2540 DATA 108,229,35,44,37,33,50,1,0,3
3,114,101,0,121,111,117,2155
2550 DATA 0,115,117,114,101,0,57,15,17
4,49,53,41,52,1,0,33,8960
2560 DATA 114,101,0,121,111,117,0,115,
117,114,101,0,57,15,174,32,2914
2570 DATA 171,57,104,104,76,49,48,32,1
71,57,104,104,76,52,48,160,4346
2580 DATA 50,185,192,127,153,128,127,1
36,16,247,96,169,52,162,103,32,8293
2590 DATA 18,52,169,255,133,141,32,152
,54,144,1,96,165,140,56,229,8888
2600 DATA 139,201,10,176,246,170,165,1
38,56,229,137,201,10,176,236,133,3359
2610 DATA 164,134,165,169,0,133,167,16
5,137,133,166,230,138,230,140,164,4387
2620 DATA 139,32,219,53,164,166,177,17
1,164,167,153,82,59,230,167,230,4100
2630 DATA 166,165,166,197,138,208,237,
165,137,133,166,230,139,165,139,197,58
32
2640 DATA 140,208,220,169,1,133,153,96
,165,153,208,1,96,169,52,162,9475
2650 DATA 115,32,18,52,173,120,2,201,1
5,240,6,32,209,48,32,216,6608
2660 DATA 48,173,252,2,201,28,208,6,16
9,255,141,252,2,96,173,132,1218
2670 DATA 2,208,225,32,98,54,173,132,2
,240,251,32,43,50,165,147,8621
2680 DATA 133,137,133,167,24,101,164,1
33,138,230,138,201,128,144,1,96,9795
2690 DATA 165,148,133,139,24,101,165,1
33,140,230,140,201,18,176,240,169,3565
2700 DATA 0,133,166,164,139,32,219,53,
164,166,185,82,59,164,167,145,1007
2710 DATA 171,230,167,230,166,165,167,
197,138,208,237,165,137,133,167,230,70
64
2720 DATA 139,165,139,197,140,208,220,
96,32,116,51,169,58,162,188,32,9041
2730 DATA 18,52,173,252,2,201,255,240,
249,201,28,208,1,96,160,9,256
2740 DATA 217,215,58,240,5,136,16,248,
48,232,165,149,153,154,0,96,9494
2750 DATA 0,0,36,101,102,105,110,101,0
,17,13,16,0,0,0,0,6485
2760 DATA 0,0,0,0,0,0,0,0,0,128,31,3
0,26,24,29,6118
2770 DATA 27,51,53,48,50,160,9,217,215
,58,240,5,136,16,248,56,8082
2780 DATA 96,185,154,0,133,149,169,255
,141,252,2,24,96,68,58,226,9275
2790 DATA 2,227,2,0,48,0,0,0,0,0,0,0
,0,0,0,3492

R E V I E W

The Disk Emulator Routine, a combination software/hardware package, allows a second Atari home computer to be used as a disk emulator or a super-fast disk drive.

Printer Buffer Routine — \$39.95
Disk Emulator Routine — \$49.95
B. L. Enterprises
P.O. Box 7881
Louisville, KY 40207

Reviewed by Jim Patterson

At last a completely new and revolutionary development for the Atari 8-bit computer system. In fact, not one but two new uses for the old standby 8-bit systems. It all started when I read a small classified ad that stated, "Put your second Atari 400/800/XL/XE to good use as a Printer Buffer for \$39.95 or high-speed Disk Emulator (DER) for \$49.95."

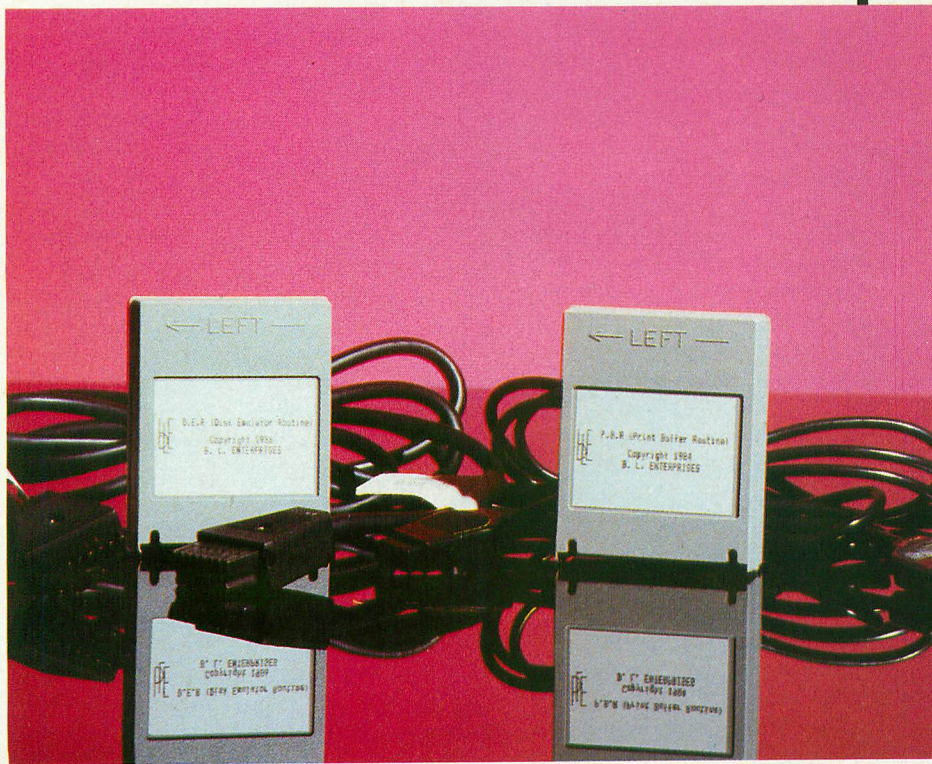
Now I'm an avid Atari 8-bit user, and this ad took me by surprise, as I had seen nothing relating to either of these products in any of the Atari-related publications. It was then I decided to take it upon myself to evaluate these products and make the information available to the Atari world.

Disk Emulator Routine

First, I'll discuss the *Disk Emulator Routine* (DER). This combination software/hardware package allows a second Atari home computer to be used as a disk emulator or a super-fast disk drive. The package consists of cartridge and disk software and a special SIO cable for connecting the second Atari to the system configuration. Also included is a nine-page instruction manual, consisting of four chapters and an appendix which cover the hardware and software installation and operation, as well as a trouble-shooting section.

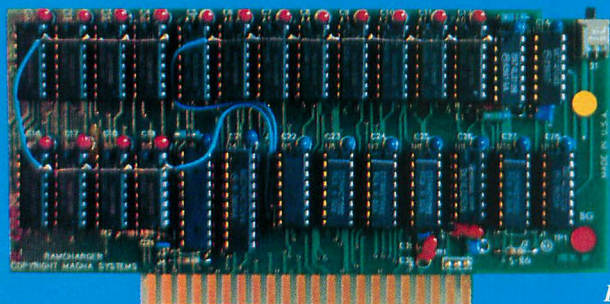
The DER hardware simply daisy-chains in the computer system, but the DER must be placed last in the SIO string with any other disk drives or interfaces (i.e., 850) cabled between the main computer and the DER. Any 8-bit system can be used as either the main computer or the DER; the DER cartridge is inserted in the computer used as the disk emulator.

The DER can be used like any other disk drive with a couple of exceptions. The DER can function as any drive (1 through 8). The amount of free sectors on the DER will depend on the available

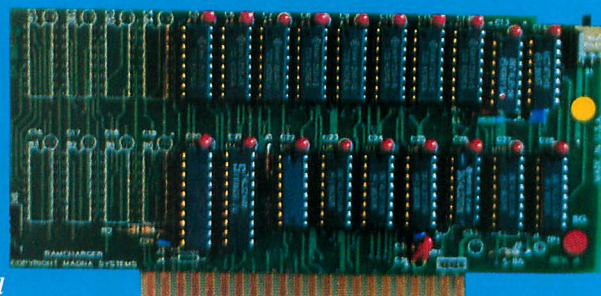


continued on page 77

R E V I E W



*Left,
1 meg
Ramcharger
board,
right, 256K
Ramcharger board*



Ramcharger Memory Board Magna Systems

**147-05 Sanford Ave., Suite 4E
Flushing, NY 11355**

256K board—\$339.95

512K board—\$469.95

Price includes MYDOS ramdisk software

Reviewed by Charles Bachand

I've always had a fondness in my heart for the old Atari computers, having originally started out with a model 400, complete with its membrane keyboard. That membrane keyboard was a unique experience, although I've almost forgotten that it was the major cause of many a bruised fingertip. It was great for non-typing applications like running a Bulletin Board System or as a cartridge-based game-playing machine.

But my needs at the time required the extensive use of a keyboard; so I was practically forced to move up to an Atari 800 after only a few months. I still have, use and love that "good old" 800 that sits next to my ST computer at home.

Now, even though there are newer Atari 8-bit computers with more memory than this one, the 800 had several attractive features that made it special. First, the computer was built like a tank, with cast aluminum parts everywhere inside its plastic case. This being one of their first

two models of home computers—the flat keyboarded 400 being the other—Atari went overboard in shielding the machine in order to prevent them from generating stray radio interference. Today, you're more likely to find only sheet metal and plastic between you and the printed circuit boards.

Four-player games were all the rage back then and could be played via the two extra joystick ports, with up to eight players competing in games that use paddle controllers, as was done in game cartridges like Super Breakout. This machine also had two cartridge slots under the hood, but unfortunately only two or three software companies ever marketed anything that plugged into the right-hand slot.

The 800 was also blessed with a replaceable OS (Operating System) board, the idea here being that upgrades would just plug in. This never really came about, although having the OS on a separate board did make the switch to the later revision B ROMS easier. Instead of disassembling the entire computer, the OS board was pulled out and the ROM chips on it replaced.

