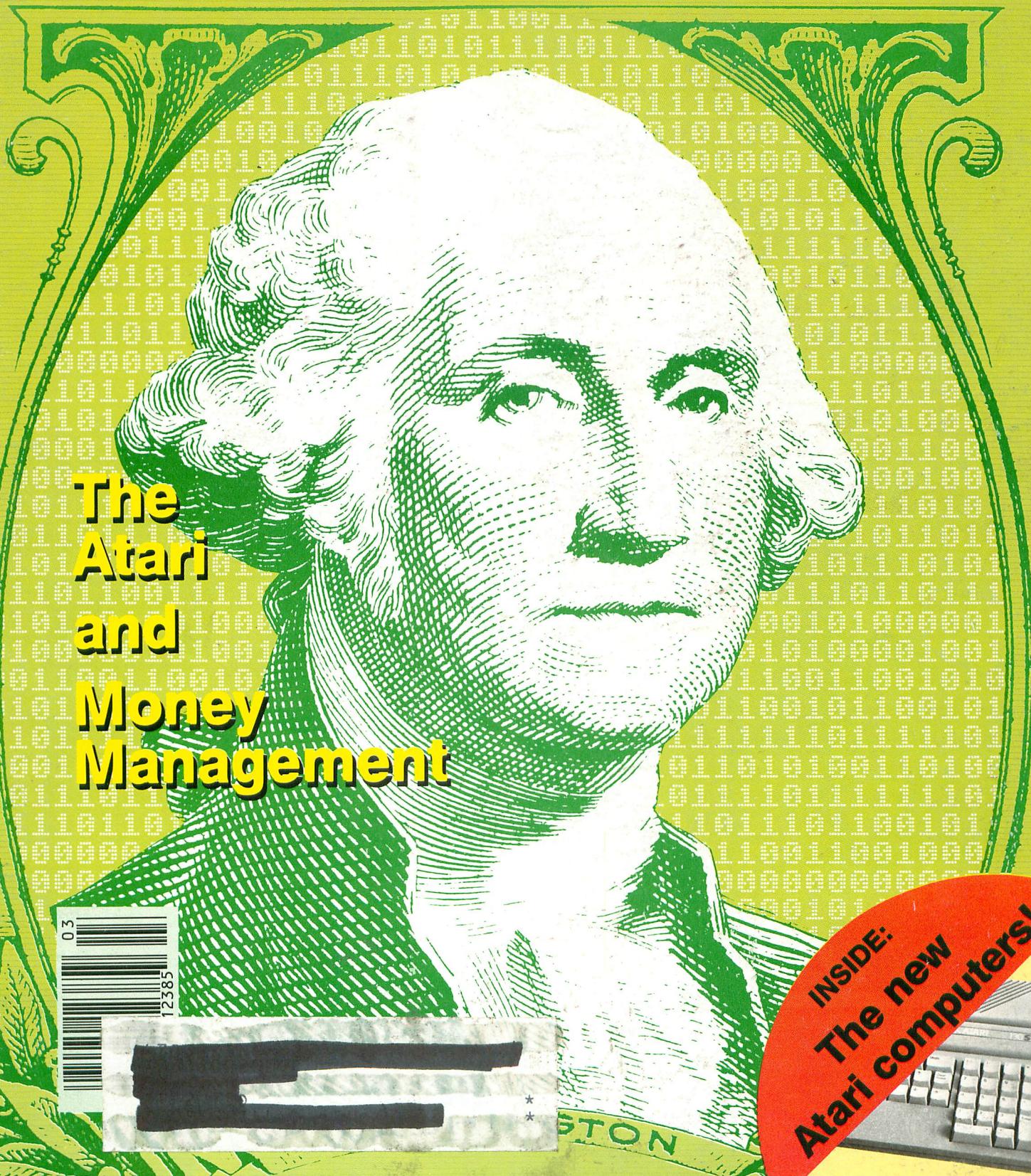


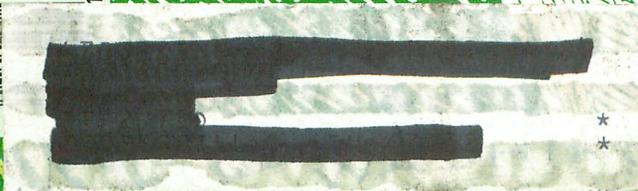
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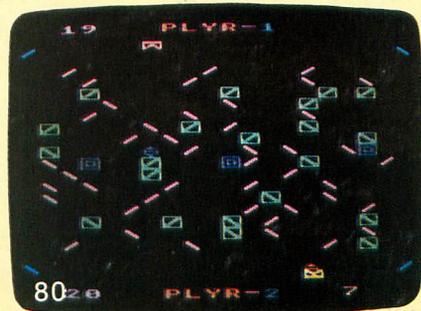
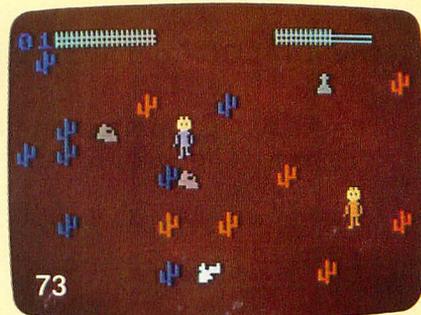
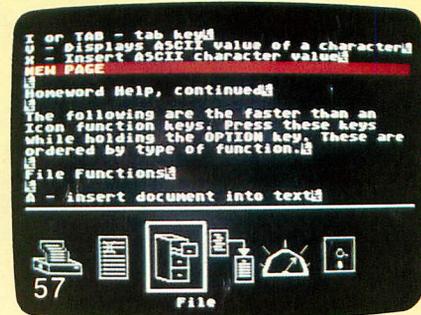
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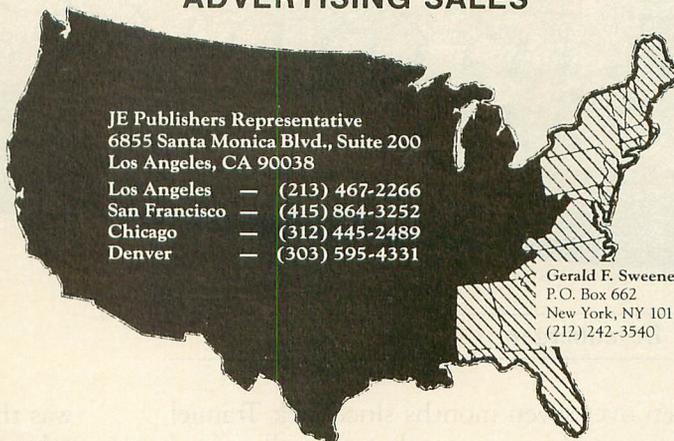
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The Atari 130ST,
a 16-bit, 68000-based computer.

by Arthur Leyenberger

It has been over seven months since Jack Tramiel and clan took over the company that we're all so fond of. Almost complete secrecy surrounded what Jack, his three sons and a host of ex-Commodore executives had been planning. No doubt, the lack of *any* information was frustrating for the loyal Atari user.

In case you've just returned from intergalactic travel or have been otherwise unaware of the ongoing Atari news, here is a short review of the events leading up to the most significant Atari announcement since the 400/800 computers were first introduced in 1979. For those of you who have been following these events, please bear with me—the news is worth waiting an extra paragraph or two.

A brief history.

Shortly after the June CES, founder/former head of Commodore International Corporation, Jack Tramiel, bought Atari from Warner Communications. In the deal, Warner virtually gave away the current inventory and became partners with their ex-rival. If Atari did well, so would Warner Communications.

The only news that was issued by Atari at the time

was that Jack Tramiel would make Atari financially solvent—and the number one computer company (*for low end machines?*—Ed.) by the end of 1985. Some vague references to being in the computer business, not the game business, were also mentioned.

Atari's introduction of their new line of computers and peripherals at the Winter CES in Las Vegas was the first product news to be released by the company. As you'll see, it's been well worth the wait.

The new computers.

Two computer lines were unveiled by Atari in Las Vegas. The XE series is basically the next "XL" generation of machines. They're reported to be completely compatible with existing hardware and software, and have been totally redesigned.

The ST (designating Sixteen/Thirty-two bit) line is what most of us have been waiting for. A 16-bit Motorola MC68000 microprocessor drives the two computers in the series. These two machines use Digital Research's Graphics Environment Manager (GEM), which allows a powerful, easy-to-use, interface like that of the Apple MacIntosh to be the computer's

“front end.” The ST “Jackintosh” machines are packaged in low profile, sleek-looking cases, similar to the Apple IIc and the new Commodore 128 computers.

XE series.

The new 65XE computer is the replacement for the 800XL. It contains 65.5 bytes of RAM, 11 graphics modes, 256 colors, 4 independent sound voices and built-in BASIC. The 65XEM computer is a 65XE with the addition of 8 independent voices and changeable music features. This “music machine” allows the user to control such features as sound duration, pitch, frequency, envelope and attack/decay attributes.

The 65XEP is Atari's portable computer. It has a built-in 5-inch monochrome monitor capable of displaying 40 columns of text, a built-in 3½-inch disk drive, 64K bytes of RAM and a shoulder strap. The 65XEP is not really a portable, in the sense that it more resembles a small Kaypro, Compaq or other box-like, “luggage” machine, rather than a true portable, such as the Radio Shack Model 100 or Epson PX-7.

The fourth XE computer is the XE130, a 128K version of the 65XE. The XE computers are priced as follows: 65XE - under \$120; 65XEM - under \$200; 65XEP - under \$400; and 130XE - under \$200. The 65XE and 130XE computers have the cartridge slot in the back of the machine. At press time, it was not known if the parallel bus (like that on the 600 and 800XLs) would be included on the 8-bit machines. Only two joystick ports are to be found on the machines. They are attractively styled in an off-white, low profile design.

The Atari 130XE computer also has a MIDI music interface. MIDI stands for Musical Instrument Digital Interface and is a hardware/software interface for I/O control of musical instruments. It allows digital data communication between a computer acting as a controller and a musical instrument, such as a synthesizer.

In addition to the new XE computers, Atari also announced new monitors, printers, modems and disk drives. Peripherals for the XE family are 100 percent compatible with the 400, 800, 600XL, 800XL and 1200XL computers. According to Sam Tramiel, President, “Atari Corp. is fully committed to supplying the consumer with powerful and quality peripherals at rock bottom prices.”

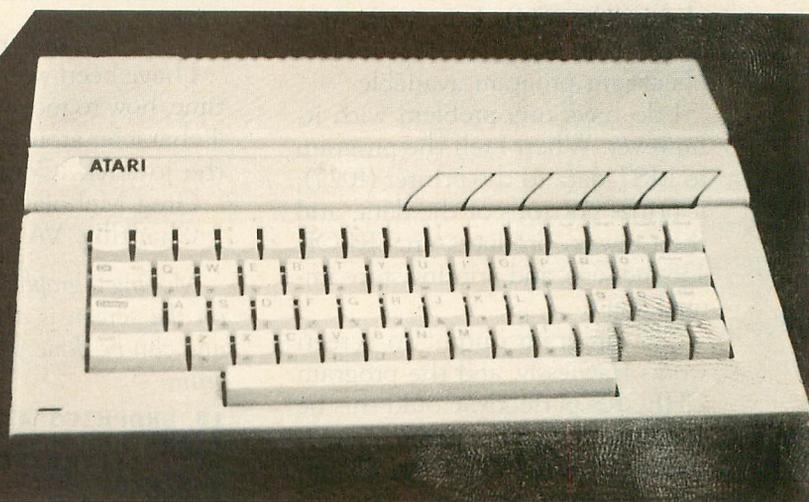
The XE peripherals consist of the following: XTM 201 - dot matrix, non-impact, 20-character/second (cps) printer, under \$100; XTC 201 - dot matrix, color 20-cps printer, under \$100; XMM 801 - dot matrix, 80-cps impact printer, under \$200; and XDM 121 - 12-cps daisy wheel, letter quality printer, similar to the Silver-Reed 400, under \$200. Currently, the 1050

disk drive is still available, but it will be repackaged into a color-matched, low profile design.

There will be two monitors available for the XE family. The XC 141 is a 14-inch color composite monitor, which will probably sell for under \$300. The XM 128 is a 12-inch 80-column monochrome monitor, which will sell for under \$100. A 300 baud, direct connect modem will be sold for the XE computers. It is called the XM 301 and will sell for under \$50.

ST series.

Atari's truly new machines are the powerful and fast (8 MHz) 130ST and 520ST. The two computers are



The Atari 65XE, the 8-bit 800XL replacement.

identical, except that the 520ST has 524 bytes of RAM instead of 131K bytes. Sleek and low, the STs include special-function keys as well as a numeric keypad. They're priced at under \$400 and under \$600, respectively. There is also, reportedly, a 260ST with 256K bytes of RAM for \$499.

The ST computers use the 16/32-bit MC68000 microprocessor and allow the use of any of 512 colors on their 32K bit-mapped screens. A choice of either 320x200 pixel, 640x200 pixel or 640x400 pixel modes are available. The graphic modes offer 16-color, 4-color and monochrome (1-color) choices, respectively. The STs are said to have RGB, composite color, RF color and high resolution monochrome video output signals. A two-button mouse can also be used with these machines.

Atari ST computers use Digital Research's GEM and GEM desktop operating system software (contained, along with BASIC and—maybe—Logo, in 192K of ROM). The desktop metaphor eliminates the need for the use of operating system commands. Instead, GEM uses icons, pull-down menus, windows and a mouse, to allow user control of the computing environment.

Both ST computers use a 3½-inch disk drive. Two types of disk drives will become available. The SF 354, a 500K separate disk drive, will sell for under \$150. There will also be a disk drive/monitor stand. This peripheral is meant to support the SC 1224 monitor and has a 3½-inch disk drive built into the base.

(continued on page 35)

READER COMMENT

Unicheck-ing.

I'd like to commend Mr. Hudson on the fantastic job he did with his newest checksum program, **Unicheck** (issue 24). It is, without a doubt, the easiest, most up-to-date checksum program available.

I do have one problem with it, however. When I tell the program to LIST data to the printer (1027), it prints portions of the data, and then always produces an ERROR 138 message, and printing stops immediately.

The program output to screen works flawlessly, and the program CHECKS perfectly. Could this be due to compatibility problems with the new 1027? I would greatly appreciate any help you can provide.

Sincerely,

Scott D. Kamp
Birmingham, MI

Slower printers, such as the 1027 and 1020 plotter, require longer timeout values than I allowed for in the original **Unicheck** program. If you have one of these printers and want to patch **Unicheck** so that it will work with them, make the following changes to the BASIC program:

```
45 GOTO 170
1030 DATA 27A9209D00001CA10
FAA99B8D260160ADF006850AAD
F106850BADF206850CADF30685
0D4C74E440015780000130,596
```

Note that the only characters to be changed in Line 1030 are the last 2 bytes of the hexadecimal values, which have been changed from 05 to 30.

When the revised BASIC program is RUN, it will ask for an output device, then create the cassette or disk version of **Unicheck**, without checking the DATA values. For this reason, you should be sure that the program worked before making the changes, then double-check Line 1030 to verify that everything is okay.

After the program is finished, the updated **Unicheck** is ready to go.

—T.H.

Joystick movers.

I have been wondering, for some time, how to move a graphics mode 4 character around the screen with the joystick. Could you help?

Greg Mehojah
Chantilly, VA

Moving a graphics 4 block around on the screen is actually very easy, and can be done with this short program:

```
10 GRAPHICS 4:DIM JX(15),J
Y(15):FOR I=5 TO 15:READ X
,Y:JX(I)=X:JY(I)=Y:NEXT I:
REM READ JOYSTICK DATA
20 DATA 1,1,1,-1,1,0,0,-
1,1,-1,-1,-1,0,0,0,1,0,-
1,0,0
30 PX=40:PY=20:REM INITIAL
POSITION
40 COLOR 1:PLOT PX,PY:5=ST
ICK(0):IF 5=15 THEN 40
50 COLOR 0:PLOT PX,PY:REM
ERASE OLD POSITION
60 PX=PX+JX(5):PY=PY+JY(5)
:REM MOVE DOT
70 IF PX>79 THEN PX=0:REM
SCREEN LIMITS
80 IF PX<0 THEN PX=79
90 IF PY>39 THEN PY=0
100 IF PY<0 THEN PY=39
110 GOTO 40
```

As written, the program will move only the block, erasing the old position each time the block moves. By removing Line 50, which erases the old position, you can draw lines on your TV screen.

This program can be modified to work in any graphics mode by changing the values in Lines 70-100 to correspond to the screen limits of the graphics mode you want to use.

—T.H.

XL/1027 delays.

When I attempt to print out any manuscripts prepared on my Atari 800XL with a 1027 printer, using

AtariWriter, a truly exasperating thing happens. . . Every once in a while, at unpredictable intervals, the printer goes "dead" for exactly 4 minutes, then resumes printing.

This has happened as often as three times a page. The 1027 not being the fastest printer to start with, a page of text can take 15 or 20 minutes to print!

Several calls to Atari (before the toll-free number was discontinued) brought an interesting variety of conflicting responses. Can anyone give me the straight dope on what's going on here?

Thank you.

Ben Poehland
Philadelphia, PA

Apparently, the reason for the delay lies, not in the **AtariWriter**, but in the XL Operating System. Originally, the delay was set up in the 400/800 OS in order to allow the print heads on Atari printers to cool down during long printing sessions. The routine had a bug, however, and was removed from the Revision B OS.

When the XL series appeared, the folks at Atari put the delay back in, with all bugs removed, possibly to allow the 1027's print mechanism to cool. This is not a bug, but a safety feature intentionally placed in the XL series.

If you don't like the delay, the **XL BOSS** (which we reviewed in issue 25) should take care of the problem.

—T.H.

U-Print U-Pdate.

Thank you for the excellent review of the **U-Print** parallel printer interface for the Atari computers. There are, however, several points which were incorrectly stated due to a lack of communications on our behalf.

The **U-Print** model A has a retail price of \$89.95 but has no provisions for internal buffer memory. The new **U-Print** model A0 retails for \$99.95 with no memory, but it can be expanded to 64K.

U-Print model A16 with 16K of memory retails for \$119.95 and not \$89.95 as mentioned in the review. Model A32 with 32K of memory is \$139.95, and model A64 with a full 64K retails for \$179.95.

The **U-Print's** other features—multiple copies up to 255, reset or clear memory button, extra I/O connector for daisy chaining, extra long cable, and user upgradeable memory—are still standard.

Please accept our apologies for the inaccuracies in the review, but, since this was a new product and we rushed to meet your deadline, problems were bound to arise.

Digital Devices is committed to providing Atari computer owners with quality products at reasonable prices. We appreciate your support, and as the new Atari Corporation springs back to life, we are all looking forward to a prosperous 1985.

Best regards,
Charles Frazier
Digital Devices, Atlanta, GA

More palette magic.

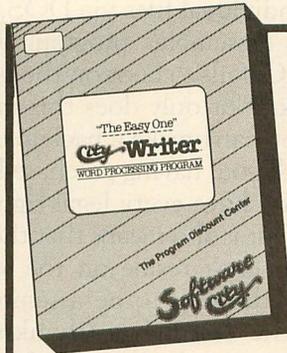
First, I would like to congratulate you on a "first class" magazine. It's really great! Second, I really enjoyed the **Magic Palette** program, but have made it even better.

Graphics mode 9 or 11 are good, but if you enter or change the program to graphics mode 30 or 31, you only get half a screen—but the pictures are much better.

If I am correct, graphics modes 14 (full screen) and 15 (full screen) are available only on the new XL computers (600XL must have memory expansion).

The following are the additional lines needed:

```
50 ? "ENTER GRAPHICS MODE
PLEASE"
55 ? :? "1) SINGLE COLOR (
ENTER 9)"
60 ? :? "2) MULT. COLOR (E
NTER 11)"
65 ? :? "3) MED. RESOLUTIO
N (ENTER 30 OR 31)"
```



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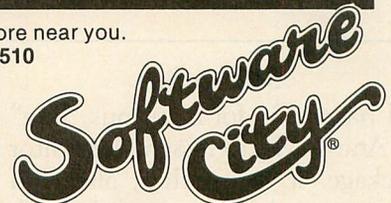
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70 INPUT AZ1

Change Line 240 to read:

```
240 GRAPHICS AZ1:FOR I=0 T
O 30:COLOR I/2:PLOT I,0:DR
AWTO I,10:NEXT I:COLOR 7:P
LOT 0,10:DRAWTO 79,10
```

Jim Kelly
Snellville, GA

Creator/Animator fix.

I would like to submit a minor fix to one of your magazine's programs. The article was published in issue 23, October 1984, on page 33, titled **P/M Creator/Animator**.

A small machine language routine makes an illegal call to the OS EOUTCH (Editor OUT CHAracter). The following BASIC line added to the program will determine the proper vector for the routine and enable it to function on all computers, including XLs.

```
20030 REM MODIFY ML
20035 POKE 1630,PEEK(58374)
)+1:POKE 1631,PEEK(58375)
```

I hope I've been of some assistance to ANALOG Computing readers.

Dwight Stanley
Brantford, Ontario, Canada

No-Frills with BASIC XL.

I recently typed in the nice, little **No-Frills Alternate Cursor** program by Tom Hudson from issue 23, and was surprised to find that it runs just fine with Atari BASIC, but won't run with OSS BASIC XL.

It initializes all right, but pressing the RESET button to activate the new cursor gets rid of the cursor altogether—similar to doing a POKE 752,1, except there is no way of getting the cursor back.

Is there a "no-frills" way of getting it to work with BASIC XL?

Sincerely,
Bob deWitt
Provo, UT

```
1 REM *****
2 REM *
3 REM * NO-FRILLS CURSOR *
4 REM * FOR BASIC-XL *
5 REM * TOM HUDSON *
6 REM * ANALOG COMPUTING *
7 REM *
8 REM *****
10 FOR X=256 TO 364:READ N
:POKE X,N:NEXT X:POKE 289,
PEEK(12):POKE 290,PEEK(13)
:POKE 12,0:POKE 13,1
20 ? "PRESS RESET TO INST
ALL CURSOR":NEW
```

```

1000 DATA 169,1,133,13,169
,0,133,12,169,0,141,7,212,
169,1,141,111,2,162,1,160,
35,169,7,32,92,228,169
1010 DATA 58,141,47,2,76,0
,0,216,169,2,141,29,208,16
9,1,141,240,2,169,58,141,4
7,2,169,0,170,157,0
1020 DATA 6,202,208,250,16
5,85,10,10,24,105,48,141,2
,208,165,84,10,10,10,24,10
5,39,168,169,240,153,0
1030 DATA 6,238,109,1,173,
109,1,74,74,74,41,1,208,4,
169,15,208,2,169,0,141,194
,2,76,98,228

```

BASIC XL likes to turn off player/missile graphics as part of its initialization process and whenever it encounters (ouch!) an END statement.

This can be easily fixed by simply rearranging the machine code to allow it to work with BASIC XL, as well as regular Atari BASIC.

—C.B.

Macro fix.

I have a fix for a curious "bug" in Atari's Macro Assembler/Editor package. It seems that, although you can make a copy of the disk

or of individual files via DOS, the Macro Assembler program itself (AMAC) fails to boot on the backup disk. Not only does this mean that you can't make a backup copy—which you, having purchased the software, have every legal right to own—but it also means that the assembler can't reside on the same disk as the files to be assembled, since the original is (thankfully) write-protected. As a result, you have to reinsert the master disk every time you do an assembly. . . which just increases the chances of damage to the original. This situation is clearly unacceptable. Fortunately, there is a solution.

The following one-line program will correct this "bug" in the assembler program, allowing it to run correctly, even on other disks. Simply use DOS to copy the AMAC file to a backup disk. Then run the following program (you can also execute it directly, by carefully typing it in without the line number):

```

10 OPEN #1,12,0,"D:AMAC":F
OR I=1 TO 8:GET #1,A:NEXT
I:PUT #1,208:PUT #1,34:END

```

This changes 2 bytes in the duplicated program, allowing it to run normally. Of course, this should only be used to make legitimate backup copies for your personal use.

Sincerely,
James A. Tunncliffe
Anaheim, CA

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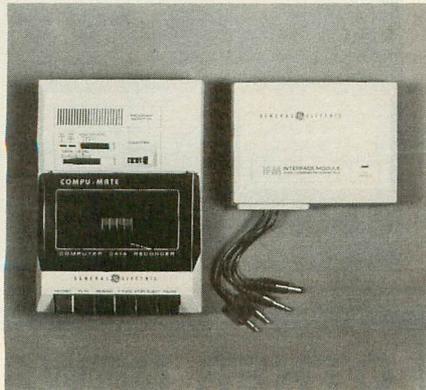
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NEW PRODUCTS

IMPRESSIVE DATARECORDER FROM GENERAL ELECTRIC

GE's model 3-5156 is designed to operate with many personal computers, and specifically with the Atari (and Commodore) line. The **Compu-Mate** is comprised of two modules that inter-connect—the recorder and the interface to which the Atari-type connectors attach.

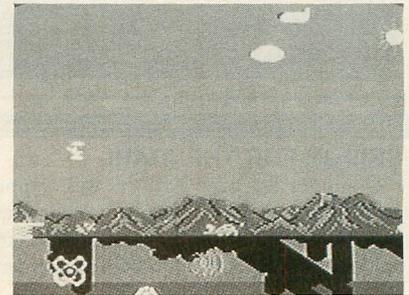


Other features include a tape counter and a recording LED, which indicates signal intensity. A data level slide switch allows for precise adjustment of volume, and a built-in speaker lets you listen to the tape to easily locate multiple programs on a single tape.

Includes Atari I/O cable, AC adapter and Atari-specific instructions, \$45.00 to \$60.00. For information, contact General Electric Co., Syracuse, NY 13221 — (800) 626-2000.

SOD BOMBS AWAY

Imagic's latest arcade-style game, **Chopper Hunt**, will test your reflexes and daring to the limit, as you pilot your 'copter and blow away earth in search of buried treasure. Use your missiles and bombs to assault the ground and protect yourself from the "dirt bombs" dropped from aircraft passing overhead.



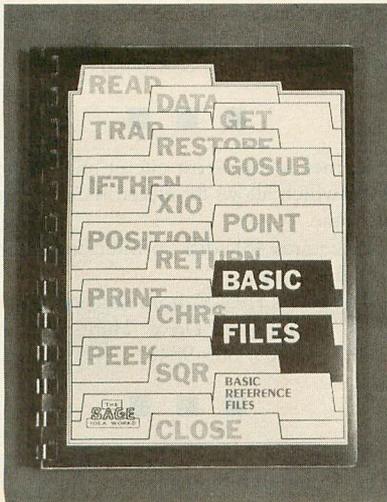
As you progress through the 99 levels, you'll encounter higher elevations, water deposits and portable enemy missile launchers. Your onboard supply of firepower is limited, so frequent runs back to your landing pad will be necessary.

Written by ANALOG Computing's Tom Hudson for Atari/Commodore, 48K disk, \$19.95 from Imagic, 981 University Avenue, Los Gatos, CA 95030 — (800) 654-7340.

Diablo 620
Panasonic 109
NEC 8023A
Gemini 10 & 10X
BMC PB 401
Silver Reed 770

BASIC INTELLIGENCE

BASIC Reference Files emphasizes diagrams in presenting its BASIC "how to" information. The book was written by a once-upon-a-time beginner who had been through the wringer a few too many times.



Designed in a "logical manner with subjects grouped together," the reference book is written for the Atari, DOS 2.0S and single-density drives, but most of its information will benefit all Atari BASIC users.

Chapters cover BASIC anatomy, special effects (colors, borders, flashing colors), helpers (NEW, REM, STOP, etc.), FOR/NEXT loops, PEEKing, POKEing, READ/DATA routines and calculations.

Written by Dennis Ashley, spiral bound, 115 pages, \$9.95 + \$1.50 p&h, The SAGE Idea Works, 112 Retriever Lane, Summerville, SC 29483 — (803) 871-7579.

ATARIWRITER PRINTER/DRIVERS STILL AVAILABLE

Gary Furr, the designer of **AtariWriter**, wrote and sold a set of routines that allowed the word processor to work with various non-Atari printers. Previously sold through the Atari Program Exchange, they are now available directly from Gary, with documentation.

Supported are the following printers:

Atari 1020 & 1027
IDS-480 Microprism
EPSON MX-80/100
EPSON RX-80/100
EPSON FX-80/100
C.Itoh ProWriter 8510
Okidata 80, 82/83, 84, 82/93
Mannesmann Tally Spirit-80
Mannesmann Tally 160/180L

Cost is \$10.00 (cashier's check or money order) from Gary W. Furr, P.O. Box 1073, Mountain View, CA 94042. Specify which driver you require.

ROBOT PLOTTER

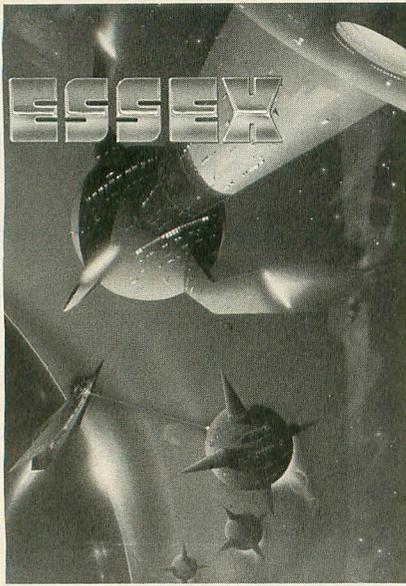
The **Penman** plotter from Axiom offers a new twist—it "drives" over a stationary, flat paper surface, rather than have the paper do the moving. Any paper up to 3 feet by 3 feet is suitable for this three-pen plotter's use.

The **Penman** connects to an RS-232 serial interface, and consists of a main control module which remains fixed and attaches to the plotter via a ribbon cable. The plotter itself is just 4 inches square.

Any number of colors can be used, three colors at a time. A built-in character set can be accessed for printing down to 1mm in height, and the full range of geometric shapes (circles, arcs and lines) can be drawn.

Price is \$399.00, from Axiom, 1014 Griswold Avenue, San Fernando, CA 91340 — (213) 365-9521.





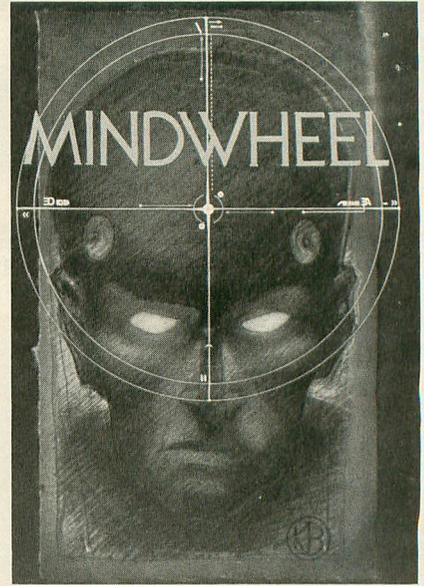
ELECTRIC NOVELS FROM SYNAPSE

Synapse Software has announced a series of adventure-type programs, packaged in hard-bound book form. All relevant information (the storyline and characters) is introduced early on in the "journey," then your task is to finish them, using the floppy disk furnished in the back of the book.

Blank pages are bound into the novel for notes or mapping. A new "parser" developed by Synapse allows the user to "talk" to the computer in far more than just two-word sentences. **Mindwheel** is the first novel, about a trip into the minds of four deceased people of extraordinary power. **Essex** deals with an intergalactic search and rescue.

Other titles to follow will include: **Robin**, a samurai adventure; **Breakers**, a science fiction story on the planet Borg, and **Brimstone**, a medieval story. **Mindwheel** and **Essex** will be shipped immediately, and the rest in mid-spring.

Priced at \$39.95 each, disk. Synapse Software, 521 Central Avenue, Richmond, CA 94804 — (415) 527-7751.



BRIDGE FOR THE ATARI

Compubridge from Artworx was compiled from Shirley Silverman's text, "Five Card Major Bridge Teacher's Manual." The computer generates an infinite number of random practice hands, corresponding to the ten chapters in the enclosed text.

Compubridge will evaluate your actions while correcting your errors and any weak moves, then suggests alternate strategies.

The program and text begin at the early stages, for novice players, but gets involved enough so that an experienced player may benefit from the program. Artworx also offers **Bridge 4.0**, a full bridge-playing game.

Cost is \$29.95 for the disk, 48K required.

Artworx Software Co., 150 North Main Street, Fairport, NY 14450 — (800) 828-6573.



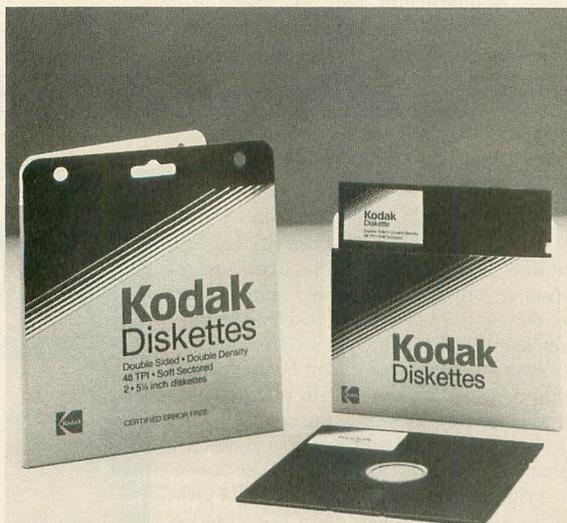
KODAK EXPANDS INTO MAGNETIC DISK LINE

Moving into the floppy disk market, Kodak now offers a full range of diskettes, including 5¼-inch, single-sided/double density and double-sided/single density—both compatible with any Atari-type disk drive.

The 5¼-inch disks come in packages of ten to a box for \$38.50 (retail price for single-sided/double density) and \$48.50 (retail price for double-sided/double density). They're available in "two packs," too—slim, two-disk packages for the home users of personal computers.

Kodak also has 3½-inch disks on the market, for the soon-to-be-released 16/32-bit Atari computers. Ten of these smaller disks per box retail at \$32.50.

Available from the **Eastman Kodak Company**, Rochester, NY 14650, or look for the familiar "yellow box" Kodak packaging at your computer store.



OTHER NEWS

Micro-Gram, an educational line from Random House, offers several new titles, including **Word Blaster**, **Galaxy Math Facts** and **Grand Prix**.

All require 48K and are packaged with up to seven disks.

Prices range from \$150.00 to \$174.00. Contact Random House School Division, Dept. 9305, 400 Hahn Road, Westminster, MD 21157 — (800) 638-6460.



Kaznet is a low-cost circuit analysis program which allows for electronic designing at home.

It requires 48K disk, printer and Microsoft BASIC II.

The cost is \$195.00, from Kaznet Software, 1917 W. Tuliptree Drive, Huntsville, AL 35803 — (205) 883-9840.



Morsecode Master, **Music Player** and **The Computer Gourmet** are among the latest Atari-compatible software packages from New Horizons.

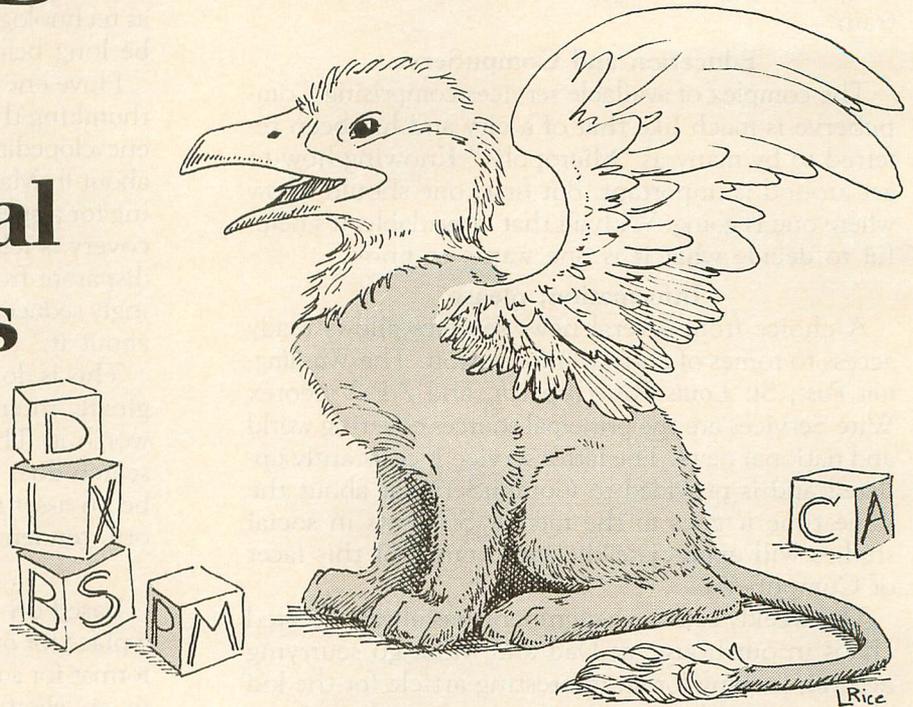
For more information, you may contact New Horizons Software, P.O. Box 180253, Austin, TX 78718.



Datasoft announces the licensing of **Alternate Reality** from Paradise Programming, a role-playing fantasy game. You've been abducted by an alien spacecraft and set in another time and place.

Cost is \$39.95, disk, from Datasoft, 19808 Nordhoff Place, Chatworth, CA 91311 — (818) 701-5161.

Griffin's Lair Educational Programs Review



by Braden E. Griffin, M.D.

As I thought about the introduction for my column this month, I wondered how best to explain the absence of **Griffin's Lair** from last month's issue. Suddenly, an unearthly shadow of a thought began to ooze through a crack in my previously-impregnable ego.

Could it be that no one is interested in the reason the column was missing? Is there a chance that the readers were fully aware of its absence and were delighted? Or, worse yet, that nobody even *noticed*? Is it conceivable that hearts were not broken, or that deep concerns for Brad's well-being were not accompanied by weeping and the gnashing of teeth? ("*Paranoia strikes deep, doesn't it?*" —Ed.) Naaah... Suffice it to say (I love a cliché), I should stick to Electronic Arts' **One on One**, rather than the real thing...

This month's column takes a look at the educational aspects of CompuServe. You're probably thinking that this subject would have been well suited to the last issue. That's just what the staff here thought, too. I fooled you all.

Those of you with modems are aware of many of the educational opportunities available "on-line," as we say. As the technological revolution continues, "a chicken in every (microwave)" will be accompanied by "a modem in every condo." This slogan may not get anyone elected President, but its realization seems likely.

The field of telecommunications is in its infancy and has experienced its share of growing pains. Just as many of our silver-tongued sports commentators say when citing the potential of young athletes, the future of telecommunications lies ahead! Huh?

There are many on-line vendors. The Source, Dialog, BRS (Bibliographic Retrieval Service), Dow Jones and many others offer extensive databases for a variety of uses. Countless individually-operated Bulletin Board Services provide the user even further, often more specific, opportunities to access information.

I could not hope to cover all of these areas. Nor could I afford it. I would guess that the major telecommunications service most frequently used by home computerists is CompuServe. I've no data to support this, but there's a *chance* I might be right.

Anyway, CompuServe Information Service (CIS) is easy to use and offers a wide range of services. I would like to highlight some of these as they relate to education.

There are several "how to" articles and books on telecommunications, and I will not get into that here. However, I would recommend a most helpful and informative book by Charles Bowen and David Peyton, entitled *How to Get the Most out of CompuServe*. I found it invaluable in helping me around the network. I also borrowed some of their "thoughts" for this ar-

ticle. The fact that they, too, hail from West (by God) Virginia had no influence on me whatsoever. They escape the hills through telephone lines. I took the train.

Education and CompuServe.

The complex of available services comprising CompuServe is much like that of a city and has been referred to by many as "Micropolis." Knowing how to get around is important, but first, one should know where one is going. With all that is available, it's helpful to decide what it is one wants to know.

Information, please.

A choice from several news services allows ready access to tomes of current information. The *Washington Post*, *St. Louis Post-Dispatch*, and AP Videotex Wire Services are the principal sources covering world and national news. The latter service is constantly updated and is provided to CompuServe at about the same time it goes to the media. Students in social studies will appreciate the importance of this facet of CompuServe.

The weekly science assignment has always created chaos in our house, as Dad and Mom go scurrying around, looking for an interesting article for the kid to report on. Now a wide variety of articles may be scanned, with the one selected downloaded to the printer. Aside from a multitude of similar scholastic endeavors, the essence of these services creates an educational environment for all of us—and a greater awareness of the world today.

Go look it up.

I have always been hesitant to buy a large set of encyclopedias. Though frequently tempted, I know that some of the information will become dated, and the almost daily appearance of new discoveries and explanations of the old ones would create a significant void in this important resource.

If only a comprehensive, current resource were available, without having to buy additional volumes or replace the loose-leaf pages of another. Grolier's *Academic American Encyclopedia* is just such a resource.

The same sort of information one finds in a conventional printed encyclopedia is contained in its electronic counterpart. The advantage is that it is updated and has new information added twice a year. This particular service is offered on a subscription basis, in addition to the regular on-line charges. The option of subscribing monthly is an excellent feature, since there are often long periods of time when it may not be needed.

Initially, it is a little difficult to search for specific subject matter. Conducting a search is educational in itself and helps develop an organized and disciplined approach to information gathering.

It's often necessary to provide illustrations and other graphic enhancements, along with text, to ensure the complete understanding of a subject. Imagine how

difficult it would be to fully appreciate the parts of the human anatomy without pictures. The electronic encyclopedia is sadly lacking in this area. As rapidly as technology is advancing, however, it probably won't be long before this capability is standard.

I love encyclopedias. There isn't *anything* quite like thumbing through the almost delicate pages of a fine encyclopedia. It is the ultimate book, with a reverence about it. Many detours are encountered while searching for a specific item. The joy of an unexpected discovery is felt when one happens upon an area quite disparate from the intended subject. . . and is seemingly seduced with the desire to learn more and more about it.

This is done, of course, at the expense of time originally intended for another subject, but it's usually worth it. The single-minded nature of an electronic search does not promote such digressions. This may be an asset to those gadabouts among us with quixotic tendencies.

. . . On the way to the forum.

Based on the original Roman model, the forum is a place for open discussions of topics of interest. The format for such activities is provided by CompuServe in an electronic forum, or Special Interest Group (SIG). Not everyone has the same interests. Consequently, there are a variety of SIGs available. . . quite a variety. If one has an interest, any interest, be assured that there is a SIG dedicated to it.

Several methods are provided for the exchange of information with SIGs. The most frequently-used one involves message boards. They serve as the foundation for the open discussion. Messages relating to the specific interests of the group may be read by all. Messages may be left to seek an answer to a question, or, conversely, a response to another's inquiry may be conveyed.

This ongoing public dialogue is unique to telecommunications. One may also leave private messages, if desired. On-line conferences underscore the distinctive nature of the forums. Formal conferences with guest "speakers" are conducted and encourage questions from the audience, through a moderator. Less structured conferences are also held regularly, more closely resembling bull or rap sessions. These may be programs in the public domain or related articles provided especially for group members.

The vast majority of SIGs are open to the public, with no additional cost over the usual connect time charges. They are run by Sysops, or Systems Operators, who receive a small portion of the regular connect time charges. Although this remuneration may help defray some of the costs, most SIGs run at a deficit and continue to function only because of the dedication of the Sysop. The greater the number of participants, the less the financial burden is for the Sysop.

New members receive a friendly welcome and are

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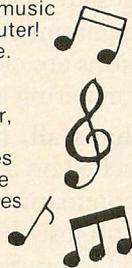
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THE BEAN MACHINE by Steve Robinson is an Award Winning Arcade game that will drive you crazy balancing a series of beams while trying to get all the beans to roll down, without touching, all the while avoiding 'strange creatures' who drop in to steal the beans. It's addicting!

