

THE MAGAZINE FOR ATARI® COMPUTER OWNERS

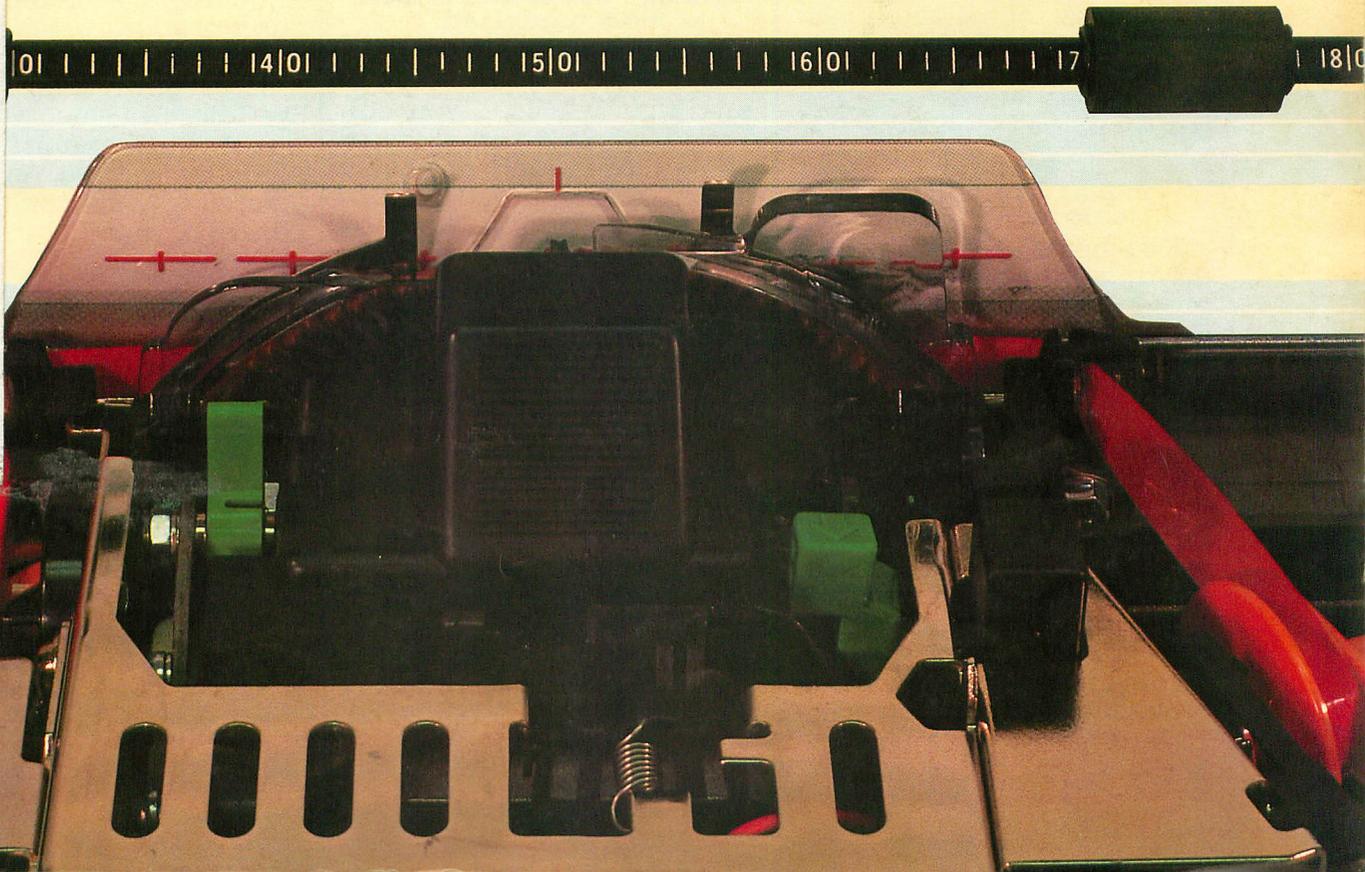
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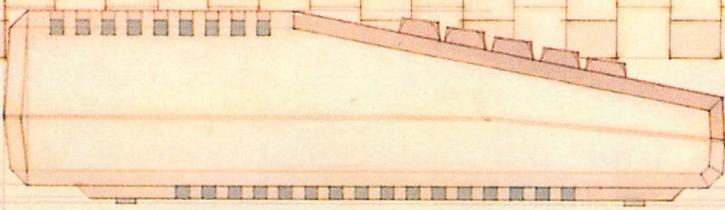
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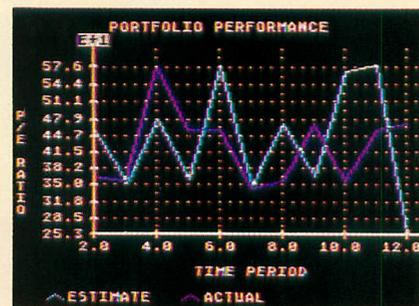




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# ANALOG

## COMPUTING

### FEATURES

The Atari 7800 .....	Arthur Leyenberger	8
Proset .....	Richard J. Browne	13
Selecting Your Perfect Printer .....	Steve Panak	21
Touch-Tone® Dialer Update .....	Tom Hudson	28
Avalanche .....	Tommy Bennett	35
Matt*Edit .....	Matthew J.W. Ratcliff	51
Graph E's .....	Robert E. Miller	59
Spy Plane .....	Mark Comeau	75
The ANALOG Card File .....	David Plotkin	83
The ANALOG Atari Printer Survey .....	Mike DesChenes	87
The Fergee File Printer .....	John C. Ferguson	95



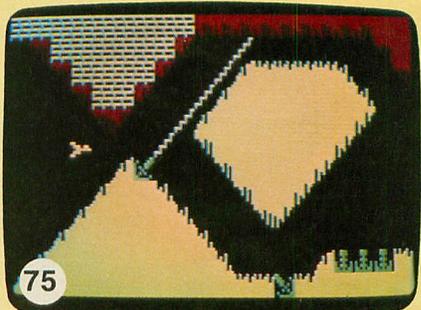
35



71

### REVIEWS

Jungle Hunt (Atari, Inc.) .....	Ray Berube	12
Spelling Checker Programs .....	Arthur Leyenberger	25
Cut & Paste (Electronic Arts) .....	Arthur Leyenberger	71



75

### COLUMNS

Reader Comment .....		6
New Products .....	Lee Pappas	11
Griffin's Lair .....	Braden Griffin, M.D.	15
D:CHECK/C:CHECK .....		27
Boot Camp .....	Tom Hudson	90
Index to Advertisers .....		104



87

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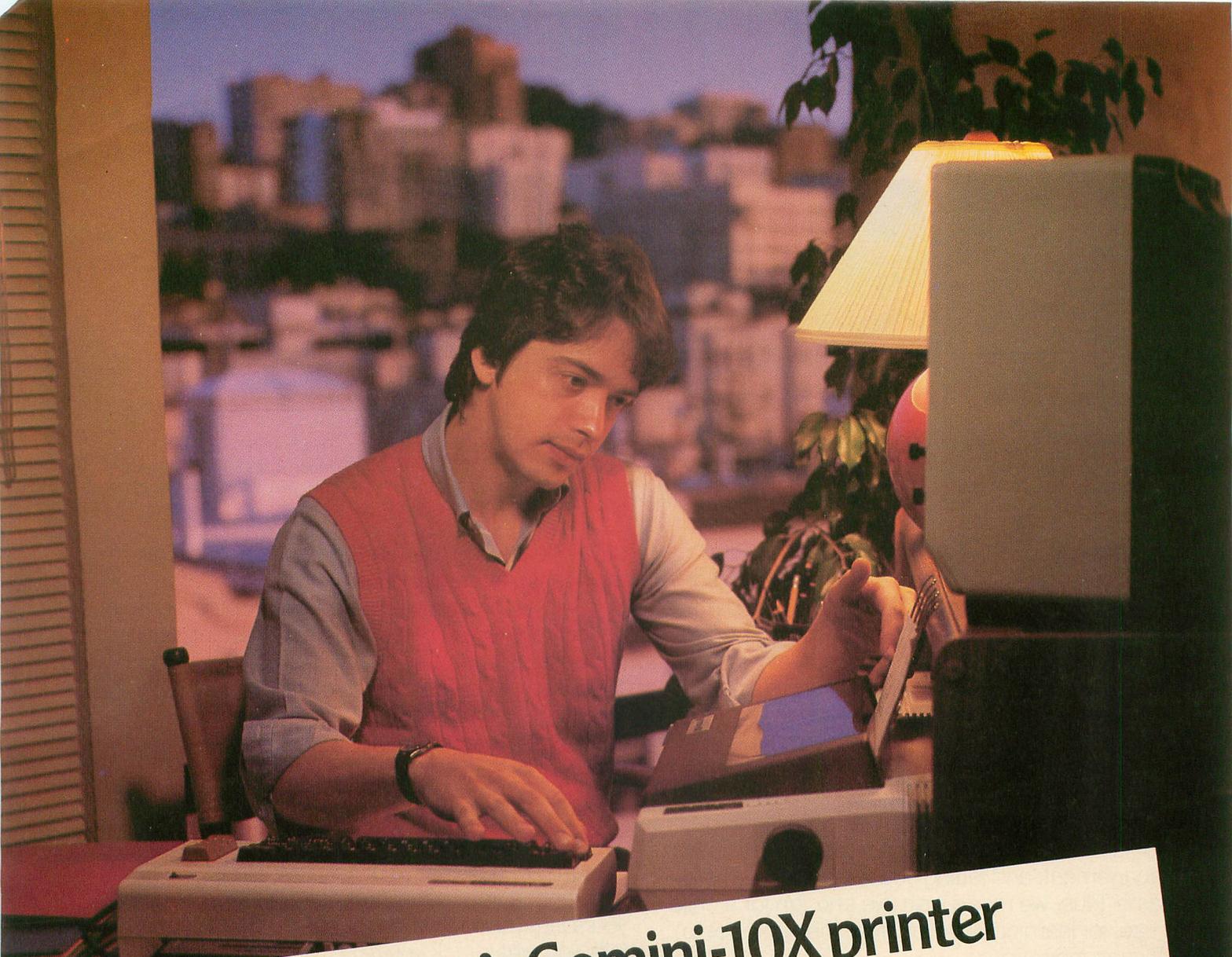
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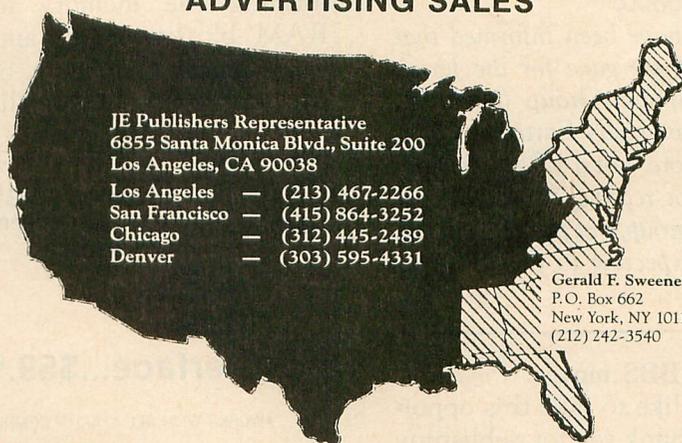
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# READER COMMENT

In your issue 19, page 46 Bulletin Board Systems article, for P.A.C.E. (Pittsburgh Atari Computer Enthusiasts), you have the wrong BBS phone number. The correct number is (412) 754-0800. We've had this number for at least one year. It was great to see our club in your listing of BBSs!

Sincerely,  
Evan Chapkis.

*Our apologies, Evan — and those of you who tried to call the incorrect number we had listed. So...don't call P.A.C.E. at (412) 655-2652! It's (412) 754-0800.*

*We also have been informed that the number we gave for the Jersey Atari Computer Group (issue 19, page 47) was really Earthrise Computers (a store, not a BBS). To date, we have not received a number for that Jersey group, but please don't call Earthrise expecting to find a BBS.*

—Ed.

## BBS moves.

I would like to take this opportunity to thank you for publishing my BBS in your article. The BBS and I have moved recently, and the new telephone number is: (703) 550-8119. The **Best Little BBS** is restricted to adults only but does support any and all types of computers.

A forwarding telephone number was not given to the telephone company, to help enforce the adults-only policy. Alternatively, I had left broadcast messages to all my users to inform them of the new telephone number.

Sincerely,  
Monica, the Sysopette  
Alexandria, VA

*Sysopette? Sysoptrix? Sysopenova?*

—Ed.

## 800XL memory test problems.

Upon unpacking my new 800XL and setting it up, I proceeded to run the built-in memory test. To my dismay, one of the RAM blocks turned red, which supposedly indicates a problem. This was, however, the only time this happened. I periodically run the test, and all RAM displays normal. I have had no problems with the unit, and entering ?FRE(0) returns 37,902 bytes free — which is normal. What happened? The owner's manual states that, when performing the memory test, 48 RAM blocks should appear. It even shows a drawing of what the screen should look like. My

unit, as well as all the others I've tested, shows only 40 blocks. I'm confused!

Lastly...Why is it that, when I have a DOS3 formatted diskette (with FMS.DYS) in my 1050 drive and enter the DOS command, the built-in function test runs? Shouldn't I get the DOS menu after booting?

Sincerely,  
Sandro V. Cuccia  
Wilmington, DE

*Don't know what caused that initial bad memory block to appear, but — as you say — it seems to have cleared up...Very strange!*

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only shows 40 blocks, though. The 800XL has BASIC built into it. This BASIC uses up 8K of memory space, and, when the computer is first powered up, it thinks it has only 40K of contiguous RAM. You can disable BASIC by turning on your machine while holding down the OPTION key on the side. It should now jump directly into the self test routine, and a memory test now will show 48K of memory.

As for your DOS3 problem, I'm

afraid that we have had very little experience with it. The situation that you describe sounds as if the DOS did not, in fact, boot up from the disk... because, if you type DOS on an XL computer that is not connected to a disk drive, it will go into the self test routine instead.

I hope that this has been of some help to you. Please feel free to contact us again if you encounter any further problems.

—CB

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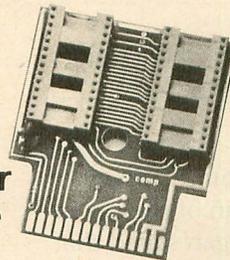
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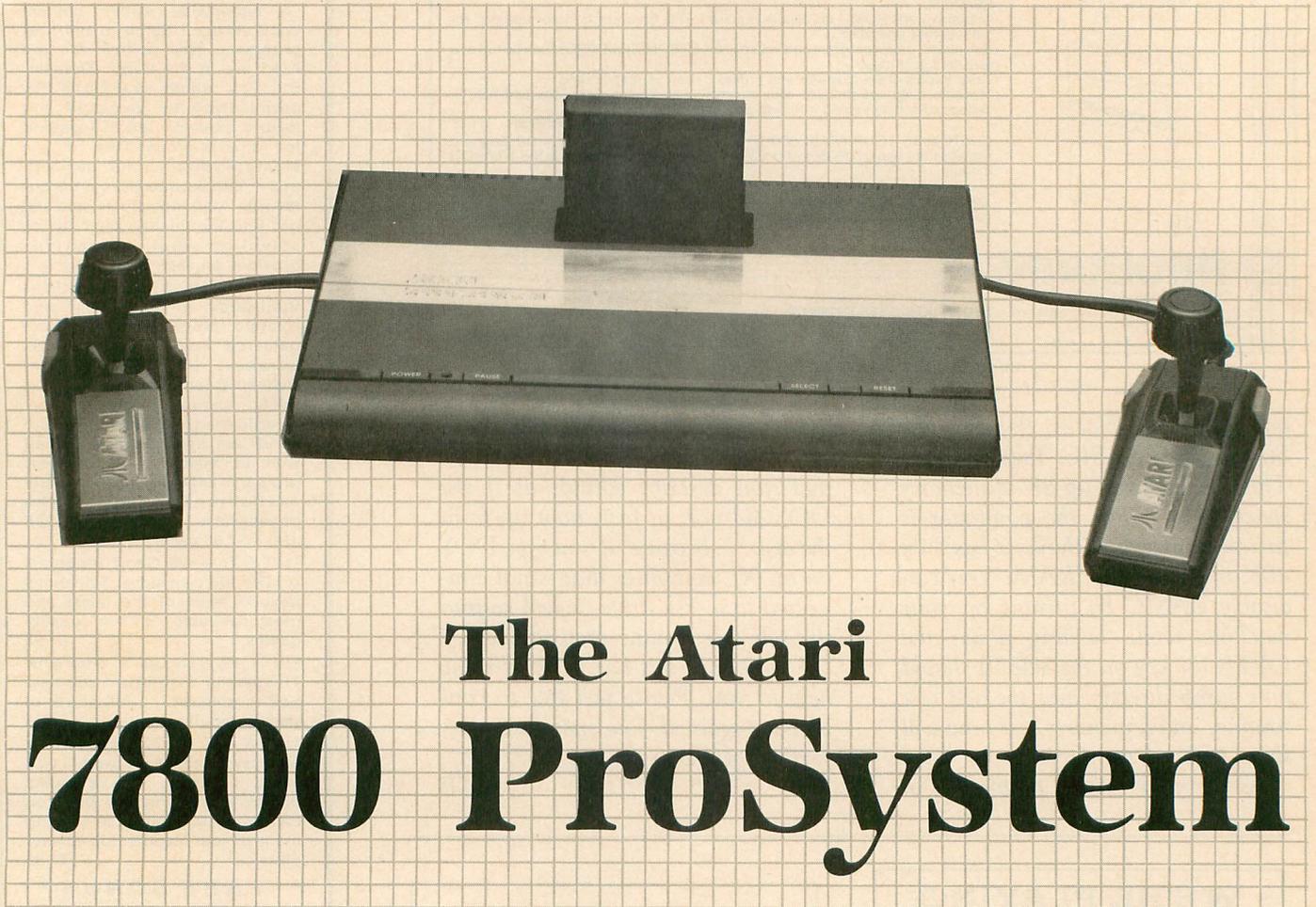
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CIRCLE #107 ON READER SERVICE CARD



# The Atari 7800 ProSystem

by Arthur Leyenberger

Atari has been fairly quiet during the first four months of 1984. In January, at the Winter Consumer Electronics show in Las Vegas, Chairman of the Board and Chief Executive Officer James Morgan stated that Atari would no longer announce products before they were ready to be delivered. This would not only give the beleaguered company time to sort out their financial and operational problems, but also would be the first step in making the company appear as a reliable and credible entertainment electronics company.

During these intervening months, we have all watched Morgan's efforts to reduce overhead by manufacturing products in Taiwan, laying off hundreds of both blue and white collar workers and eliminating unprofitable operations such as APX and Alan Kay's research division. Many of us have wondered whether these were wise moves, playing Monday morning quarterbacks with Atari's future.

At the same time, the XL line of computers, primarily the 800XL, has quietly been selling well and has helped Atari regain a prominent position in the home computer market. In 1983, Atari hardware sales accounted for only four percent of the low end computer market. As of April, 1984, Atari now commands

twenty-five percent of that market. The reports of Atari's death were premature.

Aside from the 800XL computers selling better than even Atari's prediction and the availability of the Atari Touch Tablet, there was no news coming out of Sunnyvale. Then, in early May, Atari officially announced the venture with Lucasfilm to produce state-of-the-art entertainment software for their computers and 5200 video game. The two games, **Ballblazer** and **Rescue on Fractalus**, have been well received by the press, but will not be available until July. As the approaching Summer Consumer Electronics Show loomed closer, rumors of 1450XLDs, expansion boxes and high end graphics computers began to circulate.

When Atari announced that there would be a press conference on Monday, May 21 in New York City, expectations of both consumers and the industry rose — in anticipation of what fabulous piece of hardware would be announced. The result was the introduction of the \$150 Atari 7800 ProSystem Video Game.

The 7800 ProSystem is an advanced video game that boasts having the best color graphics of any computer or video game currently available. This is

made possible by means of a custom designed semiconductor chip that Atari produced in-house. The graphics chip was designed by video game programmers and goes beyond the capabilities of the familiar ANTIC chip found in the computers. Not only does the 7800 offer better color and graphics than other systems, but the number of video objects that can appear on the screen at one time has been increased to 100. Also, the size and the shape of the objects that appear on the screen can be manipulated more, and the color is more saturated.

The 7800 is styled much like the 5200 but smaller. Two totally redesigned joysticks come with the system. The controllers, smaller and narrower than earlier models, have a self-centering stick and fire buttons located on either side, to accommodate both left- and right-handed players. These ProLine controllers will also work with other Atari products.

In addition to playing advanced video game cartridges made just for it, the 7800 will also play (without an adapter) the nearly 400 titles already designed for the 2600 VCS game. Moreover, there will be a special adapter for the 5200 system that will allow it to play the 7800 and 2600 game cartridges.

Two other features make the 7800 an interesting piece of hardware. One is the expansion interface which will allow "future video game technologies" to be used with the system. Atari would not be specific as to what "future technologies" really means. However, the other feature is more understandable. By means of an optional full-stroke keyboard, the 7800 may be turned into an "introductory" home computer. A maximum of 20K of memory and full compatibility with all current Atari computer peripherals (via a serial I/O connector) rounds out the system. However, existing computer software will not run on the 7800. The keyboard is expected to retail for less than \$100, and it — together with software — is to become available during the fourth quarter of 1984.

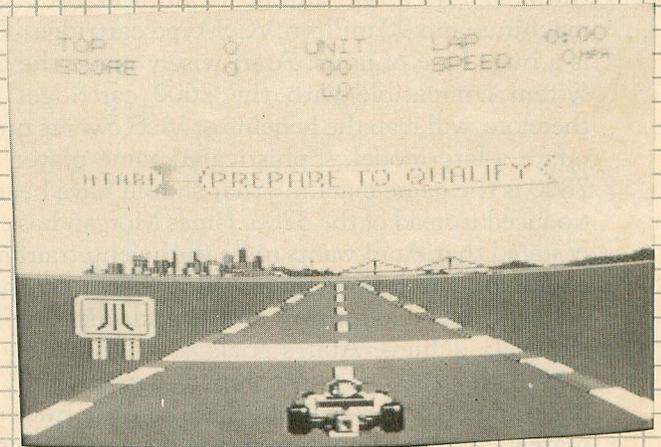
There will be thirteen games for the 7800 when it becomes available in July. These games will retail for about \$30 and will fall into three categories. In the "exciting originals" category are the two Lucasfilm games mentioned previously and **Desert Falcon** (a diagonal-scrolling shoot-'em-up). The "exclusive arcade hits" group consists of **Pole Position II**, **Food Fight**, **Galaga**, **Xevious** and **Ms. Pac-Man**. Finally, the "arcade classics with enhanced graphics" titles include **Robotron 2084**, **Dig Dug**, **Joust**, **Centipede**

and **3-D Asteroids**. Initially, a **Pole Position II** cartridge will be packed with every system, but, after September, the game will be built into the 7800. There will also be a high-score cartridge that will provide players with the ability to record, update and review the top six scores in up to 65 ProSystem games.

All of the games except the Lucasfilm titles were shown at the press conference, and most lived up to the boast of having the best graphics of any current computer or video game on the market. Five minutes or less is usually not enough time to judge the quality and playability of a video game, but, in this brief time, **Desert Falcon**, **Pole Position II**, **Robotron 2084** and **Centipede** all showed themselves to be excellent games, both in terms of graphics and playability.

Technically, the 7800 ProSystem appears to be a

**Pole Position II**  
on the new 7800  
ProSystem, featuring  
enhanced graphics  
and added  
features.



quality state-of-the-art video game machine. But there are some tough questions that need to be asked, and finding the answers may help in understanding Atari's future direction, and their success.

Is a new video game machine what consumers want right now? Atari thinks so. They believe that the video game business is very much alive and is just like any other consumer entertainment business, such as the record or movie industry. Business cycles and creativity fluctuate in a cyclical fashion. The introduction of the Atari 7800 is not just a marketing whim but, rather, is part of a "well-planned strategy" of a series of new products that extends through the end of 1985. Atari cites that, during the first four months of 1984, 20 million game cartridges were sold — and over half were purchased at full retail.

Atari commissioned a market research study to find out what consumers want and what they would pay for in a video game system. They found that game-playing consumers want outstanding software, meaning a wide variety of game cartridges and arcade-quality graphics. Consumers also want to have the

(continued on next page)

capability to expand to future "game technologies" as they become available. Of the people who were shown the 7800 system, approximately forty percent said they would buy it. In addition, Atari expects that about half of the 7800 purchasers will be 2600 owners trading up.

#### Necessity's child.

Does Atari need the 7800 right now? Yes. Atari, by their own account, says they now have about seventy-five percent of the video game market. . . and they realize that their share would slip if they were to sit back and do nothing. The 5200 is no longer in production, and the VCS is old technology. Therefore, Atari needs a new product to remain in the video game business — and they are betting heavily on the 7800.

Will the Atari 7800 ProSystem be successful? I think so. There are almost 15 million 2600 game machines and 90 million VCS-type cartridges. That is a huge base of users. Atari wisely made the 7800 system compatible with the 2600 cartridges and, therefore, will reap the benefits of VCS owners trading up for a late-model, sophisticated game-player. The 7800 is the game machine that should have been introduced instead of the 5200. James Morgan has clearly stated that Atari wants to be in the entertainment, education and leisure-time activity business, and he believes that maximizing profits and minimizing risks will help achieve Atari's goals.

Will the 7800 system compete with the XL line of computers? Atari believes that there are two viable markets: home computers and video games. Supplying both hardware and software to these markets is what Atari wants to do — and will do, according to Morgan. It is true that the 600XL computer is not selling very well. Given an almost identical price, it would seem that there would be competition between the 7800s and the XLs. But Atari maintains that there are two distinct markets, and that one does not influence the other. Regardless of what Morgan says, it would not be surprising to find the 600XL computer discontinued by the end of the year, and the 7800/keyboard computer becoming Atari's entry at that level. So, in a way, the 7800 *may* drive the 600XL off the market.

#### Marketing the 7800.

The "introductory computer," as Atari calls it, does not seem to be a strong aspect of the 7800 system. As Morgan stated, "the keyboard is not a major part of the Atari line. It is there for those people who want it. But it is important to make sure the consumer understands that, with the addition of the keyboard, they are not getting a full-powered computer." Atari and others have announced keyboard add-ons before, and few have been able to deliver. Even if Atari can deliver the keyboard at \$100, with the \$150 for the 7800 itself, the amount spent is close enough to war-

rant the buyer getting an 800XL. If there really are two separate markets, then the keyboard computer may be successful. Most of the industry, though, feels that there is only one computer/video game marketplace, and, if that holds true, Atari's 7800 will not succeed.

#### Deliverability?

A final concern relates to Atari's stated intention not to announce products unless they can be delivered. The 7800 will not ship until July, meaning that it will be August before we see it in the stores. The keyboard and 5200 adapter will not be available until the fourth quarter. We are talking about a range of two to six months for product availability. That hardly seems to fit in with the stated policy and will not improve the consumer's perception of Atari's integrity.

#### And so . . .

To summarize, I see the announcement of the 7800 ProSystem as a positive step for Atari. If it can help to regain the video game market share that Atari has lost over the last couple of years, then Atari will be better off. If Atari is financially healthier, they can put more thought into the design of their computer products — which will mean new and better equipment for the Atari user. □

## Bulletin Board Update

Here is a brand new BBS that didn't make it into our listing in the telecommunications issue (ANALOG Computing no. 19). So pick up your phone, lock down your modem and start dialing!

**Atari the Great**  
Victoria, Texas  
(512) 578-8033

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300/1200 Baud operation  
24 hours per day

- XMODEM software is preferred for accurate file transfer.
- No time limit per call at present.

# NEW PRODUCTS

by Lee Pappas

CHICAGO, IL — “June 3, 1984 — The day the future began” was Atari’s buzzword at an exclusive press conference held on that date in the Westin Hotel. Hosted by Bruce Entin, Atari PR, the press was pummeled with Atari-facts as to why the company was on the turn-around. Foremost is their new **7800 ProSystem** (see our review, page 8).

The latest computer (originally to be called the 1450XLD, but as of this writing not officially christened) sports a built-in 352K disk drive with a data transfer nearly five times that of the 810. The new machine also includes an internal modem and speech synthesizer, and bundled with it comes yet-undetermined software. The “**Atari grapevine**” will be an in-house database and Q&A service for those purchasing the new machine.



**MindLink System**, state of the art for the state of your mind. A revolutionary new product that, together with special software, allows you to manipulate video objects on your Atari 2600 Video Computer System or XL series home computer — without the use of conventional hand controllers.

The new expansion box hooks up to the no-name machine or to the 600XL or 800XL, giving them 80 columns, a real-time clock and 128K of RAM, along with future upgrades, perhaps to run MS-DOS or CPM. The Atari **MindLink** picks up impulses from your forehead (you wear it like a high-tech headband), giving you limited hands-off control of on-screen objects or functions: i.e., playing **Breakout** without any hand controls. The **Milestone** series includes a letter and word tutor, as well as various other programs

supporting the touch tablet and lightpen. Also included in the **Milestones** will be home health programs, such as a tutorial on CPR. This series is touted as “one of a kind in excellence and quality. . . to bring back the magic.” Second in the AtariLab is the **LightLab**, containing over 100 experiments.



Learn science by doing it with AtariLab. AtariLab **LightLab** shown here comes complete with 16K plug-in program cartridge, light sensor, calibrated light source, light stand, “**Magic Litestick**” and experimenter’s guide. For children ages 4-12.

The **Futuremaker** series is an effort by Atari to show how computers can be used to “enhance education.” **This Is Ground Control** and **Through the Star Bridge** are two first steps in this direction, both teaching astronomy and physics.

The recently-released **Syn-Series** developed by Synapse Software for Atari includes **SynCalc**, **SynTrend** and **SynFile+** — all outstanding programs integrated with **AtariWriter**. Yaacov Agam, the founder of kinetic art, has developed a program to assist in the interaction of creative technology and art using the computer.

The Lucasfilm games, **Rescue on Fractalus** and **Ballblazer**, promise new fun on the computer with super-enhanced graphics. All of this seems to point to the fact that Atari does indeed continue their interest in the home computer line, with some new fuel added to the fire. And lastly, Alan Alda will continue as Atari’s spokesperson, with some dynamite new TV commercials promoting the Atari computer line as the best (but we’ve known that all along). □

**JUNGLE HUNT**  
**ATARI, INC.**  
**P.O. Box 427**  
**Sunnyvale, CA 94086**  
**16K Cartridge \$44.95**

by Ray Berube

Have you ever harbored a secret desire to be Tarzan — to swing through the treetops, wrestle alligators, battle cannibals and rescue a damsel from a boiling supper pot? Well, Atari has finally put their arcade game **Jungle Hunt** on a cartridge. Now you can brave the dangers of a tropical rain forest in the comfort of your rec room.

**Jungle Hunt** is just another version of Activision's **Pitfall**, and that's certainly not new to arcade gamers. Regardless, **Jungle Hunt** (though not as exciting or varied as **Pitfall**) is still fun for the novice player. Some arcade games are fascinating and addictive. The simplicity of play plus the game's ability to sustain its challenge have made them successful. It's what makes them so enduring in this world of instant fame followed by immediate oblivion. **Pac-Man**, **Star Raiders**, **Missile Command**, **Donkey Kong**, **Tempest** and the various editions of **Jungle Hunt** have the fascination to endure. Even if you're an old hand at these games, you won't be disappointed with repeated playing of them, simply for the sake of nostalgia.

For the uninitiated in arcade gaming, **Jungle Hunt** is a fine game through which to discover the thrills of video fun. **Jungle Hunt** has three levels of play: beginner, regular and advanced. It also has an option for two players, so you can share the fun. Its beginner level allows the newest of gamers the opportunity to develop playing skills. This level permits more "deaths" and a slightly slower pace, but the challenges are still tough enough for the novice. Once you're adept at the beginner's game, you can improve your score and timing before graduating to the next skill level. If you're new to this kind of fun, become a master of the beginner's level before moving on. (Warning: this kind of play can become addictive! My wife nearly forgot she was married when she started to get the hang of playing **Jungle Hunt**.) You'll

really enjoy it and find yourself truly ready for the next level.

### The thrill of victory.

Just what are **Jungle Hunt**'s challenges? The dangers of the jungle are presented in a pleasant, horizontally-scrolling display. As an intrepid explorer, you must first swing through the treetops on vines, timing your leaps and racing against the clock to rescue a fair maiden. Your journey through the

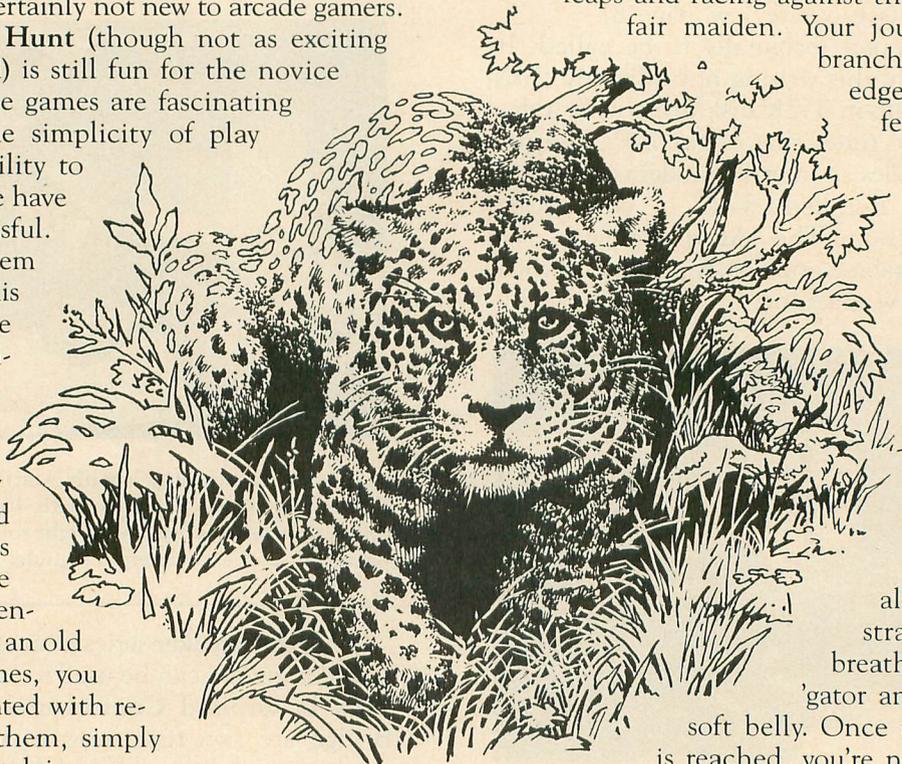
branches brings you to the edge of an alligator-infested river. Holding your breath, you dive deep into the raging current and swim for the opposite shore. While you swim, you encounter hungry 'gators and most murky muck.

You have to keep surfacing for air and stabbing at attacking alligators. The best strategy is to take a breath, dive under the 'gator and stab up into his soft belly. Once the opposite shore is reached, you're nearly home free.

Climbing out of the river, you jog up a hill while avoiding falling boulders of various sizes. Once past this obstacle, you will have to negotiate your way around hostile cannibals and time your leap onto the rope, now lowering your maiden into the boiling supper pot. If you leap too soon, you join her as an ingredient in the stew.

### Civilized considerations.

The price for this game is a little steep! Yet it seems that every arcade game that finds its way to the home is overpriced. Truly advanced arcade gamers will find **Jungle Hunt** fairly tame. If you're a master at the joystick, then this game probably isn't for you. If you're a newcomer or a parent buying a birthday surprise, and your neighborhood toy store has **Jungle Hunt** on sale, then you will probably get your money's worth. □



# Proset

16K Cassette or Disk

by Richard J. Browne

Trying to remember Printer Control Codes lead me toward the creation of this program for the NEC 8023, Prowriter 8510 and PMC DMP-85 printers (which are essentially the same machine). This listing, when run on an Atari 400, 600XL, 800 or 800XL, will program any of these printers for various font choices, margins, tabs and spacing. . .eliminating the need to search for the correct coding.

The final push I needed to make up **Proset** came when I had to set "form length" to lengths other than 66 or 72. As the three printer owner's manuals do not provide a form length setting program compatible with the Atari, I made several calls to Leading Edge, NEC and numerous computer stores, and visited two Atari computer clubs — all to no avail. Two weeks after my first call, I received a partial program from a technician at NEC. From that listing, Lines 850 through 930 emerged.

## Program overview.

Lines 40 - 260 form the first menu, which gives the user font characteristic choices, sets them and accesses the second menu. Lines 330 - 780, the second menu, define options and set form and line-spacing characteristics. Lines 270 - 300 and 790 - 820 give the user the option of combining menu choices. Lines 840 - 930 set form length, while Lines 960 and 970 reset the printer to its default settings.

After selecting the perforation skip-over, the printer will list 60 lines on a page, skip over the fanfold paper perforation and continue printing. A form length of X can be set by changing the 60 in Line 860 to X and the 62 in Line 890 to X+2.

When setting margins and tab stops, one should first set up the font size, since the settings will not change to coincide with font size changes. Note how

many characters will be permitted on a printed line — and do *not* exceed these numbers when setting either the margin or tabs. When entering these numbers, remember that they *must* be three digits long and (in the case of tabs) the numbers *must* be separated by commas.

All settings will remain enabled until the printer is turned off, this program is rerun, the program's reset option is selected by the user, or changes are received from the Atari. □

## BASIC Listing.

```

0 REM
1 REM  PRINTER CONTROL, SET-UP FOR:
2 REM      NEC 8023
3 REM      PMC DMP-85
4 REM      PROWRITER 8510
5 REM
6 REM      program by
7 REM
8 REM      RICHARD BROWNE  MAR 84
9 REM
10 DIM A$(1),C$(8),M$(3),P$(2),T$(130)
11 C$=CHR$(27)
12 GOSUB 960
13 POKE 82,0:?"K":?
14 ? "1. PICA NORMAL-(10cpi)"
15 ? "2. ELITE(12cpi)"
16 ? "3. CONDENSED(17cpi)"
17 ? "4. PROPORTIONAL SPACING"
18 ? "5. DOUBLE WIDTH CHARACTERS"
19 ? "6. BOLD PRINT"
20 ? "7. UNDERLINED PRINT"
21 ? "8. DEFINE LINE SPACING"
22 ? "9. RESET PRINTER'S DEFAULTS"
23 ? "10. TO END"
24 ? :TRAP 40:?"WHAT'S YOUR CHOICE.
25 :INPUT F
26 IF F=1 THEN LPRINT C$;CHR$(78):GOT
27 0 270
28 IF F=2 THEN LPRINT C$;CHR$(69):GOT
29 0 270
30 IF F=3 THEN LPRINT C$;CHR$(81):GOT
31 0 270
32 IF F=4 THEN LPRINT C$;CHR$(80):GOT
33 0 270

```

```

200 IF F=5 THEN LPRINT CHR$(14):GOTO 2
70
210 IF F=6 THEN LPRINT C$;CHR$(33):GOT
0 270
220 IF F=7 THEN LPRINT C$;CHR$(88):GOT
0 270
230 IF F=8 THEN 320
240 IF F=9 THEN GOSUB 960
250 IF F=0 THEN 940
260 GOTO 40
270 ? :? " DO YOU WANT TO COMBINE? (Y
es/No)";
280 INPUT A$
290 IF A$="Y" THEN 150
300 IF A$="N" THEN 940
310 GOTO 270
320 ? "K":? :?
330 ? "1. LEFT MARGIN SET"
340 ? "2. HORIZONTAL TAB SET"
350 ? "3. UNIDIRECTIONAL PRINTING"
360 ? "4. REVERSE LINE FEED"
370 ? "5. LINE FEED PITCH"
380 ? "6. PERFORATION SKIP OVER"
390 ? "7. DEFINE PRINT TYPE"
400 ? "8. RESET PRINTER'S DEFAULTS"
410 ? :? "10. TO END"
420 ? :TRAP 320:?"WHAT'S YOUR CHOICE
...";:INPUT 5
430 IF 5=1 THEN 530
440 IF 5=2 THEN 610
450 IF 5=3 THEN LPRINT C$;CHR$(62):GOT
0 790
460 IF 5=4 THEN LPRINT C$;CHR$(114):GO
TO 790
470 IF 5=5 THEN 700
480 IF 5=6 THEN 840
490 IF 5=7 THEN 40
500 IF 5=8 THEN GOSUB 960
510 IF 5=0 THEN 940
520 GOTO 320
530 ? "K":? :?
540 ? " SET LEFT MARGIN TO: XXX"
550 ? :? :? " XXX MUST = 000 TO 160
"
560 ? :? " DEPENDING ON CHARACTER PIT
CH SETTING"
570 ? :? :? " SET LEFT MARGIN TO: ";
:INPUT M$
580 IF M$("<000" OR M$)"160" THEN M$="0
00":GOTO 570
590 LPRINT C$;CHR$(76);M$
600 GOTO 790
610 ? "K":? :?
620 ? " HORIZONTAL TABS XXX,XXY,XXZ (U
P TO 32)"
630 ? :? :? " TAB STOPS MUST BE 0
00 TO 160"
640 ? :? :? " DEPENDING ON CHARACTER PIT
CH SETTING"
650 ? :? :? " caution: no error trap in
this option"
660 ? :? :? " SET TABS TO :";:INPUT T$
670 LPRINT C$;CHR$(40);T$;CHR$(46)
680 ? :? " HORIZONTAL TABS SET AT:":P
RINT T$
690 GOTO 790
700 ? "K":? :?
710 ? "LINE FEED PITCH SETTING XX"
720 ? :? :? " XX MUST = 01 TO 99"
730 ? :? :? " 18 = 1/8 INCH"
740 ? :? :? " 24 = 1/6 INCH (NORMAL)"
750 ? :? :? " SET LINE FEED PITCH TO:
";:INPUT P$
760 IF P$="00" THEN 700
770 LPRINT C$;CHR$(84);P$
780 ? :? " LINE FEED PITCH SET AT: ";
:PRINT P$;:PRINT "/144 INCH"
790 ? :? :? " DO YOU WANT TO COMBINE? (Y
es / No)";
800 INPUT A$
810 IF A$="Y" THEN 320
820 IF A$="N" THEN 0
830 GOTO 790
840 OPEN #2,8,0,"P:"
850 PUT #2,29:PUT #2,65:PUT #2,64
860 FOR X=2 TO 60
870 PUT #2,64:PUT #2,64:NEXT X

```

```

880 PUT #2,67:PUT #2,64
890 FOR X=62 TO 66
900 PUT #2,64:PUT #2,64:NEXT X
910 PUT #2,65:PUT #2,64
920 PUT #2,30
930 CLOSE #2:LPRINT :GOTO 790
940 ? :? "PROGRAMING IS NOW COMPLETE.
"
950 FOR X=1 TO 400:NEXT X:PRINT "K":EN
D
960 LPRINT C$;CHR$(78);C$;CHR$(79);C$;
CHR$(89);C$;CHR$(34);C$;"L000"
970 LPRINT CHR$(15);C$;CHR$(48);C$;CHR
$(102);C$;CHR$(65);C$;CHR$(60):RETURN

```

## CHECKSUM DATA

(see page 27)

```

0 DATA 585,796,966,244,596,595,132,599
,142,603,175,641,774,783,341,7972
60 DATA 413,274,546,694,169,63,330,72,
176,783,556,559,562,566,210,5973
210 DATA 536,561,538,408,548,506,910,7
81,782,769,713,46,661,187,840,8786
360 DATA 884,689,662,11,68,173,695,574
,580,610,406,597,609,347,439,7344
510 DATA 581,707,53,801,721,646,57,635
,403,732,49,292,437,642,472,7228
660 DATA 681,433,28,759,48,807,369,585
,133,582,670,405,238,106,769,6613
810 DATA 773,300,745,300,30,171,810,80
3,351,791,780,844,743,440,503,8384
960 DATA 933,183,1116

```



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# Griffin's Lair Educational Programs Review



by Braden E. Griffin, M.D.

So, you want Jane and Johnny to learn about life, do you? This month's **Griffin's Lair** reviews games that teach, among other things, safety and problem-solving, spatial relationships, alphabetizing and dictionary use. The reinforcement of positive habits is another promising use for educational programs. . . as long as they're not created by Orwellian hackers.

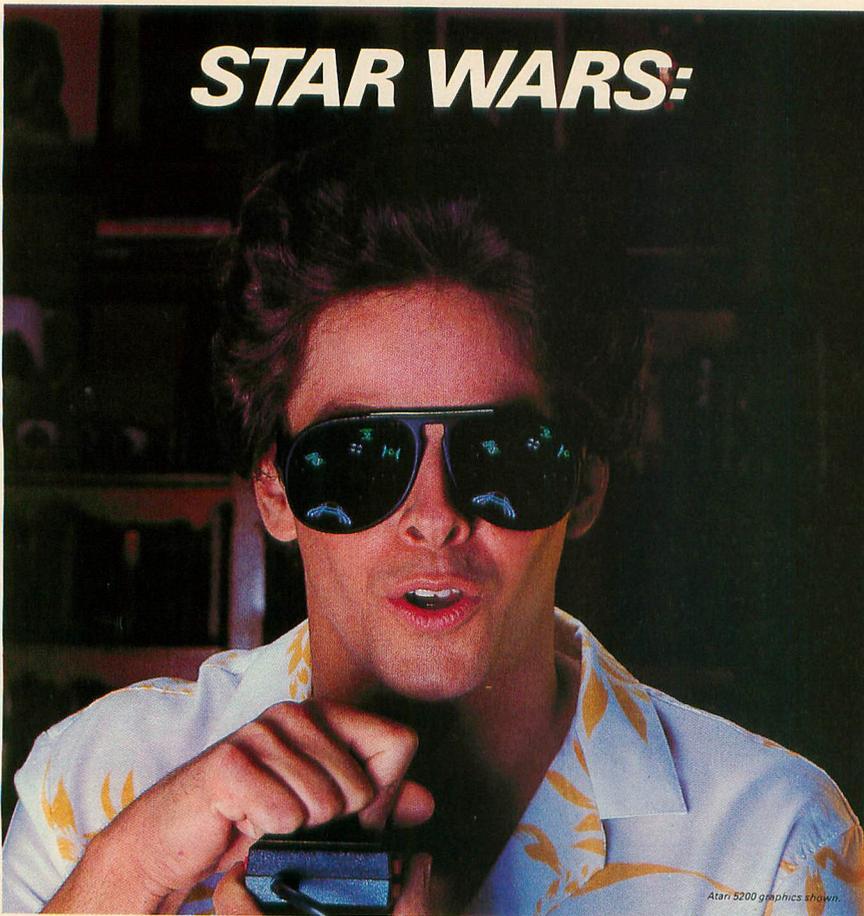
**WORD FLYER**  
by Childware  
**ELECTRONIC ARTS**  
2755 Campus Drive  
San Mateo, CA 94403  
48K Disk \$35.00

When I receive a new product to review, I throw it in the disk drive and begin to play it, paying little attention to the accompanying documentation. This is contrary to my natural tendency toward a compulsive behavior pattern which often forces me to practically memorize the instructions before beginning anything. (You can imagine my exasperation on Christmas Eve, attempting to assemble a hobby horse made in Korea, with instructions prepared in Albania. I never did find slot B!) I have developed this aforementioned impulsive approach simply because almost everyone I know does it that way. During this initial evaluation, I frequently forget what company has

produced a particular program. In a way, this may help eliminate some of my biases. However, the unique packaging of Electronic Arts' products and the uniform excellence of everything I have seen come from them, makes it impossible not to be prejudiced. The aura of high quality items associated with certain brand names is slowly fading from our society, and the old motto "a name you can depend on" is often just an advertising gimmick. Well, **Word Flyer** by Childware maintains the image of Electronic Arts as the "primo" software producer.