Lastly, the 800 had three slots to hold its memory boards. The first machines came with either an 8 or 16K RAM board, but you could easily upgrade your computer's memory capacity by changing and/or adding boards to it. The maximum potential of the machine was supposedly

48K, made up of three 16K boards, but several third-party companies proved that this limit of 16K of RAM per board did not, in fact, exist. Board manufacturers of 32K and 48K like Intec, Axlon, Austin Franklin, Mosaic, Bit-3 and others soon flourished. Axlon went one step further, producing a 128K memory board for the then inexpensive price of \$299. There were even two companies—Austin Franklin and Bit-3—that produced 80-column cards.

Now, you are probably wondering why I'm giving you this short lesson in history concerning the venerable Atari 800? After all, no one is still building computers based along the design specifications of a Sherman Tank (except for maybe the military), no one is still writing four- or eight-player computer games, and no one is still producing memory boards for that classic computer of mine.

Well, folks, one new company, Magna Systems, has pleasantly proved me wrong by coming out with not one, but three memory boards for your vintage Ataris!

Powering up with 256K memory chips

For the last few months, I'd been considering retiring my 800 for something with more memory, namely an Atari 130XE. Now, due to the immergence of Magna Systems onto the 8-bit scene, I no longer need to do that. Magna Systems produces three memory-board upgrades for the 800 which are designed along the

bank-switching scheme used by the 130XE while using higher density 256K-bit RAM chips, allowing for an elegant no-solder method of memory upgrade.

It is a simple matter to add one of Magna's *Ramcharger* memory expanders. In most cases it involves only a board swap—pulling out the 16K board that currently resides in the computer's third slot (I'm assuming that you have a 48K machine which is comprised of three 16K memory boards) and replacing it with the Magna board. Further, in the case of the one-meg board which draws more current in its operation, you must verify that the transformer used to power the computer is the type rated at 31VA and not 15VA. (The term VA used here stands for Volts x Amps, merely another way of saying Watts.) The 31VA transformers were employed almost exclusively to operate the older model 810 disk drives, the additional current being needed to power the two motors that spin the disks and move the read/write back and forth.

The design of the Ramcharger boards utilizes three layers of copper instead of two, with the center layer being connected to ground. This interior layer electrically isolates the top and bottom traces from each other. More importantly though, it insulates the two faces of the printed circuit board from spurious RF noise. This means that the traces on either side of the board can no longer act as an antenna, picking up "signals" from traces on the opposing side. The implementation using the three-layer board makes for quiet and error-free circuitry.

Programming the Ramcharger yourself

After reading the manual that comes with the board, I've opted to quote from it directly in order to explain the Ramcharger's operation. In other words, I don't think that I could have said it any better:

"The Ramcharger's memory is organized into 16K bank segments, all of which can be switched in and out at memory addresses \$4000 to \$7FFF. This is done because the 6502 microprocessor was not designed to address anything beyond a maximum of 64K. When the bank-switching method is used, the computer is tricked into using more memory (the 130XE operates the same way.) The Ramcharger 256K has 16 banks, the 512K has 32 banks and the 1MEG has 64 banks. Bank switching is accomplished by storing a bank number to any address in the range \$0FC0 through \$0FFF or \$CFC0 through \$CFFF, with the location \$CFFF being the preferred and standardized lo-

cation that all commercial software uses. Bank \$00 is the default bank that main memory uses. Banks \$01 through \$0F (512K = \$1F or 1MEG = \$3F) are used for extended memory. Writing a \$03 to \$CFFF will select bank 3. The selected bank is now addressable between \$4000 and \$7FFF.

Software Support

The following is a list of software that directly supports the Magna Systems Ramcharger boards, with more to be added in the future:

- MYDOS—Version 4.0 and up
- TOPDOS—Version 1.5 and up
- DOS XL—AXLON version
- SPARTA DOS—with AXLON ramdisk handler
- ATARI DOS 2.5—with disk software that comes with Ramcharger
- HAPPY SECTOR COPIER—makes sector copies to and from the RAMdisk
- OMNIMONR or OMNIMON8K—built in RAMdisk handlers
- FILEMANAGER 800+—supports copy function to the RAMdisk
- SYNFILE+—gives you over 15,000 record capacity
- SYNCALC—gives you up to 7,000 calculation boxes
- ATARIWRITER PLUS—supports 48K of text buffer
- OMNIWRITER 80—80-column WP supports 208K of text buffer
- PRINT SHOP COMPANION—runs in AXLON compatible mode

Magna Systems supplies a disk with their boards which contains Version 4 of MYDOS, as well as over a dozen miscellaneous programs to aid you in integrating the Ramcharger board into your system.

"Daddy, what is the switch on top for?"

Microsoft BASIC or AtariWriter, examples of 16K cartridges which move the screen's display list and RAM space down into the bank-switch area will more than likely flicker or display garbage on the screen for a short period of time while the banks are switched. This will happen when you access files in the RAMdisk that you establish using the Ramcharger and its supplied software in order to allow for faster access to your data. While this flicker is annoying, it is not fatal—unless you have DLIs (Display List Interrupts) enabled. With DLIs running it is anybody's guess.

If you try to use the Ramcharger with non-DOS software such as games, you might run into strange problems. These

programs might have other plans for the board's bank-select addresses, especially those in the range \$0FC0 through \$0FFF. These problems can be cured by temporarily disabling the Ramcharger. Simply open up the top of your Atari 800 and flip a switch located on top of the Magna board. The Ramcharger will then act just like the Atari 16K memory module that it replaced.

There is a permanent fix to this problem outlined in the owner's manual, but it does involve some soldering and wire jumpering on your part. This will, of course, void your 90-day warranty from Atari (the one that expired several years ago), but not the one from Magna Systems. If you are not sure which end of a soldering iron to hold, the people at Magna Systems will do the modification for you at a charge of \$15.

Inflation on the RAM front


Some of you are probably aware of the current price fluctuations in the RAM chip market. Devices like the 256K which went for about \$2 only a year ago are now fetching \$10 to \$12 apiece. Because of this unstable pricing structure, the costs of the Ramcharger boards will likely change between the time that I'm writing this review and when you pick up the issue at the newsstand. I therefore suggest that those who are interested should call Magna Systems for their current prices.

Of course, if you have been stockpiling 256K 150ns dynamic RAM chips as an investment in the future (I wish that I had), Magna Systems will sell you an "unpopulated" board (one that contains no RAM chips) at a greatly reduced price. Again, call Magna Systems for details.

And so it goes....

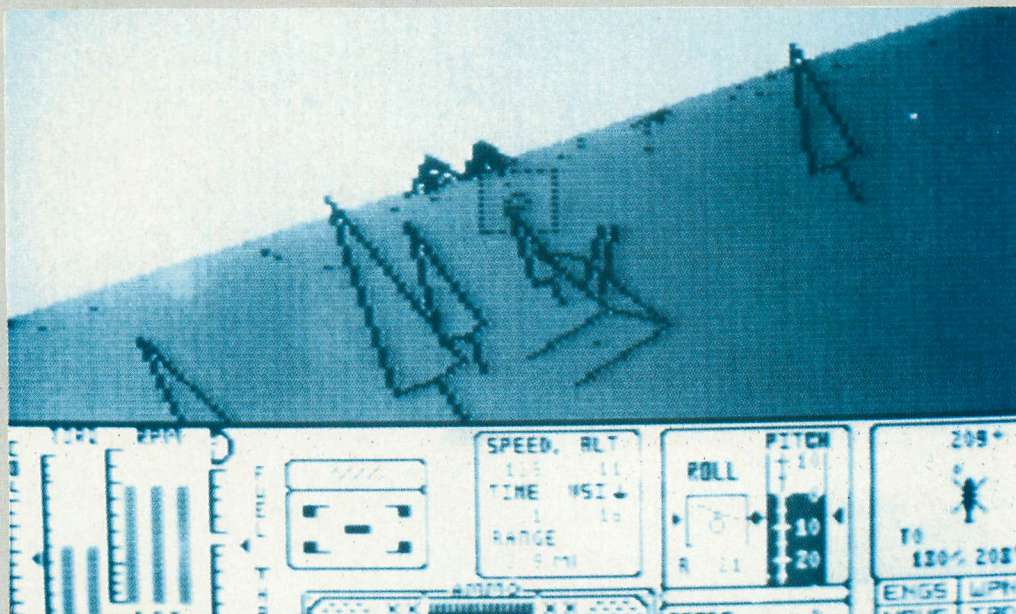
I've always had a fascination for elegant and unusual hardware, and Magna System's Ramcharger boards certainly qualify in that regard; plus I now have the best of both worlds embodied in my 8-bit system.

If you are like me and just can't bear to part with your Atari 800, consider a Ramcharger memory upgrade—you'll be glad you did.

Starting in the mid-'70s when he owned an Altair 8800, Charles Bachand has been fascinated with the hardware aspects of personal computers. He worked as a Technical Editor for ANALOG Computing and SETlog for seven years. When not typing like mad or burning his fingers on hot soldering irons, Charles can usually be found hanging around the Atari SIGs on DELPHI. 

PANAK STRIKES

by Steve Panak



It's really hard to talk about this—it happened so suddenly, so unexpectedly, without warning. I don't know, perhaps my own denial caused me to ignore the inevitable. Up to now you've been so reliable. Oh, there was that one time you had that slight lapse of memory, and I had to replace one of your bulky modules. But now—I mean, I hate to say it—you're lame, what with your space bar crippled and all. I fiddled with it as much as I could, removed it, checked the connections; but I'm a writer, not a repairman. And the cost of a replacement keyboard is simply incredible. So I lightened your load. But there are just too many programs out there that need that space bar.

Then I got an XE. Even though I tried to convince myself that you were still okay (again, denial), I knew it was just about over. I'm afraid the XE's sleeker design made it all the easier—I've always been a sucker for good looks. You've been a loyal companion, but now it's time to say goodbye.