\$24.95 list

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DIGGERBONK, another Award Winning game by Steve Robinson, challenges you to find your way through a continuously scrolling maze while avoiding some really strange creatures. Along the way you will need to Bonk some of them, but watch out for the bombs.

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GUESS WHAT'S COMING TO DINNER lets you try to maneuver a snake through 7 levels if you can keep it from starving or being electrocuted. Lots of surprises! One or two players.

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CIRCLE #105 ON READER SERVICE CARD

encouraged to continue active involvement. The first encounters with SIGs are a little overwhelming, but plenty of help is provided. The book referred to earlier by Bowen and Peyton has an excellent section on SIGs and how to get the most out of them.

As mentioned earlier, if there is an interest, there is likely a SIG dedicated to it. Examples of some of these forums include: aviation, space, medicine, writing, education, science, programming, computer education and veterinary medicine. Many of these areas have several forums available.

There are computer-specific forums which are quite active. I tried to enter the legal forum, but I had previously taken the **TMC I-Q Test** (see below) and discovered that anyone scoring in triple figures is denied access! (Just a little M.D. humor.)

Boola boola.

Two services are available which provide information about college education. **The College Board** is operated by the College Entrance Examination Board. This service covers topics such as choosing a college, preparing for the SATs, advanced placement, adult education and financial aid. It also provides current information on College Board SAT and Achievement Test dates and fees.

The College Press Service began as a national college news service. It is aimed at those involved in higher education, and covers those events which affect them. From legislative acts and court decisions in education to classroom trends and funding patterns, a broad range of subjects is reported. They are covered both with news briefs and in-depth reporting. There's even a classified section, where advertisements may be posted.

Fun and games.

A far-ranging variety of educational games may be

played on-line through CompuServe. Although no sophisticated programming is involved, many of them are quite challenging. Some are impossible.

An example of the latter is **The Whiz Quiz**, which allows as many as four players up to thirty questions in the same category at the same time. A perfect score gains entrance into the Wizards Hall of Fame. This is an offering from the Grolier's encyclopedia.

An extensive game list is found under **The Multiple Choice (TMC)**. The **TMC I-Q Test** referred to earlier is included here. This is a fairly long test, containing several categories. Problem solving, number recitation and analogies are but a few of them. It is designed for adults and would, no doubt, cause experts in this area of testing to break out in hives. Interestingly, though I thought I was doing terribly, I scored almost exactly the same as I had on previous, authentic IQ tests.

Other available offerings from TMC include the following: **So You Think You Know Me**, **Trivia Unlimited**, **Categorically Trivial**, **Classic Quotes**, **Personality Profile**, **Witty Write-Ins**, **Touch Type Tutor**, **Super Brain Challenge**, **TMC Analogies**, **Sports Rules Quiz**, **J*U*M*B*L*E*D Words**, **Silly Fill-Ins**, **State Your Capitals** and **Trivia for Kids**.

All of these games begin with specific information concerning the suggested age, classification, number of players, special requirements and minimum screen width. The instructions are clear and concise. These games make for a stimulating and enjoyable evening.

That's all, folks.

I've really only touched on a few of the many educational facets of telecommunications. There are many extensive databases, on just about every subject, readily available through CompuServe or other major on-line vendors. It's exciting to imagine what this field will be like in a few years. Hello...Central? □

Talk to ANALOG Computing

We remind you that three members of our staff can now be regularly found on CompuServe. If you're a CompuServe member, you can contact Tom Hudson, Charles Bachand or Art Leyenberger by leaving a message on the Atari SIG, which can be accessed by typing GO PCS-132 at any menu page.

The Atari SIG has logged over 100,000 calls—with over 60,000 messages posted! They have a staff of highly competent SYSOPs, headed up by Ron Luks, who are more than happy to help you. Their program database contains well over a megabyte (that's one million bytes, folks!) of Atari programs that can be downloaded into your computer.

So, if you need to get in touch with **ANALOG Computing**, you can do it through CompuServe. Our user numbers are:

Tom Hudson	70775,424
Charles Bachand	73765,646
Art Leyenberger	71266,46

FIELD OF FIRE**SSI, INC.****883 Stierlin Road, Building A-200****Mountain View, CA 94043****48K Disk \$39.95**

by Patrick J. Kelley

It is the final months of WWII. You're in command of Easy Company, one of the most battle-seasoned and toughest components of the famed 1st Infantry Division—The Big Red One. You've seen the war from its first bloody days, and after three long years, you just want to go home. Battle after battle has unfolded before you, and you've had to write one too many of "those letters" to the folks at home. For you, Thanksgiving and Christmas dinner meant a cold messkit of rations, while big German 88s dropped shells around you, with the air full of smoke and death. But it's almost behind you now, as victory awaits just around the bend. . . or over in the next town.

SSI's newest foray into the exciting world of WWII is called **Field of Fire**, fashioned after the exploits of the aforementioned Easy Co. This game is a masterful rendition of the classic wargame popularized in the past, with a few new twists.

As topkick, you must take your platoons of infantry and light armor into combat, through eight different scenarios that **FF** has cooked up for you. You won't have the experience of an Easy Co. trooper when you've finished, but you *will* have a new insight into the rigors of command.

Let's go, Easy!

You begin with your troops spread out before you, ready for orders. Symbols designate the makeup of a certain unit, differentiating between Rifle Squad, Antitank Squad, Recon Squad, Tank Squad, Command Post, Machine Gun Squad and Mortar Squad. A mobile cursor is used to designate which unit is to receive orders, where it is to concentrate fire, and where it is to move.

Actual play is divided into separate phases: Observation, Fire Order, Movement Orders and Operations, where the real-time combat takes place. During the operations phase, you see what kind of leader you are, as your "men" carry out your orders. Their computerized fate is in your hands, as is the tide of battle.

Most people cannot sympathize with a computer piece or unit as it's taking a shellacking, but this reviewer can, and does. Every time one of my units is embroiled in a firefight, I can be seen alternately wincing, screaming, cajoling, swearing or covering my eyes—depending on the outcome. The air surrounding my terminal is also known to take on a distinct blue haze, due to the extraordinarily high obscenity count.

Someone at SSI must have seen me coming in this department; they've added one of the little features that makes **FF** a winner. Each one—and I mean *each*

one—of your pieces has a name and a brief history attached, making it that much harder to see him get taken out. No longer is it just a bunch of pixels, but PFC. Mergen or Sgt. Sprock who gets splashed to the four winds. I find this little detail quite endearing, giving **FF** a certain flair. But, back to the front.

Panzers, comin' over the ridge!

As **FF** progresses, you throw your men against the forces of the Wehrmacht for control of your computerized turf, and get down to business. Play of each of the game scenarios is fast paced and not at all prey to the type of slow-moving, anemic action of other computer games.

The rotation through the game's phases is swift, and your score is displayed periodically, corresponding to your computer-assigned victory level (Questionable, Minor, Moderate and Major). The computer bases your score on different criteria depending on the level, so read up on each before you play.

Familiarizing yourself with the particulars of each scenario *will* help you, just as boning up on terrain details before an engagement aids a real infantry commander. An additional hint—get your tanks and mortar squads up onto high ground. This will increase your visibility and range, and deprive the enemy of a good shot at your behind.

As the levels progress, you'll find that your enemy's determination to make you history does, also. All I can give you in the way of advice is: keep your eyes and ears open. Be ready to exploit any weakness that the enemy shows. Use your mortar squads to suppress armor movement and harass infantry. Move your infantry out across the terrain in a straight line (men who are bunched up give the German artillery a field day, and can lose you a game *fast*). Upper levels of **FF** are for masochists only. . . those who *enjoy* seeing their troops drop like flies.

C'mon, Easy — we've got a war to win!

The actual game scenarios of **FF** are divided into eight separate actions or campaigns. Each of these has its own difficulty level, so if you want to try your luck at various levels of play, you can. Most of the campaigns you'll fight have a foundation in fact, based after actual combat situations the Big Red One found itself in. Grab your steel pot, sling that rifle, grease that MG and fix your bayonet. You're about to step into the **Field of Fire**.

The battles.

There's a night patrol mission into a Tunisian village, where you must stir up trouble and get out, before Rommel's Afrika Corps rushes back. Or you may have two hours to mop up the Germans and secure a winding mountain road for the main advance to come.

Perhaps you'll prove yourself in the spearhead of the invasion forces at Omaha Beach, or help to seal

(continued on page 91)

MicroDOS XL

32K Disk

by Walter D. Lord

MicroDOS XL is a program that combines several Atari features into a menu, with the use of a joystick or the console buttons to select and run files easily. Due to its small size, it loads and runs almost instantly. Its primary use is with games, because it will only load and run object (binary) files—such as assembly language or compiled BASIC games.

Loading it.

Listing 1 (BASIC) will produce a file called **MICRODOS.OBJ**. This is the “creator” program that writes **MicroDOS XL** onto a disk.

After typing in the program, save it in case of a computer lock-up. Then RUN it. **MicroDOS XL** will instruct you to insert a disk containing DOS and then press RETURN. After you’ve done this, the file **MICRODOS.OBJ** will be written. During the write, data lines will be listed and checked. If there is a data error, the program will display a data error message below the line where it occurred. If no error is found in that line, the previous line should be checked. The **FINISHED** message will display when the write is complete.

To run the creator program, load the **MICRODOS.OBJ** with any standard DOS (not BASIC). The screen will blank while loading, then an instruction/selection screen will appear.

Follow instructions by inserting a formatted disk—to which you want to write **MicroDOS XL**—into any drive. This disk may be empty or contain files, as long as it is formatted and there are five free sectors or a **DOS.SYS** file. Press the SELECT button to change the drive number if it’s not correct. When you press START, the write will begin.

During the write, any file that has the **.SYS** extension and starts with the letter **D** will be unlocked and deleted (**D*.SYS**). **AUTORUN.SYS** files won’t be deleted but will not autorun. **MicroDOS XL** then writes the **DOS.SYS** file, tests for density of write and writes boot sectors. The message - **DONE** - will be displayed if there were no errors. If there is an error, the message **ERROR** and the error number will be displayed (see BASIC manual).

The creator will write a double density **MicroDOS XL** if the DOS is loaded with supports and the disk is formatted in double density. The density of the disk being written will be displayed after a density test.

To boot **MicroDOS XL**, place the disk in drive 1. Remove all cartridges, turn the computer off and then on (pressing the OPTION key if using an XL computer). **MicroDOS XL** will then boot and display all locked files (remember to lock all the files you want displayed).

File selection is made with the joystick or keyboard. The currently selected file is shown magnified and changing color in the middle of the screen. By pushing the joystick forward (up) and back (down), or by pressing OPTION (up) and SELECT (down), the filenames will scroll through the magnified line. When the filename you want is magnified, press the joystick button or START to load the file.

Pressing the SYSTEM RESET button will cause the computer to reboot (cold start) the current disk. This is useful if the wrong disk is entered (to see what files are on the disk) or if the wrong file is selected (only if the file is not completely loaded). If the disk contains MicroDOS XL, it will instantly run and display the locked files.

MicroDOS XL occupies five available and four unavailable sectors on a disk. The available sectors are used by the file DOS.SYS, which contains the display, character set and program to select which file to load. The four unavailable sectors are the three boot sectors (sectors 1-3) and the very last sector on the disk (sector 720), which contains the program to load and run the DOS.SYS file.

MicroDOS XL replaces normal DOS and will free all but five of the sectors used by DOS. It is compatible with all Atari computers but not with enhanced density format, due to the use of sector 720. Also, no DOS commands are supported, so programs doing file (not sector) reads and writes will not work properly.

Listing 2 is for the creator program, which contains MicroDOS XL. It was written using OSS MAC/65.

So... put in the disk, turn on your computer, grab a joystick and take off! □

```

1010 DATA A91B850AA907850BAD1807F00218
604C77E4010000AD00078D0803D003EE0903A9
008D180785418D04038544A9,577
1020 DATA 048D05038545AD19078D0A03AD1A
078D0B03A9318D0003A9018D0103A9528D0203
20D907AD02048DE002AD0304,708
1030 DATA 8DE102200188A200B144C9FFD014
20BF07B144C9FFD00620BF074C8207A9FF8546
E8B144954620BF07E8E004D0,17
1040 DATA F4A5468D9C07A5478D9D07B90004
8DFFFF20BF07AD9D07C549B00AEE9C07D0EBEE
9D07D0E6AD9C07C54890EF20,908
1050 DATA FA074C6607C8C443B00160A07DB1
4429038D0B03C8B1448D0A030D0B03F0368A48
20ED0730FBAC000788B14485,213
1060 DATA 4368AAA00060A9408D0303A9078D
06034C59E49848FC57F758200C0868A8A90B8D
E202A9088DE302606CE20220,691
1070 DATA 0C086CE002A9FF8543A9698D0A03
A9F18D0B03A9048D0503A908D04038548A90A
8549A94E8546A971854720ED,856
1080 DATA 07304DEE0A03A2008644A000B144
F04030302920F02CE643A003B1448148E648C8
C005D0F5B14438E9208146E6,818
1090 DATA 46D002E647C8C010D0EEA5461869
1085469002E647A5441869108544CD0007F0B0
D0B0B9486199C40288D0F7A9,362
1100 DATA E88D3002A9608D3102A92C8D0002
A9618D0102A9308DF402A9F08D0ED4A9008544
85478548A9098D05D4A543F0,175
1110 DATA 09A024A260A907205CE4A9218D2F
02A547F0FCA5480AA0800A8D1907BD010A8D
1A07A900AA00A09D0020E8D0,737
1120 DATA FAE00588D0F4F858FD58EE1807
4C74E40060FB60FFF2F022F02000B604C61A2
00BD00E09D0030E8D0F7EE12,559
1130 DATA 60EE0F60AD0F60C9E2D0EA60A544
D04AD1FD06A6A902A6A9018AD78026A90126A
901EAC8402F006AD1FD06A80,941
1140 DATA 40E647D03CA548C543B036E648A2
28A00098F00CA548F029C648A2D8A0FFA90A85
4986458446A9008D1FD0E644,591
1150 DATA A649BD04603021E6498D05D4C909
9004A9008544A51429300BADC40218690109
088DC4024C62E4290F48ADF0,45
1160 DATA 601865458DF060ADF16065468DF1
60ADF601865458DFB60ADF6065468DFC60AD
FE601865458DFE60ADFF6065,187
1170 DATA 468DFF60684C7960F00102030405
06070809080706050403020100F9707070470E
61507300703333333333333392,993
1180 DATA 00D64AFC60F76171734071333333
3333331270461C6141E8600000E9E3F2EFE4
EFF30000F8EC0000F5F000E4,487
1190 DATA EFF7EE00E6E9F2E5000048AD0BD4
C940B004A904D008AD48618D19D0A9028D0AD4
8D04D46840680D852880E202,868
1200 DATA E3020B600831D6313F33337F7373
73007E66667F67677F007F67676063637F007E
66667777777F007F60607F70,77
1210 DATA 707F007F60607F707070007F6360
6F67677F00737373737373007F1C1C1C1C1C
7F000C0C0C0E0E0E0E0E06666,579
1220 DATA 6C7F67676700303030707070E00
677F7F7767670067777F6F676767007F6363
6767677F007F63637F707070,832
1230 DATA 007F63636767677F077E66667F77
777007F607F0373737F007F1C1C1C1C1C1C00
67F8615362676767677F00,690
1240 DATA 67676767673E1C0067676767F7F
6700737333E676767006767677F1C1C1C007F
666C1837677FAA70BB700823,586
1250 DATA 090037212C34002C2F3224001119
1814040305030080A030B03D002E202E302ED
07E002E10215080064FB64A0,224
1260 DATA 05B9486199C40288D0F7A9FF8D30
02A9658D3102A002A200BD00E09D0040E8D0F7
EE1864EE1E6488D0ECA2D0BD,119
1270 DATA 56619D087A1CAD0F7A9408DF402A9
218D2F02AD1FD06A902D6AB0F7ADD665C934D0
04A931D0031869018D06658D,545
1280 DATA E0658DEC65291709808D5370A900
8514A932C514D0FCF0CDA217A9009DA071CAD0
FA2083644C4064A230A0D5A9,247
1290 DATA 6520CC65A903A00820C1653030A9009D
A0DFA96520CC65A903A00820C1653030A9009D
4403A9609D4503A9549D4803,872
    
```

Listing 1.
BASIC listing.

```

10 REM *** MICRODOS XL ***
20 DATA 0,1,2,3,4,5,6,7,8,9,0,0,0,0,0,
0,0,10,11,12,13,14,15
30 DIM DAT$(91),HEX(22):FOR X=0 TO 22:
READ N:HEX(X)=N:NEXT X:LINE=990:RESTOR
E 1000:TRAP 110:?"CHECKING DATA"
40 LINE=LINE+10:?"LINE:";LINE:READ DA
T$:IF LEN(DAT$)<>90 THEN 150
50 DATLIN=PEEK(183)+PEEK(184)*256:IF D
ATLIN<>LINE THEN ? "LINE ";LINE;" MISS
ING!":END
60 FOR X=1 TO 89 STEP 2:D1=A5C(DAT$(X)
)-48:D2=A5C(DAT$(X+1))-48:BYTE=HEX(D1
)*16+HEX(D2)
70 IF PASS=2 THEN PUT #1,BYTE:NEXT X:R
EAD CHKSUM:GOTO 40
80 TOTAL=TOTAL+BYTE:IF TOTAL>999 THEN
TOTAL=TOTAL-1000
90 NEXT X:READ CHKSUM:IF TOTAL=CHKSUM
THEN 40
100 GOTO 150
110 IF PEEK(195)<>6 THEN 150
120 IF PASS THEN CLOSE #1:END
130 ? "INSERT DISK WITH DOS, PRESS RET
URN";:INPUT DAT$:OPEN #1,8,0,"D:AUTORU
N.SYS"
140 :?"WRITING FILE":PASS=2:LINE=99
0:RESTORE 1000:TRAP 110:GOTO 40
150 ? "BAD DATA: LINE ";LINE:END
1000 DATA FFFF2F022F0200C03FD13FA040A9
00AA9D0040E8D0FAEEC73F88D0F160E202E302
C03F0057FB57800300070607,78
    
```

```

1300 DATA A9029D4903A90B20C1653015A90C
20C165300EA0EBA96520CC65A92020C1651003
4C8865A9018D0A03A9008D0B,926
1310 DATA 038D0403A9638D0503A9528D0203
2053E410034C8865AD0F638DFC64F7651957AD
10638D1A57AD0E63C902F011,94
1320 DATA A205BDC2719D8971CA10F7A980A2
7DD00FA205BDC8719D8971CA10F7A980A2FD8D
00578EC657A9578D0203A957,874
1330 DATA 8D05032053E43048AD0403186980
8D04039003EE0503EE0A03AD0A03C904D0E3A9
D08D0A03A9028D0B03AD0057,658
1340 DATA 8D0803D003EE0903A9808D0303A9
078D06032059E4300CA207BD05719DA471CA10
F7609848A90CA23020C16568,174
1350 DATA 85D4A90085D520AAD920E6D8A0FF
C8B1F338E92099AA71B1F310F3297F38E92099
AA71A206BDCE719DA271CA10,653
1360 DATA F7609D4203989D4A032056E4609D
4503989D440360044313A442A2E5359539B44
313A54454D502E544D509B44,491
1370 DATA 313A54454D502E544D502C44F865
4F664F532E5359539B707046246650473266
504740665042007002020202,885
1380 DATA 02020202020202020202046A07141FF
650000000000A10EA1ACAF70000000000E9
E3F2EFE4EFF30000F8EC0000,159
1390 DATA 0000E3F2E5E1F4EFF2000000000
00705F70808080808080808080A9AEB3A5B2B480
A6AFB2ADA1B4B4A5A4808080,249
1400 DATA 8080808080808080808080808080
8080A4A9B3AB8080A9AEB4AF80808080808080
808080808080808080808080,366
1410 DATA 80808080A4B2A9B6A58083918080
808080808080808080808080C70937080B3A5ACA5
A3B480C570DA70342F002328,280
1420 DATA 212E2725002429332B0024322936
2500030C71127180B3B4A1B2B48043715B7134
2F003732293425002C2F2124,95
1430 DATA 2532002F2E342F002429332B8071
9F7180808080808080808080B3A9AEA7ACA5A4
A5AEB3A9B4B9808080808080,348
1440 DATA 808080C271DC71B3A9AEA7ACA5A4
AFB5A2ACA5E5F2F2EFF2808D00E4EFFFFE500
8DE002E10200640000000000,649

```

```

DDEVIC = $0300
DUNIT = $0301
DCOMND = $0302
DSTATB = $0303
DBUFLO = $0304
DBUFHT = $0305
DTIMLO = $0306
DBYTL0 = $0308
DBYTHI = $0309
DAUX1 = $030A
DAUX2 = $030B
;
RTCKL = $14 ;LOWER BYTE OF CLOCK
SOUNDR = $41 ;QUIET I/O FLAG
SDMCTL = $022F ;SHADOW SCREEN CONTROL REG.
SDLSTL = $0230 ;CONTAINS DISPLAY LIST ADDR.
STICK0 = $0278 ;STICK 0 SHADOW
STRIB0 = $0284 ;TRIG 0 SHADOW
COLORS = $02C4 ;COLOR 0 SHADOW
CHBAS = $02F4 ;CHAR SET ADDR HI BYTE
CHROB = $E000 ;OS CHAR SET ADDR
CONSOL = $D01F ;CONSOLE BUTTON REG
HSCROL = $D404 ;HORZ SCROLL REG
VSCROL = $D405 ;VERT SCROLL REG
WBYNC = $D40A ;CAUSES WAIT FOR VERT SYNC
VCOUNT = $D40B ;VERT LINE COUNTER
NMLEN = $D40E ;NMI ENABLE REG
;
;FLOATING POINT LOCATIONS
FASC = $DBE6 ;FLOAT->ASCII
IFP = $D9AA ;INT->FLOAT
FR0 = $D4 ;FLOAT VARIABLE
INBUFF = $F3 ;OUTPUT BUFFER PNTR
;
;--- PROGRAM VARIABLES CONSTANTS, ---
;--- AND ADDRESSES ---
;
;"BASE" IS THE DIFFERENCE BETWEEN
;THE ASSEMBLED ADDRESS AND THE RUN
;ADDRESS. USED BECAUSE MICRODOS XL
;WILL OCCUPY THE LOCATION OF DOS
;DURING OPERATION.
;
BASE = $5000
LOADADR = $0700 ;LOAD ADDR
DIRTAB = $0A00 ;DIRECTORY TBL
DSPDAT = $7000 ;DISPLAY DATA
MAGLN = DSPDAT+350 ;MAGNIFIED LINE ADDR
STRTLN = MAGLN+4 ;START OF DISPLAY FILE NAMES
BUFFER = $0400 ;INPUT BUFFER ADDR
CHSET = $3108 ;CHARSET LOAD ADDR
TOPDOS2 = $4000 ;LOMEM OF ATARI DOS 2
TOPOSS = $2000 ;LOMEM OF OSS DOS
CHSTADR = $3000 ;ADDR OF NEW CHARSET
SECBUF = $6300 ;TEMP SECTOR BUFFER
DNSYFL = $630E ;DISK DENSITY FLAG
DOSLNK = $630F ;LINKS TO DOS FILE
;
;ZERO PAGE VARIABLES USED BY CREATOR
;
FILNUM ** $43 ;# FILES DISPLAYED
MOVFL ** $+1 ;SCROLLING FLAG
MOVVNT ** $+2 ;DATA ADDR INC
INPFL ** $+1 ;INPUT ACCEPTED FLAG
PROPTR ** $+1 ;PROGRAM SELECTION PNTR
VSCRL ** $+1 ;VSCROLL PNTR
;
;ZERO PAGE VARIABLES USED BY MICRODOS XL
;
ENDBUF ** $43 ;END OF BUFFER PNTR
BFPNTR ** $+1 ;POINTS TO BUFFER
MOVLOC ** $+2 ;TEMP START MOVE ADDR
ENDPTR ** $+2 ;TEMP END MOVE ADDR
;
;*** PROGRAM START ***
;
TURN OFF SCREEN
;
** $DMCTL
; .BYTE 0
;
** $3FC0
;
;CLEAR MEMORY
CLRMEM LDY $40
CLR1 LDA #0
TAX
STA
CLR2 TOPDOS2,X
INX
BNE CLR2
INC CLR2+2
DEY
BNE CLR1
RTS
;
** INITADR
; .WORD CLRMEM
;
SECTORS #1-3 (BOOT) AND #2D0
;
** LOADADR+BASE
SECLG = *-BASE ;# BYTES/SECTOR
; .BYTE $80
; .BYTE 3 ;LOAD 3 SECTORS
; .WORD LOADADR ;LOAD ADDR
; .WORD SETVEC ;INIT ADDR
SETVEC = *-BASE
LDA # <GETFILE ;SET DOSVEC
STA DOSVEC ;TO GETFILE
LDA # >GETFILE
STA DOSVEC+1
LDA RSTFLG ;DOS RUNNING?
BEQ RESET ;YES, BRANCH
CLC
RTS
;
RESET JMP COLDSV ;RESET PRESSED, RE-BOOT
RSTFLG = *-BASE
; .BYTE 1 ;DOS RUN FLAG
SECLNK = *-BASE
; .WORD 0 ;SECTOR LINK TO FILE
;
;*** GET FILE ROUTINE ***
;
GETFILE = *-BASE
LDA SECLG ;SET TO CORRECT
STA DBYTL0 ;DENSITY FOR READ
BNE CONT0
INC DBYTHI
LDA #0
STA RSTFLG ;SET TO DOS RUNNING
STA SOUNDR ;QUIET LOAD

```

CHECKSUM DATA.
(see page 24)

```

10 DATA 86,957,808,428,727,554,599,553
,272,698,610,21,71,33,162,6579
1000 DATA 150,494,623,985,327,634,750,
709,550,783,722,881,236,190,955,8989
1150 DATA 925,78,133,659,882,827,672,4
79,724,742,221,915,921,875,599,9652
1300 DATA 558,828,144,733,753,72,548,3
71,526,734,417,503,334,597,47,7165

```

Listing 2.
Assembly listing.

```

<MICRODOS XL> BY WALT LORD (C)
;--- OPERATING SYSTEM CONSTANTS ---
;--- AND ADDRESSES ---
ICCOM = $0342 ;I/O COMMAND
ICBADR = $0344 ;BUFFER ADDR
ICBLEN = $0348 ;BUFFER LENGTH
ICAUX1 = $034A ;AUX 1
;
;VECTOR TABLE
;
DSKINV = $E453 ;DISK HANDLER
CIOV = $E454 ;CIO HANDLER
SIOV = $E459 ;SIO HANDLER
SETVBV = $E45C ;SET VBI ADDRESS
XITVBV = $E462 ;EXIT VBI
WARMV = $E474 ;WARM START
COLDSV = $E477 ;COLD START
DOSVEC = $0A ;IRUN DOS
INITADR = $02E2 ;DOS LOAD/INIT
GDADR = $02E0 ;DOS LOAD/GO
VDSLGT = $0200 ;DISPLAY LIST NMI
;
;SIO COMMAND BLOCK (DCB)

```

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OPERATION: The "IMPOSSIBLE" consists of a disk program (**unprotected** so you can make as many backups as you wish) and a 4K STATIC RAM pack which is inserted into your computer (no soldering!) The "IMPOSSIBLE" will read your program disk and then **re-write it in an unprotected format!** You may make additional backup copies using a sector copier or even regular DOS! Because your backup copy no longer has BAD SECTORS or EXOTIC FORMATS, the program data can now be manipulated into DOS compatible files (even double density!), transferred to cassette, etc. (with the aid of our Satellite programs!) No user programming knowledge required. A few programs require logical thinking.

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 6. Expands computer memory to 52K usable
 7. Simple NO SOLDER installation
 8. Satellite expandable

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REQUIREMENTS: The "IMPOSSIBLE" diskette, the 4K STATIC RAM pack, a 400 or 800 computer (please specify!) with 48K and "B" Rom's. NOTE! The very old ATARI computers were shipped with "A" Rom's which had some serious "Bugs". Even if you don't own an "IMPOSSIBLE," you should upgrade to "B" Rom's (simple to install!) We have them available at a very inexpensive price. CALL US! "XL" version available soon!

NOT A PIRATING TOOL: We at C.S.S. did not design The "IMPOSSIBLE" to put Software Manufactures out-of-business overnight! Nearly all of our products have been "ripped-off" by industry parasite who have little or no ability to develop a product of their own so we can sympathize with their dilemma. All C.S.S. products have built-in safe guards which prohibit their use for flagrant pirating. The "IMPOSSIBLE" is no exception! While The "IMPOSSIBLE" backup the most heavily protected programs, it also checks to see that the 4K STATIC RAM pack is installed before allowing the backup copy to execute!

EXAMPLES: The "IMPOSSIBLE" has been tested on 300 of the most popular and heavily protected programs we could find. With nearly 4000 programs for Atari, we DO NOT guarantee that it will backup all programs in the past-present-and future! We will supply updates at \$6 each (*non-profit!*) if and when necessary. Programs we have successfully backed up include: Blue Max, Visi-cal, Archon, Mule, File Manager 800 +, Syn Calc, Syn File, One on One, 7 Cities of Gold, Super Bunny, Load Runner, Drol, and Gumball just to name a few!

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CR5      LDA #0
          STA ERRLN, X
          DEX
          BNE CR5
          JSR WRITLDR
          JMP CRLOOP
;WRITE LOADER ON DISK
WRITLDR  LDX #030      ;SET TO CHANNEL #3
          LDY # <SYSNAME ;POINT TO
          LDA # <SYSNAME ;"D:D*.SYS"
          JSR STORADR  ;STORE POINTER
          LDA #24      ;LOAD UNLOCK COMMAND
          JSR EXCCIO   ;EXECUTE CIO COMMAND
          LDA #21      ;LOAD DELETE COMMAND
          JSR EXCCIO   ;EXECUTE CIO COMMAND
          LDY # <TMPNAME ;POINT TO
          LDA # <TMPNAME ;"D:TEMP.TMP"
          JSR STORADR  ;STORE PTRS
          LDA #03      ;LOAD OPEN COMMAND
          LDY #08      ;SET TO OUTPUT
          JSR EXCCIO   ;EXECUTE COMMAND
          BMI ERRJMP   ;BRANCH IF CIO ERROR
          LDA #0       ;SET BUFFER ADDR
          STA ICBADR, X
          LDA #50      ;
          STA ICBADR+1, X
          LDA # <DOSLEN ;BUFFER LENGTH
          STA ICBLN, X
          LDA # >DOSLEN
          STA ICBLN+1, X
          LDA #0B      ;LOAD PUT CHAR COMMAND
          JSR EXCCIO   ;EXECUTE COMMAND
          BMI ERRJMP   ;BRANCH IF CIO ERROR
          LDA #0C      ;LOAD CLOSE COMMAND
          JSR EXCCIO   ;EXECUTE COMMAND
          BMI ERRJMP   ;BRANCH IF CIO ERROR
          LDY # <RENAME ;POINT TO
          LDA # >RENAME ;"D:TEMP.TMP, DOS.SYS"
          JSR STORADR  ;STORE PTRS
          LDA #20      ;LOAD RENAME COMMAND
          JSR EXCCIO   ;EXECUTE COMMAND
          BPL GOODCIO  ;BRANCH IF CIO OK
          JMP ERRPRS   ;JUMP TO ERROR ROUTINE
ERRJMP   ;
GOODCIO  LDA #1       ;READ 1ST SECTOR
          STA DAUX1
          LDA #0
          STA DAUX2
          STA DBUFLO
          LDA # >SECBUF
          STA DBUFHI
          LDA #'R
          STA DCOHND
          JSR DSKINV
          BPL C0
          JMP ERRPRS
;
C0       LDA DOSLNK  ;DOS SECTOR LINKS
          STA SECLNK+BASE
          LDA DOSLNK+1
          STA SECLNK+BASE+1
          LDA DMSYFL  ;SET DENSITY FLAG
          CMP #2      ;DOUBLE DENSITY?
          BEQ DBLDENS ;YES, BRANCH
          LDX #5
          LDA SNBMSG, X ;SET "SINGLE" MSG
          STA DENSM56, X
          DEX
          BPL CR4
          LDA #80      ;SET SINGLE VALUES
          LDX #7D
          BNE STRDMS
;
DBLDENS  LDX #5       ;SET "DOUBLE" MSG
CR3      LDA DBLMSG, X
          STA DENSM56, X
          DEX
          BPL CR3
          LDA #0       ;SET DOUBLE VALUES
          LDX #FD
          STRDMS  STA SECLG+BASE ;STORE SECTOR LENGTH
          STX BUFFLEN ;BYTES/SECTOR OFFSET
          LDA #'W
          STA DCOHND
          LDA #57
          STA DBUFHI
          JSR DSKINV
          BMI ERRPRS
          LDA DBUFLO  ;ADVANCE TO NEXT SECTOR
          CLC
          ADC #80
          STA DBUFLO
          BCC INSC
          INC DBUFHI
          INC DAUX1
          LDA DAUX1
          CMP #4
          BNE WRSEC
          LDA #D0      ;WRITE SECTOR $2D0
          STA DAUX1
          LDA #2
          STA DAUX2
          STA SECLG+BASE ;IN DESIRED DENSITY
          STA DBYTLO
          BNE C1
          INC DBYTHI
          LDA #80
          STA DSTATS
          LDA #57
          STA DTIMLO
          JSR SIOV
          BMI ERRPRS
          LDX #7
          LDA DONEMSG, X ;PRINT "-- DONE --"
          STA ERRMSG+2, X
          DEX
          BPL C05
          RTS
;PROCESS ERROR ROUTINE
ERRPRS   TYA          ;STORE ERROR NUMBER
    
```

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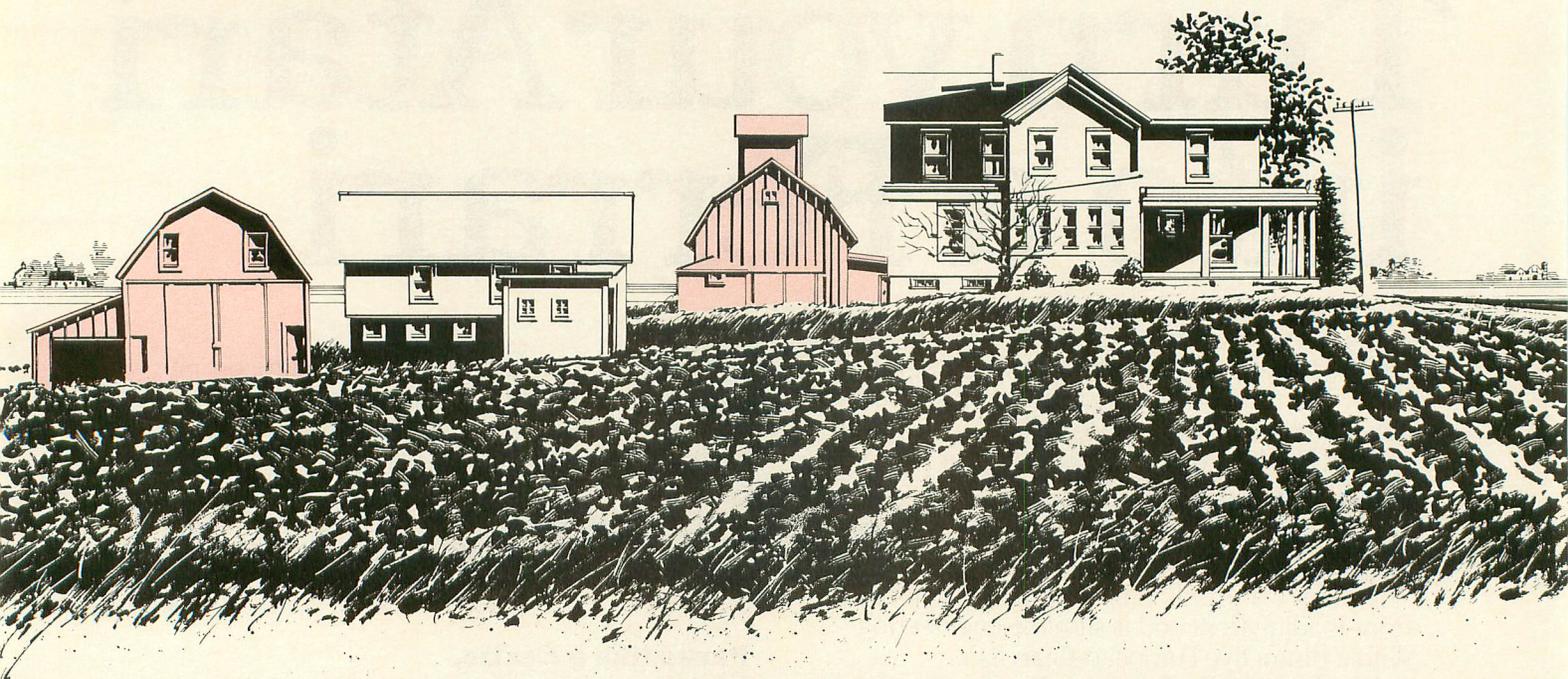


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When writing a computer program to solve a particular problem, more time can be consumed writing the program than actually solving the original problem by hand. Thus the expression, "When you're up to your neck in alligators, it is difficult to remind yourself that your initial objective was to drain the swamp." This has led to my philosophy that problems requiring repetitive calculations with varying inputs are ideally suited to computer solutions (unless the problem is so trivial that simple mathematics could manually solve it).

The **Monthly Mortgage Calculator** took about two hours to write and debug in order to answer my questions. It took another hour to pretty up the program for submission to **ANALOG Computing**. Looking back, the two hours I spent were worthwhile, as mortgage rates and points have, indeed, varied since I initially used **MMC**.

To minimize debugging time and make the program readable, I used mnemonic names that were very descriptive. Atari BASIC only stores the variable name once, so long names take up memory only the first time they're used. The advantage of mnemonics is self-evident once you read the program for **MMC**. An unexpected advantage of the mnemonics is that spelling errors on the program are lessened, presumably due to the "normal" language of the names.

Program breakdown.

Lines 300-340 open up either the screen or printer for output.

Lines 350-420 ask you to input the parameters needed to calculate mortgage information. If you ask for hardcopy of the results, the parameters are printed out.

Lines 430-460 calculate some common variables for later use in the program.

Lines 470-510 calculate your monthly payment.

Line 500 rounds the payment to the nearest penny.

Lines 520-560 calculate the total cost of the mortgage and print out the first piece of data that I needed—monthly payments.

Lines 580-780 calculate and print the yearly interest and amortization paid.

Lines 760-770 sum up the total interest and amortization paid.

Line 790 recalculates the total cost by adding the yearly interest and amortization.

Lines 800-830 print out the summary data.

Line 840 asks if you want to calculate any more.

You will notice that the total amortization calculated at the end of MMC differs slightly from the loan amount. Since this difference is minor, and the questions I had regarding the magnitude of the monthly payments and yearly interest were answered, I left this "bug." I could, of course, have spent time trying to omit this difference, but that might have defeated my original purpose, efficiency in programming.

The task this time was to determine the size of monthly payments and the yearly interest amount. A few dollars up or down will not make any appreciable difference. In programming, remember to determine your goals and stick to them; you'll reap the benefits of a very powerful tool—your computer. □

The author is a self-employed systems analyst consultant with twenty years of experience in software systems analysis and design. She holds three patents for computer-generated image systems. Her education includes a BS and MS in Mathematics, and an MS in Systems Science from Polytechnic Institute of New York.

```

100 REM *****
110 REM *
120 REM * HOME MORTGAGE CALCULATOR *
130 REM *
140 REM * WRITTEN JULY 1984 *
150 REM *
160 REM * INPUT:LOAN AMOUNT-$ *
170 REM * INTEREST RATE-% *
180 REM * LENGTH OF LOAN-YRS *
190 REM * LOAN POINTS-% *
200 REM *
210 REM * OUTPUT:MONTHLY PAYMENT *
220 REM * POINTS PAID-$ *
230 REM * TOTAL COST *
240 REM * INTEREST BY YEAR *
250 REM * AMORTIZATION BY YR *
260 REM * TOTAL INTEREST *
270 REM * TOTAL AMORTIZATION *
280 REM *
290 REM *****
300 DIM A$(1)
310 GRAPHICS 0
320 PRINT "HARDCOPY OR DISPLAY (H/D)":
INPUT A$
    
```

```

330 OPEN #4,8,0,"E:"
340 IF A$="H" THEN CLOSE #4:OPEN #4,8,0,"P:"
350 PRINT "AMOUNT OF MORTGAGE.....":;
INPUT LOAN
360 IF A$="H" THEN PRINT #4;"AMOUNT OF MORTGAGE = $";LOAN
370 PRINT "ANNUAL PERCENTAGE RATE..":;
INPUT ANNUALRATE:ANNUALRATE=ANNUALRATE/100
380 IF A$="H" THEN PRINT #4;"ANNUAL PERCENTAGE RATE = ";ANNUALRATE*100
390 PRINT "LENGTH OF LOAN IN YEARS.":;
INPUT NUMBEROFYEARS
400 IF A$="H" THEN PRINT #4;"LENGTH OF LOAN IN YEARS= ";NUMBEROFYEARS
410 PRINT "NUMBER OF POINTS.....":;
INPUT NUMBEROFPOINTS:NUMBEROFPOINTS=NUMBEROFPOINTS/100
420 IF A$="H" THEN PRINT #4;"NUMBER OF POINTS = ";NUMBEROFPOINTS*100
430 REM COMMON VALUES
440 MONTHLYINTERESTRATE=ANNUALRATE/12
450 NUMBEROFPAYMENTS=NUMBEROFYEARS*12
460 LET POINTSPAID=NUMBEROFPOINTS*LOAN
470 REM MONTHLY PAYMENT
480 FACTOR1=(1+MONTHLYINTERESTRATE)^NUMBEROFPAYMENTS
490 MONTHLYPAYMENT=LOAN*(MONTHLYINTERESTRATE*FACTOR1)/(FACTOR1-1)
500 MONTHLYPAYMENT=INT((MONTHLYPAYMENT+.50E-03)*100)
510 MONTHLYPAYMENT=MONTHLYPAYMENT/100
520 REM TOTAL COST
530 COST=(MONTHLYPAYMENT*NUMBEROFPAYMENTS)+POINTSPAID
    
```

(continued on next page)

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```

540 PRINT #4:PRINT #4;"MONTHLY PAYMENT
WOULD BE :$";MONTHLYPAYMENT
550 PRINT #4;"POINTS PAID WOULD BE
:$";POINTSPAID
560 PRINT #4;"TOTAL COST WOULD BE
:$";COST
580 REM INTEREST + AMORTIZATION
590 DEBT=LOAN
600 TOTALAMORTIZATION=0
610 TOTALINTEREST=0
620 PRINT #4:PRINT #4;"YEAR INTER
EST AMORTIZATION "
630 FOR I=1 TO NUMBEROFYEARS
640 YEARLYINTEREST=0:IF I=1 THEN YEARL
YINTEREST=POINTSPAID
650 YEARLYAMORTIZATION=0
660 FOR J=1 TO 12
670 MONTHLYINTEREST=(MONTHLYINTERESTRA
TE*DEBT)
680 MONTHLYINTEREST=INT((MONTHLYINTERE
ST*5.0E-03)*100)
690 MONTHLYINTEREST=MONTHLYINTEREST/10
0
700 MONTHLYAMORTIZATION=MONTHLYPAYMENT
-MONTHLYINTEREST
710 DEBT=DEBT-MONTHLYAMORTIZATION
720 YEARLYINTEREST=YEARLYINTEREST+MONT
HLYINTEREST
730 YEARLYAMORTIZATION=YEARLYAMORTIZAT
ION+MONTHLYAMORTIZATION
740 NEXT J
750 PRINT #4;I, YEARLYINTEREST, YEARLYAM
ORTIZATION
760 TOTALINTEREST=TOTALINTEREST+YEARLY
INTEREST
770 TOTALAMORTIZATION=TOTALAMORTIZATIO
N+YEARLYAMORTIZATION
780 NEXT I

```

```

790 TOTALCOST=TOTALINTEREST+TOTALAMORT
IZATION
800 PRINT #4:PRINT #4;:PRINT #4;"TOTAL
S:"
810 PRINT #4;"INTEREST $";TOTALINT
EREST
820 PRINT #4;"AMORTIZATION $";TOTALAMO
RTIZATION
830 PRINT #4;"COST $";TOTALCOS
T
840 PRINT :PRINT "CALCULATE ANY MORE (
Y/N)...":INPUT A$:IF A$="Y" THEN CLOSE
#4:RUN

```

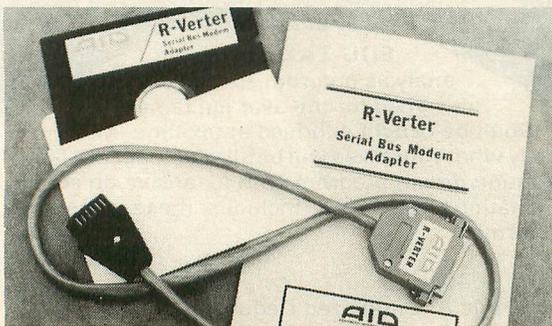
CHECKSUM DATA.
(see page 24)

```

100 DATA 778,241,191,247,527,253,749,3
93,527,266,240,229,165,6,372,5184
250 DATA 852,373,778,264,807,738,891,1
32,282,7,487,684,948,24,908,8175
400 DATA 957,796,111,3,719,634,592,944
,814,676,386,775,789,910,185,9291
550 DATA 715,786,8,182,404,94,534,145,
766,749,146,63,554,951,483,6580
710 DATA 972,808,650,754,169,258,127,7
64,919,248,807,592,686,608,8362

```

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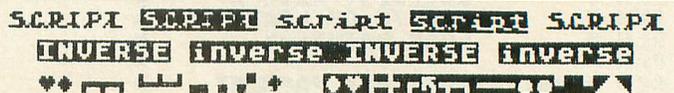
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by Arthur Leyenberger

There are many buzzwords used in the computing field. Some of the more popular are: *mouse*, *windows*, *networking* and *integrated software*. As you probably know, *integrated software* refers to a program that combines several functions. Often, such functions as word processing, spreadsheets, database management and graphics are combined into one overall program.