**Word Flyer** is a word matching game for all ages. The playing screen presents two large birds, each sitting atop a word tower. Using the joystick, one of the four words or letters in the word tower is selected to be the "flyer" and flies to the middle of the screen. Soon, zooming words appear, moving towards the center of the screen from the background. The object is to match the flyer by moving it until it touches the appropriate zooming word. As the number of correct matches increases, a score bar is filled with color. When it is totally filled, one moves on to the next level. There are five levels in all, beginning with one- or two-letter flyers and progressing to three- and, finally, four-letter words. As the levels advance, there are hazards to make

*(continued on next page)*



vocabulary of over 2000 words makes play quite interesting. It is suggested that a dictionary be used to determine if unknown letter combinations are actual words and, if so, what they mean. Development of such reference skills is essential. Hopefully, the importance of using a dictionary will be instilled, and parents will not have to continue droning, "go look it up." Parents are encouraged to play along with their children, since — in the two-player mode — the two scores add together. I was impressed with the section in the manual devoted to parents — how they might help their children. The first suggestion is that parents not stop reading to their children when they start reading themselves. Considering all the ways available to assist in a child's education, computer programs or otherwise, reading aloud may very well be one of the most productive.

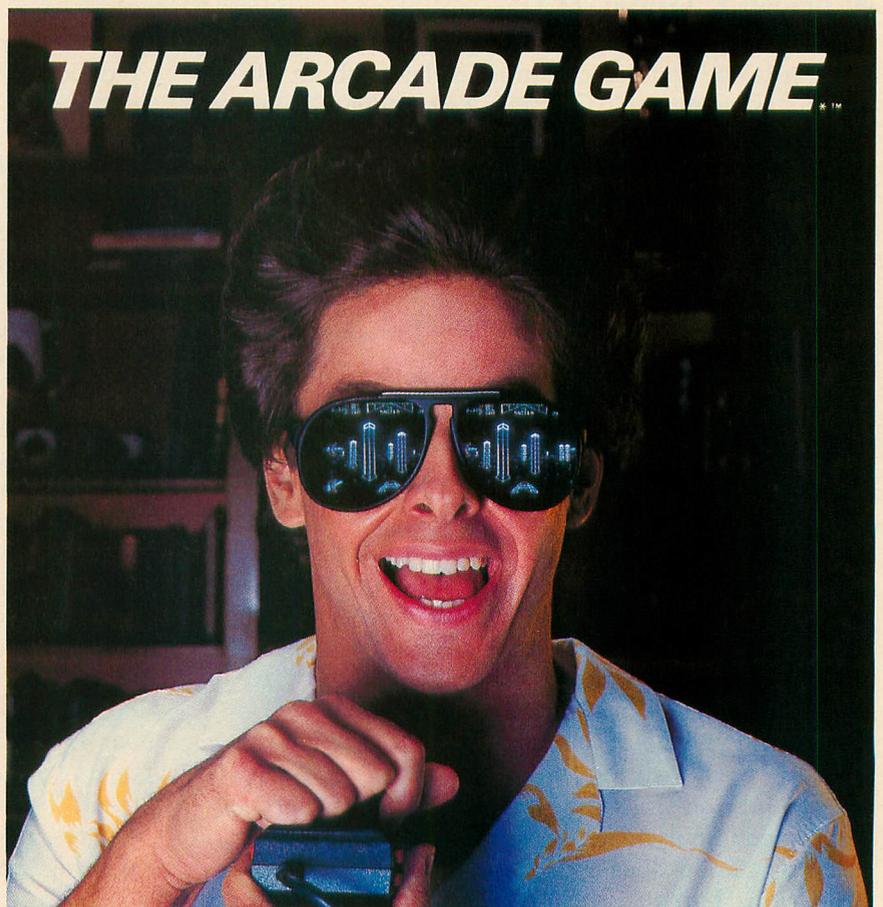
*(continued on next page)*

*(continued from previous page)*

the matching process more difficult. These include nonsense words that lower one's score if matched and a careless cloud that obscures some of the zooming words. In the fifth and final level, the flying time is shortened, and the zooming words fly much faster.

A number of options are available, including the ability to change flight levels and flight speed. The alphabet bar may be used to change the letters that the words begin with. In addition, the game may be selected for one or two players. An hourglass acts as the timer in the two-player mode.

The game itself is easy to play, and even children not yet able to read can enjoy it as much as others. Pattern recognition and hand/eye coordination are enhanced in very young children playing the lower levels. Alphabetizing and spelling skills are taught as the levels progress. A



**Word Flyer** is fun, educational and augmented with excellent sound and graphic effects. Children of all ages will thoroughly enjoy the experience. Electronic Arts is "a name you can depend on."

### SAFETYLINE/STORYLINE

#### Software Movies

**MAXIMUS, INC.**

6723 Whittier Avenue

McLean, VA 22101

48K Disk/Cassette \$34.95

48K Cassette only \$29.95

It is always nice to see new and innovative ideas in computer education, particularly when they are directed at the very young. Few programs on the market are able to hold the attention of this normally hyperactive group. With these two separate programs, **Storyline** and **Safetyline**, Maximus succeeds where others fail by presenting an interactive movie sure to brighten the eyes of preschool and early elementary aged children. Both programs follow a similar format, with two software movies on each cassette. Games designed to reinforce the movies' messages are found on an accompanying cassette or disk. The instructions are thorough, and, with a little help initially, most children will be running the programs without assistance.

#### Safetyline.

This is a great program. The movies, *Sam Goes to School* and *Sam Gets Lost at the Zoo*, are narrated by Max the Cat, Sam's invisible friend. The first movie presents important safety tips for children, as Sam learns to cross a busy street at the traffic light and arrive at school safely.

The two accompanying games are fun and masterfully complement the movie. In *Streetcross*, one must get Sam to school quickly and safely. All the safety tips learned from the movie must be observed. If Sam tries to cross in the middle of the street or against the light, warning music plays,

and Sam is moved back to a safer place. The *Hidden Tips* game is a word search game similar to those found in the newspaper's comic section. One of Max's safety tips appears at the bottom of the screen, and a key word from it appears at the top. The goal is to find the key word hidden in a matrix of random letters.

#### At the Zoo.

In this movie, the plight of a lost child is addressed. Five important safety tips are emphasized. These include: 1. stay calm; 2. try to find a policeman and tell him your name, address and telephone number; 3. seek out someone you know well and trust; 4. find a store with lots of customers and ask the clerk for help, loudly, clearly and politely; and 5. never talk to strangers. The game, *Tip-match*, is a Concentration-like matching game encompassing safety tips learned from the movie. In *Zoomaze*, Sam is lost and must wend his way through a maze to

one of four boxes. If he finds the policeman, Sam will be shown where the teacher is, and, once she is reached, a musical salute is played. But Sam must be careful, for if the stranger's box is reached, the game is lost.

Both sides of **Safetyline** present extremely important lessons for the young child. And somehow, no matter how often we admonish our children about safety, it frequently gets mixed in with messages like "eat your vegetables" or "don't sing at the supper table." The graphic depiction of these same safety tips, with the positive reinforcement of the games, may provide a more lasting impression. Reading, memory/retention and basic problem-solving skills are part of the educational experience. This program offers, not only a good way to introduce kids to the computer, but a chance to develop necessary early survival skills.

(continued on next page)



**STAR WARS™**, the arcade game that blew its way to the top of the charts, is coming home. **TIE FIGHTERS™**, fireballs, catwalks, they're all there in 3 of the hottest action screens in any galaxy. There is only one **STAR WARS: THE ARCADE GAME™**. For the Atari 2600, 5200, Atari Home Computers, ColecoVision and the Commodore 64. **PARKER BROTHERS**

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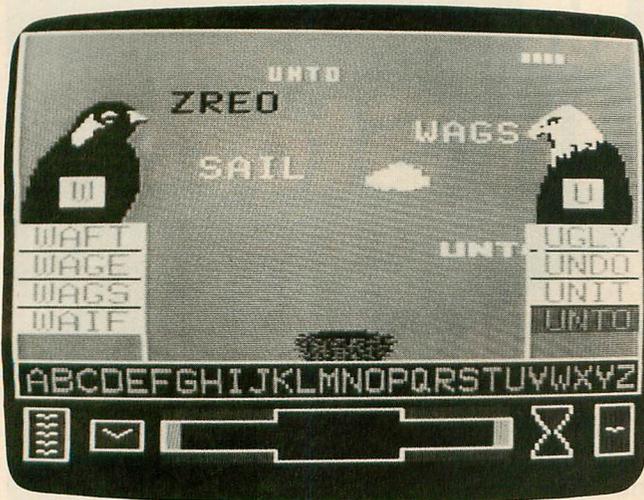
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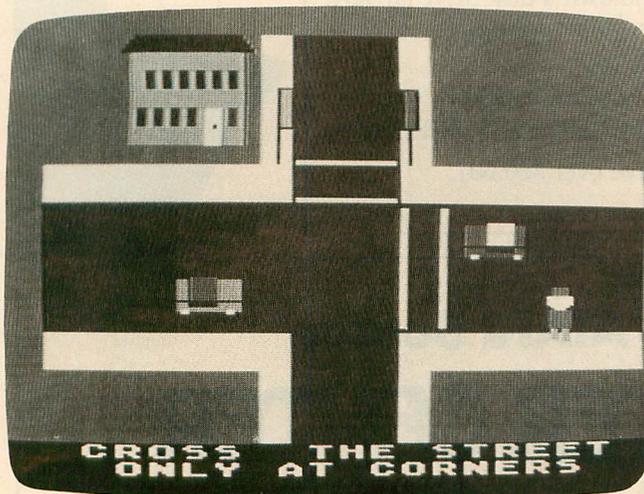


Word Flyer.

### Storyline.

Clover the Clown provides the narration for two familiar fables, "Rumpelstiltskin" and "The Ugly Duckling." These two are cleverly presented in software movies, each of which lasts about ten minutes.

On the "Rumpelstiltskin" side, the interactive games are *Guess My Name* and *Promises, Promises*. The former is a hangman-type game, where the object is to guess the letters of one of over two hundred boys' or girls' names given to the troll. A wrong guess results in part of the troll's face appearing. Correct responses build up one's stack of gold. If the name has not been spelled by a certain number of turns, and the troll's face is completed, he then growls and steals some of the gold. In *Promises, Promises*, the goal is to promise Rumpelstiltskin less gold than he wants. A number between 10 and 90 is selected on a bar, then Rumpelstiltskin moves his arrow randomly along the bar, stopping on the amount he wants. If a lesser amount is selected by the player, then that amount is added to the stack of gold. After ten tries, if the

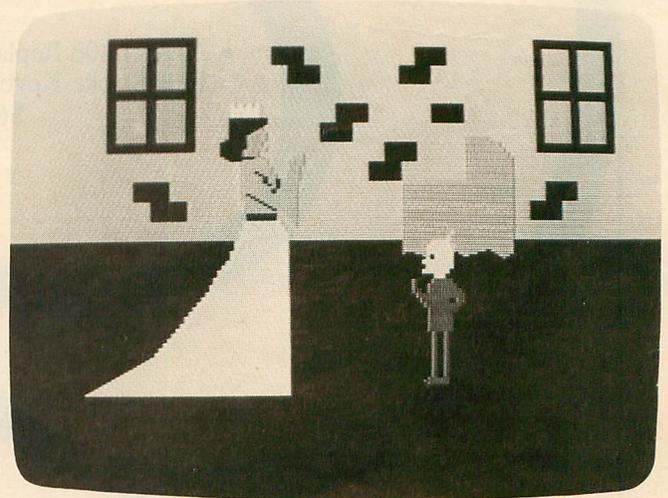


Safetyline.

troll has the most gold, he will jump with glee. On the other hand, if he loses, he will explode and become a pile of straw.

### Swan Song.

The movie sequence on this side is so well narrated that tears welled up in my eyes. (Granted, I was once accused of crying at an ROTC training film.) In spite of having to reach a bit to present two relevant interactive games, the two associated with "The Ugly Duckling" are fun and educational. *Pick the Twins* involves matching the two identical pictures from a group of eight displayed. In some, the differences are quite subtle. There are five different sets of either ducks or flowers in each round. In *Duck Puzzle*, twelve squares of a picture puzzle are scrambled, and the player must restore the original in the fewest number of moves. The hard version of this game makes the process more difficult, as the puzzle rescrambles itself during play.



Storyline.

**Storyline** teaches spatial relationships and pattern identification, as well as the skills involved in hangman. Clover the Clown's advice in "Rumpelstiltskin" — "Never make a boast that is untrue" and "Don't make promises you can't keep" — comes across loud and clear. Young children see themselves differently than we see them, and the message found in "The Ugly Duckling" is a valuable one.

Committed to providing "software designs for developing young minds," Maximus has succeeded admirably. I enthusiastically recommend both of these programs. □

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# Selecting your Perfect Printer

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by Steve Panak

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If you've had your computer for a while, maybe you feel that it's about time that you had something tangible to show your friends and relatives — to prove that your computer is more than a glorified video game. If so, then give your Atari system the power of creation with a new printer. Once you are able to produce hard copy, you will be better able to edit your programs, as well as being able to print out files and use word processing programs to pound out text, re-buffing those of little faith who are either too poor or too stupid to have their own system. But, if you've tested the waters in search of your perfect printer, you may have found yourself drowning in an ocean of different types, brands and features. Well, take heart; after reading this article, you should be able to both pull your head above the water *and* fish out the printer that will not only work for you, but one which you will later consider a wise investment.

There are two steps to follow when selecting a printer: (1) determine your needs and budget; (2) fit a printer to those needs and budget.

Your first step is the most important one, because a definite objective always improves your final decision. Ask yourself what you will use the printer for. Will it be primarily to print out program listings? Will you also want to do some word processing, and — if you do — will the output be used for informal correspondence or for school or business use? Finally, how

much do you expect to use it? Truthful answers to these questions will supply you with an objective that ensures your getting (and paying for) only the options you want and need.

Establish your budget constraints and confine yourself to a price range. Printers range in price from lows of around \$100 to highs of well into the thousands of dollars, so finding a printer to fit your budget should not be a problem.

### The three basic types.

Once you've answered the above questions, you are ready for the more difficult task of fitting a printer to your needs. Printers come in three basic types, classified by their mode of operation: thermal, dot-matrix and letter-quality. Each of these types forms the images on the paper in different ways, which give rise to advantages and disadvantages.

Printers which utilize the thermal method have a print head with a number of small electrodes which burn tiny dots onto special paper as the head moves across it. These dots form the letters and graphics. Advantages are inexpensiveness, durability and near-silent operation. Also, you will never run out of ink. However, they require a special type of paper, which is more expensive than regular typing paper and may be hard to find in different forms. So printing on labels, envelopes, index cards and the like may be impossible.

Thermal printers would be best for the person who wants his printer to primarily produce program listings. It would also allow for word processing, but the paper has a peculiar slippery feel and often darkens with age. If only program listings will be printed, the best choice would be a thermal printer which prints on narrow rolls of paper, as these are the least expensive printers available.

Dot-matrix printers are similar to thermal printers, in that they also print images using tiny dots. However, the dot-matrix printer's print head has a number of little rods or needles which strike an ink ribbon against the paper to form the image. They are noisier than thermal printers, and the head has a limited lifetime, which — after extended use — will have to be replaced, as will the ink ribbon. While a new ribbon will cost about \$10, a replacement head will range from \$40 to over \$100, so estimating your total expected use is crucial. An advantage of dot-matrix printers is that they will print on any type of paper that can be fed through the machine.

Because of the similarity of the print heads in thermal and dot-matrix printers, they can print roughly the same things. Both create graphics and characters, and both can feature various type styles, such as elongated, emphasized, compressed, etc. (see Figure 1). Both have similar print speeds and may allow lines to be printed twice, with a slight offset overlap, to nearly equal the quality of the characters of a typewriter or letter-quality printer. The quality of the print and graphics of these printers depends on the number of dots making up the image; the more dots, the better the image.

Letter quality printers are different from both the thermal and dot-matrix in that they have an element, much like a typewriter, which strikes a ribbon against the paper. The element is usually a daisy-wheel (although the Atari 1027 uses print drums to achieve the same result). These printers are noisier (again, similar to a typewriter) and are generally the most expensive (although the 1027 is, once more, the exception at a very reasonable list price of \$349). They also print much more slowly than either of the other types, and have ink ribbons which must be replaced occasionally. Their major drawback is that they can only print what is on the element (usually letters) and are thus incapable of printing graphics. However, some printers allow optional interchangeable elements. These additional elements cost around \$8 to \$10 each and include pica, elite, gothic, script and many other special type styles.

Letter-quality printers are your best bet if you plan to use the output for business or other formal correspondence. However, for school use, the dot-matrix may be adequate — depending on how particular the person receiving the printout is.

There are printers which are used to create color

graphics, using small pens to plot lines which form the images. An example of this type is the Atari 1020. These are generally only for graphics and special printing uses. Also available are printers which use laser beams or ink jets to form the images, but these generally cost well into the thousands of dollars and, because of their prohibitive cost, will not be fully explored here.

Finally, there are printers which have their own keyboards and double as electric typewriters. If you consider purchasing one of these printers, remember that, while they may cost less than both a printer and a typewriter, they are considerably more expensive than a printer and a word processing program. The simple fact — the more complex the machine, the more likely it is to fail — applies here.

#### Other considerations.

In addition to the above factors, there are a few more which apply, regardless of the type of printer under consideration. One of these is the method of paper feed. Some printers use sprockets to pull the paper through the printer, while others use friction feed (much like a typewriter), and some combine both methods. The advantage of friction feed is that anything that can fit into the machine can be printed on, while sprocket-fed printers must use paper with holes along the edges which engage their sprockets. However, the sprocket-fed printer will print on continuous fanfold paper and keep it precisely in line with the print head. Look for a sharp edge to rip paper off as it is removed from the printer.

Your new printer will have to be connected to your system with a cable and an interface. Since nearly all Atari-compatible printers utilize a parallel interface, we will consider only this type. While the Atari and Axiom printers come complete with cable and interface, most printers require you to purchase these separately — at a cost of \$50-100. This cost may or may not be included in the price of the printer, so ask to be sure. Also, refer to *ANALOG* issue 16 for a feature describing how to build an interface for around \$20. Consider to what extent the printer will become part of the peripheral daisy chain.

Determine the availability and cost of a printer driver, which will allow your computer to tell the printer what to do. Again, this cost may or may not be included in the price of the printer, depending on the supplier.

If you have a word processing program (or will be purchasing one), consider how well the printer and program will cooperate. AtariWriter will work with most printers compatible with the Atari, and allows use of a printer driver, or allows manual entry of decimal codes directly into the text to tell the printer when to underline, subscript, etc. For a review of the AtariWriter, see *ANALOG* issue 11.

A buffer takes the data your computer sends to the

printer and holds it while it is interpreted and printed. When all the data has been sent to the buffer, the computer is freed up to be used again. Since the buffer is filled up faster than the fastest printer can print, the printer's speed is the limiting factor. The larger the buffer, the more likely you will be able to go back to work while the printer labors mindlessly away. Unfortunately, most printers have a buffer of only 1-3K, roughly equivalent to 1000-3000 characters, or about one double-spaced typewritten page. Therefore, your computer could be tied up for an extended period of time when you are printing out a relatively long document. The solution is a separate buffer which can completely empty the computer's memory. . . These cost about \$300, so estimate the value of your time.

The instruction manual is a very important part of any hardware purchase. Look for completeness and clarity. Tables of the necessary decimal codes are very helpful, and a troubleshooting section will save you much time and exasperation. Also look to the instruction manual before you purchase as the definitive authority on the printer's features and options.

While, internally, most printers' mechanisms are identical, external designs differ greatly. Since the exterior will be staring at you, pick a printer which looks

aesthetically pleasing to you. Also note the location of the switches, lights and cable connections in relation to the printer's probably location, considering visibility and ease of access.

Most companies will supply you with information and brochures on their printers. If your dealer does not have this information, many companies require a stamped, self-addressed envelope for their response.

Once you've selected your printer, you will have to decide where you will buy it. While mail-order is generally much cheaper than retail, this is because they do not have the overhead of salespeople — who can help you with any little problems which may arise. Some offset this by giving you a number to call for help, and the Atari toll-free hot line is always available. Regardless of mail-order or retail outlet, determine the supplier's return policy. While warranties from the factory apply, regardless of where you purchase your printer (as long as you remember to mail in the warranty registration card), a dealer may give you additional rights. If you purchase through the mail, be sure that your package is insured against any damage in transit.

**Common abbreviations.**

**CPI** — characters per inch; measures width of print.

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**CPS** — characters per second; measures print speed; larger numbers represent faster speeds.

**DPI** — dots per inch; measures graphic resolution; the higher the number, the better the image.

**LIP** — lines per inch; measures height of print.

**MCBF** — mean (average) characters before failure; measures the life of a component before repair is needed.

### Your turn.

Now you should be prepared to venture forth and ferret out the printer you need. Take it slow and avoid the high-pressure salesman and impulse buying, as they are your worst enemies. If you are thorough in your search and follow the guidelines in this article, modified with your own common sense, you will end up treasuring your printer rather than cursing the day you bought it. □

*The author wishes to express his gratitude to Perfect Computers of Niles, Ohio for their valuable assistance in the preparation of this article.*

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*DOUBLEWIDTH, DOUBLESTRIKE, ITALICS.*  
**DOUBLEWIDTH, EMPHASIZED, DOUBLESTRIKE.**

Printout sample  
(shown actual size)

Figure 1.

# Spelling Checkers for the Atari

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by Arthur Leyenberger

---

Eight years ago the thought of processing words on a computer at home was far from a reality. Dedicated word processors such as the IBM Magnetic Tape Selectric Typewriter cost in excess of \$10,000 and were out of reach not only of home users of early microcomputers but most small businesses, as well. Now there are close to a dozen different word processors for the Atari computer.

Using a word processor is clearly more productive than typing, but there is still the chore of proofreading. Wouldn't it be great if there was some way that your computer could proofread your document? Rejoice — because there are currently three spelling checkers for the Atari computer, covering a wide range of features.

Until a couple of years ago, my definition of a "spelling checker" was Miss Snyder, my seventh grade English teacher. She was superb at checking the spelling on my compositions. I could never get away with anything. Times have changed. In today's computer jargon, a spelling checker is a program that proofreads a text file by comparing the words with a dictionary. All words that do not have a match are flagged as possible spelling errors. The dictionary is a list of words contained in a separate file. Some checking programs have the capability for the user to add further dictionaries that might contain often used — but not standard — words, such as names or technical terms.

Regardless of the spelling program, none can do all that Miss Snyder did. A spelling program cannot check for grammatical errors, such as the difference between words like "their" and "there," "way" and "weigh" or "to," "two" and "too." Also, contractions, plurals, hyphenated words, proper nouns and possessives cannot be checked. As a result, these spelling aids are limited to checking *only* spelling, and require the user to understand rules of grammar (and proofread the document, anyway).

There are currently three spelling checking programs for the Atari computer. **Spell Perfect** by LJK will only check files created by LJK's **Letter Perfect** word processor. **Spell Wizard** by Datasoft will check any text files in standard Atari DOS format. This includes files created by **Text Wizard** (Datasoft) and **AtariWriter** (Atari). **Atspeller** (APX) will also check standard Atari DOS text files. There is also a new version of **Atspeller** that works directly with Atari's **AtariWriter** word processor.

It should be noted that LJK does have an inexpensive utility program that will translate an Atari DOS file into an LJK DOS file, and vice versa. Using this program, you could have **Spell Perfect** proof Atari files and **Atspeller** or **Spell Wizard** proof LJK files. I have used this very simple procedure to convert my LJK files into Atari DOS format files, in order to use **Spell Wizard** for checking.

### How do they work?

All three programs work essentially the same way. An initial menu is presented when the program is first run. You typically have the choice of proof-reading a document, managing your dictionaries or specifying your system configuration. All three programs also count the number of words in your document — which is a handy feature. Let's take a look at the specific features of each package.

#### Atspeller.

by Atari Program Exchange (APX)

The **Atspeller** package consists of two disks: a program disk and a dictionary disk containing over 30,000 words. When the program is run, you are first asked if you have a "personal" dictionary file. This file is one that you would create from running **Atspeller** and saving all of the scientific, technical and jargon words to a separate dictionary file.

If you do have a personal dictionary, that is read first. Otherwise, the master dictionary disk is inserted into the drive, and you can choose: output to screen or printer, correction, disk directory/file delete/file rename, search dictionary, return to Atari DOS or sort personal dictionary. Regardless of your choice, the program always asks for confirmation of that choice, a useful feature. Next, you insert your document disk and enter the filename to be checked. After the program reads your document file, you must insert the dictionary disk into your drive. The program will check your text by reading the dictionary file and comparing the words. Each time a word does not have a match in the dictionary, you have the choice of correcting the word, searching the dictionary for correct spelling or accepting the current spelling.

When your entire text has been scanned, you have a new, corrected text file. You can then add the words to your personal dictionary file (or create this file, if you don't yet have one). Of the 30,000 words in the master dictionary, 10,000 have come from the *American Heritage Dictionary Word Frequency Book*. These words have been found to be the most commonly used words in the English language. Before looking up a word in the dictionary file, the program first checks to see if the word falls into one of several "nuisance" categories. These special cases consist of single-letter words and words containing a number. Words in these categories are assumed to be correct.

If words end in the possessive case (with 's), the ending is removed before the word is checked. For this reason, it is not necessary to add possessive words to your personal dictionary file. If not for these special cases, many words would be flagged as incorrect, and the checking time would be longer.

#### Atspeller for the AtariWriter.

**Atspeller for the AtariWriter** is similar to **Atspeller**, except that the spelling checking function

can be used from within the **AtariWriter** word processor. There is a simple initialization procedure in which the **Atspeller** program becomes the **AUTO-RUN.SYS** file, so that it is executed immediately upon turning on the computer. The **Atspeller** program then presents its own menu, which includes the **AtariWriter** menu.

If you use **AtariWriter** and a printer driver, there are instructions in the manual for combining the printer driver and the **Atspeller** into one autorun file. The manuals for both **Atspeller** and **Atspeller for AtariWriter** are brief and written clearly. The major difference is that the **Atspeller** manual is typeset and is, therefore, a little easier to read.

#### Spell Perfect.

by LJK

The package comes on two double-sided disks. This includes a 40/80-column program disk and a single/double density dictionary disk. The documentation is in the form of a tutorial. Although it is better than previous LJK manuals, it is still rather wordy and difficult to follow at times. One problem is that instructions for both one- and two-drive systems are intermixed throughout the text. A better method would have been to have one section for single-drive systems and another for two-drive systems.

The program is menu-driven and has provisions for backing up both the program disk and the dictionary disk. I appreciate the ability for backup, but the implementation is awkward with a two-drive system. In the case of the program disk, the original is placed in drive one, and the backup is written to drive two. Backing up the dictionary is just the reverse, with the original in drive two and the copy in drive one. A consistent method for making backups would be less confusing.

To use the program, you choose "proof a document" from the main menu and enter the name of your previously saved text file. The text file and dictionary file are then loaded. As it is being scanned, the text is shown at the bottom of the screen, and unmatching words are highlighted in inverse video. With each highlighted word, you have the option to "ignore," "change" or "match." "Ignore" skips the word and goes on to the next one. "Change" allows you to fix the spelling of the word directly. "Match" allows you to search the dictionary for similarly spelled words. Some of the words that the program thinks are similar are actually not very similar, but — if it is in the dictionary — the word will be found. A particularly useful feature is that, if a match is found, you only need to enter its number. This avoids possible keying errors and saves time.

One aspect of the program that I did not like is that words of three letters or less are simply not checked. I can understand that this may have been

done to increase the speed of checking, but — in my case — this makes the program less usable. This is because I am a fast typist who uses only four fingers. I make a lot of letter-reversal mistakes, and this happens most often with short words. Proof-reading the document for short words and typographical errors is still a must.

Another problem with the program is that you cannot add the corrected words to a separate dictionary. If you want the “misspelled” words to be included in a dictionary for proofing your next document, you must add them — typing them in by hand, using LJK’s word processor, **Letter Perfect**. The only solution to this is to add your entire document file to a dictionary. This is time-consuming and often results in adding more words than you want.

The final irksome part of **Spell Perfect** is that more than one user-generated dictionary cannot reside on the same disk. A separate disk is required for each. Overall, **Spell Perfect** is an easy-to-use, moderately powerful spelling checking program.

#### **Spell Wizard.**

by Datasoft

**Spell Wizard** comes on two disks. One disk contains the program, and the other holds a dictionary

of about 33,000 words. After loading the main program, you have the option of proofing a document, printing a dictionary, searching a dictionary or exiting the program. Each of these choices results in additional questions being asked of you. Although this adds a little time to the overall operation of the program, it is done in the interest of safety and is worthwhile. You cannot destroy a document file, and the program only does what you want it to.

If you choose the proof option from the main menu, you will be prompted to insert your text disk in the appropriate drive. A list of all of the filenames on that disk is displayed on the screen, and you are asked to select one. Then your file is loaded, words are compared to the dictionary and the number of words not recognized — plus total words in the file — are shown. Once all of this counting and checking is performed, you are ready to check the spelling in your document.

In the middle of the screen are three options: continue scanning (C), make correction (M) and search (S). As the program scans through your file, the text is scrolled through a horizontal window at the bottom of the screen. Whenever a word is not recognized, the word is highlighted, and the scrolling stops. If the word is spelled correctly, just press

## WHAT IS D:CHECK/C:CHECK?

Most program listings in **ANALOG** are followed by a table of numbers appearing as DATA statements, called “CHECKSUM DATA.” These numbers are to be used in conjunction with D:CHECK and C:CHECK, which appeared in the **ANALOG Compendium** and Issue No. 16.

D:CHECK and C:CHECK are programs by Istvan Mohos and Tom Hudson. They are designed to find and correct typing errors when entering programs from the magazine. For those readers who do not have a copy of either article, send for a copy of back issue 16 (\$4.00) or **The ANALOG Compendium** (\$14.95 plus \$2.00 shipping and handling) from:

**ANALOG Computing**  
P.O. BOX 615  
HOLMES, PA 19043

C, and the scanning continues. If you are unsure of the correct spelling, you can press S for the search function to find the word in the dictionary.

A very useful feature of **Spell Wizard** is its ability to use wild cards as part of the search criteria. For example, let's assume you did not know how many m's or t's there are in the word "committee." You do know that the word begins with *com*, so you could enter "com\*" (the \* is the wild card indicator). All the words in the dictionary that begin with *com* will be displayed on the screen. They scroll from bottom to top, and the space bar can be used to pause the display for a longer look.

This process of scanning, making corrections and searching continues until the program reaches the end of your document. At that point, you have several options. You can save the flagged words to a separate dictionary or combine them with an existing one. If you decide to use an existing dictionary, the words are inserted into the file alphabetically, and duplicates are not entered.

The first few times you use **Spell Wizard**, the flagged words will consist of technical terms, proper nouns and other words that are familiar to you but not to the dictionary. By saving these words in a separate dictionary and using that dictionary each

time you use the program, fewer words will be flagged, and the speed of the checking process will be dramatically increased. When you save the words, you have the choice of either performing the *save en masse* or approving each entry. This is just another fine touch to this useful program.

Finally, when the checking is finished and you have saved the flagged words for your dictionary, you may save the corrected document. Either the original filename may be used, or you can supply a new name.

**Spell Wizard** is an easy-to-use program that has enough features to satisfy both the casual and the not-so-casual home writer.

Before I talk about the relative performance of each of these spelling checking programs, allow me a brief diversion. I have recently begun using a CP/M system, **Wordstar** and **Spellstar** (Micropro). When checking my text documents with **Spellstar**, the entire process seems to be quicker. This is due primarily to the program's ability to read dozens of words from the dictionary file each second, rather than the handful of words Atari programs are capable of managing.

Dictionary reading speed is only half of the crite-

(continued on page 34)

issue #19  
Pg 59

## Touch-Tone<sup>®</sup> Dialer Update

by Tom Hudson

In **ANALOG** issue 19, we ran the **Touch-Tone<sup>®</sup> Dialer**, a program which allowed your computer to generate tones that would "dial" your phone. Unfortunately, some phone systems aren't as lenient as the one here at **ANALOG** and won't accept the tones as listed.

Warren P. Silberstein, M.D., of Baldwin, New York, sent in the following changes that should allow the **Dialer** to work properly for everyone. He has used the Atari's ability to combine two sound registers in order to give finer frequency control. The **POKE** in Line 90 sets up the fine-tune mode.

Simply add the following changes to the existing program, and you'll be dialing by computer in no time!

```

80 DIM F1(11),F2(11),C1(11),C2(11),PNS
(20)
90 FOR X=0 TO 3: SOUND X,0,0,0:NEXT X:P
OKE 53768,120
100 FOR X=0 TO 11: READ A,B,D,E:F1(X)=A
:C1(X)=B:F2(X)=D:C2(X)=E:NEXT X
230 POKE 53762,C1(N):POKE 53760,F1(N):
POKE 53766,C2(N):POKE 53764,F2(N)
240 POKE 53767,168:POKE 53763,168:REM
*** LEAVE TONE ON A MOMENT ***
270 POKE 53767,0:POKE 53763,0
350 DATA 150,2,176,3
360 DATA 221,2,253,4
370 DATA 150,2,253,4
380 DATA 87,2,253,4
390 DATA 221,2,131,4
400 DATA 150,2,131,4
410 DATA 87,2,131,4
420 DATA 221,2,19,4
430 DATA 150,2,19,4
440 DATA 87,2,19,4
450 DATA 221,2,176,3
460 DATA 87,2,176,3

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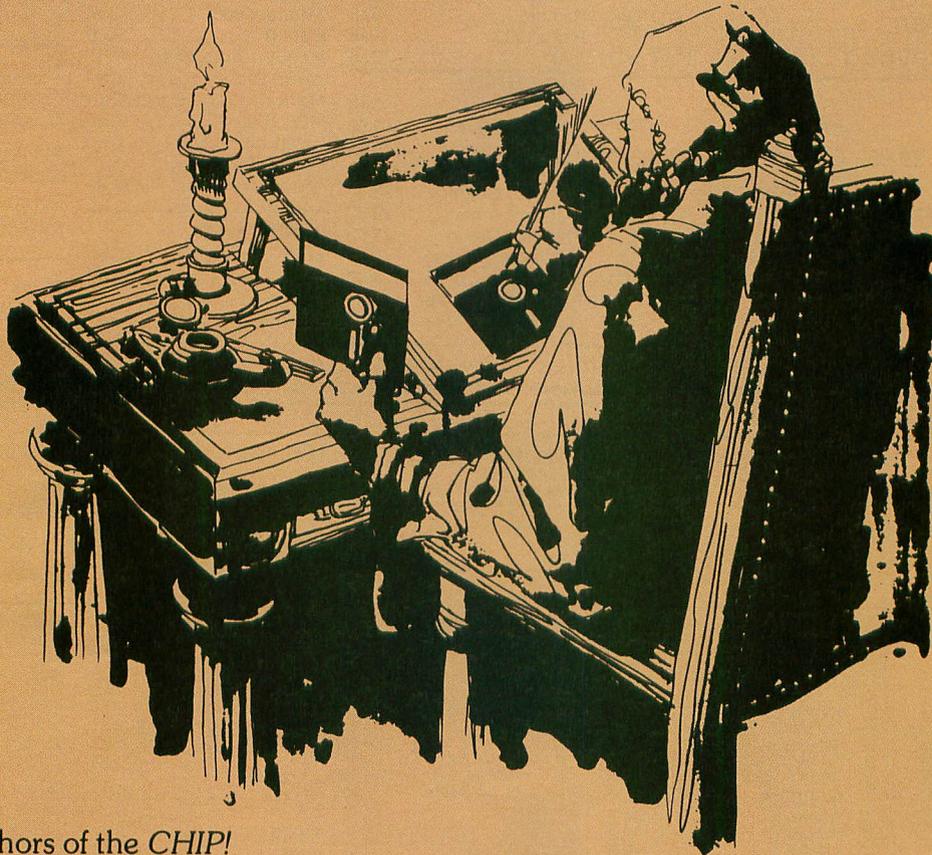
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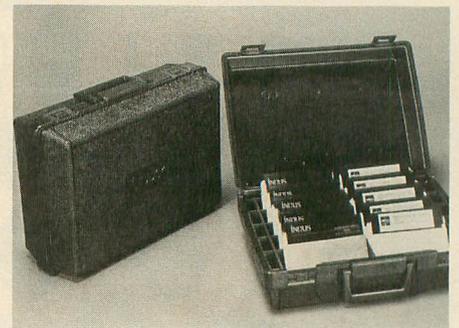
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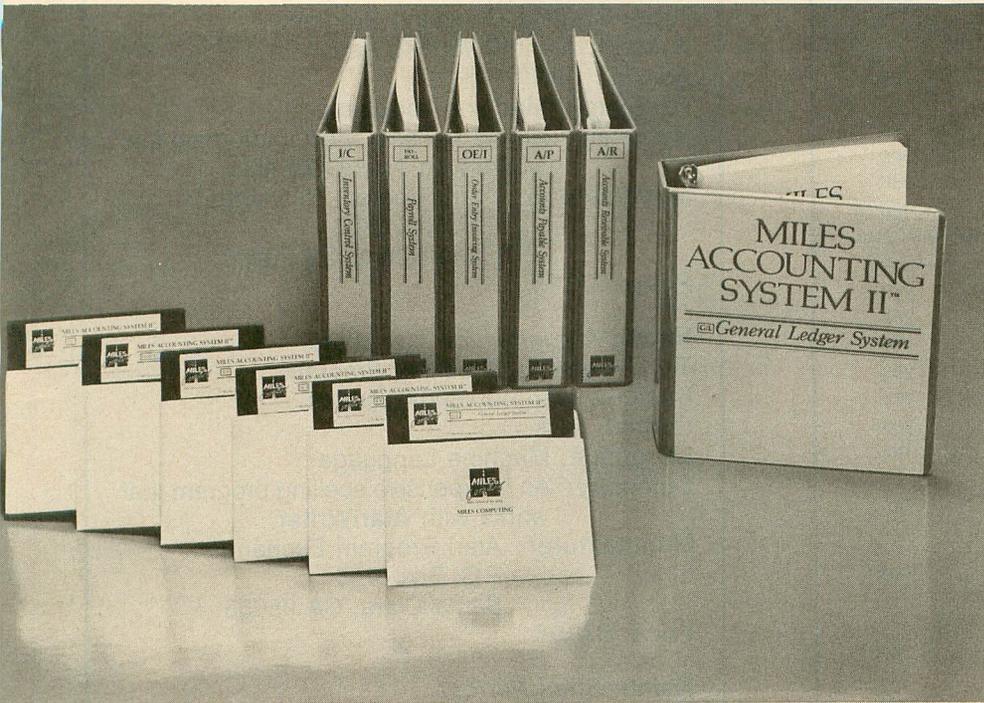
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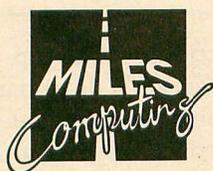
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Table 1.

	<b>Atspeller</b>	<b>Spell Perfect</b>	<b>Spell Wizard</b>
Price	\$39.95	\$79.95	\$49.95
Requires (RAM)	48K	32K	32K
Features:			
Supports 2 drives	yes	yes	yes
Add corrections to:			
Master dictionary	no	yes	yes
User dictionary	yes	no	yes
Dictionary size	30K	30K	33K
Max. number user dictionaries	1	1/disk	limited to disk size
Output to:			
Screen	yes	yes	yes
Printer	yes	no	yes
Create new file	no	yes	yes
Re-write existing file	yes	yes	yes
Search dictionary	yes	yes	yes
Word proc. access	yes	yes	yes
Ignores types of words	no	yes, less than 4 letters	no
Backup prog. poss.	yes	yes	no
Performance:			
Total words in sample text file	1591	1233	1569
Time to: (seconds)			
Load program	36	10	34
Read file		29	24
Read dictionary	540	95	143
Total time	540	124	167
Words/minute	177	597	563

ria for judging a program of this type. Ease of use is the other criterion. The Atari spelling checking programs are much easier to work with than **Spellstar**. It is important to realize that there are trade-offs with any program, and the choice finally comes down to deciding which program best suits your particular needs.

Table 1 lists the various features of each of the spelling checking programs. As can be seen, **Spell Perfect** is the fastest (597 words per minute) at checking my sample text file containing 1569 words. Since LJK's program ignores words of three letters or less, the word count was only 1233. **Atspeller** was the slowest, at only 177 words per minute. This is partly the result of the program's reading both the dictionary and text files alternately, and displaying the mismatches in reverse video on the screen.

The text file I used for the benchmark is representative of what I typically write, and I have only used the main dictionary for checking. Creating a user dictionary will speed up the checking process at the expense of lengthening the dictionary loading time. Obviously, more or less unknown words will affect the performance of the program.

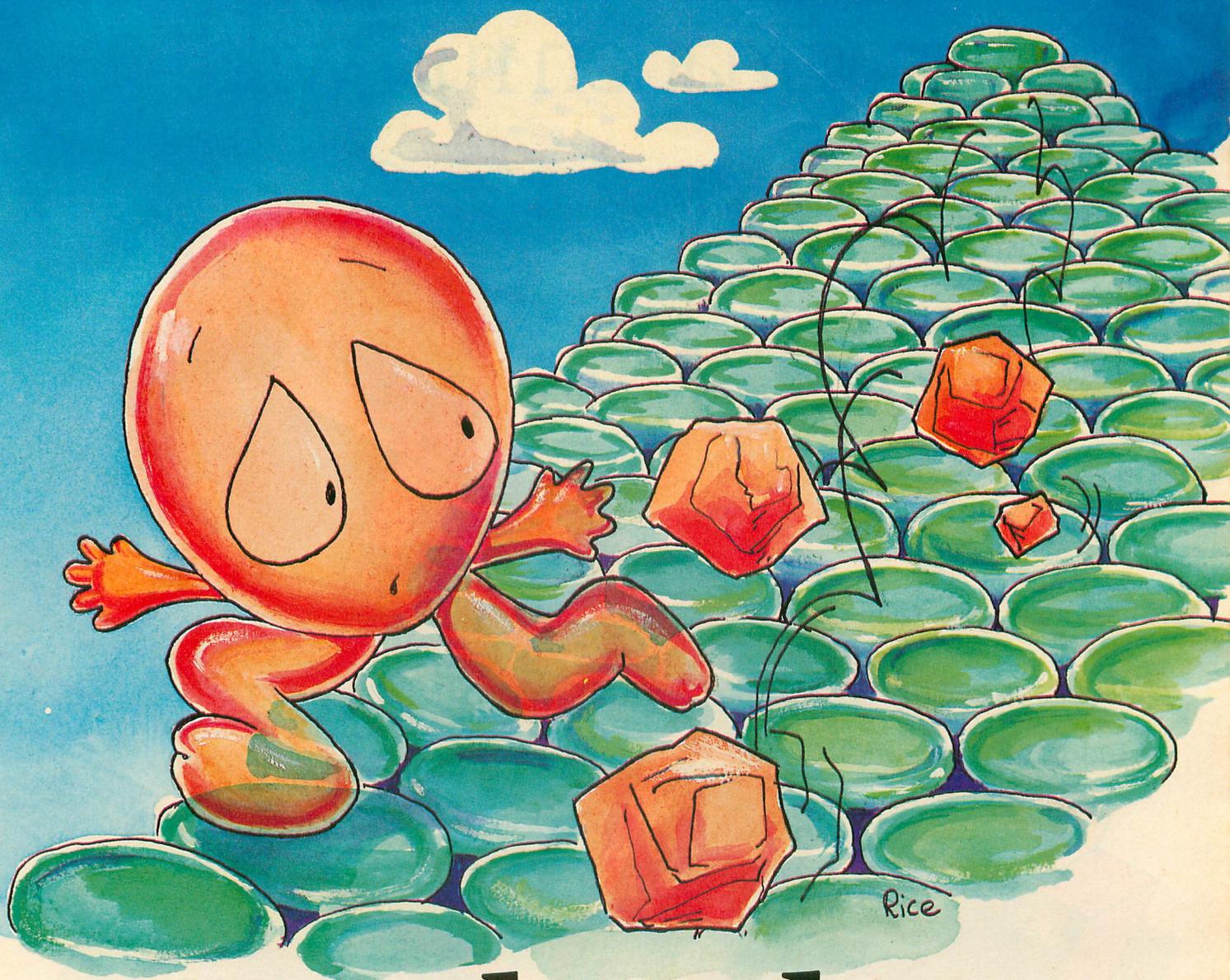
If only one disk drive is used with any of these programs, some disk swapping must occur. This is especially true when you decide to use the master dictionary to look up the spelling of a particular

## Software summary.

**Name: Atspeller****Type:** Spelling Checking Program**System:** Atari 400/800XL series**Format:** Disk**Language:** Machine Language**Summary:** An inexpensive spelling program that works with Atari DOS files.**Manufacturer:** Atari Program Exchange  
P.O. Box 3705  
Santa Clara, CA 95055**Price:** \$39.95**Name: Atspeller for AtariWriter****Type:** Spelling Checking Program**System:** Atari 400/800XL series**Format:** Disk**Language:** Machine Language**Summary:** An inexpensive spelling program that works with **AtariWriter**.**Manufacturer:** Atari Program Exchange  
P.O. Box 3705  
Santa Clara, CA 95055**Price:** \$39.95**Name: Spell Perfect****Type:** Spelling Checking Program**System:** Atari 400/800XL series**Format:** Disk**Language:** Machine Language**Summary:** A usable spelling program for LJK format files.**Manufacturer:** LJK Enterprises  
7852 Big Bend Blvd.  
St. Louis, MO 63119  
(314) 962-1855**Price:** \$79.95**Name: Spell Wizard****Type:** Spelling Checking Program**System:** Atari 400/800XL series**Format:** Disk**Language:** Machine Language**Summary:** A useful spelling program for Atari DOS files. The best value.**Manufacturer:** Datasoft, Inc.  
9421 Winnetka Ave.  
Chatsworth, CA 91311  
(213) 701-5161**Price:** \$49.95

word. I rarely use this dictionary look-up feature. Instead, I keep a pocket Webster's dictionary close at hand — I find it faster and easier to use.

All of the programs described in this article are useful for checking your documents for spelling and typographical errors. As long as you keep in mind the inherent limitations of this type of program, any one will probably meet your casual writing needs. □



# Avalanche

16K Cassette or 24K Disk

by Tommy Bennett

This month, **ANALOG** continues its custom of printing assembly-language games with **Avalanche**, a public-domain game of skill for one player.

## 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 **Avalanche**. The data statements are listed in hexadecimal (base 16), so the program will fit in 16K cassette systems. This makes typing more difficult, but it's a necessary evil.

Listing 2 is the assembly-language source code for **Avalanche**, created with the OSS MAC/65 assembler. You *do not* 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 **Avalanche**.

## Cassette instructions.

1. Type Listing 1 into your computer using the BASIC cartridge, and verify your typing with **C:CHECK** (see page 27).
2. Type **RUN** and press **RETURN**. The pro-

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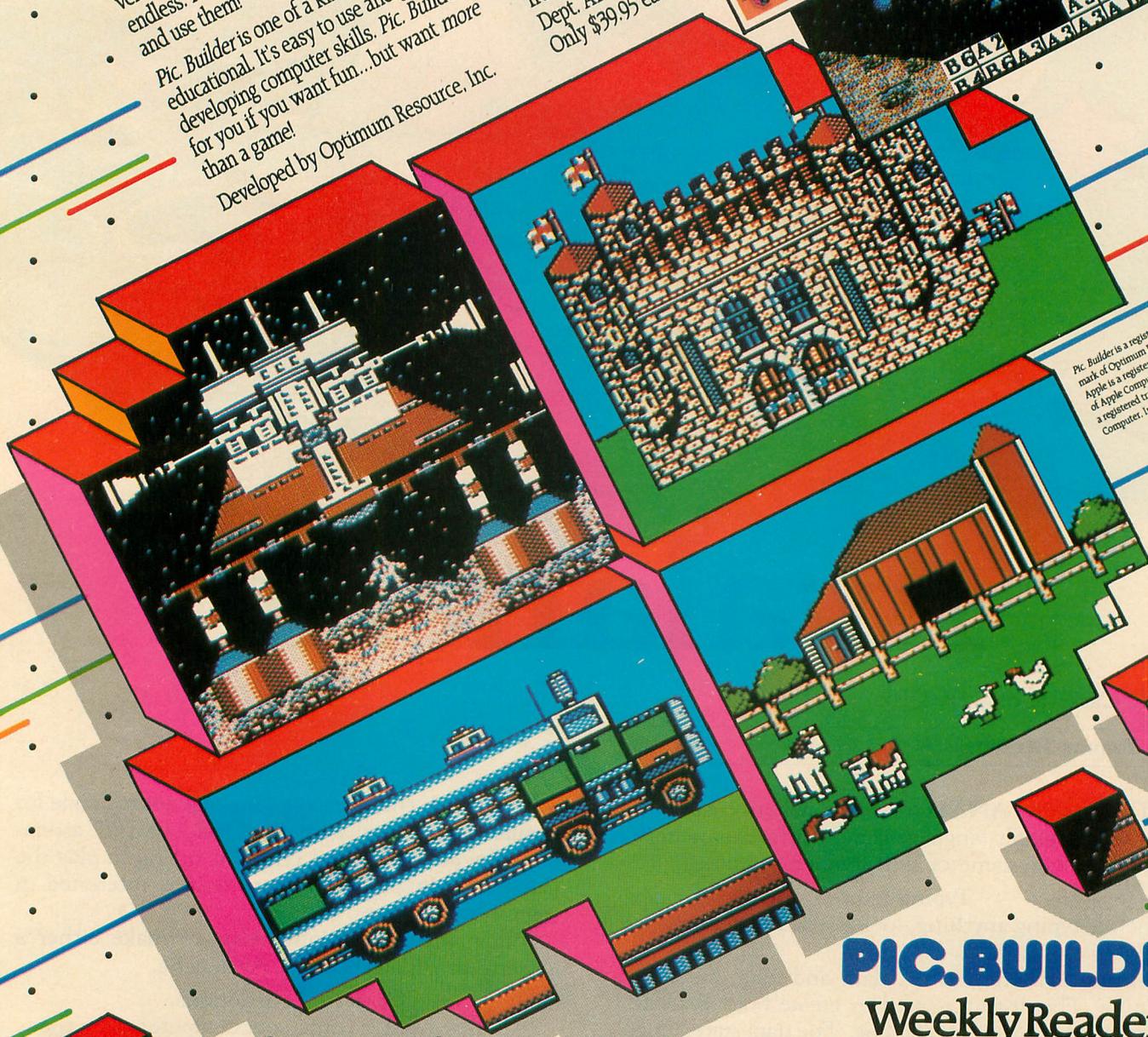
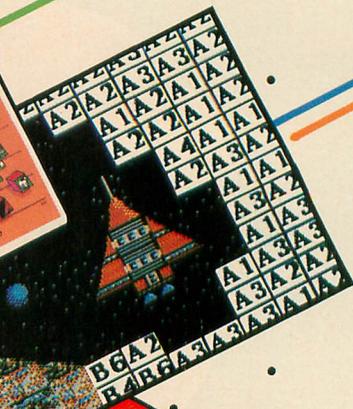
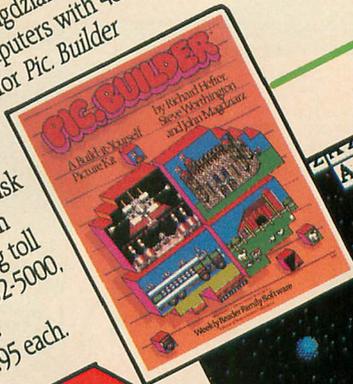
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gram will begin and ask:

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

3. When all DATA lines are correct, the computer will beep twice and prompt you to "READY CASSETTE AND PRESS RETURN." Insert a blank cassette in your recorder, press the RECORD and PLAY buttons simultaneously and hit RETURN. The message "WRITING FILE" will appear, and the program will create a machine-language boot tape version of *Avalanche*, printing each DATA line number as it goes. When the READY prompt appears, 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, while 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 *Avalanche* will load and run automatically.

**Disk instructions.**

1. Type Listing 1 into your computer using the BASIC cartridge, and verify your typing with D:CHECK2 (see page 27).

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

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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. *Avalanche* will load and run automatically.

#### Playing the game.

Plug a joystick in port 1 and press the fire button to start the game. Up at the top of the screen is a letter "N," which stands for normal play. Pressing the OPTION key will switch this to an "H," which stands for hard play.

The object of *Avalanche* is to claim the whole side of the mountain as yours. You claim each square by moving Leroy onto a square and changing it to the object color. The object color is indicated by the flashing arrows in the upper left corner. On the first level, you just have to jump on a square once to change it to the object color. On level two, you must jump on it twice, and so on.

There are up to six different levels, each having four rounds. When you complete a round, you get a bonus of 1000 points. You'll receive 25 points for changing the color of a square.

While you're doing all this, you also have to avoid the falling rocks and Big George. Big George wears a baseball hat and will chase after you. The only way you can get rid of him is to make him follow you into the path of a rock. If a rock hits him, he is out of commission for now, but he'll be back soon. There's also a little green man called Henry. Henry won't hurt you, but he will change the color of the squares back to their original. To stop him, all you have to do is touch him — and you'll get 200 points.

You get an extra man at every 10,000 points. Leroy is moved via the joystick, in four diagonal directions. It may seem difficult to move at first, but you'll get used to it after a while. Happy gaming! □

#### BASIC listing.