So, goodbye old 800, my first computer, my loyal friend. You're banished to the attic, but it's probably just as well. Lots of programs today are wanting at least 64K. Games are being written that require more mental capacity than you were

designed to provide. Games you can't even understand. Games like this first one.

Tomahawk
by D.K. Marshall
Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
64K disk, \$29.95

Up, up and away we go again, with another flight simulator. Apparently someone out there thought there's still room for just one more, or they haven't researched the market enough to know that this is the most overdone genre around. I hope that this just about ends it, as I'm getting a little tired of seeing the same thing over and over and over again. But for those of you who are still interested, *Tomahawk* is a helicopter simulation, making its direct competition Mindscape's *Infiltrator*, which I also looked at recently.

But unlike *Infiltrator*, *Tomahawk* is the most straightforward simulator since Sublogic's ground-breaking classic. Unlike similar products I've seen recently, *Tomahawk* does what a flight simulator is supposed to do: let you experience flight from the safety of your own home. Unlike *Infiltrator*, you are not required to learn

needlessly complex procedures just to get your craft off the ground. Nor are you required to land again and partake in lengthy, incidental and unnecessary ground missions. And unlike Sublogic's *Flight Simulator*, you don't need to be a certified pilot just to get off the ground in your first play session. Instead, you climb into the cockpit and fly.

After booting the game, you make a couple of decisions, mainly controlling the difficulty of play. Then you take off—it's really that simple. The vector graphics move a little slowly, but overall the game performs nicely. My main complaint involves the necessity of jabbing at the keyboard to keep control of the chopper, but such is the price of a simulation, which requires a number of keys to control a myriad of features. Once you get off the ground, your mission is to destroy all enemy ground forces and return to base. There are three missions (as well as a practice mode), each of which may be played in one of four difficulty levels. The toughest will require you to eliminate ground forces as well as blast hostile crafts out of the air.

The graphics are acceptable, with all of the many cockpit meters and dials easily discernible. The three-dimensional, real-



Video Title Shop

world display is worthy of special mention; once you fall below 500 feet, various land features rise off the earth towards you, and it's even possible to fly between them (with a little practice). The program is further blessed with excellent documentation. A colorful, scientific-looking brochure explains the features of the Tomahawk, whetting your appetite, while a supplemental reference sheet keeps all of the many commands in easy view. The main manual contains complete instructions on the program's operation, with a fine tutorial which will get you off the ground successfully the very first time.

All things considered, while Tomahawk is not ground-breaking, is not mind-boggling and doesn't make me want to toss all my other diskettes out the window, it is a competent flight simulator at a very reasonable price. When considered in light of its straightforward design and ease of use, it should appeal primarily to a newcomer who wants to wade slowly and safely into this genre, rather than diving in and drowning in needless complexity.

Video Title Shop
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
64K disk, \$29.95

If you've kept up with me for a number of years, then you know I primarily review entertainment software in these pages. For most people, that means games. But to me, entertainment software means more than just games. It means any type of software that people use in their leisure time. And what better subject for a leisure time dissertation than the home movie, that jerky 8mm nightmare which has been modernized by the proliferation of the video camcorder.

The *Video Title Shop* came at just the

right time, as I just got a camcorder. And while the package lacks the sophistication needed to create some of the high-tech, computer-generated graphics we now take for granted (is the Statue of Liberty in the intro to the *NBC Nightly News* real or animated?), this complete package will allow future Spielbergs to add credits to their masterpieces. The Shop consists of two separate, but interrelated programs: The Title Shop and Micropainter.

The Title Shop allows you to add images to your movies. These images can be pictures or text, although they will most likely be a combination of the two. And like the graphics seen on commercial television, you can move these images onto the screen using any of a number of special effects. For example, title screens can dissolve on and off of the screen, as well as wipe out one another. As you'll soon find out, your title options are as limitless as your own imagination.

The Micropainter program is used to create images or modify those which already exist. Similar to paint programs found on the ST, Micropainter allows you to use your joystick as a brush and your monitor as a canvas. Up to four colors can be displayed at once, and a fill feature colors areas with one of three patterns or a solid color. Use the magnify option to add fine detail, turning individual pixels (dots of light) on and off. And, surprisingly, although the program's interface is the joystick (as opposed to the mouse used in ST-based paint programs), it is remarkably responsive and easy to use.

The package comes with a number of images already created for you. Stored on two diskettes are dozens of pictures, ready to be used as they are, or as modified with Micropainter. These provide lazy directors with standard backgrounds for the opening credits of home movies of the major holidays and common vacation locations. The best place to start your movie

enhancement is in demonstration mode, which flashes a series of these images in front of you, displaying how the various effects work. Once you have viewed the entire sequence, you can go back and look at each individual frame and decipher how it was created.

Although the vast documentation suggests that this package could be used for commercial purposes, such as real estate display (screens could show potential clients locations, features and prices of homes), it is probably too crude for anything but amateur productions. But the program does supply all the materials necessary to put on quite a performance. The two manuals (one for The Title Shop, the other for Micropainter) are fully indexed and easy to understand, although computer novices might find it all a bit overwhelming, so consider yourself warned. Fortunately for all users, a handy reference card chock full of commands is also provided.

Getting your titles on film is really quite simple, although it takes some planning. No special adapter cables are required; you simply tape-record the sequence as your computer generates it. So all that is necessary is to hook your Atari into your VCR rather than your television. If you have only one VCR, you'll have to plan ahead, either taping your titles and then filming your movie, or leaving enough room at the beginning of your tape to insert your titles later. If you have two VCRs, you can edit your titles into your movies much easier, for a more professional look.

Overall I'm not quite sure how to summarize The Title Shop. While it does everything it says it can do, and does it all quite well, especially considering it exists in only 64K, I'm not sure how much use it will see once purchased. It seems to be too time consuming to insert the titles. But for those who want to add a little something extra to their home movies, The Title Shop is your ticket.

So, if we've learned anything this month, it's that while the two programs reviewed here live up to their claims, I was still less than impressed. As for next month, all I currently have on tap is the latest simulation from SSI. But as any of you who read the newspapers know, Nolan Bushnell, one of the original founders of Atari, is getting back into games for the first time in ten years, and if this isn't good news for videophiles, I don't know what is. His 20-game deal with Atari could mean a virtual flood of new titles, and a lot of late nights and sore wrists. Let's hope so.

The DRAM Memory Chip Crisis of 1988

In 1986, the world was literally swimming in *Dynamic Random Access Memory* (DRAM) chips. Chip prices in general were at an all time low, which coincided with an industry-wide depression in sales and profit that the American chip manufacturers were experiencing. The Japanese chip manufacturers found the American market a suitable dumping ground for their excess production of DRAMS. Chip prices kept falling, and the American DRAM manufacturers pointed their fingers even more fervidly at the Japanese. In an unlikely arrangement, Washington and Japan found themselves bound into an alliance which resolved the DRAM issue, but overall hurt the American computer industry.

The results of the American/Japanese alliance can be seen with some of the latest news from the U.S. computer industry.

Most dealers could not get shipments of Mega ST systems in April. Atari Corp. partly blamed the problem on a shortage of DRAM chips.

E. Arthur Brown, a popular mail-order supplier of ST software and hardware add-ons, almost doubled the price of its one-megabyte upgrade kit for the 520 and 1040 ST.

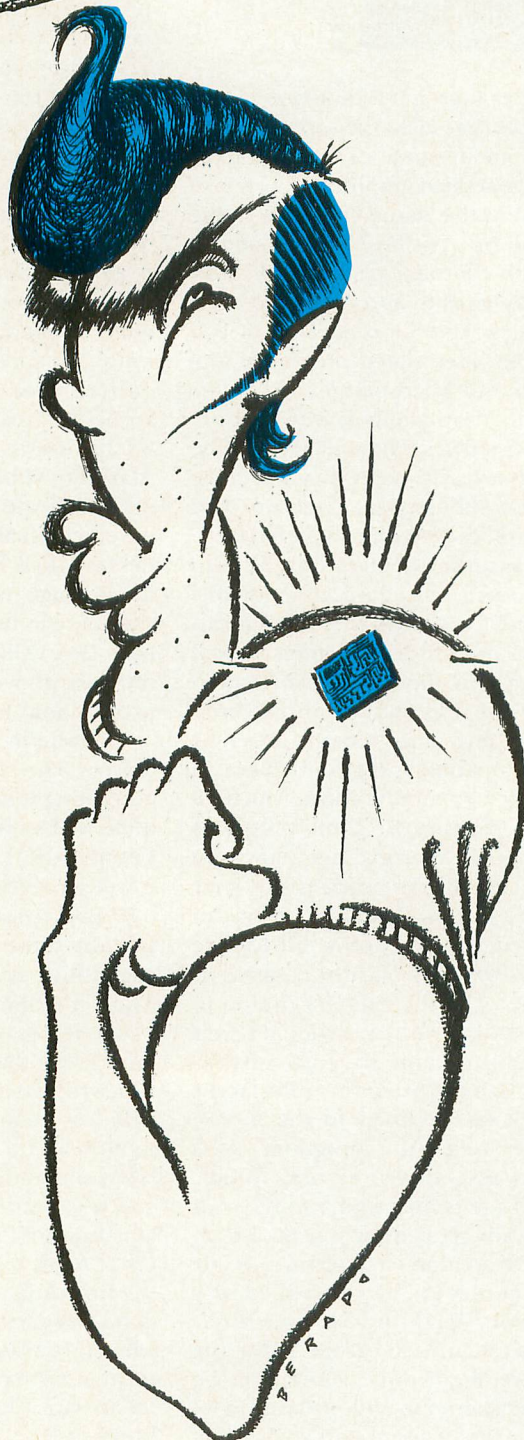
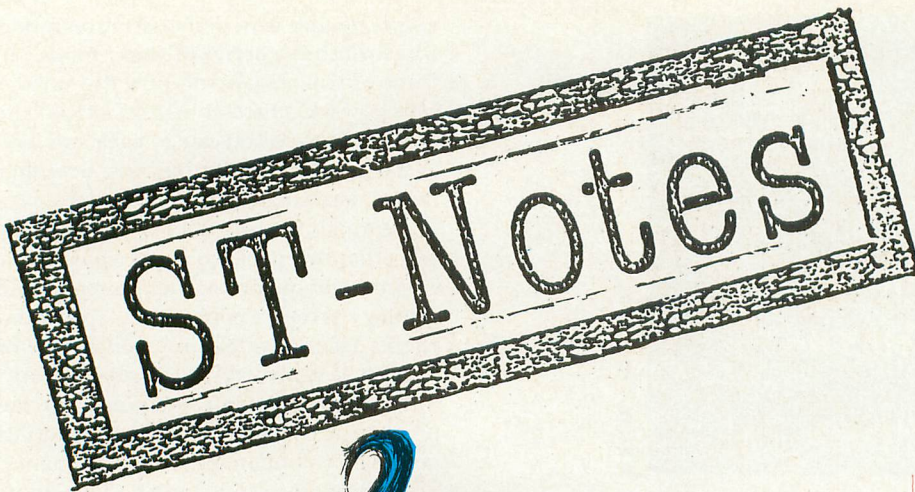
ICD discontinued the MIO Board for the Atari XL/XE computer because of limited availability of DRAM chips and higher costs.