Examples of this type of program quickly come to mind: Lotus 1-2-3, Framework and Context MBA are just a few of the products currently available. These types of programs typically cost hundreds of dollars and only run on the "big rigs," such as IBM personal computers and the PC clones.

Back in the old days (three or so years ago), when I first purchased my Atari computer, I spent \$800 for a 16K machine. Adding a printer, disk drive, interface, more memory and a monitor brought the cost of my Atari system to over \$2000. Spending a couple hundred dollars for a program (I purchased *VisiCalc* for the Atari in 1981 for the list price of \$250) was not unreasonable, given that it was about one-tenth of the cost of the entire computer system. But what do you do when the price of an Atari 800XL with 64K memory and BASIC is only \$120? Surely you don't get out and spend \$250 for a program to run on it.

If you're wondering what this is leading to, consider what you might expect to spend for an integrated program for the Atari computer. . . one that offers word processing, telecommunications and database management functions. If you glanced at the title of this review article, you know that I'm referring, of course, to **HomePak** by Batteries Included. If you think that \$50—which is less than the typical cost of a program to perform just one of these functions—can only buy a mediocre program with little practical value, you'd better finish reading this review. You should also prepare to learn that, in the case of **HomePak**, your \$50 buys a *lot* of program.

HomeTerm.

This is the telecommunications program included in **HomePak**. Ron Luks reviewed the **HomeTerm** portion itself in issue 25, so for details on the program, you can check that article. As he put it, "**HomeTerm** alone will pay for the series in a few short sessions."

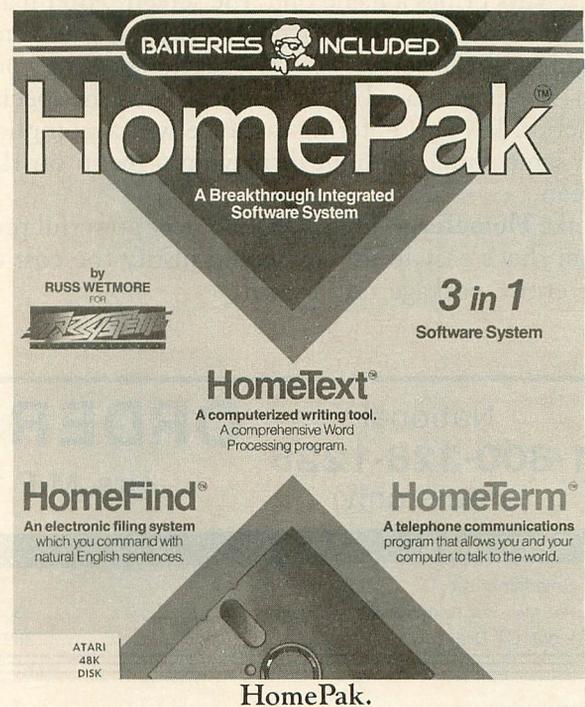
My opinion is that **HomeTerm** is one of the best available terminal programs for the Atari. Its strength lies in its power and ease of use. However, if you decide not to take advantage of the more sophisticated

features of the program, you still have a powerful program that will let you "reach out and touch someone."

HomeText.

There's more. The second program in the **HomePak** trilogy is **HomeText**, a useful, full-featured word processor. **HomeText** is a full screen editor that allows complete control of margins, indentation, line centering and spacing, and placement of headers, footers and page numbers.

You start with a blank screen, except for status information at the bottom that shows your remaining buffer size and the current mode. You can toggle between "insert" or "replace" mode, and screen color, intensity and margins may be changed at any time. Word-wrapping occurs as you type, and the current tab stops are shown at the top of the screen.



Block text operations are provided for "cutting and pasting" words, sentences, paragraphs, or even pages—you can move them *from* anywhere, *to* anywhere in your document. Searching and replacing may be performed on any text string, either individually or globally throughout the document.

A very useful feature of **HomeText** is the print preview option. When used, this gives a graphic representation on-screen of how your text will appear on the printed page. Dotted lines are used to illustrate each line of text, and special printer features are indicated. For example, underlined words are shown with a green line beneath them, normal characters are displayed in black, and boldface characters are shown in blue. This is another example of the extra features provided by **HomeText**.

In addition to printer functions (justification, centering, and bold or underline printing), **HomeText** allows you to send to the printer function codes that

are not already built into the program. This provides for the printing of sub- and superscripts, italics and other special functions, depending upon the capabilities of the printer you're using. It also ensures that your printer will be useable with **HomeText**, regardless of its brand.

HomeText also permits the chaining of files, to let you print a document that's larger than the buffer size. Output can be sent to either the printer or a disk. Disk directories of any of four disk drives may be obtained at any time from within the program.

One particularly good aspect of **HomeText** is that the various menus for block functions and other commands are readily accessible by pressing the **START/SELECT/OPTION** keys. If you're new to **HomeText**—or haven't used it for quite a while—pressing any of these keys brings a menu onto the screen. After making your selection, the program carries out your command, and the screen reverts back to showing your text. For experienced users, holding down the special function key and entering a choice will accomplish the same thing, without displaying a menu on the screen.

Like **HomeTerm**, **HomeText** is a very powerful program that's easy to use and could justify the cost of the entire package on its own.

HomeFind.

The third part of **HomePak** is the information manager, **HomeFind**. It features an easy-to-learn command language that can be mastered by first-time computer users, as well as the more experienced.

Not really a database program, **HomeFind** is what I call an "information utility." This means that information can be stored in whatever format makes sense to you—and retrieved with a few simple commands.

Database programs generally depend upon a rigid framework of fields, records and files. Once you've created and entered data into a field, it typically cannot be changed. For example, if you've got a field called "Name," and it is twenty characters in width, there's no way to enter a thirty-character name. Besides, most of us don't think of things we know in terms of fields and records. Rather, we tend to organize information in a relational way. . "Dave is my boss." When I think, "Who is my boss?" Dave comes to mind.

This is how **HomeFind** works. Information is entered in the way that it occurs to you. If *Dave's title is Supervisor of Coffee Breaks* is entered into **HomeFind**, I can later ask, "Who's Dave?" and the computer will answer with all the information I've typed in about Dave. Likewise I could ask, "What's Dave's

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title?" and the computer would respond in the same way.

Although this process is remarkably simple and straightforward, there *are* a few tricks that you must learn, to use the information manager effectively.

The syntax for data entry is always "subject's tag's object." The subject is the who or what you are storing information about; the tag is the relation of the subject to the object; and the object is the piece of information associated with the subject. This might sound complicated, but it really isn't, in practice. An example will help clarify the way it works.

Assume the following items are entered into **HomeFind**: (1) *Jean's birthday's September 21, 1984*; (2) *Teddy's Jean's cat*; (3) *Teddy's playmate's Jenny*; and (4) *Jean's Art's beautiful wife*. All of these entries are legal, and all conform to the data entry syntax. When these entries are first typed, the computer responds with *News to me*. This informs you that they are new entries. The important part of the subject and the tag is the apostrophe. That is how the computer relates the subject, tag and object together.

If I wanted the name of Jean's cat, I would type *Who's Jean's cat*, and the computer would respond with *Jean's cat's Teddy*. If I typed *Who's Teddy*, I would see *Teddy's Jean's cat* and *Teddy's playmate's Jenny*.

Comments may be added to any of the data that is entered, and they will not be part of the search criteria. Entries may be changed at any time, either during typing or after the information is stored on disk. Like the other **HomePak** programs, current status information is always displayed on the screen.

This information includes whether printing is on or off (toggled with the **OPTION** key), how much disk storage is available, whether the key click is on or off, the name of the file in use, and the drive number containing the data disk. The screen color and brightness, and the text brightness, can be varied at any time. Also, the left margin can be changed. These configuration options may be permanently stored on your program disk, to become the default values during future sessions.

HomeFind is a unique data manager that, with a little practice, can become very useful. It is powerful and contains many thoughtful features. For example, when the printer is on, the program only echoes relevant information that appears on-screen. Things like new entries, requests and everything that is retrieved is printed. Prompts and error messages do not appear on the printout. Also, printed reports can be generated by **HomeText**, using **HomeFind** information.

HomeFind also allows you to create merge files to be used with **HomeText**. A merge file is a special file created from within **HomeFind**, containing all of the objects associated with a specified subject or tag. Later, when using **HomeText**, you can insert "merge tokens" into the text, in order to call up the objects saved in the file.

For example, if I had a file with my most frequently used names and addresses, I could simply type *D1: Dave's Address* in the body of my text. When printed, Dave's full name and address would appear.

The whole pak.

Russ Wetmore has done an excellent job with all three modules of **HomePak**. The program is flexible, powerful and very simple to use. Batteries Included should also receive kudos for their pricing and marketing policy. As mentioned before, **HomePak** will retail for only \$49.95—and it will come on an unprotected disk. This means that you can make your own backup copies of the program.

Batteries Included is taking a chance on Atari users. They assume that, by offering software which provides a lot of value and is inexpensive, it will be a success—and won't be pirated. I know the former is a certainty, and I hope the latter comes true. Good job, Russ. □

For an in-depth look at the **HomeTerm** section of Batteries Included's **HomePak**, see Ron Luks' review in the December issue of **ANALOG Computing** (issue 25), page 13.

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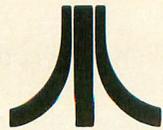
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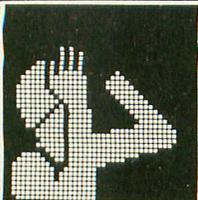


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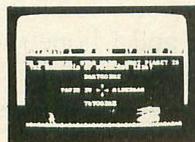
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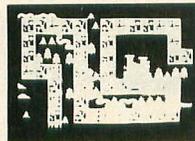
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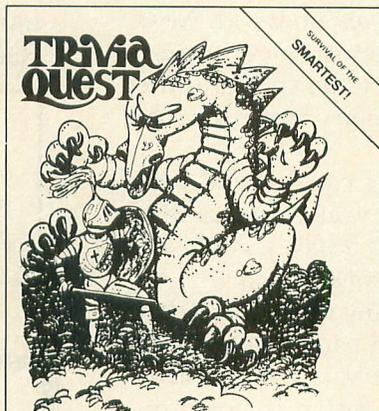


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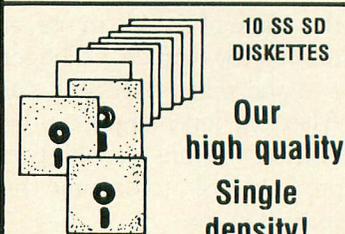
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**THE TAX ADVANTAGE
CONTINENTAL SOFTWARE**
11223 South Hindry Avenue
Los Angeles, CA 90045
48K Disk \$69.95

by Karl E. Wieggers

One way to while away the winter hours is to compute your income taxes, but this hobby quickly changes to nerve-wracking tedium. Thanks to the home computer, some relief is in sight. **The Tax Advantage** is a comprehensive aid in the preparation of your federal income tax return, including Form 1040 and all the schedules needed by a typical individual taxpayer.

Any income tax preparation program should have several basic features. Since completing my tax return takes quite a while, I'd like to be able to store intermediate results on disk and resume where I left off later. Second, it must be very easy to move around within the maze of schedules to enter and change numbers.

Next, the program should print out reports sufficiently similar to the layout of the IRS forms to make transferring data to the real thing a snap. Naturally, the program must calculate accurately and rapidly, sparing me the burden of "busy work" calculations. Finally, the documentation should be crystal clear; understanding our tax laws is complicated enough, without having to decipher the program rules as well.

I was delighted to find that **Tax Advantage** has all these desirable traits. This program comes professionally packaged in a small three-ring binder, with slots for the two-sided program disk and the data disk you will supply.

Besides a standard Form 1040, **Tax Advantage** will go line-by-line through Schedules A (itemized deductions), B (interest/dividend income), C (business income), D (capital gains/losses), E (supplemental income), G (income averaging), SE (Social Security, self-employment income), W (the married couple where both work), and 4562 (depreciation and amortization).

Tax Advantage functions are controlled by menus, movement through which is generally performed by single keystrokes. The main menu has options to enter data on the various forms and schedules, enter taxpayer information to be printed at the top of each output page, print the completed forms, run a 5-minute demonstration of the program, go to a utility menu, or exit from the program. All menu options are clearly described in the manual.

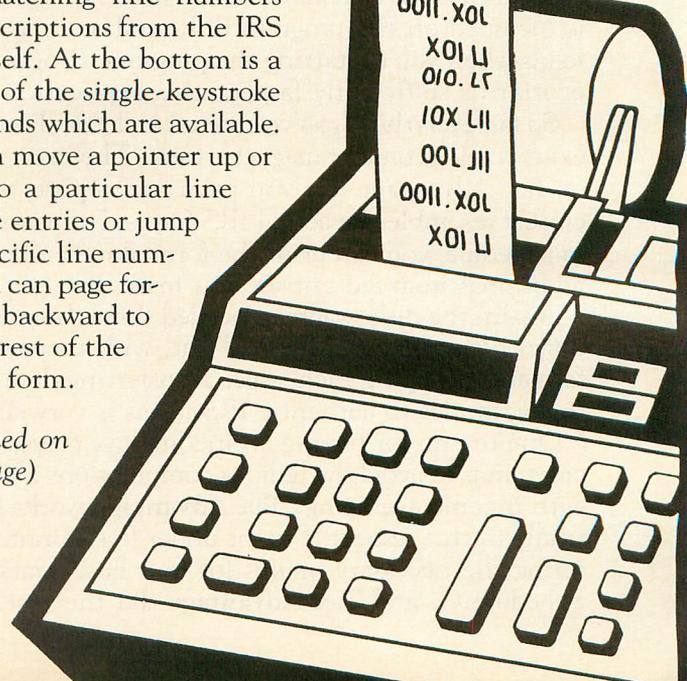
The utility menu has four functions. You can initialize a new data disk (simply formatting with Atari DOS is not enough). A separate disk is needed for each return being processed, so tell your friends to bring an extra disk.

Option two lets you specify the drive number for your data disk and the kind of printer you are using. You can choose an Atari 825, Epson MX80, NEC 8023A, Centronics 700 series, or specify printer control codes for a different type of printer. The manual thoughtfully lists appropriate codes for twenty-four printers.

Other utility menu options help you transfer data from Continental Software's **Home Accountant** financial program to a **Tax Advantage** data disk, or to convert a 1982 **Tax Advantage** disk to the 1983 format.

The heart of the program is the entry of data into the IRS forms and schedules. The screen display shows a portion of the appropriate form in each case, with matching line numbers and descriptions from the IRS form itself. At the bottom is a display of the single-keystroke commands which are available. You can move a pointer up or down to a particular line to make entries or jump to a specific line number. You can page forward or backward to see the rest of the current form.

(continued on next page)



Data can be entered several ways. If you press *E*, **Tax Advantage** accepts a numerical entry for the line number where the pointer is. Pressing *I* lets you itemize a particular entry. This is helpful if you need to break down a miscellaneous deduction or income item into individual components. Besides these modes, you can press + or - to add or subtract a new entry from the current amount shown at some line.

Entering data for **Tax Advantage** is straightforward. You always have the option to edit an entry or to continue. Detailed descriptions of many lines on the tax forms can be obtained by pressing *H*, though you may just see a *No additional information* message.

The entry and movement keystrokes are consistent from form to form, so they're easy to remember. And, if you want to peek at the financial bottom line periodically, pressing *T* shows your tax due and marginal tax bracket based on the entries made so far.

As you work on Form 1040, you may need a separate schedule, like Schedule A, to itemize. Indicating *I* at such a line takes you to an appropriate data entry form. This operation shows a shortcoming of **Tax Advantage**—its need for many disk changes. Both front and back of the program disk are used, and your data is stored on yet another disk; you must be an adroit disk jockey to keep up with frequent demands to insert side *x* of disk *y* into drive 1. It's simpler for users with two drives, but still the program disk must be flipped often, slowing data entry considerably.

After your income and deduction data is entered, **Tax Advantage** quickly calculates actual tax due and corrects for the amount withheld, or other credits, to arrive at a final figure for additional tax owed or amount overpaid. I was amused that **Tax Advantage** places the amount overpaid on the Form 1040 line indicating that the amount is to be applied against next year's taxes. I prefer the cash, personally.

Tax Advantage is written in BASIC A+ from Optimized Systems Software. The BASIC A+ language is included on the program disk, and automatically loads when you're starting the program. Program execution is sufficiently fast for this application.

So far, everything you've entered and calculated just exists in electronic or magnetic form. The main menu of **Tax Advantage** lets you print out reports which closely resemble the actual IRS forms. For each form or schedule, you can print the form alone and/or any additional itemized entries you made.

Again, the disk swapping needed slows the printing down. Printouts are well laid out, with taxpayer information topping each page. Transferring data from the facsimiles to authentic IRS forms is very simple.

One reason for buying an income tax preparation program is to avoid the tedious computations involved with income averaging. **Tax Advantage** works beautifully in this respect. I spent under five minutes entering the necessary figures for four base years into Schedule G, and **Tax Advantage** did the rest.

The report printed for Schedule G contains results from all intermediate calculations—unlike some tax programs, which show only the final result (forcing you to compute the others by hand). **Tax Advantage** makes it less painful to redo the income-averaging procedure if you dig up another deduction later on.

The documentation for **Tax Advantage** is excellent. It's well organized, with a good table of contents and index. Virtually all the screens you'll find when using the program are reproduced in the manual. Options for each menu and screen are clearly described.

A tutorial is included, in which you enter a mythical person's financial information, to get the feel of the program before tackling your own. Between this tutorial and the disk-based demonstration, where the program runs itself while you watch, you can learn to use **Tax Advantage** quickly.

I have a few minor complaints about **Tax Advantage**. It only handles whole dollars, even if you enter dollars and cents. I prefer exact amounts, to double-check my arithmetic, but that isn't an *essential* with a properly-written program. (All calculations done in my computer-completed return, when checked, were correct.) Also, the program uses no color or sound. Its background is a darker blue than Atari's standard background, and I couldn't get really sharp letters on my TV set. The incessant disk swapping will be the chief complaint of the single drive owner.

The warranty for **Tax Advantage** is a bit unusual, in that you're asked to include \$10.00 with your warranty card. Four main benefits are included. Your program disk will be replaced, if necessary, up to one year from date of purchase, instead of ninety days. You get one year's service from Continental Software's customer support group for questions or problems. Program updates will be sent free of charge for a year. Finally, you can buy next year's version of **Tax Advantage** at half the suggested retail price.

I think \$10.00 is exorbitant for these services. Customer support *should* come with any major software package. Program updates are important if you bought **Tax Advantage** before 1983 laws and forms were finalized, but corrections announced after April 15 will make many customers unhappy. Furthermore, it's already possible to buy this program at a substantial discount through mail-order software outlets, diluting the final warranty advantage.

In conclusion, **Tax Advantage** is an excellent aid in the preparation of your federal income tax return. It's comprehensive, well documented and simple to use. The options provided for tax planning and extracting data from the **Home Accountant** will attract many potential buyers.

This is not a program for the professional tax preparer, nor does it offer any tax advice, but it can make life easier for anyone whose federal return can't be squeezed onto Form 1040EZ or 1040A. And, of course, the purchase price is tax deductible. □

New Computers

(continued from page 5)

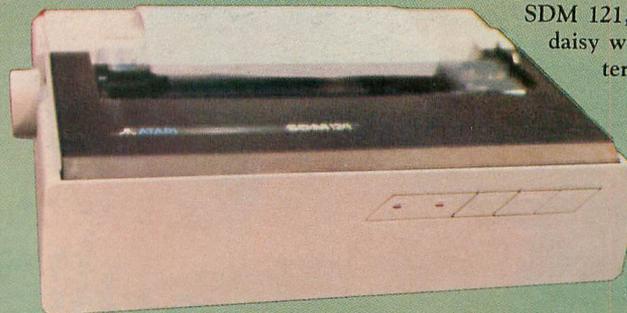
In addition, a 3½-inch, 10-megabyte hard disk will be available for under \$600, to be used with the built-in DMA hard disk controller (1.333 megabytes/second transfer rate). An RS232C serial port and a Centronics parallel port can be found on the computers. A ROM cartridge port, two joystick ports and an audio output round out the ST interfacing. One of the joystick ports doubles as a mouse port.

Monitors for the ST family consist of the SM 124, a 12-inch, high resolution monochrome model priced under \$100, and the SC 1224, a 12-inch, medium resolution RGB color monitor for under \$200. Another monitor was on display but not included as part of the official line. The VMF 300F is a 19-inch composite/RGB monitor that had an excellent display. The electronics and picture tube are made by JVC. Price had yet to be decided for this particular model.

Four printers were announced as part of the ST peripherals family. The STC 204 is a non-impact, dot matrix, 20-cps color printer, under \$100. The STC 504 is a non-impact, 50-cps color printer, under \$150. The SMM 801 is an 80-cps, dot matrix im-



Above: the STC 504, the new dot matrix, non-impact, color printer. Below: the SDM 121, Atari's daisy wheel letter quality printer.



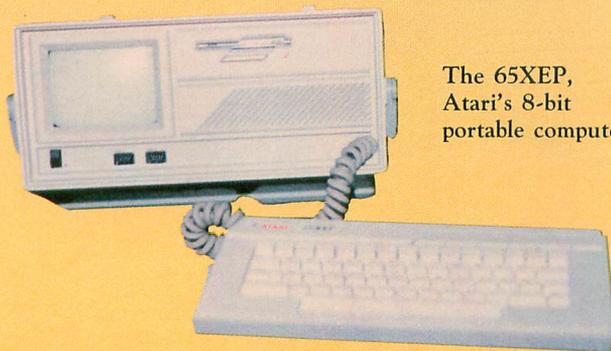
the hands of software developers by the end of January. Jack is known for keeping his promises.

The other question is: will anyone buy the ST computers? Do they offer enough of an upgrade from existing technology for the experienced user to want one? Do they offer the types of capabilities that the new user would want? The answer to both questions is yes.

The new Atari ST computers truly represent to the consumer what Jack Tramiel is saying—easy-to-use computing power without the price. And you can be sure that **ANALOG Computing** magazine will support all of the new machines in these very pages. 1985 will definitely be an interesting year, not only for Atari users, but for the entire computer industry.

Congratulations, Atari, on your debut. It was worth the wait! □

Arthur Leyenberger is a human factors psychologist and free-lance writer living in New Jersey.



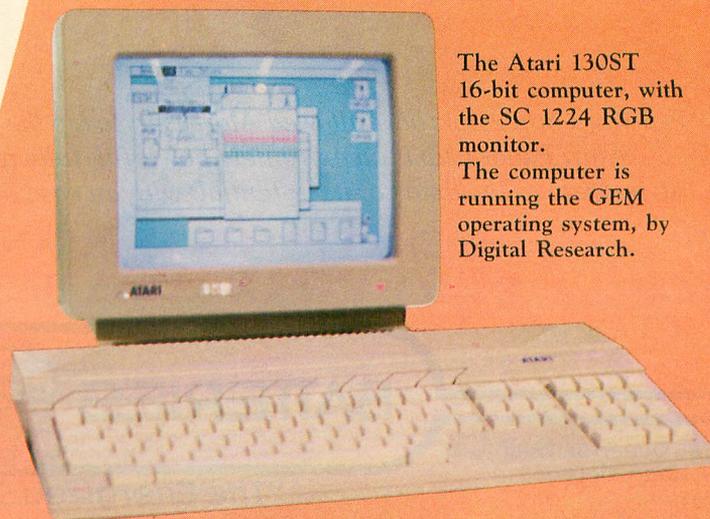
The 65XEP, Atari's 8-bit portable computer.

compact printer, under \$200. The SDM 121 is a 12-cps, letter quality, daisy wheel printer, under \$200.

Rock bottom prices.

Not only did Atari announce two major computer lines, they also made history with their extremely low prices. Atari's theme for CES was "Power without the Price." Consider the effect Atari will have on the entire computer industry with its low prices. If you're familiar with the Apple Macintosh, then you probably know that to upgrade to 512K bytes of RAM from the original 128K costs approximately \$1000. Now, for the price of a Mac upgrade, you can have an *entire* 512K computer, two 3½-inch 500K disk drives and color. I'd imagine Apple must be just a little worried right now.

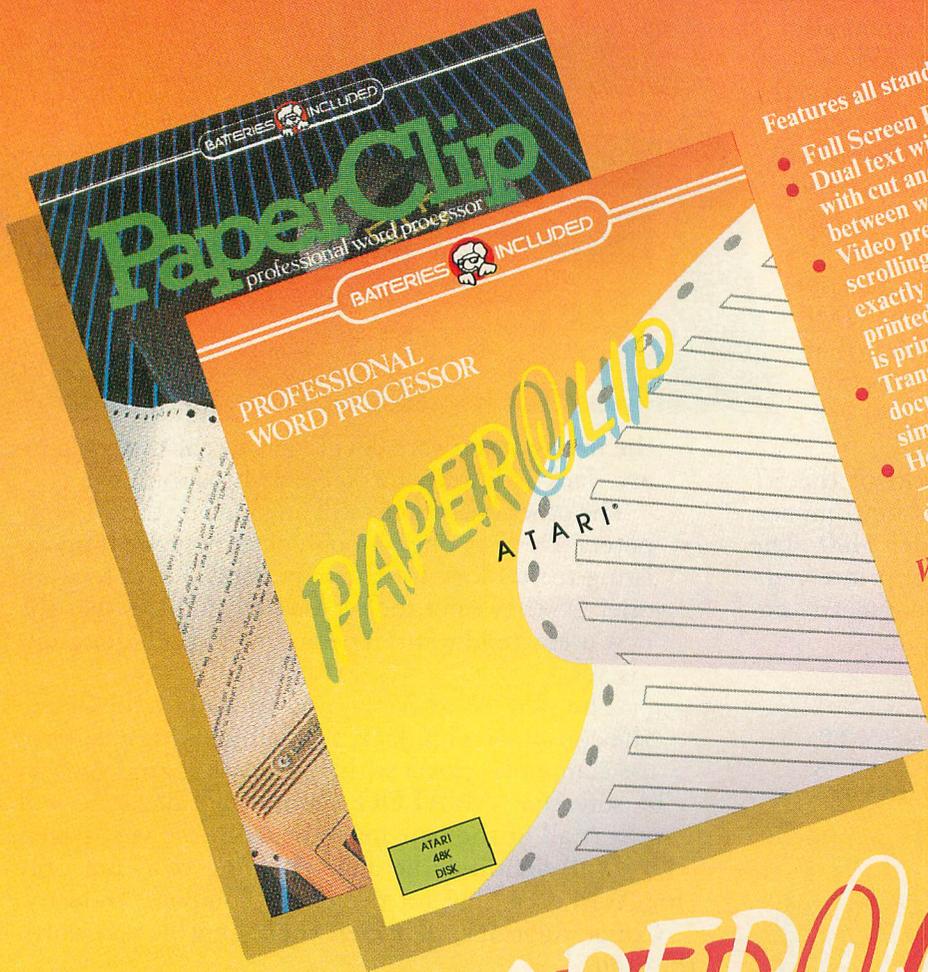
The main question, of course, is: can Atari deliver the new ST computers in a timely way? Jack Tramiel promised to put the machine in



The Atari 130ST 16-bit computer, with the SC 1224 RGB monitor. The computer is running the GEM operating system, by Digital Research.

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CIRCLE #116 ON READER SERVICE CARD

YOUR PERSONAL NET WORTH

Developed by ISA Software, Inc.

Published by SCARBOROUGH SYSTEMS, INC.

25 North Broadway

Tarrytown, NY 10591

(914) 332-4545

48K Disk \$79.95

by Bob Curtin

Certainly games are fun, but in the long run, it's the utilities—the number-crunching capability of the Atari—which keep me at the keyboard. My trusty 800 has been used to bang out articles and programs, write a novel, keep track of the household budget, and perform a slew of other, less important tasks. It's still used to play games, of course, but I learned a long time ago that my Atari has a serious side.

So, when I noticed the Scarborough System box on a recent work-scrounging trip to the **ANALOG Computing** offices, I grabbed it. I'd heard of the excellent software products by this company but, until now, have not had the pleasure of actually using any of it. I was certainly not disappointed.

Financial control for everyone?

Well, not exactly, but **Your Personal Net Worth** is a beautifully packaged, well-documented, and suitably complex program. It is, without a doubt, a powerful tool for managing just about anyone's finances.

Net Worth is based on standard accounting principles, though they've wrung out a lot of the detail of a full blown accounting method, leaving you with a nicely manageable system. **Net Worth** will handle up to 420 different financial categories and store over 3000 financial records on each disk.

It'll help you manage up to ten separate bank accounts, including helping you reconcile your bank accounts each month. It'll keep a record of your credit card transactions and reconcile those accounts at month's end.

Net Worth will also allow you to keep a household inventory, including the purchase price, current market value, and whether or not an item is insured. There's also a stock portfolio provision to record your stock purchases and sales, and to keep a history of your portfolio. If that isn't enough, how about printing your checks for you?

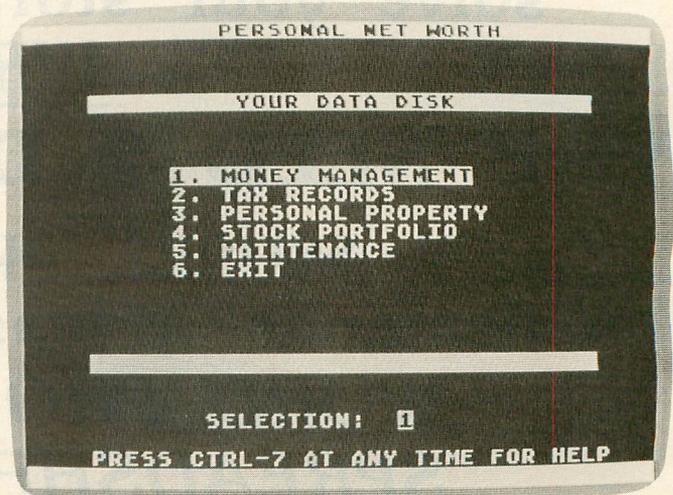
As with all financial packages of any worth (pun intended), most of the work is in the initial setup and the first few months of the data entry process. It takes a while to get any system down pat, and **Net Worth** is certainly no different.

There are two disks included in the package. One is copy-protected and contains the program. The other is a data disk which is not copy-protected—in fact, they recommend that you copy it immediately. This data disk holds the categories and accompanying data.

The first step in using **Net Worth** is to define your categories in each of the four types of accounts. The data disk provides a full range of suggested categories, any of which can be changed or eliminated.

Once the categories are fixed, the next step is to input the beginning balances, set up your loan accounts and do your household inventory. (It's recommended that you do this on paper before you enter the data into the computer, since accuracy at this point is essential.) If you have a stock portfolio, now is the time to enter that information.

From then on, **Net Worth** goes to work for you, on several different levels. Each category is treated as a separate account, and the accounts are grouped together into five distinctly different types.



Your Personal Net Worth.

Income accounts and expense accounts are used to record all monies coming in or going out of the household. These two account types are used in conjunction with a monthly budget, and at any given time, you can get a summary of the incoming or outgoing accounts, so you can compare the actual against the budgeted amounts. Expense accounts include utilities, car expenses, clothing, groceries, medical/dental, etc. Income accounts include salaries, bonuses, commissions, interest, etc.

Asset accounts record the value of your assets—that is, the things you own—such as your house or car. These assets can change in value from year to year through depreciation, appreciation or damage. Asset accounts include your bank accounts, cash, jewelry, stocks, bonds, life insurance, car(s), house(s), and so on.

Liability accounts record the amount of money you owe, such as the mortgage on your house, car loan and the like. **Net Worth** makes a distinction between expenses and liabilities. Liability accounts do not re-

(continued on page 40)

YOU HAVE ALREADY MADE YOUR FIRST MISTAKE!

You thought that cassette recorder would handle your storage needs.

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WRONG

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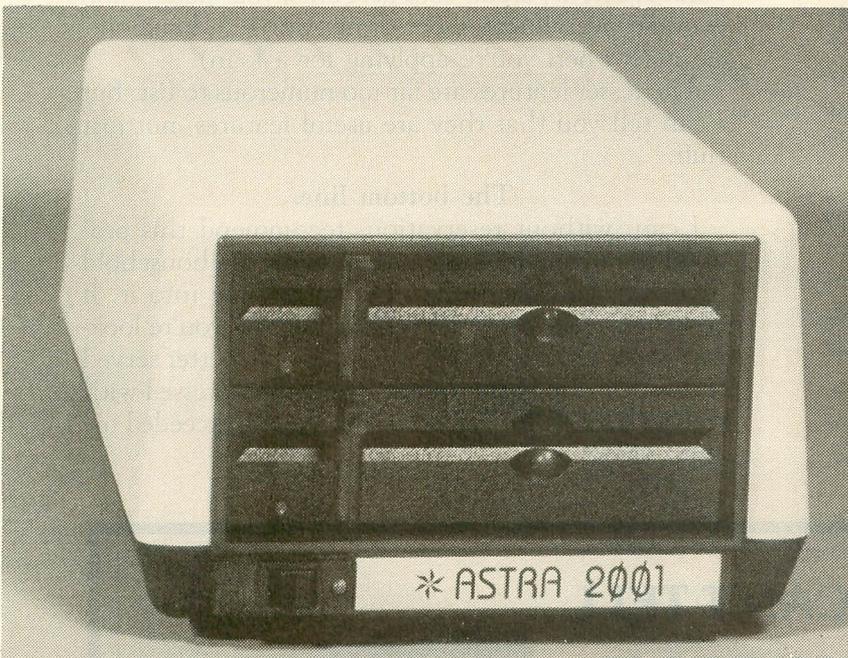
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CIRCLE #116 ON READER SERVICE CARD

cord the outlay of money, but only the amount of money owed. As payments are made, the liability gets smaller.

The last account type is the credit card account. This is simply another form of liability account, but it's set up so that you can record purchases and payments specific to your credit cards.

How it works.

Basically, as you enter day-to-day transactions into the computer, they're put into a particular electronic "journal." In essence, these journals contain, in chronological order, a record of all of your transactions—whether they're payments, deposits, credit card purchases, transfers or loan payments. In this form, the data does nothing. Periodically, however, this data is "posted."

Posting journal entries is a function performed by the computer on command. The appropriate account balances are updated, and all of the journal entries are transferred to your HISTORY file. Once posted, the data becomes permanent (corrections can be made only by making "reversing" entries).

The hardest part about using Net Worth is learning into which journals your entries should be made.

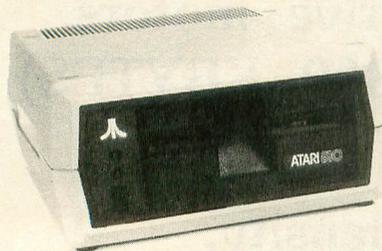
Certain transactions require entries to be made in more than one journal, and some entries will seem sort of weird. For instance, the purchase of an asset (let's say, a stereo component system) is treated as a transfer, and the transaction is entered into the "transfers" journal.

With practice, however, the program becomes second nature. Once mastered, Net Worth allows remarkable control over your finances. At any given time, it will provide you with printouts of the status of your bank accounts, credit card accounts, your budget and even an overall statement of net worth (a handy little item when you're applying for a loan).

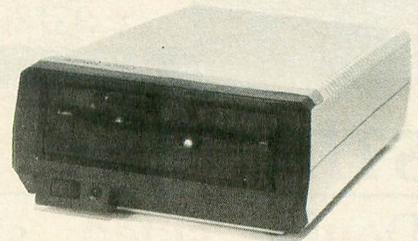
The lesser features are far too numerous to list, but I can tell you that they are useful features, not just fluff.

The bottom line.

I can, without reservation, recommend this program to anyone looking for help with the household finances, who's willing to put some time into it. If you're not ready to spend this time, or if you're looking for something simple, then you'd be better served by looking elsewhere. In any case, I'm impressed with the package. Your Personal Net Worth exceeded my expectations. □



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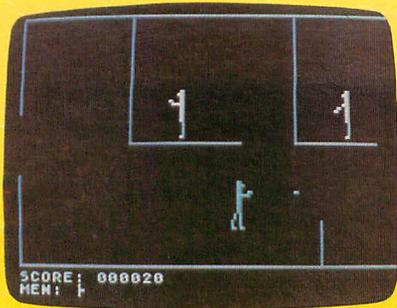
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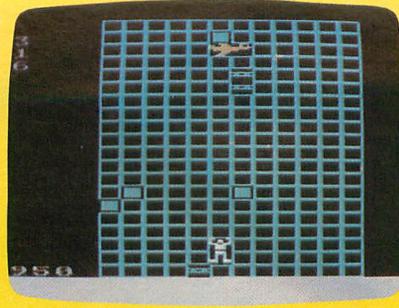
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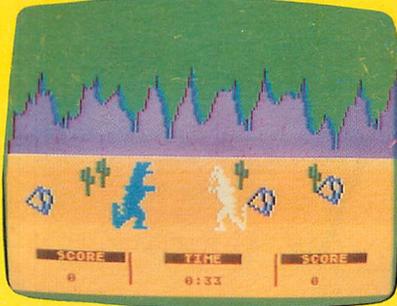
Maniac!



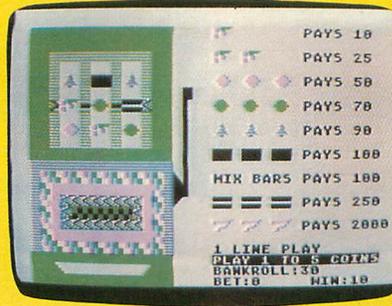
Stuntman



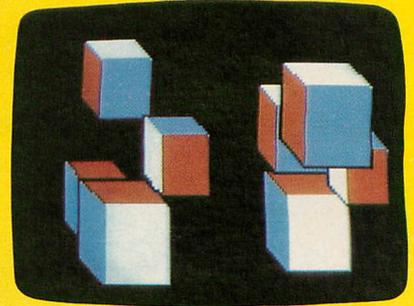
Fill 'Er Up



Dino Battle



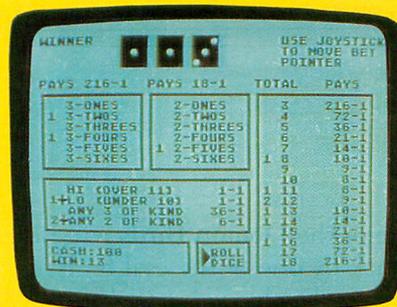
Color Slot Machine



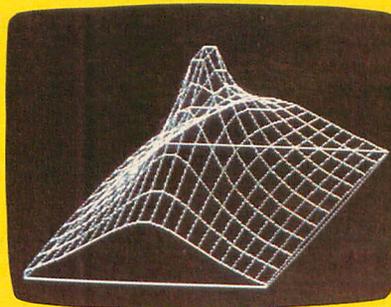
Cubes

Where can you get all of these programs
(and dozens more!) for only \$14.95?

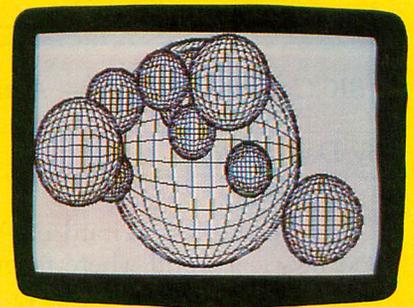
See page 51 to find out.



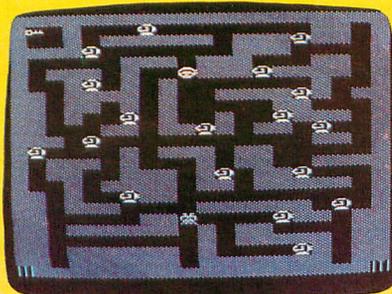
Triple Threat Dice



3-D Graphs



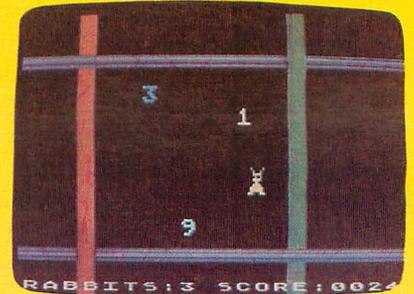
Sphere Demo



Leprechaun King



Sketch Pad



Harvey Wallbanger



48K Cassette or Disk — Action! cartridge

by Dan Bullok

You are the last Wizard of Akturnis, the strange and mystical world where magic can be worked by anyone with the will to do so. But, in the past few years, people have lost their faith in Wizards and magic. Now the evil **Demon Birds** have begun to plague them, and you are their *only* hope.

To save the people of Akturnis, you must enter the dreaded Valley of Death and destroy all of the **Demon Birds** found there.

Your Wizard starts the game with four lives and fifty units of energy. For every bird you destroy, you will gain two units of energy. However, every time you cast a fireball, you *lose* one unit of energy.

You move your Wizard left and right at the bottom of the screen, using the joystick. You may cast a fireball by pressing the red button while moving in the direction in which you wish it to travel.

Ridding your people of the **Demon Birds** will not be easy. If you are struck by one of the evil birds, or are hit by a meteor from the sky, you will lose one life. You'll also lose a life if your energy reaches zero. Furthermore, the ground in the valley is very *unstable*, because it sits on top of a pool of lava. If you stand in one place for too long, the ground will open up, and your Wizard will be lost.