```
10 REM *** AVALANCHE ***
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$) <> 90 THEN 220
60 DATLIN=PEEK(183)+PEEK(184)*256: IF D
ATLIN <> LINE THEN ? "LINE "; LINE: " MISS
ING!": END
70 FOR K=1 TO 89 STEP 2: D1=ASC(DAT$(K,
K))-48: D2=ASC(DAT$(K+1,K+1))-48: BYTE=H
EX(D1)*16+HEX(D2)
```

```
80 IF PA55=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 PA55=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 116:PUT #1,0:NEXT X:CLO
SE #1:END
170 IF NOT DSK THEN 200
180 ? "INSERT DISK WITH DOS, PRESS RET
URN";:DIM IN$(1):INPUT IN$:OPEN #1,8,0
,"D:AUTORUN.5Y5"
190 PUT #1,255:PUT #1,255:PUT #1,0:PUT
#1,32:PUT #1,99:PUT #1,52: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":PA55=2:LINE=99
0:RESTORE 1000:TRAP 120:GOTO 50
220 ? "BAD DATA: LINE ";LINE:END
230 DATA 0,42,216,31,255,31,169,0,141,
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 2065E4A9008D088D2A9018584A9AE
858520CF2C20DA21208C23200F2320FA2220AD
23205D23A20FBDA6339D3E36,360
1010 DATA BDB6339DBA37BDC6339DCE37CA10
EBAD8402D013208C23200F2320FA22205D23A9
00854D4C8120AD1FD0C903D0,228
1020 DATA 19A585C9AED008A9A88585A901D0
06A9AE8585A900858420AA24A5858D0936A914
20D3214C3C2020BD2120C821,64
1030 DATA AD120609108D1236AD130609108D
2636A207BD74339D4236CA10F7A97820D32120
BD21A9148D0306AE1306BDD6,982
1040 DATA 338DD822BDD8B338DE022BDE0338D
E522BDE5338DEA22208C2320F124A9018D1406
20AD23AD2006C901F0034C7A,23
1050 DATA 21EE130620E323207924A900854D
AD1306C905D013EE1206A9018D1306AD120685
83200F234C1421A9008D0206,400
1060 DATA 200F234C812020C821A204BD7C33
90BF37CA10F7AD120609108DC537A20BA9968D
00D2A9A88D01D2A91C8DD822,117
1070 DATA A9888DE022A90620D321A9328D00
D2A9888D0822A91C8DE022A90620D321CA10D0
A9008D01D220C821AD1206C9,195
1080 DATA 07D004A9068583A9008D20068D02
064C8120C902F0034C9B21C689A20FA9788D00
D28A09108D01D2A90520D321,414
1090 DATA CA10ED4CA221C689A9018D6F0220
7924A589D00EA208BD81339D4236CA10F74C3C
2020FA224C8120A213A9009D,121
1100 DATA 3C36CA10FA60A227A9009DB837CA
10FA608582A582D0FC60A2008D00E09D00388D
00E19D0039CAD0F1A22FBDEA,942
1110 DATA 339D1838CA10F7A9388DF402A93E
8D2F02A9338D3102A9548D3002A9038D1DD0A9
388D07D4A9268DC002A9348D,623
1120 DATA C1028DC2028DC302A97C8D00D0A9
748D01D08D02D08D03D0A9018D6F02A90F8DC4
02A9288DC502A9888DC602A9,784
1130 DATA D68DC702A9228D0102A97D8D0002
A22A074A907205CE4A900AA9D00369D036E8
E0F0D0F5A9C08D0ED460A582,393
1140 DATA F002C6824C622E448A9448D0AD48D
16D0A9228D0102A9928D08D0026840048A9588D0A
D48D17D0A9228D0102A9A78D,269
1150 DATA 0002684048A5CB8D0AD4C928D012
A9085CBA5CC1006A90085CCF004A98E85CCA5
CC8D16D0E6CBA9228D0102A9,692
1160 DATA D68D0002684048A90E8D0AD48D16
D0A9FC8D17D0A9928D18D0A9428D19D0A9228D
0102A97D8D00026840A9468D,628
1170 DATA 2836A95D8D2936A58938E9010910
8D2A3660A9368581A9A98580A9018586A486B9
1A3A91808810F8A586186902,355
1180 DATA C90FF0128586A5801869278580A5
81690085814C1B2320AA24A9008D12368D2636
A205BD90339D0C36BD96339D,791
```

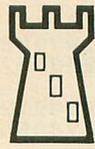
1190 DATA 2036CA10F160A205A9109D0036BD  
8A339D5036CA10F2A9348D6636A92F8D6736A9  
078D8D36A9438D8E36A9448D,619  
1200 DATA 8F36A9088D903660A9018D120685  
838D1306A9048589A9008D1406A9028D5A06A9  
608587A910858860A9008D01,774  
1210 DATA D28D03D28D05D28D07D260A583C9  
01F004C904D007ADE0228D942260C902F004C9  
05D007ADE5228D942260ADEA,290  
1220 DATA 228D942260A2148D28348D00D2A9  
AA8D01D2BD3D3420D32120E624CA10E9A23C8E  
00D220E624A90220D321E8E8,358  
1230 DATA E8E05190EE8E00D220E624A90220  
D321CACACAE039D0EEA9008DC802A9608587A2  
0A8A09A08D01D2A90420D321,32  
1240 DATA CA10F2A9008D01D2A209BD9C339D  
BD37CA10F7AD1C06186901C91AD018AD1B0618  
6901C91AD00EAD1B06186901,363  
1250 DATA 8D1B068D0136A9108D1C068D0236  
A9C820D32160AD0136C588F002B00160E688E6  
8920FA22A202A9208D00D2A0,32  
1260 DATA 0F9809A08D01D2A90320D3218810  
F2CA10EDA9008D01D260A5848D1C258D3325AD  
1206C903D011AD1306C901F0,632  
1270 DATA 04C903D006A9008D332560AD1206  
C907D006A9008D1C2560C908F0E9C90990EAA9  
008D1C25F0DEA58718690205,309  
1280 DATA 878DC8026020322C20E32CAD2006  
C900F00160AD2A06C901D0062058254C1525AD  
78028D3106205825200226AD,882  
1290 DATA 5706C901D008A9008D5706204D27  
4C2F25A9018D5706AD5806C901D008A9008D58  
062080254C4625A9018D5806,388  
1300 DATA 20CA28200C3220453120262C2060  
314CF724AD2606C901D00160AD3106C909D003  
40CE2FC905D0034C282FC906,853  
1310 DATA D0034C5C2FC90AD0034C422F60AD  
2706C901D00160AD3206C950F004EE320660AD  
3606C901D0034CF525AD3906,95  
1320 DATA C901F00EAD0AD2300160A9018D39  
0620BA2EAD4206C901D0034CDE2520F42F20F4  
2F20F42F20F42FAD0B06C96D,512  
1330 DATA B00160A9018D42068D2706A9AF8D  
2E0660A9018D3606AD0AD23008A9008D3C064C  
F525A9018D3C06AD3C06C901,359  
1340 DATA D0034C82F4CC22FAD2806C901D0  
0160AD3306C928F004EE330660AD4606C901D0  
034CC826AD3406C901D0034C,732  
1350 DATA 5326AD1306C902D0034C3A26C904  
F0034C5326AD4506C932F012AD4706C902900B  
AD0AD23006EE45064CC826AD,894  
1360 DATA 3706C901D0034C8B26AD3A06C901  
F014AD0AD2300160A9018D3A068D3406EE4706  
20CC2EAD4306C901D0034CA4,976  
1370 DATA 26204930204930204930204930AD  
0C06C96DB00160A9018D43068D2806A9AF8D2F  
0660A9018D3706AD0AD23008,426  
1380 DATA A9008D3D064CBB26A9018D3D06AD  
306C901D0034C0D304C2130A9018D4606A900  
8D4706AD4C06C901D0034C40,11  
1390 DATA 27AD4B06C901F008A9018D4B0620  
502DAD4D06C901D0034C172720493020493020  
4930204930AD0C06C968B001,395  
1400 DATA 60A9018D4D068D2806A9AF8D2F06  
60A9018D4C06EE4A06EE4A06AD0AD2300EA900  
8D4806EE490620502D4C4027,231  
1410 DATA A9018D4806CE490620682DAD4806  
C901D0034C0D304C2130AD2906C901D00160AD  
5006C901D0034CF727AD3506,37  
1420 DATA C901D0034C8227AD1306C903B003  
4C8227AD4E06C9029008AD0AD230034CF727AD  
3806C901D0034CEA27AD3B06,174  
1430 DATA C901F014AD0AD2300160A9018D3B  
068D3506EE4E0620ED2EAD4406C901D0034CD3  
2720DE3020DE3020DE3020DE,533  
1440 DATA 30AD006C96DB00160A9018D4406  
8D2906A9AF8D300660A9018D3806AD0AD23008  
A9008D3E064CEA27A9018D3E,486  
1450 DATA 06AD3E06C901D0034C64304C7830  
A9018D5006AD5306C901D0034CAF28AD5106C9  
01F008A9018D510620B12DAD,512  
1460 DATA 5206C901D0034C412820DE3020DE  
3020DE3020DE30AD006C962B00160A9018D52  
068D2906A9AF8D300660A901,558  
1470 DATA 8D5306AD0006CD0406B032AD0106  
CD0506F016901420B12DCE0406EE0506EE0506  
A9008D4F064CAF2820DE2DCE,389

1480 DATA 0406CE0506CE0506A9028D4F064C  
AF28AD0106CD0506F016901420C92DEE0406EE  
0506EE0506A9018D4F064CAF,14  
1490 DATA 2820F32DEE0406CE0506CE0506A9  
038D4F06AD4F06C900D0034C6430C901D0034C  
7830C902D0034C8C304CA030,967  
1500 DATA AD2606C901F0034CF029AD2D068D  
01D2CE2D06AD2D06C9A0F0034CF029A9008D01  
D28D26068D2A06A9088D0E06,237  
1510 DATA AD04D0C900D00420732E6020DD2B  
AD1206C901D0034C3C29C902D0034C4C29C903  
D0034C7F29C904D0034C6629,308  
1520 DATA C905D0034CA329C906D0034CC629  
C907D0034C7F294CC629AD04D0C901D006EE02  
0620A314CF029AD04D0C901,830  
1530 DATA D00620A314CF029C902D006EE02  
062033314CF029AD04D0C901D009EE0206202A  
314CF029C902062018314CF0,841  
1540 DATA 29AD04D0C901D006202A314CF029  
C902D0062033314CF029C904D056EE0206203C  
314CF029AD04D0C901D00620,145  
1550 DATA 2A314CF029C902D009EE02062033  
314CF029C90206202A314CF029AD04D0C901D0  
0620A314CF029C9020620,172  
1560 DATA 33314CF029C904D009EE0206203C  
314CF029C90206203331A200A000207F2BAD24  
06C901F0034CA2AAC006A2,820  
1570 DATA 008A9003DE8CAE00AD0F7A9008D  
3206A20020B82BAD4606C901D0034CBE2AA201  
A002207F2BAD2406C901F003,237  
1580 DATA 4C512AAC06A2008A99003EE8C8  
E00AD0F7A9008D33068D3406A20120B82BAD50  
06C901F029A202A004207F2B,522  
1590 DATA AD2406C901F00160AC0D06A2008A  
99003FC8E8E00AD0F7A9008D3506A20220B82B  
60AD2906C901F00160AD3006,978  
1600 DATA 8D07D2CE3006AD3006C9A0F00160  
AD07D0C900D00CA9058D2306206E3220DA3160  
A9008D07D28D29068D5306A9,387  
1610 DATA 088D110660AD2806C901F0034C51  
2AAD2F068D05D2CE2F06AD2F06C9A0F0034C51  
2AA9008D05D2AD06D0C9000,709  
1620 DATA 3220802DA9008D48068D4D068D46  
068D4C068D28068D3306A90A8D4A06A9088D49  
068D1006A92D8D0C06A9748D,163  
1630 DATA 02D08D090660A9008D28068D4C06  
A9088D1006AD06D0C901D0016020492BA94C85  
8A933858BAD49068D5906AD,255  
1640 DATA 4A068D5A0620282E60AD1206C901  
F013C902F017C903F018C904F007C905F008B4C  
732BAD06D0C902F01160AD06,646  
1650 DATA D0C904F00960AD06D0C908F00160  
CE020660BD2706C901F00160BD2E069903D2DE  
2E06BD2E06C9A0F00160A900,409  
1660 DATA 9903D2BD05D0C900D006A9018D24  
0660A9009D27069D3606A9089D0F0660A9009D  
36069D27069D39069D42068D,258  
1670 DATA 2406A9089D0F06A92D9D0B068D54  
069D01D09D080660AD3106C909F00DC905F013  
C906F023C90AF01560CE006,373  
1680 DATA EE106EE010660EE0006EE0106EE  
010660CE0006CE0106CE010660EE0006CE0106  
CE010660AD00068D5906AD01,878  
1690 DATA 068D5A0660AD2FFAC030688D0FDCA  
D0F760AD1406C900D011A9008D0206A910A200  
9D1A06E8E006D0F8A900A200,893  
1700 DATA 9D2006E8E064D0F8A9088D0E068D  
0F068D10068D1106A9098D0006A9088D0106A9  
0A8D04068D05068D4A06A908,457  
1710 DATA 8D4906A97C8D06068D00D0A9558D  
0706A9748D08068D09068D01D08D02D08D5406  
8D5506A9848D0A068D5608D,472  
1720 DATA 03D0A92D0806068D00C068D000618  
A9A8D00D269A8D02D269A8D04D269A8D06  
D2A9018D1ED0A900A2FF9D00,790  
1730 DATA 3C9D003D9D003C9D003FCAD0F160  
AD2506C909F011AC0706A200BD43299003CC8  
E8E010D0F460AD2506C905F0,782  
1740 DATA 1420A02D0C0706A2008D0B4329900  
3CC8E8E010D0F460AD2506C90AF01420A02DAC  
0706A200BDC43299003CC8E8,589  
1750 DATA E00F00F460AD2506C906F01420A0  
2DAC0706A2008D033299003CC8E8E00FD0F460  
20802DAC0C06A2008D23299,700  
1760 DATA 003EE8CE00D0F420902D602080  
2DAC0C06A2008D0EE3299003CC8E8E00D0F420  
902D60AC0C06A2008A99003E,592

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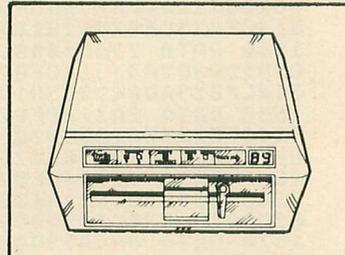
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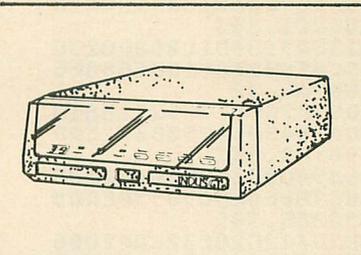
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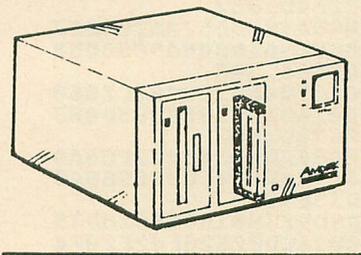
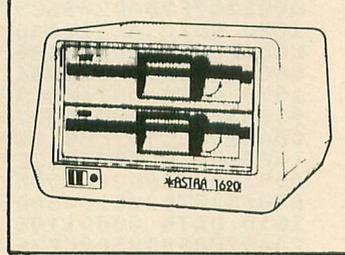
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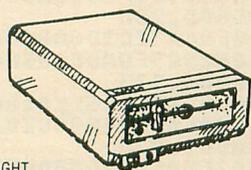
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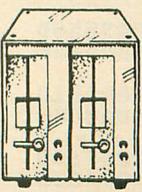
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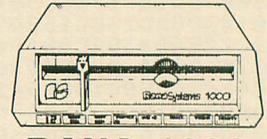
- Double Density
  - Double Sided
- For use with AMDEK or ATR-8000
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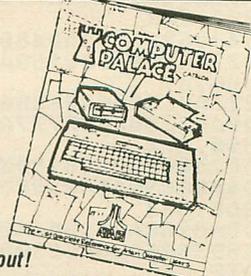
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CHKEND	JSR BONLIF ;BONUS LIFE CHECK LDA TOM ;MORE LIVES? BNE NOTEND ;YES! LDX #9 ;NO, SHOW END MESSAGE		PLA RTI PHA LDA #58 ;SET COLPF1 STA WSYNC STA #D017 LDA # >DLI3 ;POINT TO DLI #3 STA #0201 LDA # <DLI3 STA #0200 PLA RTI PHA	STA DISP4, X DEX BPL ZSCLP LDA #52 STA DISP5+2 ;SET UP ARROWS... LDA #47 ;AND COLOR INDICATOR STA DISP5+3 LDA #7 STA DISP7+1 LDA #47 STA DISP7+2 LDA #68 STA DISP7+3 LDA #8 STA DISP7+4 RTS	
SHOEND	LDA ENDM88, X STA DISP3+4, X DEX BPL SHOEND JMP CKSTR8 ;80 CHECK RESTART JSR SHOLIV ;SHOW LIVES LEFT JMP READY ;AND PLAY!		LDX #19 ;ERASE JRD SCREEN LINE LDA #0 STA DISP3, X DEX BPL CL3LP RTS	STA #CB ;TOBBLE... STA WSYNC ;FLASHING... CMP #028 ;ARROW... BNE DLI3B ;COLORS	INILVL LDA #1 ;START AT... STA LEVEL ;LEVEL 1, STA LVL STA ROUND ;ROUND 1 LDA #4 ;4 LIVES! STA TOM LDA #0 ;SET START FLAG STA START LDA #2 ;SET MISC VARIABLES STA ROW LDA #96 STA COLR LDA #16 STA PNT RTS
NOTEND	LDX #19 ;ERASE JRD SCREEN LINE LDA #0 STA DISP3, X DEX BPL CL3LP RTS		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS	STA #CB LDA #0 STA #CC LDA #0 BPL DLI3A LDA #0 STA #CC BEQ DLI3B LDA #88E STA #CC LDA #CC STA #D016 ;PF 0 LDA # >DLI4 ;POINT TO DLI #4 LDA # <DLI4 STA #0200 PLA RTI PHA	LDA #0 ;TURN OFF... STA AUDC1 ;SOUND CHANNEL 1 STA AUDC2 ;SOUND CHANNEL 2 STA AUDC3 ;SOUND CHANNEL 3 STA AUDC4 ;SOUND CHANNEL 4 RTS LDA LVL ;SET LEVEL CMP #1 ;LEVEL 1? BEQ L14 ;YES! CMP #4 ;LEVEL 4? BNE CL25 ;NO! CHECK 2/5 LDA DLI4C2+1 ;SET COLOR STA DLI2C1+1 RTS CMP #2 ;LEVEL 2? BEQ L25 ;YES! CMP #5 ;LEVEL 5? BNE L36 ;NO! LDA DLI4C3+1 ;SET COLOR STA DLI2C1+1 RTS LDA DLI4C4+1 ;SET COLOR STA DLI2C1+1 RTS
CLINE3	LDX #19 ;ERASE JRD SCREEN LINE LDA #0 STA DISP3, X DEX BPL CL3LP RTS		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS	CL25 CMP #2 ;LEVEL 2? BEQ L25 ;YES! CMP #5 ;LEVEL 5? BNE L36 ;NO! LDA DLI4C3+1 ;SET COLOR STA DLI2C1+1 RTS LDA DLI4C4+1 ;SET COLOR STA DLI2C1+1 RTS	
CL3LP	LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS	L25 LDA DLI4C3+1 ;SET COLOR STA DLI2C1+1 RTS L36 LDA DLI4C4+1 ;SET COLOR STA DLI2C1+1 RTS	
CLINE22	LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS	BONUS LDX #20 ;PLAY MUSIC LDA NOTE, X ;SET NOTE STA AUF1 LDA #AA STA AUDC1 LDA DUR, X ;SET DURATION JSR WAIT ;WAIT JSR COLCYC ;CYCLE COLORS DEX ;MORE NOTES? BPL MUSLP ;YES! LDX #60 ;DO DOWN-SLUR STX AUF1 JSR COLCYC LDA #2 JSR WAIT INX INX CPX #81 BCC MDOWN ;NOW UP-SLUR STX AUF1 JSR COLCYC LDA #2 JSR WAIT DEX DEX CPX #57 BNE MUP LDA #0 ;RESET BACKEND COLOR STA COLBK LDA #96 STA COLR LDA #10 ;FAND FADE OUT... TXA ;LAST NOTE ORA #A0 STA AUDC1 LDA #4 JSR WAIT DEX BPL FADE ;SHUT OFF SOUND LDA #0 STA AUDC1 ;SHOW BONUS MESSAGE LDX #9 LDA BONM88, X STA DISP22+5, X DEX BPL SHOBMS	
CL22LP	LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS	MDOWN STX AUF1 JSR COLCYC LDA #2 JSR WAIT DEX DEX CPX #81 BCC MDOWN ;NOW UP-SLUR STX AUF1 JSR COLCYC LDA #2 JSR WAIT DEX DEX CPX #57 BNE MUP LDA #0 ;RESET BACKEND COLOR STA COLBK LDA #96 STA COLR LDA #10 ;FAND FADE OUT... TXA ;LAST NOTE ORA #A0 STA AUDC1 LDA #4 JSR WAIT DEX BPL FADE ;SHUT OFF SOUND LDA #0 STA AUDC1 ;SHOW BONUS MESSAGE LDX #9 LDA BONM88, X STA DISP22+5, X DEX BPL SHOBMS	
WAIT	STA TIMER ;SET TIMER LDA TIMER ;GET TIMER BNE WAITLP ;NOT ZERO YET RTS ;TIME'S UP! LDX #0 ;COPY CHAR SET		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS	FADE TXA ;LAST NOTE ORA #A0 STA AUDC1 LDA #4 JSR WAIT DEX BPL FADE ;SHUT OFF SOUND LDA #0 STA AUDC1 ;SHOW BONUS MESSAGE LDX #9 LDA BONM88, X STA DISP22+5, X DEX BPL SHOBMS	
WAITLP	STA TIMER ;SET TIMER LDA TIMER ;GET TIMER BNE WAITLP ;NOT ZERO YET RTS ;TIME'S UP! LDX #0 ;COPY CHAR SET		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS	SHOBMS LDA #16 STA DISP, X LDA CHGM88, X ;SET CHANGE TO M88	
SETCHR	LDX #0 ;COPY CHAR SET LDA #0000, X STA CHSET, X LDA #E100, X STA CHSET+0100, X DEX BNE MOVCHR ;AND CHANGE... LDX #47 ;AND CHANGE... LDA NEWCHR, X ;THE CHARACTERS... STA CHSET+24, X ;WE'RE USING!		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS		
MOVCHR	LDX #0 ;COPY CHAR SET LDA #0000, X STA CHSET, X LDA #E100, X STA CHSET+0100, X DEX BNE MOVCHR ;AND CHANGE... LDX #47 ;AND CHANGE... LDA NEWCHR, X ;THE CHARACTERS... STA CHSET+24, X ;WE'RE USING!		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS		
CHGCHR	LDX #0 ;COPY CHAR SET LDA #0000, X STA CHSET, X LDA #E100, X STA CHSET+0100, X DEX BNE MOVCHR ;AND CHANGE... LDX #47 ;AND CHANGE... LDA NEWCHR, X ;THE CHARACTERS... STA CHSET+24, X ;WE'RE USING!		LDX #39 ;ERASE LAST 2... LDA #0 ;SCREEN LINES STA DISP22, X DEX BPL CL22LP RTS		

```

LDA SCORE+2 ;ADD 1000 POINTS
CLC
ADC #1
CMP #24
BNE SHOSP2
LDA SCORE+1
CLC
ADC #1
CMP #24
BNE SHOSP2
LDA SCORE+1
CLC
ADC #1
STA SCORE+1
STA DISP+1
LDA #16
STA SCORE+2
STA DISP+2
LDA #200 ;WAIT 200 JIFFIES
RTS
WAIT

SHOSP2 LDA DISP+1 ;SET SCORE
CMP PNT ;> BONUS AMT?
BEQ BRRET ;NO!
BCS BONUSL ;YES!

BRRET RTS
BONUSL INC PNT ;INC BONUS LEVEL
INC TOM ;1 MORE LIFE
JSR SHOLIV ;SHOW LIVES
LDX #2 ;3 BONUS SOUNDS
LDA #32 ;PITCH = 32
STA AUDF1
LDY #15 ;VOLUME 15

BLB1 TYA
BLB2 ORA #A0
STA AUDC1
LDA #3 ;LEAVE ON 3 JIFFIES
JSR WAIT
DEY
BPL BLB2 ;NEXT VOLUME
DEX
BPL BLB1 ;TURN OFF SOUND
LDA #0
STA AUDC1

STODIF LDA OPT ;SET DIFF FLAG
STA OPTN1+1 ;STORE IN...
STA OPTN2+1 ;PROGRAM
LDA LEVEL ;GET LEVEL
CMP #3 ;LEVEL 3?
BNE NOTL3 ;NO!
LDA ROUND ;GET ROUND
CMP #1 ;ROUND 1?
BEQ SET1 ;YES!
CMP #3 ;ROUND 3?
BNE NOTL3 ;NO!
LDA #0 ;SET DIFFICULTY
STA OPTN2+1

SET1 DIFRTS RTS
NOTL3 LDA LEVEL ;GET LEVEL #
CMP #7 ;LEVEL 7?
BNE NOTL7 ;NO!
LDA #0 ;SET DIFF
STA OPTN1+1

RTS
NOTL7 CMP #8 ;LEVEL 8?
BEQ SET1 ;YES!
CMP #9 ;LEVEL 9?
BCD DIFRTS ;NO!
LDA #0 ;SET DIFF
STA OPTN1+1

COLCYC LDA COLR ;GET COLOR FLAG
CLC ;ADD 2
ADC #2
STA COLR ;SAVE IT
STA COLBK ;AND SET BACKGND
RTS

;-----
;START OF PROGRAM
;-----
GAME JSR SETUP ;INIT.....
JSR FIG1

;-----
;MAIN LOOP
;-----
MAIN LDA BACK ;BACK TO
CMP #000
BEQ CHKSTK ;CONTROLLER?
RTS
LDA MOVFLB ;YES...
CMP #1 ;ALREADY...
BNE A1 ;NO!
JSR MOVE.MAN ;YES, MOVE MAN
JMP A2

CHKSTK LDA MOVFLB ;YES...
CMP #1 ;ALREADY...
BNE A1 ;NO!
JSR MOVE.MAN ;YES, MOVE MAN
JMP A2

A1 LDA STICK# ;CHK STICK
STA DIRECT ;SAVE STICK POS
JSR MOVE.MAN ;MOVE MAN

A2 JSR ROCK2 ;HANDLE ROCK 2
LMA #1 ;GET ADVANCE FLAG
OPTN1 ;#1 SETS DIFFICULTY
BNE A6 ;NO ADVANCE!
LDA #0 ;RESET ADV FLAG
STA TEMP
JSR ROCK3 ;HANDLE ROCK 3
JMP A5 ;SKIP NEXT CODE
LDA #1 ;SET ADV FLAG

A6 STA TEMP
A5 LDA TEMP1 ;GET ADV FLAG 2
OPTN2 CMP #1 ;#1 SETS DIFFICULTY
BNE A3 ;NO ADVANCE!
LDA #0 ;RESET ADV FLAG 2
STA TEMP1
JSR ROCK1 ;HANDLE ROCK 1
JMP A4

A3 LDA #1 ;SET ADVANCE FLAG
STA TEMP1
JSR SOUND ;DD SOUNDS
JSR CHECK ;CHECK SQUARES HIT
JSR CLEAR ;RESET P/M COLLISION
JSR DELAY ;DELAY...
JSR PL.PL ;CHECK PLR-PLR COLL.
JMP MAIN ;GO AGAIN

;-----
;MOVE MAN SUBROUTINE
;-----
MOVE.MAN LDA S01FLB ;CHK SOUND
CMP #1 ;FLB
BNE CHECKDIR

CHECKDIR LDA DIRECT ;GET STICK...
CMP #9 ;DIRECTION
BNE B1
JMP DNLEFT# ;DOWN & LEFT
CMP #5
BNE B2
JMP DNRIGHT# ;DOWN & RIGHT
CMP #6
BNE B3
JMP UPRIGHT# ;UP & RIGHT
CMP #10
BNE B4
JMP UPLEFT# ;UP & LEFT
RTS

;-----
;ROCK 1 SUB
;-----
ROCK1 LDA S02FLB ;SOUND ON?
CMP #1
BNE C1 ;NO!
RTS
LDA DRP1 ;DROPPING?
CMP #00
BEQ C11 ;NO!
INC DRP1 ;NEXT DROP
RTS
LDA B1MOV ;MOVING...
CMP #1
BNE C2
JMP MOVE1 ;YES...
LDA B1DRP ;DROPPED??
CMP #1
BEQ C3 ;YES...
LDA RANDOM ;NOT YET..
BNI C4
RTS ;DONT DROP
LDA #1 ;SET DRP..
STA B1DRP
JSR BAL1DRW ;DRAW ROCK
LDA FNB1DRP ;FINISHED..
CMP #1
BNE DROP1 ;NO...
JMP GETDIR1

DROP1 JSR DOWN1 ;DROP...
JSR DOWN1
JSR DOWN1
JSR DOWN1
LDA YPOSP1 ;FINISHED..
CMP #109
BCS D1 ;YES...
RTS ;NO....
LDA #1
STA FNB1DRP ;SET FLG..
STA S02FLB ;SOUND FLB
LDA #0AF
STA PITCH2 ;PITCH...
RTS ;RETURN...

D1 GETDIR1 LDA #1 ;GET DIRECT
STA B1MOV
LDA RANDOM
BNI J1
LDA #0 ;IT'S DOWN & RIGHT!
STA B2DIR
JMP MOVE2 ;GO MOVE IT!
LDA #1 ;IT'S DOWN & LEFT!
STA B2DIR

MOVE2 LDA B2DIR ;WHICH DIR
CMP #1 ;DN & LEFT?
BNE K1 ;NO!
JMP DNLEFT2
JMP DNRIGHT2

K1 GREEN LDA #1 ;SET BRNFLB
STA BRNFLB

E1 LDA #1 ;1=DNLEFT
STA B1DIR
;MOVE1 LDA B1DIR ;WHICH WAY?
CMP #1 ;DNLEFT??
BNE F1 ;NO...
JMP DNLEFT1 ;YES...
JMP DNRIGHT1

F1 ;-----
;ROCK 2 SUB
;-----
ROCK2 LDA S03FLB ;SOUND ON?
CMP #1
BNE G1 ;NO!
RTS

G1 LDA DRP2 ;DROPPING?
CMP #40
BEQ G11 ;NO!
INC DRP2 ;INC DROP COUNT
RTS
LDA BRNFLB ;BRN MAN
CMP #1 ;OUT....
BNE G2
JMP GREEN ;YES...
LDA BAL1FLB ;ROCK OUT??
CMP #1
BNE G3
JMP MOVBAL2 ;YES...
LDA ROUND ;CAN GREEN
CMP #2 ;COME OUT??
BNE G4 ;NO...
JMP BRNCAN ;YES...
CMP #4
BEQ BRNCAN ;NO....
JMP MOVBAL2

BRNCAN LDA MAN
CMP #30
BEQ MOVBAL2
LDA OUTFLB2 ;ROCK COME
CMP #2 ;TWICE....
BCD MOVBAL2
LDA RANDOM ;GREEN OR
BNI MOVBAL2 ;ROCK...
INC MAN ;IT'S GREEN MAN!
JMP GREEN

MOVBAL2 LDA B2MOV ;MOVING...
CMP #1
BNE H2 ;NO...
JMP MOVE2 ;YES...
LDA S2DRP ;DROPPED??
CMP #1
BEQ H3 ;YES...
LDA RANDOM ;NOT YET...
BNI H4
RTS
LDA S2DRP ;SET DRP..
STA S2DRP
STA BAL1FLB
INC OUTFLB2
JSR BAL2DRW ;DRAW ROCK
LDA FNB2DRP ;FINISHED..
CMP #1
BNE DROP2 ;NO...
JMP GETDIR2

DROP2 JSR DOWN2 ;ADVANCE...
JSR DOWN2 ;FOUR...
JSR DOWN2 ;TIMES
JSR DOWN2 ;DONE DROPPING?
LDA YPOB2
CMP #109
BCS I1 ;YES!
RTS
LDA #1 ;FINISHED!
STA FNB2DRP
STA S03FLB
LDA #0AF
STA PITCH3
RTS

GETDIR2 LDA #1 ;ROCK 2 MOVING
STA B2MOV
LDA RANDOM ;GET RANDOM DIR
BNI J1
LDA #0 ;IT'S DOWN & RIGHT!
STA B2DIR
JMP MOVE2 ;GO MOVE IT!
LDA #1 ;IT'S DOWN & LEFT!
STA B2DIR

J1 MOVE2 LDA B2DIR ;WHICH DIR
CMP #1 ;DN & LEFT?
BNE K1 ;NO!
JMP DNLEFT2
JMP DNRIGHT2

K1 GREEN LDA #1 ;SET BRNFLB
STA BRNFLB

```

```

LDA #0
STA OUTFLB2
LDA GRNMOV #MOVING?
CMP #1
BNE L1
JMP MOVEBRN #YES MOVE IT!
L1 LDA GRNDRP #DROP YET?
CMP #1
BEQ L2
LDA #1
STA GRNDRP #FOR DROP
JSR GRN# #DRAW
L2 LDA GRNFDRP #DRAW DONE?
CMP #1
BNE DROPBRN #NO!
JMP BEDIRBRN #YES, GET DIRECTION
DROPBRN JSR DOWN2 #MOVE...
JSR DOWN2 #DOWN...
JSR DOWN2 #FOUR...
JSR DOWN2 #TIMES!
LDA YPOBP2 #DROP DONE?
CMP #104
BCS M1 #YES!
RTS
M1 LDA #1
STA GRNFDRP
STA SO3FLB
LDA #*AF #AND SOUND!
STA PITCH3
RTS
BEDIRBRN LDA #1 #SET GREEN MOVE FLAG
STA GRNMOV
INC GROW #INC GREEN ROW
INC GROW
LDA RANDOM #GET RANDOM COL MOVE
BMI N1
LDA #0 #DOWN & RIGHT
STA BRNDR
INC BCOL #INCREMENT COLUMN
JSR GRN# #DRAW FACING RIGHT
JMP MOVEBRN #AND MOVE HIM!
N1 LDA #1 #DOWN & LEFT
STA BRNDR
DEC BCOL #DRAW FACING LEFT
JSR BRN1
MOVEBRN LDA BRNDR #SET DIRECTION
CMP #1 #DOWN & LEFT?
BNE O1
JMP DNLEFT2 #MOVE IT!
JMP DNRIGHT2 #DITTO!
O1
-----
ROCK 3 SUB
-----
ROCK3 LDA SO4FLB #SOUND ON?
CMP #1
BNE P1 #NO!
RTS
P1 LDA BRGFLB #GEORGE ON?
CMP #1
BNE P2 #NO!
JMP GEORGE #HANDLE GEORGE
P2 LDA BAL2FLB #ROCK 2 OUT?
CMP #1
BNE P3 #NO!
JMP MOVBAL3 #MOVE ROCK 3
P3 LDA ROUND #GET ROUND
CMP #3 #ROUND 3/4?
BCS BRGCAN #YES BRING OUT GEORGE!
JMP MOVBAL3 #MOVE ROCK 3!
BRGCAN LDA OUTFLB #CAN GEORGE...
CMP #2 #COME OUT?
BCD MOVBAL3 #NO DO ROCK 3
LDA RANDOM #GET RANDOM CHANCE...
BMI MOVBAL3 #NO, HE CAN'T
JMP GEORGE #COME ON, GEORGE!
MOVBAL3 LDA B3MOV #ROCK 3 MOVING?
CMP #1
BNE Q2
JMP MOVE3 #MOVE IT!
Q2 LDA B3DRP #ROCK 3 DROPPING?
CMP #1
BEQ Q3 #YES!
LDA RANDOM #READY TO DROP?
BMI Q4 #YES!
RTS
Q4 LDA #1 #SET DROP FLAG
STA B3DRP
STA BAL2FLB
INC OUTFLB #INC GEORGE CHANCE
JSR BAL3DRW #DRAW ROCK 3
LDA FN3DRP #IS ROCK 3...
CMP #1 #DROP COMPLETE?
BNE DROP3 #NO!
JMP GETDIR3 #YES, GET DIRECTION
DROP3 JSR DOWN3 #MOVE...
JSR DOWN3 #DOWN...
JSR DOWN3 #FOUR...

```

```

JSR DOWN3 #TIMES
LDA YPOBP3 #DROP DONE?
CMP #109
BCS R1 #YES!
RTS
R1 LDA #1 #SET DROP...
STA FN3DRP #FINISH FLAG
STA SO4FLB
LDA #*AF #AND SOUND!
STA PITCH4
RTS
GETDIR3 LDA #1 #SET ROCK 3 MOVE FLAG
STA B3MOV
LDA RANDOM #GET RANDOM CHANCE
BMI S1
LDA #0 #DOWN & RIGHT!
STA B3DIR
JMP MOVE3 #MOVE IT
S1 LDA #1 #DOWN & LEFT!
STA B3DIR
MOVE3 LDA B3DIR #GET ROCK 3 DIRECTION
CMP #1 #DOWN & LEFT?
BNE T1 #NO!
JMP DNLEFT3 #MOVE IT!
JMP DNRIGHT3 #DITTO!
T1
GEORGE LDA #1 #SET...
STA GRGFLB #GEORGE FLAG
LDA GRGMOV #GEORGE MOVING?
CMP #1
BNE U1 #NO!
JMP MOVBRG #GO MOVE HIM!
U1 LDA GRDRP #GEORGE DROPPING?
CMP #1
BEQ U2 #YES!
LDA #1 #OK, START...
STA GRDRP #GEORGE DROP
JMP GEORGE# #GEORGE FACING LEFT
U2 LDA FN3DRP #GEORGE DROP DONE?
CMP #1
BNE DROPGRB #NO, DROP HIM!
JMP GETDRGRB #GET GEORGE DIRECTION
DROPGRB JSR DOWN3 #MOVE GEORGE...
JSR DOWN3 #DOWN...
JSR DOWN3 #FOUR...
JSR DOWN3 #TIMES!
LDA YPOBP3 #DROP DONE?
CMP #98
BCS V1 #YES!
RTS
V1 LDA #1 #SET GEORGE'S DROP...
STA FN3DRP #DONE FLAG
STA SO4FLB
LDA #*AF #SET SOUND
STA PITCH4
RTS
GETDRGRB LDA #1 #SET GEORGE...
STA GRGMOV #MOVING FLAG
LDA PCOL #GET DIRECTION...
CMP #0 #BASED ON PLAYER POS.
BCS RIGHT #GO RIGHT!
LDA PROW #GET UP/DOWN
CMP SROW
BEQ W1 #UP!
BCD W1 #UP!
JMP GEORGE# #FACING LEFT & DOWN
DEC SCOL #MOVE LEFT
INC SROW #MOVE DOWN...
INC SROW #2 TIMES
LDA #0 #0 = DOWN & LEFT
STA GRDIR
JMP MOVBRB #MOVE GEORGE!
W1 JSR GEORGE2 #FACING LEFT & UP
INC SCOL #MOVE LEFT
DEC SROW #MOVE UP...
DEC SROW #2 TIMES
LDA #2 #2 = UP & LEFT
STA GRDIR
JMP MOVBRB #MOVE GEORGE!
RIGHT LDA PROW #GET UP/DOWN
CMP SROW
BEQ X1 #UP!
BCD X1 #UP!
JMP GEORGE1 #FACING RIGHT & DOWN
INC SCOL #MOVE RIGHT
INC SROW #MOVE DOWN...
INC SROW #2 TIMES
LDA #1 #1 = RIGHT & DOWN
STA GRDIR
JMP MOVBRB #MOVE GEORGE!
X1 JSR GEORGE3 #FACING RIGHT & UP
INC SCOL #MOVE RIGHT
DEC SROW #MOVE UP...
DEC SROW #2 TIMES
LDA #3 #3 = RIGHT & UP
STA GRDIR
MOVBRB LDA BRDIR #GET GEORGE DIRECTION

```