Apple has pushed the release of its Macintosh SE upgrade and Macintosh Laptop computer to next year. Apple is also having software problems with *MultiFinder*, their new multitasking operating system. Running *Hypercard* on a Mac II with MultiFinder requires two megabytes of memory; Mac IIS are sold with only one megabyte of RAM. Most systems have one megabyte or less, and users are finding that upgrade kits cost upwards of \$700.

Sun Microsystems is facing a four- to six-month backlog on delivery of its Sun 3/60 workstation. Sun is also delaying production of its new Sun 386i workstation because of DRAM availability. The Sun 386i was shown at the April COMDEX computer trade show in Atlanta. It runs both IBM and AT&T Unix.

Hewlett Packard's Vectra 386 high-end system was conspicuously absent from the April COMDEX trade show. HP had hoped to unveil the computer and announce availability.

Several other companies have delayed



entry into the market until DRAM prices and availability become more stabilized. You might have wondered by now, how could all this have happened by protecting the American DRAM business?

How the game is played

In Japan, most computer manufacturers make their own memory chips. Companies like Hitachi, NEC, Fujitsu and Toshiba have their own DRAM manufacturing plants. When demand for computers increases, the DRAM plants increase production. Throughout the early 1980s, DRAM prices have been dropping while production of the chips has been increasing. Eventually, Japan found itself among a huge surplus of chips in 1985. What they don't use, the Japanese export to other countries.

Most American computer manufacturers relay on companies such as Intel, Texas Instruments and Motorola to supply their memory chips. The increasing supply of Japanese imported DRAM chips has forced the price of a 256K DRAM chip to less than 10% of its value five years ago. Faced with low revenues and a flood of imported chips, the American chip manufacturers quickly saw their profits from the DRAM market being eaten up. To make things worse, in 1985 the computer industry as whole was experiencing its first major depression.

In July 1986, after two years of threatened protectionist legislation, the Japanese Ministry of International Trade & Industry (MITI) agreed to a new trade pact with the United States. Japanese production of DRAM chips was reduced by 30%. This sent the industry into a tailspin; American computer manufacturers demand was on the rise just when supply was at its all time low.

American demand

Over the past three years, the computer industry has become intensely memory dependant. Since the 1985 release of the Atari 1040 ST computer, one megabyte of memory became pretty much a standard thing. Previously, the average IBM PC or Macintosh was equipped with 512K of memory.

Computers are not the only users of large memory arrays. Most Postscript compatible laser printers are equipped with two megabytes of memory. Local area networks, scanners, FAX machines, bar-code readers and laptop computers also use large amounts of memory.

The demand for memory extends into many other consumer electronic developments. Some new videotape recorders

come with special effects systems that digitize and improve the resolution of an image before showing it on your television screen. Some "high definition" television monitors use huge amounts of memory for special effects and video transmission.

Who is the bad guy?!

The Japanese are not the only ones to be blamed for the shortage of DRAM chips. In 1987, AT&T made the decision to leave the DRAM chip manufacturing business, shortening the already tight supply of chips.

Another reason for the shortage was the finicky nature of producing 256K and one-megabyte DRAM chips. The Korean DRAM industry has been trying since 1985 to attract a good portion of the world DRAM demand. But they have been mostly unsuccessful due to low yields at the manufacturing sites.

In early 1987 when demand for DRAM chips was at its highest point, the Japanese should have normally geared up production to meet the demand. Instead, the trade pact forced MITI to reduce chip production. Finally in November, MITI removed its production controls.

All of this, plus an earthquake at one of Japan's larger DRAM plants, caused the shortage to become a huge obstacle in the ever-expanding American computer industry.

The hidden damage

The common perception of the worldwide electronics industry is that the Japanese are taking over. Many people believe the U.S. has lost its advantage to the Japanese, who have shown us how to make things smaller and less expensive such as cars, steel and consumer electronics. *Forbes* magazine reports that U.S. software production is five times larger in revenue than Japan, and the lead has been growing significantly faster in recent years. The American software industry has generated just under \$23 billion, while Japanese software yielded only \$3 million.

U.S. computer-hardware sales have also been more than two thirds larger than Japan. More than \$150 billion in American computer hardware was sold in 1987, while the Japanese sold less than \$80 billion. Both countries are increasing their sales, but the Japanese are catching up significantly.

The Japanese have been well aided by the trade pact with the U.S. The Japanese were dumping DRAM chips into the U.S. because of their own wasteful overproduction of chips at a time when demand and revenues were at very low levels. The limit

on exports caused the Japanese market dip during 1986, but they have come out of the small recession with dramatically higher revenues and profits.

The trade pact has also hurt the U.S., which was previously making great inroads into the Japanese computer, software and telecommunications markets. Due to the delayed roll-outs of new American computers and technology, the Japanese computer manufacturers have become more viable because they can deliver the product quicker.

The hidden winner

One of the largest DRAM chip makers is IBM. In 1985, IBM smartly invested \$1.5 billion in a new memory-chip production center. The plant was also established to develop improved techniques in memory-chip production. So, while the supply of chips to all of IBM's competitors has been shrinking, IBM finds itself for the first time with the distinct advantage of being able to supply its own manufacturing centers with IBM chips.

And the need for expanded memory in IBM computer products is becoming more important. IBM has bet its strength in the personal computer market on the emergence of the PS/2 computer with the new OS/2 and *Presentation Manager* operating system. *Presentation Manager* is a window-based, mouse-driven operating system that is virtually identical to the successful Macintosh operating system. Unfortunately, you need almost three megabytes of memory to run *Presentation Manager* and OS/2.

The future

The only good news that resulted from the American/Japanese trade pact is that the American chip manufacturers have rebounded from the 1985-86 slump to post record sales of \$633 million this year. *Computer Reseller* magazine expects that number to top \$1.5 billion this year with continued growth into the 1990s.

In response to the chip shortages, major computer manufacturers like Sun and Apple have been rumored to be ready to build their own DRAM chip manufacturing centers. The Koreans are also coming on strong with a new 350,000-square-foot DRAM plant which should be in operation next year. And finally, Micron Technology, a U.S. chip producer, is breaking new ground with a 256K DRAM chip that is 40% smaller than existing chip sizes. Micron expects that it will be able to reduce the size of a one megabyte chip to the size of a 256K DRAM chip. **A**