Disk instructions.

Type in Listing 1 and **SAVE** it to disk under the filename "D:BIRDS". You must have 48K and the Action! cartridge.

2. Reboot your computer and enter the monitor. Type **C** "BIRDS".

3. When the disk drive stops, type **W** "AUTO-RUN.SYS" to save the object code to disk.

4. Whenever you want to play **Demon Birds**, insert the Action! cartridge into the left slot. Insert the disk with the AUTORUN.SYS file into drive one and turn on the computer. The program will load and run automatically.

Cassette instructions.

1. Type in Listing 1 and SAVE it to cassette. You must have at least 48K and the Action! cartridge.
2. Reboot your computer and enter the monitor. Type C "C:".
3. When the cassette stops, type W "C:" to save the object code to cassette.
4. Whenever you want to play **Demon Birds**, insert the Action! cartridge into the left slot. Insert the cassette with the object code into the cassette recorder. Turn on the computer and enter the monitor. Type R "C:". The program will load and run automatically.

That's all there is to it. You're ready to do battle with the **Demon Birds**. □

Action! listing.

```

;*****
;*                               *
;*  Demon Birds                 *
;*    by                          *
;*  Dan Bullok                   *
;*                               *
;*****
;Data For Player 0
BYTE ARRAY p0=[12 12 12 12 4 12 14 30
29 45 13 0 0 0 0 0 0 102 12 12
12 12 4 12 14 14 13 30 12 0 0 0
0 0 2 50 12 12 12 4 12 14 14 14
30 12 0 0 0 0 4 4 0 24 12 12 12
12 4 12 12 12 14 14 28 0 0 0 0
0 48 6 48 48 48 48 32 48 112 120
184 180 176 0 0 0 0 0 0 102 48
48 48 48 32 48 112 112 176 120 48 0
0 0 0 0 0 64 76 48 48 48 32 48
112 112 112 120 48 0 0 0 0 32 32
0 24 48 48 48 48 32 48 48 112
112 56 0 0 0 0 0 12 96]

;Data For Player 1
BYTE ARRAY p1=[0 0 0 4 12 14 30 29
13 12 12 28 28 20 50 34 34 102 0
0 0 0 4 12 14 14 13 14 8 12 12 12
28 24 20 20 18 50 0 0 0 4 12 14
14 14 14 8 12 12 28 28 8 12 12 8 24
0 0 0 4 12 12 12 14 14 12 12 12
12 12 20 20 18 50 6 0 0 0 32 48
112 120 184 176 48 48 56 56 40 76
68 68 68 102 0 0 0 32 48 112 112
176 112 16 48 48 48 56 24 40 40 72
76 0 0 0 32 48 112 112 112 112 16
48 48 56 56 16 48 48 16 24 0 0 0
32 48 48 48 112 112 48 48 48 48 48
40 40 72 76 96]

;Meteor Data
BYTE ARRAY
ball=[60 126 126 255 255 255 255
126 60],
ball(8),coordstore(30)

;Character Set
BYTE ARRAY chset=
[0 0 0 0 0 0 0
0 32 32 160 168 168 170 170
170 170 170 170 170 170 170 170
0 128 128 128 162 170 170 170

```

```

128 128 128 136 136 168 170 170
0 0 0 0 0 0 170 170
0 0 2 34 42 170 170 170
0 2 2 2 34 42 42 170
0 0 0 2 2 34 42 170
0 5 85 1 1 1 0 0
20 92 85 64 64 64 64 0
0 1 1 1 5 85 0 0
64 64 64 84 92 85 0 0
20 53 85 1 1 1 1 0
0 80 85 64 64 64 0 0
1 1 1 21 53 85 0 0
0 64 64 64 80 85 0 0
252 254 102 102 102 254 252 0
0 0 60 102 124 96 56 14
0 0 254 255 219 219 219 3
0 0 63 102 102 102 60 0
0 0 220 102 102 102 246 7
252 254 102 126 102 254 252 0
24 0 56 24 24 24 62 0
0 0 223 96 96 96 240 0
14 12 252 204 204 204 119 0
0 0 62 96 60 6 252 0
0 195 60 60 60 195 0 01,

```

```

chset2=
[15 31 63 120 120 120 124 127
248 252 252 28 28 28 28 220
127 124 124 126 126 126 126 60
220 28 28 28 28 20 20 8
126 126 127 127 121 121 124 124
8 28 28 28 156 156 220 220
126 126 127 127 127 127 127 62
252 124 124 60 60 20 20 8
96 112 112 112 112 112 112 120
0 0 0 0 0 0 0 0
120 124 124 126 126 127 127 63
0 0 0 0 248 236 248
63 127 127 120 112 112 112 120
248 252 252 28 28 28 28 28
120 124 124 126 126 127 127 63
28 28 28 28 28 244 244 248
63 127 127 120 112 112 112 121
248 252 252 0 0 0 0 248
120 124 124 126 126 127 127 63
252 124 28 28 28 244 244 248]

;Notes for song
BYTE ARRAY notes=
[243 243 162 182 162 182 193 243],
notes1=
[162 96 108 121 108 121 128 162],
dur=[10 10 30 6 6 10 20],
increase=[2 0]

;y-positions of birds
BYTE ARRAY strafey=
[10 11 12 13 14 15 16 17 18 19 19
19 19 18 17 16 15 14 13 12 11 10
11 12 11 10 11 11 10 10 10 10
10 10 10 10 10 10 07 08 10 12
14 16 17 17 18 18 18 18 17 16
15 15 14 14 13 13 13 13 14 14
15 15 14 13 12 12 11 10 10 09
08 08 08 14 14 14 15 15 16 16
17 18 18 18 18 18 18 18 18 19
19 20 20 20 20 20 20 19 19 18
18 17 17 16 15 15 14 14 14 12
12 13 14 15 16 18 19 19 20 19
19 18 16 15 14 13 12 12 13 13
15 16 17 18 18 18 18 18 18 16
15 14 13 12 12 12 14 14 14 15
16 16 17 18 18 19 19 19 19 18
18 17 17 17 17 17 17 18 18 19
19 19 19 18 17 17 16 15 15 14
14 14 14 14 15 16 16 17 17 18
18 18 19 19 20 20 19 19 19
18 18 17 17 16 16 16 15 15 15
15 15 14 14 14 14 14 14]

BYTE ARRAY flapinc=[1 0], bexist(10)
BYTE bcount,char1,char2,dieflag,bx,
by,fallx,fally,fallflag,bflap

;Miscellaneous variables
BYTE a,b,c,d,e,x=[100],y=[154],

```

```

ctr=[0],dir,fx,fy,fireflag,df,
mx=[10],my=[10],chad,men=[4],
memory,gflag=[1]

;Hardware registers
BYTE vcount=54283,colpf0=53270,
colpf1=53271,colpf2=53272,
colpf3=53273,wsync=54282,
chbase=54281,random=53770,
consol=53279,rtclock=20,ch=764

CARD pmbase,ac,bc,cc,vdslst=512,
dliivec,score=[0],energy=[50]

PROC Dli2()
;Changes color of text window to red
[72 169 68 141 10
212 141 24 208
169 0 141 23 208]
vdslst=dliivec
[104 64]
RETURN

PROC Dli1()
;Changes color of ground to Brown
[72 169 20 141 10
212 141 23 208]
vdslst=Dli2
[104 64]
RETURN

INT FUNC DeltaX()
;Returns Delta-X value of stick(0)

BYTE aa
INT xx

aa=Stick(0)
IF aa>12 THEN xx=0
ELSEIF aa<8 THEN xx=1 dir=80
ELSE xx=-1 dir=0
FI
RETURN(xx)

PROC Center(CARD cnum
            BYTE basx,basy)

;right-justifies number
IF cnum<10 THEN
  Position(basx,basy)
  PrintD(6,"0")
ELSEIF cnum<100 THEN
  Position(basx-1,basy)
  PrintD(6,"0")
ELSEIF cnum<1000 THEN
  Position(basx-2,basy)
  PrintD(6,"0")
ELSE
  Position(basx-3,basy)
  PrintD(6," ")
FI
PrintD(6,cnum)
RETURN

PROC Delay(CARD cnt)
;Delay Loop

CARD cnt

FOR cnt=1 TO cnt DO OD
RETURN

PROC PMove(CARD pm,add
           BYTE plr,px,py,pix)
;Moves Player
;Variables passed:
;pm: address of pmbase
;add: address of source image
;plr: # of player to move 0-3

```

```

;px: x-position of player
;py: y-position of player
;pix: number of bytes to move

px==+48
py==+32 ;add screen margin offsets
ac=pm+1024+plr*256 ;add work space
Zero(ac+py-5,pix+10) ;clear area out
MoveBlock(ac+py,add,pix)
Poke(53248+plr,px)
RETURN

PROC BirdPos
  (BYTE xpos,ypos,char1,char2)
;Puts Two bytes, char1 & char2
;at xpos, ypos on screen

CARD scmem=88

ac=scmem+xpost+(ypos*40)
Poke(ac,char1)
Poke(ac+1,char2)
RETURN

PROC Song()

FOR a=0 TO 7 DO ;eight notes in song
  b=notes(a)
  c=dur(a)
  d=10
  e=notes1(a)
  FOR ac=1 TO c*40 DO
    IF ac MOD 100=0 THEN
      d=-1 ;decrement volume
    FI
    Sound(0,b,10,d)
    Sound(1,e,10,d)
  OD
  Sound(0,0,0,0)
  Sound(1,0,0,0)
OD
RETURN

PROC Init()
;Initialize chset,pmg & playfield

Poke(106,memory) ;reset top of memory
Graphics(0)
Poke(559,0) ;turn ANTIC off
;Display List
ac=PeekC(560)
FOR a=6 TO 24 DO
  Poke(ac+a,4) ;IR Mode 4
OD
Poke(ac+25,164) ;DLI & VSCROLL on
Poke(ac+26,164)
Poke(ac+27,34) ;VSCROLL Set
Poke(ac+28,34)
;colors
Poke(706,30)
Poke(707,14)
Poke(708,68)
Poke(709,12)
Poke(710,128)
Poke(712,128)
Poke(752,1) ;cursor off
Poke(82,0) ;Left margin=0
;Character Set
a=Peek(106)-8
chad=a
Poke(106,a)
Poke(756,a)
FOR ac=0 TO 1023 DO
  b=Peek(57344+ac)
  Poke(a*256+ac,b)
OD
MoveBlock(a*256+512,chset,224)
MoveBlock(a*256+776,chset2,160)
;Player missile graphics
a=-16
Poke(106,a)
Poke(54279,a)
Poke(53277,3)
Poke(623,52)

```

```

pmbase=a*256
Zero(pmbase,2048)
;Playfield
Position(14,0)
Print("  |H| |L|")
;above is CTRL-Q R S T U V W X Y Z
Position(0,21)
Print(" |H| |L|")
Print(" |H| |L|")
;above is CTRL B B D 23-E's F B B
Position(0,22)
Print("  SCORE: 000000")
PrintE("  MEN: 00")
Print("  ENERGY: 00000")
Center(score,13,22)
Center(energy,14,23)
Position(31,22)
Print("0")
PrintC(Men)
;DLI's
dliilvec=Dlii1
vds1st=Dlii1
Poke(54286,192)
Poke(559,62)
FOR e=0 TO 19 DO ;reset x & y values
  coordstore(e)=0 OD
FOR e=20 TO 29 DO ;random wing flaps
  coordstore(e)=Rand(2) OD
fallflag=0 ;disable meteor
RETURN

```

PROC CntFire()

```

;Continue firing
cc=PeekC(88)
bc=fy*40+fx
Sound(0, fy+fy+180, 10, fy/2)
Poke(cc+bc, 0) ;Erase Fireball
;Check for Illegal coordinates
IF fx=2 OR fx=37 OR fy=2 THEN
  fireflag=0
  Sound(0, 0, 0, 0)
  RETURN
FI
;Increment positions
fx==+df
fy==-1
cc=PeekC(88)
bc=fy*40+fx
c=Peek(cc+bc) ;Object under fireball
Poke(cc+bc, 219) ;fireball character
Delay(300)
IF c THEN ;check what under fireball
  FOR e=0 TO 5 DO ;Which bird hit?
    IF bexist(e)=1 THEN
      a=coordstore(e)
      b=coordstore(10+e)
      IF a<fx+2 AND a>fx-2 AND fy=b
        THEN
          bexist(e)=0
          BirdPos(a,b,0,0)
          PMove(pmbase,ball2,3,fx*4,
            fy*8,8);put explosion
          Delay(200)
        FI
      FI
    OD
  Sound(0, 150, 8, 10)
  Delay(3000)
  ;Clear player 3 area
  Zero(pmbase+fy*8+1824, 8)
  energy==+2
  fireflag=0
  Sound(0, 0, 0, 0)
  score==+1 ;increase score
  Poke(cc+bc, 0)
  FI
  Poke(cc+bc, 0)
  RETURN

```

PROC Title()

```

;Prints out title page
Graphics(17)
Poke(559, 0);turn ANTIC off

```

```

;Display list
ac=PeekC(560)
Poke(ac+13, 7)
Poke(ac+15, 4)
Poke(ac+13, 7)
Poke(756, chad+2)
Position(3, 2)
PrintD(6, "ABEFABIJMNQR")
Position(3, 3)
PrintD(6, "CDGHCDKLOPST")
Position(5, 5)
PrintD(6, "PRESENTS")
Position(4, 8)
PrintD(6, "12345 6789")
Position(3, 15)
PrintD(6, "BY DAN BULLOK")
Position(0, 18)
PrintD(6, "  press start")
Position(5, 10)
PrintD(6, " ")
;above=space INVERSE CTRL-I J 4spaces
;CTRL-K L 4spaces CTRL-I J 4spaces
;CTRL-K L 4spaces CTRL-I J 2spaces
;PMG stuff
Poke(53277, 3)
Poke(623, 32)
Poke(704, 28)
Poke(705, 128)
Poke(708, 12)
Poke(709, 92)
Poke(712, 134)
PMove(pmbase, p0, 0, 119, 131, 20)
PMove(pmbase, p1, 1, 119, 131, 20)
Poke(559, 62);Turn ANTIC back on
WHILE consol#6 DO
  colpf3=random ;flash start
  wsync=0 ;wait for sync
  ;scroll colors in Demon Birds
  colpf2=128-vcount+(rtclock R5H 3)
  IF vcount=34 THEN
    chbase=chad
    colpf0=26
  ELSEIF vcount=41 THEN
    chbase=chad+2
  ELSEIF vcount=58 THEN
    chbase=chad
    colpf0=68
  ELSEIF vcount=65 THEN
    colpf0=168
  FI
  OD
  RETURN

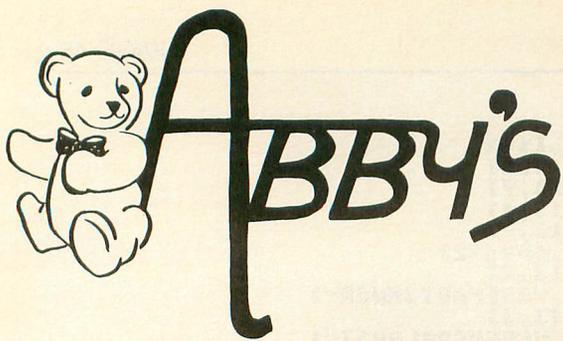
```

PROC GameOver()

```

;Game Over message
SndRst()
gflag=1
Poke(106, memory)
Poke(623, 4)
Poke(53277, 0)
Graphics(17)
Poke(559, 0)
Poke(708, 14)
Poke(709, 70)
Poke(710, 128)
Poke(711, 0)
Poke(712, 136)
ac=PeekC(560)
Poke(ac+9, 7) ;Graphics(2) at line 4
Position(5, 4)
PrintDE(6, "game over")
Position(4, 10)
PrintDE(6, "final SCORE")
Position(7, 12)
PrintD(6, "000000")
Center(score, 10, 12)
Position(4, 18)
PrintDE(6, "press start")
Poke(559, 34)
WHILE consol#6 DO
  wsync=0
  colpf3=vcount+rtclock/2
  OD
  RETURN

```



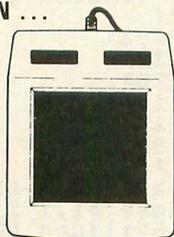
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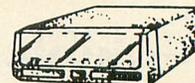
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```

PROC NewMan()
;Materialize New Wizard
Zero(pmbase,2048)
Poke(704,78) Poke(705,78)
FOR a=0 TO 100 STEP 2 DO
  FOR b=0 TO 7 DO
    ball2(b)=ball(b)&random
    Sound(1,a+a,8,a/10)
  OD
  PMove(pmbase,ball2,0,a,y,8)
  PMove(pmbase,ball2,1,200-a,y,8)
OD
Zero(pmbase,2048) ;clear pm area
b=10
;materialize man
FOR a=0 TO 20 STEP 2 DO
  b=10-a/2
  PMove(pmbase,p0+b,0,100,y+b,a)
  PMove(pmbase,p1+b,1,100,y+b,a)
  Poke(704,30-a/10)
  Poke(705,140-a/2)
  FOR c=0 TO 100+a*6 DO
    d=255-c
    Sound(1,d,10,10-a/2)
  OD
OD
Sound(1,0,0,0)
Poke(704,28)
Poke(705,130)
x=100
y=154
fireflag=0
rtclock=0
RETURN

PROC Die()
;Death of wizard
;Puts player data in missile area
;and blows player apart into 4 pieces
BYTE ARRAY image(20)
Poke(704,14)
Poke(705,14)
;spins player around
FOR a=0 TO 15 DO
  PMove(pmbase,p0+40,0,x,y,20)
  PMove(pmbase,p1+40,1,x,y,20)
  Delay(1000)
  PMove(pmbase,p0+120,0,x,y,20)
  PMove(pmbase,p1+120,1,x,y,20)
  Delay(1000-a*30)
  Sound(0,155-a*10,10,a)
OD
SndRst()
Zero(pmbase,2048)
FOR a=0 TO 20 DO
  image(a)=p0(a)%p1(a) OD
FOR a=0 TO 20 DO
  image(a)=image(a) RSH 1 OD
MoveBlock(pmbase+800+y,image,20)
Poke(711,14)
;blows player apart
FOR a=0 TO 100 DO
  Poke(53254,x-a+48)
  Poke(53253,x-a/2+48)
  Poke(53252,x+a/2+48)
  Poke(53255,x+a+48)
  Sound(0,a/3,8,a/12)
  Delay(a)
OD
SndRst()
RETURN

PROC Move()
;move wizard
ctr==+20 ;image counter
IF ctr=80 THEN
  ctr=0 ;reset counter if too big
FI
x=x+DeltaX()
IF x<10 THEN x=10
ELSEIF x>142 THEN x=142 FI
IF DeltaX()=0 THEN
  ctr== -20 ;if player is not moving
  Delay(250)
  IF ctr>60 THEN ctr=60 FI
  ;If player stood still too long,
  ;Make him sink in the mud
  IF rtclock>80 THEN
    Birdpos(x/4-1,21,0,0)
    Birdpos(x/4+1,21,0,0)
    SndRst()
    FOR c=0 TO 24 DO
      PMove(pmbase,p0,0,x,y+c,26-c)
      PMove(pmbase,p1,1,x,y+c,26-c)
      Delay(3000)
      Sound(0,c+150,10,5)
    OD
    Sound(0,0,0,0)
    dieflag=1
  FI
ELSE
  Poke(20,0)
  PMove(pmbase,p0+ctr+dir,0,x,y,20)
  PMove(pmbase,p1+ctr+dir,1,x,y,20)
FI
IF ctr=40 AND DeltaX()#0 THEN
  ;click feet
  Poke(53279,0)
  Poke(53279,8)
ELSE
  Delay(250)
FI
IF fireflag THEN
  CntFire()
ELSEIF STrig(0)=0 THEN
  fireflag=1
  fx=x/4+1
  fy=20
  df=DeltaX()
  energy== -1
ELSE
  Delay(300)
FI
RETURN

PROC GetReady()
Graphics(18)
Position(5,5)
PrintD(6,"GET ready")
Poke(623,4) ;players behind playfields
Poke(53277,0)
FOR ac=1 TO 20000 DO
  wsync=0
  colpf0=128-vcount+rtclock RSH 2
  colpf1=vcount+rtclock RSH 2
OD
RETURN

PROC MainLoop()
BYTE mcount,lum
;Infinite Loop
DO
  ;7 player moves to one bird move
  FOR mcount=1 TO 7 DO
    IF random<10 AND fallflag=0 THEN
      fallx=Rand(140)+10 ;drop meteor
      fally=10
      fallflag=1
    ELSEIF fallflag THEN
      fally==+5
      fallx==+Rand(5)-2
      FOR b=0 TO 7 DO ;random ball
        ball2(b)=ball(b)&random OD
      PMove(pmbase,ball2,2,fallx,
        fally,8)
      Sound(0,fally,8,fally/10)
      IF fally>170 THEN ;hit bottom?
        fallflag=0
        Zero(pmbase+1536,256)
        Sound(0,0,0,0)
      FI
    FI
  Poke(53278,1) ;hitclr

```

```

Move()
Poke(711,random) ;flash bird eyes
;kill wizard
IF energy=65535 OR Peek(53252)=1
OR dieflag#0 OR Peek(53262)#0
THEN
men=-1
energy=20
SndRst()
;Turn birds off
FOR e=0 TO 5 DO
bexist(e)=0
BirdPos(coordstore(e),
coordstore(e+10),0,0)
OD
IF men=0 OR men>10 THEN
gflag=0
EXIT
ELSE
IF dieflag THEN
dieflag=0
ELSE
Die()
FI
rtclock=0
GetReady()
Init()
Newman()
Poke(20,0)
FI
FI
OD
IF gflag=0 THEN
EXIT
FI
;Shake earth
e=Rand(4)
Poke(54277,e)
b=Rand(10)
Sound(1,50+b*20,8,e+3)
y=154-e
PMove(pmbase,p0+ctr+dir,0,x,y,20)

```

```

PMove(pmbase,p1+ctr+dir,1,x,y,20)
;If a bird isn't on screen,
;put it there if random<30
FOR e=0 TO 5 DO
IF bexist(e)=0 AND random<30 THEN
bexist(e)=1
IF e MOD 2=0 THEN
coordstore(e)=0
ELSE
coordstore(e)=39
FI
FI
OD
;Center score and energy
Center(score,13,22)
Center(energy,14,23)
Position(31,22)
Print("0")
PrintC(men)
;Start Key ends the game
;Option Key stops the program
;Any key pauses game
IF consol=6 THEN
EXIT
ELSEIF consol=3 THEN
Poke(106,memory)
Graphics(0)
Break()
ELSEIF ch#255 THEN
ch=255
WHILE ch=255
DO OD
ch=255
rtclock=0
FI
;Move all 6 birds
FOR bcount=0 TO 5 DO
bx=coordstore(bcount)
by=coordstore(10+bcount)
BirdPos(bx,by,0,0)
IF bexist(bcount)=1 THEN
bflap=coordstore(20+bcount)
char1=201+bflap+bflap+4#
(bcount MOD 2)
char2=char1+1
bflap=flapinc(bflap)
coordstore(20+bcount)=bflap
bx=++increase(bcount MOD 2)-1
IF bx=40 THEN
bx=0
FI
IF bx=255 THEN
bx=39
FI
coordstore(bcount)=bx
by=strafey(bcount*40+bx)
by=by
coordstore(10+bcount)=by
BirdPos(bx,by,char1,char2)
FI
OD
RETURN

```

```

PROC Game()
Memory=Peek(106) ;Get top of memory
DO
;reset variables
Men=4
Score=0
Energy=50
Init()
Title(); ;Title screen
Init()
Song()
Newman()
Mainloop()
;play song when game is over
Graphics(17)
Poke(712,134)
Poke(623,4)
Poke(53277,0)
Song()
GameOver()
OD
RETURN

```

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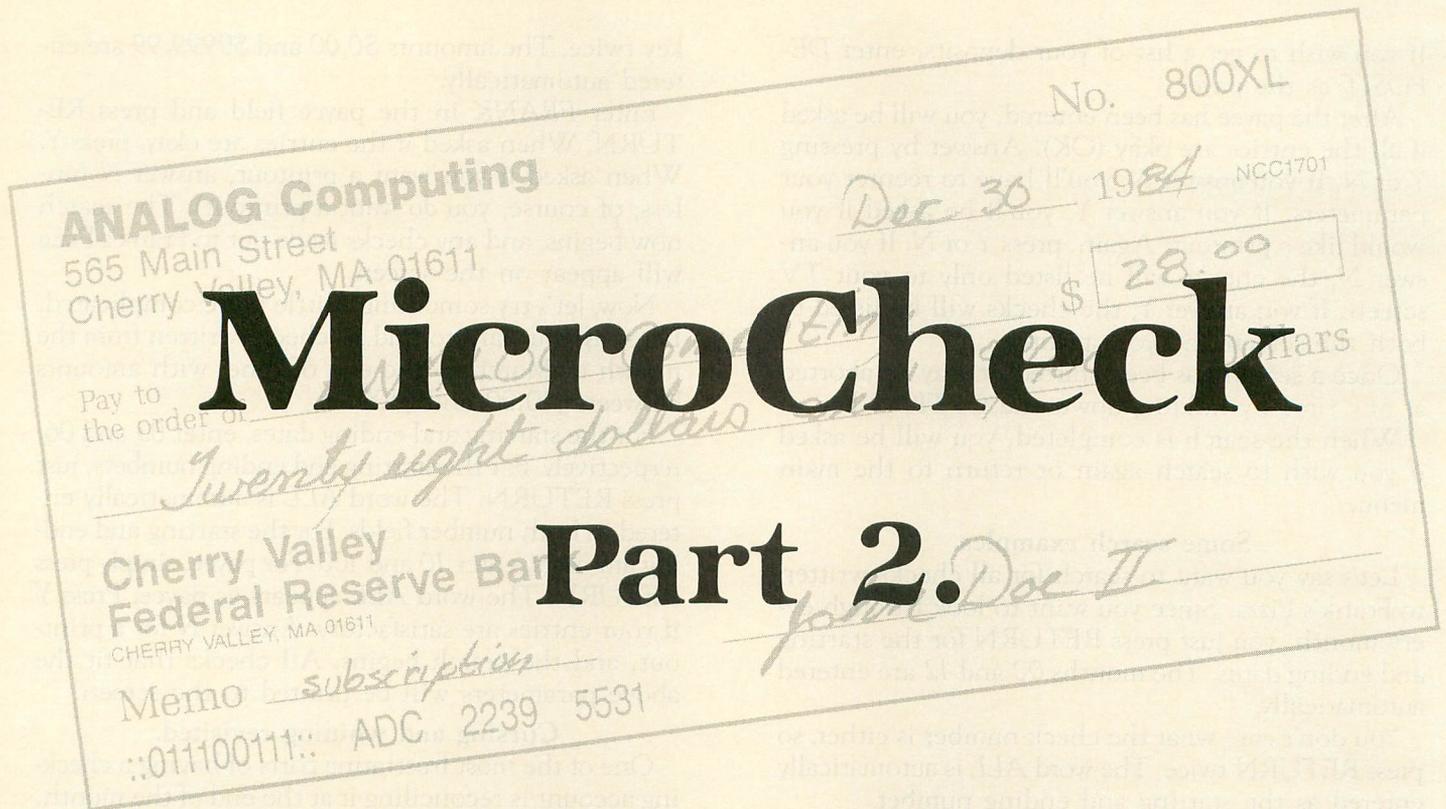
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by Clayton Walnum

Welcome to the conclusion of **MicroCheck**. This month, with the addition of the check search program and the account balancer, we will complete the system and send you happily on your way. You'll find that checking accounts need not lead to nervous disorders. In fact, you can remove that bottle of Valium from your desk drawer. You'll no longer need it.

I assume that, over the last month, you've been frantically writing checks. In fact, you're probably reading this with your latest statement clutched in your sweaty palm, eager to begin your first computer account balancing. So let's go!

More swollen fingers.

Listing 1 is the check search program. Type it in and **SAVE** it to your **MicroCheck** program disk under the filename **CHECKPRT**.

Listing 2 is the final part of **MicroCheck**, the account balancer. Type it in and **SAVE** it to your program disk under the filename **CHECKBAL**.

You are now the proud owner of a complete **MicroCheck** system!

Needle in a haystack.

One of **MicroCheck**'s handiest features is its ability to find a specific check or group of checks. Boot up your **MicroCheck** program disk. From the main menu, choose the **SEARCH CHECKS** option, then press **START** to run the program.

After you insert your data disk, the search parameter entry form will appear. Prompts at the bottom of the screen will guide you as you enter information.

First, you must enter the starting and ending dates for the search. For example, if you wish to search for checks from January to March, you would enter **01** as the starting date and **03** as the ending date. If you wish to search only one month, enter that month as both the starting and ending date. For example, **05** as the starting date and **05** as the ending date will search only the month of May. If you don't enter a starting or ending date, and just press **RETURN**, the dates **00** and **12** will be entered automatically.

You must then enter the check numbers you want to find. Numbers must be entered in four digits (i.e., **0001**, **0897**, **8756**, etc.). If you'd like to search for checks numbered **874** to **967**, you would enter **0874** as the starting number and **0967** as the ending number. If you don't enter a starting or ending number, and just press **RETURN**, the word **ALL** will appear as the search parameters.

Next, the amounts you wish to search for must be entered. Any amount from **\$0.00** to **\$9999.99** will be accepted. If you do not enter a starting or ending amount, and just press **RETURN**, the above amounts will be entered automatically.

Finally, the payee to be searched for must be entered. If you wish, you may enter only the first few letters of a payee. For example, if you wish to search for checks with **Frank's Pizza** as the payee, you could simply enter **FRA** as the payee. Of course, if you've also written checks to **Frannie Smith** and **Frabble Lumber**, these will also be fair game for the search.

If you wish to get a list of your deposits, enter *DEPOSIT* as the payee.

After the payee has been entered, you will be asked if all the entries are okay (OK). Answer by pressing Y or N. If you answer N, you'll have to reenter your parameters. If you answer Y, you'll be asked if you would like a printout. Again, press Y or N. If you answer N, the checks will be listed only to your TV screen. If you answer Y, the checks will be listed to both the screen and your printer.

Once a search has been started, it may be aborted at any time by holding down the *OPTION* key.

When the search is completed, you will be asked if you wish to search again or return to the main menu.

Some search examples.

Let's say you want to search for all checks written to Frank's Pizza. Since you want to look through every month, you just press *RETURN* for the starting and ending dates. The months *00* and *12* are entered automatically.

You don't care what the check number is either, so press *RETURN* twice. The word *ALL* is automatically entered as the starting and ending number.

You're not interested in the amount (at least, not as a search parameter), so, again, press the *RETURN*

key twice. The amounts \$0.00 and \$9999.99 are entered automatically.

Enter *FRANK* in the payee field and press *RETURN*. When asked if the entries are okay, press Y. When asked if you want a printout, answer N (unless, of course, you *do* want a printout). The search now begins, and any checks made out to Frank's Pizza will appear on the screen.

Now, let's try something a little more complicated. Let's say you want to find all checks written from the month of March to the end of June, with amounts between \$10.00 and \$100.00.

For the starting and ending dates, enter *03* and *06*, respectively. For the starting and ending numbers, just press *RETURN*. The word *ALL* is automatically entered in both number fields. For the starting and ending amounts, enter *10* and *100*. For payee, simply press *RETURN*. The word *ALL* appears as payee. Press Y if your entries are satisfactory. Answer N for a printout, and the search begins. All checks that fit the above parameters will be printed to the screen.

Cursing and whining revisited.

One of the most frustrating parts of having a checking account is reconciling it at the end of the month. The frustration level is in direct proportion to the number of checks written. If you write more than fif-

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teen a month, your desk is almost certainly cluttered with little clumps of hair which you've removed—none too gently—from your scalp.

Well, cancel your appointment for hair transplants! **MicroCheck** will be delighted to help you balance your account, and since it doesn't have any hair, your desk will be much neater.

To balance your account, simply select the **BALANCE ACCOUNT** option from the main menu. Press **START** to run the program.

Enter your ending balance and the month you wish to work on, as prompted. You'll find your ending balance somewhere on the bank statement. It is *not* the last balance in your checkbook. Also remember that, if you've started a new year recently, there may be checks in month #0 that need to be cleared.

If there are no checks entered for the month requested, you will see the message **NO ENTRIES FOR THIS MONTH**.

At the top of the screen are the commands used with the account balancer. Press **C** to move the cursor. Press ***** to cancel or uncanceled a check. Press **M** to toggle between a check and its memo. Press **P** to see the next page of entries. Press **N** to work on a new month. Press **E** to end your work and balance the account.

You balance your account with **MicroCheck** the same way you do it by hand. The only difference is that, now, the computer will do all the figuring for you. Go through your bank statement item by item. Press the ***** for each entry cleared by the bank. When you've cleared all the items in one month, press **N** to work on another. When all the transactions on your statement have been accounted for, press the **E**—and watch the computer go to work.

When **MicroCheck** has finished its calculations, it will display a final report. If all is well, you'll be rewarded by a short musical interlude. If the account doesn't balance, you'll be given a "raspberry." If the latter happens, please don't punch out your computer. It's not its fault!

Good-bye.

Just one final suggestion... It's a good practice to keep a backup copy of your data. Your checking information is too important to risk losing it to a silly accident. Every time you update your account, you should update your backup (use the **J** option of Atari DOS to copy the disk). Keep the backup stored away from the original. That way, the aforementioned silly accident won't wipe out both disks in one shot.

Well, that's about it. **MicroCheck** is now in your hands. I hope you'll get as much use out of it as I have. □

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Listing 1.

```

10 GOTO 1580
30 I=PEEK(16):IF I>127 THEN I=I-128:PO
KE 16,I:POKE 53774,I
50 RETURN
70 OPEN #K1,K4,K0,"K:" :POKE 764,255:PO
KE 702,64:POKE 694,K0
80 A=PEEK(764):IF A=255 THEN 80
90 IF A=39 OR A=60 OR A=103 OR A=124 T
HEN 80
100 GET #K1,A:CLOSE #K1:RETURN
120 L=K0:TEMP$="" :POKE 764,255
130 GOSUB IN2:POKE 752,K0:IF A=155 THE
N POKE 752,K1:RETURN
140 IF A=126 THEN 170
150 L=L+K1:IF L>L1 THEN RETURN
160 POSITION COL+L-K1,ROW:? CHR$(A):;T
EMP$(L,L)=CHR$(A):GOTO 130
170 IF L>K0 THEN ? CHR$(126):;L=L-K1:I
F NOT L THEN TEMP$=""
180 IF L>K0 THEN TEMP$=TEMP$(K1,L)
190 GOTO 130
210 FOR X=K1 TO LEN(TEMP$):IF TEMP$(X,
X)<>"." THEN NEXT X:TEMP$(X)=".00":RET
URN
220 IF LEN(TEMP$)=X THEN TEMP$(X+K1,X+
22)="00"
230 IF LEN(TEMP$)=X+K1 THEN TEMP$(X+K2
,X+K2)="0"
240 RETURN
260 SOUND K0,50,10,K8:FOR X=K1 TO 20:N
EXT X:SOUND K0,K0,K0,K0:RETURN
280 SOUND K0,100,12,K8:FOR X=K1 TO 25:
NEXT X:SOUND K0,K0,K0,K0:RETURN
300 POKE 752,K1:POSITION 9,K6:? "":L1
=K2:COL=9:ROW=K6:POSITION COL,ROW
310 GOSUB SND1:POSITION 27,18:? "enter
":POSITION 23,19:? "starting date"
320 GOSUB IN:IF TEMP$="" THEN TEMP$="0
0"
330 DATES=TEMP$
340 FOR X=K1 TO LEN(DATES):IF DATES(X,
X)<"0" OR DATES(X,X)>"9" THEN 370

```

```

350 NEXT X:FIRSTMON=VAL(DATES):IF FIRS
TMON>12 THEN 370
360 POSITION COL,ROW:? " ":POSITION C
OL,ROW:? DATES:GOTO 380
370 GOSUB SND2:POSITION COL,ROW:? " "
:GOTO 380
380 GOSUB SND1:POSITION 9,K7:? "":RO
W=K7
390 POSITION 23,19:? " ending date "
400 GOSUB IN:IF TEMP$="" THEN TEMP$="1
2"
410 DATE$=TEMP$
420 FOR X=K1 TO LEN(DATES):IF DATE$(X,
X)<"0" OR DATE$(X,X)>"9" THEN 450
430 NEXT X:LASTMON=VAL(DATES):IF LASTM
ON<FIRSTMON OR LASTMON>12 THEN 450
440 POSITION COL,ROW:? " ":POSITION C
OL,ROW:? DATES:RETURN
450 GOSUB SND2:POSITION COL,ROW:? " "
:GOTO 380
470 POSITION 27,K6:? "":COL=27:ROW=K
6:L1=K4
480 GOSUB SND1:POSITION 22,19:? " start
ing number "
490 GOSUB IN:IF TEMP$="" THEN TEMP$="A
NY":FIRSTCH=-K1:GOTO 540
500 IF LEN(TEMP$)<K4 THEN 550
510 CHNUM$=TEMP$
520 FOR X=K1 TO K4:IF CHNUM$(X,X)<"0"
OR CHNUM$(X,X)>"9" THEN 550
530 NEXT X:FIRSTCH=VAL(CHNUM$)
540 POSITION COL,ROW:? TEMP$:GOTO 560
550 GOSUB SND2:POSITION COL,ROW:? "
":GOTO 470
560 POSITION 27,K7:? "":ROW=K7
570 GOSUB SND1:POSITION 22,19:? " endi
ng number "
580 GOSUB IN:IF TEMP$="" THEN TEMP$="A
NY":LASTCH=9999:GOTO 630
590 IF LEN(TEMP$)<K4 THEN 640
600 CHNUM$=TEMP$
610 FOR X=K1 TO K4:IF CHNUM$(X,X)<"0"
OR CHNUM$(X,X)>"9" THEN 640
620 NEXT X:LASTCH=VAL(CHNUM$):IF LASTC
H<FIRSTCH THEN 640
630 POSITION COL,ROW:? TEMP$:RETURN
640 GOSUB SND2:POSITION COL,ROW:? "
":GOTO 560
660 POSITION 9,13:? "":COL=9:ROW=13:
L1=K7:POSITION COL,ROW
670 GOSUB SND1:D=K7:POSITION 22,19:? "
starting amount "
680 GOSUB IN:IF TEMP$="" THEN TEMP$="0
.00":GOTO 730
690 FOR X=K1 TO LEN(TEMP$):A$=TEMP$(X)
:IF (A$<"0" OR A$>"9") AND A$<>"." THE
N 760
700 IF A$="." THEN D=X
710 NEXT X:IF LEN(TEMP$)>D+K2 THEN 760
720 GOSUB DOLFORMAT
730 AMOUNT$=TEMP$:LOAMNT=VAL(AMOUNT$)
740 IF LOAMNT<K0 OR LOAMNT>9999.99 THE
N 760
750 POSITION COL,ROW:? " ":POSIT
ION COL,ROW:? AMOUNT$:GOTO 770
760 GOSUB SND2:POSITION COL,ROW:? "
":GOTO 660
770 POSITION 9,14:? "":ROW=14
780 GOSUB SND1:POSITION 22,19:? " endi
ng amount "
790 GOSUB IN:IF TEMP$="" THEN TEMP$="9
999.99":GOTO 840
800 FOR X=K1 TO LEN(TEMP$):IF (TEMP$(X
,X)<"0" OR TEMP$(X,X)>"9") AND TEMP$(X
,X)<>"." THEN 880
810 IF TEMP$(X,X)="." THEN D=X
820 NEXT X:IF LEN(TEMP$)>D+K2 THEN 880
830 GOSUB DOLFORMAT
840 AMOUNT$=TEMP$:HIAMNT=VAL(AMOUNT$)
850 IF HIAMNT>9999.99 THEN 880
870 IF HIAMNT>=LOAMNT THEN POSITION CO
L,ROW:? " ":POSITION COL,ROW:? A
MOUNT$:RETURN
880 GOSUB SND2:POSITION COL,ROW:? "
":GOTO 770
900 POSITION 20,13:? "":COL=20:ROW=1
3:L1=15:POSITION COL,ROW

```

```

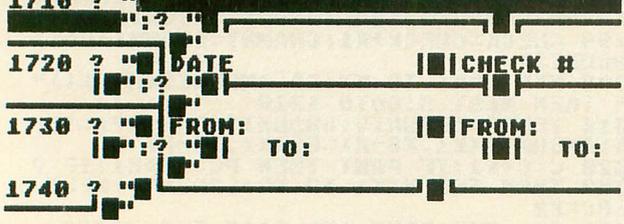
910 GOSUB SND1:POSITION 23,19:? "
avee "
920 GOSUB IN:IF TEMP$="" THEN TEMP$="A
NY"
930 PAYEE1$=TEMP$:POSITION COL,ROW:? B
$(23):POSITION COL,ROW:? PAYEE1$:RETUR
N
940 GOSUB 300:GOSUB 470:GOSUB 660:GOSU
B 900
950 POSITION 20,18:? B$(19):POSITION 2
0,19:? B$(19):POSITION K2,19:? "ALL EN
TRIES OK?"
960 GOSUB IN2:IF A=A5C("Y") THEN 1000
970 IF A<>A5C("N") THEN 960
980 POSITION 9,K6:? " ":POSITION 9,K7
:? " ":POSITION 27,K6:? " ":POSITI
ON 27,K7:? " "
990 POSITION 9,13:? B$(31):POSITION 9,
14:? B$(31):POSITION 20,13:? B$(23):PO
SITION K0,19:? B$(19):GOTO 940
1000 POSITION K0,19:? B$(19)
1010 POSITION 22,18:? " DO YOU WANT
":POSITION 24,19:? "A PRINTOUT?"
1020 GOSUB IN2:IF A=A5C("Y") THEN PRNT
=K1:GOTO 1040
1030 IF A<>A5C("N") THEN 1020
1040 GRAPHICS 17:GOSUB DISBRK:POKE 712
,144:POKE 710,12
1050 POSITION K1,K6:? #K6:"IF, AT ANY
TIME,":POSITION K1,K8:? #K6:"YOU WISH
TO ABORT"
1060 POSITION K1,10:? #K6:"THE SEARCH,
HOLD":POSITION K1,12:? #K6:"DOWN OPTI
ON"
1070 FOR X=K1 TO 500:NEXT X
1080 GRAPHICS K0:GOSUB DISBRK:POKE 710
,160:POKE 752,K1:C=K0:PC=K5
1090 POSITION K0,K0:? " CH# AMNT
PAYEE DATE "?:
1100 TRAP 1840
1110 IF PRNT THEN LPRINT :LPRINT :LPRI
NT " CH# AMNT PAYEE
DATE"
1120 IF PRNT THEN LPRINT "-----
-----":LPRINT
1130 TRAP 40000
1140 FOR MONTH=FIRSTMON TO LASTMON
1150 IF MONTH<10 THEN MONTHFILES(K8,K8
)="0":MONTHFILES(9,9)=STR$(MONTH):GOTO
1170
1160 MONTHFILES(K8,9)=STR$(MONTH)
1170 CLOSE #K2:OPEN #K2,K4,K0,MONTHFIL
E$
1180 INPUT #K2:CHECK$:IF CHECK$="END"
THEN NEXT MONTH:GOTO 1390
1190 IF PEEK(53279)=K3 THEN CLOSE #K2:
GOTO 1860
1200 TRAP 1210:AMNT=VAL(CHECK$(35,41))
:M=VAL(CHECK$(K2,K5)):TRAP 40000:GOTO
1230
1210 IF FIRSTCH=-K1 THEN 1240
1220 GOTO 1180
1230 IF N<FIRSTCH OR N>LASTCH THEN 118
0
1240 IF AMNT<LOAMNT OR AMNT>HIAMNT THE
N 1180
1250 PAYEE$=CHECK$(14,34):IF PAYEE1$="
ANY" THEN 1270
1260 IF LEN(PAYEE1$)>LEN(PAYEE$) OR PA
YEE$(K1,LEN(PAYEE1$))<>PAYEE1$ THEN 11
80
1270 DATE$=CHECK$(K6,10):AMOUNT$=CHECK
$(35,41):C$=CHECK$:CHNUM$=CHECK$(K2,K5
):MEMO$=CHECK$(42,63)
1280 IF CHNUM$="DEP" THEN DEP=DEP+K1:
DEPAMNT=DEPAMNT+VAL(AMOUNT$):GOTO 1300
1290 CHECK=CHECK+K1:CHAMNT=CHAMNT+VAL(
AMOUNT$)
1300 FOR X=K1 TO K7:IF AMOUNT$(X,X)<>"
" THEN NEXT X:GOTO 1320
1310 TEMP$=AMOUNT$:AMOUNT$(9-X,K7)=TEM
P$:AMOUNT$(K1,K8-X)=B$(K1,K8-X)
1320 C=C+K1:IF PRNT THEN PC=PC+K1:IF P
C>62 THEN FOR X=K1 TO K5:LPRINT :NEXT
X:PC=K2
1330 IF NOT PRNT AND C>18 THEN 1370

```