```

CMP #0 #DOWN & LEFT?
BNE Y1 #NO!
JMP DNLEFT3
CMP #1 #DOWN & RIGHT?
BNE Y2 #NO!
JMP DNRIGHT3
CMP #2 #UP & LEFT?
BNE Y3 #NO!
JMP UPLEFT3
JMP UPRIGHT3
Y1
Y2
Y3
-----
SOUND SUBROUTINE
-----
SOUND LDA SO1FLB #SOUND 1 ON?
CMP #1
BEQ Z1 #YES!
JMP SO2 #NO, DO SOUND 2
LDA PITCH #GET SOUND 1 PITCH
STA AUCC1
DEC PITCH1 #NEXT PITCH
LDA PITCH1 #GET PITCH
CMP #*A0 #ALL DONE?
BEQ Z2 #YES!
JMP SO2
LDA #0 #TURN OFF...
STA AUCC1 #SOUND 1
STA SO1FLB #SOUND 1 FLAG
STA MOVFLB #MOVEMENT FLAG
LDA #8
STA COUNT1
LDA P0PF #MAN ON SQUARE?
CMP #0
BNE SETLEVEL #YES!
JSR FALL #UH-OH, HE FELL!
RTS #HE'S OK
SETLEVEL JSR UPDATMAN #MOVE MAN
LDA LEVEL #GO TO...
CMP #1 #APPROPRIATE...
BNE AA1 #LEVEL HANDLER!
JMP LEVEL1
CMP #2
BNE AA2
JMP LEVEL2
CMP #3
BNE AA4
JMP LEVEL3
CMP #4
BNE AA5
JMP LEVEL4
CMP #5
BNE AA6
JMP LEVEL5
CMP #6
BNE AA7
JMP LEVEL6
CMP #7
BNE AA8
JMP LEVEL3
JMP LEVEL6
AA1
AA2
AA4
AA5
AA6
AA7
AA8
LEVEL1 LDA P0PF #HIT
CMP #1 #PLAYFIELD #?
BNE BB1 #NO...
INC NUMSQ #YES-INCREMENT SQUARES
JSR PLAYFLD1 #CHANGE IT TO PF1
JMP SO2
LEVEL2 LDA P0PF #HIT
CMP #1 #PLAYFIELD #?
BNE CC1 #NO...
JSR PLAYFLD1 #CHANGE IT TO PF1
JMP SO2 #AND PROCEED
CMP #2 #PLAYFIELD 1?
BNE CC2 #NO...
INC NUMSQ #1 MORE SQUARE
JSR PLAYFLD2 #CHANGE IT TO PF2!
JMP SO2 #AND PROCEED
LEVEL4 LDA P0PF #HIT PLAYFIELD #?
CMP #1
BNE DD1 #NO...
INC NUMSQ #1 MORE SQUARE!
JSR PLAYFLD1 #CHANGE TO PF1
JMP SO2 #PROCEED!
DEC NUMSQ #DEDUCT SQUARE!
JSR PLAYFLD# #BACK TO PF#
JMP SO2 #AND GO ON.
LEVEL3 LDA P0PF #HIT PLAYFIELD #?
CMP #1
BNE EE1 #NO...
JSR PLAYFLD1 #CHANGE TO PF1
JMP SO2 #AND PROCEED
CMP #2 #HIT PLAYFIELD 2?
BNE EE2 #NO...
JSR PLAYFLD2 #CHANGE TO PF2
JMP SO2 #AND PROCEED
CMP #4 #HIT PLAYFIELD 2?
BNE SO2 #NO...

```

```

INC NUMSQ ;1 MORE SQUARE
JSR PLAYFLD3 ;CHANGE TO PF3
JMP S02 ;AND PROCEED
;
; LEVEL5
LDA P0PF ;HIT PLAYFIELD 0?
CMP #1
BNE FF1 ;NO...
JSR PLAYFLD1 ;CHANGE TO PF1
JMP S02 ;PROCEED
CMP #2 ;HIT PLAYFIELD 1?
BNE FF2 ;NO...
INC NUMSQ ;1 MORE SQUARE
JSR PLAYFLD2 ;CHANGE TO PF2
JMP S02 ;PROCEED
DEC NUMSQ ;1 LESS SQUARE
JSR PLAYFLD1 ;CHANGE TO PF1
JMP S02 ;PROCEED
;
; LEVEL6
LDA P0PF ;HIT PLAYFIELD 0?
CMP #1
BNE 001 ;NO...
JSR PLAYFLD1 ;CHANGE TO PF1
JMP S02 ;PROCEED
CMP #2 ;HIT PLAYFIELD 1?
BNE 002 ;NO...
JSR PLAYFLD2 ;CHANGE TO PF2
JMP S02 ;PROCEED
CMP #4 ;HIT PLAYFIELD 2?
BNE 003 ;NO...
INC NUMSQ ;1 MORE SQUARE
JSR PLAYFLD3 ;CHANGE TO PF3
JMP S02 ;PROCEED
DEC NUMSQ ;1 LESS SQUARE
JSR PLAYFLD2 ;CHANGE TO PF2
;
; S02
LDX #0 ;ROCK 1
LDY #0
JSR BALCHK ;SEE IF IT FELL
LDA FALOFF ;DID IT FALL?
CMP #1
BEQ HH1 ;YES!
JMP S03 ;NO, PROCEED
LDY YDOSP1 ;ERASE ROCK 1
LDX #0
;
; HH2
STA PLAY1,Y
INX
INX
CPX #10
BNE HH2
LDA #0 ;RESET DROP FLAG
STA DRP1
LDX #0 ;CLR OTHER FLAGS
JSR CLRFLB
;
; S03
LDA BRNFLB ;GREEN MAN ACTIVE?
CMP #1
BNE I199 ;NO!
JMP BRNCHK ;SEE IF HE FELL
LDX #1 ;ROCK 2
LDY #2
JSR BALCHK ;SEE IF IT FELL
LDA FALOFF ;DID ROCK 2 FALL?
CMP #1
BEQ I11 ;YES!
JMP S04 ;NO, PROCEED
LDY YDOSP2 ;ERASE ROCK 2
LDX #0
;
; I12
STA PLAY2,Y
INX
INX
CPX #10
BNE I12
LDA #0 ;RESET DROP FLAG
STA DRP2
STA BAL1FLB
LDX #1 ;AND OTHER FLAGS
JSR CLRFLB
;
; S04
LDA BRGFLB ;GEORGE ACTIVE?
CMP #1
BEQ BRGCHK ;YES!
LDX #2 ;CHECK ROCK 3
LDY #4
JSR BALCHK ;SEE IF IT FELL
LDA FALOFF ;DID IT FALL?
CMP #1
BEQ JJ1 ;YES!
RTS
LDY YDOSP3 ;ERASE ROCK 3
LDX #0
TXA
;
; JJ2
STA PLAY3,Y
INX
INX
CPX #10
BNE JJ2
LDA #0 ;CLEAR ROCK 3 FLAG
STA BAL2FLB
LDX #2 ;AND OTHER FLAGS
JSR CLRFLB
;
; BRNCHK
LDA S03FLB ;SOUND 3 ON?
CMP #1
BEQ LL1 ;YES!
JMP S04 ;NO, DO SOUND 4
LDA PITCH3 ;SET SOUND 3 VOLUME
STA AUDC3 ;NEXT VOLUME
DEC PITCH3 ;SOUND 3 DONE?
CMP #0
BEQ LL2 ;YES!
JMP S04 ;NO, DO SOUND 4
LDA #0 ;TURN OFF SOUND 3
STA AUDC3
LDA P2PF ;DID GREEN MAN...
CMP #0 ;HIT PLAYFIELD?
BNE GOBACK ;YES!
JSR ERASEBRN ;GREEN MAN BONE
LDA #0 ;RESET GREEN MAN
STA BRNDRP
STA BRNFDRP
STA BRNFLB
STA BRNMOV
STA S03FLB
STA DRP2
LDA #16 ;RESET ROW
STA BROW
LDA #8 ;RESET COLUMN
STA BCOL
STA COUNT3
LDA #43
STA YDOSP2
LDA #116
STA HPOS2
STA XPOS2
RTS
LDA #0 ;RESET SOUND 3
STA S03FLB
STA BRNMOV
LDA #8
STA COUNT3
LDA P2PF ;DID GREEN HIT PF0?
CMP #1
BNE MM4 ;NO!
RTS
JSR DECNUM ;DEC # SQUARES
LDA # <PF0 ;CHANGE TO PF0
STA FILE
LDA # >PF0
STA FILE+1
LDA BCOL ;SET COLUMN
STA COL
LDA BROW ;AND ROW
STA ROW
JSR CHANGE ;CHANGE IT!
RTS
LDA LEVEL ;SET LEVEL
CMP #1
BEQ NN1 ;LEVEL 1
CMP #2 ;LEVEL 2
BEQ NN2 ;LEVEL 3
CMP #3 ;LEVEL 4
BEQ NN1 ;LEVEL 4
CMP #5 ;LEVEL 5
BEQ NN2 ;LEVEL 5
JMP NN4 ;LEVEL 6
;
; NN1
LDA P2PF ;HIT PF1?
CMP #2
BEQ DECR ;YES!
RTS
LDA P2PF ;HIT PF2?
;
; BRGCHK
LDA S04FLB ;SOUND ON?
CMP #1
BEQ KK1 ;YES!
RTS
LDA PITCH4 ;SET VOLUME
STA AUDC4
DEC PITCH4 ;NEXT VOLUME
LDA PITCH4 ;SOUND DONE?
CMP #0
BEQ KK2 ;YES!
RTS
LDA P3PF ;DID GEORGE...
CMP #0 ;HIT PF?
BNE KK3 ;YES!
LDA #5 ;ADD 500 POINTS...
STA SUM
JSR ADD200
JSR RESET ;RESET GEORGE
RTS
LDA #0 ;ZERO...
STA AUDC4 ;SOUND 4
STA S04FLB ;SOUND 4 FLAG
STA BRGMOV ;GEORGE MOVE FLAG
LDA #8
STA COUNT4
RTS
;
; BRNCHK
LDA S03FLB ;SOUND 3 ON?
CMP #1
BEQ LL1 ;YES!
JMP S04 ;NO, DO SOUND 4
LDA PITCH3 ;SET SOUND 3 VOLUME
STA AUDC3 ;NEXT VOLUME
DEC PITCH3 ;SOUND 3 DONE?
CMP #0
BEQ LL2 ;YES!
JMP S04 ;NO, DO SOUND 4
LDA #0 ;TURN OFF SOUND 3
STA AUDC3
LDA P2PF ;DID GREEN MAN...
CMP #0 ;HIT PLAYFIELD?
BNE GOBACK ;YES!
JSR ERASEBRN ;GREEN MAN BONE
LDA #0 ;RESET GREEN MAN
STA BRNDRP
STA BRNFDRP
STA BRNFLB
STA BRNMOV
STA S03FLB
STA DRP2
LDA #16 ;RESET ROW
STA BROW
LDA #8 ;RESET COLUMN
STA BCOL
STA COUNT3
LDA #43
STA YDOSP2
LDA #116
STA HPOS2
STA XPOS2
RTS
LDA #0 ;RESET SOUND 3
STA S03FLB
STA BRNMOV
LDA #8
STA COUNT2,X
STA COUNT2,X
RTS
;
; CLRFLB
LDA #0 ;RESET MISC FLAGS
STA BMOV,X
STA S02FLB,X
STA BDRP,X
STA BNDROP,X
STA FALOFF
LDA #8
STA COUNT2,X
LDA #45
STA YDOSP1,X
LDA HPOS,X
STA HOSP1,X
STA XOSP1,X
RTS
;
; UPDATMAN
LDA DIRECT ;GET DIR...
CMP #9
BEQ PP1 ;DOWN & LEFT
CMP #5
BEQ PP2 ;DOWN & RIGHT
CMP #6
BEQ PP4 ;UP & RIGHT
CMP #10
BEQ PP3 ;UP & LEFT
RTS
;
; PP1
DEC PCOL ;MOVE LEFT
INC PROW ;MOVE DOWN...
INC PROW ;2 TIMES
RTS
;
; PP2
INC PCOL ;MOVE RIGHT
INC PROW ;MOVE DOWN...
INC PROW ;2 TIMES
RTS
;
; PP3
DEC PCOL ;MOVE LEFT
DEC PROW ;MOVE UP...
DEC PROW ;2 TIMES
RTS
;
; PP4
INC PCOL ;MOVE RIGHT
DEC PROW ;MOVE UP...
DEC PROW ;2 TIMES
RTS
;
; PCUBPOS
LDA PCOL ;SAVE SQUARE POS.
STA COL
LDA PROW
STA ROW
RTS
;
; -----
; DELAY
; -----
DELAY LDX #FF ;TIME DELAY
QQ1 LDY TIME
DEY
BNE QQ2
DEX
BNE QQ1
RTS
;
; -----
; SETUP ROUTINE
; -----
SETUP LDA START ;INIT ALL?
CMP #0
BNE PART ;NO...

```

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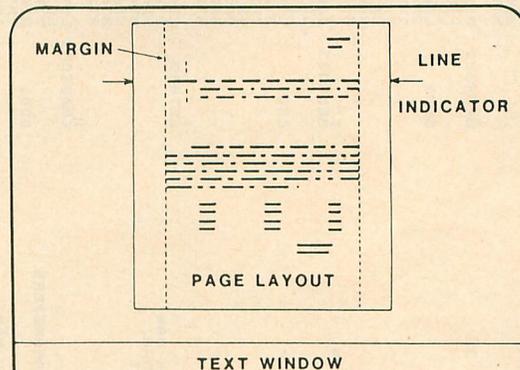
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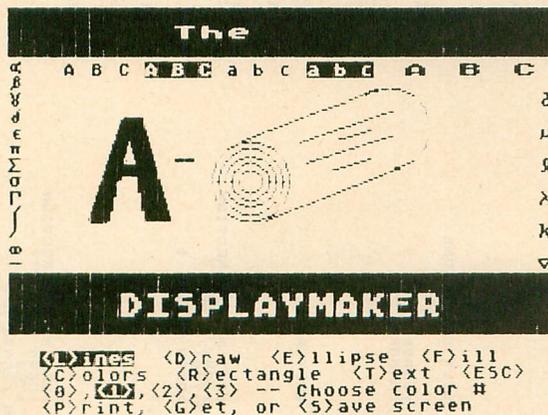
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-----
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<S>AVE FILE
<A>PPEND FILE
<F>ILENAMES

<C>REATE NEW RECORDS
<E>DIT/VIEW RECORDS
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-----
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```

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```

LDA #000 ;YES...
STA NUMSD
LDA #010 ;RESET
LDX #0 ;SCORE...
RESET1 STA SCORE,X
INX
CPX #006
BNE RESET1
;
; PART
SETZERO LDA #000 ;SET FLG'S
LDX #0 ;TO ZERO..
STA BACK,X
INX
CPX #100
BNE SETZERO
LDA #008 ;SET COUNT
STA COUNT1
STA COUNT2
STA COUNT3
STA COUNT4
;
LDA #9 ;SET PLAYER
STA PCOL ;COLUMN &
LDA #8 ;ROW...
STA PROW
;
LDA #10 ;SET GEORGE
STA SCOL ;GREEN
STA SROW ;COLUMN...
LDA #3
STA SCOL
;
LDA #124 ;PM DATA..
STA PXPOS
STA HPOS90
LDA #85
STA PYPOS
LDA #116
STA XPOS1
STA XPOS2
STA HPOS1
STA HPOS2
STA HPOS
STA HPOS+1
LDA #132
STA XPOS3
STA HPOS+2
STA HPOS3
LDA #45
STA YPOS1
STA YPOS2
STA YPOS3
;
CLC ;SET UP...
LDA #170 ;SOUND...
STA ADF1 ;FREQUENCIES
ADC #10
STA ADF2
ADC #10
STA ADF3
ADC #10
STA ADF4
;
LDA #001 ;CLR COLLISIONS
STA HITCLR
;
PMCLR LDA #000 ;ERASE P/M
LDX #0FF ;MEMORY
ERASEMEM STA PLAY0,X
STA PLAY1,X
STA PLAY2,X
STA PLAY3,X
DEX
BNE ERASEMEM
RTS ;RETURN...
;
;-----
; FIGURES FOR MAN
;
; FIG1
LDA DIRFLB ;GET MOVE DIRECTION
CMP #9 ;DOWN & LEFT?
BEQ RR2 ;YES!
LDY PYPOS ;DRAW FIGURE 1
LDX #0
RR1 LDA FIG1DAT,X
STA PLAY0,Y
INX
INX
CPX #16
BNE RR1
RTS
;
; FIG2
LDA DIRFLB ;GET MOVE DIRECTION
CMP #3 ;DOWN & RIGHT?
BEQ SS2 ;YES!
JSR ERASEMAN ;ERASE MAN
LDY PYPOS ;DRAW FIGURE 2
LDX #0
SS1 LDA FIG2DAT,X
STA PLAY0,Y
INX
INX
CPX #16
BNE SS1
RTS
;
; ERASE MAN SUB
;
ERASEMAN LDY PYPOS
LDX #000
LDA #000
STA PLAY0,Y
YY1 INX
INX
CPX #20
BNE YY1
RTS
;
; FIGURES FOR GEORGE !!
;
GEORGE0 JSR ERASEGRB ;ERASE GEORGE
LDY YPOS3 ;DRAW GEORGE...
LDX #0
ZZ1 LDA GRB0DAT,X
STA PLAY3,Y
INX
INX
CPX #18
BNE ZZ1
RTS
;
; SET GEORGE PARAMETERS
;
GEORGE1 JSR ERASEGRB ;ERASE GEORGE
LDY YPOS3 ;DRAW GEORGE...
;
AAA1 LDX #0 ;IN POSITION 1
LDA GRB1DAT,X
STA PLAY3,Y
INX
INX
CPX #18
BNE AAA1
RTS
;
GEORGE2 JSR ERASEGRB ;ERASE GEORGE
LDY YPOS3 ;DRAW GEORGE...
LDX #0
BBB1 LDA GRB2DAT,X
STA PLAY3,Y
INX
INX
CPX #18
BNE BBB1
RTS
;
GEORGE3 JSR ERASEGRB ;ERASE GEORGE
LDY YPOS3 ;DRAW GEORGE...
LDX #0
CCC1 LDA GRB3DAT,X
STA PLAY3,Y
INX
INX
CPX #18
BNE CCC1
RTS
;
SETGRB LDA #19 ;GEORGE 19 LINES TALL
STA LENGTH3
LDA #16
STA ADDNUM3 ;GEORGE PURPLE!
LDA #86
STA PCOLR3
RTS
;
ERASEGRB LDY YPOS3 ;ERASE GEORGE
LDX #0
TXA
STA PLAY3,Y
INX
INX
CPX #20
BNE DDD1
RTS
;
;-----
; CHANGE SQUARE SUB
;
CHANGE LDA ROW ;SET ROW,
STA LO ;SAVE IN...
LDA #0 ;MULT AREA
STA HI
ASL LO ;#2
ASL LO ;#4
LDA LO ;SAVE #4 VALUE
STA TIMES4 ;#8
ASL LO ;#16
ASL LO ;#16
ROL HI ;#4 = #20
LDA LO
CLC
ADC TIMES4
STA LO
LDA HI
ADC #0
STA HI
LDA LO ;NOW ADD COLUMN
CLC
ADC COL
STA LO
LDA HI
ADC #0
STA HI
LDA LO ;NOW DISPLAY START
CLC
ADD # <DISP
STA LO
LDA HI
ADC # >DISP
STA HI
LDA #1
LDA (FILE),Y ;GET RIGHT OF SQUARE
STA (LO),Y ;PUT ON SCREEN
DEY
LDA (FILE),Y ;GET LEFT OF SQUARE
STA (LO),Y ;PUT ON SCREEN
RTS ;ALL DONE!
;
;-----
; FALL OFF SUB
;
FALL LDA #004 ;SET PRIOR
STA PRIOR
LDA #2
STA TIME
JSR TURNOFF
LDA #AAA

```

```

EEE1  STA AUDC1      ;GET YPOS
      LDA PYPOS    ;MAKE 90...
      STA AUDF1   ;MAKE 90...
      CNP #240    ;OFF SCR...
      BEQ ENDLP   ;YES...
      JSR ENDLP   ;NO...
      JSR DOWN0   ;DELAY...
      JSR DELAY   ;DO AGAIN
      JMP EEE1
ENDLP  LDA #36F
      STA AUDC1
      CLC
      LDA #130
      STA AUDF1
      ADC #1
      JSR DELAY
      CNP #210
      BNE FFF1
      LDA #100
      STA AUDF1
      STA AUDC1
      LDA #3
      STA BACK
      RTS
;-----
;DRAW ROCK
BAL1DRM LDY YPOSP1 ;DRAW ROCK 1
        LDY #000
        LDA BALDAT,X
        STA PLAY1,Y
        INY
        INX
        CPX #10
        BNE 0001
        RTS
;
BAL2DRM LDY YPOSP2 ;DRAW ROCK 2
        LDY #0
        LDA BALDAT,X
        STA PLAY2,Y
        INY
        INX
        CPX #10
        BNE HHH1
        LDA #10 ;SET ROCK PARAMS
        STA LENGTH ;(INSTEAD OF...
        LDA #8 ;(GREEN MAN)
        STA ADDNUM
        LDA #32
        STA PCOLR2
        RTS
;
BAL3DRM LDY YPOSP3 ;DRAW ROCK 3
        LDY #0
        LDA BALDAT,X
        STA PLAY3,Y
        INY
        INX
        CPX #10
        BNE III1
        LDA #10 ;SET ROCK PARAMS
        STA LENGTH3 ;(INSTEAD OF...
        LDA #8 ;(GEORGE!)
        STA ADDNUM3
        LDA #32
        STA PCOLR3
        RTS
;-----
;MOVEMENT SUBS
;
DNLEFT0 JSR FIB1 ;SHAPE...
        LDA #1
        STA MOVFL0
        JSR LEFT0 ;MOVE...
        JSR DOWN0
        JSR DOWN0
        DEC COUNT1
        BNE JJJ1
        JSR SETFL0 ;RETURN
        RTS
JJJ1
DNRIGHT0 JSR FIB2 ;SHAPE...
        LDA #1
        STA MOVFL0
        JSR RIGHT0 ;MOVE...
        JSR DOWN0
        JSR DOWN0
        DEC COUNT1 ;DONE...
        BNE KKK1
        JSR SETFL0 ;RETURN
        RTS
KKK1
UPLEFT0 JSR FIB3 ;SHAPE...
        LDA #1
        STA MOVFL0
        JSR LEFT0 ;MOVE...
        JSR UP0
        JSR UP0
        DEC COUNT1 ;DONE???
        BNE LLL1
;
LLL1 JSR SETFL0 ;SETFL0...
      RTS
UPRIGHT0 JSR FIB4 ;SHAPE...
        LDA #1
        STA MOVFL0
        JSR RIGHT0 ;MOVE...
        JSR UP0
        JSR UP0
        DEC COUNT1 ;DONE???
        BNE MMM1
        JSR SETFL0
        RTS
MMM1
LEFT0 DEC PXPOS ;MOVE MAN LEFT
      LDA PXPOS
      STA HPOSP0
      RTS
RIGHT0 INC PXPOS ;MOVE MAN RIGHT
      LDA PXPOS
      STA HPOSP0
      RTS
UP0 LDY PYPOS ;MOVE MAN UP
    LDY #000
    LDA PLAY0,Y
    STA PLAY0-1,Y
    INX
    INY
    CPX #17
    BNE NNN1
    DEC PYPOS
    RTS
NNN1
DOWN0 LDY #0 ;MOVE MAN DOWN
      CLC
      LDA PYPOS
      ADC #14
      TAY
      LDA PLAY0,Y
      STA PLAY0+1,Y
      DEY
      INX
      CPX #17
      BNE 0001
      INC PYPOS
      RTS
0001
;ROCK 1 MOVEMENT
DNLEFT1 JSR LEFT1 ;MOVE LEFT,
        JSR DOWN1 ;MOVE DOWN...
        JSR DOWN1 ;2 TIMES
        DEC COUNT2
        BNE PPP1
        LDY #0
        JSR SETFL0 ;SET UP SOUND
        RTS
PPP1
DNRIGHT1 JSR RIGHT1 ;MOVE RIGHT,
         JSR DOWN1 ;MOVE DOWN...
         JSR DOWN1 ;2 TIMES
         DEC COUNT2
         BNE QQQ1
         LDY #0
         JSR SETFL0 ;SET UP SOUND
         RTS
QQQ1
LEFT1 DEC XPOSP1 ;MOVE ROCK 1 LEFT
      LDA XPOSP1
      STA HPOSP1
      RTS
RIGHT1 INC XPOSP1 ;MOVE ROCK 1 RIGHT
      LDA XPOSP1
      STA HPOSP1
      RTS
DOWN1 LDY #0 ;MOVE PLAYER 1 DOWN
      CLC
      LDA YPOSP1
      ADC #8
      TAY
      LDA PLAY1,Y
      STA PLAY1+1,Y
      DEY
      INX
      CPX #10
      BNE RRR1
      INC YPOSP1
      RTS
RRR1
;ROCK 2 MOVEMENT
;SAME AS ROCK 1, BUT FOR ROCK 2
DNLEFT2 JSR LEFT2
        JSR DOWN2
        JSR DOWN2
        DEC COUNT2
        STA HPOSP2
        RTS
LEFT2 DEC XPOSP2
      LDA XPOSP2
      STA HPOSP2
      RTS
RIGHT2 INC XPOSP2
      LDA XPOSP2
      STA HPOSP2
      RTS
UP0 LDY PYPOS ;MOVE MAN UP
    LDY #000
    LDA PLAY0,Y
    STA PLAY0-1,Y
    INX
    INY
    CPX #17
    BNE NNN1
    DEC PYPOS
    RTS
NNN1
DOWN2 LDY #0
      CLC
      LDA YPOSP2
      ADC ADDNUM
      TAY
      LDA PLAY2,Y
      STA PLAY2+1,Y
      DEY
      INX
      CPX LENGTH
      BNE UUU1
      INC YPOSP2
      RTS
UUU1
;ROCK 3 MOVEMENT
;SAME AS ROCK 1, BUT FOR ROCK 3
DNLEFT3 JSR LEFT3
        JSR DOWN3
        JSR DOWN3
        DEC COUNT4
        BNE VVV1
        LDY #2
        JSR SETFL0
        RTS
VVV1
DNRIGHT3 JSR RIGHT3
         JSR DOWN3
         JSR DOWN3
         DEC COUNT4
         BNE WWW1
         LDY #2
         JSR SETFL0
         RTS
WWW1
UPLEFT3 JSR LEFT3
        JSR UP3
        JSR UP3
        DEC COUNT4
        BNE XXX1
        LDY #2
        JSR SETFL0
        RTS
XXX1
UPRIGHT3 JSR RIGHT3
         JSR UP3
         JSR UP3
         DEC COUNT4
         BNE YYY1
         LDY #2
         JSR SETFL0
         RTS
YYY1
LEFT3 DEC XPOSP3
      LDA XPOSP3
      STA HPOSP3
      RTS
RIGHT3 INC XPOSP3
      LDA XPOSP3
      STA HPOSP3
      RTS
UP3 LDY YPOSP3
     LDY #0
     LDA PLAY3,Y
     STA PLAY3-1,Y
     INY
     INX
     CPX LENGTH3
     BNE ZZZ1
     DEC YPOSP3
     RTS
ZZZ1
DOWN3 LDY #0
      CLC

```

```

AAAA1 LDA YPOSP3
      ADC ADDNUM3
      LDA #1
      STA PLAY3,Y
      STA PLAY3+1,Y
      DEY
      INX
      CPX LENBTH3
      BNE AAAA1
      INC YPOSP3
      RTS

; SETFLB0
SETFLB0 LDA #1 ;SET FLB
        STA S01FLB
        STA MOVFLB
        LDA #9AF
        STA PITCH1 ;PITCH...
        LDA DIRECT
        STA DIRFLB
        RTS

; SETFLB
SETFLB LDA #1
        STA S02FLB,X
        LDA #9AF
        STA PITCH2,X ;PITCH...
        RTS

; PLAYFLD0
PLAYFLD0 LDA # <PF0 ;POINT TO...
         STA FILE ;COLOR 0 SQUARE
         LDA # >PF0
         STA FILE+1
         JSR ADD25 ;ADD 25 POINTS
         JSR PCUBPO8 ;GET CUBE POS
         JSR CHANGE ;CHANGE COLOR
         RTS

; PLAYFLD1
PLAYFLD1 LDA # <PF1 ;POINT TO...
         STA FILE ;COLOR 1 SQUARE
         LDA # >PF1
         JMP DOSQUARE ;DD MISC STUFF

; PLAYFLD2
PLAYFLD2 LDA # <PF2 ;POINT TO...
         STA FILE ;COLOR 2 SQUARE
         LDA # >PF2
         JMP DOSQUARE ;DD MISC STUFF

; PLAYFLD3
PLAYFLD3 LDA # <PF3 ;POINT TO...
         STA FILE ;COLOR 3 SQUARE
         LDA # >PF3
         JMP DOSQUARE ;ETC.

; CLEAR
CLEAR LDA ##01 ;RESET COLLISIONS
      STA HITCLR
      RTS

; TURNOFF
TURNOFF LDA ##00 ;NO AUDIO...
        STA AUDC2 ;DN CHANNELS...
        STA AUDF2 ;2, 3, 4!
        STA AUDC3
        STA AUDF3
        STA AUDC4
        STA AUDF4
        RTS

; PL.PL
PL.PL LDA P0PL ;DID MAN...
      CMP #1 ;HIT PLAYER 0?
      BCC BBBB1 ;NO!
      CMP #4 ;HIT PLAYER 2?
      BNE BBBB2 ;NO!
      LDA GRNFLB ;GREEN MAN ACTIVE?
      CMP #1
      BNE BBBB2 ;NO!
      JSR HITORN ;CLOBBER GREEN MAN!
      LDA #2 ;AWARD 200 POINTS!
      STA SUM
      JSR ADD200
      JMP BBBB1

; BBBB2
BBBB2 LDA P0PL ;DID MAN HIT...
      CMP #8 ;PLAYER 3?
      BNE BBBB8 ;NO!
      LDA GR0FLB ;GEORGE ACTIVE?
      CMP #1
      BEQ BBBB1 ;YES!
      LDA WARN1
      CMP #4
      BEQ BBBB7
      INC WARN1
      RTS

; BBBB7
BBBB7 LDA #2 ;DEATH DUE TO...
      STA BACK ;GEORGE!
      RTS

; BBBB1
BBBB1 LDA #0
      STA WARN1
      LDA GR0FLB
      CMP #1
      BNE RET
      LDA P3PL
      CMP #1
      BNE BBBB5
      LDA WARN
      CMP #4
      BEQ BBBB6

INC WARN
RTS
RTS
RTS
LDA #2
STA BACK
RTS
LDA #0
STA WARN1
LDA GRNFLB
CMP #1
BNE RET
LDA P3PL
CMP #1
BNE BBBB5
LDA WARN
CMP #4
BEQ BBBB6

INC WARN
RTS
RTS
RTS
LDA #5
CLC
LDA SCORE,Y
ADC #5
CMP #01A
BNE DDDD1
LDA #10
STA DISP,Y
STA SCORE,Y
DEY
LDA SCORE,Y
CLC
ADC #1
STA SCORE,Y
JMP DDDD2
LDA #15
STA DISP,Y
STA SCORE,Y
DEY
LDA SCORE,Y
CLC
ADC #2
CMP #01A
BEQ DDDD3
STA DISP,Y
STA SCORE,Y
RTS
LDA #10
STA DISP,Y
STA SCORE,Y
DEY
LDA SCORE,Y
CLC
ADC #1
CMP #01A
BEQ DDDD3
STA DISP,Y
STA SCORE,Y
RTS

; ADD200
ADD200 LDY #3 ;ADD SUM * 100...
        CLC ;TO SCORE
        LDA SCORE,Y
        STA SUM
        ADC #01A
        BCC EEEE1
        SEC
        SBC #01A
        STA ADD
        CLC
        LDA #10
        ADC ADD
        STA DISP,Y
        STA SCORE,Y
        LDA #0
        STA ADD
        DEY

; SCORE ROUTINES
;-----
; SCORE ROUTINES
;-----
LDY #5 ;ADD 25 POINTS
CLC ;TO SCORE
LDA SCORE,Y
ADC #5
CMP #01A
BNE DDDD1
LDA #10
STA DISP,Y
STA SCORE,Y
DEY
LDA SCORE,Y
CLC
ADC #1
STA SCORE,Y
JMP DDDD2
LDA #15
STA DISP,Y
STA SCORE,Y
DEY
LDA SCORE,Y
CLC
ADC #2
CMP #01A
BEQ DDDD3
STA DISP,Y
STA SCORE,Y
RTS
LDA #10
STA DISP,Y
STA SCORE,Y
DEY
LDA SCORE,Y
CLC
ADC #1
CMP #01A
BEQ DDDD3
STA DISP,Y
STA SCORE,Y
RTS

; ADD200
ADD200 LDY #3 ;ADD SUM * 100...
        CLC ;TO SCORE
        LDA SCORE,Y
        STA SUM
        ADC #01A
        BCC EEEE1
        SEC
        SBC #01A
        STA ADD
        CLC
        LDA #10
        ADC ADD
        STA DISP,Y
        STA SCORE,Y
        LDA #0
        STA ADD
        DEY

; SQUARES !!!
; SQUARES !!!
PF0 .BYTE #03,#04
PF1 .BYTE #43,#44
PF2 .BYTE #03,#04
PF3 .BYTE #C3,#C4
; DISPLAY LIST
; DLIST
DLIST .BYTE #70,#70,#70,#46
      .WORD DISP
      .BYTE #,6,#86,6,#86,#86,#86,6,6,6
      .BYTE #,6,6,6,6,6,6,6,6,6
      .BYTE #,6,6,6,6,6,6,6,6,6
      .WORD DLIST
RDYMS0 .SBYTE +00,"READY %%"
LVMS0 .SBYTE "LeVeL"
ENDMS0 .SBYTE +00,"GAME OVER"
CHMS0 .SBYTE "CHANGE"
LVLMS0 .SBYTE +00,"Level:"
RNDMS0 .SBYTE +00,"round:"
BONMS0 .SBYTE +00,"BONUS"
      .SBYTE " 1000"
TITLE .SBYTE " AVALANCHE "
AUTHOR .SBYTE "BY TOMMY BENNETT"
WAGMS0 .SBYTE +00,"ANALOG COMPUTING"
; MISC. DATA
; R1SET
R1SET .BYTE #,15,90,4,156
R2SET .BYTE #,13,246,12,146
R3SET .BYTE #,2,164,118,84
R4SET .BYTE #,196,66,34,102
; CHAR SET DATA
; NEWCHR
NEWCHR .BYTE 3,15,63,127,63,15,3,0
      .BYTE 192,240,252,254,202,240,192,0
      .BYTE #,4,12,24,48,0,48,0
      .BYTE 12,30,63,43,63,30,18,34
      .BYTE 8,12,124,127,126,12,8,0
      .BYTE 16,48,126,254,126,48,16,0
; JUMPING PADS
; PADATA
PADATA .BYTE 3,4,3,4,3,4,3,4
      .BYTE 3,4,3,4,3,4,3,4
; MUSIC DATA
; NOTE
NOTE .BYTE 60,47,0,47,60,72,60,0
      .BYTE 72,64,72,64,72,64,0,81
      .BYTE 72,81,72,81,72
DUR .BYTE 11,14,7,11,7,7,7,7
      .BYTE 7,7,7,7,7,7,7,7

```

# Matt\*Edit

24K Cassette or Disk

by Matthew J.W. Ratcliff

**Matt\*Edit** is a menu-driven 40-column text and character graphics editor. It was originally developed for the local Bulletin Board System Operators, who frequently create text files for transmitting over the modem to other Atari users. If you have a Gemini or Epson with Grafrax (or Epson graphics compatible) printer, then you will be able to print your text files, using Atari's character set. See the sample printout below (Figure 1). **Matt\*Edit** also has the capability of printing in a "newspaper" dual- or triple-column format. This will allow you to put much more information on a single page than the normal 40-character per line print mode. Text files created with the editor can be saved as BASIC routines, as PRINT, PRINT #n; (i.e., ? #6; "text") or DATA statements, with line numbers that you specify.

```

MATT*EDIT SAMPLE PRINTOUT

Character GRAPHICS
  GET BE TSK TO MAKE
  CUSTOM CHARACTERS

THIS PROGRAM WILL MANAGE YOUR
DISK CATALOGS AS WELL. HERE IS
A DIRECTORY FROM THE MATT*EDIT
PROGRAM.

MATT*EDIT DIRECTORY
005 .SYS 039 | DUP .SYS 042
MATTEDIT.LST 119 | MATTEDIT.BAS 109
398 FREE SECTORS
  
```

Figure 1.

With this editor, you will quickly learn the hidden value of character graphics. They can be used to make superb title pages for your school papers — or lovely greeting cards. I use it to manage a "chords" file for my wife, who is learning how to play the guitar. Figure 2 gives an example of this. **Matt\*Edit** will even allow you to treat disk directories as text files. This enables you to create a complete catalog of all your disks in very short order.

```

1 INDEX FINGER
2 MIDDLE FINGER
3 RING FINGER
4 PINKIE FINGER
  
```

0 - Above string indicates OPEN and SHOULD be played with chord.  
X - Above string indicates OPEN and SHOULD be played with chord.

```

0 00
0 0 00
0 000
XX
0
2
02
2
3
  
```

Figure 2.

Below is a rundown on all the menu functions in **Matt\*Edit**, along with a short explanation of each item.

#### Main menu.

1. Disk DIR — Go to the disk directory functions menu.
2. Edit Text — Go to the text editing functions menu.
3. LOAD File — LOAD a new text file into memory. All old text currently in memory will be erased first.
4. Merge File — Merge a text file with the old text currently in memory.
5. SAVE Text — Go to the save text functions menu.
6. Print Text — Go to the print functions menu.
7. Kill File — Delete a file from the disk.
8. Quit — Exit the program.

#### Disk Directory.

1. LIST DIR — LIST the disk directory to the screen and return to the main menu.
2. PRINT DIR — LIST the disk directory to the screen and make a quick print of it on the printer. You will be asked for a disk title before printing; the same holds true for LOAD and merge functions below.
3. LOAD DIR — LOAD the disk directory into memory. All old text will be deleted.
4. Merge DIR — Merge the disk directory into memory with the old text already there.
5. GOTO Main — Return to the main menu.

#### Edit text.

1. GOTO Start — Go to the edit mode, at the start of the current text buffer.
2. GOTO End — Go to the edit mode at the end of the current text buffer (last two lines of the file will be displayed at the top of the screen).
3. GOTO a Line — Input the desired line number to begin editing.
4. Delete Line(s) — This function allows you to delete lines of text from the buffer.
5. Insert Line(s) — Place blank lines in the buffer before the specified line.
6. Empty Buffer — Delete all text from the buffer.
7. GOTO Main — Exit to main menu.

#### Edit functions.

You may use all of Atari's standard editing keys to create text on the screen. A status line is displayed at the bottom of the screen. As you type text, the current line you are on will be updated. Typing past the last line on the screen (or pressing RETURN on the last line) will cause the editor to read the current page and place you on the next page to edit (showing the last two lines worked on at the top). You can use the CTRL-ARROW keys to move anywhere on the screen. Sometimes certain edit functions will cause the cursor

to get ahead of the current line number shown in the status line. If in doubt, just press the RETURN key, and it will be updated correctly. Certain keys are disabled when in the edit mode. The SHIFT-CLEAR and CTRL-CLEAR keys are not allowed, so that you cannot accidentally erase a page of work. The ESCAPE key is not allowed in the edit mode, although it is used to abort functions in other parts of the program. If an incorrect keypress is made, you will hear a short buzzing sound. To read the current page and exit to the edit menu, just press the START key.

Once you have created more than one page of text (23 lines), the OPTION key will read the page and move up one page in the buffer, and SELECT will read and move down one page. These key functions make it a simple task to move to any page in the buffer. Note that, if you make any editing changes on the current page, the cursor must be on or below the last changed line in the page before you may press one of the console keys. The read routine only reads text up to the line that the cursor is resting on at the time of the console key press. The SHIFT-INSERT and -DELETE keys will function as well. You should be aware, however, that any text lines shifted down off the page will not appear on the next page of text. If you do not wish to lose any lines, then the Insert Line(s) function should be used. This editor, unfortunately, does not support "parsing" or "word wrap," as it would take too much overhead. You format your text as you type it in. The printout will be exactly as you typed it in with the editor.

#### SAVE menu.

1. SAVE as Text File — SAVE the current text buffer to a disk file as 40-column text file. All spaces at the end of the lines will be stripped off.
2. SAVE as PRINT Statements — Write text file as ? or ?#n; statements, with user-specified line, increment.
3. SAVE as DATA Statements — Write text file as DATA statements, with user-specific line; increment. If your file has any quotes (" "), you should use this format. The print format will generate errors when ENTERed if it has any quote characters in the print statements.
4. Return to main menu.

#### SAVE functions.

One SAVE option is to delete all blank lines from the text buffer as it is written to disk. This will make the file compact for you. I tend to use a lot of blank lines, especially if working with character graphics. This allows me to use SHIFT-INSERT and SHIFT-DELETE more liberally while editing the screens of text, without having to go to the Delete Lines and Insert Lines menu functions as often. If you save text as a BASIC PRINT or DATA file, you should also save it as a "40 Char Lines" file. It will be handy, if you should need to go back and edit the text again.

**Print options.**

1. 40 Char Lines — Print text, 40 characters per line format.
2. Newspaper [2] Col — Print text, 40 character lines, but in dual-column "newspaper" format. Effectively, 80 characters per line.
3. Newspaper [3] Col — Print in three "newspaper" column format.
4. Return to main menu.

**Print functions.**

You will be requested to input a TITLE for your print-out. Press RETURN if none is desired. Pages will always be numbered, however. Single-line spacing will print text *exactly* as it appears on the Atari screen. Double spacing is also provided for. To abort the printing function, just press the ESCAPE key.

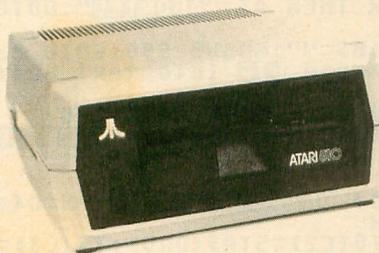
**On your own.**

That should cover the major functions of **Matt\*Edit**. I think that you will find the rest of it self explanatory, since the program has many helpful prompts. Should you select any function accidentally, the ESCAPE key will usually exit it.

A special routine is called to input titles and filenames. This routine will not allow invalid text keypresses. Only upper and lower case, numeric keys and

punctuation keys are allowed. Backspace editing is the only edit function provided for. This routine will keep you from accidentally clearing the screen in the middle of typing a filename. When in the edit mode, you can use inverse video, control graphics and more. Anytime you exit to a menu, the keyboard will automatically be restored to normal video, upper case characters. You may use CTRL-TAB to clear tabs and SHIFT-TAB to set special tabs for your editing screens. They will remain in effect until you change them.