When you want to talk Atari

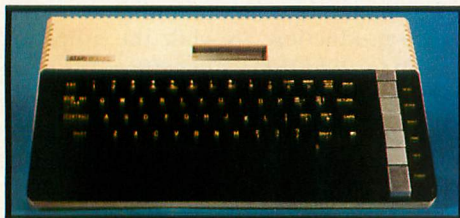
XL/XE HARDWARE

INTERFACES

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| Supra | |
| 1150 | 39.99 |
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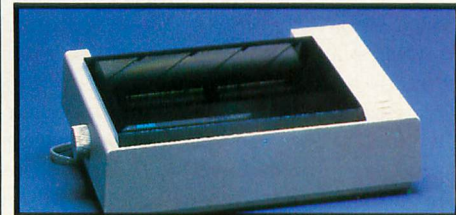
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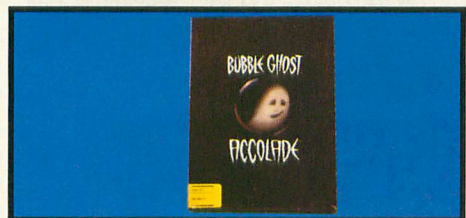
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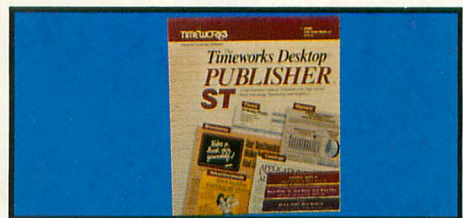
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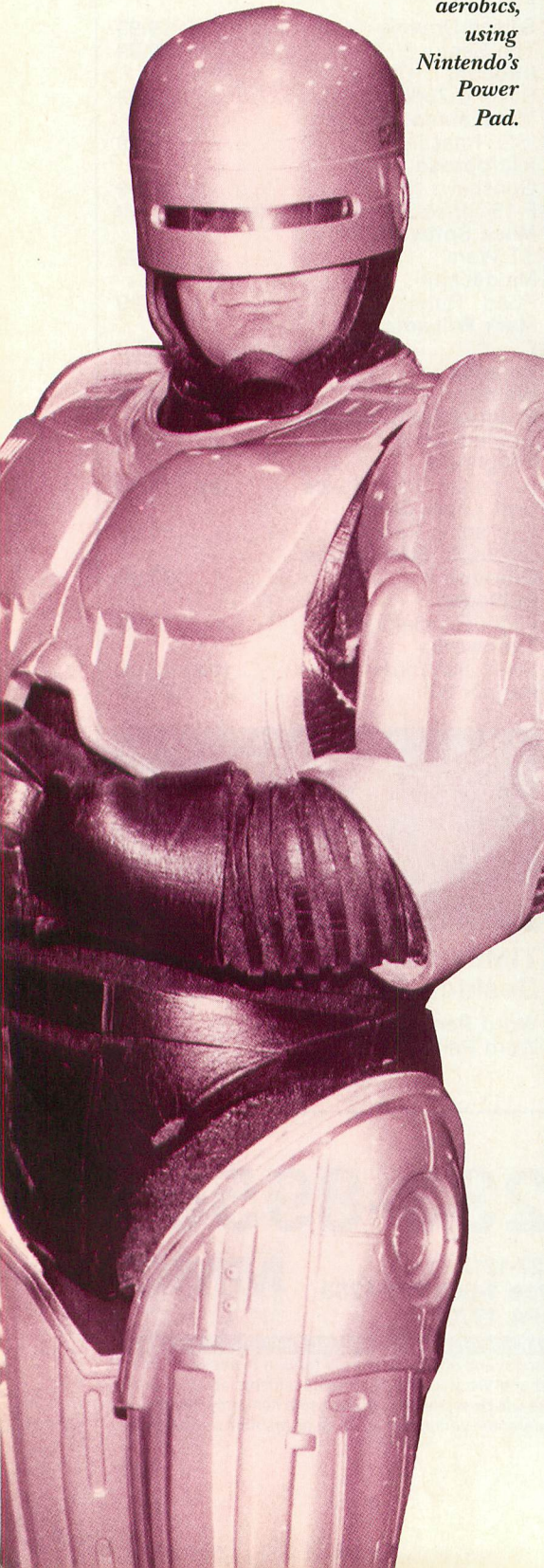
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Clockwise from below: Robocop during 1988 Summer CES; Nintendo's many products on display in over 20,000 square feet of booth space; Wrestling's Andre the Giant signs autographs in Acclaim's booth; a demonstration of aerobics, using Nintendo's Power Pad.



continued from page 47
different versions for Nintendo, Sega and Atari/Commodore machines.

Bridging the gap even further is the Camerica Freedom Stick, another infrared wireless unit. This joystick contains adapters to match all the major game machines, so the player won't have to buy multiple Freedom Sticks. This unit also received the endorsement of the U.S. National Video Game Team, who could be

seen on the show floor in their colorful satin jackets. Camerica was also sponsoring a competition that culminated in a trip to Rio for the winner.

Industry overview

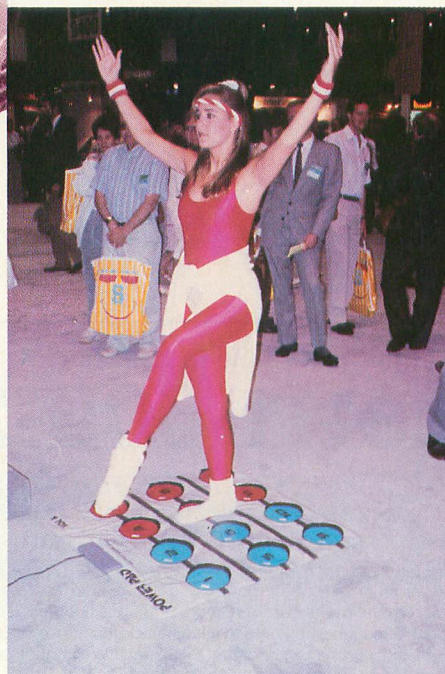
Many have aired the speculation that this sudden resurrection of the video game industry will spawn a similar crash as was experienced by Atari, Mattel and Coleco in 1982. In fact, talk at the show was rampant regarding the previous crash and how to avoid it now. Ancient history speaks for itself: After staking themselves firmly in the marketplace, the 2600 and Intellivision units were plagued with a glut of software—much of it poor towards the end—that led to drastic price cuts for all cartridges; the same won't be likely under current conditions.

It would appear that Nintendo is taking steps to assure their survival in the video game market by quality checking every game available on their machine. This will keep the level of software high, and seeing Nintendo's gold seal on the box assures the buyer that their purchase is supported.

Dick Rhoads, Sega's Vice President of Sales, tends to disagree with the crash comparisons, stating a number of factors in defense. Thanks to the increased memory capability of the newer video games, he said, more can be put in the products, such as longer playfields, better quality graphics and animation. This serves to keep the player interested in a single game longer, something that the simplistic arcade games on the 2600 had trouble doing. Rhoads also noted that many of the newer contests take over 80 to 100 hours to complete, particularly in the case of role-playing adventure cartridges. With a quantity of satisfying games available, a player will not be as likely to wear out his or her investment in software—ergo, hardware—as easily.

The most positive result in the video game resurgence that I see is the activity by big name companies like Activision (under their new corporate umbrella, Mediagenic), Broderbund and Mindscape. Companies like this have learned the lessons of the past and are careful to get into ventures only if they prove profitable; this is especially the case after the previous video game rise and fall.

Again, the CES is a biannual event. By the time you read this, the cast of characters will be gearing up for the Las Vegas show. If things go as briskly—and the chip situation clears up—we could be seeing an even larger display of bravado and risk-taking, aside from entertaining fare. **F**



continued from page 67

Speaking of speed, I decided to use a couple of DOS disk-drive speed-check tests to see what they would give me.

memory in the system being used: An XL system will give 403 free sectors, emulating a single-density disk drive, while using a 130XE gives 914 free sectors, emulating an Atari 1050 enhanced-density disk drive.

The exceptions are as follows: To write protect the DER, you simply press the break key, the *P* key (for protect), followed by the return key. This is like placing a write protect tab on a regular diskette. To enable writing to the disk again, you press the break key, the *E* key (for enable), followed by the return key. DER can be disabled and re-enabled without losing the stored information and data. To disable hit the break key; then to enable hit RETURN.

Likewise, you can change the drive number of the DER without losing stored information. To change the drive number, you press the break key, the number key for the desired drive number (1-8), and RETURN. DER can also be formatted instantly by pressing the RESET. You cannot use the DOS format command; you must use RESET as described above. Also you cannot use the DOS duplicate disk command; instead you use the COPY command. Turning off the power to the DER drive will lose all information stored there (as with any other RAM disk); you must remember to transfer the information to a disk before shutting off the power. Except for these few restrictions, the DER functions as any other disk drive except for its great increase in speed.

Speaking of speed, I decided to use a couple of DOS disk-drive speed-check tests to see what they would give me. I came out with about a three times increase in speed, which compares favorably with the manual's "Time Comparison Chart."

Along with the software on the included disk is a Translator, which transfers the operating system from a 400/800 ROM B operating system when the 400/800 is used as the DER to a XL/XE system, eliminating the need of a translator disk; and DER copy, which is a multifORMAT sector copy program that uses the extra memory and speed of the DER to reduce swapping of disks on single-drive systems.

Printer Buffer Routine

The *Printer Buffer Routine* (PBR) is indeed a great bargain. This hardware/software package allows the use of a second 8-bit Atari computer system to be used as a print buffer, allowing the main system to do double duty. The PBR package consists of the following: one modified joystick-extension cable, one cartridge and disk software package and a 14-page

manual on disk.


The first thing one notices upon opening the PBR package is the enclosed letter to the purchaser explaining how to print out the operator's manual from the disk to a printer. The manual consists of chapters that explain the system installation and operation, as well as a troubleshooting section and an appendix listing programs that are known to work with the PBR.

The PBR system is compatible with any 8-bit Atari system. The manual states that it makes no difference whether either one (main or PBR) is an XL or a 400/800. This is great, since many people consider the keyboard on the 800 to be the best in the 8-bit line.

The printer and printer interface (if needed) are connected to the print buffer. The disk drives are left connected to the main computer. The special joystick-extension cord is connected from joystick port #1 of the main computer to joystick port #1 of the second computer (printer buffer). The cartridge that comes with the PBR is inserted into the printer buffer.

There are several different versions of the PBR included with the package. The manual states that this is done to achieve compatibility with as much software as possible.

Some nice features included for use while printing are the ability to send a top-of-form command to the buffer to ensure that the printer will be positioned properly for the next document, the ability to completely erase the buffer by pressing the reset key on the buffer computer, and the ability to abort a transfer of data to the buffer by pressing the break key on the main computer.

I highly recommend these two packages to anyone with an 8-bit Atari system. If speed and efficiency are as important to you as they are to me, then these two products fit the bill. With the price of 8-bit computers as low as \$29 for the 400s, where else could you purchase a disk drive or printer buffer for that price? If you would like your computer to do double or even triple duty, get in touch with the folks at B. L. Enterprises—and tell them where you read about them. 

Jim Patterson is a former product support representative for Texas Instruments. He holds a degree in electro-mechanical engineering and is currently working toward a degree in computer science. He is a member of Phi Theta Kappa and the Data Processing Management Association. He has been an avid Atari user since 1981. (The author would like to gratefully acknowledge the assistance of Sherry Oakes in the preparation of this review.)

E N D . U S E R

by Arthur Leyenberger

It was a rainy Saturday afternoon. I had spent the morning doing some chores and running a few errands. I was now ready to embark on that continually postponed task of cleaning up the computer office. As I started to sort through what seemed like months of press releases, demo copies of games and partially written manuscripts, I came upon my collection of 8-bit game cartridges.