```

1340 ? C$;" ";CHNUM$;" ";AMOUNT$;" ";P
AYEE$(K1,15);" ";DATE$
1350 IF PRNT THEN LPRINT ;" ";C$;"
";CHNUM$;" ";AMOUNT$;" ";PAYEE$;" ";ME
MO$;" ";DATE$
1360 GOTO 1180
1370 POSITION K8,22:? "PRESS ANY KEY T
O CONTINUE":GOSUB IN2
1380 FOR X=K2 TO 22:POSITION K2,X:? B$
:NEXT X:C=K0:POSITION K2,K2:GOTO 1320
1390 IF PRNT AND PC>59 THEN FOR X=K1 T
O 67-PC:LPRINT :NEXT X
1400 IF NOT PRNT AND C>15 THEN 1520
1410 TEMP$=STR$(CHAMNT):GOSUB DOLFORMA
T:? :? " ";CHECK;" DEBITS TOTALING
$";TEMP$
1420 TEMP$=STR$(DEPAMNT):GOSUB DOLFORM
AT:? :? " ";DEP;" CREDITS TOTALING
$";TEMP$
1430 IF PRNT THEN LPRINT :LPRINT "
";CHECK;" DEBITS T
OTALING $";CHAMNT
1440 IF PRNT THEN LPRINT "
";DEP;" CREDITS TOTALING $
";DEPAMNT
1450 POSITION 9,23:? "M=MENU S=SEARCH
AGAIN";
1460 CLOSE #K2:GOSUB IN2:IF A=ASC("S")
THEN 1670
1470 IF A<>ASC("M") THEN 1460
1480 GRAPHICS 17:GOSUB DISBRK:POSITION
K3,K5:? #K6;"please insert":POSITION
K3,K7:? #K6;"program disk"
1490 POSITION K3,16:? #K6;"PRESS ANY KE
Y":GOSUB IN2:TRAP 1550:RUN "D:MENU"
1500 OPEN #K1,K4,K0,"K:":GET #K1,A:CLO
SE #K1:RUN "D:MENU"
1510 GOSUB IN2:TRAP 1550:RUN "D:MENU"
1520 POSITION K8,22:? "PRESS ANY KEY T
O CONTINUE":GOSUB IN2
1530 FOR X=K2 TO 22:POSITION K2,X:? B$
:NEXT X:GOTO 1410
1550 GRAPHICS 17:POSITION K4,K8:? #K6;
"PROGRAM DISK":POSITION K7,10:? #K6;"M
OT IN"
1560 POSITION K6,12:? #K6;"DRIVE #1":S
OUND K0,100,12,K8:FOR X=K1 TO 100:NEXT
X:SOUND K0,K0,K0,K0
1570 FOR X=K1 TO 500:NEXT X:GOTO 1480
1580 K1=1:K2=2:K3=3:K4=4:K5=5:K6=6:K7=
7:K8=8:DIM MONTHFILE$(13),TEMP$(63),DA
TE$(K8),CHNUM$(4),C$(K1),A$(K1)
1590 DIM AMOUNT$(K7),PAYEE$(20),PAYEE1
$(20),B$(37),CHECK$(63),MEMO$(21)
1600 B$=" ":B$(37)=B$:B$(K2)=B$
1610 MONTHFILE$="D:MONTH .DAT"
1620 IN=120:DOLFORMAT=210:SN1=260:SN2
=280
1630 DISBRK=30:IN2=70
1640 GRAPHICS 17:GOSUB DISBRK:POSITION
K3,K8:? #K6;"please insert":POSITION
K3,10:? #K6;"your data disk"
1650 POSITION K3,12:? #K6;"into drive
#1":POSITION K3,22:? #K6;"PRESS ANY KE
Y":GOSUB IN2
1660 TRAP 1910:OPEN #K2,K4,K0,"D:MONTH
01.DAT":CLOSE #K2:TRAP 40000
1670 DEP=K0:CHECK=K0:DEPAMNT=K0:CHAMNT
=K0:PRNT=K0
1680 GRAPHICS K0:POKE 559,K0:GOSUB DIS
BRK:DL=PEEK(560)+256*PEEK(561)+23
1690 FOR X=DL TO DL+K4:POKE X,K6:NEXT
X:POKE 1546,K0:POKE 1555,15
1700 POKE 710,146:POKE 752,K1:POKE 708
,248:POKE 82,K1:? :?
1710 ? "

```



```

1750 ? "
1760 ? "
1770 ? " AMOUNT PAYEE
1780 ? "
1790 ? " FROM:$
1800 ? " TO:$
1810 ? "
1820 ? "
1830 POKE 82,K2:POKE 559,34:GOTO 940
1840 GRAPHICS 17:GOSUB DISBRK:POSITION
K3,9:? #K6;"CHECK PRINTER":POSITION
K3,12:? #K6;"PRESS ANY KEY"
1850 SOUND K0,150,12,K8:FOR X=K1 TO 10
0:NEXT X:SOUND K0,K0,K0,K0:GOSUB IN2:G
OTO 1080
1860 GRAPHICS 18:GOSUB DISBRK:POSITION
K2,K2:? #K6;"search aborted":POSITION
5,K8:? #K6;"S = SEARCH"
1870 POSITION K6,10:? #K6;"M = MENU"
1880 GOSUB IN2:IF A=ASC("M") THEN 1480
1890 IF A=ASC("S") THEN 1670
1900 GOTO 1880
1910 CLOSE #K2:GRAPHICS 17:POSITION K4
,K8:? #K6;"THIS IS NOT":POSITION K4,10
:? #K6;"microcheck"
1920 POSITION 5,12:? #K6;"DATA DISK":
SOUND K0,100,12,K8:FOR X=K1 TO 100:NEX
T X:SOUND K0,K0,K0,K0
1930 FOR X=K1 TO 500:NEXT X:GOTO 1640

```

CHECKSUM DATA.

(see page 24)

10	DATA	672,193,760,982,55,190,221,701,375,690,342,354,384,493,719,7131
210	DATA	52,837,933,595,850,146,551,649,348,230,466,490,195,124,765,7231
390	DATA	916,349,226,459,967,94,136,305,730,83,577,451,754,330,209,6586
550	DATA	565,509,884,992,603,450,752,673,107,566,156,928,577,354,867,8983
710	DATA	910,32,428,625,669,769,380,911,1,436,972,920,37,407,967,8464
870	DATA	144,781,366,450,343,645,770,634,828,414,976,897,592,930,531,9301
1030	DATA	322,871,328,720,425,280,126,678,982,56,877,235,165,498,347,6910
1180	DATA	216,535,690,487,721,237,644,566,796,927,104,478,696,96,978,8171
1330	DATA	574,836,282,728,677,591,606,554,841,861,774,857,191,2,347,8721
1480	DATA	67,884,908,933,678,118,100,12,846,694,181,596,228,667,861,7773
1640	DATA	150,287,110,890,686,42,853,75,698,399,951,950,96,891,14,7092
1790	DATA	407,223,131,950,598,414,440,399,657,613,554,747,716,581,856,8286

Listing 2.

```

10 N0=0:N1=1:N2=2:N3=3:N4=4:N5=5:N6=6:
N7=7:N8=8:N9=9:N10=10:N11=11:N12=12:N1
3=13:N14=14:N15=15:N16=16:N17=17
20 N20=20:GOTO 210
50 SOUND N0,100,N12,N8:FOR X=N1 TO 175
:NEXT X:SOUND N0,N0,N0,N0:RETURN
60 FOR X=N1 TO 85:NEXT X:RETURN

```

```

80 OPEN #N1,N4,N0,"K":POKE 764,255:PO
KE 702,64:POKE 694,N0
90 A=PEEK(764):IF A=255 THEN 90
100 IF A=39 OR A=60 THEN POKE 764,255:
GOTO 90
110 GET #N1,A:CLOSE #N1:RETURN
130 I=PEEK(N16):IF I>127 THEN I=I-128:
POKE N16,I:POKE 53774,I
140 RETURN
160 FOR X=N1 TO LEN(TEMP$):IF TEMP$(X,
X)<>"." THEN NEXT X:TEMP$(X)="00":RET
URN
170 IF LEN(TEMP$)=X THEN TEMP$(X+N1)="
00"
180 IF LEN(TEMP$)=X+N1 THEN TEMP$(X+N2
)="0"
190 RETURN
200 REM INITIALIZE
210 DIM MONTHFILE$(N13),CHECK$(63),CHE
CKNUM$(N4),DATE$(N8)
220 DIM PAYEE$(21),AMOUNT$(N8),C$(N1),
MONTHDAT$(6300),B$(39)
230 DIM MEMO$(21),TEMPFILE$(N14),BALAN
CE$(N8),DIF$(N8),TEMP$(N8),EBAL$(N8),U
CAMNT$(N8),UCDAMNT$(N8)
240 B$(N1)="":B$(39)=B$:B$(N2)=B$
250 INDEX=N1:UNCAN=N0:UCAMNT=N0:UCDEP=
N0:UCDAMNT=N0:DOLFORMAT=160:BRKDIS=130
:SD1=50:START=N0:SVE=N0
260 GRAPHICS N17:GOSUB BRKDIS:POSITION
N3,N8:? #N6;"please insert":POSITION
N3,N10:? #N6;"your data disk"
270 POSITION N3,N12:? #N6;"into drive
#1":POSITION N3,N22:? #N6;"PRESS ANY KE
Y":GOSUB 80
280 TRAP 1550:OPEN #N2,N4,N0,"D:MONTH0
1.DAT":CLOSE #N2
290 GRAPHICS N17:GOSUB BRKDIS
295 DL=PEEK(560)+PEEK(561)*256+N4:POKE
DL+N11,N2:POKE DL+N13,N2:POKE 87,N0:P
OKE 82,N0:POKE 752,N1
300 IF NOT START THEN TRAP 300:POSITI
ON N6,N5:? "ENDING BALANCE";" "
+++++";:INPUT EBAL:START=N1
310 TRAP 310:POSITION 38,N6:? " "":P
OSITION 26,N6:? "WHICH MONTH";:INPUT M
ONTH
320 IF MONTH<N0 OR MONTH>N12 THEN 310
330 MONTHFILE$="D:MONTH .DAT"
340 IF MONTH<N10 THEN MONTHFILE$(N8,N8
)="0":MONTHFILE$(N9,N9)=STR$(MONTH):GO
TO 360
350 MONTHFILE$(N8,N9)=STR$(MONTH)
360 CLOSE #N2:OPEN #N2,N4,N0,MONTHFILE
$:POKE 82,N2
370 INPUT #N2;CHECK$:IF CHECK$="END" T
HEN 390
380 COUNT=COUNT+N1:MONTHDAT$(COUNT*63-
62,COUNT*63)=CHECK$:GOTO 370
390 GRAPHICS N0:GOSUB BRKDIS:POKE 559,
N0:DL=PEEK(560)+256*PEEK(561)+N4
400 POKE DL-N1,70:FOR X=DL+N2 TO DL+N4
:POKE X,N6:NEXT X
410 POKE 708,N14:POKE 709,N10:POKE 710
,112:POKE 711,N0:POKE 712,N6
420 POKE 1546,N0:POKE 1547,N0
430 POKE 752,N1:POSITION N2,N0:? "CECU
ASON PE2390"
440 POSITION 22,N0:? "X=cancel N=new"
:POSITION N2,N1:? "M=MEMO E=end"
450 POSITION N0,N2:? " "
460 POSITION N0,N21:? " "
470 POKE 559,34:POSITION N15,N3:? "MON
TH #":MONTH
480 IF COUNT=N0 THEN ? :? " NO ENT
RIES FOR THIS MONTH":GOTO 590
490 R=N5:C=N1:P=N0
500 CHECK$=MONTHDAT$(C*63-62,C*63)
510 CHECKNUM$=CHECK$(N2,N5):DATE$=CHEC
K$(N6,N13):PAYEE$=CHECK$(N14,34):AMOUN
T$=CHECK$(35,41):C$=CHECK$(N1,N1)
520 FOR X=N1 TO N7:IF AMOUNT$(X,X)<>"
" THEN NEXT X:GOTO 540
530 TEMP$=AMOUNT$:AMOUNT$(N9-X,N7)=TEM
P$:AMOUNT$(N1,N8-X)=B$(N1,N8-X)

```

```

540 POSITION N2,R:? C$;" ";CHECKNUM$;"
$";AMOUNT$;" ";PAYEE$(N1,N15);" ";DAT
E$(N1,N5);
550 R=R+N1:C=C+N1:IF R<N20 AND C<=COUN
T THEN 500
560 R=N5
570 IF C=N1>COUNT THEN C=N1
580 POSITION N0,R:? ">"
590 OPEN #N1,N4,N0,"K":GET #N1,A:CLOS
E #N1
600 IF COUNT=N0 AND (A<>ASC("N") AND A
<>ASC("E")) THEN 590
610 IF A=ASC("C") THEN 680
620 IF A=ASC("M") THEN 720
630 IF A=ASC("P") THEN 750
640 IF A=ASC("N") THEN 790
650 IF A=ASC("E") THEN 790
660 IF A=ASC("E") THEN 790
670 GOTO 590
680 OLDR=R:R=R+N1:IF R>22 THEN R=N5
690 IF R>C-P*N15+N3 THEN R=N5
700 POSITION N0,OLDR:? " ":POSITION N
0,R:? ">":POKE 53279,N0
710 INDEX=R-N4+P*N15:GOTO 590
720 SVE=N1:LOCATE N2,R,Z:IF Z=ASC("*")
THEN 740
730 POSITION N2,R:? "*" :MONTHDAT$(INDE
X*63-62,INDEX*63-62)="*":GOTO 680
740 POSITION N2,R:? " ":MONTHDAT$(INDE
X*63-62,INDEX*63-62)="":GOTO 680
750 FOR X=N5 TO C-P*N15+N4:POSITION N0
,X:? B$;NEXT X
760 P=P+N1:INDEX=P*N15+N1:IF C=N1 THEN
490
770 IF C>COUNT THEN P=N0:INDEX=N1:C=N1
780 R=N5:GOTO 500
790 IF NOT SVE THEN CLOSE #N2:GOTO 88
0
800 POKE 559,N0
810 TEMPFILE$=MONTHFILE$:TEMPFILE$(N11
,N13)="TMP":CLOSE #N1:OPEN #N1,N8,N0,T
EMPFILE$
820 FOR X=N1 TO COUNT:? #N1;MONTHDAT$(
X*63-62,X*63):NEXT X
830 ? #N1;"END":CLOSE #N1
840 XIO 33,#N1,N0,N0,MONTHFILE$:MONTHF
ILE$=MONTHFILE$(N3)
850 GRAPHICS N0:GOSUB BRKDIS:POKE 559,
N0:? :? :? "XIO 32,#N1,N0,N0,";CHR$(34
):TEMPFILE$;"",":MONTHFILE$
860 ? :? :? "CONT":POSITION N0,N0:POKE
842,N13:STOP
870 POKE 842,N12
880 IF A=ASC("N") THEN COUNT=N0:INDEX=
N1:SVE=N0:MONTHDAT$="":GOTO 290
890 IF A=ASC("E") THEN 980
900 LOCATE N7,R,Z:IF Z=ASC("M") THEN 9
30
910 MEMO$=MONTHDAT$(INDEX*63-21,INDEX*
63)
920 POSITION N4,R:? " MEMO: ";MEMO$;
" ":GOTO 590
930 POSITION N7,R:? B$(N8):CHECK$=MONT
HDAT$(INDEX*63-62,INDEX*63)
940 CHECKNUM$=CHECK$(N2,N5):DATE$=CHEC
K$(N6,N13):PAYEE$=CHECK$(N14,34):AMOUN
T$=CHECK$(35,41):C$=CHECK$(N1,N1)
950 FOR X=N1 TO N7:IF AMOUNT$(X,X)<>"
" THEN NEXT X:GOTO 970
960 TEMP$=AMOUNT$:AMOUNT$(N9-X,N7)=TEM
P$:AMOUNT$(N1,N8-X)=B$(N1,N8-X)
970 POSITION N2,R:? C$;" ";CHECKNUM$;"
$";AMOUNT$;" ";PAYEE$(N1,N15);" ";DAT
E$(N1,N5);:GOTO 590
980 GRAPHICS N17:GOSUB BRKDIS:POSITION
N3,N9:? #N6;"SCANNING MONTH":POSITION
N10,N11:? #N6;"# "
990 MONTHFILE$="D:MONTH .DAT"
1000 MONTH=N0:AMOUNT=N0
1010 COUNT=N0
1020 IF MONTH<N10 THEN MONTHFILE$(N8,N
8)="0":MONTHFILE$(N9,N9)=STR$(MONTH):G
OTO 1040
1030 MONTHFILE$(N8,N9)=STR$(MONTH)
1040 POSITION N11,N11:? #N6;MONTH
1050 CLOSE #N2:OPEN #N2,N4,N0,MONTHFIL
E$

```

```

1060 INPUT #N2;CHECK$:IF CHECK$="END"
THEN 1100
1070 COUNT=COUNT+N1:IF CHECK$(N1,N1)="
*" THEN 1060
1080 IF CHECK$(N2,N5)="DEP " THEN UCDE
P=UCDEP+N1:UCDAMNT=UCDAMNT+VAL(CHECK$(
35)):GOTO 1060
1090 UNCAN=UNCAN+N1:UCAMNT=UCAMNT+VAL(
CHECK$(35)):GOTO 1060
1100 MONTH=MONTH+N1:IF MONTH<N13 THEN
1010
1110 CLOSE #N2:OPEN #N2,N4,N0,"D:BALAN
CE.DAT":INPUT #N2;BALANCE$:CLOSE #N2
1120 AMOUNT=EBAL+UCDAMNT-UCAMNT
1130 TEMP$=STR$(UCAMNT):GOSUB DOLFORMA
T:UCAMNT$=TEMP$:TEMP$=STR$(UCDAMNT):GO
SUB DOLFORMAT:UCDAMNT$=TEMP$
1140 TEMP$=STR$(EBAL):GOSUB DOLFORMAT:
EBAL$=TEMP$
1150 GRAPHICS N0:GOSUB BRKDIS:POKE 752
,N1:POKE 710,N8:POKE 709,N0
1160 POSITION N2,N4:? "ENDING BALANCE
-----":POSITION 30,N4:? "$":POS
ITION 38-LEN(EBAL$),N4:? EBAL$
1170 TEMP$=STR$(UNCAN)
1180 POSITION N2,N6:? "-- OUTSTANDING C
HECKS (";UNCAN;")":
1190 FOR X=24+LEN(STR$(UNCAN)) TO 27:?
"--":NEXT X:POSITION 38-LEN(UCAMNT$),
N6:? UCAMNT$
1200 POSITION N2,N8:? "SUBTOTAL -----"
-----"
1210 POSITION 31,N7:? "-----":TEMP$=
STR$(EBAL-UCAMNT):GOSUB DOLFORMAT:POS
ITION 30,N8:? "$"
1220 POSITION 38-LEN(TEMP$),N8:? TEMP$
:TEMP$=STR$(UCDEP)
1230 POSITION N2,N10:? "+ OUTSTANDING
DEP. (";UCDEP;")":
1240 FOR X=22+LEN(STR$(UCDEP)) TO 27:?
"--":NEXT X:POSITION 38-LEN(UCDAMNT$)
,N10:? UCDAMNT$
1250 POSITION 31,N11:? "-----":TEMP$
=STR$(EBAL-UCAMNT+UCDAMNT):GOSUB DOLFO
RMA
T
1260 POSITION 30,N12:? "$":POSITION 38
-LEN(TEMP$),N12:? TEMP$
1270 POSITION N2,N12:? "YOUR BALANCE S
HOULD BE ----"
1280 POSITION N2,N14:? "YOUR BALANCE I
S -----":POSITION 38-LEN(BALANCE
$),N14:? BALANCE$
1290 POSITION 31,N15:? "-----"
1300 DIF=AMOUNT-VAL(BALANCE$)
1310 POSITION N2,N16:? "DIFFERENCE ---
-----":TEMP$=STR$(DIF):GOSUB D
OLFORMAT
1320 POSITION 30,N16:? "$":POSITION 38
-LEN(TEMP$),N16:? TEMP$
1330 IF DIF THEN 1450
1340 POSITION N13,N20:? "IT BALANCES!
█":RESTORE 1390
1350 READ A,B,C:IF A=-N1 THEN SOUND N1
,N0,N0,N0:SOUND N2,N0,N0,N0:GOTO 1350
1360 IF A=-N2 THEN FOR X=N1 TO 40:NEXT
X:FOR X=N0 TO N2:SOUND X,N0,N0,N0:NEX
T X:GOTO 1470
1370 SOUND N0,A,N10,N6:SOUND N1,B,N10,
N6:SOUND N2,C,N10,N6
1380 FOR X=N1 TO N10:NEXT X:GOTO 1350
1390 DATA 121,47,40,121,47,40,-1,-1,-1
,162,47,40,162,47,40,121,53,45,121,60,
47,-1,-1,-1
1400 DATA 162,60,47,162,60,47,121,64,5
0,121,60,47,-1,-1,-1,162,60,47,162,60,
47
1410 DATA 121,60,47,121,64,50,162,60,4
7,162,60,47,121,64,50,121,60,47,-1,-1,
-1
1420 DATA 162,60,47,162,60,47,121,64,5
0,121,60,47,162,47,40,162,47,40
1430 DATA 121,60,47,121,47,40,162,53,4
5,162,53,45,162,53,45,162,53,45
1440 DATA 162,64,53,162,64,53,162,64,5
3,162,64,53,-2,-2,-2
1450 GOSUB SND1:POSITION N17,N20:? "█
ORRY"

```

```

1460 C=(N20-LEN(DIF$))/N2
1470 POSITION N15,21:? #N6;"T=TRY AGAI
N"
1480 POSITION N17,22:? #N6;"M=MENU"
1490 CLOSE #N1:OPEN #N1,N4,N0,"K":GET
#N1,A:CLOSE #N1
1500 IF A=A5C("M") THEN 1530
1510 IF A=A5C("T") THEN INDEX=N1:UNCAN
=N0:UCAMNT=N0:UCDEP=N0:UCDAMNT=N0:STAR
T=N0:GOTO 290
1520 GOTO 1490
1530 GRAPHICS N17:GOSUB BRKDIS:POSITIO
N N3,N5:? #N6;"please insert":POSITION
N3,N7:? #N6;"program disk"
1540 POSITION N3,N16:? #N6;"PRESS ANY
KEY":GOSUB 80:TRAP 1570:RUN "D:MENU"
1550 CLOSE #N2:GRAPHICS N17:GOSUB BRKD
IS:POSITION N4,N8:? #N6;"THIS IS NOT":
POSITION N4,N10:? #N6;"A Microcheck"
1560 POSITION N5,N12:? #N6;"DATA DISK!
":GOSUB SND1:FOR X=N1 TO 500:NEXT X:GO
TO 260
1570 GRAPHICS N17:GOSUB BRKDIS:POSITIO
N N4,N8:? #N6;"PROGRAM DISK":POSITION
N7,N10:? #N6;"NOT IN"
1580 POSITION N6,N12:? #N6;"DRIVE #1":
GOSUB SND1:FOR X=N1 TO 500:NEXT X:GOTO
1530

```

CHECKSUM DATA.

(see page 24)

```

10 DATA 822,400,132,379,8,58,596,236,7
99,593,74,46,537,608,780,6068
210 DATA 508,201,121,20,923,585,171,75
2,45,214,642,380,89,110,884,5645
350 DATA 591,239,812,827,48,633,122,53
5,577,225,51,242,472,232,528,6134
500 DATA 334,590,684,220,369,254,157,7
30,281,402,53,64,31,67,81,4317
650 DATA 90,84,749,674,633,866,727,877
,750,713,935,423,173,235,330,8259
800 DATA 78,88,751,313,606,721,38,351,
55,97,236,232,536,176,607,4885
950 DATA 718,237,472,556,140,175,31,60
9,824,396,366,737,995,431,595,7282
1100 DATA 443,252,623,209,844,185,913,
180,210,572,891,224,211,825,804,7386
1250 DATA 743,771,652,403,214,854,408,
794,634,77,437,203,206,865,834,8095
1400 DATA 29,985,196,203,221,376,125,2
71,333,762,517,937,735,220,885,6795
1550 DATA 803,419,587,164,1973

```

ATTENTION USER GROUPS

I'd like to extend my thanks to all of the Atari groups and their officers in response to our survey.

If your group hasn't received a questionnaire, please contact me as soon as possible at:

ANALOG Computing

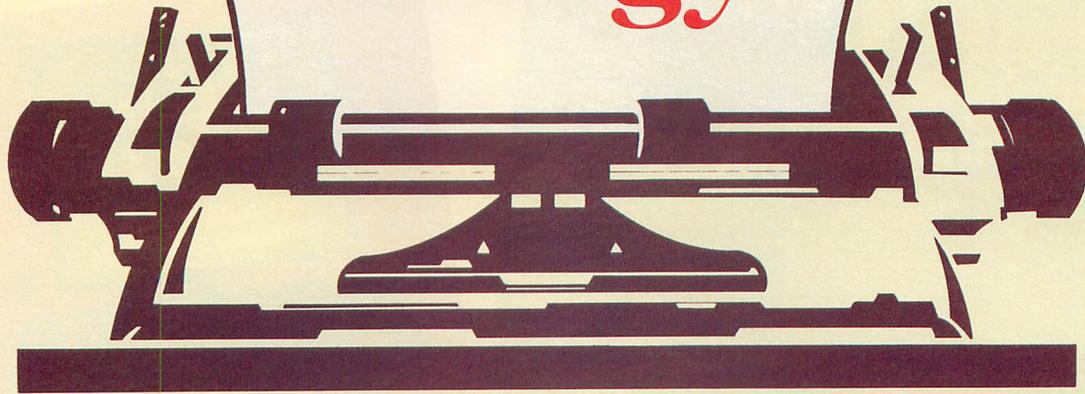
Attn: Lee Pappas

P.O. Box 23

Worcester, MA 01603

(617) 892-9230

A Word Processing Trilogy



by Bob Curtin

I like to write, and it takes very little to move me to the keyboard. In the past, the procedure I had to use to write something was to rough-draft the document, blue-pencil the first draft, type the second draft and include any new paragraphs or phrases I'd written between the lines, in margins or on separate sheets of paper.

If I'd been really on the ball, the second draft would need only a fraction of the editing the first one required. I simply edited it, checked the grammar and spelling, then typed the final draft. Since I'm not exactly the quickest typist in North America, this procedure took a while. And, though I'm an accurate typist, the inevitable dabs of Liquid Paper appeared on each and every page.

If I was then struck with another Lucid Thought which I wanted to include in the text, I had a choice: retype all of the pages from the Thought to the end of the piece; or just leave out the additions. I won't *bother* to describe the horror of finding a major error in the typing of the final draft, or the frustration of having to retype rejected manuscripts, or the tedium of typing additional copies of a manuscript.

Well, word processing has changed all of that. My Atari simply outclassed my battered electric typewriter. With the addition of word processing software and an inexpensive printer (and there are a slew of them out there), I'm now able to spend my time creatively writing, instead of tediously typing.

So what is word processing, anyway?

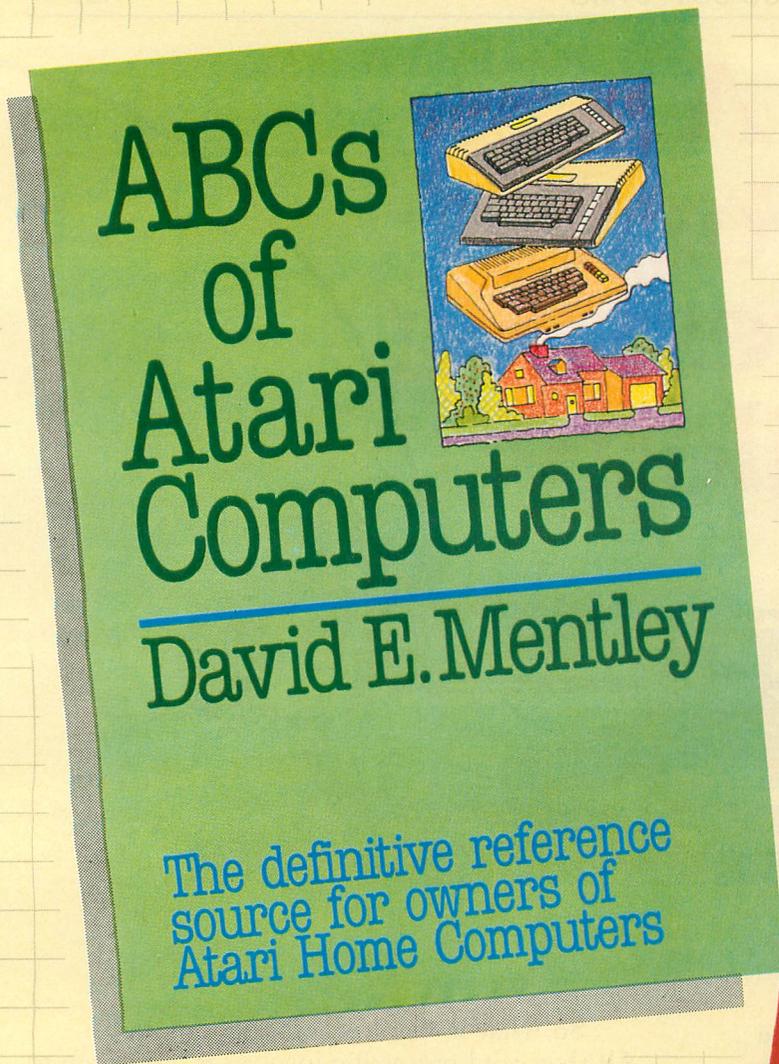
All that word processing involves is a program to allow you to type documents, letters, forms, reports—or anything else your heart desires—onto your TV or monitor screen. This text can then be edited, altered, rearranged, merged with other documents, formatted (a way of telling the printer how you want the thing to look), saved to a disk and, finally, dumped to a printer.

The enormous advantage that word processing has over a typewriter is its ability to do all of the editing on the screen and get it right *before* you print it out. Whole blocks of text can be moved, deleted, added or stuffed into a completely different document.

The features of word processing programs vary drastically, from super-complicated business-oriented and dedicated word processors to ultra-simple miniprocessors which you can type in from various books and computer magazines. For selection, we Atari owners are fortunate, indeed, to have many programs of this type available to us.

Choosing a word processing program is a highly subjective affair. There's no such thing as the "ideal" word processor, except where it relates to individual needs. By that, I mean that what's good for one person may be a white elephant to someone else.

Generally, the more features, flexibility and power the word processor has, the more complex it'll be to use. If all you plan on doing is writing letters, school



ABCs of Atari Computers

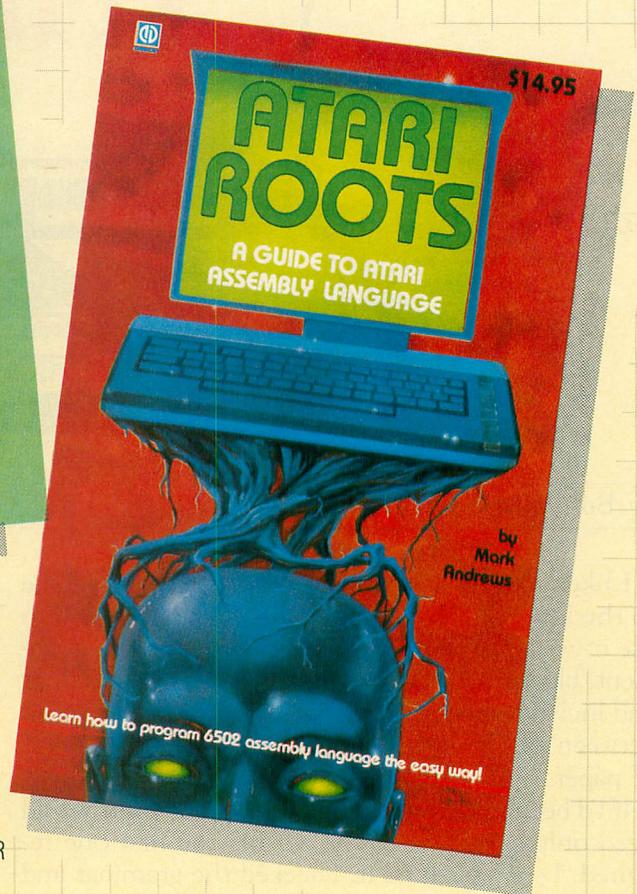
by David E. Mentley Sugg. Retail **\$14.95**

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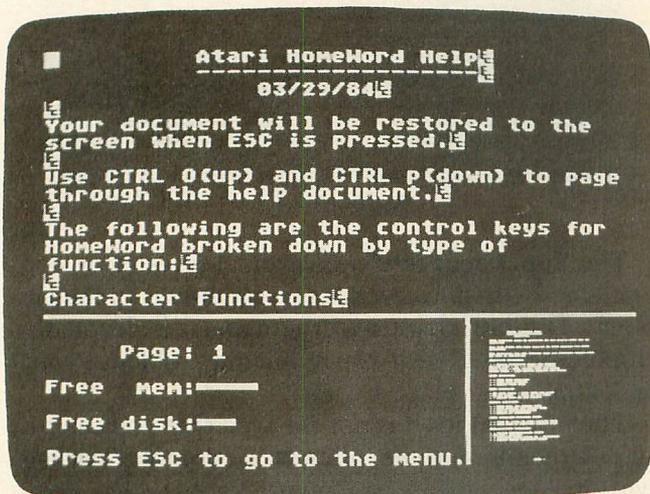
reports and general household correspondence, then one of the less complicated word processors would probably be best for you. If you're really into writing, then something more powerful would fit the bill.

The following three reviews are not meant to be a comparison. Each word processor is aimed at a different type of user. Which one is "best" is a decision destined to be made by different people with differing needs. I can say emphatically that all three of these programs are excellent. They're all solid, quality programs with superb documentation. Although each has deficiencies, nobody will be stuck with a lemon by buying one of these packages.

HOMEWORD
SIERRA ON-LINE, INC.
P.O. Box 485
Coarsegold, CA 93614
48K Disk \$69.95

Homeword takes an approach to word processing not unlike that used by some high-priced computers on the market. It's essentially a menu-driven program, but, in place of numbers or letters to identify the elements in each menu, **Homeword** uses "icons" (illustrations of the functions to be performed).

The main menu contains—among others—pictures of a filing cabinet, a printer and a disk. By placing the cursor on one of these icons and pressing RETURN, the user is rewarded with another menu containing additional icons which graphically illustrate their function.



Homeword.

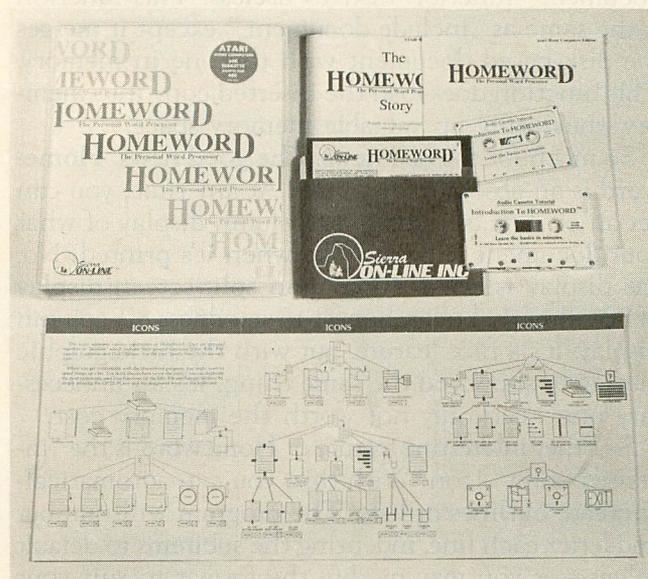
One doesn't have to be Fellini to understand what an illustration of a filing cabinet with an arrow pointing up out of an open drawer means. Not surprisingly, the amount of time it takes to use this program effectively is a mere fraction of what it would take if the menus contained letters or numbers.

The working area of the screen is only fifteen lines long, but, because of another nice touch, it's plenty.

In the lower right-hand corner of the screen is a graphic representation of what your document will look like on an 80-column page. There's even a little blinking cursor to show you where you are on the page. I loved this feature. There was never any guesswork about how close you were to the end of the printed page.

Each individual letter is represented by a graphics 8 size pixel, and the display is updated every time you stop typing for about two seconds.

The bottom left side of the screen contains a bar graph display, showing how much disk space and free memory is available for your use. There's also a notation of what page is currently displayed.



Homeword.

Homeword has little more than the expected controls, though there are a couple of unique features in the program. The block operations include: erase, insert erased text, move and copy. The "find" and "find and replace" functions are limited to words or phrases up to thirty characters long, but there are no "wild card" characters available.

File manipulation is quick and easy. The usual save, load and chain capabilities are available, as well as a couple of modifications. There's an "include document" function, which is simply the chain function with a little twist.

With "include document," you can combine any named file on disk with the file in memory as it's being printed. It can be put at the beginning, the end or anywhere in between, and the included document is not loaded into memory. It never shows up on the screen, nor is it displayed in the print preview. This feature is not just a convenience; it's an absolute necessity. Which brings me to my only severe criticism of **Homeword**.

Apparently, the icon concept is a memory-expensive route to travel. I started writing this introduction and first review with **Homeword** but quickly discovered that, with my 48K Atari 800, I had only enough working memory to type in less than three double-spaced pages of text.

I don't know how much is gained on an 800XL, but I doubt it's enough to more than double the capacity. And less than six double-spaced pages is just not enough for serious writing. Even in a strictly "home" environment, it's a deficiency I'd find pretty hard to live with, though the ease of use may offset this for some folks. Anyway, there *are* ways around the problem, even if they're inconvenient.

The low memory capacity also makes the "insert document" function next to useless. This function is the same as "include document," except it merges the disk-based document with the one in memory. This function does load the inserted copy into memory, thus using up valuable memory space.

So much for the bad news. The good news: **Homeword** is an absolute joy to use. At any time, you can get an on-line, scrolling, 80-column display of what your document will look like when it's printed. No, the display is not a 40-column split-screen display of 80 columns, but an honest-to-goodness 80-column display. It's a nice feature, but with the little graphic display to show you the same thing, it's an unnecessary one—certainly not worth the memory cost.

Another interesting feature of **Homeword** is the "indented point" icon. With this, you can automatically create outlines or lists. The program will number and letter each line, indenting the subitems to default values—or you may modify the format to suit your needs.

The cursor controls are standard Atari fare, as are the delete functions. In fact, there are no "unnatural" controls to get used to. Learning to use the package is easy and painless. There was obviously a lot of thought put into this aspect of the program.

Although there is no printer driver software (other than for Atari-compatible printers), the "customize" menu allows you to take advantage of the special features of your Atari-compatible printer.

All in all, I give this program very high marks in ease of use, speed and overall value. It's the perfect word processor for young children and for those among us who are a bit frightened by a computer. This program will certainly put you at ease.

SUPER-TEXT
MUSE SOFTWARE
347 N. Charles Street
Baltimore, MD 21201
48K Disk \$175.00

Super-Text is touted on the package as a "professional word processor." If they mean that it's on a par with **Wordstar** or **Peachtext**, then I'm afraid they're

stretching the truth some, if for no other reason than that there are no 80-column screen boards supported here. If they mean that it has a good many of the features, plus the power and flexibility that the full-bore professional word processors have, then they hit the nail right on the head.

Super-Text is packaged with two copy-protected disks, a quick reference card and a fat, spiral-bound reference manual. The manual is complete and set up so that you can easily find an answer to most any problem you might run into. The handy quick reference card lists all of the commands (and there are many) in each of the modes (and there are many).

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MUSE SOFTWARE
 347 N. CHARLES STREET, BALTIMORE, MD 21201 (301) 694-7210

Super-Text.

The **Super-Text** reference manual gives clear, concise, step-by-step instructions on all aspects of the program. The last chapter of the manual is devoted to troubleshooting, so if you're having problems, you'll at least have a place to start.

The program itself is not the type that you can just sit down and use to its fullest. It's a complex package with a respectable learning curve attached to it, especially if you're short on experience with word processors. However, once the system is absorbed, and the power of the program manifests itself, I believe you'll find the effort well worth it.

Super-Text has most of the features found in the "pro" word processors, including: file merge; word find (more about that in a minute); word occurrence count; word count in files (a handy item for those of you writing for publication and have editors counting every word); the usual block operations, such as move, delete, copy and save as a new file; and an impressive

array of formatting commands. There's no spelling correction program (electronic dictionary) or mail merge capability, which you'd expect for the price, but perhaps it's coming up in the future.

The word find capabilities are truly remarkable. Any word or phrase of up to thirty characters in length can be found and replaced, if desired, quickly and easily. There are two special characters in this function which give you some latitude.

The $\&$ character will match any number of spaces in your text (including no spaces at all). For example, if you tried to find *any&one*, you'd actually find *any one*, *anyone* or *any one*. The $!$ character acts as a wild card. Any character can be matched to it. For instance, if you tried to find *P!lson*, **Super-Text** would find *Poison*, *Person*, *Parson*, etc.

Another nice feature is the multiple word find/word replace capability. Any number of words or phrases can be found at the same time, as long as the total characters don't exceed thirty. All that's necessary is to separate the words by commas.

Formatting can be done line by line, if desired. That is, you can start off with margins, line spacing or any of a number of other parameters set one way, change them at any point in your work and change them again, etc. The formatting controls allow just about any format your printer will support.

Moreover, if the ready-made printer drivers aren't up to the job, there is a module which allows you to modify the driver to use the control characters your printer accepts. Those of you with off-brand or weird printers can modify the program to recognize this and print documents using the special features of your printer, such as double-column printing, boldface, special fonts, etc.

Super-Text doesn't stop there. Though the general editing controls are pretty much standard, they seem to provide those little extras which save enormous amounts of time and effort. As an example, the page numbering can be turned on or off, set to any desired number, set to chapter relative numbering (page 2 in chapter 5 would be numbered 2-5) and combined with text in the header or footer. The page numbering can also be formatted to be printed on alternating sides of the pages.

I could go on and on about the control this program provides, but I think a couple of examples would serve to illustrate the fact in far less space.

Super-Text's program provides a feature called "autolink" which, when turned on, will link an unlimited number of files together on one or more disk drives. The functions supported with the autolink feature are: find, find and replace, print, and load the next linked file. Files can even be linked together into a loop and accessed forward or backward. An obvious use for this feature would be finding word or phrase occurrences in multiple files.

(continued on next page)

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CIRCLE #122 ON READER SERVICE CARD

Another neat feature is something which is a life-saver for those of us with the less expensive printers. Pressing a couple of buttons will advance the paper forward exactly one page. I grant you that, by itself, this last feature isn't a reason to go buy **Super-Text**, but it does give you an idea of the attention to detail which was paid in developing the program.

Gripes? Only one, and it's minor. The editing is done by switching modes. The "add" mode allows you to type in your document, but if, along the way, you make a mistake, you must switch modes to position the cursor over the mistake to make the change, then *make the change*, then switch back to "add" to continue typing in text. It's awkward, but something that can be lived with as familiarity with the program develops speed.

I'm impressed with **Super-Text**. It's a powerful, incredibly versatile word processor with depth and sophistication. It's not for the casual user, by any means, and the price will bear that out. But if you're a person who does a lot of serious writing, it's a package well worth looking into.

**THE WRITER'S TOOL
OPTIMIZED SYSTEMS SOFTWARE
P.O. Box 710337
San Jose, CA 95171
48K Cartridge or Disk \$129.95**

The Writer's Tool (TWT) is probably the best compromise between total word control and ease of use that I've seen in a word processor. **TWT** is loaded with features; in fact, it has most of the features found in the "professional" word processors, plus a few tricks of its own. But it's an easy package to learn and even easier to use.

TWT comes with a ROM cartridge, a disk containing the printer drivers and customizing program, and the nicest manual I've ever seen. The manual is bound in a three-ring vinyl-covered notebook and covers every aspect of the program in infinite detail. There's both a table of contents and a thorough index, so finding the topic you're having trouble with is easy. The book is set up in two parts: a tutorial section and reference section. Once you've gained some experience with the program, you need not wade through unnecessary text to find what you need.

One of the things I liked most about **The Writer's Tool** is the integrated text entry and editing. There are no changing modes to move the cursor or make corrections. If you've been using an Atari for a while, the editing controls will feel completely natural, since they work in almost the same way as the editor in Atari BASIC.

If you don't like the big, fat block of a cursor that Atari uses, then press **SELECT**. Presto! You now have a blinking underline for a cursor. Press it again, and the block comes back.

The automatic word wrap can also be turned on and off, by pressing **START**. I know that doesn't sound like a useful feature at first, but it is. There are times when, because of the word wrap, you can't tell how many spaces you've left between words or between the period at the end of a sentence and the first letter of the next sentence (especially if you've been doing extensive editing). By turning off the word wrap, you can tell at a glance. With other 40-column word processors, I had to physically back up the cursor and count the spaces.

Speaking of modifying things you don't like, **TWT** provides a customizer program which allows you to change a wide variety of the default values in the program, such as the page length, line spacing, screen color and character luminance, cursor brightness, and cursor blink frequency. There's a lot more, but I won't bother to list them. These new parameter values can be saved in files to be called up later, or they can be made to boot up automatically with program initialization.

As I said, **TWT** sports a list of very useful items, not the least of which are the soft hyphen and the group command. The latter is essentially a conditional page eject which gives the user the ability to prevent page breaks happening in awkward places (immediately after a topic heading).

The soft hyphen will, when right justification is in use, hyphenate long words only when needed to prevent those wide spaces that occur between words otherwise. Your text appears much more professional and is also more readable. The soft hyphen is conditional and will only be used by **TWT** when needed.

TWT has a full range of printing formatting controls, accessed through either an internal or external formatting line. The external line reverts to default values after printing, whereas the internal line remains a part of the file and overrides all relevant values every time it's printed.

The imbedded format line can be inserted anywhere in the text to change line spacing, margins, printer fonts, tab values, page ejects, justification, centering, and any of a host of other controls. There isn't much you can't do with the formatting controls available here. With practice and imagination, you should have remarkable control over the printing process.

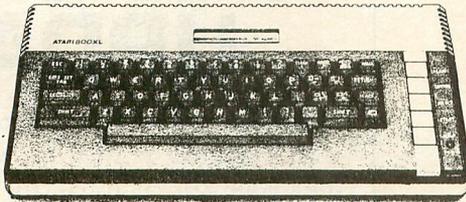
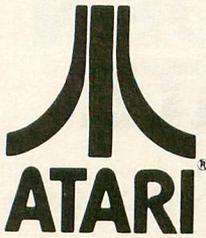
TWT also allows full linking capabilities, as well as a merge system which you can use in conjunction with a template. A template is simply a document containing space for variables.

For instance, suppose you wanted to send a form letter to two hundred people, and wanted their names and addresses in the heading, with their names in the salutation. The template would be the letter itself, with the headings and salutations as the variables.

You could create a database with the names and

(continued on page 64)

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(continued from page 62)

addresses, then merge the data with the template during printing. Each letter would contain the name of a new addressee in the salutation and that name and address in the heading. Now you, too, can send junk mail!

The block operations consist of the usual mark, copy and delete. To move text from one place to another, you must mark it and copy the text to the new location. Then you'd go back and delete the text originally marked. It's a little awkward if you're used to simply moving copy from one place to another, but it's not a serious handicap.

OSS has included drivers for sixteen different printers, including Epson, Okidata, Gemini, NEC, C.Itoh, Atari, Centronics and Brother. There's also a "generic" driver for use with any printer.

Is there anything I don't like about *The Writer's Tool*? Actually, no. Is there anything I can criticize? Not much, except for the fact that there's no printer driver that can be modified to take care of that weird printer you may have.

Other than that, *The Writer's Tool* is an excellent program. It's as useful to the casual writer as to the constant user and, although it's not a truly professional level word processor, it will certainly be adequate for anything but professional writing. □

POPCORN UPDATE

Several readers have written about a problem with *Popcorn*, printed in *ANALOG Computing's* issue 26. As listed, the program cannot be restarted after the first play.

The short section of DATA statements below replace Lines 1740-1780 of the original BASIC program and fix the restart program. After placing these lines in the BASIC program, simply RUN the program to create the boot tape or AU-TORUN disk.