This program has a couple of short machine language routines, in strings, to speed things up a bit. It will run well on an 800XL, since I followed the proper Operating System (OS) entry points. You should be aware of an XL OS bug, however. Sometimes, while printing, everything will stop for 35 to 40 seconds and then start again. No data is lost, and the program continues to function correctly. I checked with Atari on this problem, and it seems that a "certain combination of characters" being sent to the printer will put the system in a pause mode. Atari has informed me that they are working on a fix for this one. Don't worry if this happens to you; be patient, and all will pick up right where it left off. If you have Atari's **Translator Disk** (converts the 800XL OS to the old OS Rev. A or B, user selectable), it may be used to avoid this "timeout delay" problem. □



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```

10 DIM PROG$(182),LN$(55):PT=ADR(PROG$
):LX=ADR(LN$):C0=0:C1=1:C2=2:COLR=710:
C7=7:C3=3
20 FOR X=C1 TO 182:READ N:PROG$(X,X)=C
HR$(N):NEXT X:FOR X=C1 TO 55:READ N:LN
$(X,X)=CHR$(N):NEXT X
60 GRAPHICS C0:5IZ=FRE(C0)-256:LW=37:C
4=4:C23=23
70 DIM A$(LW),W$(LW),BL$(LW),T$(LW),B$
(SIZ):B$="":OPEN #C1,C4,C0,"K":MAXLIN
=INT(5IZ/LW)
80 XCURS=85:YCURS=84:LINE5=C1:BL$(C1)=
" ":BL$(LW)=" ":BL$(C2)=BL$
90 CONSOLE=53279:KEY=764
100 ? "K":POKE 16,112:POKE 53774,112:A
$="
110 POKE COLR,128:X=10:GOSUB 430
120 CLOSE #C2:CLOSE #C3:CLOSE #C7
130 ? " MAIN MENU "
140 ? " 1 Disk DIR "
150 ? " 2 Edit Text "
160 ? " 3 Load File "
170 ? " 4 Merge File "
180 ? " 5 Save Text "
190 ? " 6 Print Text "
200 ? " 7 Kill File "
210 ? " 8 Quit "
220 ? "
230 MN=-C1:MX=8:GOSUB 280:A=X:ON A GOT
0 810,1300,2320,2450,2480,2870,1250,35
70
240 FOR W=15 TO C0 STEP -C1/C2:SOUND C
0,60,10,W:NEXT W:RETURN
250 ? "Try Again Please"
260 FOR W=C1 TO 25:SOUND C0,100,10,8
270 SOUND C0,140,10,8:NEXT W:SOUND C0,
C0,C0,C0:RETURN
280 TRAP 320:POKE 82,C4:? :? "<press #
key 1-";MX;" [RTN=1] ">";:GET #C1,X:IF
X=155 THEN X=49
290 X=X-48:IF X<C1 OR X>MX THEN 320
300 ? X:POKE 82,C2:IF MN<C0 THEN ? "K"
:MN=C0
310 RETURN
320 ? :? "Out of range.":GOSUB 260:GOT
0 280
330 MN=C0:GOTO 350
340 MN=C1
350 TRAP 400
360 ? "<Type # & press RTN >":? " [RTN
ONLY="":MN;" "":INPUT T$:IF LEN(T$)=C0
THEN X=MN:? X:GOTO 380
370 X=INT(VAL(T$))
380 IF X)=MN AND X<=MX THEN RETURN
390 ? X:"K Out of range (":MN;"-":MX;"
only)":GOSUB 250:GOTO 350
400 ? "Bad input char(s)"
410 ? "#'s only, ":MN;"-":MX;" valid."
420 GOSUB 250:GOTO 350
430 POKE 702,64:POKE 694,C0:? "K MATT
CREDIT Rev. 12.0 "":? :? A$
440 ? "Current Lines=":LINE5*(LEN(B$))
=LW)
450 ? " Free Lines =":MAXLIN-LINE5+(L
EN(B$)<LW)
460 POKE 82,X:POKE 752,C0:? :RETURN
470 TRAP 500:POKE 702,64:POKE 694,C0:?
"<Press Y or N ">":GET #C1,X
480 IF X=89 THEN ? "Yes":X=C1:RETURN
490 IF X=78 THEN ? "No":X=C0:RETURN
500 ? "Bad Key":GOSUB 250:GOTO 470
510 A$="":CNT=C0
520 ? "<ESC To Abort>":? "Type text &
press RTN:"
530 Y=PEEK(YCURS):IF Y>=22 THEN ? "K X
KEEP TRYING":GOTO 510
540 X=PEEK(XCURS):FOR I=C1 TO LN:? "-":
: NEXT I:POSITION X,Y:? "-<";
550 TRAP 550:GET #C1,X:IF X=27 THEN PO
P:POP:A$="Aborted":GOTO 110
560 IF X<>126 THEN 590
570 CNT=CNT-C1:IF CNT<0 THEN GOSUB 26
0:CNT=C0:A$="":GOTO 530
580 ? CHR$(X):A$=A$(C1,CNT):GOTO 550
590 IF X=155 THEN ? :LN=LEN(A$):RETURN
600 IF X<32 OR X>122 OR X=96 THEN GOSU
B 260:GOTO 550

```

```

610 ? CHR$(X):CNT=CNT+C1:A$(CNT,CNT)=
CHR$(X)
620 IF CNT<=LN THEN 640
630 ? :? " K TOO LONG!":GOSUB 260:GOTO
510
640 IF CNT>LN-C4 THEN GOSUB 240
650 GOTO 550
660 L1=A-C2
670 X=C2:GOSUB 430
680 ? " DRIVE # ":MX=C4:GOSUB 280:DR
V=X
690 ? :? " FILENAME to ";
700 ON L1 GOTO 710,720,730,740
710 ? " LOAD "":? "<any OLD text will b
e DELETED >":GOTO 750
720 ? " MERGE ":GOTO 750
730 ? " SAVE text TO":GOTO 750
740 ? " DELETE "
750 ? "(press RTN only for DIR)"
760 LN=12:GOSUB 510:IF LN>C0 THEN 780
770 A=C0:GOSUB 1010:GOTO 670
780 T$="D":T$(C2)=STR$(DRV):T$(C3)="":
:T$(C4)=A$
790 TRAP 800:OPEN #C2,L2,C0,T$:? :? "W
orking...":RETURN
800 CLOSE #C2:A$=" I/O Error ":A$(LEN(
A$)+C1)=STR$(PEEK(195)):POP:GOTO 110
810 A$="":POKE COLR,144
820 X=12:GOSUB 430
830 ? " DISK DIR "
840 ? " 1 List DIR "
850 ? " 2 PRINT DIR "
860 ? " 3 Load DIR "
870 ? " 4 Merge DIR "
880 ? " 5 Go To Main "
890 ? "
900 MN=-C1:MX=5:GOSUB 280:A=X:ON A GOT
0 910,980,920,960,100
910 A=C0:GOSUB 990:GOTO 100
920 A=C1:? "Load Disk DIR into buffer.
"
930 ? "<OLD TEXT will be LOST>":? "Are
you SURE ":GOSUB 470
940 IF NOT X THEN A$=" ABORTED ":GOTO 8
20
950 LINE5=C0:B$="":GOSUB 990:GOTO 820
960 A=C1:? "Merge DIR into text buffer
"
970 GOSUB 990:A$=" DONE ":GOTO 820
980 A=C0:C=C1:GOSUB 1000:A$=" PRINT DON
E ":GOTO 820
990 C=C0
1000 ? " DIR of DRIVE # 1-4 ?":MX=C4:GO
SUB 280:DRV=X
1010 T$="D":T$(C2)=STR$(DRV):T$(C3)="":
*:*
1020 IF (A OR C) THEN ? :? " TITLE fo
r this DIR ":LN=LN:GOSUB 510:W$=A$:IF
LN=LN THEN 1040
1030 W$(LEN(W$)+C1)=BL$(LEN(W$)+C1)
1040 ? :TRAP 800:CLOSE #C2:OPEN #C2,6,
C0,T$:IF C THEN OPEN #C3,8,C0,"P":? #
C3:"EA"
1050 T$=BL$:TRAP 1180:X=C1:IF C THEN ?
#C3:W$=? #C3
1060 IF A THEN A$=W$:Y=C1:GOSUB 1160:A
$=BL$:GOSUB 1160
1070 TRAP 1180:INPUT #C2,A$:X=-X:Y=C0
1080 IF A$(C4,5)=" F" THEN A$(17,18)="
":GOTO 1100
1090 A$=A$(C3):W$=A$(9):A$(9,9)="":A$
(10)=W$:A$(17,18)="":IF X<C0 THEN A$
(17,18)="| "
1100 ? A$::IF C THEN ? #C3:A$;
1110 IF X<C0 THEN 1130
1120 ? :IF C THEN ? #C3
1130 IF NOT A THEN 1070
1140 IF X<C0 THEN T$(C1,18)=A$:GOTO 10
70
1150 T$(19,LW)=A$:A$=T$:GOSUB 1160:GOT
0 1070
1160 LINE5=LINE5+C1:IF LINE5>MAXLIN TH
EN POP:GOTO 1240
1170 B=LW*(LINE5-C1)+C1:B$(B,B+LW-C1)=
A$:RETURN
1180 TRAP 800:IF C THEN ? #C3:? #C3:?
#C3

```

```

1190 CLOSE #C2:CLOSE #C3:IF PEEK(195)<
>136 THEN GOTO 800
1200 IF NOT A THEN GOTO 1230
1210 IF X<C0 THEN A$=T$:A$(19,LW)=BL$(
19,LW):GOSUB 1160
1220 A$=BL$:GOSUB 1160
1230 TRAP 800: ? :? "End of DIR <press
RTN to cont>":GET #C1,A: ? :RETURN
1240 LINES=LINES-C1:A$="Incomp. Load,
BUFF full":RETURN
1250 A$="Kill File":A=6
1260 L2=C4:GOSUB 660:CLOSE #C2
1270 ? "Delete File ";T$: ? "Are you SU
RE ";:GOSUB 470
1280 IF NOT X THEN A$="QUIT":GOTO 110
1290 #IO 33,#C2,C0,C0,T$:A$=T$:A$(LEN(
A$)+C1)="DELETED":GOTO 110
1300 A$="":POKE COLR,130
1310 X=C2:GOSUB 430
1320 ? "READ KEYS": ? " OPTION >& Scrol
l Up 1 Pg"
1330 ? " SELECT >& Scroll Dn 1 Pg"
1340 ? " START >& Exit to EDIT Menu":
POKE 82,13: ?
1350 ? " EDIT TEXT "
1360 ? "1GoTo Start "
1370 ? "2GoTo End "
1380 ? "3GoTo LINE "
1390 ? "4Delete Lns "
1400 ? "5Insert Lns "
1410 ? "6Empty BUFF "
1420 ? "7GoTo Main "
1430 ? "
1440 MN=-C1:MX=C7:GOSUB 280:A=X:ON A G
OTO 1450,1460,1500,1530,1630,2250,110
1450 LI=C1:GOTO 1720
1460 LI=LINES:IF LI<C23 THEN GOTO 1730
1470 B=LW*(LI-C1)+C1:IF B$(B,B+LW-C1)<
>BL$ THEN 1490
1480 LI=LI-C1:IF LI>C1 THEN 1470
1490 GOTO 1720
1500 X=C2:GOSUB 430
1510 ? "Go To Line #":MX=LINES:GOSUB 3
40:LI=X
1520 GOTO 1720
1530 IF LEN(B$)<LW THEN A$="BUFF EMPTY
":GOTO 1310
1540 X=C2:GOSUB 430: ? "First line to
DELETE":MX=LINES:GOSUB 340:LI=X
1550 ? "Last line to DELETE":MX=LIN
ES:MN=L1:GOSUB 350:L2=X
1560 ? : ? "Delete Lines > ";L1;" - ";L
2: ? "Are you SURE ";:GOSUB 470
1570 IF X THEN 1590
1580 A$="Aborted":GOTO 1310
1590 IF L2=LINES THEN B$(LW*(L1-C1)+C1
)="":GOTO 1610
1600 B$(LW*(L1-C1)+C1)=B$(LW*(L2-C1)+L
W+C1)
1610 LINES=LINES-C1-(L2-L1)
1620 A$="Deleted LNS":A$(LEN(A$)+C1)=
STR$(L1):A$(LEN(A$)+C1)="-":A$(LEN(A$)
+C1)=STR$(L2):GOTO 1310
1630 ? "Insert LINE(S)":IF LEN(B$)<LW
THEN A$="BUFF EMPTY":GOTO 1310
1640 ? "Insert BEFORE Line # ":MX=LINE
S:GOSUB 340:LI=X
1650 MX=MAXLIN-LINES: ? "# of LINES to
insert ?": ? "(MAX=";MX;" ) ";:GOSUB 340
:L2=X
1660 ? "Are you SURE ";:GOSUB 470:IF
NOT X THEN 1580
1670 ? "Working..":FOR I=LINES+C1 TO L
INES+L2:A=LW*(I-C1)+C1
1680 B$(A,A+LW-C1)=BL$:NEXT I
1690 FOR I=LINES TO L1 STEP -C1
1700 A=LW*(I-C1)+C1:B=LW*(I+L2-C1)+C1:
B$(B,B+LW-C1)=B$(A,A+LW-C1):B$(A,A+LW-
C1)=BL$:NEXT I
1710 LINES=LINES+L2:A$=STR$(L2):A$(LEN(
A$)+C1)=" Lines INSERTED before ":A$(
LEN(A$)+C1)=STR$(L1):GOTO 1310
1720 POKE 752,C1:LE=LI+22:IF LE>LINES
THEN LE=LINES
1730 ? "K";
1740 IF LEN(B$)<LW THEN LI=C1:GOTO 179
0

```

```

1750 Y=C0:FOR I=LI TO LE
1760 A=LW*(I-C1)+C1
1770 POSITION C2,Y: ? B$(A,A+LW-C1):Y=
Y+C1
1780 NEXT I
1790 POKE 752,C1:POSITION C2,C23: ? "LI
NE # ";LI;" ";:Y=C0
1800 POSITION 15,C23: ? "EDIT MODE <STA
RT-EXIT>":POKE 752,C0
1810 LOCATE C2,C0,A:POSITION C2,C0
1820 ? CHR$(A);CHR$(30):X=C2:Y=C0
1830 IF F=C1 THEN ? "44";
1840 TRAP 1840:IF PEEK(KEY)<>255 THEN
GET #C1,A:GOTO 1890
1850 IF PEEK(CONSOL)=C7 THEN 1840
1860 IF PEEK(CONSOL)<>6 AND LINES<C23
THEN GOSUB 260:GOTO 1840
1870 IF PEEK(CONSOL)=6 THEN F=C0:GOTO
2070
1880 IF PEEK(CONSOL)=5 THEN F=C2:GOTO
2070
1890 IF PEEK(CONSOL)=C3 THEN F=C3:GOTO
2070
1900 IF A=125 OR A=27 THEN GOSUB 260:G
OTO 1840
1910 IF A<>157 THEN 1940
1920 X=PEEK(XCURS):Y=PEEK(YCURS):POKE
752,C1
1930 POSITION C2,22: ? CHR$(156):POKE
752,C0:POSITION X,Y
1940 ? CHR$(A):IF (A=31 OR A=30) AND
PEEK(XCURS)>38 THEN ? CHR$(A):GOTO 18
40
1950 IF (A=28 OR A=29) AND PEEK(YCURS)
=C23 THEN ? CHR$(A):GOTO 1840
1960 IF PEEK(YCURS)=Y AND A<>156 THEN
2020
1970 Y=PEEK(YCURS):X=PEEK(XCURS):POKE
752,C1
1980 IF A=156 THEN POSITION C2,22: ? CH
R$(157):GOTO 2010
1990 IF Y=C23 AND A=155 THEN Y=22:F=C1
:POKE YCURS,22:GOTO 2070
2000 POSITION C2,C23: ? "LINE # ";LI+Y;
" ";
2010 POKE 752,C0:LOCATE X,Y,A:POSITION
X,Y: ? CHR$(A);CHR$(30);
2020 X=PEEK(XCURS):IF X<=38 THEN 2060
2030 IF Y=22 THEN F=C1:GOTO 2070
2040 IF Y<22 THEN Y=Y+C1: ? CHR$(155):
GOTO 2060
2050 LOCATE C2,Y,A: ? CHR$(A);CHR$(30);
2060 GOTO 1840
2070 X=PEEK(XCURS):Y=PEEK(YCURS):POKE
752,C1
2080 POSITION 15,C23: ? "READING PAGE
";:LOCATE X,Y,A
2090 COLOR A:PLOT X,Y:GOSUB 240
2100 FOR Y1=C0 TO Y:BB=LW*(LI-C1+Y1)+C
1
2110 POSITION C1,Y1
2120 POKE 842,13:INPUT A$:POKE 842,12
2130 IF LEN(A$)=LW THEN 2150
2140 A$(LEN(A$)+C1)=BL$(LEN(A$)+C1)
2150 B$(BB,BB+LW-C1)=A$:NEXT Y1
2160 LI=LI+Y:IF LI>LINES THEN LINES=LI
2170 IF F=C1 THEN LI=LI-C1:GOTO 1720
2180 IF F<>C2 THEN 2210
2190 LI=LE+C1:IF LI>LINES THEN LI=LINE
S-C1
2200 GOTO 1720
2210 IF F<>C3 THEN 2240
2220 LI=LI-C23:IF LI<C1 THEN LI=C1
2230 GOTO 1720
2240 A$="** Last line read >":A$(LEN(
A$)+C1)=STR$(LI):GOTO 1310
2250 A$="Empty BUFF NOW *":GOSUB 430
2260 ? "Delete ALL text from BUFF"
2270 ? "Are you SURE ";:GOSUB 470
2280 IF X THEN 2300
2290 GOTO 1580
2300 B$="":LINES=C1:A$="BUFF EMPTY":GO
TO 1310
2310 RETURN
2320 POKE COLR,208:A$="LOAD FILE"
2330 L2=C4:GOSUB 660:LINES=C0:B$="
2340 TRAP 2400

```

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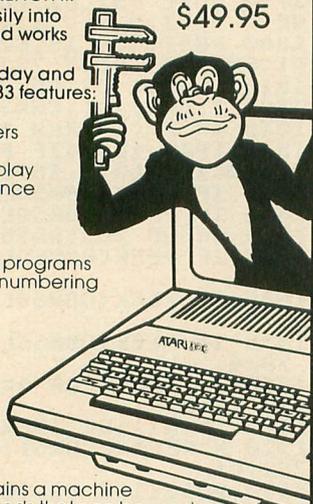
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```

2350 INPUT #C2,A$:IF LEN(A$)=LW THEN 2
370
2360 A$(LEN(A$)+C1)=BL$(LEN(A$)+C1)
2370 LINES=LINES+C1:IF LINES>MAXLIN TH
EN GOTO 2440
2380 B$(LW*(LINES-C1)+C1,LW*(LINES-C1
+LW))=A$
2390 GOTO 2350
2400 CLOSE #C2
2410 IF PEEK(195)=136 THEN 2430
2420 GOTO 800
2430 A$="END-FILE":GOTO 110
2440 CLOSE #C2:A$="BUFF Full, File to
O BIG":LINES=MAXLIN:GOTO 110
2450 POKE COLR,178:A$="MERGE FILE"
2460 L2=C4:GOSUB 660
2470 GOTO 2340
2480 IF LEN(B$)=LW THEN 2500
2490 A$="BUFF EMPTY":GOTO 110
2500 A$=""
2510 CLOSE #2:POKE COLR,32:X=8:GOSUB 4
30
2520 ? "SAVE MENU"
2530 ? "As Text File"
2540 ? "2As PRINT Stmnts"
2550 ? "3As DATA Stmnts"
2560 ? "Main Menu"
2570 ?
2580 MN=-C1:MX=C4:GOSUB 280:A=X
2590 IF A=C4 THEN GOTO 100
2600 ? "Delete ALL blank lines from bu
ffer":? "During SAVE":GOSUB 470:DB=X
2610 ON A GOTO 2680,2620,2650
2620 ? "File # for PRINT statements":?
"(i.e. 6 for '? #6;)"
2630 ? "<USE ZERO if NO file #>"
2640 MX=C7:GOSUB 330:F=X:GOTO 2660
2650 ? "Write DATA Statements"
2660 ? "Starting Line #":MX=32767-LI
NES:GOSUB 330:5L=X
2670 MX=INT((32767-5L)/LINES):? "Line
Increment":GOSUB 340:INC=X
2680 Q=A:A$="SAVE FILE":A=5:L2=8:GOSUB
660:A=0
2690 FOR I=C1 TO LINES
2700 B=LW*(I-C1)+C1:IF B$(B,B+LW-C1)=B
L$ AND DB THEN GOTO 2840
2710 IF A=C1 THEN 2780
2720 ? #C2;5L;:5L=5L+INC
2730 ON A-C1 GOTO 2740,2770
2740 ? #C2;" ? ":IF NOT F THEN 2760
2750 ? #C2;"#";F;"";
2760 ? #C2;CHR$(34);:GOTO 2780
2770 ? #C2;" DATA"
2780 A$=B$(B,B+LW-C1)
2790 EL=USR(LX,ADR(A$),LW)
2800 IF EL=C0 THEN GOTO 2820
2810 ? #C2;A$(C1,EL);
2820 IF A=C2 THEN ? #C2;CHR$(34);
2830 ? #C2
2840 NEXT I
2850 A$="Done":IF A>C1 THEN A$(LEN(A$)
+C1)="Last Line #":A$(LEN(A$)+C1)=5
TR$(5L)
2860 CLOSE #C2:GOTO 2510
2870 IF LEN(B$)<LW THEN GOTO 2490
2880 A$="":POKE COLR,32
2890 X=8:GOSUB 430
2900 ? "PRINT OPTIONS"
2910 ? "1 40 Char Lines"
2920 ? "2 Newspaper [2] Col"
2930 ? "3 Newspaper [3] Col"
2940 ? "4 Return to Main"
2950 ?
2960 MN=-C1:MX=C4:GOSUB 280:A=X
2970 IF A=C4 THEN 110
2980 POKE 82,C2: ? ? "TITLE for Printo
ut":LN=30:GOSUB 510:W$=A$:W$(LEN(W$)+C
1)="Pg"
2990 ? "Center text as it is printed:
":GOSUB 470:CR=X
3000 IF A=C3 THEN LM=C1:GOTO 3020
3010 MX=20*A: ? "Left Margin (max=";MX;
)":GOSUB 340:LM=X
3020 ? : ? "Vertical line spacing:"
3030 ? "1 Single (screen format)"
3040 ? "2 Double"

```

```

3050 ? :MX=C2:GOSUB 280
3060 IF X=C1 THEN 5P=8:LPG=96
3070 IF X=C2 THEN 5P=16:LPG=48
3080 ? "Get [Printer Ready NOW]"
3090 ? "And Press [RTN] key"
3100 ? "<ESC to abort>"
3110 TRAP 800:GET #C1,X:IF X=155 THEN
3130
3120 IF X=27 THEN A$="Print Aborted":G
OTO 110
3130 TRAP 2420:CLOSE #C7
3140 PG=C1:LPC=LPG-12
3150 OPEN #C7,8,C0,"P:":? #C7;"EA";CHR
$(5P);"EO";
3160 IF A>C1 THEN 3270
3170 DNS=ASC("K"):GOSUB 3460
3180 FOR I=C1 TO LINES
3190 B=LW*(I-C1):A$=B$(B+C1,B+LW):IF A
$=BL$ THEN ? #7:GOTO 3240
3200 IF NOT (CR) THEN 3230
3210 A=USR(LX,ADR(A$),LW):A=INT((LW-A)
/C2):IF A=C0 THEN 3230
3220 T$=A$:A$=BL$:A$(A)=T$(C1,LW-A)
3230 GOSUB 3500: ? #C7
3240 CNT=CNT-C1:IF NOT (CNT) THEN GOS
UB 3550
3250 NEXT I
3260 ? #C7:CLOSE #C7:A$="PRINT DONE":G
OTO 2870
3270 DNS=ASC("L"):GOSUB 3460
3280 I=C1
3290 FOR J=C1 TO A
3300 IF J=C1 THEN GOSUB 3560
3310 B=LW*(I-C1)+LPC*(J-C1)*LW+C1
3320 IF J>C1 THEN A$="|":GOSUB 3510
3330 IF B>=LEN(B$) AND J=A THEN 3400
3340 IF B>=LEN(B$) THEN A$=BL$:GOTO 33
80
3350 A$=B$(B,B+LW-C1):IF NOT (CR) THE
N 3380
3360 X=USR(LX,ADR(A$),LW):X=INT((LW-X)
/2):IF X<C1 THEN 3380
3370 T$=A$:A$=BL$:A$(X)=T$:A$(LW+C1)="
"
3380 IF A$=BL$ AND J=A THEN 3400
3390 GOSUB 3510
3400 NEXT J
3410 ? #C7:CNT=CNT-C1:IF CNT THEN 3440
3420 I=I+(A-C1)*LPC:IF I>LINES THEN 34
40
3430 GOSUB 3550
3440 I=I+C1:IF I>LINES THEN 3260
3450 GOTO 3290
3460 T$=STR$(PG):PG=PG+C1
3470 ? #7:GOSUB 3560:X=LEN(W$):GOSUB 3
540:X=USR(PT,ADR(W$),LEN(W$)):X=LEN(T$
):GOSUB 3540
3480 X=USR(PT,ADR(T$),LEN(T$)): ? #C7:F
OR X=C1 TO 5: ? #C7:NEXT X:CNT=LPC:RETU
RN
3490 FOR X=C1 TO C4: ? #C7:NEXT X:GOTO
3460
3500 GOSUB 3560
3510 X=LEN(A$):GOSUB 3540:X=USR(PT,ADR
(A$),LEN(A$))
3520 IF PEEK(KEY)<>255 THEN GET #C1,X:
IF X=27 THEN POP:CLOSE #C7:GOTO 3120
3530 RETURN
3540 X=X*8:HI=INT(X/256):LO=X-256*HI: ?
#C7;CHR$(27);CHR$(DNS);CHR$(LO);CHR$(
HI);:RETURN
3550 FOR X=C1 TO C2+(5P=8): ? #C7:NEXT
X: ? #C7;"EA": ? #C7;"EA";CHR$(5P);:GOS
UB 3490:RETURN
3560 X=LM:GOSUB 3540:X=USR(PT,ADR(BL$)
,LM):RETURN
3570 ? "End Edit [NOW]":GOSUB 240:G
OSUB 470
3580 IF NOT X THEN A$="":GOTO 110
3590 GRAPHICS C0:CLR:END
4000 DATA 104,240,10,201,2,240,7,170,1
04,104,202,208,251,96,104,133,213,104,
133,212
4010 DATA 104,104,133,216,160,0,177,21
2,230,212,208,2,230,213,160,0,132,217,
201,128

```

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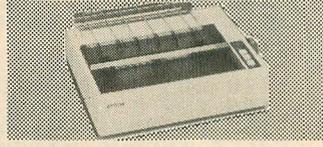
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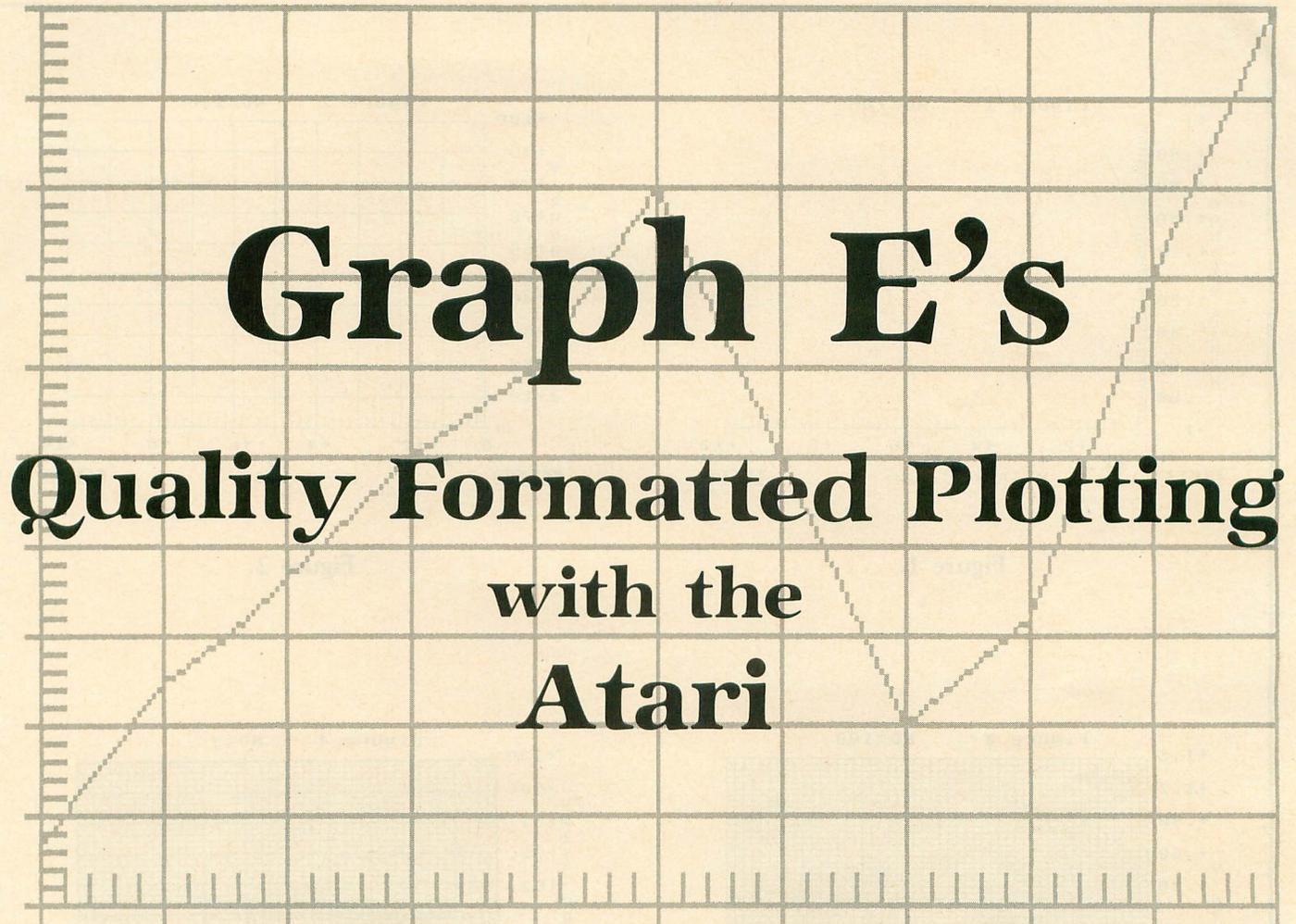
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4020 DATA	144, 4, 41, 127, 198, 217, 170, 133, 218, 224, 96, 176, 11, 169, 64, 224, 32, 144, 2, 169
4030 DATA	224, 24, 101, 218, 133, 214, 169, 0, 133, 215, 162, 3, 6, 214, 38, 215, 202, 208, 24, 9, 24
4040 DATA	173, 244, 2, 101, 215, 133, 215, 16, 0, 0, 240, 2, 208, 187, 162, 0, 177, 214, 230, 21, 4, 208
4050 DATA	2, 230, 215, 69, 217, 149, 228, 232, 224, 8, 208, 239, 162, 0, 22, 228, 42, 232, 224, 8
4060 DATA	208, 248, 153, 220, 0, 200, 192, 8, 208, 238, 162, 0, 181, 220, 201, 155, 208, 4, 16, 9, 151
4070 DATA	149, 220, 232, 224, 8, 208, 241, 16, 2, 112, 169, 11, 157, 66, 3, 169, 220, 157, 68, 3, 169
4080 DATA	0, 157, 69, 3, 169, 0, 157, 73, 3, 16, 9, 8, 157, 72, 3, 32, 86, 228, 198, 216, 208
4090 DATA	166, 96
4100 DATA	104, 240, 10, 201, 2, 240, 15, 170, 104, 104, 202, 208, 251, 169, 0, 133, 212, 169, 1, 133
4110 DATA	213, 96, 104, 133, 215, 104, 133, 2, 14, 104, 104, 168, 136, 177, 214, 201, 32, 208, 9, 136, 208
4120 DATA	247, 177, 214, 201, 32, 240, 1, 200, 132, 212, 169, 0, 133, 213, 96

## CHECKSUM DATA

(see page 27)

10 DATA	690, 721, 162, 784, 89, 117, 133, 105, 258, 0, 145, 389, 343, 577, 403, 4916
190 DATA	738, 338, 922, 883, 53, 888, 920, 42, 7, 890, 667, 502, 794, 588, 22, 511, 9143
340 DATA	361, 715, 223, 473, 605, 137, 57, 12, 73, 65, 965, 194, 723, 822, 7, 5432
490 DATA	762, 664, 228, 245, 895, 846, 740, 9, 36, 119, 643, 197, 801, 787, 991, 39, 8893
640 DATA	179, 731, 460, 529, 314, 5, 620, 99, 949, 830, 254, 398, 791, 804, 683, 7646
790 DATA	620, 98, 891, 482, 579, 807, 723, 73, 7, 924, 952, 401, 84, 605, 16, 593, 8512
940 DATA	923, 971, 488, 31, 752, 92, 280, 759, 807, 10, 579, 210, 588, 982, 549, 8021
1090 DATA	565, 513, 901, 655, 970, 51, 83, 59, 0, 919, 637, 904, 524, 761, 916, 650, 9639
1240 DATA	724, 183, 830, 924, 738, 437, 14, 6, 80, 853, 601, 793, 67, 832, 567, 473, 8716
1390 DATA	839, 887, 807, 645, 536, 772, 468, 765, 358, 766, 728, 685, 515, 724, 437, 9932
1540 DATA	926, 625, 535, 568, 596, 306, 68, 5, 38, 767, 245, 143, 817, 35, 53, 581, 6803
1690 DATA	106, 399, 896, 511, 260, 916, 195, 469, 274, 513, 933, 638, 573, 257, 70, 7010
1840 DATA	140, 211, 754, 276, 281, 677, 823, 924, 903, 232, 207, 98, 239, 907, 679, 7351
1990 DATA	564, 33, 758, 99, 892, 621, 572, 72, 0, 883, 94, 343, 27, 715, 653, 656, 7630
2140 DATA	884, 804, 194, 608, 617, 484, 715, 621, 504, 718, 612, 506, 6, 791, 549, 8613
2290 DATA	734, 424, 791, 535, 214, 681, 909, 892, 612, 595, 732, 743, 845, 899, 683, 10289
2440 DATA	501, 953, 458, 731, 410, 416, 386, 352, 328, 973, 403, 182, 722, 782, 325, 7922
2590 DATA	210, 273, 291, 806, 224, 572, 919, 318, 554, 382, 101, 242, 926, 202, 265, 6285
2740 DATA	478, 291, 585, 250, 576, 384, 665, 352, 920, 375, 514, 90, 42, 220, 837, 6579
2890 DATA	430, 795, 982, 637, 640, 671, 662, 335, 662, 779, 487, 181, 357, 666, 453, 8737
3040 DATA	855, 821, 747, 947, 218, 798, 37, 2, 44, 861, 65, 795, 612, 903, 717, 87, 8707
3190 DATA	374, 247, 408, 947, 608, 761, 499, 560, 721, 255, 312, 780, 20, 512, 303, 7307
3340 DATA	154, 71, 564, 452, 672, 957, 503, 6, 07, 215, 966, 992, 743, 409, 190, 103, 7598
3490 DATA	241, 969, 298, 179, 801, 328, 789, 621, 678, 369, 334, 394, 382, 191, 131, 6705
4040 DATA	324, 89, 364, 237, 598, 147, 290, 9, 17, 577, 3543



32K Disk

by Robert E. Miller

The excellent Atari 800 graphics package allows easy plotting of data on the screen, but, unfortunately, considerable labor is involved in providing titles, legends and scale values. **Graph E's** makes nicely formatted graphs available with a minimum of effort.

#### Screen dump.

Hardcopy capability greatly enhances the utility of **Graph E's**. I have provided a minimum capability for immediate demonstration purposes by incorporating the "49 Second Screen Dump" program from *Compute's Second Book of Atari*<sup>1</sup>. See Line 3620. Thus, as written, the screen can be dumped to an Epson MX-80 printer with Graphtrax 80 by pressing START after the graph is displayed on the screen. The resulting graph is the small size as shown in Figures 1 through 6. If you have your own screen copy utility, invoke it after the screen display is complete.

The sample plots in Figures 1 through 6 will allow you to quickly judge whether **Graph E's** is useful for your application. Note that these plots are available on your screen whether you have screen dump/printer capability or not.

#### Samples.

The program as presented includes several built-in plots, so that you can try it out immediately. Once you see the action, I'm sure you will want to replace my examples with your own. The discrete point routine is especially useful, since data not represented by closed form equations can be readily handled. Explanatory remarks are included in the program listing to provide insight into the approach.

#### Number of points plotted.

In general, curves are drawn more rapidly as the number of points is decreased, but smoother curves result from more points. In the steps beginning with Line 120, the choice of number of points, ND, is requested. As currently dimensioned, 402 points is the upper limit. 100 point curves are adequate for most purposes. Use a small ND for the first runs, to become acquainted with the program flow and screen blanking employed to speed up the program.

For the discrete point routine, ND is superceded so that it is equal to or less than the number of XY pairs in the associated data statement. Insert in Line

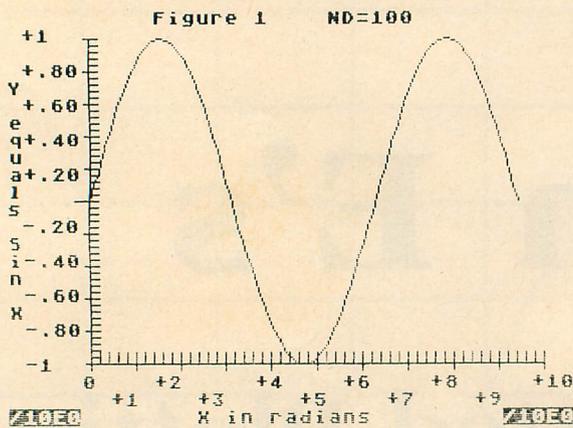


Figure 1.

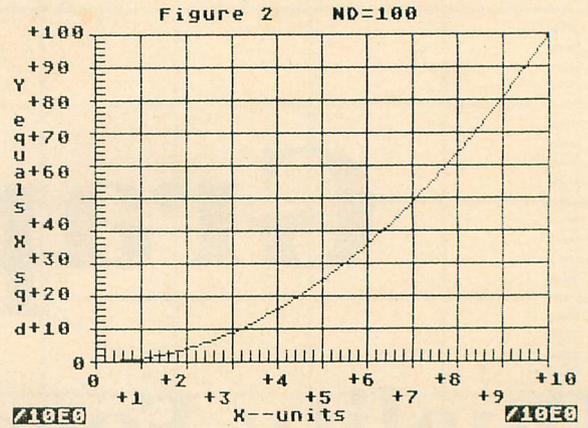


Figure 2.

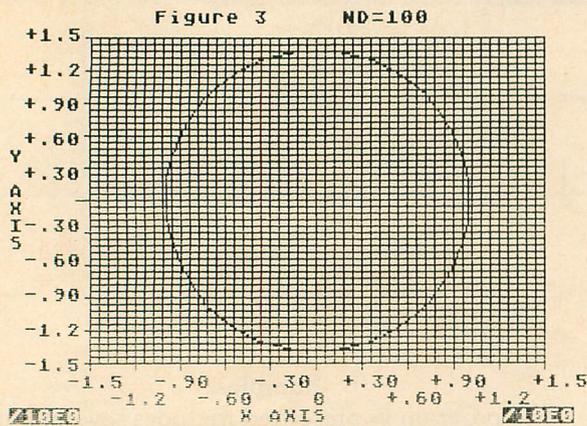


Figure 3.

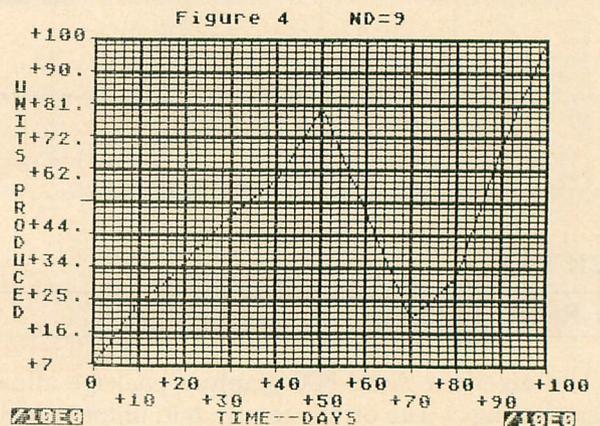


Figure 4.

3110 the ND that is appropriate for your data. Note that sequential pairs are required if the points are to be connected as programmed. (For disconnected points on any plot, use PLOT X(J),Y(J) in Line 760.)

**Grid options.**

The user has a choice as to the grid, tic mark and axis arrangement. Choices 1, 2, 3 and 4 are illustrated in Figures 1 through 4, respectively. The four built-in plots — 1, 2, 3 and 4 — are also illustrated in these figures.

Once the grid and plot are selected, titles and legends are entered from the keyboard as prompted. Any keyboard character can be used.

**Manual or auto scaling.**

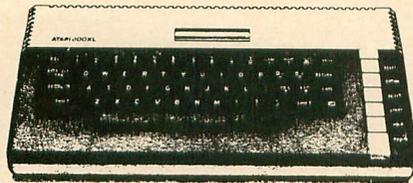
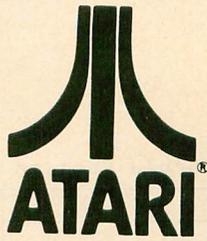
Auto scaling is most useful for first pass or casual plotting. The manual feature can then be used to get the most suitable arrangement for your purposes. Figure 5 illustrates an auto scaled plot. All other figures are scaled manually.

Since the axis limits are under your control in the manual scale mode, portions of the plot can be enlarged by choosing the range of interest to be the full axis length (see Figure 6).

The scaling routines, and the method of title and legend centering, were provided by Mr. Bregoli<sup>2</sup>.

(continued on page 62)

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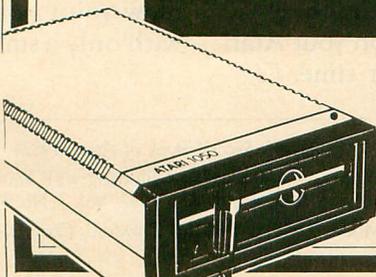
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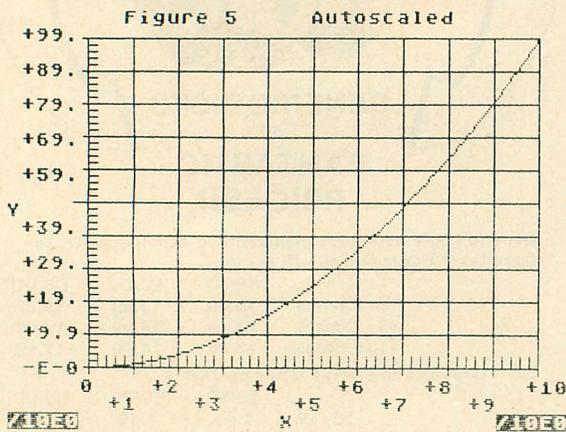


Figure 5.

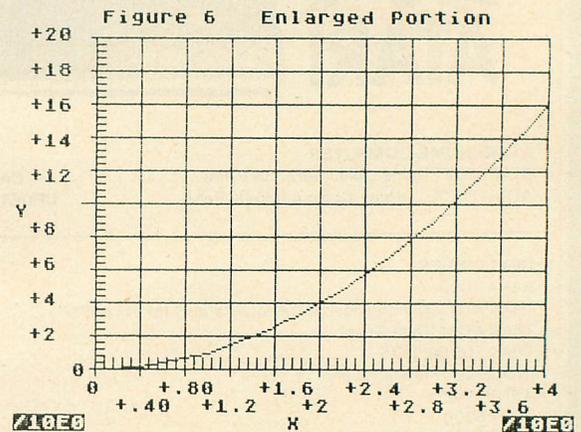


Figure 6.

### Mixed graphics.

Text is obtained by drawing graphics 0 characters with the graphics 8 mode. The necessary machine language routine was presented by Mr. Crawford<sup>3</sup>. The routine is flexible and can be relocated. In fact, for this application, it was moved (in page 6), to avoid overlap with the screen dump program.

All printing on the graphics 8+16 screen is done by defining TEXT\$ and its starting location, H,V, which is in graphics 0 coordinates. Line 1690 calls the machine language portion loaded in subroutine 1520, through the powerful USR function.

### Retention, hard copy and re-entry.

When the graph is completed on the screen, Lines 2550 and 2600 serve to hold it, by suppressing the READY prompt until the user takes further action. To obtain a hard copy with the 49-second screen dump subroutine, press the START key. There will be a pause, followed by a printout. If no printout is required, or if the printout is complete, press the OPTION key to display the re-entry options for drawing a new graph on the screen, modifying the current one or exiting. If you have your own screen dump program, take the appropriate action while the graph is being displayed. If you do not have a printer, the program can be used to produce screen-only graphs, if program lines involving device #5 are deleted.

### Approach forces choices.

Several choices were necessary in order to produce consistently useful graphs. It was decided that ten major divisions, with five subdivisions, would be used

along each axis. It was also decided that only four characters would be used in the scale values, including the sign and decimal point, if present. If you don't object to encroaching on the Y-axis and overlapping more on the X-axis, the number of characters can be easily changed. One line was allowed for the title, the Y-axis legend, and the X-axis legend and scale factors. The scale factors make the limit of four characters in the scale values acceptable. However, truncation occurs in some instances until a suitable scale is selected. (Values = actual/s.f.)

### Screen dump options.

The example plots shown thus far are all small, but the Atari Epson **Screen Dump II** program, for example, which was purchased from Computer Age Software, Silver Springs, Maryland, will produce a printout that substantially fills an 8½×11 page (see Figure 7). The plotting time is greater, however, especially for the 960 dots/line mode. For the most rapid plotting, one uses the 480 dots/line mode and the small plot. With the **Dump II** program, another option gives a white curve on a dark background.

Employment of **Graph E's** will allow you to produce useful graphs on your Atari — with only a small expenditure of your time. □

<sup>1</sup>"49 Second Screen Dump," *Compute's Second Book of Atari*, 1982.

<sup>2</sup>"A BASIC Plotting Subroutine — Sophisticated Plotting with Your MX-80," Lawrence J. Bregoli, *Byte Magazine*, March 1982, Vol. 7, No. 3.

<sup>3</sup>"Mixing Atari Graphics Modes 0 and 8," Douglas Crawford, *Compute*, June 1981, issue 13.