It has been a while since I earnestly played what I have always thought were excellent games for *any* computer. And now, with the Atari XE Game System having been sold in stores for almost a year, I decided to take another look at the "best" of 8-bit games. What I discovered surprised me.

Prologue

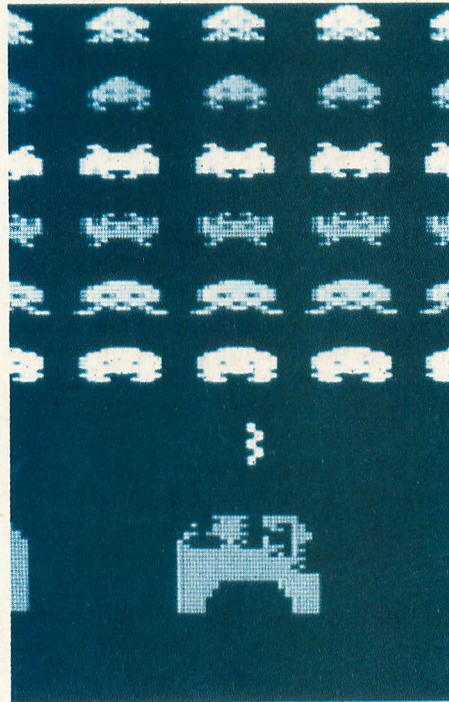
Most 8-bit Atari users who have been around since the XL days, or even before, are probably familiar with the majority of good games. The early to mid 1980s were the heyday of game software for the Atari. Companies such as Synapse, Broderbund, Electronic Arts, Sierra On-line, producing some excellent games for the Atari. And, believe it or not, Atari themselves were the leaders in game software by obtaining the rights and making cartridges of almost all of the popular arcade games of the time.

Many of these companies are gone now and the ones that remain don't publish 8-bit Atari games anymore. Many people say the Atari 8-bit software market is dead, and that may be true if you are an old-timer and happen to have every title that has ever been produced. But with the introduction of the Atari XE Game System, a lot of new users have been drawn into the Atari fold. For these new users there hardly seems to be a dearth of software. Instead, there appears to be a mind-boggling assortment of 8-bit games on disk and cartridge and selling for either normal or bargain basement prices.

It is for these new Atari users that I dedicate this month's column and present what I consider to be the some of the best 8-bit entertainment software.

I can't get no satisfaction

Sometime around 1983 or 1984, a couple years before the arrival of the Tramiels



Space Invaders

With the introduction of the Atari
XE Game System, a lot of
new users have been drawn
into the Atari fold.

Microprose, Datasoft, First Star, Big Five, Activision and a host of others were at Atari, the old Atari was going through some tough times. The 2600 game machine had by that time been available for about five years and the 800 computer was facing stiff competition from the then-cheaper Commodore 64. Atari needed a new hardware product upon which to sell additional software titles. What they introduced was the 5200 Game System.

At the time, many of us hard-core Atari users thought a more appropriate product would have been an 8-bit computer sans keyboard. This would have been basically a game player's machine that could use all of the existing 8-bit cartridges. It would also allow a keyboard

and disk drive to be attached to it, transforming the unit into a full-blown 8-bit computer. Game players could buy the machine and later trade up to a computer if they were so inclined.

Some of us felt strongly about it and wrote letters to Atari. There were articles in user group newsletters and some forward-thinking magazines shared our views and mentioned the idea in print. Atari was often known to shoot itself in the foot in those days. They introduced a similar product at the 1984 Summer Consumer Electronics Show in Chicago. What was it? A 7800-based computer system with keyboard and disk drive (or tape) add-on units. They dubbed it the Introductory Computer. These were the Alan Alda days.

Had Atari introduced the 8-bit game/computer system that I described, they could have called it...let's see...how about...the Atari XL Game System. Things might have been much different.

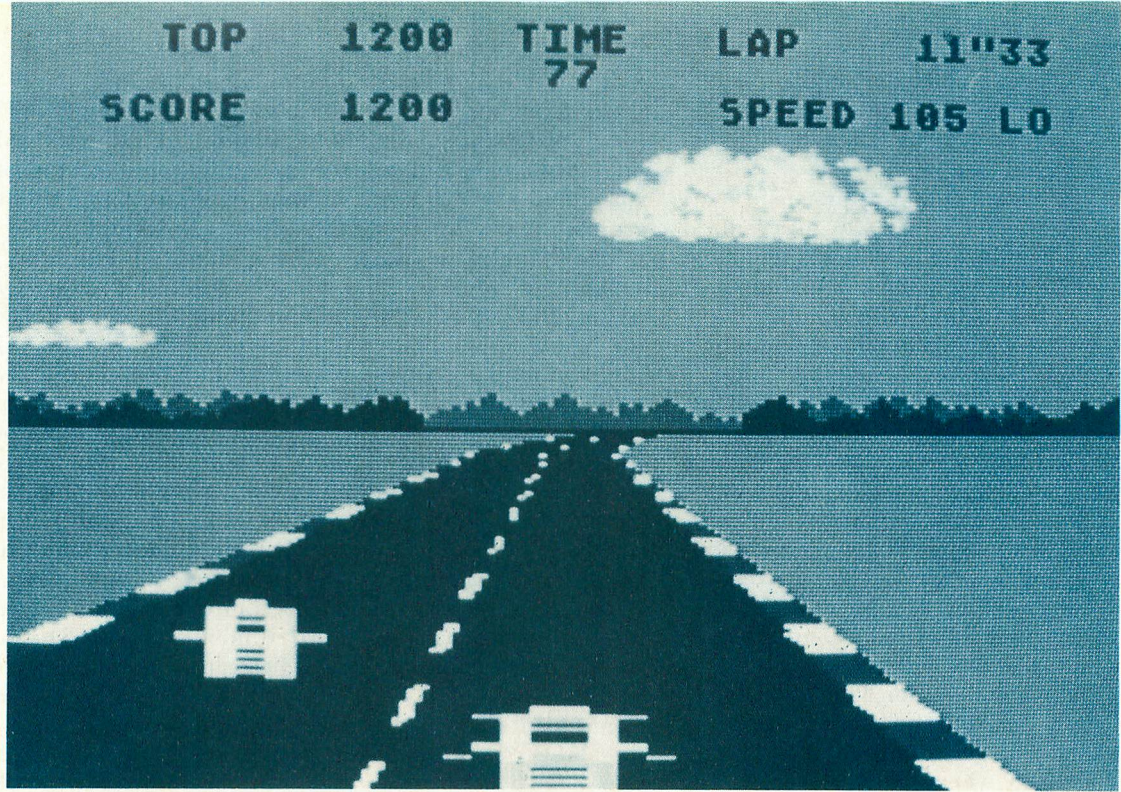
The games

I can't believe that anyone residing in North America in 1988 hasn't heard of *Pole Position*. But if you have just returned from a five-year tour on one of the outer worlds, I guess I can describe this game for you. It's a racing game. Not just any old racing game but *the* Atari racing game.

The first part of the game is to qualify for the big race. You have 73 seconds to complete the first lap, and your starting position for the actual race is determined by how well you complete the time trial. If you complete the lap in less than 58.5 seconds you earn the coveted "pole position" or first spot among eight cars.

A joystick is used to steer (left and right), shift gears (forward and back) and brake (button). The "Christmas tree" starting lights signal the beginning of the race and your goal is to complete the circuit in the shortest amount of time. Points are awarded for passing cars, and completing the circuit in the allotted time earns you 45 seconds of extended play. You gain additional time for each lap you complete and can race as long as you have remaining time. But taking a turn too fast will slow your time as you spin out or possibly worse, crash into another car or billboard and erupt into a big fireball.

The magic hasn't left. Pole Position is



Pole Position

one of Atari's best game cartridges then and now. This is one game that has to be part of your 8-bit or XEGS game collection.

Choplifter is a world-class game. It was when it first came out and it still is. Originally produced by Broderbund, *Choplifter* has a simple scenario. You pilot a helicopter from your home base (complete with an American flag waving in the breeze) across enemy lines and attempt to rescue hostages. During your flight you must avoid or engage tanks, enemy aircraft and heat-seeking missiles. Your defense consists of a machine gun, bombs and your flying skill.

There are two things that make *Choplifter* so engaging. One is the excellent simulation of helicopter flight coupled with a very intuitive joystick control arrangement. If only real helicopters were this easy to fly! Of course the graphics are excellent and support the verisimilitude of flying.

The other aspect of the game that continues to impress me is the open-ended nature of the game. You can either fight the enemy or simply fly a rescue mission. Three scores are kept: the number of hostages killed, the number rescued and the number currently in the chopper (a maximum of 16). Decisions must be made. Should you wait for one extra hostage to enter the chopper and risk the lives of the other 15? Or should you make a run for it? When you return the hostages to your home base, they wave as they get out of the chopper.

Choplifter, written by Dan Gorlin, re-

mains an excellent game and one of the all-time best games for the Atari computer. I had forgotten, but *Choplifter* has been around (initially on the Apple) since 1982. That's a long time for a video game.

If you were an Atari 2600 gamer in the early 1980s, you might remember the *Pacman* video game fiasco (not to be confused with the E.T. video game fiasco). Atari was so anxious to get *Pacman* out the door and into eager buyers hands that they did a less-than-spectacular job with the game. Frankly, it stunk. I remember buying the 2600 *Pacman* game and feeling ripped off. It didn't look like the arcade version, and most importantly, it didn't *play* like the arcade version.

Atari learned their lesson. The 8-bit computer version of *Pacman* was not rushed. And man, was it worth the wait! This game was the *real* thing. I'm embarrassed to admit how many hours I logged chasing (or being chased) by Pinky, et. al.

Anyway, the 8-bit *Pacman* cart should contain a printed warning on the side of it written by C. Everett Coop stating that this video game is addictive. No lie, it was when it first came out, it still is after all these years and I imagine it will be in another five years. If you don't own the 8-bit Atari *Pacman* game, you're excused from the table. Go out and buy it, play it for a dozen hours (oh, you *will*), then come back and finish reading this month's End User column.