```

1740 DATA 85A6A5A518658685A59002E6A618
A5A5690085A5A91065A685A6A9008595A5870A
0A26890A268918658785A7A5,333
1750 DATA 8965A885A8A4A0B1A7A00091A5A5
A518692885A59008E6A6A5A6C920B008E6A0A5
A0C909D0DFC68A30034CD02C,342
1760 DATA 60A59C38E9244A4A38E9048591A0
00A200BD0006F004C591F010E8E8E00CD0F1E6
91C8A200C006D0E860E8BD00,203
1770 DATA 06CAC94E90E7859EBD00068586A9
0F8587A9009D00069D01064CC82CA000989180
C8D0FBE681CAD0F6602070F0,825
1780 DATA F2F2FE7E3E0F0F0F0F0F0F0FFFFF
FF7E7E7E7E7E7E00000000000078F8808000
000000000000000000000000,127
    
```

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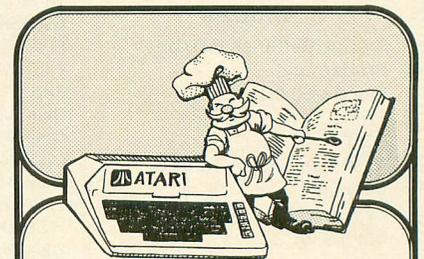
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**SMOOTHWRITER WORD PROCESSING SYSTEM
DIGITAL DELI
4470 SW Hall, Suite 291
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48K Disk \$79.95**

by Keith Valenza

If you've been shopping around for a sophisticated word processing system for your Atari, you might want to take a look at **Smoothwriter** from Digital Deli. It's one of the most advanced microcomputer word processors I've ever seen.

Designed for use with an Epson or NEC printer, **Smoothwriter** has several features not normally associated with word processors. For example, have you ever heard of a word processor that can use a trackball or a joystick to move the cursor in lightning speed? **Smoothwriter** can. Of course, you can always move the cursor using the keyboard if you prefer, but the game controllers move it much faster. They're also more fun to use, if word processing could ever be called "fun."

You can also make backup copies of the **Smoothwriter** program disk, a feature which can prevent a lot of headaches. Apparently, **Smoothwriter's** author does not feel threatened by potential piracy.

Text editing, formatting and printing are usually functions of one program in many microcomputer word processors. Not so with **Smoothwriter**. This system uses separate programs for each function. The author maintains that having separate programs "optimizes" each function, without "taxing the computer's resources." In this way, **Smoothwriter** is able to have nearly as many features as the more sophisticated professional word processors.

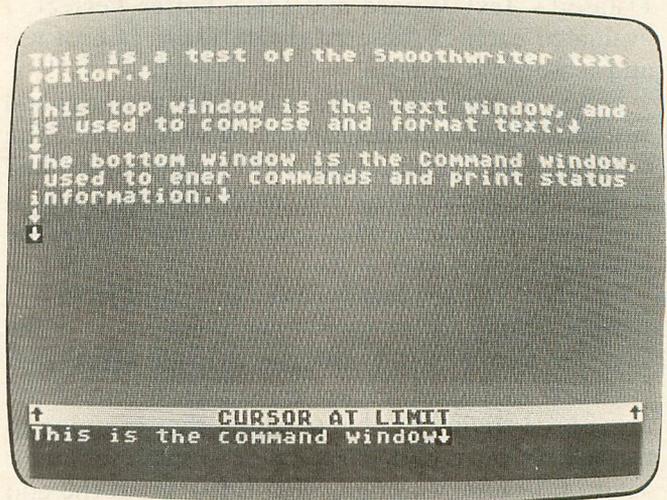
Quickedit is the text editing program, which features windows in three separate colors. The text editor is located at the top of the screen. This is the largest of the three windows, and the entering and editing of text takes place here. In the center, the message window tells you if an error has been made or if a command has been executed. At the bottom of the screen is the command window.

The difference in each window's color allows the user to distinguish between the "active" and "inactive" windows. The blue-colored window is the active one, and it receives text or commands. The green window is inactive. By pressing SELECT, the windows can be switched back and forth as needed.

My only criticism of the Quickedit program is that it makes a distinction between the "physical" and the "logical" lines. The physical line is composed of the forty characters that appear from left to right on the screen. The logical line includes all of the text that appears on one line of a printed page. Because many of Quickedit's commands use logical line concept, un-

derstanding this is a must for the user. However, I found the concept very confusing, and would never have missed it if it had been left out.

Smoothwriter contains the most complete text-formatting program I've ever seen. This program, Interactive Runoff, includes such features as paragraph and page formatting, headers and trailers, plus print characteristics like italics, doublestriking, underlining and various type sizes. Especially useful are the widow and orphan commands. When these commands are used, you can prevent having the first line of a paragraph appear at the bottom of a page, or the last line of a paragraph at the beginning of a page—before it's ever printed.



Smoothwriter.

Runoff Review, another program in **Smoothwriter**, will review any portion of the document on-screen, or print specified pages from the document.

I was very impressed with **Smoothwriter's** documentation. It should be a model for all computer software. Although extremely detailed, it is very well organized and well written, section by section. Numerous tutorials, examples, reference manuals (in addition to the instructions), and reference cards covering each of the hundreds of commands in the program—all make this documentation a user's dream.

Beginners take note: don't expect to learn instant word processing in just a few short hours. Learning to use **Smoothwriter** is simple, however, if you are patient and willing to take the time to study the manual page by page.

If you own an Epson or NEC printer, **Smoothwriter** should be a part of your software collection. It is both comprehensive and well documented. I only hope that **Smoothwriter's** author will write similar programs for the many Atari users who own other types of printers. **Smoothwriter** is too well written to benefit only one group of people. □

CITYWRITER WORD PROCESSOR

by Michael T. Wallmeyer
SOFTWARE CITY
1415 Queen Ann Road
Teaneck, NJ 07666
(201) 575-4574
48K Disk \$39.95

by Arthur Leyenberger

When I first purchased my Atari computer system almost three years ago, my primary application was word processing. At the time, three word processing programs were available: the Atari Word Processor, Datasoft's Text Wizard and LJK's Letter Perfect. I evaluated each of these products, using ease of use and features as criteria.

I chose Letter Perfect, because it was powerful and had an adaptable printer driver that would utilize the features of my C.Itoh printer. Although initially I had to fight my way through the awful manual, I was finally able to understand it, and have been using the program heavily ever since.

One feature I've always wanted in a word processor was the ability to assign my own commands to any key. For example, if I thought it made sense that CTRL-B should represent "go to the bottom of the text file," I should be able to assign that meaning to those keys once and never have to worry about it again. Likewise, if using CTRL-E for "go to the end of text" made sense, then I should be able to use that set of keystrokes.

So far, I haven't found a word processor for Atari that has offered this significant, useful feature. The CityWriter from Software City *does* include user-definable printer control codes and, therefore, comes as close as I have seen to my ideal in this respect.

To use this feature of CityWriter, you must define a set of control characters which identify the appropriate printer commands. These control codes are stored in a separate file, which is read once by CityWriter in the print mode. The file consists of three pieces of information for each code: the control character (in inverse video) that you want to use, the number of ASCII characters that define the function, and the actual ASCII printer codes that should be transmitted to the printer.

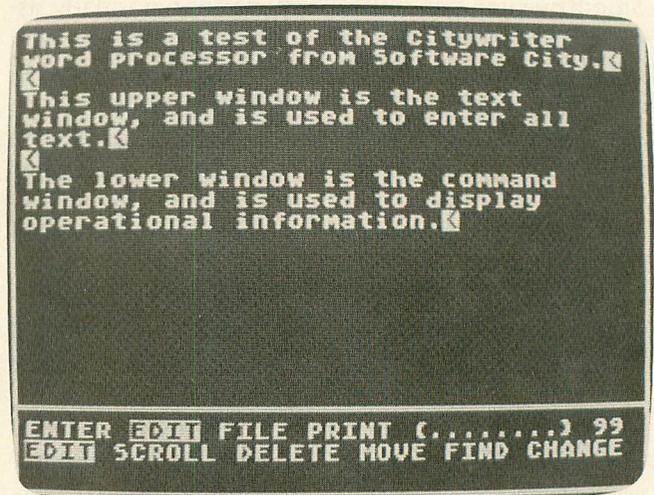
For example, if you want italics on an Epson FX-80 printer, you would type in I,2, 27,52 and J,2,27,53. CTRL-I and CTRL-J would turn italic print on and off, respectively. Unfortunately, there is no method of allowing just one control code to toggle the print function on and off.

CityWriter separates the screen into two areas. The majority of the screen is used as a text window, which allows text input, editing and scrolling. At the bottom of the screen is a three-line command window.

All of the information and commands that you need to operate the program (such as prompts, system functions and status) are contained here.

There are four basic operational modes that all text processing functions are implemented with. The OPTION key is used to select the desired mode, and the SELECT key is used to select sub-functions within a mode. Once a function has been selected, pressing START activates it.

The ENTER function is used to input text. If text is already in memory, the new text will be appended to it. In this mode, the CLEAR, INSERT DELETE and cursor control keys are disabled. If a mistake is made while typing, the BACKSPACE key can be used.



CityWriter.

EDIT allows you to perform a variety of functions on your existing text by choosing one of several sub-functions. Scroll permits you to move throughout your text with the cursor control keys. You can also jump to the top or bottom of your file, or scroll up or down one screen. Delete lets you delete a block of text after first responding to the *delete from* and *delete to* prompts. Once text has been deleted, there is no way to get it back.

EDIT Move allows you to copy—or move—a block of text anywhere in your document. Again, you are prompted to enter the *move start* and *move end* locations, after which you are asked if you want to move or copy the block of text. Only about seventeen lines may be moved or copied at a time.

EDIT Find is essentially a search command, and EDIT Change is a basically a search and replace command. When using the edit change function, you can change either all or individual occurrences of the specified string.

The major drawback to the editing capabilities of CityWriter is that there is no "insert" mode. This means that, to insert additional text into your file, you must first append it to the end of the document, then use the edit move function to place the text

where you want it. The manual states that this is a "...relatively quick and painless process," but it would have been more convenient to be able to go to the place you want to insert your new text, enter an "insert" mode, and simply begin typing.

CityWriter's third operational mode is the FILE function. Here, you can load and save files, display a directory of your disk, and erase or rename disk files. One particularly useable feature: when you select the FILE Load function with existing text in memory, you can choose either to append the file to the current text or replace the current text.

The other function of the file mode is to format an entire disk. **CityWriter** wisely asks twice if you want to perform this function, since all files will be destroyed when the disk is formatted.

PRINT is the fourth operational mode, which allows various print options to be selected by answering prompts. Text can be printed either with or without page numbers (including a specified starting page number, if desired), and the page numbers may appear either on the top right or bottom center of the page. You can also choose to have the right margin justified or unjustified (ragged edge).

Additional prompts ask for: left margin and page width, lines per page, single or double spacing, and whether you want the output to go to the printer or a disk file.

The 38-page manual that accompanies **CityWriter** is brief but clear. There is no index, but that's not a problem, since the manual is arranged by functions. The program itself was originally written in Atari BASIC, then compiled using the **ABC Compiler** (Monarch Data Systems). This results in reasonably fast movement when scrolling.

The files that **CityWriter** creates are Atari DOS compatible, which means that spelling checking programs (such as **Spell Wizard** and APX's **Atspeller**) should be useable.

Atspeller worked without a hitch with the **CityWriter** files. However, **Spell Wizard** was able to read the files, but could not display them properly. During correction, what appeared to be random characters were displayed on the screen. Amazingly, when **Spell Wizard** saved the file back onto disk, **CityWriter** was able to read it. I still haven't figured out what is going on here.

So what do you get for \$39.95, compared to other inexpensive word processors like **Bank Street Writer** or **Cut&Paste**? You get a useable, "no-frills" word processor that will probably meet most of the needs of the typical Atari user.

One of the strengths of **CityWriter** is that, by using the command window to separate the commands from your text, you always know what mode you're in and which commands are available. This ensures that you are in control of the program at all times.

Another strength is the error trapping, which—as

an example—won't let you accidentally format a disk if you really don't want to. Finally, user-definable printer codes let you customize your printing commands.

On the negative side is the lack of an insert function, which results in an awkward technique for inserting text. Also, there is no provision for headers, footers, print previewing or automatically chaining files.

All in all, **CityWriter** is worth considering if you're looking for an inexpensive, general purpose word processor. But be sure to test drive it first, to determine that it meets *your* needs. □

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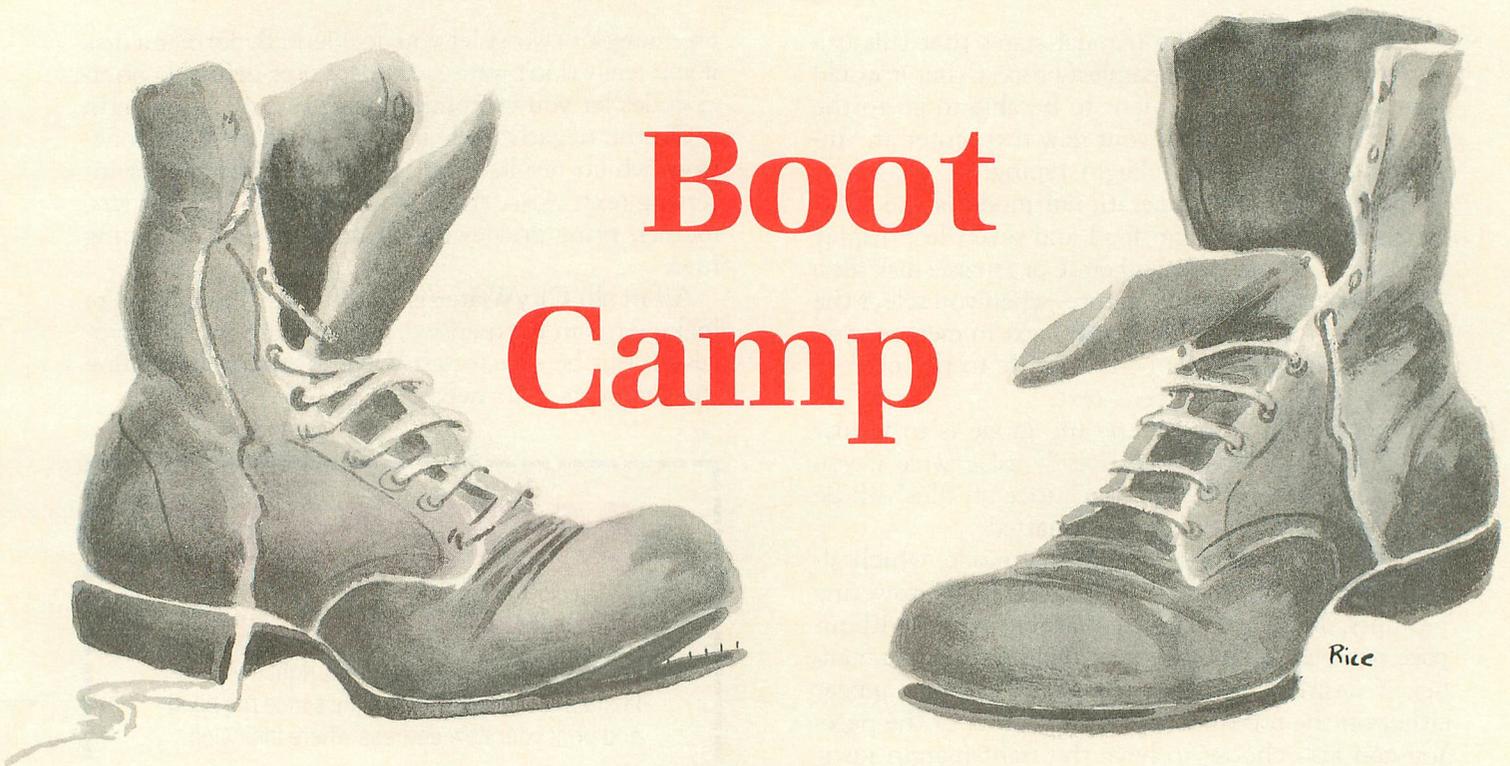
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by Tom Hudson

All right, **Boot Camp** trainees, here we are again in the wonderful world of assembly language programming. This issue, we continue our work with BASIC USR calls, the mechanism which allows us to use assembly language routines in conjunction with BASIC.

DPOKE solution.

Last issue, we wrote a routine that allowed us to examine the contents of 2-byte data items in memory, and called it DPEEK (double PEEK). Your homework was to write a companion routine, DPOKE, which will POKE a 2-byte value into memory. We will write the USR call so that it can be called with the BASIC statement:

```
A~USR(DPOKE, ADDRESS, VALUE)
```

The DPOKE routine can be written very easily. In fact, the DPEEK routine from last issue can be used as a starting point. Figure 1 shows the assembly language source code for the DPOKE routine.

```
0100 POKEL - $CB
0110 POKEH - $CC
0120 *= $0600
0130 CLD ;CLEAR DECIMAL
0140 PLA ;DISCARD HARG5
0150 PLA ;PULL POKE HI
0160 STA POKEH ;AND SAVE IT
0170 PLA ;PULL POKE LO
0180 STA POKEL ;AND SAVE IT
0190 LDY #1 ;POINT Y TO HI
0200 PLA ;PULL VALUE HI
0210 STA (POKEL),Y ;POKE HI VAL
0220 DEY ;POINT Y TO LO
0230 PLA ;PULL VALUE LO
0240 STA (POKEL),Y ;POKE LO VAL
0250 RTS ;ALL DONE!
```

Figure 1.

Let's look at this code and see what makes it tick. For purposes of demonstration, we'll assume that we're DPOKEing the value 16479 (\$405F) into location 560 (\$0230).

Line 130 clears the decimal mode, placing us in binary math mode. This program doesn't do any add or subtract operations, but let's do this anyway, just to get into the habit.

Line 140 pulls the number of arguments off the stack. We will assume that the programmer has sent two arguments, and discard this value.

Line 150 pulls the high byte of the DPOKE address off the stack, placing it in the accumulator. At this point, the accumulator contains \$02, the high-order portion of \$0230.

Line 160 stores the high byte of the address in the location POKEH, at address \$00CC. We use a page 0 address for this value, since we'll want to use the address as an indirect pointer.

Line 170 pulls the low byte of the DPOKE address off the stack, leaving it in the accumulator. The accumulator now contains the low-order portion of \$0230, or \$30.

Line 180 stores the low byte of the DPOKE address in the location labeled POKEL, which, like POKEH, is located on page 0. At this point, the 2 bytes POKEL and POKEH make up a 2-byte pointer for the specific location in memory corresponding to the first argument sent by BASIC. Using the address in our demonstration, POKEL contains \$30, and POKEH contains \$02,

making a 2-byte pointer which points to \$0230. We're now ready to perform the DPOKE operation using the next two values on the stack.

Line 190 places a 1 in the Y register, readying it for the storage of the high byte of the DPOKE value.

Line 200 pulls the high byte of the value to be DPOKEd off the stack and places it in the accumulator. Once again, using our demonstration values, you can see that the accumulator will, at this point, contain \$40, the high byte portion of \$405F.

Line 210 stores the high byte of the value we want to DPOKE. As you see, the program uses the *post-indexed indirect* form of addressing to perform this function. POKEH and POKEL contain the values \$02 and \$30, and form a pointer to location \$0230. The accumulator at this point contains \$40, and the Y register contains the number 1. When we execute the instruction *STA (POKEL),Y* the computer will store the accumulator at location \$0231, the address which is the sum of the pointer at POKEL (\$0230) and the Y register (\$01).

Line 220 decrements the Y register by 1, making it 0. This will enable the low byte of the 2-byte DPOKE value to be stored in Line 240.

Line 230 pulls the low byte of the value to be DPOKEd from the stack, leaving it in the accumulator. At this point, using our example data, the accumulator would contain \$5F, the low byte of the value to be POKEd, \$405F.

Line 240 stores the low byte of the DPOKE data in the low-order byte of the DPOKE address. The address used to store the accumulator is calculated as in Line 210. Using our example values, the address contained in POKEL and POKEH (\$0230) plus the value in the Y register (0), gives a storage location of \$0230. After this instruction has been executed, both bytes of the 2-byte DPOKE value have been properly stored, and we're finished.

Line 250 executes an RTS instruction, which returns program control to BASIC.

? PEEK (560)+PEEK (561)*256

The number that BASIC prints is the address of the Atari computer's *display list*. This is a set of specialized instructions used to generate the computer's display. Add 1 to this number and write down the new value. Now RUN the BASIC DPOKE program. The computer will ask:

ENTER ADDRESS TO DPOKE?

Type 560 and press RETURN. Memory locations 560 and 561 are a 2-byte pointer which tells the computer where the display list is in memory. We will change this pointer, using the DPOKE function.

After you enter the DPOKE address, the computer will ask:

ENTER DATA TO DPOKE?

Now type the number you wrote down earlier (the display list address + 1) and press RETURN. You should see your computer's display move up by one line.

What happened? Because we changed the display list pointer so that it points 1 byte higher than it originally did, the display processor starts eight scan lines farther into the display, and the display is shifted up. If you change the pointer back to its original value, the display returns to normal. This is just one example of how the DPOKE subroutine can help. You can write a program with two display lists in memory, then switch between them with one simple USR call.

The DPOKE subroutine can be a very handy addition to your utility subroutine library—and add convenience to programs which must alter the system pointers repeatedly.

One word of caution, though. Be sure you know what locations you're changing! The DPOKE subroutine will allow you to change any 2-byte memory group without restrictions, and careless use of this freedom could destroy vital system data or your program. . . or it could crash the system.

You'll flip.

Our next USR call example will give us some more experience with the post-indexed indirect addressing mode, this time in conjunction with BASIC strings.

Many times, you'll want to manipulate the data in a BASIC string, or use the string as a method of storing miscellaneous data. When you do this, you must tell the USR subroutine where the string is and how long it is. This is actually quite simple.

This subroutine accepts two parameters, a string's address and its length. It then flips the state of the 128 bit of each character in the string. Now, the 128 bit of a character byte has a special significance to the Atari display processor: this is the bit which tells whether or not a character is to be displayed in inverse video.

If the 128 bit is off (0), the character is displayed normally, white character on blue background. If the bit is on (1), the character will be displayed in inverse,

```

10 FOR X=1536 TO 1553:READ N:POKE X,N:
NEXT X:DPOKE=1536
20 TRAP 20:? "ENTER ADDRESS TO DPOKE";
:INPUT ADDRESS
30 TRAP 30:? "ENTER DATA TO DPOKE";:IN
PUT DATA:TRAP 40000
40 A=USR(DPOKE,ADDRESS,DATA)
50 GOTO 20
100 DATA 216,104,104,133,204,104,133,2
03,160,1,104,145,203,136,104,145,203,9
6

```

Figure 2.

The BASIC program in Figure 2 allows you to test the DPOKE subroutine yourself. After typing in the program, type the following line and press RETURN.

a blue character on a white background.

How will we manage to flip the 128 bit? Remember the *exclusive-or* function? We discussed it in issue 18. Briefly, the exclusive-or operation will flip the state of any bit in the accumulator if the corresponding bit in the operand byte is on. We'll use this principle to flip the high-order bit of each byte of the string.

The USR statement that will be used to call this subroutine is of the form:

```
A=USR (FLIP,ADR (A$),LEN (A$))
```

Now let's look at the assembly code needed to perform this function. Figure 3 shows one possible solution.

```
0100 STRADL = $CB
0110 STRADH = $CC
0120 STRLEL = $CD
0130 STRLEH = $CE
0140      *- $0600
0150      CLD
0160      PLA          ;DISCARD # ARGS
0170      PLA          ;PULL ADDR HI
0180      STA STRADH   ;AND SAVE IT
0190      PLA          ;PULL ADDR LO
0200      STA STRADL   ;AND SAVE IT
0210      PLA          ;PULL LENGTH HI
0220      STA STRLEH   ;AND SAVE IT
0230      PLA          ;PULL LENGTH LO
0240      STA STRLEL   ;AND SAVE IT
0250      INVLPLDA STRLEL ;GET LENGTH LO
0260      ORA STRLEH   ;MIX W/HI BYTE
0270      BNE FLIPIT  ;IT'S NON-ZERO!
0280      RTS          ;ALL DONE!
0290      FLIPITLDA STRLEL ;DECREMENT THE
0300      SEC          ;LENGTH COUNTER
0310      SBC #1      ;BY 1
0320      STA STRLEL   ;AND PUT IT
0330      LDA STRLEH   ;BACK!
0340      SBC #0
0350      STA STRLEH
0360      LDY #0       ;READY Y REG.
0370      LDA (STRADL),Y ;GET BYTE
0380      EOR #$80     ;FLIP HI BIT
0390      STA (STRADL),Y ;PUT BACK!
0400      LDA STRADL   ;NOW ADD 1...
0410      CLC          ;TO STRING...
0420      ADC #1       ;ADDRESS...
0430      STA STRADL   ;POINTER
0440      LDA STRADH
0450      ADC #0
0460      STA STRADH
0470      JMP INVLPL ;AND LOOP BACK!
```

Figure 3.

Lines 100-110 reserve 2 bytes to store the address of the string that the subroutine will alter. Once again, since these bytes will be used as an indirect pointer in the post-indexed indirect instruction format, they must be stored on page 0.

Lines 120-130 reserve 2 more bytes to hold the string length value. This area will be used as a counter to determine when the flip process is complete.

Line 150 clears the decimal mode. This program uses the arithmetic instructions ADC and SBC, and works with binary math. Therefore, we must be sure that the 6502 processor is ready to work with binary values.

Line 160 pulls the number of arguments from the stack. We'll assume the programmer has sent the proper number of arguments, and discard this value.

Lines 170-200 pull the 2 bytes that make up the string's address from the stack and store them in the string address hold area (STRADL and STRADH) on page 0. Remember, it's necessary for this value to be located on page 0, because we're going to use it as an indirect pointer to the string. All indirect pointers used in pre- and post-indexed operations must be stored on page 0. This is a limitation of the 6502 processor.

Lines 210-240 pull the 2 bytes which make up the string's length from the stack and place them in the string length hold area (STRLEL and STRLEH). At this point, we're ready to begin processing the string and flipping bits.

Lines 250-260 first load the accumulator with the value in STRLEL (the low byte of the string length), then OR this value with the number in STRLEH (the string length high byte). By using the ORA instruction, we combine the bits in STRLEL with those in STRLEH, allowing us to check very quickly to see if they are both 0. If either STRLEL or STRLEH have bits on, they will show up in the accumulator, and we'll know there are more characters left to process in the string. On the other hand, if the string length has reached 0, both STRLEL and STRLEH will be 0, and the ORA operation will result in a 0 value in the accumulator.

Line 270 tests the result of the previous ORA instruction. If there are more characters to process in the string, the accumulator will not be 0, and the computer will BNE (branch if not equal/zero) to the location labeled FLIPIT, to process the next character. If the accumulator is 0, all the characters have been processed, and the program continues at the next instruction.

Line 280 is executed after all the characters have been processed. This is simply an RTS instruction, and the computer resumes processing in BASIC.

Lines 290-350, labeled FLIPIT, begin the actual bit-flipping operation. These lines subtract 1 from the string length counter, STRLEL and STRLEH. As each character in the string is processed, this counter is decremented by 1. When this counter reaches 0, the ORA instruction at INVLP detects the condition and terminates the subroutine.

Line 360 places a 0 in the Y register, getting it ready for the post-indexed indirect operation that we'll use to flip the string's bits. By placing a 0 in the Y register, the indirect operation will have a 0 offset from the address in the pointer, STRADL and STRADH.

Line 370 loads the accumulator from the address contained in the pointer STRADL and STRADH, which contains one of the characters in the string. As mentioned above, the Y register is set to 0, so that the byte is loaded from the address in the pointer, with no offset added by the Y register. For example, if STRADL/H is pointing to \$457F, the accumulator will be loaded from address \$457F (\$457F + 0).

Line 380 exclusive-ORs the accumulator with the value \$80 (128 decimal, 10000000 binary). As you can see from the binary representation, this will flip the highest bit of the value in the accumulator. If the bit was on before the operation, it will be turned off, and vice-versa. Since the value in the accumulator is one of the characters in the string, this will change normal characters to inverse, and inverse characters to normal.

Line 390 uses the post-indexed indirect addressing mode to store the character in the accumulator back into memory, after the flip operation is complete. One thing to note here is that you must pay close attention to what happens to the registers when programming in 6502 assembly language. For example, this STA instruction uses the Y register as an offset, and you

should be sure that it's not altered between the time you load the character value and store it. In this case, there's nothing to worry about, but in larger programs, you could run into trouble if many registers are being used, and the Y register had been changed.

Lines 400-460 add 1 to the string address pointer, STRADL and STRADH. This advances the pointer to the next character in the string.

Line 470 executes a JMP instruction, looping the program back to the label INVLP, where it will test for more characters to process.

The BASIC program for the character flip program is shown in Figure 4. Type in the program and RUN it.

```

10 FOR X=1536 TO 1593:READ N:POKE X,N:
NEXT X:FLIP=1536
20 DIM A$(20):A$="THIS IS A TEST"
30 A=USR(FLIP,ADR(A$),LEN(A$))
40 PRINT A$:GOTO 30
100 DATA 216,104,104,133,204,104,133,2
03,104,133,206,104,133,205,165,205,5,2
06,208,1,96,165,205,56,233
110 DATA 1,133,205,165,206,233,0,133,2
06,160,0,177,203,73,128,145,203,165,20
3,24,105,1,133,203,165
120 DATA 204,105,0,133,204,76,14,6
    
```

Figure 4.




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As you can see, each time the program executes Line 30, the string A\$ is changed from normal video to inverse and vice-versa. The program changes all the characters, because we told it to start at the address of A\$, and to flip as many characters as A\$ contains.

Let's try something a little different. Change Line 30 to look like this and RUN the program again:

```
30 A=USR(FLIP,ADR(A$(11)),4)
```

Now you'll see an interesting variation on the original function. As you'll note when the program runs, only the word TEST is changing! We told it to change the eleventh character of A\$ (ADR(A\$(11))), and we told it to flip four characters. You can flip any portion of a string you like, and any number of characters.

Here's another example of what this program can do. Change Lines 30 and 40 to read:

```
30 A=USR(FLIP,PEEK(88)+PEEK(89)*256,40)
40 FOR WAIT=1 TO 50:NEXT WAIT:GOTO 30
```

After you've made the changes, RUN the program. You'll see the top line on the graphics 0 screen flash. How is this being done? Locations 88 and 89 are a 2-byte pointer to the start of screen memory. By sending their address to the subroutine instead of a string address, along with a length of 40 bytes, the subrou-

tine will flip the actual screen memory's inverse bits, and we have a flashing display line!

Stay tuned.

As you've seen from the examples I've used so far, you can perform a large variety of useful functions, very quickly, with USR subroutines. Next issue, we'll wrap up our USR call series so that we can proceed to bigger and better things. We'll still cover USR calls from time to time, but I'm sure there are a lot more areas that you'll enjoy exploring.

Until then, play around with the 6502 and try writing your own USR calls. And, should you find yourself stuck, remember that you can get in touch with me on CompuServe via the Atari SIG (my user ID is 70775,424), or by writing. □

Boot Camp

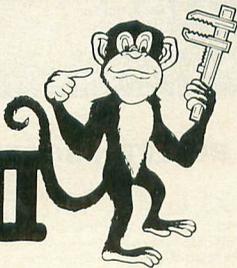
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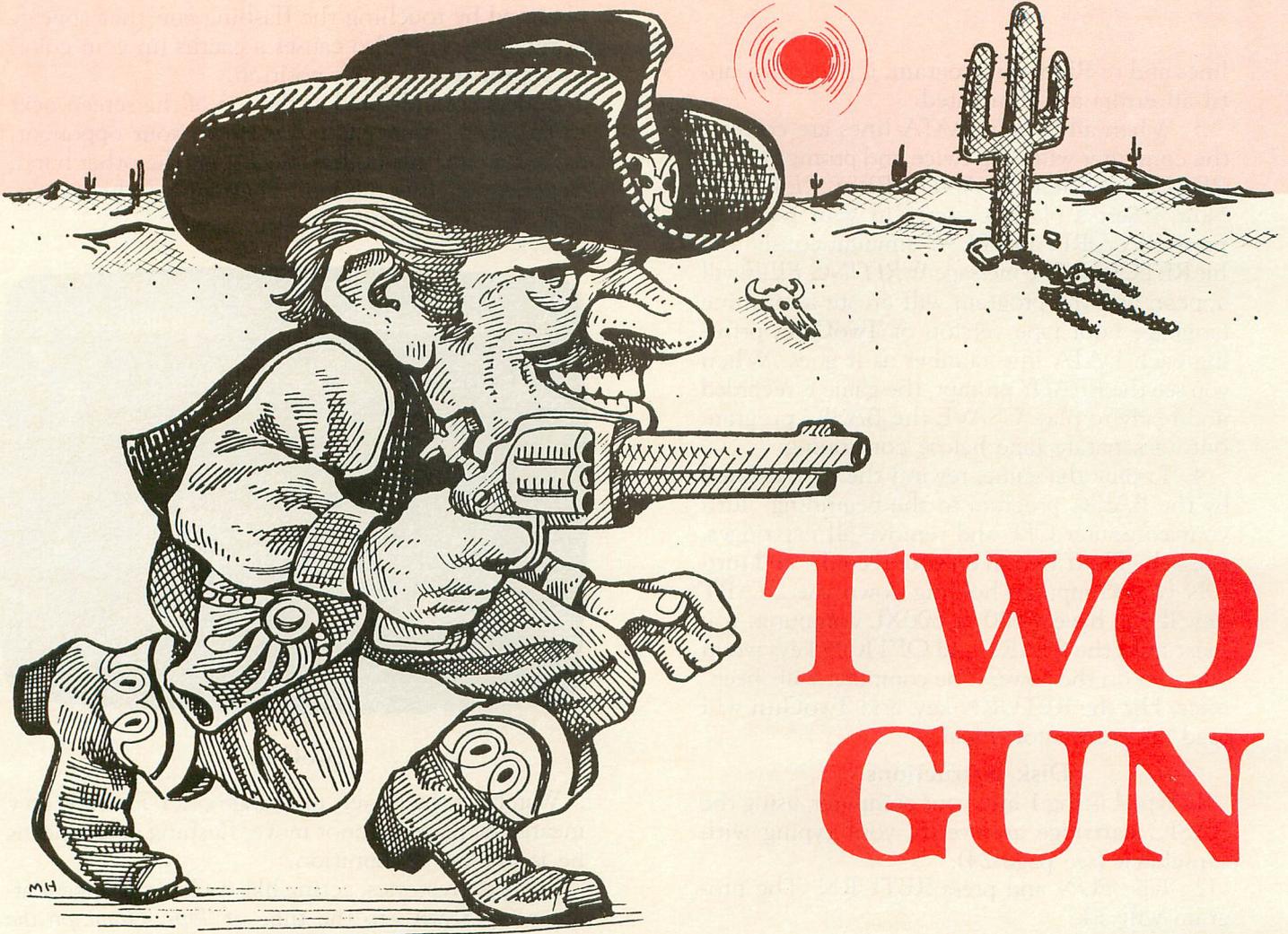
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TWO GUN

16K Cassette or 24K Disk

by Conrad Tatge

All right, you potential Matt Dillons, here's your chance to walk down the main street of town . . . into the legends.

TwoGun is a two-player machine language game. It demonstrates two assembly techniques essential on the Atari home computer: color changing and collision detection. VCOUNT (\$D40B) is monitored for the majority of the time, to change the color of the players partway down the screen, much like a display list interrupt. Also, the complexity of collision detection becomes apparent, as most of the vertical blank is devoted to this.

Typing it in.

Before typing anything, look at the listings accompanying this article.

Listing 1 is the BASIC data and data checking routine. This listing is used to create both cassette and disk versions of **TwoGun**. The data statements are listed in hexadecimal (base 16), so the program will fit in 16K cassette systems.

Listing 2 is the assembly language source code for the game of **TwoGun**, created with the Atari Macro assembler. You *don't* have to type this listing to play the game! It is included for those readers interested in assembly language.

Follow the instructions below to make either a cassette or disk version of **TwoGun**.

Cassette instructions.

1. Type Listing 1 into your computer using the BASIC cartridge and verify your typing with **Unicheck** (see page 24).
2. Type **RUN** and press RETURN. The program will begin and ask:

MAKE CASSETTE (0) OR DISK (1)?

Type 0 and press RETURN. The program will begin checking the DATA statements, printing the line number of each as it goes. It will alert you if it finds any problems. Fix any incorrect

(continued on page 74)

lines and re-RUN the program, if necessary, until all errors are eliminated.

3. When all of your DATA lines are correct, the computer will beep twice and prompt you to *READY CASSETTE AND PRESS RETURN*. Now, insert a blank cassette in your recorder, press RECORD and PLAY simultaneously and hit RETURN. The message *WRITING FILE* will appear, and the program will create a machine language boot tape version of **TwoGun**, printing each DATA line number as it goes. When you see the *READY* prompt, the game is recorded and ready to play. *CSAVE* the BASIC program onto a separate tape before continuing.

4. To play the game, rewind the tape created by the BASIC program to the beginning. Turn your computer OFF and remove all cartridges. Press the PLAY button on your recorder and turn ON your computer, holding down the START key. If you have a 600 or 800XL computer, you must hold the START and OPTION keys when you turn on the power. The computer will "beep" once. Hit the RETURN key, and **TwoGun** will load and run automatically.

Disk instructions.

1. Type Listing 1 into your computer, using the BASIC cartridge and verify your typing with **Unicheck** (see page 24).

2. Type *RUN* and press RETURN. The program will ask:

MAKE CASSETTE (0) OR DISK (1)?

Type 1 and press RETURN. The program will begin checking the DATA lines, printing the line number of each statement as it goes. It will alert you if it finds any problems. Fix incorrect lines and re-RUN the program, if necessary, until all errors are eliminated.

3. When all DATA lines are correct, you will be prompted to *INSERT DISK WITH DOS, PRESS RETURN*. Put a disk containing DOS 2.0S into drive #1 and press RETURN. The message *WRITING FILE* will appear, and the program will create an *AUTORUN.SYS* file on the disk, displaying each DATA line number as it goes. When the *READY* prompt appears, the game is ready to play. Be sure the BASIC program is *SAVED* before continuing.

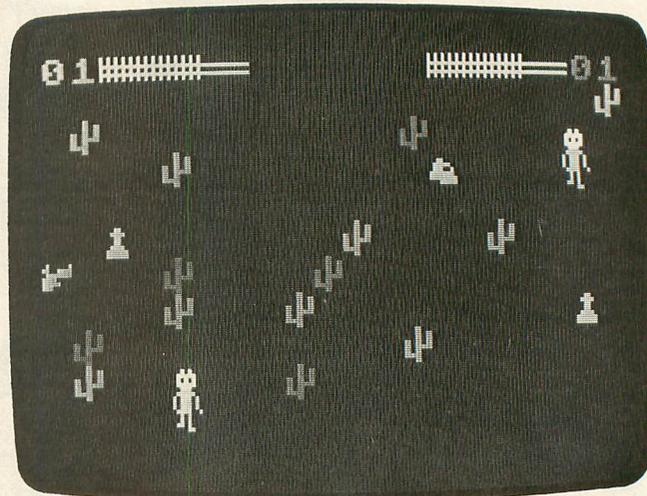
4. To play the game, insert the disk containing the *AUTORUN.SYS* file into drive #1. Turn your computer OFF, remove all cartridges and turn the computer back ON. **TwoGun** will load and run automatically.

How to play.

In **TwoGun**, shooting your opponent scores a point . . . and causes him to fall down dead. Bullets can be

obtained by touching the flashing gun that appears at random. This also causes a cactus (in your color) to appear in the gun's position.

Bullets are indicated at the top of the screen next to the score. Your cacti slow down your opponent, as well as stop his bullets. Rocks, on the other hand, ricochet bullets at random. They appear when you've shot your opponent's cactus.



TwoGun.

Watch for the players to change color. Flashing grey means the player cannot move; flashing green means he is low on ammunition.

Little gravestones, acting like rocks, will appear after every death—to the tune of *Taps*. *Home on the Range* runs throughout the game.

Shoot 'em up!

My first game creation, **TwoGun** was built with APX's editor. The source code is in macro assembly form.

Practice your draw. **TwoGun** should keep you in top gunfighting shape just in case the villains ride into town. □

Listing 1.