Figure 7 Production Record

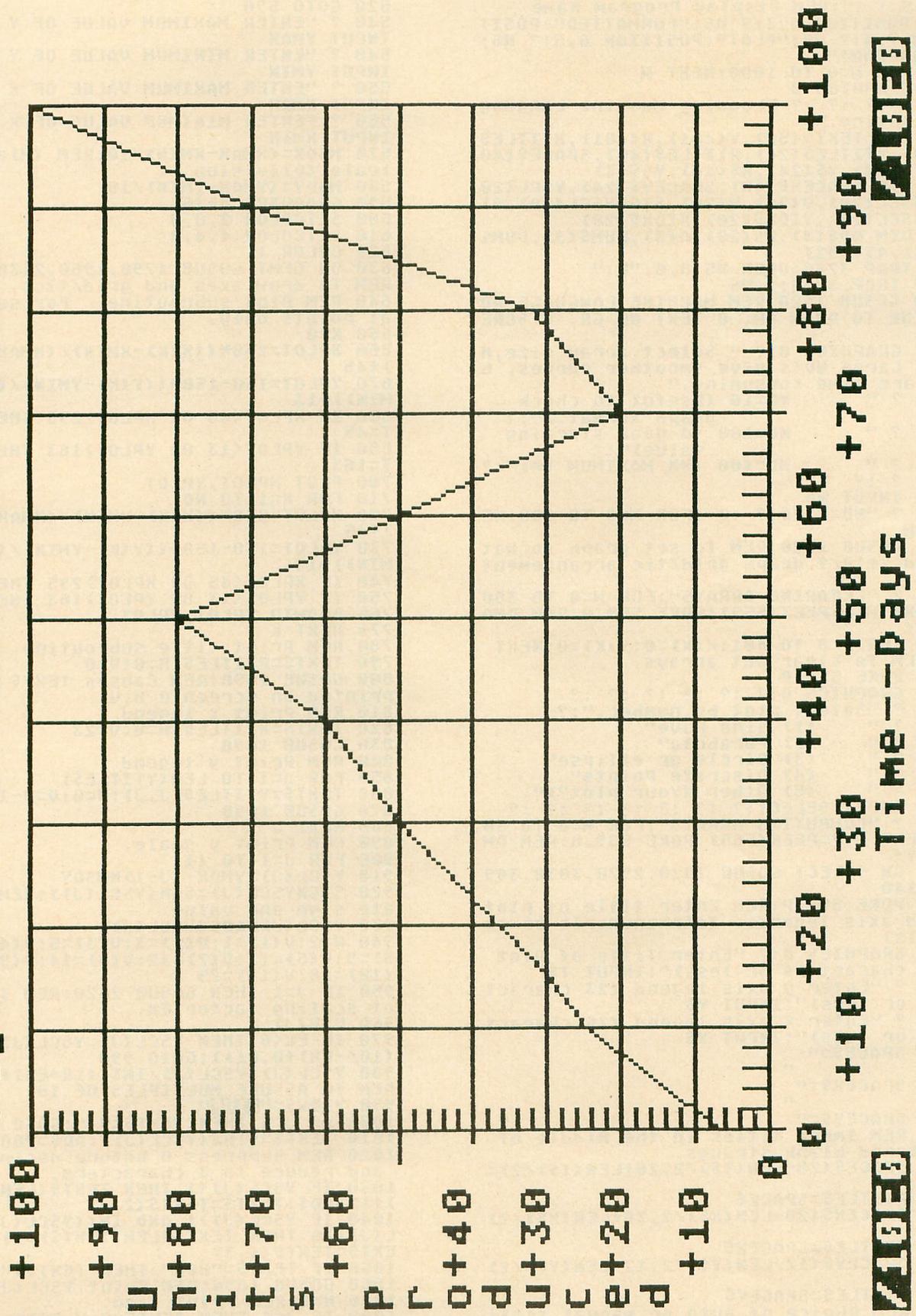


Figure 7.

```

10 GRAPHICS 2:POSITION 4,1:? #6;"GRAPH
E'S ! !":REM Display Program Name
20 POSITION 5,3:? #6;"FORMATTED":POSIT
ION 7,4:? #6;"PLOT":POSITION 6,5:? #6;
"PROGRAM!"
30 FOR W=0 TO 1000:NEXT W
40 GRAPHICS 0
50 ? :? :? :? "Loading Machine Languag
e Routine."
60 DIM TEXT$(50),Y(401),X(401),XTITLE$(
40),YTITLE$(24),PTITLE$(40),SPACES(40
),T$(40),Y$(24),X$(40),Y$(3)
70 DIM SPACEX$(40),SPACEY$(24),Y5CL(20
),X5CL(20),V(20),H(20),SIGNY5CL(20),SI
GNX5CL(20),YIDX$(20),XIDX$(20)
80 DIM AD$(4),H$(20),A(3),DUM$(3),DUM1
$(3),A$(192)
90 TRAP 3740:OPEN #5,8,0,"P:"
100 TRAP 3750:? #5
110 GOSUB 1520:REM MACHINE LANGUAGE RO
UTINE TO DRAW GR. 0 TEXT ON GR. 8 SCRE
EN.
120 GRAPHICS 0:? " Select array size,N
D. Large ND's give smoother curves, b
ut are time consuming."
130 ? " ND=10 (Useful to check
graph format.)"?
140 ? " ND=100 (A good starting
value)"?
150 ? " ND=400 (** MAXIMUM **)"?:?
160 ? :?
170 INPUT ND
180 ? "ND=";ND: ? :? :FOR W=0 TO 100:NE
XT W
190 GOSUB 1720:REM To set graph format
and select graph grid/tic arrangement
.
200 ? "CLEARING ARRAYS":FOR W=0 TO 300
:NEXT W:P=PEEK(559):POKE 559,0:REM DMA
off
210 FOR K=0 TO 401:X(K)=0:Y(K)=0:NEXT
K:REM To clear out arrays.
220 POKE 559,P
230 GRAPHICS 0:? :? :? :? :? :?
240 ? "Select plot by number.":?
250 ? " (1) Sine Wave"
260 ? " (2) Parabola"
270 ? " (3) Circle or ellipse"
280 ? " (4) Discrete Points"
290 ? " (5) Other (Your plot)?"
300 INPUT SELECT: ? :? :? :? :? :? :?
310 ? "COMPUTING ARRAYS":FOR W=0 TO 30
0:NEXT W:P=PEEK(559):POKE 559,0:REM DM
A off
320 ON SELECT GOSUB 2920,2970,3030,309
0,3140
330 POKE 559,P:REM Enter title of plot
and axis legends. [Alphanumeric or sy
mbols]
340 GRAPHICS 0:? "Enter Title of Plot
(40 characters or less)":INPUT T$
350 ? "Enter y axis legend (23 charact
ers or less)":INPUT Y$
360 ? "Enter x axis legend (26 charact
ers or less)":INPUT X$
370 SPACES$=""
380 SPACEX$=""
390 SPACEY$=""
400 REM Imbed titles in the middle of
centered blank strings.
410 SPACES$(20-LEN(T$)/2,20+LEN(T$)/2)=
T$
420 PTITLE$=SPACES$
430 SPACEX$(20-LEN(X$)/2,20+LEN(X$)/2)
=X$
440 XTITLE$=SPACEX$
450 SPACEY$(12-LEN(Y$)/2,12+LEN(Y$)/2)
=Y$
460 YTITLE$=SPACEY$
470 REM Choice of auto or manual scali
ng.
480 ? "DO YOU WANT (A)UTO OR (M)ANUAL
SCALING":INPUT Y5$
490 IF Y5$="M" THEN Y5$=0
500 IF Y5$="A" THEN GOSUB 3150

```

```

510 IF Y5$(0)"A" THEN 480
520 GOTO 590
530 ? "ENTER MAXIMUM VALUE OF Y AXIS":
INPUT YMAX
540 ? "ENTER MINIMUM VALUE OF Y AXIS":
INPUT YMIN
550 ? "ENTER MAXIMUM VALUE OF X AXIS":
INPUT XMAX
560 ? "ENTER MINIMUM VALUE OF X AXIS":
INPUT XMIN
570 MSDX=(XMAX-XMIN)/10:REM (M)ajor (S
)cale (D)ivision
580 MSDY=(YMAX-YMIN)/10
590 GRAPHICS 8+16
600 SETCOLOR 2,8,0
610 SETCOLOR 4,4,8
620 COLOR 1
630 ON GFMT GOSUB 1790,1960,2130,2300:
REM To draw axes and grid/tics.
640 REM Plot subroutine. For sequenti
al points only.
650 K=0
660 XPLOT=250*((X(K)-XMIN)/(XMAX-XMIN
))+45
670 YPLOT=150-150*((Y(K)-YMIN)/(YMAX-Y
MIN))+13
680 IF XPLOT<45 OR XPLOT>295 THEN XPLO
T=45
690 IF YPLOT<13 OR YPLOT>163 THEN YPLO
T=163
700 PLOT XPLOT,YPLOT
710 FOR K=1 TO ND
720 XPLOT=250*((X(K)-XMIN)/(XMAX-XMIN
))+45
730 YPLOT=150-150*((Y(K)-YMIN)/(YMAX-Y
MIN))+13
740 IF XPLOT<45 OR XPLOT>295 THEN 770
750 IF YPLOT<13 OR YPLOT>163 THEN 770
760 DRAWTO XPLOT,YPLOT
770 NEXT K
780 REM Print title subroutine
790 TEXT$=PTITLE$:H=0:V=0
800 GOSUB 1690:REM Causes TEXT$ to be
printed on screen @ H,V.
810 REM Print x legend
820 TEXT$=XTITLE$:H=0:V=23
830 GOSUB 1690
840 REM Print y legend
850 FOR J=1 TO LEN(YTITLE$)
860 TEXT$=YTITLE$(J,J):H=0:V=J-1
870 GOSUB 1690
880 NEXT J
890 REM Print y scale.
900 FOR J=1 TO 11
910 Y5CL(J)=YMAX-(J-1)*MSDY
920 SIGNY5CL(J)=SGN(Y5CL(J)):REM Separ
ate sign and value.
930 Y5CL(J)=ABS(Y5CL(J))
940 H=2:V(1)=1:V(2)=3:V(3)=5:V(4)=7:V(
5)=9:V(6)=11:V(7)=12:V(8)=14:V(9)=16:V
(10)=18:V(11)=20
950 IF J=1 THEN GOSUB 2620:REM To sele
ct scaling factor,EX.
960 V=V(J)
970 IF EX<0 THEN Y5CL(J)=Y5CL(J)*(INT(
(10^EX)+0.01)):GOTO 990
980 Y5CL(J)=Y5CL(J)/INT((10^EX)+0.01):
REM TO ASSURE MULTIPLES OF 10
990 YIDX$="10E"
1000 IF J=6 THEN TEXT$=" ":GOTO 1050
1010 TEXT$=STR$(Y5CL(J)):AD$="0000"
1020 REM Suppress 0 before decimal pt.
and reduce to 3 characters.
1030 IF Y5CL(J)<1 THEN TEXT$(LEN(TEXT$
)+1)=AD$:TEXT$=TEXT$(2,4)
1040 IF Y5CL(J)>1 AND INT(Y5CL(J))-Y5C
L(J)<>0 THEN TEXT$(LEN(TEXT$)+1)=AD$:T
EXT$=TEXT$(1,3)
1050 IF TEXT$="000" THEN TEXT$=" 0"
1060 GOSUB 1690:REM Print Y5CL(J)
1070 H=1:REM Print sign.
1080 IF J=6 THEN TEXT$=" ":GOTO 1120
1090 IF SIGNY5CL(J)<0 THEN TEXT$="--":G
OTO 1120
1100 TEXT$="+"
1110 IF Y5CL(J)=0 THEN TEXT$=" "
1120 GOSUB 1690

```

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```

1130 NEXT J
1140 H=0:V=23:REM Print yaxis scale factor.
1150 GOSUB 3520
1160 YIDX$(LEN(YIDX$)+1)=DUM$:TEXT$=YIDX$
1170 GOSUB 1690
1180 REM Print X scale.
1190 FOR J=1 TO 11
1200 X5CL(J)=XMAX-(J-1)*M5DX
1210 SIGNX5CL(J)=SGN(X5CL(J)):REM Separate sign and value.
1220 X5CL(J)=ABS(X5CL(J))
1230 IF INT(J/2)-J/2=0 THEN V=22:GOTO 1250:REM IF J IS EVEN THEN....
1240 V=21
1250 H(11)=5:H(10)=8:H(9)=11:H(8)=14:H(7)=18:H(6)=21:H(5)=24:H(4)=27:H(3)=30:H(2)=33:H(1)=37
1260 IF J=1 THEN GOSUB 2770
1270 H=H(J)
1280 IF EX<0 THEN X5CL(J)=X5CL(J)*(INT((10^-EX)+0.01)):GOTO 1300
1290 X5CL(J)=X5CL(J)/INT((10^EX)+0.01)
1300 XIDX$="X10"
1310 REM
1320 TEXT$=STR$(X5CL(J))
1330 REM See 1020
1340 IF X5CL(J)<1 THEN TEXT$(LEN(TEXT$)+1)=AD$:TEXT$=TEXT$(2,4)
1350 IF X5CL(J)>1 AND INT(X5CL(J))-X5CL(J)<0 THEN TEXT$(LEN(TEXT$)+1)=AD$:TEXT$=TEXT$(1,3)
1360 IF TEXT$="000" THEN TEXT$="0"
1370 GOSUB 1690:REM Print X5CL(J)
1380 REM Print sign of x scl.
1390 H5(J)=H(J)-1:H=H5(J)
1400 IF INT(J/2)-J/2=0 THEN V=22:GOTO 1420
1410 V=21
1420 IF SIGNX5CL(J)<0 THEN TEXT$="-":GOTO 1450
1430 TEXT$="+"
1440 IF X5CL(J)=0 THEN TEXT$=""
1450 GOSUB 1690
1460 NEXT J
1470 H=34:V=23:REM Print Xaxis scale factor.
1480 GOSUB 3520
1490 XIDX$(LEN(XIDX$)+1)=DUM$:TEXT$=XIDX$
1500 GOSUB 1690
1510 GOTO 2470
1520 BYTES=166:REM M.L. SUBROUTINE
1530 ML=1620:REM LOCATED TO GIVE ROOM FOR GRAPHIC DUMP PROGRAM.
1540 RESTORE 1610
1550 FOR I=0 TO 165
1560 READ A
1570 POKE ML+I,A
1580 NEXT I
1590 RESTORE
1600 RETURN
1610 DATA 104,201,4,240,9,170,240,5,104,104,202,208,251,96,104,133,215,104,133,214,104,104,168
1620 DATA 104,133,217,104,133,216,104,104,240,236,133,212,24,165,214,101,88,133,214,165,89
1630 DATA 101,215,133,215,152,240,15,165,214,105,64,133,214,165,215,105,1,133,215,136,208,241
1640 DATA 132,221,160,0,132,220,177,216,160,0,170,16,1,136,132,213,138,41,96,208,4,169,64
1650 DATA 16,14,201,32,208,4,169,0,16,6,201,64,208,2,169,32,133,218,138,41,31,5,218,133,218
1660 DATA 169,0,162,3,6,218,42,202,208,250,109,244,2,133,219,164,221,177,218,69,213,164,220,145,214
1670 DATA 200,132,220,196,212,208,182,24,165,214,105,40,133,214,144,2,230,215,230,221,169,8
1680 DATA 197,221,208,159,96
1690 A=USR(ML,H,V,ADR(TEXT$),LEN(TEXT$)):REM H=HORIZ. LOC. OF TEXT$ IN GR. 0 COORD.,V=VERT. LOC.

```

```

1700 TEXT$=""
1710 RETURN
1720 GRAPHICS 0:? "Select graph format from the following":?
1730 ? " (1) Tic marks only":?
1740 ? " (2) Coarse grid with tic marks":?
1750 ? " (3) Fine grid":?
1760 ? " (4) Fine grid with double weight major scale divisions":?
1770 INPUT GFMT
1780 RETURN
1790 PLOT 45,163:DRAWTO 45,13:REM Axes with tic marks only.
1800 PLOT 37,88:DRAWTO 45,88:REM At omitted ysc1 value.
1810 PLOT 45,163:DRAWTO 295,163
1820 REM :GRID
1830 FOR YTL=13 TO 163 STEP 15:REM (Y) (T)IC (L)ARGE
1840 PLOT 42,YTL:DRAWTO 50,YTL
1850 NEXT YTL
1860 FOR YTS=16 TO 160 STEP 3:REM (Y) (T)IC (S)MALL
1870 PLOT 45,YTS:DRAWTO 50,YTS
1880 NEXT YTS
1890 FOR XTL=45 TO 295 STEP 25:REM (X) (T)IC (L)ARGE
1900 PLOT XTL,166:DRAWTO XTL,158
1910 NEXT XTL
1920 FOR XTS=45 TO 295 STEP 5:REM (X) (T)IC (S)MALL
1930 PLOT XTS,163:DRAWTO XTS,158
1940 NEXT XTS
1950 RETURN
1960 PLOT 45,163:DRAWTO 45,13:REM Axes with coarse grid and tic marks.
1970 PLOT 37,88:DRAWTO 45,88:REM At omitted ysc1 value.
1980 PLOT 45,163:DRAWTO 295,163
1990 REM :GRID
2000 FOR YTL=13 TO 163 STEP 15:REM (Y) (T)IC (L)ARGE
2010 PLOT 42,YTL:DRAWTO 295,YTL
2020 NEXT YTL
2030 FOR YTS=16 TO 160 STEP 3:REM (Y) (T)IC (S)MALL
2040 PLOT 45,YTS:DRAWTO 50,YTS
2050 NEXT YTS
2060 FOR XTL=45 TO 295 STEP 25:REM (X) (T)IC (L)ARGE
2070 PLOT XTL,166:DRAWTO XTL,13
2080 NEXT XTL
2090 FOR XTS=45 TO 295 STEP 5:REM (X) (T)IC (S)MALL
2100 PLOT XTS,163:DRAWTO XTS,158
2110 NEXT XTS
2120 RETURN
2130 PLOT 45,163:DRAWTO 45,13:REM Fine grid.
2140 PLOT 37,88:DRAWTO 45,88:REM At omitted ysc1 value.
2150 PLOT 45,163:DRAWTO 295,163
2160 REM :GRID
2170 FOR YTL=13 TO 163 STEP 15:REM (Y) (T)IC (L)ARGE
2180 PLOT 42,YTL:DRAWTO 295,YTL
2190 NEXT YTL
2200 FOR YTS=16 TO 160 STEP 3:REM (Y) (T)IC (S)MALL
2210 PLOT 45,YTS:DRAWTO 295,YTS
2220 NEXT YTS
2230 FOR XTL=45 TO 295 STEP 25:REM (X) (T)IC (L)ARGE
2240 PLOT XTL,166:DRAWTO XTL,13
2250 NEXT XTL
2260 FOR XTS=45 TO 295 STEP 5:REM (X) (T)IC (S)MALL
2270 PLOT XTS,163:DRAWTO XTS,13
2280 NEXT XTS
2290 RETURN
2300 PLOT 45,163:DRAWTO 45,13:PLOT 44,163:DRAWTO 44,13:REM DOUBLE WEIGHT LINES.
2310 PLOT 37,88:DRAWTO 45,88:REM At omitted ysc1 value.

```

```

2320 PLOT 45,163:DRAWTO 295,163:PLOT 4
5,164:DRAWTO 295,164
2330 REM :GRID
2340 FOR YTL=13 TO 163 STEP 15:REM (Y)
(T)IC (L)ARGE
2350 PLOT 42,YTL:DRAWTO 295,YTL:PLOT 4
5,YTL+1:DRAWTO 295,YTL+1:REM DOUBLE WE
IGHT LINES.
2360 NEXT YTL
2370 FOR YTS=16 TO 160 STEP 3:REM (Y)
(T)IC (S)MALL
2380 PLOT 45,YTS:DRAWTO 295,YTS
2390 NEXT YTS
2400 FOR XTL=45 TO 295 STEP 25:REM (X)
(T)IC (L)ARGE
2410 PLOT XTL,166:DRAWTO XTL,13:PLOT X
TL-1,163:DRAWTO XTL-1,13
2420 NEXT XTL
2430 FOR XTS=45 TO 295 STEP 5:REM (X)
(T)IC (S)MALL
2440 PLOT XTS,163:DRAWTO XTS,13
2450 NEXT XTS
2460 RETURN
2470 REM Returns here from 2520 to sup
press "READY" prompt until finished wi
th display.
2480 REM "OPTION" key provides the opt
ions shown in 2550 to 2600
2490 POKE 53279,8:P=PEEK(53279):REM RE
AD CONSOLE KEYS.
2500 IF P=3 THEN 2530:REM "OPTION" byp
asses hard copy.
2510 IF P=6 THEN GOSUB 3620:REM "START
" activates 49 sec. screen dump.
2520 GOTO 2470
2530 GRAPHICS 0
2540 ? "Choose option":?
2550 ? " (1) New plot?":?
2560 ? " (2) New plot,current ND":?
2570 ? " (3) New plot,current ND an
d
grid format":?
2580 ? " (4) Current plot,new title
and scales":?
2590 ? " (5) Current plot,new scale
s":?
2600 ? " (6) Exit ":?
2610 INPUT CHSE:ON CHSE GOTO 120,180,2
00,330,470,3460
2620 REM To scale y axis values to red
uce number of digits.
2630 IF Y5CL(1)>=1 AND Y5CL(1)<=100 TH
EN EX=0:GOTO 2760
2640 IF Y5CL(1)>100 THEN 2660
2650 GOTO 2700
2660 FOR EX=1 TO 10
2670 YPR1=Y5CL(1)/INT((10^EX)+0.01)
2680 IF YPR1<100 AND YPR1>1 THEN 2760
2690 NEXT EX
2700 IF Y5CL(1)<1 THEN 2720
2710 GOTO 2760
2720 FOR EX=-1 TO -10 STEP -1
2730 YPR1=Y5CL(1)*(INT((10^-EX)+0.01))
2740 IF YPR1<100 AND YPR1>1 THEN 2760
2750 NEXT EX
2760 RETURN
2770 REM To scale X axis values to red
uce number of digits.
2780 IF X5CL(1)>=1 AND X5CL(1)<=100 TH
EN EX=0:GOTO 2910
2790 IF X5CL(1)>100 THEN 2810
2800 GOTO 2850
2810 FOR EX=1 TO 10
2820 XPR1=X5CL(1)/INT((10^EX)+0.01)
2830 IF XPR1<100 AND XPR1>1 THEN GOTO
2910
2840 NEXT EX
2850 IF X5CL(1)<1 THEN 2870
2860 GOTO 2910
2870 FOR EX=-1 TO -10 STEP -1
2880 XPR1=X5CL(1)*(INT((10^-EX)+0.01))
2890 IF XPR1<100 AND XPR1>1 THEN GOTO
2910
2900 NEXT EX
2910 RETURN
2920 REM Sine Curve
2930 FOR I=0 TO ND
2940 X(I)=3*3.1416*(I/ND):Y(I)=SIN(X(I)
))

```

```

2950 NEXT I
2960 RETURN
2970 REM Parabola
2980 FOR I=0 TO ND
2990 X(I)=I/(0.1*ND)
3000 Y(I)=X(I)^2
3010 NEXT I
3020 RETURN
3030 REM Circle or ellipse
3040 FOR I=0 TO ND
3050 THETA=(2*3.1416*I)/ND
3060 X(I)=COS(THETA):Y(I)=SIN(THETA)/0
.72
3070 NEXT I
3080 RETURN
3090 REM Discrete Points
3100 RESTORE 3120
3110 ND=9:FOR J=0 TO ND:READ DUM1,DUM2
:X(J)=DUM1:Y(J)=DUM2:ND=J:NEXT J
3120 DATA 0,7,10,25,15,30,30,50,40,60,
50,80,70,20,80,32,90,70,100,100
3130 RETURN
3140 REM Your Selection
3150 REM Auto scaling subroutines
3160 YMIN=Y(0):XMIN=X(0):YMAX=Y(0):XMA
X=X(0)
3170 FOR I=1 TO ND
3180 IF Y(I)>YMAX THEN YMAX=Y(I)
3190 IF Y(I)<YMIN THEN YMIN=Y(I)
3200 IF X(I)>XMAX THEN XMAX=X(I)
3210 IF X(I)<XMIN THEN XMIN=X(I)
3220 NEXT I
3230 ? "YMAX=":YMAX:" YMIN=":YMIN:" XM
AX=":XMAX:" XMIN=":XMIN
3240 RESTORE 3450
3250 MSDY=(YMAX-YMIN)/10
3260 FOR I=-2 TO 4
3270 FOR K=1 TO 3:READ J
3280 IF MSDY<INT(100*J*10^(I)+0.5)/100
THEN MSDY=INT(100*J*10^(I)+0.5)/100:G
OTO 3300
3290 NEXT K:RESTORE 3450:NEXT I
3300 FOR I=1 TO -10 STEP -1
3310 IF (YMAX<=I*MSDY)*(YMAX>I*MSDY-0.
99999*MSDY) THEN YMAX=I*MSDY
3320 NEXT I
3330 YMIN=YMAX-10*MSDY
3340 RESTORE 3450
3350 MSDX=(XMAX-XMIN)/10
3360 FOR I=-2 TO 4
3370 FOR K=1 TO 3:READ J
3380 IF MSDX<=INT(100*J*10^(I)+0.5)/10
0 THEN MSDX=INT(100*J*10^(I)+0.5)/100:
GOTO 3400
3390 NEXT K:RESTORE 3450:NEXT I
3400 FOR I=10 TO -10 STEP -1
3410 IF (XMAX<=I*MSDX)*(XMAX>I*MSDX-0.
99999*MSDX) THEN XMAX=I*MSDX
3420 NEXT I
3430 XMIN=XMAX-10*MSDX
3440 RETURN
3450 DATA 1,2,5
3460 GRAPHICS 2:REM Closing display.
3470 POSITION 0,5
3480 ? #6;"SEE YOU NEXT SESSION "
3490 FOR W=0 TO 100:NEXT W
3500 GRAPHICS 0
3510 END
3520 REM Inverse scale factor.
3530 DUM$="":DUM1$="
3540 DUM$=STR$(EX)
3550 FOR J=1 TO LEN(DUM$)
3560 A(J)=ASC(DUM$(J,J))
3570 A(J)=A(J)+128
3580 DUM1$(J,J)=CHR$(A(J))
3590 NEXT J
3600 DUM$=DUM1$
3610 RETURN
3620 RESTORE 3710:FOR B=1 TO 61:READ N
:POKE 1535+B,N:NEXT B:DM=PEEK(88)+PEEK
(89)*256:DM=DM+40*191
3630 REM THIS IS 49 SEC. SCREEN DUMP P
ROGRAM. POKE IN M/L PROGRAM AND SET UP
DISPLAY MEMORY POINTER
3640 TRAP 3740
3650 ? #5:CHR$(27);"A";CHR$(8):FOR X=D
M TO DM+39

```



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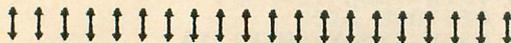
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```

3660 REM SET LINE SPACING AND MAKE LOO
P
3670 A$=CHR$(0):A$(192)=CHR$(0):A$(2)=
A$
3680 W=USR(1536,X,ADR(A$)):LPRINT CHR$
(27);"K";CHR$(192);CHR$(0);A$
3690 REM PASS BOTH VALUES TO M/L PROGR
AM AND PRINT STRING
3700 NEXT X
3710 DATA 104,104,141,21,6,104,141,20,
6,104,141,27,6,104,141,26,6,160,193,17
3,255,255,136,240,35,141,255,255,238
3720 DATA 26,6,240,21,173,20,6,56,233,
40,141,20,6,144,4,24,76,19,6,206,21,6,
76,19,6,238,27,6,76,33,6,96
3730 RETURN
3740 OPEN #1,4,0,"K:"
3750 ? "Please turn printer on!!"
3760 ? :? :? :? "Press any key to cont
inue.":? :? :?
3770 GET #1,A
3780 IF A<>255 THEN 100
3790 CLOSE #1

```

### CHECKSUM DATA

(see page 27)

```

10 DATA 350,27,508,158,49,236,278,439,
435,275,624,542,637,840,223,5621
160 DATA 240,847,64,83,154,314,875,575
,380,399,261,943,844,167,702,6848
310 DATA 785,81,654,164,181,181,426,48
9,534,6,909,629,799,938,816,7592
460 DATA 948,230,404,826,780,101,732,6
32,637,635,640,206,232,246,461,7710
610 DATA 470,487,101,755,226,559,11,71
9,959,129,246,549,1,32,20,5264
760 DATA 443,765,493,773,328,890,625,8
34,900,683,231,846,768,826,131,9536
910 DATA 668,203,328,264,849,620,522,9
88,184,348,294,642,840,547,277,7574
1060 DATA 582,816,349,0,687,853,964,49
3,501,946,197,969,662,345,986,9350
1210 DATA 292,454,94,209,951,357,371,3
0,720,14,285,302,205,849,554,5687
1360 DATA 284,591,701,213,33,212,15,69
9,864,976,505,35,958,204,974,7264
1510 DATA 733,942,520,189,616,400,351,
507,61,797,732,244,529,8,520,7149
1660 DATA 146,454,338,238,815,801,82,6
46,150,763,888,164,808,913,526,7732
1810 DATA 29,907,706,159,107,202,186,1
24,732,261,103,228,283,120,811,4958
1960 DATA 96,536,39,917,268,404,82,177
,161,99,707,381,85,210,258,4420
2110 DATA 95,786,976,511,14,892,278,41
4,92,180,441,102,710,384,88,5963
2260 DATA 213,406,105,796,231,514,252,
895,281,624,95,190,451,112,713,5878
2410 DATA 104,91,216,409,108,799,134,5
56,947,9,502,736,62,177,398,5248
2560 DATA 553,439,389,710,53,263,430,8
69,314,731,619,355,832,744,286,7587
2710 DATA 742,666,519,831,743,808,372,
876,313,743,620,352,336,745,310,8976
2860 DATA 742,674,523,342,744,809,313,
468,907,518,814,827,473,322,269,8745
3010 DATA 489,785,475,444,64,133,495,7
91,343,180,374,947,789,996,57,7362
3160 DATA 755,451,213,210,200,197,496,
144,196,255,274,109,826,439,310,5075
3310 DATA 628,499,341,199,253,277,112,
338,442,582,618,502,338,799,868,6796
3460 DATA 867,233,507,386,61,273,176,5
77,530,476,42,201,35,515,67,4946
3610 DATA 802,955,239,706,617,326,606,
116,963,554,576,662,807,471,445,8845
3760 DATA 576,863,691,887,3017

```

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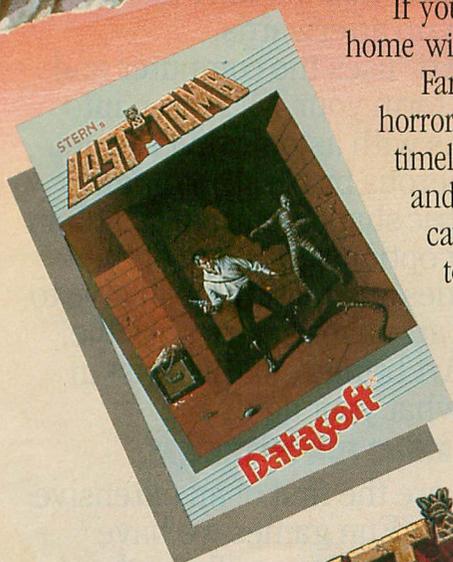


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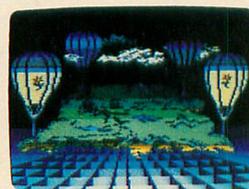
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by Arthur Leyenberger

**Cut & Paste** from Electronic Arts is the newest word processor for the Atari computer. Originally released for the Commodore computer, the addition of this word processor brings the total of commercial word processors for the Atari up to eight. Let's take a closer look at what this word processor can do for you, and how it compares to the competition.

The user interface is probably **Cut & Paste's** strongest feature. There is virtually no way you are going to kill a document if you really do not want to. We are talking *user friendly* here. I was able to start typing this review using the program as soon as I put the disk in the drive.

#### Using it.

Two disks come with the package: a program disk and a document disk. Once the program disk is booted up, the program politely asks you to insert its document disk, and you are then ready to begin.

The first decision you have to make is to either **LOAD** an existing document (file) or to create a new one. The top of the screen displays all of the document names currently on the disk. To choose an existing document, the cursor is positioned over the name with the cursor control keys. Then the **ESCAPE** and **RETURN** keys are pressed. The file is **LOADed**, and you may begin typing or editing.

Like most word processors, **Cut & Paste** features an automatic word wrap. You are always in insert mode, which means that, as text is entered, all of the text to the right and below is moved out of the way. Some word processors give you the option of using either an insert or overwrite mode. Insert mode is generally preferred, because you cannot accidentally type over existing text. But overwrite mode is useful when selected portions of your text have to be changed. **Cut & Paste** has no overwrite mode *per se* — although, if you first mark your text, you can overwrite that particular portion of the text.

Various program functions are selected from a scrolling menu bar at the bottom of the screen. The menu is scrolled by using the arrow keys and pressing **RETURN** to activate the selection. If you want to delete a sentence, for example, you would move the cursor to the beginning of the sentence, press **CONTROL-A** to indicate (mark) the beginning of the deletion, and use the arrow keys to move the cursor to the end of the sentence. Then you press **ESCAPE** to enable the bottom function menu, and

use the cursor control keys to move the cursor to cut. Finally, you press **RETURN**, and the text is deleted. To get back into the edit mode, you press **ESCAPE** again.

This is a rather cumbersome procedure for anything less than a couple of sentences. It has to be used, because the program does not allow the usual Atari editing function of **CONTROL-DELETE** to delete text to the right of the cursor. Another approach to deleting a sentence is to first move the cursor to the end of the sentence and press the **DELETE** key. This deletes text to the left as the cursor moves left.

**CONTROL-S** and **CONTROL-E** move the cursor to the start and end of the document, respectively. The cursor control keys allow you to move up, down, left and right within the text. Unfortunately, there are no features that allow you to easily and quickly move to the start or end of a line.

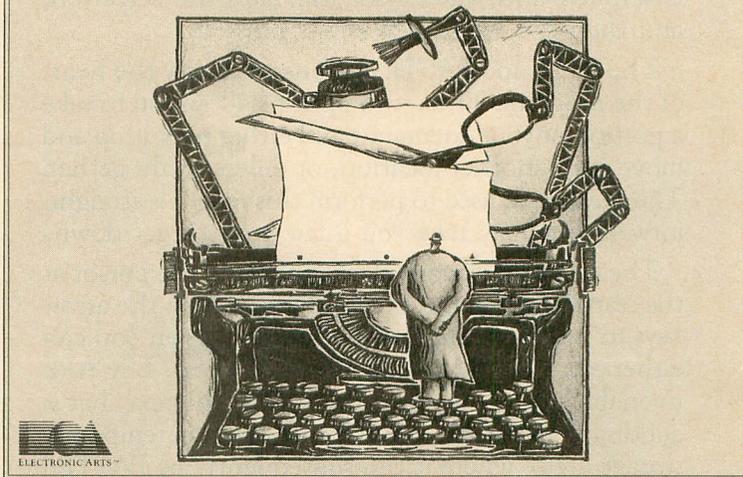
Home management software from Electronic Arts:

## Cut & Paste.™

The remarkably simple word processor.

by Tim Mott, Steve Hayes,  
 Norm Lane, David Maynard, Jerry Morrison,  
 Steve Shaw and Dan Silva.

Until quite recently we used pens and paper and typewriters to write with, mostly because we knew *how* to use them. They're good tools, but rather slow and cumbersome. You tend to make mistakes with them, and getting rid of those mistakes makes extra work. *Cut & Paste* is an inexpensive and practical alternative. Because you can learn to use it in several minutes, you really *will* use it. And that fact alone may make it the first sensible word processor for the home.



### Cut & Paste.

Other options at the bottom of the screen during the editing session are: **SAVE**, **PRINT**, **CATALOG**, **CUT**, **PASTE**, **INDENT**, **UNINDENT** and **BUFFER**. When each of these menu items is selected, easy to understand secondary menus appear. For example, if you selected **SAVE**, you would have the choice of saving the text under the existing filename, a new filename or not to save at all. If you choose to save the text as the original filename, **C&P** just does it. Selecting **SAVE-NEW** first displays a catalog of the disk contents and then asks for a filename. If it already exists, you cannot use that name. **DON'T SAVE** allows you to gracefully return to the edit mode.

One nice touch to **Cut & Paste** is that filenames can be up to twelve characters long. Letters or numbers may be used in any order. Upper and lower case and spaces may also be used. This makes for more clarity in naming documents, since you do not have to abbreviate the name to only eight characters.

The PRINT option allows you to print your document to your printer after first specifying several pieces of information. A one-line, 38-character head may be placed at the top of each page. You can also print page numbers, beginning with any number you like. Other print options include selecting top, bottom, left and right margins. These margin settings are specified in inches rather than characters — since most of us are more familiar with inches than characters — another useful touch.

Up to three sets of printer characteristics may be specified. These settings may then be saved for future use. You can also select double- or single-spaced output, single or continuous sheets and number of copies.

The CATALOG menu selection displays the name of the disk files at the top of the screen but not the size of the files. You can then perform assorted disk operations. Options include disk copying and formatting, file loading, renaming and deleting, and disk drive selection (drive 1 or drive 2). As usual, the menu is scrolled until the cursor indicates the selection, and then the RETURN key is pressed.

The CUT and PASTE options are really the heart of the program. These two options allow you to take a portion of your document and either pick it up and move it to another location, or delete it altogether. The technique used to perform this magic is straightforward but may take you a few tries to get down.

The text is first marked by anchoring the cursor at the starting point and then moving it with the arrow keys to highlight the rest of the text. Then you can either press CONTROL-C directly or press ESCAPE to enable the menu and select CUT. The text that is cut disappears and is stored in the buffer (a temporary storage area), where it can subsequently be PASTEd anywhere in the document. If you CUT another section of text, the previous buffer contents are lost.

#### Bottom line.

I am generally disappointed with **Cut & Paste**. On one hand, it is very easy to use. Flipping between the edit and various command menu modes was easier and faster than with the **Bank Street Writer** (the main competitor at this price). The built-in fail-safe features ensure that you will not destroy any text before its time.

On the other hand, **Cut & Paste** just does not have enough features to make it a serious choice for anyone doing more than writing an occasional letter. Features such as right justification, underlining, searching and replacing are not available. And you can forget about

superscripts and subscripts. Even such basic features as selecting the font of the printer (bypassing printer control codes) and centering text cannot be accomplished.

To top off the list of non-features, the files created by **Cut & Paste** are not Atari DOS compatible files. This means you will be unable to use a spelling checking program or pass files to and from another word processor. Also, the documentation is weak, containing no index and little meaty information.

Electronic Arts is a state-of-the-art software company that has, until now, delivered excellent products with superb packaging. The quality was there, and the price was right. I don't know what went wrong with their design of **Cut & Paste**, but I suspect that they wanted to rush the product to market. In doing so, they have marketed a less than "No-Frills" word processor that provides few features and little value. Other word processors I have used in this price category have more features than **Cut & Paste**.

Even the slickest manuals and state-of-the-art advertising cannot help this product. I guess, with the winning track record that Electronic Arts has demonstrated, one flop is to be tolerated. However, I am embarrassed for Electronic Arts, because **Cut & Paste** is, frankly, a turkey. □

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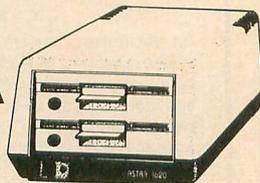
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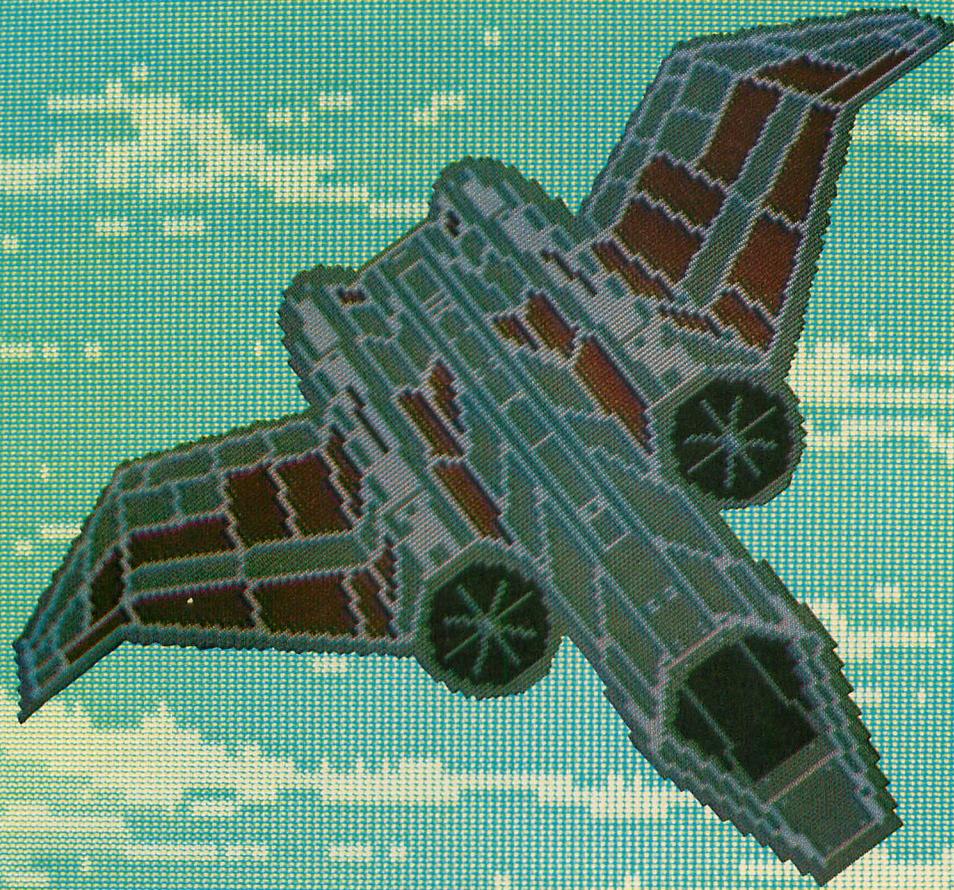
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CIRCLE #137 ON READER SERVICE CARD



# SPY PLANE

24K Cassette or 32K Disk

by Mark Comeau

Your mission, should you choose to accept it, is to recover the lost plans to the top secret satellite. You will be flying a superpowered, highly maneuverable spy plane. You must dodge enemy lasers, rockets and an active volcano. You will either succeed or die in the process. Seven cases of plans must be recovered from the seven multi-colored screens. Report to the base immediately and get your spy plane flying!

**Spy Plane** is a fast moving, BASIC game that will test your arcade skills to the limit. You must fly your plane through a long cavern full of lasers and missiles. The objective is to capture the seven cases of plans that were stolen from your government base. Only one case is present in the cavern at once. If you get all seven cases, the intermission comes up, you are rewarded 100 points and get an extra man.

You get ten points for every case recovered and 100 points for every set of cases. After seven cases, the lasers fire faster, and the missiles come out of the silos faster.

### Running the game.

When you run the game, the screen will go blank for thirty seconds. After that the **Spy Plane** logo will appear (if you typed it in correctly). Press the fire button and hold it down to see the score display screen. Let go of the button, and the game will begin. If you are hit or you collide with anything, hold down the button to see your score and how many men you have. If you press **START** on the score display, the game will end.

*(continued on page 77)*

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**The program.**

**Spy Plane** uses player-missile graphics and character sets in graphics mode 2+16. In this mode you can create graphics 7-type graphics, but you can display them a lot more quickly. When you run the program, the screen will turn white for twenty seconds, then blue for ten seconds. While the screen is white, the computer is setting up the character sets. While the screen is blue, the computer is setting up the player-missile graphics.

When programming a BASIC game, use anything that you can get. I used Tom Hudson's P/M mover from **ANALOG #10** and Steven Pogatch's character set initializer from **ANALOG #8**. Both do their job effectively, and I am sure that you can hack them out of there for your own use.

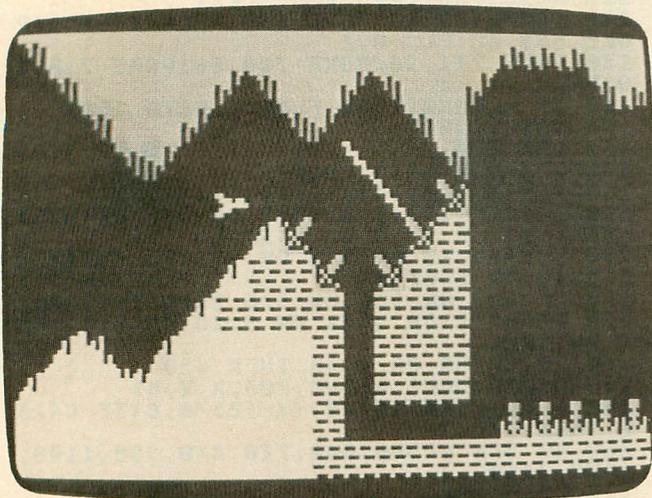
The main objective with a BASIC game is not to make it too slow; you should make your main loop as small as possible.

If you look at Lines 1330-2280, you will notice that all of the screens are displayed with print statements. If you want to make your own screen, just modify the print statements. If you want lasers or something special, you will have to modify the screen subroutines. It isn't that hard, I promise you!

Type in the program exactly as it appears. Be careful with the data statements. Use **D:CHECK** or **C:CHECK** to check your work.