I liked this one from the start. The start was the 1984 Winter Electronics where First Star Software first showed what the world now knows as a classic: *Boulder Dash*.

Boulder Dash has 16 screens or caves in which the player (Rockford) digs around walls of rock, searching for jewels. If enough jewels are collected within a given amount of time, an escape tunnel appears, and the player progresses to the next screen.

Each level of *Boulder Dash* takes place in a separate "cave" made up of several scrolling screens. The difficulty of each cave ranges from easy to very difficult, and the time is limited in each cave. Every four caves you get to play a "playable intermission." If you are successful on this screen, you are awarded an extra Rockford life.

In addition to dodging the falling boulders and diamonds, Rockford must avoid or destroy some other creatures. Fireflies are flashing objects that kill Rockford on contact or can be killed by dropping a boulder on them. Butterflies are similar to fireflies but turn into diamonds when killed. There are other obstacles as well, such as killer amoebas that eventually encompass an entire cave.

What makes *Boulder Dash* exceptional is what the company calls "Boulder Dash Physics." This is just a fancy term for the very realistic way that rocks and diamonds fall once Rockford has dug underneath them. There's more to this game, though. When Rockford is standing still, he impatiently taps his foot and blinks his eyes.

Boulder Dash has stood the test of time. Playing this game in 1988 is as exciting and challenging as it was in 1984. *Boulder Dash* is one of the all-time best video

games for the Atari computer.

How many of us old-timers had our patience tried waiting for *Donkey Kong* to make the transition from arcade to Atari screen? Yup, *that* many. In this game it seems that our hero, Mario, is separated from his girlfriend by an assortment of girders and ramps. Mario is at the bottom of the screen and his lady is being held captive by Donkey Kong.

Mario's goal is to climb a series of ladders in order to rescue his girlfriend at the top of the screen. Of course Donkey Kong attempts to interfere with Mario's progress by rolling barrels down the ramps which Mario can either jump over or smash. There are four screens, each increasing in difficulty. Moving elevators, conveyor belts and falling girders comprise the advanced screens.

There is no question about it—Donkey Kong by Atari is a fun game. After being around for over four years, it still seems as fresh as when I first played it. The graphics and animation are first-rate, and I had forgotten about the catchy tune. If you haven't played Donkey Kong, you're missing out on a barrel of fun.

When *Miner 2049er* by Big Five Software first arrived on the Atari scene, my recollection is that all work ceased for two days. This was so that every Atari owner could get in at least a dozen games. Really! The game was that addicting.

Miner 2049er is a jumping and climbing game which stars Bounty Bob. The race is against the clock as you move your player through the ten different mine levels. You must traverse all of the platforms in each level before you move on to the next, and each screen is more difficult than the last. Every level has its own unique hazards and challenges such as elevators, moving ramps, ladders, nuclear waste piles and much more. If you can manage to finish all ten screens, you start over again at a much faster pace.

As you might guess, this is one of those games that nearly prevented me from finishing this column. The game is still addicting as ever and very well done. The graphics are colorful, there is excellent play action, and the joystick control is responsive.

I've always thought that *Necromancer* by Synapse was a different sort of game. Not different as in bad, but different as in unusual, imaginative, strange! You play the part of Illuminar, a druid, and your first task is to create a forest of enchanted trees and protect them from the Troglodytes. As you plant new seedlings and the trees grow, the ogres try to stomp down the young trees. Ogres will not harm full-

grown trees, but the forest spider will bite them and turn them into useless stumps. Your goal is to grow as many trees as possible, which will aid you in your fight against the evil Necromancer.

The second screen occurs in the spider vaults. Here you must use your trees to destroy the spider larvae while avoiding the hands of fate that can destroy your player or trees. Also to be avoided are the deadly salivating spiders who hatch from the larvae. These nasties eat trees and spit poison. The third screen is the Necromancer's lair. Here you must destroy all of the Necromancer's graves while avoiding the zombie spiders that have been reincarnated from the previous screen. Also, you have to watch out for the mother spider who will turn zombie spiders into immortal spiders which cannot be killed.

Few games match the originality and playability of *Necromancer*. Its combination of fantasy and action result in a well-conceived and beautifully implemented game. The music that accompanies each screen is both eerie and pretty. I still like it, and it's a shame that Tramiel's Atari put Synapse out of business. Just think what Synapse would be creating for the ST.

Qix is one of those games that is different. It really doesn't fit neatly into any category. It could be called a drawing game, but that would sound incredibly boring and not do it justice. When I first encountered *Qix* in the arcade several years ago, I instantly became hooked on it. I just couldn't wait for the 8-bit cartridge to arrive and when it did, I must have played the game for months.

The object of *Qix* is to make boxes by drawing lines vertically and horizontally on the screen. Once a new box is formed by connecting up to four lines, it gets shaded in either red or blue, depending upon which of the two drawing speeds were used to make the box. Red is for the slow speed and is worth twice the amount of points as blue boxes, the faster, easier speed. Once you have covered 75 percent of the screen with shaded boxes, the game moves on to a quicker screen. The end of the line that you draw with is called the marker, and you have only three markers when you start the game.

The difficulty of the game comes from the three distinct and tenacious "enemies." The *QIX* is a whirling opponent that roams the empty part of the screen and which will destroy your box and eliminate a marker if it touches your line before you complete a box. There can be as many as eight SPARXs at one time, which can eliminate your box if it cross-

es your line. The third opponent is the FUSE which will ignite the second you stop moving and follow along your line. If it touches your marker, you lose the marker.

It has been at least two years since I have played *Qix*, and I wasn't sure if it would still hold my interest or be challenging. All I need tell you is that there were several of the games mentioned in this column that almost prevented me from meeting my deadline. *Qix* was one of those games. It still is as challenging, fresh and fun as I had remembered and, an enjoyable way to spend some time. Like many excellent games though, it can be very addicting.

When I inserted the *Space Invaders* cart into my 8-bitter I thought that I would be disappointed. It *has* been several years since I even thought about this game, let alone played it. You can guess the result. Although *Space Invaders* is a "blast from the past," it still is quite satisfying to fire at the alien creatures. However, I still prefer the 2600 game version of *Space Invaders*, perhaps because it was the first video game I ever played.

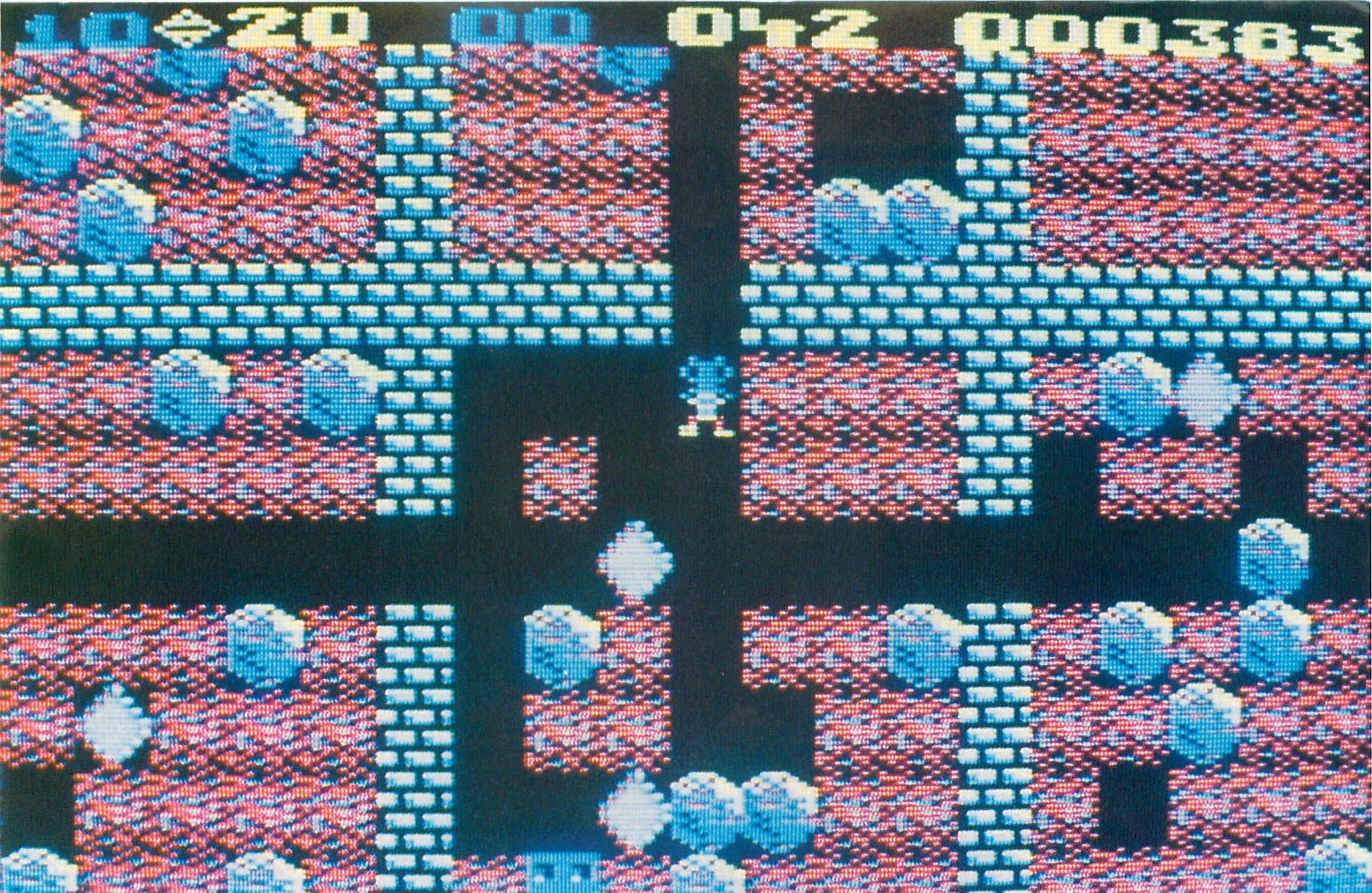
I don't have space in this month's column to include all of the games I really should for a complete unabridged list of top games. In brief, *Missile Command* is still a clever and challenging game. Simple graphics, easy plot—but great game play. *Star Raiders* is the game that sold me on buying an Atari 8-bit computer back in 1982. If you have never played it, shame on you. You owe it to yourself to have and play this game. It looks good on a resume, too.