```
10 REM *** TWOGUN ***
20 TRAP 20: ? "MAKE CASSETTE (0), OR DI
5K (1)"; INPUT DSK: IF DSK > 1 THEN 20
30 TRAP 40000: DATA 0,1,2,3,4,5,6,7,8,9
,0,0,0,0,0,0,10,11,12,13,14,15
40 DIM DAT$(91), HEX(22): FOR X=0 TO 22:
READ N: HEX(X)=N: NEXT X: LINE=990: RESTOR
E 1000: TRAP 120: ? "CHECKING DATA"
50 LINE=LINE+10: ? "LINE:"; LINE: READ DA
T$: IF LEN(DAT$) <> 90 THEN 220
60 DATLIN=PEEK(183)+PEEK(184)*256: IF D
ATLIN <> LINE THEN ? "LINE "; LINE: " MISS
ING!": END
70 FOR X=1 TO 89 STEP 2: D1=ASC(DAT$(X,
X))-48: D2=ASC(DAT$(X+1,X+1))-48: BYTE=H
EX(D1)*16+HEX(D2)
80 IF PASS=2 THEN PUT #1, BYTE: NEXT X: R
EAD CHKSUM: GOTO 50
90 TOTAL=TOTAL+BYTE: IF TOTAL > 999 THEN
TOTAL=TOTAL-1000
100 NEXT X: READ CHKSUM: IF TOTAL=CHKSUM
THEN 50
```

```

110 GOTO 220
120 IF PEEK(195)(<)6 THEN 220
130 IF PASS=0 THEN 170
140 IF NOT DSK THEN 160
150 PUT #1,224:PUT #1,2:PUT #1,225:PUT
#1,2:PUT #1,0:PUT #1,32:CLOSE #1:END
160 FOR X=1 TO 97:PUT #1,0:NEXT X:CLOS
E #1:END
170 IF NOT DSK THEN 200
180 ? "INSERT DISK WITH D05, PRESS RET
URN";:DIM IN$(1):INPUT IN$:OPEN #1,8,0
,"D:AUTORUN.SYS"
190 PUT #1,255:PUT #1,255:PUT #1,0:PUT
#1,32:PUT #1,246:PUT #1,40:GOTO 210
200 ? "READY CASSETTE AND PRESS RETURN
";:OPEN #1,8,128,"C":RESTORE 230:FOR
X=1 TO 40:READ N:PUT #1,N:NEXT X
210 ? :? "WRITING FILE":PASS=2:LINE=99
0:RESTORE 1000:TRAP 120:GOTO 50
220 ? "BAD DATA: LINE ";:LINE:END
230 DATA 0,19,216,31,255,31,169,0,141,
47,2,169,60,141,2,211,169,0,141,231,2,
133,14,169,56,141,232,2
240 DATA 133,15,169,0,133,10,169,32,13
3,11,24,96
1000 DATA 2065E420E92220DE22A9D38D3002
A9288D3102A92E8D2F02A9388D07D4A9038D1D
D0A9088D0C00A9188D6F02A9,606
1010 DATA 008D08D2A9068D0C602A9AA8DC702
A200BD00E09D0030BD00E19D0031E8D0F1A930
8DF402A248BDCB279D0830CA,927
1020 DATA 10F7A900A27F9580CA10FBA2079D
00D0CA10FAA9008583A223A000A906205CE4A2
12BD8C26BC9F26990038CA10,72
1030 DATA F4A20FA058BD832899003A889900
3A88CA10F2A207A058BD032799803A99813A99
823A99833ABDD0B2799003B99,285
1040 DATA 013B99023B99033B88888888CA10
DBA9038D08D08D09D08D0AD0A9368DC002A9C2
8DC102A9068DC202A9788D00,200
1050 DATA D0A9A88D01D0A9488D02D0A94A8D
2327A9018D6D27A9018589A220ADC40248ADC5
028DC402688DC502A9108585,287
1060 DATA A585D0FCCAD0E720E922A9078581
A9008583A2079D00D2CA10FAAD0AD20901858E
A9008D08D08D09D085908594,980
1070 DATA 8D1527858B858A85918592A9028D
00D2A9AA8D03D2A9FF858685878588A213BD78
269DDC38CA10F7A681A51409,639
1080 DATA 079D0C002E002B00729F0090A9DC4
02AD1FD02901D0E720E92220DE22AD1FD02901
F0F9A9F28DC802A9BA8DC702,935
1090 DATA A201A91A9DC0028DC727090A9DC4
02BDC92795AA95AEA93095AC95B0A90095A495
9A95A295BE95A695A8A90395,761
1100 DATA 9CCA10D18D1ED0A9018583A90085
84858AA580F0FCA584F0034C1C21A9008580A2
01B5AC18691E9596BDC72709,164
1110 DATA 069598A590F012B5A4F004A90495
98B59CC902B004A9CA9598CA10D9A201AD0BD4
8D0AD4D596D00748B5989D12,8
1120 DATA D068CA10F2C97090E6A201BD04D0
3DC02648D5A0F0129010B59AD00CB5A2D008A9
2D95A4A91085886895A0BD04,886
1130 DATA D02908F022A9108588A482BDB826
9914388D1ED0AD0AD22903090118759C959CAD
0AD20940858EA58ED00EAD0A,686
1140 DATA D2D02EA482A900991438F0E7C68E
D02120B022F011293FC902F00BC982F0F1A900
991438F0EA8482A9C1991438,488
1150 DATA A9108588CA30034C27224CD321AD
0AD2C9C8B0F9A8B91438600A0A858D0A0A1865
8D601875B84A4A4A20BC2285,18
1160 DATA 8DB5861869014A4A4A18658DA860
A2F0A9009DFF37CAD0FA60A27FA9009D80399D
003A9D803A9D003B9D803BCA,318
1170 DATA 10EE60A9018580C685A589F03CCE
6D27AD6027D01AEE2327AD2327C94A9005A901
8D2327AABD6D278D6D27A90A,284
1180 DATA 858CAE2327BD23278D06D2A58529
01D00BC68CA58C30059A08D07D2A583D0034C
7526C6911033A91F8591A592,144
1190 DATA 49108592A59049018590AD0AD209
06CDC702F0F68DC702A5861012A5A425A5D00C
A690BDE6268D00D2A908858B,465
1200 DATA A58BF00FC68BA58610F6A58B0980
8D01D2300BA5863007C686290F8D01D2A58730
10C687A687BDF4268D03D2BD,880

```

```

1210 DATA E8268D02D2A5883010C688A6888A
09408D05D2BDFD268D04D2AC1527D00AA58A10
22A9018589D02BA9008589CE,45
1220 DATA 1C271013B91C278D1C27B915278D
06D2A910858ACE1527A5852901D009C68AA58A
09A08D07D2A201B59AF012A9,579
1230 DATA 019D08D0D69AD009A94095A2A900
9D08D0B5A2F002D6A2B5A4F008D6A4D004A920
95A2BCBC26A905858FB59C95,630
1240 DATA 9EB59EC90A8B00C186984990038A9
00959EF00CA988990038B59E38E904959EC8C6
8FD00DBD0C03DC026F00BB5,273
1250 DATA AE95AAB5B095AC4C7224B5AA95AE
B5AC95B0BC7802B9C62695B21875AAC998B00C
858DB5A815A4D004A58D95AA,582
1260 DATA B9D62695B41875ACC940B00C858D
B5A815A4D004A58D95ACB5A8F042BD8402F03D
B5B215B4D006854D95A8F031,630
1270 DATA B59CF0F6B59A15A4D027D69CA901
95A6A90095A8A9188586B5AA18690395B6B5AC
95B8B5B20A0A95BAB5B40A95,755
1280 DATA BC4CFD24BD8402D008B5A6D004A9
0195A8BD08D03DC026F068A90095A6A90F20C6
22A989990038BCBE26B99A00,138
1290 DATA F006A9A095A4D04FA9008D1C27A9
068D1527A9B0999A00A9A99A400F8B5BE1869
01D895BE48BCBA26290F1DB6,427
1300 DATA 2699003864A4A4A4A4A4A4A4A4A4A4
37290FC90190158681BCBE26A90099C002A900
8583A90185844C6726B5AA18,864
1310 DATA 69309D00D08A48BDB2685958DB4
268594A9B08593B5A01BA5028593B5A8F013
BD7802C90FF00CB59CF008BC,923
1320 DATA 7802B9B7278593B5AC186928A8B5
9AF004A9A08593A59318690FAABD1328919488
CAE49310F568AAB5A6D017B5,784
1330 DATA B818691FA8B980393DC426998039
A9009D04D04C6126BD00D3DC26F011A90720
C622A983991438A91085884C,492
1340 DATA 5B26BD00D290F01D9A90A8587AD
0AD2290FA8B9C626190626F0F2B9C6260A95BA
B9D62695BCB5B61875BAC99E,165
1350 DATA B03295B61869309D04D0B5B81869
1FA8B980393DC426998039B5881875BCC95080
1295B818691FA8B980391DC2,387
1360 DATA 269980394C6126A90095A695A8CA
30034C06248D1ED0AD1FD02901D004A9018584
4CD1E7B0B2A5B3B300F3F4E1,731
1370 DATA F2F400B4AF00A2A5A7A9AE34772F
67356E6279636F6E7261647461746765293051
65798D3F4042434445464749,433
1380 DATA 4A4B4C4D4A3A00000105002420113
020D01000201030CF3000000000001010100
FFFFF0000000000000000000,460
1390 DATA 01FF000001FF000001FF0000A1028
18100C0A09080A0F161040ACADAEAFADAA6A2
A00A0B0A090B0A0807090C0D,135
1400 DATA 0A0605080A0F100FA006070A0A00
51607960797900408810400810006C6C514840
5155603C3C3C3C3C35515151,366
1410 DATA 5551486C6C5148405155603C3C3C
3C3C40485155514851353C4048404851515151
5551486C6C5148405155603C,837
1420 DATA 3C3C3C3C3C40485155514851001010
10102008081808102008081808101010104010
101010200808180810200808,189
1430 DATA 1808101808104030180810301018
08101010104010101010200808180810200808
180810101010800000000000,101
1440 DATA 2030400050607000809000703010
880041CF7FF0F8E000181B1DBDFD8F8180000
307C72FEFF1F000000FF00FF,572
1450 DATA 0000008080FF80FF800000A00FF
A0FFA00000A8A8FFA8FFA80000AAFFAAFFAA
0000183C18183C7E7E00287C,724
1460 DATA 547C387CBABAB792828680C0000
143E2A3E1C3E5D5D9E141416300004147C68
743878BCB8B9782828282C60,293
1470 DATA 04147C67963C788B8B8878282828
2C6004147C6874387FB8B8B87828282C6020
283E162E1C1E3D5D9D1E1414,900
1480 DATA 14340620283E966E3C1E1D1D1D1E
141414340620283E162E1CFE1D1D1E141414
340604147C6874387EBABABA,524
1490 DATA 7A2828282C6020287E566E5C7E1D
1D1D1E141414340600000000000000000000
3BBBFF000000143E2A3E1C3E,546

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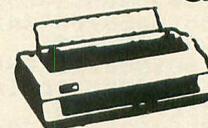
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1500 DATA 5D5D5D5D14141436007070704700
 38070707070707070707070741D32800000000
 000000000000000000000000,888

CHECKSUM DATA.

(see page 24)

10 DATA 698,351,496,811,423,729,200,60
 3,555,573,694,613,29,205,214,7194
 160 DATA 769,198,962,620,491,30,155,11
 5,169,894,100,27,33,792,849,6204
 1060 DATA 818,980,986,35,910,822,843,8
 94,846,94,72,87,840,879,855,9961
 1210 DATA 137,824,974,0,187,37,140,980
 ,21,733,937,979,842,125,859,7775
 1360 DATA 928,774,82,781,351,297,907,6
 78,541,6,841,715,741,425,909,8976

Assembly listing.

```

TITLE 'TWOGUN - A Shootout'
SUBTTL 'By Conrad Tatge 84'

CONSOL EQU %D01F ;Console switch
RANDDM EQU %D20A ;random byte
HPOSPO EQU %D000 ;horizontal
MOPF EQU %D000 ;collisions
MOPFL EQU %D008
POPF EQU %D004

ORG %00 ;Page zero

VBIDD DS 1 ;vertical blank shake
WINNER DS 1 ;starts glow
LOOT DS 1 ;where loot is
ENABLE DS 1 ;VBI allowance
DOCPU DS 1 ;game over flag
TIMER DS 1 ;inc'ed every VBI
SND1 DS 1 ;firing sound
SND2 DS 1 ;ricochet
SND3 DS 1 ;wooop
DOHOME DS 1 ;flag for little music
VOLUME DS 1 ;taps note volume
VOL2 DS 1 ;footstep volume
SUSTA1 DS 1 ;tune volume
TEMP DS 1 ;work
NOLOOT DS 1 ;countdown
COUNT DS 1 ;counter
ONOFF DS 1 ;foot switch
STEPTH DS 1 ;time for next step
STEP DS 1 ;step pointer
PICTUR DS 1 ;frame
PIC DS 2 ;Page zero PM point
CHANGE DS 2 ;where to change color
NEWCOL DS 2 ;what color to change
DEAD DS 2 ;dead flag
AMMO8 DS 2 ;bullets
AMMO82 DS 2 ;for displaying
PLPF2 DS 2
NOCOL DS 2 ;after a collision
NOMOVE DS 2 ;after a shot
MISSLF DS 2 ;1 = shooting
PRESSF DS 1 ;aiming
HORIZ DS 2 ;cowboy position
VERT DS 2
HORIZ2 DS 2 ;previously
VERT2 DS 2
DIRX DS 2 ;aim direction
DIRY DS 2
SHORIZ DS 2 ;shot position
SHVERT DS 2
SHDIRX DS 2 ;shot direction
SHDIRY DS 2
SCORE DS 2 ;BCD player score

ASSERT * < %100 ;page zero!

PMHORZ = %30 ;For screen
PMVERT = %28 ;offsets
PMTITL = PMVERT+%30 ;for title page
AMMO = 1 ;character codes
CACTUS = 2
ROCK = 3
CHAMMO = 4 ;bullets character
GRAVE = 9 ;gravestone
HONES = 74 ;length of song
CHRSET EQU %3000 ;memory space
PMAREA EQU %3800
DISP EQU PMAREA+180
MIS EQU PMAREA+200
PL0 EQU PMAREA+220
PL1 EQU PMAREA+280
PL2 EQU PMAREA+300
PL3 EQU PMAREA+380
PLAREA EQU DISP+20 ;play area

ORG %2000

INIT JSR %E465 ;init sound
JSR PMCLR ;clear buffer
JSR CLDISP ;clear screen
LDA #LOW DLIST
STA %230
LDA #HIGH DLIST
STA %231
LDA #%2E
STA %22F ;P/M
LDA #HIGH PMAREA
STA %D407
LDA #3
STA %D01D ;BRACTL
LDA #0
    
```

```

STA %D00C ;BIZEM
LDA #%1B
STA %25F ;PRIOR
LDA #0
STA %D208 ;init
LDA #006 ;light grey
STA %2C6 ;rocks
LDA #%AA
STA %2C7 ;bullets

MOVEIT LDX #0
LDA %E000,X ;move ROM set
STA CHRSET,X
LDA %E100,X
STA CHRSET+%100,X
INX
BNE MOVEIT
LDA #HIGH CHRSET
STA %736 ;point to new one
LDX #%4B ;move 9 characters
LDA NEWSET,X ;and copy new
STA CHRSET+%8,X
DEX
BPL MOVECHR
LDA #0
LDX #%7F
CLPZER DEX
DEX #80,X ;zero variables
BPL CLPZER
LDX #7
ZHORIZ STA HPOSPO,X ;horizontals
DEX
BPL ZHORIZ

LDA #0
STA ENABLE ;Not yet
LDX #HIGH VBLANK ;Set up
LDY #LOW VBLANK ;NMI
LDA #6
JSR %E45C

PRINT LDX #18 ;19 characters
LDA CHR8,X
LDY CHRPOS,X
STA DISP,Y ;put to screen
DEX
BPL PRINT

LDX #%F
LDY #PMTITL
LDA THEMAN,X
DOMAN STA PL0,Y
DEY
STA PL0,Y
DEY
DEX
BPL DOMAN
LDX #%7
LDY #PMTITL
DOCAC LDA NEWSET+%8,X ;display dudes
STA PL1,Y
STA PL1+1,Y
STA PL1+2,Y
STA PL1+3,Y
LDA NEWSET+%10,X
STA PL2,Y
STA PL2+1,Y
STA PL2+2,Y
STA PL2+3,Y
DEY
DEY
DEY
DEX
BPL DOCAC

LDA #3
STA %D008 ;x4 width
STA %D009
STA %D00A
LDA #%36 ;red cowboy
STA %2C0
LDA #%C2 ;green cactus
STA %2C1
LDA #%06 ;grey rocks
STA %2C2
LDA #%78 ;horizontals
STA %D000
LDA #%A8
STA %D001
LDA #%48
STA %D002
LDA #HONES ;set it up...
STA HOMEON
LDA #1 ;and
STA DURAT2
LDA #1 ;start the tune...
STA DOHOME

ABAIN LDX #32
LDA %2C4 ;switch %2C4 & %2C5
PHA
LDA %2C5
STA %2C4
PLA
STA %2C5
LDA #16 ;quarter of a second
STA TIMER
TWAITA LDA TIMER
BNE TWAITA
DEX
BNE ABAIN
JSR PMCLR ;clear PM title
LDA #7 ;low title
STA WINNER
START LDA #0
STA ENABLE
LDX #7
NOSNDS STA %D200,X
DEX
BPL NOSNDS
LDA RANDOM
ORA #1 ;at least one
STA NOLOOT ;set up timer
LDA #0
STA %D008
STA %D009
sta ONOFF
STA PIC
STA TAP8
STA VOL2
STA VOLUME
STA STEPTH
STA STEP
LDA #2 ;Sound freq'
STA %D200 ;AUDF1
LDA #%AA
STA %D203 ;sound ctrl 2
LDA #%FF
    
```

```

STA SND1
STA SND2
STA SND3

LDX #19
LDA PRESSM,X ;write message
STA DISP+220,X
DEX
BPL PRESS

LDX WINNER
LDA #14 ;blow
ORA #7
STA %2C0,X
CPX #2
BCS DOGAME
AND #F0
ORA #FA
STA %2C4,X
LDA CONSOL
AND #1 ;START?
BNE DOWN
JSR PMCLR
JSR CLDISP

LDA CONSOL
AND #1 ;Let go yet?
BEQ UP

LDA #F2 ;brown
STA %2C8
LDA #BA ;color of loot
STA %2C7
LDX #1 ;Set up game
LDA #1A ;flash
STA %2C0,X ;COLPM0
LDA TCOL0R,X
ORA #4
STA %2C4,X ;COLPF0
LDA THORIZ,X
STA HORIZ,X
STA HORIZ2,X ;old
LDA #30
STA VERT,X
STA VERT2,X ;old
LDA #0
STA NOMOVE,X
STA DEAD,X
STA NOCOL,X
STA SCORE,X
STA MISSLF,X
STA PRESSF,X ;etc...
LDA #3 ;give him some!
STA AMM08,X
DEX
BPL SETUP
STA #D01E ;HITCLR
LDA #1 ;Now it can
STA ENABLE
LDA #0
STA DDCPU
STA VOLUME ;quiet!

* CPU moves the random gun, checks
* for it's collision, and does color
CPU PROC
LDA VBID0 ;wait for VBI
BEQ CPU
LDA DDCPU ;end game?
BEQ :CPU.2
JMP START ;do it again!
:CPU.2 LDA #0
STA VBID0
setvp LDX #1
LDX VERT,X
CLC
ADC #30 ;where to change
STA CHANGE,X
LDA TCOL0R,X
ORA #6
STA NEWCOL,X
LDA ONOFF ;alternate
BEQ SETVP3 ;natural color
LDA NOMOVE,X
BEQ SETVP2
LDA #4
STA NEWCOL,X ;darken him!
SETVP2 LDA AMM08,X
CMP #2
BCS SETVP3
LDA #CA ;embarrassment
STA NEWCOL,X
DEX
BPL SETVP
KERNEL LDX #1
LDA #D40B
STA #D40A ;WSYNC
CKVP CMP CHANGE,X ;time to change?
BNE nochan
PHA
LDA NEWCOL,X ;get new color
STA #D012,X
nochan PLA
DEX
BPL CKVP
CMP #070
BCC KERNEL

:CPU1 LDX #1
LDA P0PF,X ;have we run into
AND MISHIT,X ;a cactus?
PHA ;hold on to
CMP PLPF2,X
BEQ :CPU1.2
BCC :CPU1.2
LDA DEAD,X ;O.K. if dead...
BNE :CPU1.2
LDA NOCOL,X ;or already hit
BNE :CPU1.2
LDA #45 ;.75 seconds
STA NOMOVE,X ;stop there
LDA #10 ;start boing
STA SND3
:CPU1.2 PLA
STA PLPF2,X ;remember it
LDA P0PF,X
AND #0 ;got the loot?
BEQ :CPU3
LDA #10
STA SND3 ;boing
LDY LOOT
LDA BOTIT,X ;make a cactus
STA PLAREA,Y
STA #D01E ;HITCLR
LDA RANDOM
AND #3
ORA #1
CLC
ADC AMM08,X
STA AMM08,X
LDA RANDOM ;wait a little
ORA #40 ;not zero
NEWAMO BPL DOSNDS
STA NOLOOT
LDA NOLOOT ;waiting?
:CPU3 BNE lootdn
LDA RANDOM ;chance it
BNE :CPU3.1
LDY LOOT ;erase old one
LDA #0
STA DISP+20,Y
BEQ LOOTDN
DEC NOLOOT
:CPU2 JSR RANDY ;hide loot
BEQ DOLOOT
AND #3F ;remove color
CMP #CACTUS
BEQ DOLOOT
BEQ #LOOT ;the loot?
BEQ :CPU2
LDA #0 ;erase it
STA PLAREA,Y
BEQ :CPU2 ;now try again
STY LOOT ;use this value
LDA #AMM0 OR #C0 ;PF3
STA PLAREA,Y
LDA #10
STA SND3 ;boing
:CPU3.1 DEX
BHI RECPU
JMP :CPU1
RECPU JMP CPU
SUBTTL "Subroutines"
RANDY LDA RANDOM ;find a random
CMP #200 ;byte on screen
BCS RANDY
TAY ;and get its contents
LDA PLAREA,Y
RTS

* Multiply by 20 for screen plotting
MULT20 ASL A ;*2
ASL A ;*4
STA TEMP
ASL A ;*8
ASL A ;*16
CLC
ADC TEMP ;*20
RTS

* Finds screen location from a missile
PMDISP CLC ;offset is on A
ADC SHVERT,X ;get horizontal
LSR A
LSR A
LSR A ;1/8
JSR MULT20 ;times 20
STA TEMP ;hold
LDA SHORIZ,X
CLC
ADC #1
LSR A
LSR A
LSR A ;1/8
CLC
ADC TEMP ;add on to
TAY ;and put in Y
RTS

CLDISP LDX #240 ;Clear screen
LDA #0
CLEAR STA DISP-1,X
DEX
BNE CLEAR
RTS

PMCLR LDX #07F ;clear out P/M
LDA #0
ZPLYR STA MIS,X
STA PL0,X
STA PL1,X
STA PL2,X
STA PL3,X
DEX
BPL ZPLYR
RTS

SUBTTL "The Vertical Blank"
* Vertical BLANK does everything else
VBLANK PROC
LDA #1 ;VBI call flag
STA VBID0
DEC TIMER
LDA DDOHME ;Home on the range
BEQ CKENAB
DEC DURAT2 ;count it down
LDA DURAT2
BNE DONOTE
INC HOMEON ;next note
LDA HOMEON
CMP #HOMES ;done yet?
BCC NEWDUR
LDA #1 ;yes, start again
STA HOMEON
NEWDUR TAY ;note getter
LDA DURAT2,X
STA DURAT2,X
LDA #A ;start volume
STA SUSTAI
DONOTE LDX HOMEON
LDA HOMEON,X ;play the note
STA #D206
LDA TIMER ;decrease volume?
AND #1
BNE CKENAB
DEC SUSTAI ;a little softer
LDA SUSTAI
BHI CKENAB ;not too much!
ORA #A0 ;adjust sound
STA #D207
CKENAB LDA ENABLE ;should we?
BNE :L1
JMP LOOP6
DEC STEPTM
BPL DOSNDS
LDA #01F ;wait for next
STA STEPTM
LDA STEP ;take a step!
EOR #010
STA STEP
LDA ONOFF
EOR #1
STA ONOFF
LDA RANDOM
ORA #6
CMP #2C7
BEQ NEWAMO
STA %2C7 ;new ammo color
LDA SND1 ;not during a shot!
BPL DOSNDS
LDA NOMOVE ;if not moving...
AND NOMOVE+1
BNE DOSNDS
LDX ONOFF
LDA FEET,X ;make footsteps
STA #D200
LDA #8
STA VOL2
LDA VOL2
DOSNDS BEQ DOSND1
DEC VOL2
LDA SND1
BPL DOSNDS
LDA VOL2
ORA #00 ;decrease volume
STA #D201
BHI CKSND2
LDA SND1 ;gunshot
DOSND1 BHI CKSND2
DEC SND1
AND #F
STA #D201
LDA SND2
BHI CKSND3
DEC SND2
LDX SND2
LDA CONT2,X
STA #D203
LDA FREQ2,X
STA #D202
CKSND3 LDA SND3 ;boing
BHI CKTAPS
DEC SND3
LDX SND3
TXA ;use pointer as volume
ORA #A0
STA #D205 ;AUDC3
LDA FREQ3,X
STA #D204 ;AUDF3
LDY TAPS
CKTAPS BNE DOTAPS
LDA VOLUME ;of last note?
BPL TAPS2
LDA #1 ;we're done!
STA DDOHME
BNE LOOP
DOTAPS LDA #0 ;reset flag
STA DDOHME
DEC DURAT ;note length
BPL TAPS2
LDA DURAT,Y
STA DURAT
LDA TAPS,Y ;new note
STA #D206 ;AUDF4
LDA #10 ;new volume
STA VOLUME
DEC TAPS ;next note
TAPS2 LDA TIMER
AND #1
BNE LOOP
DEC VOLUME
LDA VOLUME
ORA #A0
STA #D207
LOOP LDX #1
LOOP1 LDA DEAD,X ;6 feet under?
BEQ ALIVE1
LDA #1 ;elongate him
STA #D008,X
DEC DEAD,X ;and decrement
BNE ALIVE1
LDA #40
STA NOCOL,X
LDA #0 ;back to normal
STA #D008,X
ALIVE1 LDA NOCOL,X
BEQ DECHD0
DEC NOCOL,X
LDA NOMOVE,X ;movement?
DECMOV BEQ SHOAMM
DEC NOMOVE,X
BNE SHOAMM
LDA #20
STA NOCOL,X
SHOAMM LDA #WHERE2,X ;get posit'
LDA #5
STA COUNT
LDA AMM08,X ;replicate
LDA AMM082,X
STA AMM082,X ;ammo left
SHOAM1 CMP #4
BCS SHOAM2 ;full four?
CLC ;partial
ADC #CHAMMO OR #00
STA DISP,Y
LDA #0 ;no more
STA AMM082,X
BEQ SHOAM3
LDA #CHAMMO+4 OR #00
STA DISP,Y
LDA AMM082,X
SEC
SBC #4
STA AMM082,X
SHOAM3 INY ;go right one
DEC COUNT
BNE SHOAM1
LDA #00C,X
AND MISHIT,X ;other guy?
BEQ safety
LDA HORIZ2,X ;move back!
STA HORIZ,X
LDA VERT2,X
STA VERT,X
JMP GETSTK
safety LDA HORIZ,X ;safe place!
STA HORIZ2,X
LDA VERT,X
STA VERT2,X
LDY #278,X ;Y is STICK
LDA DIRX,X ;hold direction
CLC
ADC HORIZ,X ;new HORIZ
CMP #0B ;off of screen?
BCS CKVERT
STA TEMP ;no...could use
LDA PRESSF,X ;unless aiming
ORA NOMOVE,X

```

```

BNE CKVERT
LDA TEMP
STA HORIZ,X ;update it
: L2
CKVERT LDA DIRY,Y ;same for VERT
STA DIRY,X
CLC
ADC VERT,X
CMP #*40
BCS CKPRES
STA TEMP
LDA PRESSF,X
ORA NOMOVE,X
BNE CKPRES
LDA TEMP
STA VERT,X
* Joystick fire button code:
* test for ammos then
* if not strig then set PRESSF
* if strig and PRESSF then fire
CKPRES LDA PRESSF,X ;already?
BEQ CKBUTT
LDA #284,X ;letting go?
BEQ CKBUTT
LDA DIRX,X
ORA DIRY,X
BNE FIRE ;any direction?
NOFLIP STA 77 ;stop attract
STA PRESSF,X ;not pressing
BEQ CKBUTT
FIRE LDA AMMOS,X ;any bullets?
BEQ NOFLIP
LDA DEAD,X ;if dead
ORA NOMOVE,X ;for immobile...
BNE CKBUTT ;don't shoot!
DEC AMMOS,X ;use a bullet
LDA #1 ;he's shooting
STA MISSLF,X
LDA #0
STA PRESSF,X
LDA #18 ;fire sound
STA SND1
LDA HORIZ,X ;make a bullet
CLC
ADC #3 ;center it
STA SHORIZ,X
LDA VERT,X
STA SHVERT,X
LDA DIRX,X
ASL A ;4 times as fast
ASL A
STA SHDIRX,X
LDA DIRY,X
ASL A ;twice as fast
STA SHDIRY,X
JMP LOOP2
CKBUTT LDA #284,X ;now button?
BNE LOOP2
LDA MISSLF,X ;or shoot?
BNE LOOP2
LDA #1
STA PRESSF,X ;pressed...
LOOP2 LDA #0FL,X
AND MISHIT,X ;player hit?
BEQ MOVEM
LDA #0 ;stop shooting
STA MISSLF,X
LDA #*F ;offset
JSR PHDISP ;find where
LDA #GRAVE OR #00
STA DISP,Y ;put on screen
LDY DPPDN,X
LDA DEAD,Y ;already dead?
BEQ KILLEM
LDA #*A0 ;slow shooter
STA NOMOVE,X
BNE MOVEM ;JMP
killem LDA #0 ;play taps
STA DURAT
LDA #6
STA TAPS
LDA #*B0 ;kill him
STA DEAD,Y
LDA #*A8
STA NOMOVE,Y
SED
LDA SCORE,X
CLC
ADC #1 ;give him 1 point
CLD
STA SCORE,X
PHA ;And display his score
LDY WHERE,X
AND #*F
ORA COLSCO,X
STA DISP,Y
PLA
LSR A
LSR A
LSR A
LSR A
ORA COLSCO,X
STA DISP-1,Y
AND #*F
CMP #1 ;20 points wins
MOVEM MOVEM
STX WINNER
LDY DPPDN,X
LDA #0 ;darken loser
STA #2C0,Y
LDA #0
STA ENABLE
LDA #1
STA DDCPU
JMP LOOP4 ;Remember who
MOVEM LDA HORIZ,X
CLC
ADC #PMHORZ ;small adjust
STA HPOS#0,X ;horizontal
TXA
PHA
LDA PLOFF1,X ;set up PM
STA PIC+1 ;pointers for
LDA PLOFF2,X ;players
STA PIC
LDA #*B0 ;hold him still
STA PICTUR
LDA NOMOVE,X
BNE :L2
LDA STEP ;now animate
STA PICTUR
LDA PRESSF,X ;aiming?
BEQ :L2
LDA #278,X
CMP #15 ;stick centered?
BEQ :L2
LDA AMMOS,X ;or out?
BEQ :L2
LDY #278,X
LDA PICOFF,Y ;According
STA PICTUR ;to BTICK#0
CLC
ADC #PMVERT
TAY ;No more Y!
LDA DEAD,X
BEQ ALIVE
LDA #*A0 ;draw dead guy
STA PICTUR
ALIVE LDA PICTUR
CLC
ADC #*F ;16 bytes
TAX ;X is saved on stack
LDA SHAPE,X ;draw him!
STA (PIC),Y
DEY
DEX
CPX PICTUR ;done yet?
BPL DRAW
PLA
TAX ;restore player X
LDA MISSLF,X ;I should we
BNE MVHORZ ;kill missile?
LDA SHVERT,X ;IY not stick
CLC
ADC #PMVERT-9
TAY
LDA MIS,Y
AND BITSO#F,X ;Out bits
STA MIS,Y
LDA #0
STA #D0#4,X ;Zero HPOS#0
JMP LOOP3
MVHORZ LDA #0#F,X ;have we hit
AND MISHIT,X ;a cactus?
BEQ HORZ1 ;no collision
LDA #7 ;offset
JSR PHDISP ;figure out where
LDA #ROCK OR #00
STA DISP+20,Y ;make rock
LDA #*10 ;make boing
STA SND3
JMP KILMSL ;kill missile
HORZ1: LDA #0#F,X ;have we hit a
AND #1#F2 ;rock?
BEQ HORZ3
LDA #10 ;iricochet
STA SND2
HORZ2: LDA RANDOM ;new direc'
AND #*F
TAY
LDA DIRX,Y
ORA DIRY,Y
BEQ HORZ2 ;some delta
LDA DIRX,Y
ASL A ;a little slower
STA SHDIRX,X
LDA DIRY,Y
STA SHDIRY,X
HORZ3: LDA SHORIZ,X ;update
CLC
ADC SHDIRX,X
CMP #*9E ;off screen?
BCS KILMSL
STA SHORIZ,X
CLC
ADC #PMHORZ ;Compensate
#D0#4,X
LDA SHVERT,X ;Remove old
CLC
ADC #PMVERT-9
TAY
LDA MIS,Y
AND BITSO#F,X
STA MIS,Y
LDA SHVERT,X ;Now update
CLC
ADC SHDIRY,X
CMP #*50 ;off screen?
BCS KILMSL
STA SHVERT,X
CLC
ADC #PMVERT-9 ;Compensate
TAY
LDA MIS,Y
ORA BITSON,X ;Turn on bit
STA MIS,Y
JMP LOOP3
KILMSL LDA #0 ;kill this missile
STA MISSLF,X
STA PRESSF,X
LOOP3 DEX ;Next player
BNI LOOP4 ;end part of VBI
JMP LOOP1
LOOP4 STA #D01E
LDA CONSOL
AND #1
BNE LOOP6
LDA #1
STA DDCPU
LOOP6 JMP #E7D1 ;Exit VBI
SUBTTL 'Data Tables'
* Various tables
PRESSM DB #B0,#B2,#A5,#B3,#B3,0
DB #F3,#F4,#E1,#F2,#F4,0
DB #B4,#F4,0,#A2,#A5,#A7
DB #A9,#A8,#A5 ;press start...
DB #34,#77,#2F,#67,#33,#6E
DB 'byconradtq'
CHRPOS DB 41,41,81,101,121,141
DB 63,44,46,67,18,69,70,71
DB 73,74,75,76,77 ;position
PLOFF1 DB HIGH PL0 ;PM pointers
DB HIGH PL1
PLOFF2 DB LOW PL0
DB LOW PL1
COLSCO DB #10,#50 ;masks
GOTIT DB CACTUS OR #00 ;PF0
DB CACTUS OR #40 ;PF1
WHERE DB 1,19 ;score posit'
WHERE2 DB 1,0 ;ammo position
OPPON DB 2,1 ;opponent
MISHIT DB 2,1 ;collision checks
BITSON DB 3,0 ;ORA turn ons
BITSO#F DB #FC,#F3 ;AND turn offs
DIRX DB 0,0,0,0,1,1,1 ;stick
DB 0,0,#*F,#*F,#*F,0 ;deltas
DB 0,0
TDIRY DB 0,0,0,0,1,1,1 ;FF
DB 0,0,1,1,1,1,1 ;FF
DB 1,1,1,1,1,1,1 ;FF
FEET DB 10,16 ;footsteps
FREQ2 DB 40,24,10,12,10,9,8,10
CONT2 DB 13,22,16,64 ;iricochet
DB #AC,#AD,#AE,#AF,#AD,#AA
DB #A6,#A2,#A0
FREQ3 DB 10,11,10,9,11,10,8 ;boing
DB 7,5,12,13,0,0,3,0,10
DB 15,16,15,10,1,7,10,10
TAPS DB 0
DB #51,#60,#79 ;notes
DURAT DB #60,#79,#79
DB 0
HOMEON DB 64,8,16,64,8,16 ;durations
DB 0 ;Home, home on the...
DB 100,100,81,72,64 ;Oh give
DB 81,85,76,60,60,60
DB 60,60,53,81,81,85,81,72
DB 100,100,81,72,64 ;where
DB 81,85,76,60,60,60
DB 60,60,64,72,81,85,81,72,81
DB 53,60,64,72,64 ;Home, home
DB 72,81,81,81,81,85,81,72
DB 100,100,81,72,64 ;where
DB 81,85,76,60,60,60
DURAT2 DB 60,60,64,72,81,85,81,72,81
DB 0
DB 16,16,16,16,32
DB 8,8,24,8,16,32
DB 8,8,24,8,16,16,16,64
DB 16,16,16,16,32
DB 8,8,24,8,16,32
DB 8,8,24,8,16,24,8,16,64
DB 48,24,8,16,48
DB 16,24,8,16,16,16,64
DB 16,16,16,16,32
DB 8,8,24,8,16,16,16,120
PICOFF DB 0,0,0,0,0,0,0,0,0,0,0,0
DB 0,0,0,0,0,0,0,0,0,0,0,0
TCOLOR DB #70,#30 ;player colors
THORIZ DB #10,#80 ;and positions
* Alternate character set
NEWSET DB #*41,#*CF,#*7F ;ammo dump
DB #*F0,#*FB,#*E0,0
DB #18,#1B,#1B ;cactus
DB #DB,#DF,#DB,#FB,#1B
DB 0,0,#30,#7C,#72
DB #*FE,#*FF,#1F ;rock
DB 0,0,0,0,0,0,0,0,0,0,0,0
DB 0,0,0,0,0,0,0,0,0,0,0,0
DB 0,0,0,0,0,0,0,0,0,0,0,0
DB #*A0,#*A0,#*FF ;12
DB #*A0,#*FF,#*A0,0 ;3
DB #*AB,#*AB,#*FF ;13
DB #*AB,#*FF,#*AB,0 ;3
DB #*AA,#*AA,#*FF ;14
DB #*AA,#*FF,#*AA,0
DB 0,0,0,0,0,0,0,0,0,0,0,0
DB #18,#3C,#18 ;a grave
DB #18,#3C,#7E,#7E
* Cowboy shape table
SHAPE DB #00,#28,#7C,#34 ;1+1
DB #7C,#38,#7C,#BA
DB #BA,#38,#7C,#28
DB #28,#68,#0C,#00
DB #00,#14,#3E,#2A ;1+2
DB #3E,#1C,#3E,#5D
DB #5D,#3D,#7E,#14
DB #14,#16,#30,#00
DB #04,#14,#7C,#68 ;
DB #74,#38,#78,#8C
DB #BA,#B9,#78,#28
DB #28,#28,#2C,#60
DB #04,#14,#7C,#68 ;
DB #74,#38,#78,#88
DB #BB,#BB,#78,#28
DB #28,#28,#2C,#60
DB #04,#14,#7C,#68 ;
DB #74,#38,#7F,#88
DB #BB,#BB,#78,#28
DB #28,#28,#2C,#60
THEMAN DB #20,#28,#3E,#16 ;
DB #2E,#1C,#FE,#1D
DB #1D,#1D,#1E,#14
DB #14,#14,#34,#06
DB #04,#14,#7C,#68 ;
DB #74,#38,#7E,#BA
DB #BA,#BA,#7A,#28
DB #28,#28,#2C,#60
DB #20,#28,#7E,#56 ;
DB #6E,#5C,#7E,#1D
DB #1D,#1D,#1E,#14
DB #14,#14,#34,#06
DB 0,0,0,0,0,0,0,0,0,0,0,0 ;DEAD
DB #10,#3B,#BB,#FF,0,0,0,0
DB #00,#14,#3E,#2A ;NOMOVE
DB #7E,#1C,#7E,#1D
DB #3D,#5D,#3D,0,0,0,0
DB #14,#14,#34,#00
* The display list is 12 graphic 2's
DLIST DB #70,#70,#70
DB #47
DW DISP
DB 7,7,7,7,7,7,7,7,7,7,7,7
DB #41
DW DLIST
;and that's all she wrote!
END INIT

```



CASCADE

16K Cassette or 24K Disk

by F. Neil Simms

Cascade is a two-person game of strategy and quick reflexes, where the object is to whisk away twenty spheres before your opponent does.

Getting started.

Plug one pair of paddles into joystick port 1. Then RUN the program. Press one of the fire buttons to begin, after the title screen is displayed.