One of the best ways to learn about how to make your own games is to analyze other people's games. When you finish typing in this game, improve it! Change it! Learn it! That's how I learned to make games. □

*(Program documentation and listing start on page 78.)*



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# Bacterion! Update

Due to a printing error, a line of the **Bacterion!** BASIC listing (**ANALOG Computing**, issue 20) was difficult to read. Here is the corrected line:

```
2080 DATA 00003FF000
00000000004FF0000000
000005FF000000000000
6FF0000000000007FF00
000000000055A0FF,320
```

## Program breakdown.

Lines	Function
60 - 100	Initial title
160 - 300	Main loop
210 - 450	Death
460 - 620	GOTO screen
630 - 690	Screen #1 (Turns radar)
700 - 820	Screen #2 (Fires laser)
830 - 960	Screen #3 (Fires missile)
970 - 1080	Screen #4 (Fires laser)
1090 - 1150	Screen #5 (Volcano)
1160 - 1310	Screen #6 (Fires laser)
1320 - 2290	Displays screens
2300 - 2420	Screen #7 (Fires laser)
2430 - 2590	Intermission
2600 - 2880	Score display
2890 - 2980	Game over display
2990 - 3090	Enters data for case pos.
3100 - 3170	Data for case positions
3180 - 3190	DIMension everything
3220 - 3320	P/M mover — Tom Hudson
3330 - 3380	Char.Set initializer — Steven Pogatch
3390 - 3740	Char.Set data
3750 - 3780	P/M mover data
3790 - 3840	P/M graphics data

## Variables used.

A	For P/M mover
C	Color of character under player
D1\$	1st piece of dying plane
D2\$	2nd piece of dying plane
E	Also character number of laser
E	Random number for laser
FL	Counter for screen subroutines
LGO\$	Characters of logo
MN	Number of planes
NB	Number of screens
P(E)	Positions of cases
PD	DRAWTO position of laser
PE	DRAWTO position of laser
PMC	Data for player facing left
PMD	Data for player facing right
POS	Players' current shape
PX	Horizontal position of laser
PY	Vertical position of laser
PO\$	Data for player
P1\$	Data for player
P2\$	Data for missile (screen #3)
S	Stick position
SC	Score
SCR	Screen number
T	Varied uses
X	Horizontal position of player
Y	Vertical position of player
Z\$	Data for blank

```

1 REM
2 REM
3 REM      SPY PLANE
4 REM      BY : Mark Comeau
5 REM      FOR : A.N.A.L.O.G
60 REM
60 POKE 764,158
70 GRAPHICS 17:POSITION 0,5:? #6;"
SPY PLANE":? #6;" by Mark Comeau":?
#6:? #6:? #6;" Initializing"
80 FOR T=0 TO 255:POKE 712,T:NEXT T:PO
KE 712,62:FOR T=0 TO 1000:NEXT T
90 GRAPHICS 0:NB=7:POKE 559,0:POKE 712
,14:GOTO 3180
100 GOSUB 3000
110 X=96:Y=82:POS=PMD:SCR=1
120 GRAPHICS 18:POKE 756,PEEK(106)+1:P
OKE 559,46:FL=-0.1
130 POKE 711,14:POKE 708,56:POKE 710,3
0:POKE 712,2
140 IF FLAG=0 THEN FLAG=1:GOTO 2610
150 GOTO 490
160 REM
170 REM      MAIN LOOP
180 REM      ++++++
190 S=STICK(0):X=X+(S=7 OR S=6 OR S=5)
*8-(S=11 OR S=10 OR S=9)*8
200 Y=Y+(S=13 OR S=5 OR S=9)*8-(S=14 O
R S=10 OR S=6)*8
210 IF S=7 OR S=6 OR S=5 THEN POS=PMD
220 IF S=11 OR S=11 OR S=10 OR S=9 THE
N POS=PMC
230 IF X=208 OR X=40 THEN 490
240 A=USR(MOVE,0,PMB,POS,X,Y,8)
250 LOCATE (X-48)/8,(Y-18)/8,C:IF C<>3
2 THEN 340
260 ON SCR GOSUB 640,710,840,980,1100,
1170,2310
270 GOTO 190
280 REM      ++++++
290 REM      END OF MAIN LOOP
300 REM
310 REM
320 REM      DEATH
330 REM
340 IF C=249 THEN 570
350 POP :D=244:POKE 53278,0
360 MN=MN-1:IF MN=0 THEN 2900
370 FOR K=Y TO Y+18
380 A=USR(MOVE,0,PMB,D2,X,K,8)
390 A=USR(MOVE,0,PMB,D1,X,Y-(K-Y),8)
400 SOUND 0,RND(0)*14,0,14:NEXT K
410 A=USR(MOVE,0,PMB,Z,0,0,8)
420 A=USR(MOVE,0,PMB,Z,0,0,8)
430 POKE 704,62:FL=-0.1:IF STRIG(0)=1
THEN 110
440 GOTO 2720
450 REM
460 REM
470 REM
480 REM      GOTO SCREEN
490 IF X=208 THEN SCR=SCR+1:X=48
500 POKE 77,0
510 IF X=40 THEN SCR=SCR-1:X=208
520 A=USR(MOVE,0,PMB,POS,X,Y,8)
530 POSITION 0,0:SOUND 0,0,0,0:POKE 55
9,0
540 GOSUB 5CR*140+1190:POKE 559,46
550 IF S(NM=SCR THEN COLOR 249:E=5CR*
2:PLOT P(E-1),P(E)
560 FL=-0.1:GOTO 190
570 FOR W=14 TO 0 STEP -1:SOUND 0,100+
M,14,W:SOUND 1,100-W,14,W:NEXT W:NM=NM
+1:SC=SC+10
580 IF NM=8 THEN 2440
590 COLOR 32:E=5CR*2:PLOT P(E-1),P(E):
GOTO 190
600 REM
610 REM
620 REM
630 REM      SCREEN #1 SUB
640 FL=FL+0.1:IF FL>3.9 THEN FL=0
650 IF FL=0 THEN D=244:SOUND 0,36,4,2
660 IF FL=1 THEN D=245:SOUND 0,35,4,2
670 IF FL=2 THEN D=246:SOUND 0,34,4,2
680 IF FL=3 THEN D=245:SOUND 0,33,4,2
690 COLOR 0:PLOT 3,7:RETURN

```



```

2030 ? #6;"CAAAAAAAAAAAAAAAAAADDDAA";
2040 ? #6;" CAAAAECAAECAAE CD";
2050 ? #6;" CAEE CE CA ";
2060 ? #6;" CE ";
2070 ? #6;" ";
2080 ? #6;" F1 j ";
2090 ? #5;" Fbb1 jbb ";
2100 ? #6;" Fbbbbb bbb ";
2110 ? #6;" FH FAAAAb bbb ";
2120 ? #6;" FAAGAAAAAb bbb ";
2130 ? #6;" AAAAAAAAAAb kkkkk ";
2140 ? #6;" AAAAAAAAAAbbbb bbbbbb ";
2150 RETURN
2160 REM SCREEN #7
2170 ? #6;"ADDDDDbAAAAAAAAADDD";
2180 ? #6;"E bAAAAAAAA ";
2190 ? #6;" b bAAAAAAAA ";
2200 ? #6;" bb bAAAAA ";
2210 ? #6;" bb bAAAAA ";
2220 ? #6;" bb bAAAAA ";
2230 ? #6;" bb bAAE ";
2240 ? #6;" bb bAE FH ";
2250 ? #6;" bb bE FAAB ";
2260 ? #6;" bb b FAAB ";
2270 ? #6;" bbk k j l l FAAAAA ";
2280 ? #6;"GAAAAAAAAAAAAAAAAAAAA";
2290 RETURN
2300 REM SCREEN SUB #7
2310 FL=FL+1:IF FL<WV THEN RETURN
2320 FL=0
2330 E=INT(RND(0)*5)+1:IF E=1 THEN E=8
0:PX=3:PY=9:PD=3:PE=1
2340 IF E=2 THEN E=80:PX=5:PY=9:PD=5:P
E=1
2350 IF E=3 THEN E=79:PX=6:PY=9:PD=3:P
E=6
2360 IF E=4 THEN E=81:PX=10:PY=9:PD=18
:PE=1
2370 IF E=5 THEN E=81:PX=12:PY=9:PD=18
:PE=3
2380 COLOR E+160:PLOT PX,PY:DRAWTO PD,
PE
2390 FOR T=14 TO 0 STEP -1:SOUND 0,T,2
,T:NEXT T
2400 LOCATE (X-48)/8,(Y-18)/8,C:IF C<
32 THEN 340
2410 SOUND 0,0,0,0:COLOR 32:PLOT PX,PY
:DRAWTO PD,PE
2420 RETURN
2430 REM FINI
2440 GRAPHICS 18:POKE 559,46
2450 POSITION 2,5:? #6;"Congratulation
!"
2460 FOR T=0 TO 100:POKE 712,RND(0)*25
5:NEXT T:POKE 712,0
2470 POSITION 2,7:? #6;"score : "
2480 FOR SC=50 TO SC+100 STEP 10:POSIT
ION 9,7:? #6;SC
2490 FOR T=14 TO 0 STEP -1
2500 SOUND 0,14-T,14,T:NEXT T:NEXT SC
2510 POSITION 2,3:? #6;"EXTRA MAN!!!!
!" :MN=MN+1
2520 IF MN=19 THEN MN=18
2530 FOR T=0 TO 255 STEP 5
2540 POKE 710,T:SOUND 0,T,14,14
2550 NEXT T
2560 SOUND 0,0,0,0
2570 WV=WV-3:IF WV<10 THEN WV=10
2580 GOSUB 3000:GOTO 110
2590 REM
2600 REM TITLE DISPLAY
2610 COLOR ASC("E"):PLOT 0,0:DRAWTO 19
,0:PLOT 19,11:DRAWTO 0,11:PLOT 0,1:DRA
WTO 19,1
2620 PLOT 0,10:DRAWTO 19,10
2630 POSITION 0,2:? #6;LG0$;LG2$;LG0$;
LG2$;LG0$;LG2$;LG0$;LG2$;:WV=0
2640 FOR X=0 TO 7:POKE 464+X+START,255
:NEXT X
2650 FOR X=0 TO 7:POKE 464+X+START,0:N
EXT X:POKE 712,RND(0)*255
2660 IF STRIG(0)=0 THEN WV=20:MN=7:NM=
1:SC=0:GOTO 2720
2670 WV=WV+1:IF WV=50 AND FLAG=2 THEN
2900
2680 GOTO 2640
2690 SOUND 0,0,0,0,SOUND 1,0,0,0

```

```

2700 REM
2710 REM DISPLAY SCORE
2720 ? #6;"K":POSITION 0,0:POKE 712,2
2730 SOUND 0,0,0,0:SOUND 1,0,0,0
2740 ? #6;LG2$;
2750 ? #6;"CAAAAECECAAAAAAAAAECE";
2760 ? #6;" CAEE CAAAAAE ";
2770 ? #6;" CE CAAAAE ";
2780 ? #6;" CECE ";
2790 COLOR 188:PLOT 2,5:DRAWTO 1+MN,5
2800 POSITION 4,6:? #6;SC
2810 ? #6;"H FHFH FHF";
2820 ? #6;"AH FAAAAH FAAA";
2830 ? #6;"AAHFAAAAAH FAAAA";
2840 ? #6;"AAAAAAAAAAHFHFAAAA";
2850 ? #6;LG0$;
2860 IF PEEK(53279)=6 THEN 2900
2870 IF STRIG(0)=0 THEN 2860
2880 GOTO 110
2890 REM GAME OVER
2900 GRAPHICS 18:POKE 559,46:? #6;"
GAME OVER"
2910 SOUND 0,0,0,0:SOUND 1,0,0,0
2920 A=USR(MOVE,0,PMB,Z,0,0,8)
2930 POSITION 5,3:? #6;"score:";SC
2940 POSITION 2,9:? #6;"by :Mark comea
!"
2950 POSITION 5,6:? #6;"Sp plane"
2960 FOR WV=0 TO 100:POKE 711,RND(0)*2
55:NEXT WV:WV=0:FLAG=2:GOSUB 3000
2970 POKE 711,14:POKE 708,50:POKE 710,
30:POKE 712,2
2980 ? #6;"K";:POSITION 0,0:POKE 756,P
EEK(106)+1:GOTO 2610
2990 REM ENTER CASE POS.
3000 RESTORE 3100:T=1:NM=1
3010 E=INT(RND(0)*2)+1:IF E=1 THEN REA
D X,Y
3020 READ X,Y:IF X=-1 THEN GOTO 3050
3030 X(T)=X:Y(T)=Y:IF E=2 THEN READ X,
Y
3040 T=T+1:GOTO 3010
3050 E=INT(RND(0)*5)+1:RESTORE (E*10)+
3120
3060 FOR T=1 TO NB
3070 READ X:E=T*2:P(E-1)=X(T):P(E)=Y(T
)
3080 S(T)=X:NEXT T
3090 RETURN :GOTO 110
3100 DATA 10,3,15,6,10,1,15,9,15,4,7,9
3110 DATA 13,5,4,3,16,5,5,6,4,4,14,6
3120 DATA 11,6,18,7,-1,0,-1,0
3130 DATA 5,1,4,2,7,3,6
3140 DATA 6,2,5,1,3,4,7
3150 DATA 3,5,4,1,2,7,6
3160 DATA 4,3,5,7,6,1,2
3170 DATA 6,7,2,5,3,1,4
3180 DIM P0$(8),P1$(8),P2$(8),A$(2),BU
G$(5),Z$(8),PMMOVS(100),X(NB),Y(NB),P(N
B*2),S(NB),D1$(8),D2$(8),LG0$(20)
3190 DIM LG2$(20)
3200 GOSUB 3330:RESTORE 3750:POKE 712,
126
3210 LG0$="=====[\]^?@e=====":LG2$="
===== "
3220 MOVE=ADR(PMMOVS):FOR X=1 TO 100:R
EAD N:PMMOVS(X)=CHR$(N):NEXT X
3230 FOR I=1 TO 8:READ N:P0$(I)=CHR$(N
):NEXT I
3240 FOR I=1 TO 8:READ N:P1$(I)=CHR$(N
):NEXT I
3250 FOR I=1 TO 8:READ N:P2$(I)=CHR$(N
):NEXT I
3260 FOR I=1 TO 8:READ N:Z$(I)=CHR$(N)
:NEXT I
3270 FOR I=1 TO 8:READ N:D1$(I)=CHR$(N
):NEXT I
3280 FOR I=1 TO 8:READ N:D2$(I)=CHR$(N
):NEXT I
3290 PMBASE=INT((PEEK(145)+3)/4)*4:POK
E 54279,PMBASE:PMB=PMBASE*256:PMD=ADR(
P0$):POKE 53277,3
3300 POKE 704,62:POKE 705,46
3310 PMC=ADR(P1$):PME=ADR(P2$):Z=ADR(Z
$):D1=ADR(D1$):D2=ADR(D2$)
3320 GOTO 100

```

# Parallel Printer Interfaces

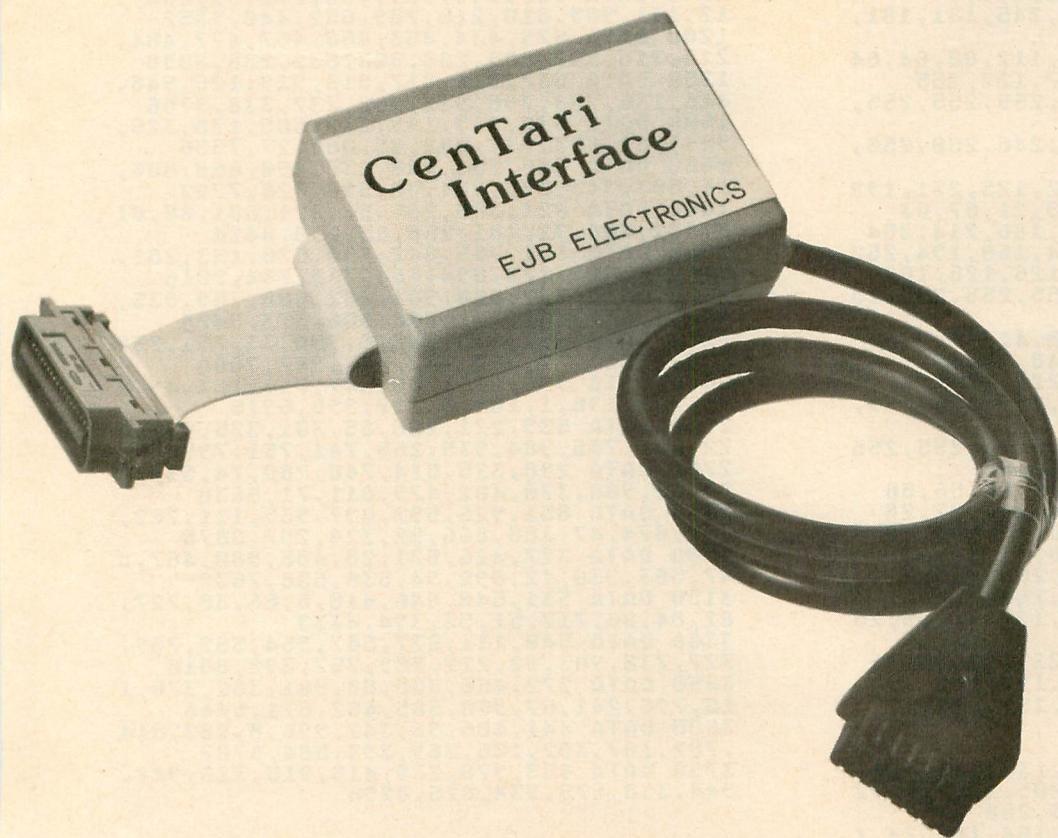
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CIRCLE #141 ON READER SERVICE CARD

```

3330 POKE 106,PEEK(106)-5:START=(PEEK(
106)+1)*256:POKE 756,START/256:POKE 75
2,1
3340 RESTORE 4000:DIM XFR$(38):FOR Y=1
TO 38:READ Z:XFR$(Y,Y)=CHR$(Z):NEXT Y
3350 Z=USR(ADR(XFR$)):RESTORE 3390:X=2
32-8:READ Z
3360 IF Z=-1 THEN RESTORE :RETURN
3370 FOR Y=0 TO 7:POKE X+Y+5*START,Z:REA
D Z:NEXT Y:X=X+8
3380 GOTO 3360
3390 DATA 0,192,118,63,112,192,0,0
3400 DATA 0,0,0,0,0,0,255,255
3410 DATA 0,0,199,207,205,207,237,237
3420 DATA 0,0,59,187,191,191,183,183
3430 DATA 0,0,120,96,112,96,127,127
3440 DATA 255,255,255,255,255,255,255,
255
3450 DATA 255,17,255,136,255,17,255,13
6
3460 DATA 255,255,55,21,21,5,5,1
3470 DATA 255,255,255,247,245,181,181,
144
3480 DATA 255,246,244,244,112,80,64,64
3490 DATA 1,7,23,23,55,127,127,255
3500 DATA 164,173,253,255,255,255,255,
255
3510 DATA 128,136,168,232,248,250,250,
255
3520 DATA 195,199,46,30,62,125,251,199
3530 DATA 192,226,113,53,9,21,67,63
3540 DATA 56,56,16,56,146,186,214,254
3550 DATA 3,71,142,172,144,168,194,252
3560 DATA 24,24,24,24,60,126,126,102
3570 DATA 60,60,255,255,255,255,255,25
5
3580 DATA 192,64,112,16,28,4,7,1
3590 DATA 24,48,24,48,24,48,24,48
3600 DATA 3,2,14,8,56,32,224,128
3610 DATA 255,146,255,146,255,146,159,
159
3620 DATA 255,73,255,73,255,73,255,255
3630 DATA 2,6,6,31,22,22,18,56
3640 DATA 56,68,130,146,130,68,56,56
3650 DATA 64,96,96,248,104,104,72,28
3660 DATA 16,74,84,137,100,146,84,40
3670 DATA 84,96,170,85,178,41,38,20
3680 DATA 0,60,36,255,255,255,255,0
3690 DATA 0,0,0,0,0,0,255,255
3700 DATA 127,255,192,254,127,3,255,25
4
3710 DATA 0,115,123,107,121,112,96,96
3720 DATA 0,48,48,240,224,192,192,192
3730 DATA 252,254,198,254,252,192,192,
192
3740 DATA -1
3750 DATA 216,104,104,104,133,213,104,
24,105,2,133,206,104,133,205,104,133,2
04,104,133,203,104,104,133,208
3760 DATA 104,104,133,209,104,104,24,1
01,209,133,207,166,213,240,16,165,205,
24,105,128,133,205,165,206,105
3770 DATA 0,133,206,202,208,240,160,0,
162,0,196,209,144,19,196,207,176,15,13
2,212,138,168,177,203,164
3780 DATA 212,145,205,232,169,0,240,4,
169,0,145,205,200,192,128,208,224,166,
213,165,208,157,0,208,96
3790 DATA 0,192,118,63,112,192,0,0
3800 DATA 0,3,110,252,14,3,0,0
3810 DATA 24,24,24,24,60,126,126,102
3820 DATA 0,0,0,0,0,0,0,0
3830 DATA 0,192,118,37,8,0,0,0
3840 DATA 0,0,20,55,112,192,0,0
4000 DATA 104,169,0,133,203,133,205,16
9,224,133,206,165,106,24,105,1,133,204
,160,0,177,205,145,203,200,208
4010 DATA 249,230,204,230,206,165,206,
201,228,208,237,96

```

## CHECKSUM DATA

(see page 27)

```

1 DATA 62,334,58,584,70,259,976,412,94
4,518,793,852,842,41,365,7110
150 DATA 731,164,816,62,11,526,116,871
,565,431,714,231,733,28,362,6361
300 DATA 150,81,596,87,719,361,619,794
,976,673,114,663,666,782,977,8258
450 DATA 95,98,101,61,254,950,100,431,
81,414,159,447,813,745,934,5683
600 DATA 84,87,90,953,149,693,700,707,
710,39,947,636,79,283,428,6585
750 DATA 433,442,449,621,108,711,614,6
01,959,903,230,169,173,638,311,7362
900 DATA 52,651,772,987,684,511,997,97
4,661,376,310,310,441,444,461,8631
1050 DATA 941,946,989,450,212,52,804,9
12,151,989,810,215,789,652,440,9352
1200 DATA 579,434,453,460,467,477,484,
213,316,997,889,288,923,832,286,8098
1350 DATA 637,916,917,918,919,125,546,
446,136,778,796,932,965,337,338,9706
1500 DATA 532,819,149,239,505,178,326,
923,882,803,934,292,85,862,27,7556
1650 DATA 446,253,448,837,450,668,606,
14,803,943,378,944,80,596,326,7792
1800 DATA 321,388,285,86,821,681,88,81
0,952,306,92,481,258,65,790,6424
1950 DATA 371,795,842,190,620,153,782,
926,19,815,272,894,864,739,734,9016
2100 DATA 732,688,981,482,688,789,935,
388,1,522,801,732,708,606,373,9426
2250 DATA 652,638,708,8,796,33,791,258
,202,151,177,597,607,443,947,7008
2400 DATA 996,895,795,547,716,164,49,2
92,907,196,1,168,6,187,996,6915
2550 DATA 539,221,206,85,301,326,988,4
22,406,785,984,935,265,741,751,7955
2700 DATA 298,325,614,748,789,74,517,2
83,61,988,370,402,479,611,71,6630
2850 DATA 851,926,692,897,939,111,752,
902,874,47,388,866,22,324,287,8878
3000 DATA 327,426,571,28,485,980,467,8
47,503,930,12,890,94,536,536,7632
3150 DATA 531,540,546,418,6,66,38,727,
82,84,86,717,51,53,394,4339
3300 DATA 540,111,877,567,954,582,709,
377,738,903,92,222,989,757,392,8810
3450 DATA 272,455,385,88,901,382,378,1
15,796,241,67,938,305,452,671,6446
3600 DATA 441,405,96,342,996,8,982,814
,782,107,302,186,269,393,584,6707
3750 DATA 883,970,239,418,915,313,942,
944,338,575,934,825,8296

```

Coming soon:  
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# BOPOTRON!

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# The ANALOG Card File

16K Disk

by David Plotkin

As I was doing my income taxes this year, I found that I needed a tool to organize and catalog the veritable mountain of receipts. This little utility was just what the doctor ordered. It allows you to type just about anything you want on the screen, save the screen to disk, edit it in the future and print it out for posterity.

The first thing you are presented with is the general menu screen, offering various options: 1. getting a disk directory and purging files from the disk; 2. starting with a new screen; or 3. Editing an old screen. Also on this screen are some brief instructions.

If you choose a new screen, you'll need to specify the filename to store the screen under, then you are presented with a blank lined screen, similar to a 5" x 7" index card. On the first line is the title; this doesn't get printed out when you dump the screen to the printer. Be careful not to scroll the screen, or some of your information will move up into the title area, with some pretty strange-looking results. If you do inadvertently have this problem, you can just RE-SET and RUN the program again. If you choose to edit an old screen, you'll need to give the filename of the screen, which will then be presented for editing. Press SELECT to print the screen, START to save the screen to disk, and OPTION to start over without saving the screen. The major sections of the program are as follows:

**Lines 0-20** — Set up, initialize and modify the display list.

**Lines 25-60** — Draw the menu screen with instructions and get the users choice.

**Lines 100-120** - The New Screen routine.

**Lines 130-160** — Read the keyboard directly from the memory location 764. Also check for pressing of the console buttons (START, SELECT, and OPTION).

**Lines 700-720** — Delete a file.

**Line 800** — Get the name of the file to edit, then go get it.

**Lines 900-960** — The disk directory.

**Lines 1000-1030** — Write a screen to disk. The write is done using the fast IOCB routines, which are set up in Lines 1020 and 1030, then called in Line 2030 by the USR call.

**Lines 2000-2030** — Read a screen from disk. This routine also uses the high speed IOCB call.

**Lines 3000-3010** — Print out the screen. Each character in a line is PEEKed from the screen. The memory address of the beginning of each line is looked up in the array LINE; this is much faster than calculating the address each time. Before the character PEEKed from the screen can be printed, however, it must be translated from Internal Code to ATASCII,

which is what the printer understands. The variable IC is a value of Internal Code. HOLD\$ is an array of ATASCII codes in Internal Code order, so looking up HOLD\$(IC+1) returns the ATASCII code HOLD\$(IC+1). It's pretty fast, too.

Lines 3100-3150 — This section of code fills the array HOLD\$ with ATASCII codes in Internal Code order, for use in the printer dump routine.

Lines 3200-3260 — Set up the Player/Missile graphics. What Player/Missile graphics? What do you think those nice, thin lines are? They are single-line resolution Player/Missiles, in triple width, butted edge-to-edge to fill the screen. By proper positioning, there is no overlap between the lines and the letters.

I have found this program to be quite useful for keeping records, since I can set up full screens of data in any format I want. □

```

0 REM ANALOG CARD FILE
1 REM
2 REM : IF NEW SCREEN THEN DRAW A
3 REM : BLANK SCREEN AND PUT THE
4 REM : CURSOR ON THE FIRST LINE.
5 REM
6 REM : IF OLD SCREEN THEN LOAD THE
7 REM : SELECTED SCREEN, GOTO EDITOR,
8 REM : AND SAVE OVER OLD FILE.
9 REM
14 K1=1:K255=255:K256=K255+K1:TRAP 20:
POKE 752,K1:? "INITIALIZING"
15 DIM A$(K1),FILES(15),LINE(25),PP$(4
0),HOLD$(K256),FN$(14)
16 SCREEN=PEEK(88)+K256*PEEK(89)+40:F0
R J=K1 TO 23:LINE(J)=SCREEN:SCREEN=5CR
EEN+40:NEXT J:GOSUB 3100
19 REM MAIN MENU SCREEN
20 TRAP 20:GRAPHICS K0:POKE 559,62:POK
E 53277,3:SETCOLOR 2,K0,K0:GOSUB 30000
:POKE 82,K0
25 ? :? :? ")**** ANALOG CARD FILE ***"
:? :PP$(18):PP$(40)=PP$:PP$(2)=PP
$:? PP$
26 ? "AFTER SCREEN IS LOADED, TYPE ON
THE":? "SCREEN AS DESIRED. START=SAVE
TO"
27 ? "DISK. OPTION=START OVER WITHOUT
SAVING"
28 ? "SELECT=PRINT OUT THE SCREEN.":?
:? PP$
30 ? :? "NEW OR OLD SCREEN, DIRECTORY"
:? "OR PURGE A CARD":? :CLOSE #K1:OPEN
#K1,4,K0,"K":GET #1,J:A$(J)=CHR$(J)
40 IF A$="O" THEN 800
45 IF A$="P" THEN 700
50 IF A$="D" THEN 900
60 IF A$("<" THEN 30
99 REM NEW SCREEN ROUTINE
100 ? "NEW":? :? "FILE NAME TO SAVE AS
":GOSUB 4000:GRAPHICS K0:POKE 559,62
110 POKE 53277,3:SETCOLOR 2,8,2:SETCOL
OR K1,K0,13:SETCOLOR K0,K1,15:DL=PEEK(
560)+PEEK(561)*K256:GOSUB 30000
120 POKE DL+3,70:POKE DL+6,11:? "ANAL
OG CARD FILE":
129 REM EDITOR ROUTINE
130 TRAP 20:CLOSE #K1:OPEN #K1,4,K0,"K
":POKE 82,K0:POKE 752,K0:POSITION K0,
K1:? ")+":POKE 764,K255
140 IF PEEK(764)<>K255 THEN GET #K1,K:
? CHR$(K):GOTO 140

```

```

150 IF PEEK(53279)=6 THEN POKE 752,K1:
? ")+":GOTO 1000
155 IF PEEK(53279)=3 THEN 20
156 IF PEEK(53279)=5 THEN 3000
160 GOTO 140
699 REM DELETE A FILE
700 ? "PURGE":? :CLOSE #K1:? "ENTER FI
LENAME TO DELETE OR PRESS":? "RETURN T
O ABORT":GOSUB 4000
710 IF FN$="" THEN 20
720 XIO 33,H3,K0,K0,FILES:GOTO 20
799 REM EDIT SCREEN ROUTINE
800 ? "OLD":? :? "FILE NAME TO EDIT":
GOSUB 4000:GOTO 2000
899 REM DISK DIRECTORY
900 ? "DRIVE #":GET #K1,X:FN$="D1:*
*":FN$(2,2)=CHR$(X):CLOSE #K1:? CHR$(X
):? :OPEN #K1,6,K0,FN$
910 FOR X=K1 TO 64:INPUT #K1,FN$:FN$=F
N$(3):IF FN$(3,12)="FREE SECTO" THEN 9
45
920 IF X/2=INT(X/2) THEN POSITION 15,(
X+K1)/2:? FN$:GOTO 940
930 POSITION 2,(X+2)/2:? FN$
940 NEXT X
945 ? :? "PRESS ANY KEY TO CONTINUE...
":POKE 764,K255
950 IF PEEK(764)=K255 THEN 950
960 POKE 764,K255:CLOSE #K1:GOTO 20
999 REM WRITE SCREEN TO DISK
1000 CLOSE #K1:OPEN #K1,8,K0,FILES
1010 PUT #K1,PEEK(939):FOR I=708 TO 71
2:PUT #K1,PEEK(I):NEXT I
1020 RAMTOP=PEEK(106)*K256:DL=PEEK(560
)+K256*PEEK(561):BYTES=RAMTOP-DL:HI=IN
T(BYTES/K256):LO=BYTES-HI*K256

```

(continued on page 86)

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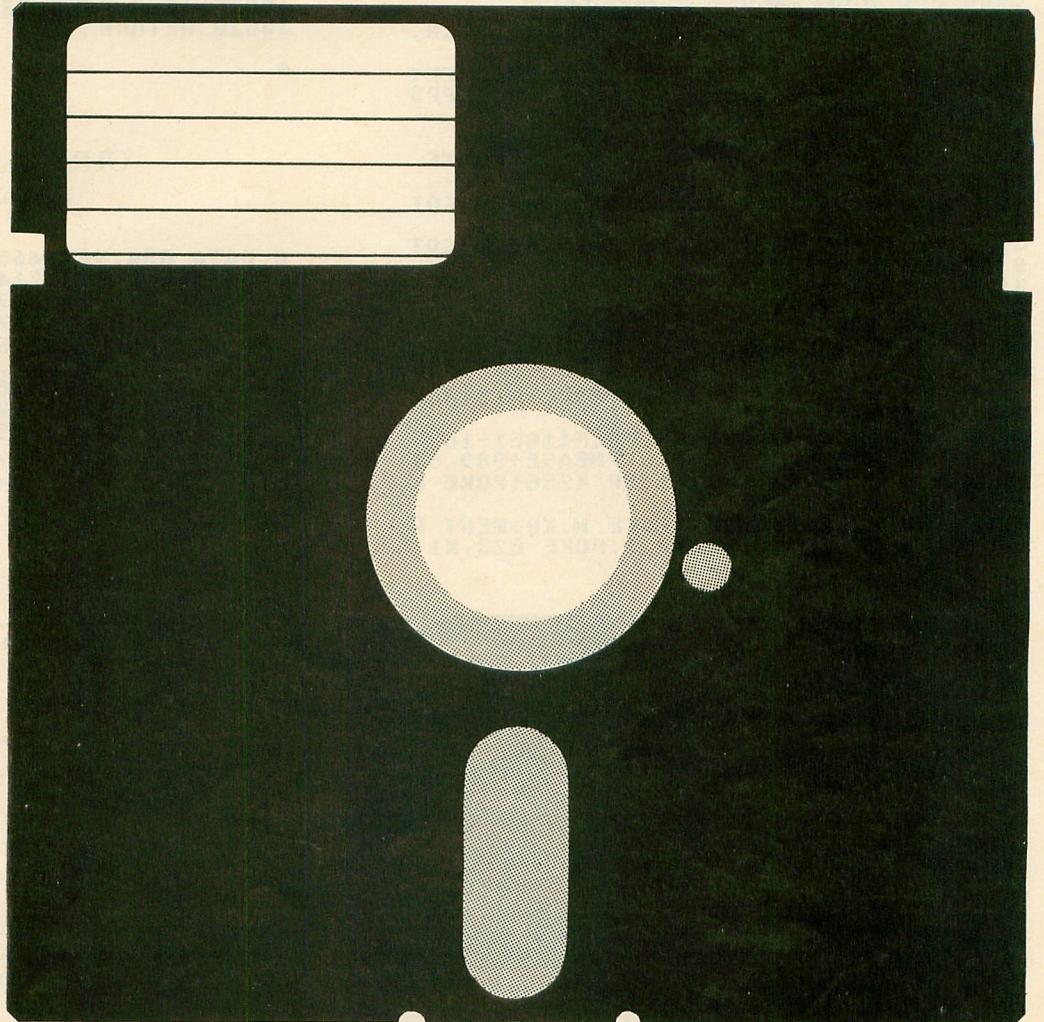
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```

1030 POKE 850,11:POKE 856,10:POKE 857,
HI:GOTO 2030
1999 REM READ SCREEN FROM DISK
2000 CLOSE #K1:OPEN #K1,4,K0,FILES
2010 GET #K1,A:GRAPHICS A:POKE 559,62:
POKE 53277,3:FOR I=708 TO 712:GET #K1,
A
2020 POKE I,A:NEXT I:GOSUB 30000:POKE
850,7:POKE 856,K255:POKE 857,K255
2030 POKE 852,PEEK(560):POKE 853,PEEK(
561):X=USR(ADR("hhhllvv")),16):CLOSE #1
:GOTO 130
2999 REM PRINT OUT THE SCREEN
3000 TRAP 130:CLOSE #K1:OPEN #K1,8,K0,
"P:":FOR J=K1 TO 23
3010 FOR I=K1 TO 40:PP$(I)=HOLD$(PEEK(
LINE(J)+I-K1)+K1):NEXT I:PRINT #K1;PP$
:NEXT J:CLOSE #K1:GOTO 130
3099 REM ARRAY TO MAKE IC TO AC
3100 FOR II=K0 TO K255:IC=II:IV=K0:IF
IC>127 THEN IV=K1:IC=IC-128
3110 IF IC<64 THEN AC=IC+32+128*IV:GOT
O 3140
3120 IF IC<96 THEN AC=IC-64+128*IV:GOT
O 3140
3130 AC=IC+128*IV
3140 HOLD$(II+K1)=CHR$(AC):NEXT II
3199 REM P/M INITIALIZATION
3200 PMBASE=PEEK(106)-16:POKE 54279,PM
BASE:PMBASE=PMBASE*K256
3210 FOR W=53256 TO 53259:POKE W,3:NEX
T W:POKE 53260,K255
3220 POKE 88,K0:POKE 89,PEEK(106)-16
3230 FOR W=PMBASE+809 TO PMBASE+989 ST
EP 8:FOR J=K0 TO 1024 STEP K256:POKE W
+J,K255:NEXT J:NEXT W
3240 FOR W=704 TO 707:POKE W,K0:NEXT W
:POKE 559,62:POKE 53277,3:POKE 623,K1

```

```

3250 FOR I=53248 TO 53255:READ J:POKE
I,J:NEXT I:RETURN
3260 DATA 48,80,112,144,176,184,192,20
0
3999 REM FILE NAME HANDLER
4000 INPUT FN$:IF FN$="" THEN RETURN
4010 FOR J=K1 TO LEN(FN$):IF FN$(J,J)=
":" THEN FILE$=FN$:RETURN
4020 NEXT J:FILE$="D:":FILE$(3)=FN$:RE
TURN
29999 REM DISABLE BREAK KEY
30000 U=PEEK(16):IF U>127 THEN U=U-128
:POKE 16,U:POKE 53774,U
30010 RETURN

```

## CHECKSUM DATA

(see page 27)

```

0 DATA 854,987,465,241,702,995,615,302
,260,3,508,874,214,229,790,8039
25 DATA 436,318,575,582,603,712,728,68
3,526,15,389,7,607,425,558,7164
140 DATA 958,403,693,738,713,830,564,5
48,14,330,266,420,338,467,628,7910
930 DATA 769,786,6,849,540,748,337,789
,57,990,268,331,426,725,214,7835
2999 DATA 21,853,992,562,105,145,168,1
28,319,151,136,16,481,609,426,5112
3250 DATA 978,265,761,24,16,603,741,61
3,46,4047

```

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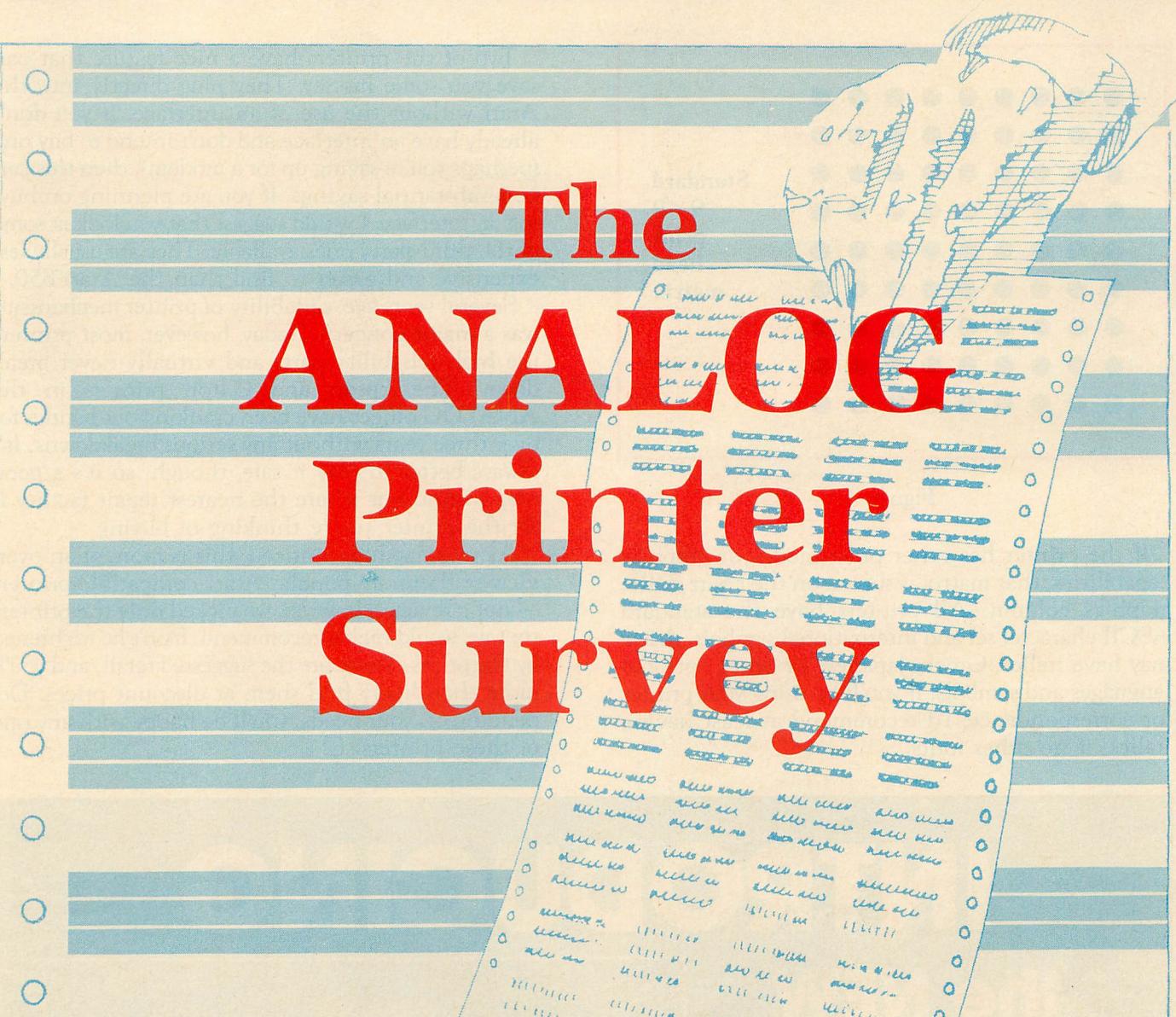
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# The ANALOG Printer Survey

by Michael DesChenes

This printer overview is limited to the more popular dot-matrix printers, which we feel deserve your first consideration when shopping for a printer. Most of the companies have higher and lower end models, but we'll stick with the models shown, because of their popularity and dependability.

I hate to admit this, but I almost forgot to include the Atari 1025 printer in the comparison chart. Being an Atari-exclusive magazine, we felt that it *should* be included. Don't get me wrong — it's a good heavy-duty general printer (actually, it's an Okidata 80), but I've been spoiled with printers offering more features.

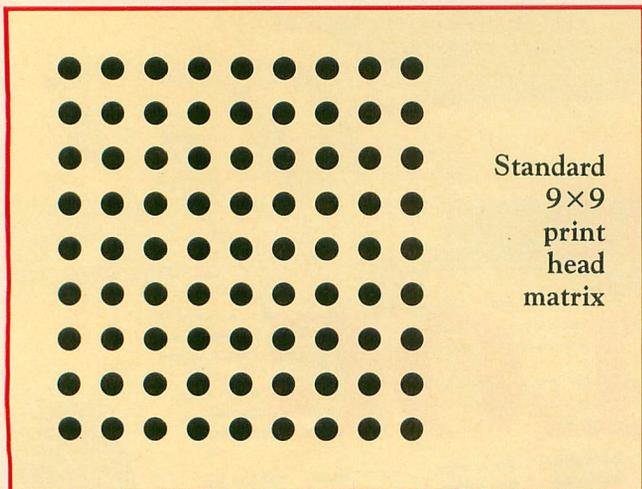
As the chart shows, all but one of the printers use a nine-wire print head, and, unless you're looking for a near-letter quality printer with the ability to do graphics and general printouts, the nine-wire print heads are fine.

As far as the print speed, ANALOG uses both the Epson RX80 and C.Itoh Prowriter. . . and the slower Epson doesn't cause anyone to pace the floor in an-

icipation. So don't feel that speed should be your major concern (speed is slower in enhanced or letter quality modes).

Because printers are usually a lot slower than computers, a printer buffer is a nice feature. The print buffer is essentially memory that resides between the computer and printer. The buffer takes the information that is sent from the computer and sends it to the printer, according to the printer's speed limitation. With some of the larger optional buffers (up to 32K), this can leave the computer free to do other things while the printer is still at work.

Varying print modes (i.e., double width, emphasized, compressed, etc.) will have a direct effect on the print size, which is measured in characters per inch, and the number of characters per column. For example, the Epson's smallest type, compressed, can fit 137 characters per line. The matrix listed for each printer is for that printer's normal character, not its expanded or compressed type (see Figure 1).



Standard 9x9 print head matrix

Figure 1.

If the printer has other print modes or graphics capabilities, that matrix is shown on the chart in the graphics column. All printers have the standard ASCII character set and international symbols. A few may have italics, Greek, Japanese or other optional languages and symbols. If you'll be using your printer for correspondence, I'd recommend at least having italics, if no other fonts.

Two of the printers have a nice feature that can save you some money. They plug directly into the Atari without the use of an interface. If you don't already have an interface and don't intend to buy one (perhaps you're saving up for a modem), then this can be a substantial savings. If you are planning on buying an interface, I would suggest that you look at some of the third-party ones available. They are usually less expensive and easier to find than the Atari 850.

Several years ago, reliability of printer mechanisms was a major concern. Today, however, most printers use high-reliability parts and virtually never break down. The Epson and C.Itoh printers in the ANALOG offices have been cranking out listings for over three years without any serious breakdowns. It's always better to play it safe, though, so it's a good idea to find out where the nearest repair facility is for the printer you're thinking of buying.

As you may have noticed, this is more of an overview of the more popular Atari-compatible printers — not a review. However, we picked only the printers that we would highly recommend. Don't be frightened by the prices. These are the suggested retail, and you'll more than likely find them at discount prices. Depending on your needs, you'll be happy with any one of these printers. □

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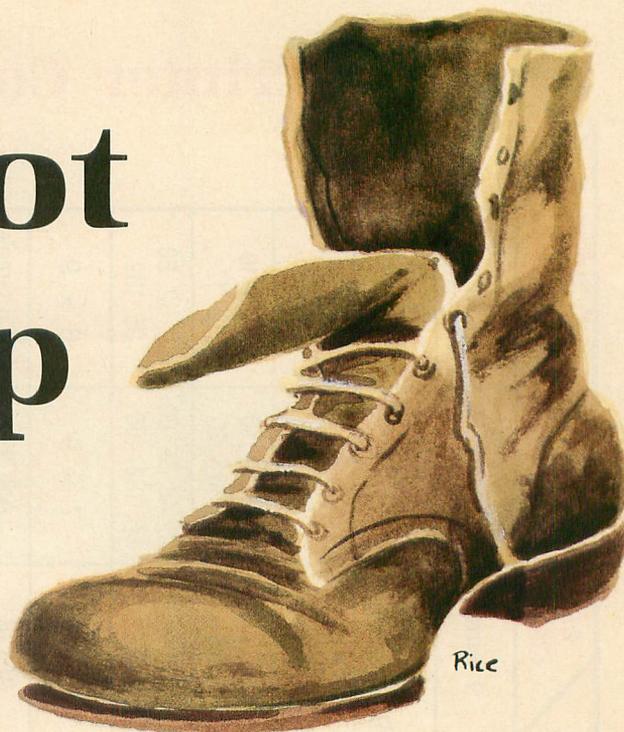
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<b>Print Head</b>	9 wire	Hammer 4-Heads	9 wire	9 wire	9 wire	9 wire	9 wire	9 wire
<b>Maximum Print Speed</b>	40 cps	86 cps	160 cps Bi-Directional	100 cps Bi-Directional	120 cps	120 cps Bi-Directional	160 cps	180 cps
<b>Buffer Size</b>	None	1K	8K Optional	None	2K	2K Optional	2K	2K
<b>Print Size CPI</b>	5, 10, 16	10, 13.3	5, 6, 8.5 10, 12, 17	5, 6, 8.5 10, 12, 17	5, 6, 8.5 10, 12, 17	5, 8.3, 10, 16.5	5, 6, 8.2, 10 12, 16.5, 20	5, 6.5, 10 12, 17
<b>Characters Per Column</b>	40, 80, 128	80, 106	40, 48, 68 80, 96, 136	40, 48, 68, 80, 96, 137	40, 48, 68 80, 96, 136	40, 66.4, 80 132	40, 48, 65, 80 96, 132, 160	40, 52, 80 96, 132
<b>Standard Print Matrix</b>	9 × 7	7 × 8	9 × 9	9 × 9	8 × 8	9 × 9	7 × 9	8 × 9
<b>Character Sets</b>	ASCII International	ASCII International	ASCII Italics International	ASCII Italics International	ASCII Italics International	ASCII International	ASCII International	ASCII Greek International
<b>No. of Fonts</b>	1	1	8	5	4	1	1	6
<b>Ribbon Type</b>	1/2" Twin Spools	4-Color Cartridge	2" Twin Spools	3/8" Cartridge	1/2" Cartridge	1/2" Twin Spools	3/8" Cartridge	3/8" Cartridge
<b>Interface</b>	Directly to Serial Port	Directly to Serial Port	Serial Parallel	Serial Parallel	Serial	Serial Parallel	Serial Parallel	Serial Parallel
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## Printer Comparison Chart

# Boot Camp



by Tom Hudson

Well, for the last week or so I've been receiving your solutions to the 5 times 27 multiply problem, and it looks like everybody's got the hang of it. Some people tried to cheat by multiplying 27 by 5. This is a much simpler operation, but we'll see later why this type of shortcut is not always possible.

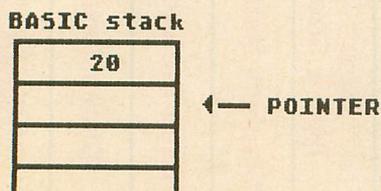
## What happened?!!

Figure 6 from last issue's column was a simple BASIC program that looked like this:

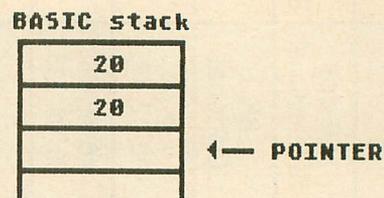
```
10 GOSUB 10
20 END
```

I told you to execute it and see if you could determine what went wrong. If you look at the code, you'll see that the program places itself in an infinite loop with the GOSUB 10 statement. If you let the program run for a few minutes, you'll eventually see an ERROR 2 message. What happened? Let's step through the program and find out.

Line 10 executes a GOSUB 10 statement. The next executable statement is Line 20, so the line number 20 is placed on the stack. The program then branches to Line 10. The stack now looks like this:



Line 10 executes GOSUB 10 again, with the same results as above. The line number 20 is placed on the stack *again*, and execution continues at Line 10 again. Now the stack looks like this:



Line 10 performs the same set of operations again, and you can see that the program is in an infinite loop. Each time the GOSUB 10 statement is executed, the BASIC stack gets larger and larger...until there is no more memory available. When this happens, the computer stops with the ERROR 2 AT LINE 10 message.

Obviously, one must take care that all subroutines are terminated by a RETURN. Each subroutine must contain at least one RETURN statement, otherwise you'll find yourself running out of memory far faster than you ever dreamed!

## Assembly subroutines.

Last issue, as you recall, we found out what a stack is and how BASIC uses a stack to execute subroutines. There is a lot of "housekeeping" done by the system to keep track of subroutines, and we don't want to

write all those routines ourselves, do we?

Luckily for us, the 6502 microprocessor has its own set of subroutine instructions. They are: JSR (jump to subroutine), which corresponds to the BASIC GOSUB statement; and RTS (return from subroutine), which performs the same function as the BASIC RETURN statement.

The format of the JSR instruction is:

JSR nn (ABSOLUTE)

The operand of the JSR instruction can be any address, such as JSR \$4000, or a program label, such as JSR PRINT.

When the JSR instruction executes, things happen a little differently than they did in our BASIC example, last issue. Instead of a line number being placed on the stack, a two-byte address is used. More on that in a moment.

The format of the RTS instruction is:

RTS

Like the RETURN statement in BASIC, the RTS instruction will continue execution at the instruction following the JSR which called the subroutine.

Let's look at an assembly program which uses the JSR and RTS instructions. For purposes of illustration, we'll duplicate the function of the BASIC pro-

gram we used last time. Figure 1 is a listing of the assembly program, with the addresses and hex codes of the instructions shown to the left of the line numbers. The corresponding BASIC statements are shown in the comment fields.