As far as playability goes, one of the best shoot-'em-up games is *Astrochase* from First Star Software. It's got excellent graphics and smooth scrolling (that still amaze me) and super player control. It was advertised almost six months before it was available, but it was worth the wait. Finally, one of the most *fun* games is *Frogger*. Great graphics, excellent sound effects and a catchy tune so hummable that I often find myself humming it at the office.

Where did the time go?

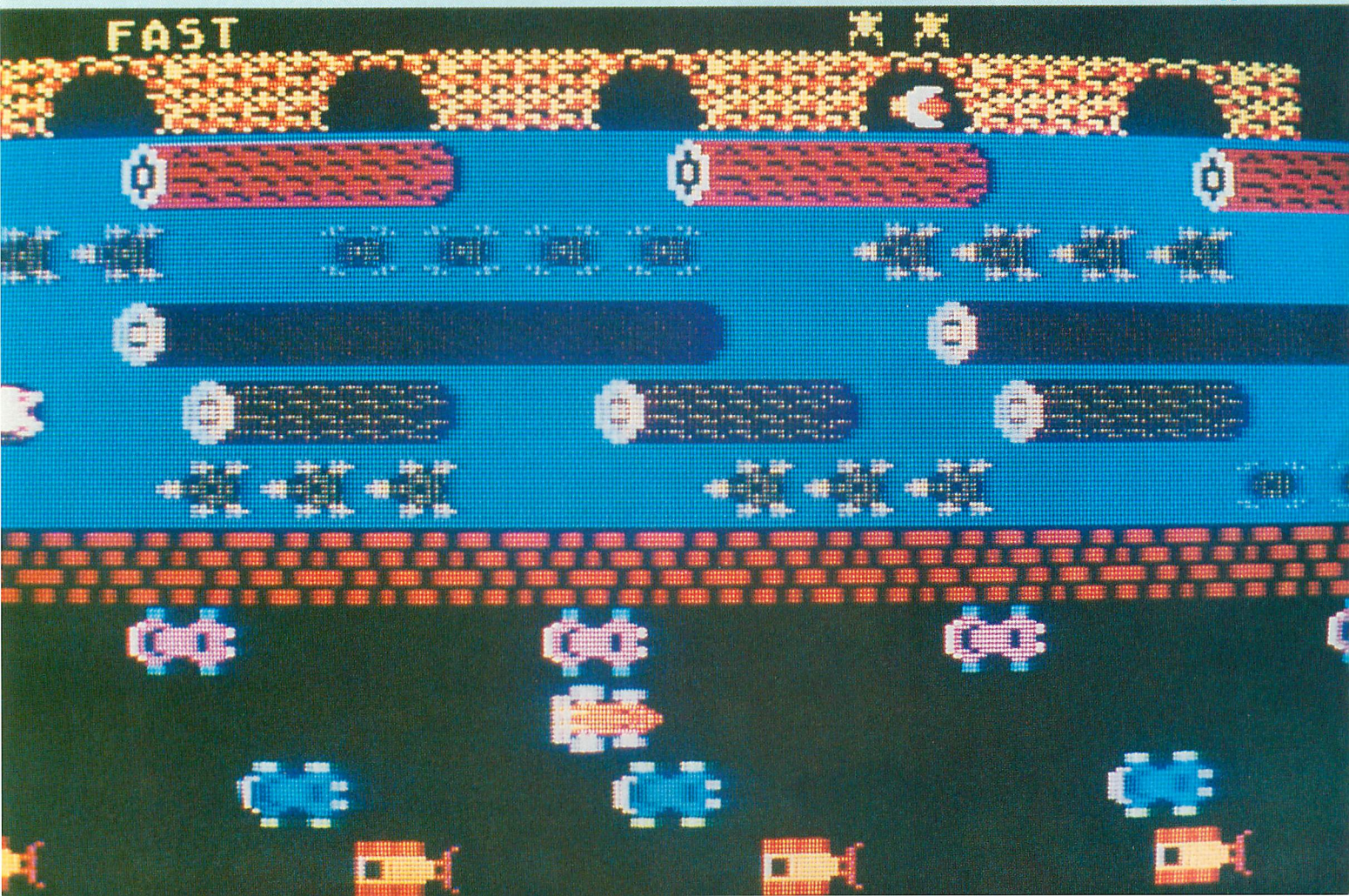
Guess what? The office didn't get cleaned up. It still takes me a half-hour to find a particular program or half-finished column. But I sure had a lot of fun playing these computer games for the last several hours, and I know you will too. Whether you just got an Atari XE computer or the XE Game System, just about any of the games I described will entertain you for hours.

Now, where did I put that disk . . . ?



Boulderdash

Frogger



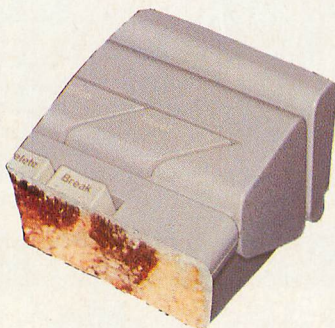
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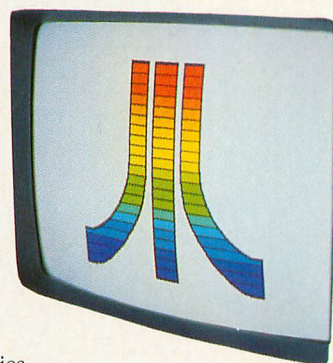
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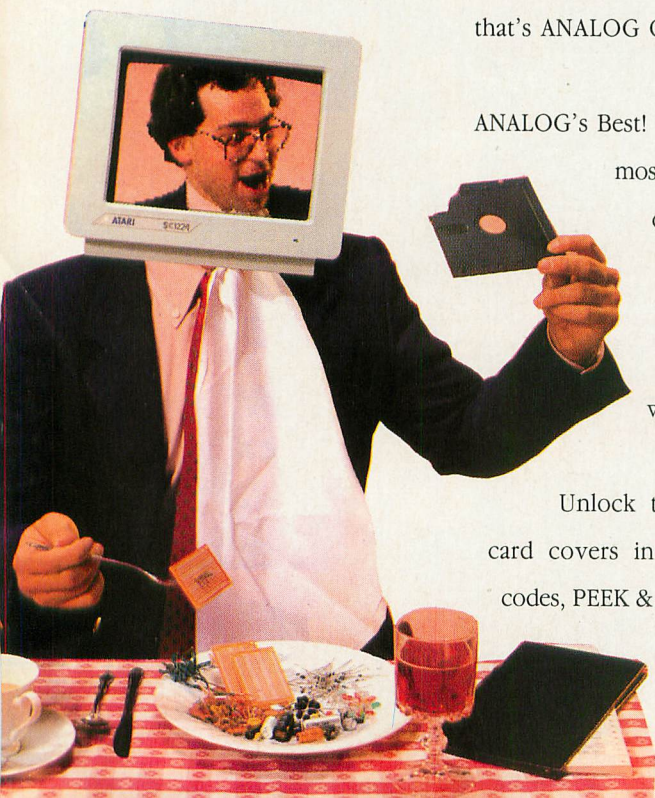
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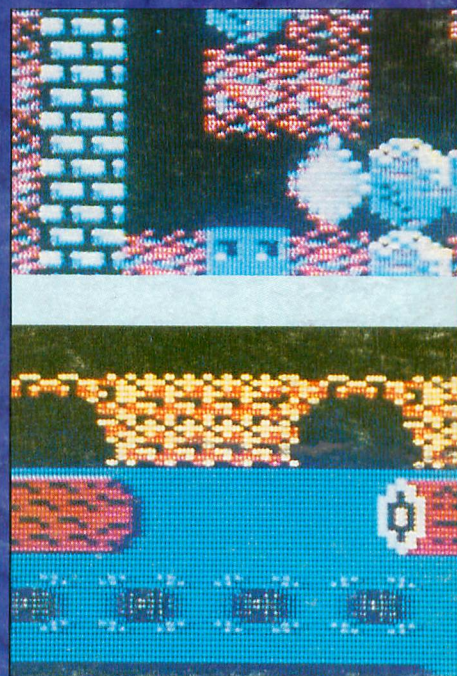
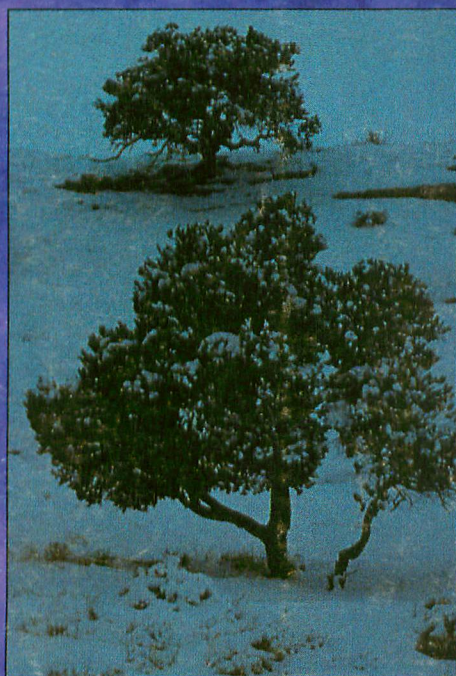
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