Your screen will be filled with angles, angles within squares, and squares within square characters. A clock will start to count down, and player 1 will be able to use the paddle to move a cursor and sphere back and forth across the top of the screen. When player 1 presses the fire button, or if time runs out, the sphere will drop, and that player's score will decrease by one.

If a sphere strikes an angle character, it will bounce to the left or right, then keep on dropping. If it encounters a square within a square (a "black hole"), the sphere will be swallowed up. If it lands on an angle within a square, the descent is stopped, and the sphere will change from red to blue.

Thus, the object is to decrease your score by either dropping the sphere into an angle within a square, or into a black hole. If a sphere makes it all the way

to the other end of the screen, then the opposing player must "catch" it with their cursor. If they do, a point is added back onto the "dropping" player's score. But, if the opponent misses, a point is added to their score.

Play then switches to this player (player 2), whose sphere drops up from the bottom of the screen in a similar manner, and so on...back and forth until someone's score reaches zero, and a winner (or a deadlock) is declared. Press one of the fire buttons at this point to play another game.

Caution.

One further complication can occur. When a descending sphere moves onto a square occupied by a stationary blue one, the computer records this coordinate. When the original sphere has reached its destination, any such accumulated spheres will drop, the latest struck being the first to fall.

The opponent must also catch any of these cascading spheres which make it through, or their score will increase, as mentioned before. Note that, if any one of these spheres falls into a black hole, the **Cascade** will stop, and the turn will end. □

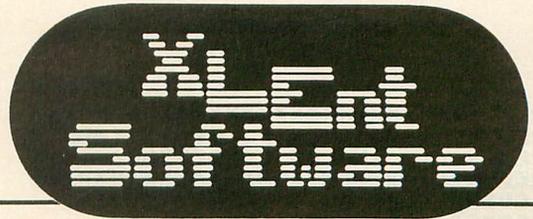
Table 1.

Line(s)	Function
100	Go initialize, then to main loop.
150	Determine which "squashed" character to print.
200-210	Busy wait using system timer.
250	Update plot of previous character.
260	Plot current character and reset previous X and Y.
300	Print score.
400-440	Push coordinates of "hit" sphere onto stack (if not already there).
500-510	Plot reverse angle "square" character.
1000-1050	Beginning of main loop—reserve variables.
1060-1120	Move sphere back and forth with paddle until fire pressed or time up.
1200	Prepare to drop sphere.
1230-1245	Get coordinate of character below sphere.
1250	Check for end of drop.
1260-1320	Drop sphere one row—deflecting, halting or swallowing sphere as appropriate.
1330-1380	Collision with another sphere—process according to character below sphere, after placing coordinates on stack.
1500	If stack not empty, go drop more hit spheres.
1520	Ensure player 2 gets last drop.
1525-1535	Check for game over—determine winner if so.
1540	End of main loop.
1600-1650	Pop coordinates of hit sphere off stack and go perform from this point.
2000-2140	Did opponent catch sphere?
2500-2550	End of game.
3000-3020	Black hole animation.
4000-4160	Draw playfield.
5000-5500	Initialize—player/missile graphics, VBI routine, custom characters.
6000-6050	Print title screen.

Table 2.

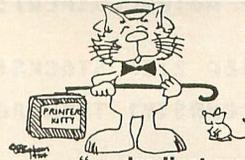
Program Variables	
A	Temp for READS.
BALLS()	Score for each player.
CHAR	ATASCII value of character at X,Y.
CHBASE	New character set page number.
CLEAR	Flag—blank out previous square if set.
COPY\$	Machine language routine to clear 256 bytes.
DIR	Direction of drop (-1/1).
HIT	Flag—set if sphere caught.
I	General purpose counter.
LIMIT	Row number where catch is to be made.
MES\$	Game over message.
OBJ	Indicates left or right angle (0/1) character.
P	Paddle reading.
P2,P3	Player addresses for player/missile graphics.
PLR	Human player (0/1).
PMBASE	Player/missile base address.
PREV	Previous character COLOR value.
PX,PY	Coordinates of previous character.
RAMTOP	Page number of top of RAM.
SQ	Indicates which "squashed" character is to replace angle character during animation.
STACK\$	Stack of coordinates for hit spheres.
TIME	Time before drop.
TOP	Top of stack.
VBONOFF	POKE this address with 1 to turn on VBI routine.
VBSET	Machine language routine to initialize VBI routine.
WINNER	1 = PLYR-1, 2 = PLYR-2, 3 = deadlocked.
X,Y	Coordinates of current character.

(Listing starts on next page.)



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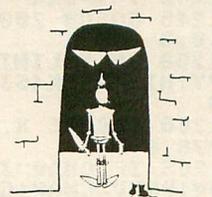
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CIRCLE #130 ON READER SERVICE CARD

BASIC listing.

```

10 REM *****
20 REM * CASCADE by F. Neil Simms *
30 REM * ANALOG COMPUTING *
40 REM *****
100 GOSUB 500:GOTO 1000
150 50=OBJ+2*(DIR=-1):RETURN
200 IF PEEK(540)<>0 THEN 200
210 RETURN
250 COLOR PREV:PLOT PX,PY:RETURN
260 PLOT X,Y:PX=X:PY=Y:RETURN
300 POSITION 2,PLR*23:? #6;BALLS(PLR);
" ";:RETURN
400 IF TOP=0 THEN 440
410 FOR I=1 TO TOP-1 STEP 2:IF STACK$(
I,I)<>CHR$(X) THEN 430
420 IF STACK$(I+1,I+1)=CHR$(Y) THEN PO
P:RETURN
430 NEXT I
440 TOP=TOP+1:STACK$(TOP,TOP)=CHR$(X):
TOP=TOP+1:STACK$(TOP,TOP)=CHR$(Y):RETU
RN
500 COLOR 3+(CHAR=3):PLOT X,Y
510 FOR I=10 TO 0 STEP -1:SOUND 0,180,
2,I:POKE 540,2:GOSUB 200:NEXT I:RETURN
1000 PLR= NOT PLR:TOP=0:TIME=10:X=9:PX
=X:Y=2+19*PLR:PY=Y:LIMIT=1+21*( NOT PL
R):DIR=1-2*PLR:PREV=32:CLEAR=0
1020 POSITION 16,PLR*23:? #6;TIME;
1050 POKE 540,10:GOSUB 200:POKE 542,60
:GOTO 1080
1060 IF NOT PTRIG(PLR) THEN POKE 77,0
:GOTO 1200
1070 IF PEEK(542)=0 THEN POKE 542,60:T
IME=TIME-1:POSITION 16,PLR*23:? #6;TIM
E;" ";:IF TIME=0 THEN 1200
1080 P=228-PADDLE(PLR):IF P<48 THEN P=
48
1090 IF P>191 THEN P=191
1100 X=INT(P/8)-5
1110 IF X=PX THEN 1060
1120 SOUND 0,30*X+X,10,8:COLOR 32:PLOT
PX,PY:PX=X:COLOR 134:PLOT X,Y:SOUND 0
,0,0:GOTO 1060
1200 BALLS(PLR)=BALLS(PLR)-1:GOSUB 300
:POSITION 16,PLR*23:? #6;" ";:POKE 53
278,0
1230 POKE 540,2:SOUND 0,100*X+X,10,8:5
OUND 1,150+Y+Y,10,8
1240 Y=Y+DIR
1245 GOSUB 200:SOUND 0,0,0,0:SOUND 1,0
,0,0
1250 IF Y=LIMIT THEN COLOR 32:PLOT PX,
PY:HIT=PEEK(53254+( NOT PLR)):GOTO 200
0
1260 LOCATE X,Y,CHAR:GOSUB 250:POKE 53
278,0
1265 IF CHAR=32 THEN COLOR 134:GOSUB 2
60:PREV=CHAR:GOTO 1230
1270 IF NOT (CHAR=161 OR CHAR=162) TH
EN 1280
1275 PREV=CHAR:LET OBJ=CHAR-161:GOSUB
150:COLOR 169+50:GOSUB 260
1277 LET X=X-DIR*(CHAR=161)+DIR*(CHAR=
162):GOTO 1260
1280 IF CHAR<=4 THEN COLOR 166:PLOT PX
,PY:GOSUB 500:GOTO 1500
1290 IF CHAR<>33 AND CHAR<>34 THEN 132
0
1295 SOUND 0,20,10,8
1300 PREV=33+(CHAR=33):OBJ=CHAR-33:GOS
UB 150:COLOR 41+50:GOSUB 260:X=X-DIR*(
CHAR=33)+DIR*(CHAR=34)
1310 SOUND 0,0,0,0:GOTO 1260
1320 IF CHAR=165 THEN GOSUB 3000:GOTO
1520
1330 GOSUB 400
1335 COLOR 134:PREV=166:GOSUB 260
1340 Y=Y+DIR:LOCATE X,Y,CHAR:IF CHAR=3
3 OR CHAR=34 OR CHAR=166 THEN 1260
1350 IF CHAR=32 THEN COLOR 134:PLOT PX
,PY:PREV=166-134*CLEAR:CLEAR=0:GOTO 12
60
1360 IF CHAR=165 THEN GOSUB 250:GOSUB
3000:GOTO 1520
1370 GOSUB 250:OBJ=CHAR-3:GOSUB 150:CO
LOR 137+50:PREV=3+(CHAR=3):GOSUB 260
1380 X=X-DIR*(CHAR=3)+DIR*(CHAR=4):GOT
0 1260
1500 IF TOP<>0 THEN 1600
1520 IF NOT PLR THEN 1000
1525 IF BALLS(0)=0 THEN WINNER=1
1530 IF BALLS(1)=0 THEN WINNER=WINNER+
2
1535 IF WINNER THEN 2500
1540 GOTO 1000
1600 Y=ASC(STACK$(TOP,TOP)):TOP=TOP-1:
X=ASC(STACK$(TOP,TOP)):TOP=TOP-1:PX=X:
PY=Y:COLOR 32:PLOT PX,PY
1650 HIT=0:CLEAR=1:GOTO 1340
2000 IF HIT<8 THEN 2100
2010 FOR I=0 TO 14:SOUND 0,I*10+40,2,I
:COLOR INT(I/5)+134:PLOT PX,PY:NEXT I:
SOUND 0,0,0,0:GOSUB 250
2020 BALLS(PLR)=BALLS(PLR)+1:GOSUB 300
2030 GOTO 1500
2100 COLOR 32:PLOT PX,PY
2110 FOR I=14 TO 0 STEP -1:SOUND 0,I*1
0+40,10,I:NEXT I:SOUND 0,0,0,0
2120 PLR= NOT PLR:BALLS(PLR)=BALLS(PLR
)+1:GOSUB 300:PLR= NOT PLR
2140 GOTO 1500
2500 IF WINNER<3 THEN ME5$(29,29)=CHR$(
48+WINNER):GOTO 2530
2520 ME5$(21,35)="&&Deal locked&& "
2530 FOR I=1 TO 61:POSITION 0,11:? #6;
ME5$(I,I+19);:POKE 540,2:SOUND 0,80,2,
4:GOSUB 200:SOUND 0,0,0,0:POKE 540,5
2540 GOSUB 200:IF PTRIG(0) AND PTRIG(1
) THEN NEXT I:GOTO 2530
2550 POP:GOSUB 5400:GOTO 1000
3000 TOP=0:GOSUB 250
3010 FOR I=134 TO 136:COLOR I:PLOT X,Y
:SOUND 0,(139-I)*40,2,10:POKE 540,5:GO
SUB 200:NEXT I:SOUND 0,0,0,0
3020 COLOR 165:PLOT X,Y:RETURN
4000 COLOR 161:PLOT 0,2:PLOT 19,21:COL
OR 162:PLOT 19,2:PLOT 0,21
4020 FOR Y=4 TO 19:X=-1
4040 X=X+INT(PEEK(RANDOM)*6/256)+2:IF
X>18 THEN 4090
4060 COLOR INT(PEEK(RANDOM)*2/256)+3+3
0*(PEEK(RANDOM)<190)
4080 PLOT X,Y:GOTO 4040
4090 NEXT Y:FOR I=3 TO 13 STEP 5
4100 X=I+INT(PEEK(RANDOM)*5/256):COLOR
165:PLOT X,11+INT(PEEK(RANDOM)*2/256)
:POSITION X-1,6:? #6;" ";CHR$(3):" "
4160 POSITION X-1,17:? #6;" ";CHR$(4);
" ";NEXT I:RETURN
5000 DIM STACK$(100),BALLS(1),COPY$(35
),CLEAR$(16),VBSET$(11),ME5$(81)
5001 RANTOP=PEEK(106):POKE 106,RANTOP-
8
5002 PMBASE=RANTOP-8:CHBASE=RANTOP-4:P
2=(PMBASE+6)*256:P3=P2+256
5003 GRAPHICS 1+16:GOSUB 6000
5005 FOR I=1 TO 16:READ A:CLEAR$(I)=CH
R$(A):NEXT I
5010 DATA 104,104,133,213,104,133,212,
169,0,168
5015 DATA 145,212,200,208,251,96
5050 FOR I=1 TO 35:READ A:COPY$(I)=CHR
$(A):NEXT I
5052 DATA 104,104,133,213,104,133,212,
133,214,169
5054 DATA 224,133,215,169,4,133,216,16
0,0,177
5056 DATA 214,145,212,200,208,249,230,
215,230,213
5058 DATA 198,216,208,241,96
5060 FOR I=1536 TO 1573:READ A:POKE I,
A:NEXT I
5065 DATA 0,216,173,0,6,240,28,162,1,1
69
5066 DATA 232,56,253,112,2,201,52,176,
4,169
5067 DATA 52,208,6,201,196,144,2,169,1
95,157
5068 DATA 2,208,202,16,230,76,98,228
5070 FOR I=1 TO 11:READ A:VBSET$(I)=CH
R$(A):NEXT I

```



```

NEWBAS  == **+2
OLDBAS  == **+2
;Zero page var's
;
PAGES   == **+1
;Equates
;
ROMSET  = 0E0      ;1st page of ROM set
;Start of routine
START
    PLA          ;ignore count
    PLA
    STA NEWBAS+1 ;hi byte of new base
    PLA
    STA NEWBAS   ;and lo byte
    STA OLDBAS  ;A must equal zero,
    LDA #7      ;use to clear OLDBAS (lo)
;
;
    LDA #ROMSET ;hi byte of ROM set addr.
    STA OLDBAS+1 ;put in vector
;
;
    LDA #4      ;copy 4 pages
    STA PAGES
;
    LDY #0
LOOP
    LDA (OLDBAS),Y ;Get ROM byte
    STA (NEWBAS),Y ;Store in RAM
    INY
    BNE LOOP     ;Page at a time
;
    INC OLDBAS+1 ;INC hi (next page)
    INC NEWBAS+1 ;New base vector too
    DEC PAGES    ;4 pages copied?
    BNE LOOP
;
    RTS          ;Else return to BASIC

;USR routine to steal VBI vector
; for setting up RICVB routine.
;
;Equates
;
SETVBI  = 043C
HYVBR   = 0601
;
;
; == 0800 ;relocatable
;
VBISET
    PLA
    LDY #HYVBR/256
    LDY #HYVBR&255
    LDA #7
    JSR SETVBI ;set the VBLANK!
    RTS
    
```

```

;Vertical Blank Routine
; to control Player/Missile
; horizontal positions by
; reading paddle ports.
;
;Initiate by first calling
; VBISET routine to steal vector.
;
; Turn off and on by paking location
; 1536 with 0 or 1 respectively.
;Equates
;
HPOSP2  = 0002
PADDL0  = 0270
XITVBL  = 0462
;
; == 0600
;
ONOFF   .BYTE 0
;
START
    CLD          ;ensure binary arith.
    LDA ONOFF   ;routine on?
    BEQ GOVBI   ;skip if not
;
;
    LDX #2-1    ;Read paddles 0 and 1
;
LOOP
    LDA #232    ;Subtract from 232
    SEC          ;so clockwise turn is
    SBC PADDL0,X ;a "right" turn
    CNP #32     ;left limit reached?
    BCS SKIP1   ;Branch if not
    LDA #32     ;Use left limit
    BNE SETHPOS
;
SKIP1
    CMP #196    ;Right limit reached?
    BCC SETHPOS ;Branch if not
    LDA #195    ;Use right limit
;
SETHPOS
    STA HPOSP2,X ;Set horiz. pos. of plyr.
    DEX
    BPL LOOP    ;Do for each player
;
GOVBI
    JMP XITVBL ;Let OS do its VBI chores
    
```

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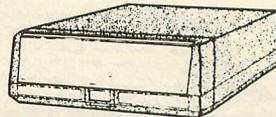
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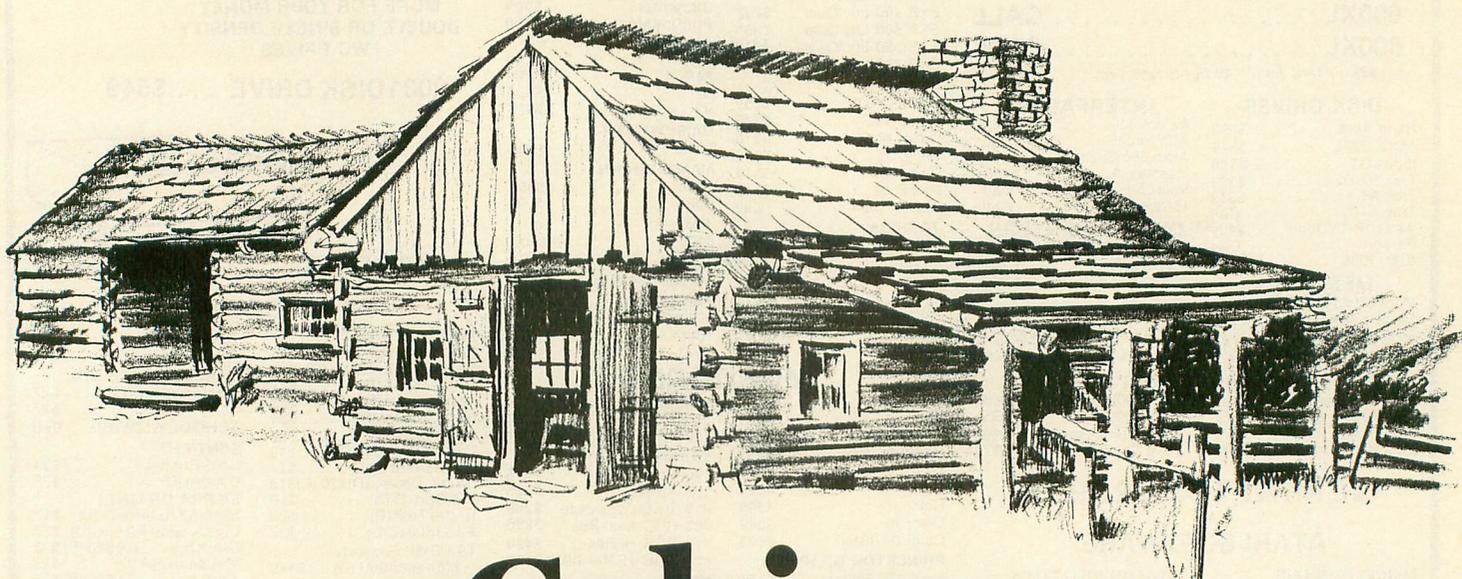
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Cabin Fever Fantasies

by Steve Panak

Here we are again, in the heart of winter. The rustic atmosphere of snow-covered houses, smoke curling from brick chimneys, and the prospects of a great new year fail to quench my desire for the warm sun. Westerners and Southerners don't know how nice they have it, but battling waist-high snow to get to school makes me appreciate warm weather. Still, as my living room windows go static white with snow, I think, "What better time to curl up with a good game in my Atari?"

SPELUNKER

by MicroGraphicImage and Tim Martin

BRODERBUND

17 Paul Drive

San Rafael, CA 94903

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I don't know if I'm normal (and the professionals are still out on that issue, as well), but I've always wanted to explore caves. Stories of Huck Finn, Tom and Becky lost in those country caverns lured me out in search of depths to claim as my own.

Alas, the closest I've yet come were the small caves in the nearby national forest and guided tours through some of Virginia's caverns. I could only pretend to

be the first one to see and explore these new worlds. Worn paths, graffiti and litter brought me back to reality—quickly. Another unfulfilled dream.

Spelunker, by Broderbund, comes a little too late for my first childhood, but that doesn't prevent it from rekindling those old dreams. **Spelunker** combines all of the arts of cave exploring with arcade-quality graphics and fast action—all from the safety of your favorite chair, *sans* the dangers of cave-ins, bottomless pits and vampire bats.

Spelunking, for the uninformed, is the technical term for cave exploring. As **Spelunker**, you are given an impressive network of caverns to explore and plunder. The object of the game is to move throughout the caves, gathering up treasures and other items necessary to survive.

At the start of play, you descend via elevator and must decide on which level to exit. This is of paramount importance, as only a portion of any level is visible at a time; the remainder scrolls into view only as you move along its paths.

This is an adequate simulation of a maze, and while it's unlikely that you will truly get lost, it is highly likely that it will take you a while to find the optimum route to the key or power module you need.

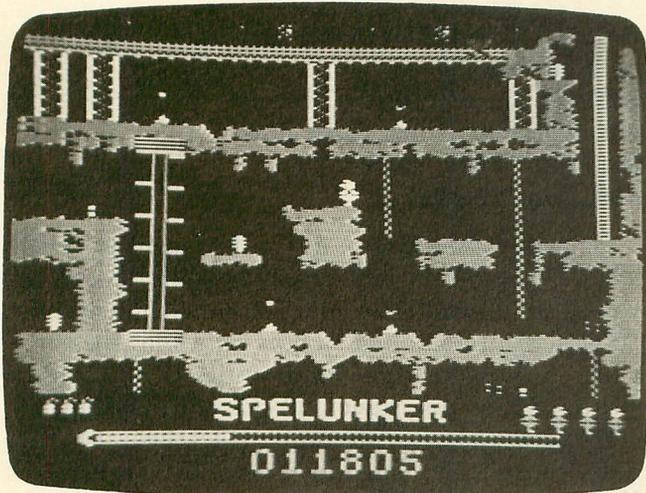
You see, you must have those keys to gain access

to locked portions of your new world. And power modules? Well, they only keep you alive. Throughout **Spelunker**, your power level is constantly decreasing and must be continually replenished to keep functioning.

Strategy is required here, as the power modules return you to full energy—but no more. It is, therefore, advantageous to wait as long as possible to pick up a module. More than a few times, I fizzled out with the module just at my fingertips. But loss of power isn't the only frustration.

Numerous **Spelunkers** of days gone by haunt the caves, hoping to sell you a one-way ticket to their realm. However, you do have a phantom blaster to bust these ghosts. Stand firm and fire to eradicate the spirit, but avoid overuse, as the weapon consumes your power rapidly.

Vampire bats also torment you by dropping something (I'm not quite sure what) on you from above. These bats prefer the dark and can be neutralized with a flare, if you happen to have one. Other dangers include dizzying heights, tight squeezes, volcano pits and deadly gases.



Spelunker.

If you find yourself against an immobile obstacle (like a solid rock wall), you'd better hope that you remembered to pick up some dynamite. Jab at the *D* key, then run—fast! If you place it properly, the explosive will blow anything off the screen. If you move too slowly, it will blow *you* off the screen.

The keyboard launches flares, ignites dynamite and blasts ghosts, while the joystick controls up, down, left and right movement, with the button jumping your character over obstacles and from place to place. If this sounds familiar to the **Donkey Kong** player, the similarity is unmistakable; this is definitely a **Donkey Kong** derivative. But that doesn't stop it from being a truly good game.

For, while **Spelunker** is a rehash of familiar game themes, it does add some twists and turns which definitely make it worth the money. Controls are very responsive, and they never feel sluggish. Graphics, as

well, are of the highest quality; quite colorful and detailed, these push your computer and monitor to their limits.

The variety of scenes is incredible. There are ladders, ropes, elevators, mine cars and more, each providing its own particular risk. The display also tallies your dynamite, flares and keys, so you always know exactly where you stand. **Spelunker's** difficulty level is high, and should be challenging for a while—but, more importantly, its variety provides incentive to continue.

Free lives are liberally provided, although you'll always need one more. And the manual, while not a Pulitzer Prize contender, tells most of what you need to know about **Spelunker**.

It may be nitpicking, but two things *did* really bother me. The game is reloaded after each play, a lengthy and wasteful procedure. While other levels are loaded from the disk as you need them, the post-game reloading takes place regardless of whether additional caverns have been added. Also, only one player may explore the underground world at a time.

Overall, though, **Spelunker** is an excellent game and cannot be too enthusiastically recommended.

CUTTHROATS

by Michael Berlyn and Jerry Wolper
INFOCOM

55 Wheeler Street
Cambridge, MA 02138
48K Disk \$34.95

Cutthroats follows **Infidel** as Infocom's second installment in **Tales of Adventure** series. True-to-life dangers and rewards are the cornerstones of this series. You'll find no magic—nor little elves—to aid you.

There's sunken treasure out there somewhere, and you must dive for it. . . not only because you want it, but also because you're forced to. It seems that you've fallen in with the wrong crowd. You have the money, maps and diving skills that they need to recover a treasure. But any of your "friends" (Johnny Red, the Weasel, or Pete the Rat) would just as soon kill you if you get in their way. The thought of double-crossing them shouldn't even enter your mind.

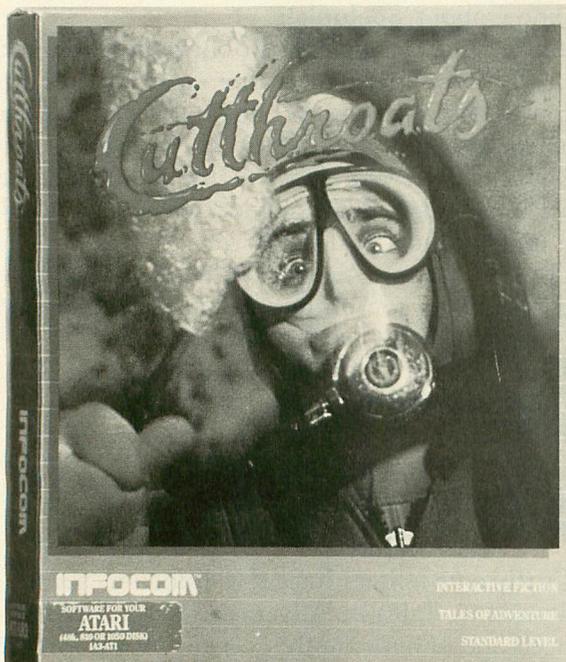
Interaction with the characters is necessary to succeed, and their unpredictability will keep you on your toes for hours. Even more than in most of Infocom's games, you must keep your eyes and ears peeled for any clues which may reveal the characters' true personalities and motives.

In **Cutthroats**, you wake up in your hotel room to find a note that has been slipped under the door. You begin to remember the events of the previous night, how your friend Hevlin gave you a map with sunken treasure pinpointed. Then Hevlin's luck took a downturn—and he turned up dead. Now Johnny Red, a particularly shady fellow, invites you to the Shanty, a particularly shady bar, for a little conversation.

He wants you to take him to the treasure Hevlin told him about. It seems that Hevlin had the loose lips sailors always worry about. You're also enlisted to pay the way and dive for the riches. All Johnny wants is the glory and the bucks.

What's more, lurking in the shadows are those who would like to see you lose the treasure—and those who would like to see you dead. McGinty, for example, is a nervous and uncooperative little fellow who will try to foil any attempts to form a diving party.

If you survive the journey, the shark attacks and the untold other plot complications, you'll end up bringing back the treasure (and yourself) intact.



Cutthroats.

There are two separate sunken ships with treasure, and in any given game, you're not sure which one you'll be diving for. Using an enclosed booklet, you must piece together clues supplied by Johnny Red, to determine which treasure you're after. And, if you're wrong. . .well, one doesn't think of such things on an empty stomach.

Infocom has introduced a new packaging design and has repackaged all of their games. The new carton is similar to a book in size, and the cover opens up to show the latest issues of *True Tales of Adventure*. This can be read both for clues and for fun, and it also provides the new adventurer with basic game information, rules and strategies. When the book is finished, pop open the back. Inside the carton is your disk, along with the other necessary game materials.

Infocom has started rating their games by level—Junior, Standard, Advanced or Expert. **Cutthroats** is Standard, on the same level as **Zork I**, the **Enchanter**, **Witness** and **Planetfall**. It was a bit too easy for me, as I'm somewhere between Advanced and Expert. Still, the challenge lasted a few hours, and the diffi-

culty (of lack thereof) rarely spoils an Infocom experience. I must admit that I used a printer this time, and being able to reread the text between sessions is a great help.

Infocom games must be reviewed more as books than as games. The descriptions are complete and vivid, just what you would expect from Infocom, but **Cutthroats** lacks the humor of some earlier offerings. I missed it. Nevertheless, the characters *are* brought to life, and this is one of the best compliments that could be paid such a game. Overall, **Cutthroats** is not one of Infocom's best games, but is still so far above the competition as to make them pale by comparison.

I just realized that, unlike the arcade games that litter the market, there are few copiers of Infocom's interactive fiction, few imitators. Can it be done? Probably. Can it be done as well as Infocom does it, or better? Unlikely. With each new game, Infocom is further entrenched in their position as manufacturer of the most unique, highest quality software available on the market today.

GALACTIC ADVENTURES

by Tom Reamy

STRATEGIC SIMULATIONS, INC.

465 Fairchild Drive, Suite 108

Mountain View, CA 94043

48K Disk \$59.95

Galactic Adventures is a very hard game to review. The main problem is the finite space I have to tell you about an infinitely complex game. You're right; I'd better stop rambling and get right into the game. I must warn you, though: an entire book could be written about this game and *still* not do it justice.

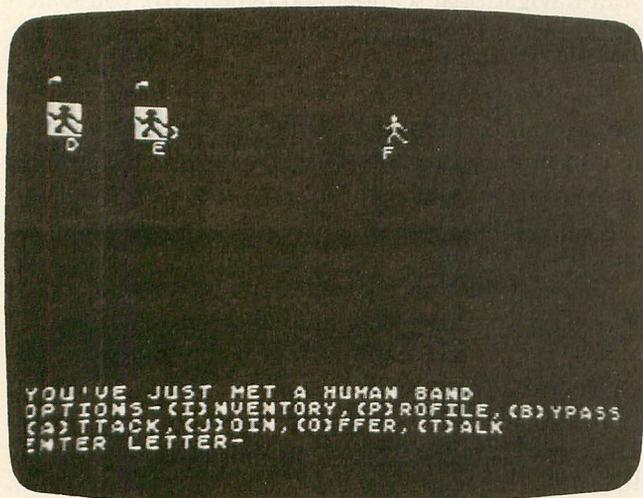
Basically, **Galactic Adventures** takes the usual D&D adventure themes and adds a few of its own twists. Your objective is to build up your strength until you're powerful enough to tackle an adventure—at which point, you realize that you were nowhere near ready to start, and you must begin the game anew.

After this has occurred a few times, you'll learn your lesson and begin to strengthen your characters *enough* to survive at least the first encounter. Familiar attributes (speed, intelligence, dexterity, etc.) are used to breathe life into the characters you and the computer create.

Throughout the game, you're constantly being given choices—where to go, what to do, even what to say. This is done with a hierarchy of option levels, narrowing down to the *exact* thing you want to do. You continue until you relinquish your turn to the machine. The program executes your commands, and then the machine moves. The readouts indicate if you've survived. If you did, they'll tell how well you fared.

Jobs are available, and successfully completing one will increase your bankroll. Whether you complete

the job or not depends on both your character's skills and your own. When a job is offered, its skill requirements are compared with your character's skills, to determine the probability of success. You then opt for an abstract resolution, or you may play the skill game. The abstract randomly determines your success, while the skill game is a logic puzzle similar to Mastermind. If you're not familiar with Mastermind, wake up! It's one of the most popular logic games in the world.



Galactic Adventures.

Using the currency of the land, frilbees, you purchase weapons, armor, spaceships and aid for your quest. In the first phase of **Galactic Adventures**, you meet with various fellow creatures and attempt to increase your wealth, skill and the size of your band.

When you feel that you're ready, you enter the adventure phase of play. There are three types of adventures: Explore, Escape and Agent. In the first two, you must find your way out of the battlefield; in the latter, you must capture a specific enemy agent. In all three types, there are numerous treasures to obtain and unlimited battles to fight.

If you're still not satisfied, there is an additional program. It allows you to create your own adventure, either from scratch or by modifying an already existing one. This feature is extremely user friendly, and I experienced no problems as it walked me through the phases of creation. It looks as though this could be used to provide a skeleton for many D&D scenarios, virtually eliminating dice and paperwork.

The manual for **Galactic Adventures** is complete; at first glance, its complexity may overwhelm you. However, everything is fully described—if you can find it—and additional player aids, like charts and grids, are included, along with abundant background information. A two-sided disk contains the game on side one and the adventure on side two.

There are some bad points. Combat is hard to get used to, as the movement is controlled with the keys 1-8, which correspond to the eight possible directions a joystick can move. Remembering which number

moves you in which direction is a nearly impossible feat. Fortunately, the moves usually depend on strategy rather than arcade speed. Also, while the graphics are not to be considered state-of-the-art, it must be remembered that this is a simulation, and as such, the display is only there to spark your imagination and allow you to keep track of play. The real enjoyment of a game like this is not on the screen, but in the mind. This one isn't for arcade action addicts.

One thing can be said for certain, though: **Galactic Adventures** is an incredibly complex game with enough versatility to keep even the experienced adventurer busy for decades to come, whether saving a damsel in distress or rocketing to the stars.

QUEST OF THE SPACE BEAGLE

by Scott Lamb

AVALON HILL MICROCOMPUTER GAMES

4517 Harford Road

Baltimore, MD 21214

48K Disk \$35.00

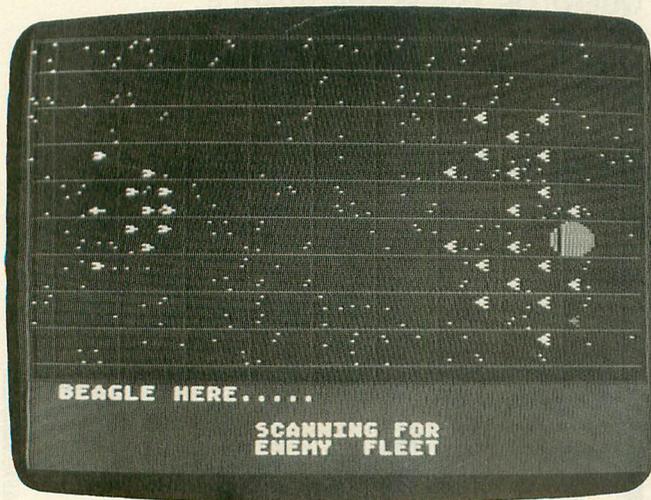
Avalon Hill games mean many different things to many different people. Some of the finest games I've ever played were Avalon Hill board games and simulations. Gettysburg, Squad Leader and others brought

Soon
**ANALOG
 Computing**
 will be
 only
 a phone call
 away.

me as close to the real thing as I'd ever care to be. Likewise, their board games, such as the classic GO, are indispensable entries in my game library.

It would seem only natural that Avalon Hill bring their years of experience to the realm of the personal computer. A drawback of those early strategy games was the need, in order to simulate reality, of performing a large number of calculations and comparisons to resolve each and every turn. As a result, they were hard to learn and tiresome to play—and their complexity screamed for computer simplification.

But, somehow, until **Quest of the Space Beagle** (or **Beagle**), I had never played an Avalon Hill microcomputer game. I now consider myself to have been lucky; it's hard to see an old friend fail—and so miserably.



Quest of the Space Beagle.

Beagle is introduced as the second part of an earlier Avalon Hill game, **Jupiter 1999**. This introduction states that, while playing **1999** is not necessary for you to enjoy **Beagle**, it is helpful. It seems more likely, if **1999** is anything like **Beagle**, that purchasing the sequel would be the farthest thing from your mind.

In **Beagle**, you find yourself many light-years from mother Earth, and you must find your way back. To play (rather than enjoy) this game, you'll need a BASIC cartridge, a joystick and a translator disk for the XL series. And, although your disk drive may object, it must be used to load the game.

Scrolling text provides background information, and then you're plunged into a battle to capture an alien planet. This sounds far better than it is. Graphics are poor; the action, slow and (worst of all) frustrating.

The manual (which is, by the way, very thorough and complete) says that the "task may seem difficult at first. . . (but) . . . Take your time; it can be done." Well, so can the colonization of the moon, but that doesn't make me want to sit around and wait for it. It simply is not enjoyable, but more like root canal work without anesthesia.

For the few hardy souls (or, more accurately, the masochists) who make it past the dreadful first phase,

two more await you. In the second phase, the Labyrinthes of Kamerra, you must solve problems and find the only exit before your oxygen or stamina run out. Oxygen decreases constantly, while stamina is reduced each time you bump into things. Within the maze, there are rations which restore you to full power—should you be able to find them.

In the third and final Exploration phase, having escaped the maze, you must now find the Earth. Using your navigational scanner and hyperdrive, you search the known and unknown universe for your small home planet. The task is just as hopeless as it sounds.

Beagle's graphics are poor, moving erratically at times, and the monitor must be adjusted and dimmed to minimize a distracting flicker. This isn't the strategy or simulation game one might expect from Avalon Hill, but relies heavily on graphics. When they fail, so does the game.

Quest of the Space Beagle can't be recommended. It is disappointing, slow and laborious. A few years ago it might have been a good game, but we've advanced and don't need to step backwards. If Avalon Hill can't live up to their previous record, they should stay out of computer games; by putting out something like this, they can only lose valuable customers who trust their name. And I know *someone* will like it—everything has its own market. Just don't say I didn't warn you.

S.S. ACHILLES

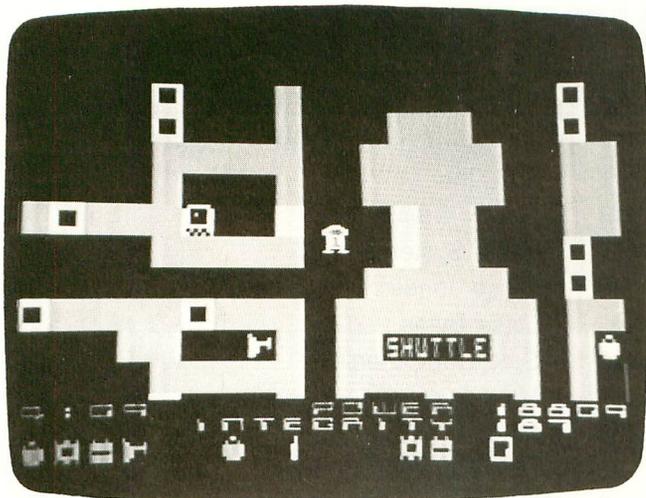
by Simon Goodwin & David Muncer
BEYOND SOFTWARE

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I find it hard to even imagine a game worse than this one. No, wait. . . I mean it's not *pleasant* to imagine a game worse than this one. Unfortunately, with my demented mind, I can imagine just about anything—except, perhaps, why anyone would like this game.

The **S.S. Achilles** is a ship you find yourself aboard in this dog. Suddenly a red alert sounds, and you learn that the ship is being invaded by an enemy growth. Every so often a new seed suddenly appears on the ship and begins to grow, until the entire craft is infected. Your duty, rather than simply evacuate and save yourself, is to collect up all the relic containers and then flee in panic.

This you do from the safety of your droid, which can withstand contact with the growth for limited periods of time. What the droid can't withstand, however, is loss of power or integrity. Power loss is constant, while integrity decreases when you contact any object. Both can be increased; you collect power modules and integrity packs, then return them, along with the relic containers, to your escape shuttle. The droid can carry only one of each at a time. It's a pretty worthless droid.



S.S. Achilles.

And so it goes, with you racing around the ship (which resembles a huge maze), while the growth inches towards you. By using a sealant gun, you can seal holes in bulkheads and slow the growth. When you've collected all the relics you think you can—or taken all your mind can bear—you escape in the emergency shuttle. You're then given a rating, from a lowly commendation to an Imperial Medal.

Graphics are poor; I've seen better on the 2600 with a two-dollar bargain bin game. The lower part of the display shows power and integrity levels, as well as what the droid is currently carrying. Also, a timer counts down in the lower left display. . . Use it to time eggs.

This is a one-player game. Options allow you to see an overall map of the ship, pause the action, and select a starting level of play from Inept (for those with no computer experience) to Expert (for 11-year-olds). Perhaps this just about sums it up for **S.S. Achilles**: while an expert may be an 1-year-old, I'm afraid the average 11-year-old would find the game insulting. The manufacturer encloses no address with the game, so you can tell he's hiding. And, while I know not the retail price, I do know precisely what it's worth: \$2.00. Not coincidentally, that's the price of a blank disk.

Well, that's it for this month. . . I'll just power down until next time. □

The author wishes to thank Perfect Computers of Niles and Boardman, Ohio for their assistance in assembling this review.

Field of Fire review

(continued from page 15)

the Germans into the town of St. Anne. Some of the worst combat is the inch-by-inch type, wresting the town of Aachen from the grip of the Waffen SS—not an easy task.



Field of Fire.

Ardennes dawn.

This is the big one. All of your experience comes into play here, as you relive the dark days of the bat-

tle for the Ardennes, witnessing the last dying gasp of the Wehrmacht in its do-or-die offensive blitzkrieg through the snow.

Your mission is to regroup your demoralized troops into an effective fighting force and halt the charge of the Panzers at the berg of Dom Buttenbach. You gain points and victory status if you stall the advance of the tanks and retreat into the protection of the town. As the dawn breaks, you hear the rumble of the incoming Panzers. What are *you* going to do about it?

Take ten, Easy!

All things considered, **FF** is an excellent simulation of tactical infantry combat. Assaults and firefights are carried out in an exciting and realistic fashion, and you can use your rifle squads to turn a bad situation around.

If I could find any fault with the game, it would be in the documentation. The tactical hints offered for each game level are the bare-bones minimum, not much in the way of help. Terrain keys enclosed in the instruction manual are also woefully inadequate. A separate map for each conflict would be a big help to the wargamer in planning advances, etc.

Field of Fire is a game that novice and seasoned wargamer should enjoy, and it won't get stagnant. Besides, what scholar of WWII history wouldn't want to move out with the Big Red One. . . and into the history books? □

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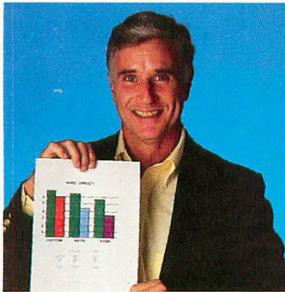
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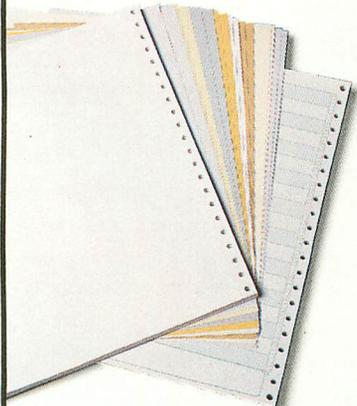
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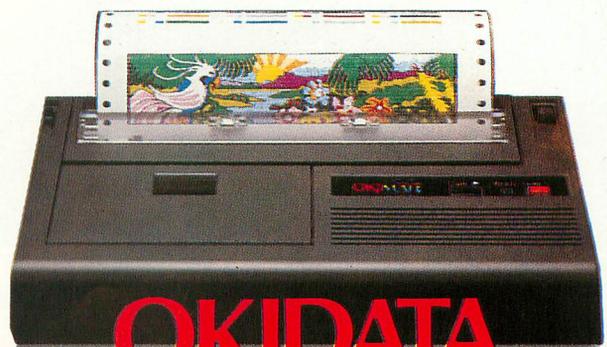


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