```

0000          10          ** 00600
0001 DB          15          CLD
0002 200506    20          JSR SUB1      ;GOSUB 100
0003 00          25          BRK           ;END
0004 00          30          JSR SUB2      ;GOSUB 200
0005 200906    35 SUB1    LDA          ;RETURN
0006 00          40          RTS           ;VARA=VARA+1
0007 AD1306    45 SUB2    CLC
0008 18          50          ADC          #1
0009 00          55          STA          VARA
000A 8D1306    60          RTS           ;RETURN
000B 00          65          **
000C 00          70          .END
000D 00          75
000E 00          80
000F 00          85
0010 00          90
0011 00          95
0012 00          00
0013 00          05
0014 00          10
    
```

Figure 1.

Let's walk through this program and watch what happens to the stack. Remember, the 6502 does all the stack handling for us, and this walk-through is just to familiarize you with what's happening inside the machine.

Line 15 clears the decimal mode for the binary arithmetic the program will do later. At the start of the program, the stack pointer will be at some arbitrary location. We'll assume that it's set to \$00 for this demonstration. The stack at this point looks like this:

(continued on next page)

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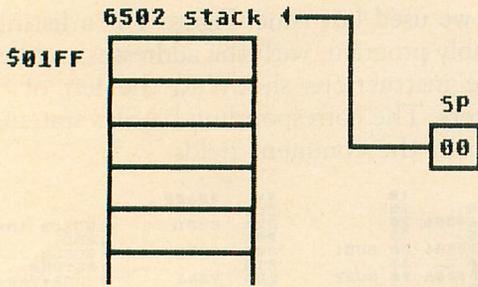
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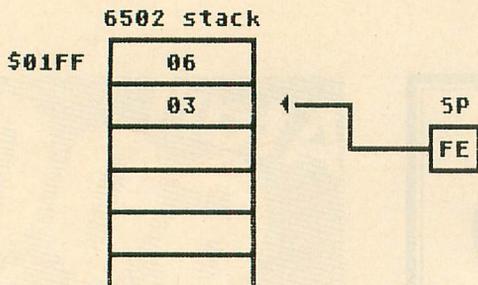
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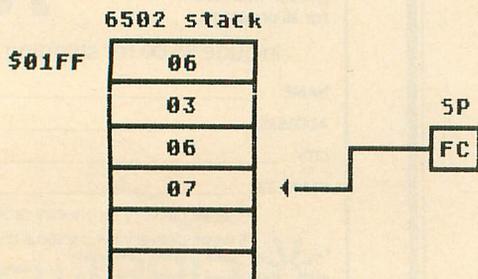
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Line 20 performs a JSR to the location labeled SUB1. Before going to the subroutine, the 6502 must save the return address on the stack. The next instruction after the JSR is at \$0604, so the 6502 takes this address and *subtracts 1* from it, resulting in a return address of \$0603. The stack pointer is decremented by 1, and contains \$FF. The high byte of the return address (\$06) is placed at location \$01FF. The stack pointer is decremented again, and now contains \$FE. Now the 6502 stores the *low* byte of the return address (\$03) on the stack at location \$01FE. The return address is now properly stored, and execution continues at location \$0605, the address of SUB1. At this point, the stack looks like this:

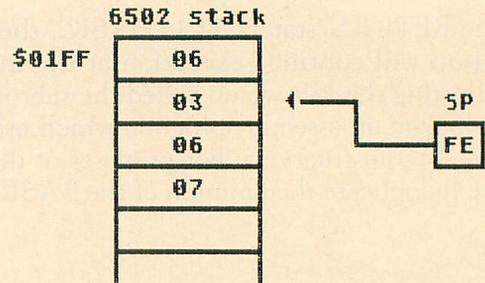


Line 30 — Execution continues here after the JSR process is complete. This is another JSR, this time to the subroutine labeled SUB2. As in the previous JSR, the return address minus 1 (\$0607 this time) is stored in the next two stack locations, and execution continues at the subroutine. The stack pointer now contains \$FC, and the stack looks like this:

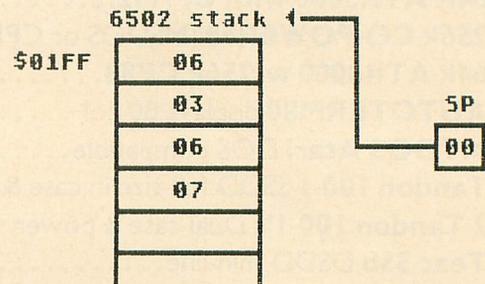


Lines 40 - 55 add 1 to the contents of location VARA, placing the result back into VARA. The stack is unchanged by this operation.

Line 60 — Now we encounter our first RTS instruction. It functions almost like the BASIC RETURN statement, but with a small difference. When executed, the RTS gets the byte from the stack location indicated by the stack pointer and places it in the *low* byte of the program counter. Remember that the program counter is where the 6502 stores the address of the instruction that is currently being executed. The stack pointer is then incremented (to \$FD), the next byte in the stack is placed in the *high* byte of the program counter, and the stack pointer is incremented again (to \$FE). At this point, the program counter contains the return address minus 1, so the program counter is incremented by 1 to get the proper return address. In this case, the return address is \$0608, and the program continues there (Line 35). After this instruction executes, the stack will look like this:



Line 35 executes another RTS instruction. This time, the program will return to location \$0604 (1 byte higher than the location in the last two bytes of the stack). The stack pointer will be incremented twice, and when the program is complete, the stack pointer will contain \$00. After this RTS, execution continues at Line 25, and the stack looks like this:



Line 25 stops the execution of the program with the BRK instruction. The stack is unchanged.

**Don't panic!**

Remember, the 6502 performs all of the stack maintenance functions for you. Writing a subroutine in assembly is just as easy as writing one in BASIC. I've just explained the details of the stack, so that you'll be prepared for next issue's stack-manipulation instructions.

Later on, when you're more comfortable with assembly language and the stack, we'll see how we can use the stack for some fancy control structures.

### Simple subroutines.

Right now, let's see how simple assembly subroutines can be. Let's write a subroutine that will add 1 to a two-byte counter for us.

Let's assume the counter is labeled COUNTL (low byte) and COUNTH (high byte). The normal code we'd use to add 1 to this two-byte counter is shown in Figure 2.

```
LDA COUNTL ;GET LO BYTE
CLC        ;CLEAR CARRY
ADC #1     ;ADD 1
STA COUNTL ;SAVE LO BYTE
LDA COUNTH ;GET HI BYTE
ADC #0     ;ADD WITH CARRY
STA COUNTH ;SAVE HI BYTE
```

Figure 2.

Clearly, this is just a simple two-byte add operation (if you have problems with addition, review issue 17's **Boot Camp**).

Let's say you're writing a program which needs to increment this counter in several different places. You could re-type the addition code each time you need it, but this would waste quite a bit of memory. Luckily, you know all about the 6502 JSR and RTS instructions, so you write a simple subroutine to do the job. Figure 3 shows the code necessary.

```
INCCTR LDA COUNTL ;GET LO BYTE
CLC    ;CLEAR CARRY
ADC #1 ;ADD 1
STA COUNTL ;SAVE LO BYTE
LDA COUNTH ;GET HI BYTE
ADC #0 ;ADD W/CARRY
STA COUNTH ;SAVE HI BYTE
RTS
```

Figure 3.

If you look at the subroutine closely, you'll see only *two* changes from Figure 1! The first line of the subroutine contains the label INCCTR (INCRement CounTER). This allows us to reference the subroutine with an easy-to-remember name. The other change is the addition of an RTS instruction at the end of the routine. See? Writing assembly subroutines isn't so hard, after all.

To call this subroutine, all we need is the statement:

```
JSR INCCTR
```

I'm sure you'll agree that this is much easier than re-typing the addition code each time you need to increment the counter. Figure 4 shows a complete program which uses the subroutine in three places.

```
10      * = $0600
20      CLD          ;BINARY MATH
30      LDA #0      ;ZERO OUT...
40      STA COUNTL  ;COUNTER LO
50      STA COUNTH  ;COUNTER HI
```

```
60      JSR INCCTR  ;INC COUNTER
70      LDX #4      ;5 TIMES...
80 LOOP1 JSR INCCTR ;INC COUNTER
90      DEX         ;NEXT X
0100    BPL LOOP1   ;LOOP IF POS.
0110    LDA #50     ;GET # IN ACC.
0120    JSR INCCTR  ;INC COUNTER
0130    STA ACCUM   ;SAVE ACCUM.
0140    BRK        ;ALL DONE!
0150 INCCTR LDA COUNTL ;GET LO BYTE
0160    CLC        ;CLEAR CARRY
0170    ADC #1     ;ADD 1
0180    STA COUNTL ;SAVE LO BYTE
0190    LDA COUNTH ;GET HI BYTE
0200    ADC #0     ;ADD W/CARRY
0210    STA COUNTH ;SAVE HI BYTE
0220    RTS        ;RETURN!
0230 COUNTL * = * + 1
0240 COUNTH * = * + 1
0250 ACCUM  * = * + 1
0260                .END
```

Figure 4.

Line 20 clears the decimal mode for binary arithmetic.

Lines 30 - 50 set the counter (COUNTL and COUNTH) to zero.

Line 60 increments the counter using the JSR INCCTR instruction.

Lines 70 - 100 increment the counter five times using the X register as a loop counter. The count starts at 4, and the routine loops back to LOOP1 until the X register is less than zero.

Line 110 loads the accumulator with \$50.

Line 120 JSR's to INCCTR to increment the counter a final time.

Line 130 stores the contents of the accumulator at the location labeled ACCUM. Note that this will *not* be the value \$50 loaded in Line 110, but will be whatever value the subroutine left there! This is an important point: You must remember which registers are altered by a subroutine, because the values in those registers will be lost when the subroutine is called! In this case, only the accumulator is used by the subroutine, so the X and Y registers can be used without concern.

Line 140 stops the program with the BRK instruction. At this point, you can examine the counter (COUNTL and COUNTH) and see that it contains the value \$0007. The location ACCUM will contain \$00, not the value \$50 loaded in Line 110.

Lines 150 - 220 are the INCCTR subroutine.

### Flexible subroutines.

The INCCTR subroutine showed how a subroutine could be written to perform the same function each time. Now we're going to write a subroutine that will perform a function on a value passed to the subroutine in one of the registers. We'll use another familiar routine, multiplication by 27.

We'll write a subroutine which will multiply the contents of the accumulator by 27 and return with the value times 27 in the accumulator.

Those people who took the multiply 27 by 5 shortcut are in for a little surprise! In order for this subroutine to work, the multiply by 27 approach *must* be used. Take that!

Figure 5 shows the subroutine necessary to multiply the accumulator by 27 and return the result in the accumulator. Only the accumulator is altered; the X and Y registers are untouched. The subroutine requires three one-byte storage locations, TIMES1, TIMES2 and TIMES8.

```
MULT27 STA TIMES1 ;SAVE NUMBER
      ASL A      ;* 2
      STA TIMES2 ;SAVE # TIMES 2
      ASL A      ;* 4
      ASL A      ;* 8
      STA TIMES8 ;SAVE # TIMES 8
      ASL A      ;* 16
      CLC        ;CLEAR CARRY
      ADC TIMES8 ;*16 + *8 = *24
      CLC        ;CLEAR CARRY
      ADC TIMES2 ;*24 + *2 = *26
      CLC        ;CLEAR AGAIN
      ADC TIMES1 ;*26 + *1 = *27
      RTS        ;ALL DONE!
```

Figure 5.

This routine is essentially the same as the multiply by 27 solution shown last issue. The accumulator is assumed to contain the number to be multiplied upon entry into the subroutine. After the multiply is complete, the result is left in the accumulator. The RTS instruction at the end of the routine lets us know that this is a subroutine. The subroutine is labeled MULT27 and is called with the statement:

```
JSR MULT27
```

Let's put this subroutine to work, using a program which will multiply the numbers 3, 7 and 9 by 27. We will place the results in locations labeled THREE, SEVEN and NINE, respectively. Figure 6 shows one possible solution.

```
10      *= $0600
20      CLD        ;BINARY MATH
30      LDA #3     ;GET 3,
40      JSR MULT27 ;MULT BY 27,
50      STA THREE  ;SAVE RESULT
60      LDA #7     ;GET 7,
70      JSR MULT27 ;MULT BY 27,
80      STA SEVEN  ;SAVE RESULT
90      LDA #9     ;GET 9,
0100    JSR MULT27 ;MULT BY 27
0110    STA NINE   ;SAVE RESULT
0120    BRK        ;AND STOP!
0130    MULT27 STA TIMES1 ;SAVE NUMBER
0140    ASL A      ;* 2
0150    STA TIMES2 ;SAVE # TIMES 2
0160    ASL A      ;* 4
0170    ASL A      ;* 8
0180    STA TIMES8 ;SAVE # TIMES 8
0190    ASL A      ;* 16
0200    CLC        ;CLEAR CARRY
0210    ADC TIMES8 ;*16 + *8 = *24
0220    CLC        ;CLEAR CARRY
0230    ADC TIMES2 ;*24 + *2 = *26
0240    CLC        ;CLEAR AGAIN
0250    ADC TIMES1 ;*26 + *1 = *27
0260    RTS        ;ALL DONE!
0270    TIMES1 *=*+1
0280    TIMES2 *=*+1
0290    TIMES8 *=*+1
```

```
0300 THREE  *=*+1      ;3*27 RESULT
0310 SEVEN  *=*+1      ;7*27 RESULT
0320 NINE   *=*+1      ;9*27 RESULT
0330                .END
```

Figure 6.

Line 20 clears the decimal mode for binary arithmetic.

Line 30 places the number 3 in the accumulator, so that it can be multiplied by 27.

Line 40 performs a JSR to the subroutine MULT27, which multiplies the accumulator by 27. The result of the multiply will be in the accumulator when the subroutine is finished.

Line 50 stores the contents of the accumulator in the location THREE. This is the value 3\*27.

Lines 60 - 80 multiply the number 7 by 27 and place the result in the location SEVEN.

Lines 90 - 110 multiply the number 9 by 27 and place the result in the location NINE.

Line 120 stops the program's execution. At this point, you can examine the locations THREE, SEVEN and NINE to be sure they contain 81 (\$51), 189 (\$BD) and 243 (\$F3), respectively.

Lines 130 - 260 are the multiply by 27 subroutine.

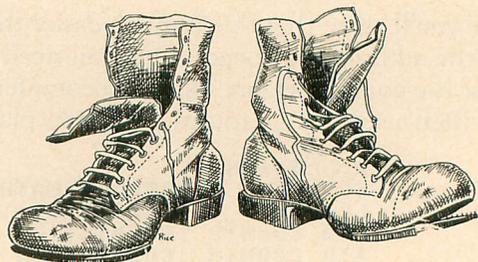
**Homework.**

Now you know how to write subroutines in 6502 assembly language. Subroutines are a powerful programming technique, and open doors into the Atari operating system (OS). Future installments of **Boot Camp** will show how to access these OS routines.

Until next time, write a subroutine that will add the X register to the Y register, placing the result in the accumulator. If the result of the add is greater than 255 (carry flag set), put the value \$FF in the X register. Otherwise, set the X register to \$00. Good luck! □

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# The Fergee File Printer

## A major enhancement for “simple” word processors

40K Disk

---

by Dr. John C. Ferguson

---

The **Bank Street Writer** is an example of a simple word processor that is a near-perfect match for the Atari. Like the computer itself, it is rather inexpensive, a joy to use, and has a beautiful display. Unlike many other word processors, the **BSW** can be mastered in a few minutes. Even more important for the home user, it can be employed after several weeks of idleness with practically no effort needed to relearn the system.

With the beauty of simplicity, however, there are always trade-offs. I found that the **BSW**'s major limitations were not with the editing and filing functions, but with the printout. Printing a hard copy was awkward and required a great many keystrokes to initiate. Even after all this effort, there was only very limited capacity to control the format, and no provision at all to use the many extraordinary functions built into my NEC 8023AC printer. For example, if I wanted enhanced printing for a letter I had just typed, I would usually have to save the letter to disk, return to BASIC (perhaps inserting the cartridge), turn on the printer, LPRINT the enhanced print code, reboot the **BSW** (perhaps after removing the BASIC cartridge) and then go through the tedious procedure of initiating the printing. For reports, I could not use underline, tab stops, or the special Greek characters or numerical superscripts of the NEC 8023AC font!

Recognizing that work was almost always saved to disk anyway, and that the problem was not really in the word processing, I began to develop the present program as an easier method to format printing functions and to allow the use of some seldom-used characters as “tokens” to call forth the underline, special symbols, and control functions of the printer. As I got more into it, I found that there were almost an infinite number of additional enhancements that could be incorporated, including right justification of text and word counting. The result is the **Fergee File Printer**, which is a smorgasbord of the functions that I find most useful. It can easily be modified to add still others, but, again, there are always trade-offs between simplicity of use and complexity of control.

### What FFP does.

The program is designed to be easy and fast. The major functions — file calling, token translation, word wrap, right justification and word counting — are all accomplished with machine language subroutines, thus execution will only be slowed by the speed of the printer itself, and the NEC 8023AC is quite fast. Actually, only a few lines identified by REM statements call on printer-specific functions, so the program can easily be modified to work with Epsoms or other common printers.

When the program is run, a title page is briefly

displayed, showing the translations which are made in the file written with the word processor. These were selected to be easy to remember. Underline is set with "<" and cleared with ">". The "I" (like "C") causes the next letter typed to be interpreted as a CTRL character, and "J" (nearest the ATARI key) similarly causes the next letter to be interpreted as an ATARI character. A CTRL-ATARI character can likewise be called with "^" (above the ATARI key), while next to it "\" produces the ESC code. The BSW program's CTRL-C for centering text and the CTRL-1 for indenting are retained. If you would like the indent to be less than the preset eight spaces, a REM statement in the program tells how this function can be modified.

The redefined keys are lost for their normal functions, but their use while typing BSW files will now permit almost all of the printer function codes to be embedded in the text.

### Working with the FFP.

While the program is displaying the title page, the computer is busily loading some of the machine language subroutines into memory. During this period you may, if you wish, remove the program disk from your drive and insert your disk of BSW files. When the poking is done, the display will shift to the

primary menu for controlling printer format. The menu page also shows the preset default values. If these are satisfactory, simply push RETURN, and you will quickly see a display of the disk inventory with a code letter by each filename. Another push of RETURN will put you back in the menu, if you now decide you want to change something or try another disk. Otherwise, press the letter of the file you want printed, and it will rapidly load into memory.

You are now given a choice of either printing the file, viewing it (and possibly editing the starting or ending point) or returning again to the menu. A press of "P" will immediately initiate printing, provided you have turned on the printer. Thus, from booting the program, just three keystrokes will suffice to initiate printout of any file on the disk, unless you want to change any of the many options that are available in the menu. As soon as the file is dumped out to the printer's buffer, the screen will display a count of the words (actually spaces and EOL codes), and an option, either to print another copy or to return to the menu, will be given.

The menu shows a number of format changes that can be implemented, plus the current values. The initial default values are found in Lines 51 and 52 and can be altered to suit your own tastes.

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Any menu item may be changed by typing its number and RETURN. Some will toggle to the alternative value; others will call for you to enter some specific data. In either case, the new values will be shown in a redisplay of the menu screen, and they will remain in effect until changed again, or until the program is restarted.

Most menu items are sufficiently self-explanatory to need no comment, but a few do. In item 10, the set default of Right Justified calls forth a subroutine which inserts extra spaces within the lines, so that the text is neatly lined up on both the left and right margins, producing what — in many cases — is a more pleasing page appearance. I have also used it, in combination with changes in margin settings and line lengths, to produce dual column printing similar to this page. Note that there may be combinations of short line lengths, long words or non-printing control characters that will produce aberrant results, which can, infrequently, be a problem.

Item 12 allows you to define tab spacing at the time of printing. The tabs would be called by inserting the proper tokens in the text ("I" for the NEC 8023). This greatly simplifies using the BSW for composing tables. A single default tab to position 50 has been included; I use this routinely for the date and signature lines in letters.

Item 13 allows other special codes to be sent out directly to the printer at the beginning of a session. I find that I often use it to call for  $\frac{3}{16}$ -inch line spacing (about equivalent to  $1\frac{1}{2}$  spacing), which — together with a setting of 35 lines per page, a line length of 78 and elite type — makes a nice format.

Item 14 allows you to enter a header of up to 75 letters. If used, this will be printed out at the top of every page except page number 1 (Line 4020 prevents the header and page number from being printed on that page). Automatic page numbering in a choice of formats is provided in items 5 and 6. Be careful, when you print more than one file, that you set the correct first page number each time. If you want to set a new top-of-page position on the printer, turn it off and on again, to clear its memory.

After a file is called, you are given an option to see it displayed. If this is chosen, you will quickly see the first 500 characters, in a readable form with word wrap. You can toggle up and down, or from beginning to end, using the same controls as in the BSW, but note that, if the 500 characters contain an unusually large number of EOL codes, some of the display may scroll off of the screen. At any point, pressing "C" will produce a redisplay of slightly more than the 500 characters without word wrap, and with the EOL codes translated to a visible symbol. In this mode, a new beginning or ending point may be designated by moving the cursor to the proper location and pressing "B" or "E." You can also abort back to the word wrap display. From it, you can choose

further changes, to print the file, or return to the menu and start all over again.

Et al.

While the **Fergee File Printer** was specifically written to enhance the **BSW**, it is certainly not limited to that function. It should work with files generated by most other word processors and editors. I have found it extremely useful in printing out listings of assembly language routines generated with the Atari Macro Assembler-Editor, and with the Atari Assembler Cartridge. Try it on anything you like — you may be surprised at the results.

The program is dimensioned for a 48K machine, a capacity which is usually recommended for word processing. It may be adapted for less memory by reducing the text buffer set in Line 44, eliminating REM statements and, if necessary, leaving out such subroutines as the title page (Lines 6000 - 6200) or view and editing (Lines 7000 - 8150). □

### BASIC listing 1.

```

1 REM *
2 REM *   THE FERGEE FILE PRINTER
3 REM *
4 REM *           BY
5 REM *   DR. JOHN FERGUSON
6 REM
10 REM * This program will print files
    REM * created with BANK STREET
    REM * WRITER and a number of other
11 REM * editors and word processors.
    REM * It will translate symbols
    REM * embedded in text as shown
12 REM * on the title page, and print
    REM * out the file on a NEC 8023AC
    REM * printer using its special
13 REM * characters and controls.
    REM * For other printers, change
    REM * control codes in lines
14 REM * 3515-3570 and 4340. The
    REM * underline is set by ASCII
    REM * codes 27 and 88 found in
15 REM * lines 5030 and 5040. It is
    REM * cleared with ASCII codes 27
    REM * and 89 in line 5040. These
16 REM * may be substituted one for
    REM * one with other codes if
    REM * necessary. Change number of
17 REM * indent spaces by replacing
    REM * the two 8's in line 5060.
    REM * Change other defaults at 50.
18 REM
30 GOTO 6000
35 GRAPHICS 0
40 DIM TOP$(10),NF$(1),PAUSE$(1),EM$(1
0),H$(75),FONT$(5),S$(30),FILE$(15),R$
(1),TAB$(40),Z$(34)
44 MEM=16000
45 DIM T$(MEM),SPACES$(8),L$(150),A$(1
),RJ$(203),N$(150),WCT$(27):RJ$(1)=""':R
J$(203)=""':RJ$(2)=RJ$
50 REM DEFAULTS
51 NO=1:MAR=8:LL=64:PG=1:TOP$="TOP (#.
)"':TOP=1:NF$="Y":PAUSE$="N":NUM=55:EM$
=""':FONT$="PICA":H$=""':S$=""
52 R$="Y":TAB$="050"
70 FOR N=0 TO 234:READ R:POKE 1536+N,R
:NEXT N:REM TRANSLATE 5RT
75 FOR N=0 TO 202:READ R:POKE ADR(RJ$)
+N,R:NEXT N:REM RIGHT JUSTIFY 5RT
76 FOR N=1 TO 34:READ R:Z$(N,N)=CHR$(R
):NEXT N
77 FOR N=1 TO 27:READ R:WCT$(N,N)=CHR$
(R):NEXT N:REM WORD COUNTER 5RT
80 GRAPHICS 0

```



```

3570 N$="E("N$(LEN(N$)+1)=TAB$:N$(LEN
(N$)+1)="."? #2;N$;:REM SET TAB$
3580 ? #2;S$;:REM SPECIAL CODES
3590 POKE 1787,0:POKE 1789,LL+1
3600 PGS=PG:IF N$="N" THEN 4110
3610 LINES=0
4000 REM TRANSLATE SECTION
4020 IF PGS=1 THEN ? #2:GOTO 4080
4030 ? #2;H$;:REM HEADER
4040 IF TOP>2 THEN ? #2:GOTO 4080
4050 FOR N=1 TO LL-LEN(H$)-2:? #2;" ";
:NEXT N
4060 IF TOP=1 THEN ? #2;PGS;"."
4070 IF TOP=2 THEN ? #2;"Page ";PGS
4080 ? #2;? #2:REM TOP SPACE
4110 E=LEN(T$)
4120 L$="":L$(150)="":L$(2)=L$
4125 N$=" ":N$(150)=" ":N$(2)=N$
4130 USED=PEEK(1787):F=F+USED:LIMIT=E-
F:IF LIMIT>255 THEN LIMIT=255
4135 IF PEEK(1791)<LL+1 THEN POKE 1785
,1
4140 IF LIMIT<0 THEN 4600:REM END
4150 POKE 1791,LIMIT
4155 X=USR(ADR(Z$),ADR(T$)+F,ADR(L$))
4160 X=USR(1536)
4165 X=USR(ADR(NCT$))
4170 IF R$="Y" THEN X=USR(ADR(RJ$),ADR
(N$))
4200 REM PRINT SECTION
4230 IF PEEK(1790)>0 THEN FOR N=1 TO P
EEK(1790):? #2;" "":NEXT N
4240 IF PEEK(1787)<1 THEN POKE 1787,1
4250 IF R$<>"Y" THEN 4280
4260 IF PEEK(1782)=0 THEN ? #2:GOTO 43
10
4270 ? #2;L$(1,PEEK(1782)):GOTO 4310
4280 IF PEEK(1788)<1 THEN ? #2:GOTO 41
30
4285 IF L$=" " THEN ? #2:GOTO 4130
4300 ? #2;L$(1,PEEK(1788))
4310 IF NO=2 THEN ? #2:LINES=LINES+1:R
EM LINE SPACING
4320 LINES=LINES+1
4325 IF LINES<NUM THEN 4130
4330 IF TOP=3 THEN ? #2:FOR N=1 TO LL/
2-3:? #2;" "":NEXT N:? #2;"- ";PGS;" -
"
4340 PGS=PGS+1:LINES=0:? #2;"":REM TO
F
4350 IF PAUSE$="Y" THEN ? "K":? :? "PR
ESS RETURN WHEN PRINTER IS READY":? :?
:INPUT L$
4355 TRAP 40000:TRAP 4000
4360 GOTO 4000
4500 TRAP 40000:? "K":? "TURN PRINTER
ON!"
4510 FOR N=1 TO 200:NEXT N:GOTO 3000
4600 CLOSE #2:POKE 764,255
4605 ? "K":? :? "WORD COUNT = ";PEEK(1
779)+256*PEEK(1780):POKE 1779,0:POKE 1
780,0:? :?
4610 ? :? "ENTER 'P' TO PRINT A SECOND
COPY":? "OR RETURN FOR MENU":? :?
4620 TRAP 40000:TRAP 100
4630 INPUT L$:IF L$="P" THEN F=0:GOTO
3500
4640 GOTO 100
5000 DATA 104,174,253,6,216,172,251,6,
204,255,6,240,61,177,203,201,60,240,61
,201,62,240,72,201,93,240,83
5010 DATA 201,94,240,92,201,91,240,101
,201,92,240,111,201,3,240,114,201,9,24
0,119,201,155,240,20,172,252
5020 DATA 6,140,246,6,145,205,238,252,
6,238,251,6,202,208,193,76,192,6,238,2
45,6,238,251,6,76,229,6,169,27
5030 DATA 172,252,6,145,205,238,252,6,
169,88,232,208,212,169,27,172,252,6,14
5,205,238,252,6,169,89,232,208
5040 DATA 197,238,251,6,172,251,6,177,
203,24,105,128,144,184,238,251,6,172,2
51,6,177,203,24,105,64,144,171
5050 DATA 238,251,6,172,251,6,177,203,
56,233,64,76,51,6,169,27,232,232,76,51
,6,238,250,6,238,251,6,76,5,6
5060 DATA 173,254,6,24,105,8,141,254,6
,138,56,233,8,170,238,251,6,76,5,6,138
,74,141,254,6,96,206,252,6,172

```

```

5070 DATA 252,6,177,205,201,32,240,25,
201,27,208,9,238,251,6,206,246,6,206,2
46,6,201,128,144,3,206,251,6
5080 DATA 206,251,6,208,219,206,250,6,
240,208,96
5100 DATA 104,104,133,208,104,133,207,
173,246,6,208,1,96,206,245,6,208,9,238
,246,6,169,1,141,249,6,96,56
5110 DATA 237,252,6,133,209,169,0,205,
249,6,208,58,238,249,6,141,252,6,141,2
48,6,172,252,6,177,205,238,252
5120 DATA 6,172,248,6,145,207,238,248,
6,204,246,6,176,85,201,32,208,231,165,
209,240,227,198,209,169,32,172
5130 DATA 248,6,204,246,6,176,65,145,2
07,238,248,6,24,144,207,206,249,6,230,
209,173,246,6,141,248,6,238,248
5140 DATA 6,172,252,6,177,205,206,252,
6,172,248,6,145,207,206,248,6,48,25,20
1,32,208,234,165,209,240,230
5150 DATA 198,209,169,32,172,248,6,145
,207,206,248,6,48,3,24,144,213,160,0,1
77,207,145,205,200,204,246,6
5160 DATA 144,246,165,209,240,31,173,2
49,6,240,15,238,246,6,230,209,169,0,14
1,252,6,141,248,6,240,160,173
5170 DATA 246,6,141,248,6,141,252,6,20
8,166,96
5200 DATA 104,104,133,204,104,133,203,
104,133,206,104,133,205,169,0,141,250,
6,141,251
5210 DATA 6,141,252,6,141,254,6,141,24
6,6,141,245,6,96
5300 DATA 104,172,252,6,240,17,136,240
,6,177,205,201,32,208,247,238,243,6,20
8,3
5310 DATA 238,244,6,136,16,239,96
6000 REM TITLE PAGE
6005 GRAPHICS 0
6010 DL=PEEK(560)+256*PEEK(561)
6020 POKE DL+7,7:POKE DL+8,7:POKE DL+9
,6:POKE DL+10,7
6022 POKE 712,148:POKE 708,154
6030 POKE DL+27,65:POKE DL+28,PEEK(560
):POKE DL+28,PEEK(561)
6040 POKE 752,1:? :POKE 85,17:? "THE":
? :? :? :? :POKE 85,13:? "TRANSLATI
ON$"
6050 POKE 87,2:POSITION 14,4:? #6,"FER
GEE FILE"
6060 POSITION 16,6:? #6,"PRINTER"
6070 POKE 87,0:POKE 85,13:? "
"
6080 ? :POKE 85,7:? "CTRL C = CENTER L
INE"
6090 POKE 85,7:? "CTRL I = INDENT 8 SP
ACES"
6100 ? :POKE 85,9:? "< = SET UNDERL
INE"
6110 POKE 85,9:? "> = CLEAR UNDERLI
NE"
6120 POKE 85,9:? "]" = ATARI CHARACT
ER"
6130 POKE 85,9:? "[ = CTRL CHARACTE
R"
6140 POKE 85,9:? "^ = ATARI CTRL CH
ARACTER"
6150 POKE 85,9:? "\ = ESCAPE"
6200 GOTO 40
7000 REM VIEW FILE ROUTINE
7010 CLOSE #1:OPEN #1,12,0,"S:"
7020 B=1:F=0:G=0
7030 TRAP 40000:REM TRAP 7000
7040 ? "K";"PRESS: [UP, DOWN, BEGINNIN
G, END,"
7050 ? " CHANGE, PRINT, KEN
U"
7055 ? "
"
7060 POKE 764,255
7070 GOTO 8000
7080 IF PEEK(764)=58 AND LEN(T$)-B>500
THEN B=F:GOTO 7040
7090 IF PEEK(764)=11 THEN B=B-G:GOTO 7
040
7100 IF PEEK(764)=21 THEN 7020
7110 IF PEEK(764)=42 THEN B=INT(LEN(T$
)/500)*500:GOTO 7040

```

```

7120 IF PEEK(764)=18 THEN 7500
7130 IF PEEK(764)=10 THEN 3500
7140 IF PEEK(764)=37 THEN POKE 764,255
:GOTO 100
7150 GOTO 7080
7500 REM EDIT PRINT FILE ROUTINE
7510 ? "K";"MOVE CURSOR AND SET:  BEG
INNING,  END"
7520 ? "OR:  ABORT      (NOTE: EOL =  A
)"
7525 ? "-----"
" :? :? :X=3:Y=18:IF B<1 THEN B=
1
7530 TRAP 7540:FOR N=B TO B+531:IF ASC
(T$(N,N))=155 THEN ? "A";:NEXT N
7535 ? T$(N,N);:NEXT N
7540 POKE 764,255:POSITION X,Y:? "E";
7550 IF PEEK(764)=135 THEN X=X+1:GOTO
7620
7560 IF PEEK(764)=134 THEN X=X-1:GOTO
7620
7570 IF PEEK(764)=142 THEN Y=Y-1:GOTO
7620
7580 IF PEEK(764)=143 THEN Y=Y+1:GOTO
7620
7590 IF PEEK(764)=21 THEN 7700
7600 IF PEEK(764)=42 THEN 7800
7610 IF PEEK(764)=63 THEN 7000
7615 GOTO 7550
7620 IF X>38 THEN X=1
7630 IF X<1 THEN X=38
7640 IF Y>23 THEN Y=0
7650 IF Y<0 THEN Y=23
7660 GOTO 7540
7700 B=B+(Y-4)*38)+X-3:T$=T$(B,LEN(T$
)):GOTO 7000
7800 B=B+(Y-4)*38)+X-3:T$=T$(1,B):GOT
O 7000
8000 POKE 1787,0:POKE 1789,38
8010 IF B<2 THEN B=0:GOTO 8030
8020 IF T$(B,B)<" " THEN B=B-1:GOTO 8
020
8030 E=LEN(T$):F=B:G=0
8040 FOR M=1 TO 16
8050 L$="":L$(80)="":L$(2)=L$
8060 USED=PEEK(1787):F=F+USED:G=G+USED
:LIMIT=E-F:IF LIMIT>255 THEN LIMIT=255
8070 IF LIMIT<0 THEN 7080
8080 POKE 1791,LIMIT
8090 X=USR(ADR(Z$),ADR(T$)+F,ADR(L$))
8100 X=USR(1536)
8110 IF PEEK(1782)=0 THEN ?
8120 IF PEEK(1788)=0 THEN ? :GOTO 8140
8125 IF PEEK(1790)>0 THEN FOR NN=1 TO
PEEK(1790):? " ";:NEXT NN

```

```

8130 ? L$(1,PEEK(1788))
8140 NEXT M
8150 GOTO 7080

```

## CHECKSUM DATA

(see page 27)

```

1 DATA 226,269,230,340,748,997,600,772
,260,391,195,252,200,190,275,5945
30 DATA 647,171,233,651,971,284,13,342
,256,446,153,73,166,386,975,5767
106 DATA 395,909,514,633,731,191,691,4
97,960,340,278,971,973,242,943,9268
250 DATA 927,712,392,963,966,440,925,9
89,494,699,304,387,292,130,602,9222
355 DATA 882,709,120,862,708,75,403,29
1,144,102,57,428,921,186,96,5984
430 DATA 500,512,460,472,494,506,278,2
79,266,576,132,431,886,86,433,6311
505 DATA 307,296,267,102,789,925,486,8
15,646,729,581,370,836,576,864,8589
1040 DATA 203,117,225,280,812,991,167,
939,658,942,33,905,536,657,261,7726
2010 DATA 337,849,284,978,308,875,345,
364,614,773,829,536,826,276,689,8883
2180 DATA 202,788,779,712,448,945,804,
937,10,524,537,336,721,154,514,8411
3510 DATA 567,191,733,745,679,488,266,
698,403,63,239,10,902,737,770,7491
4020 DATA 992,69,8,339,872,437,600,690
,313,233,918,967,335,600,718,8091
4160 DATA 238,831,489,423,847,593,236,
891,158,908,79,881,869,552,566,8561
4330 DATA 525,971,962,300,726,462,611,
109,102,914,39,185,890,511,430,7737
5020 DATA 7,106,57,840,33,525,139,610,
39,69,965,515,572,788,104,5369
5200 DATA 888,731,349,712,866,62,924,4
31,607,468,448,771,314,818,195,8584
6090 DATA 549,987,781,868,23,822,581,6
36,622,786,211,452,705,203,886,9112
7060 DATA 21,736,783,868,536,35,561,53
4,486,750,391,824,431,894,409,8259
7535 DATA 133,821,132,136,141,139,565,
568,560,770,754,645,750,638,763,7515
7700 DATA 623,853,435,649,661,940,362,
939,146,397,608,717,240,489,461,8520
8125 DATA 553,613,517,752,2435

```

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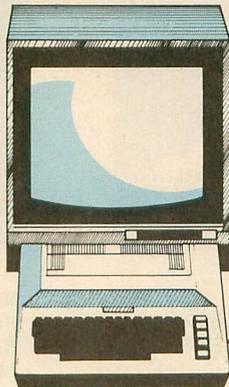
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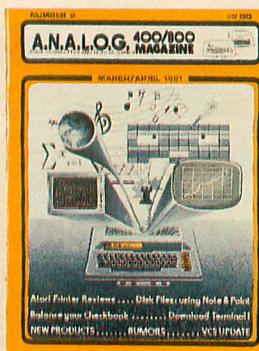


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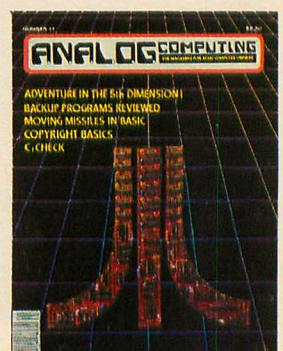
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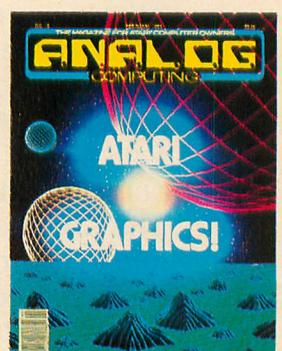
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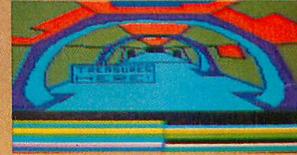
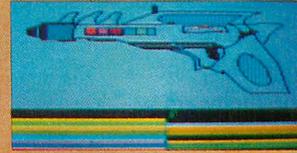
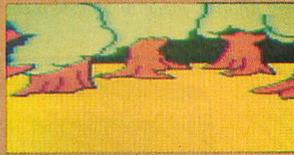
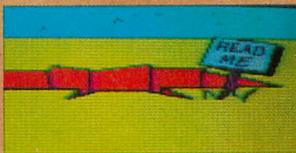
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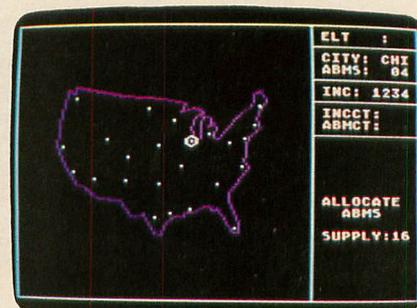
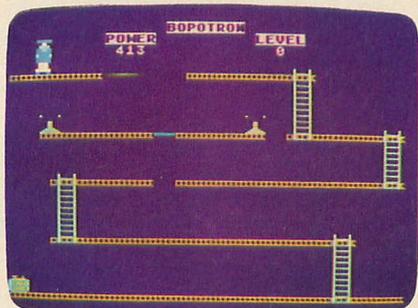
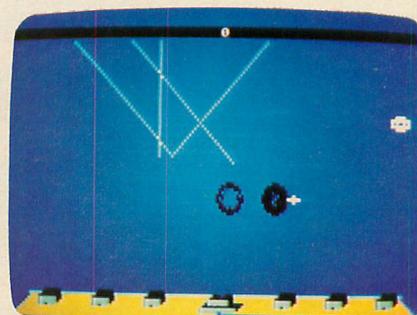
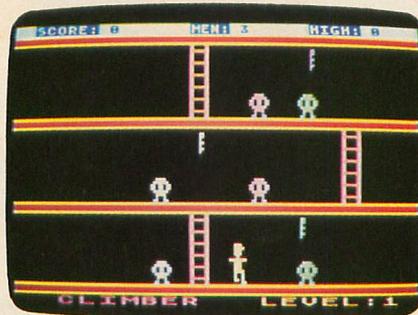
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# INDEX TO ADVERTISERS

READER SERVICE #	ADVERTISER	PAGE #	READER SERVICE #	ADVERTISER	PAGE #
149	Advanced Interface	100	110	Lateral Software	14
151	Adventure International	103	108	Lotsa Bytes	7
143	Allen Macroware	86	131	Lyco	65
124	ALOG Computing	47	127	Micca Enterprises	56
148	Alpha Systems	96	147	Micro Plus	96
153	ANALOG Publishing	IBC	119	Mighty Byte/Spartan	30
144	Astra Systems	88	120	Miles Computing	31, 32, 33
101	Atari Inc.	IFC	142	MSB Software	84
145	Atto-Soft	91	132	Non-Standard Magic	68
117	C.A.P. Software	24	111	Parker Brothers	16, 17
118	Computability	29	129	PC Gallery	58
130	Computer Creations	61	137	Programmers Workshop	74
116	Computer Games Plus	23	104	PS Technologies	6
133	Datasoft	69	113	RAM Computer Center	20
152	Dennison Computer Supplies	OBC	102	Rana Systems	2, 3
138	Digital Devices	76	128	Robert Jacobs	56
126	Eastern House	56	123	Royal Software	40
141	E.J.B.	81	150	Sar-An	101
134	Epyx, Inc.	70	114	Soft Sectre	23
146	Firstware	91	115	Southern Software	23
136	Future Tech	73	103	Star Micronics Inc.	4
122	Gardner Computing	37	105	Superware	6
107	Halcon Co.	7	140	Thompson Electronics	77
125	Happy Computing	53	139	Walling Co.	77
106	Horizon Software	7	135	Wedgewood Rental	73
112	Indus Systems	18	121	Xerox/Weekly Reader	36

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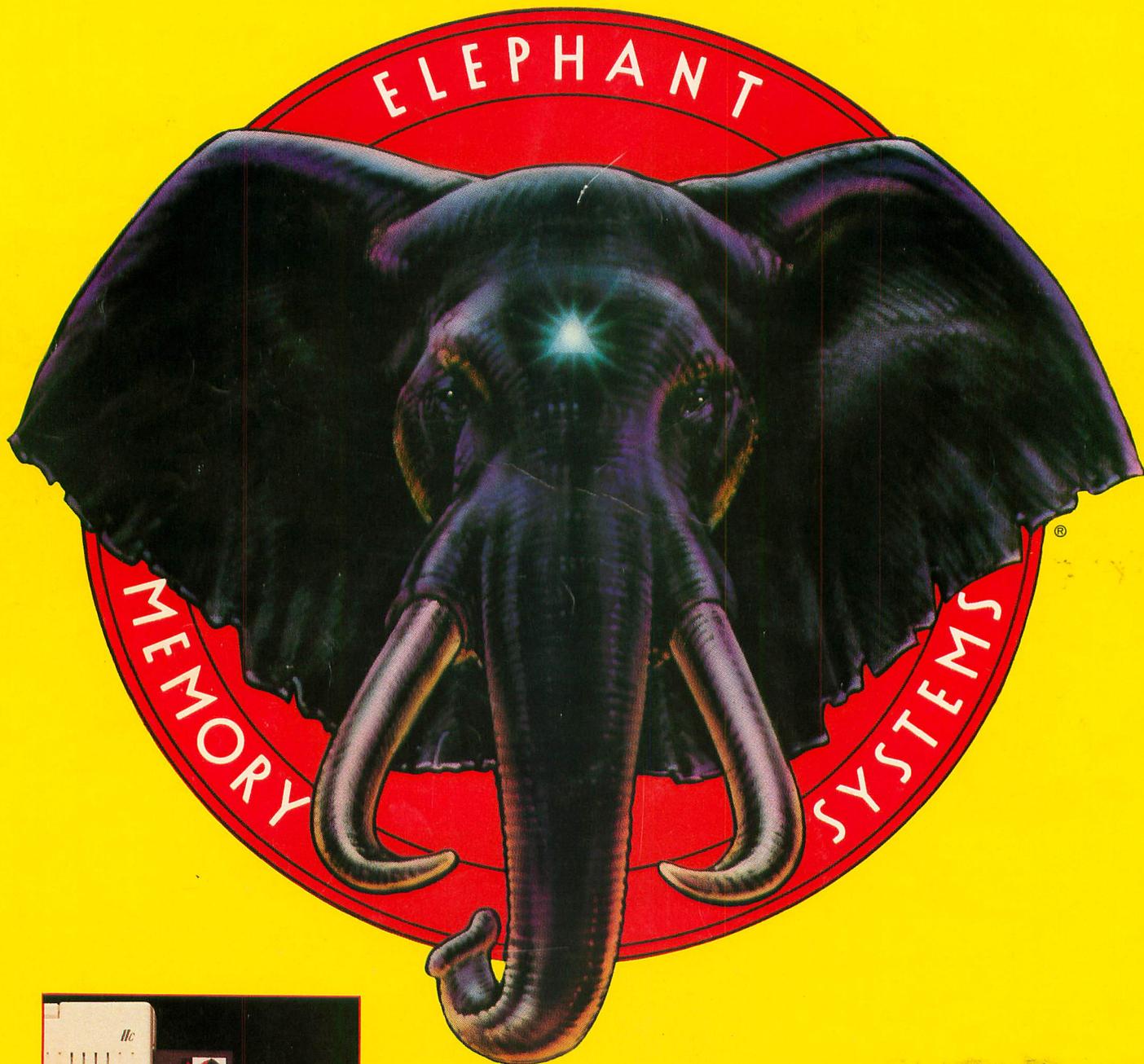


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