NUMBER 6

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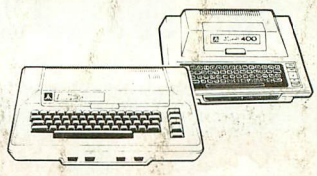

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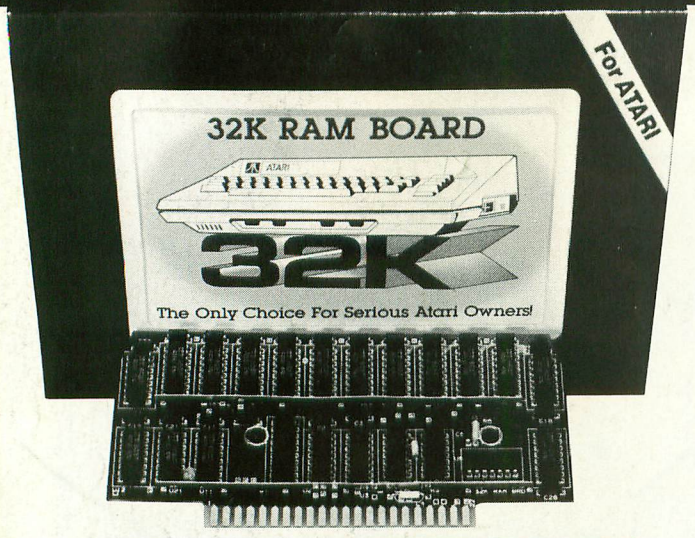

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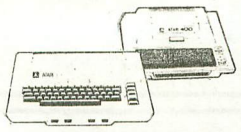

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EDITORIAL

by Mike Des Chenes

Whew! Issue number six. A years worth of A.N.A.L.O.G. in only 14 months. Most of you must be surprised at the short time span between this issue and the last. Yes, this issue is out on time. We are now finally getting caught up so that we will now be able to get A.N.A.L.O.G. out on a regular basis. Careful readers have noted, I'm sure, that there have been vast changes in our publication since our premiere issue. We started as a forty page, single color magazine, and have now grown to seventy-two pages with color throughout, including a full color cover. These changes are not made to bring us more profits; on the contrary, they bring our costs up a great deal. However, our readers deserve the best possible ATARI publication we can produce. We have been listening to the feedback from our readers and incorporated many of their ideas in A.N.A.L.O.G. whenever possible. An example would be our new policy to have a game listing in every issue. You may have noticed that issue number five was dedicated to graphics, so we opted to use tutorials rather than games. The majority of our readers felt as though number five was one of our best. However, we learned that our game listings were missed. You'll be happy to learn that we will include a quality game listing in all future issues. The Maniac program in this issue is an example of this. A.N.A.L.O.G. is still in its infancy and we're always learning. Let us know your likes, dislikes, and ideas. If there is a subject you would like to see covered in a future issue of A.N.A.L.O.G., please let us know. Or better yet, submit a program or article yourself on whatever you're interested in.

I would like to take this opportunity to thank our charter subscribers for their patience and support in 1981. I would also like to thank the many dealers who carry A.N.A.L.O.G. Please note that we now have a separate toll free telephone number and address for our subscriptions, dealer orders and customer service department. Now we can devote all of our time to the publishing of the magazine.

We finally have back issues available again. At last our newer subscribers who missed out can make their collection complete. (See our ad for back issues elsewhere in this issue.)

In our next issue, we will have an update on the West Coast Computer Faire. A.N.A.L.O.G. staffers Lee Pappas and Tom Hudson represented us at the fair and have a lot to report concerning new products for the ATARI. Lee brought back so much new software to our offices that we spent an entire day looking them over; a pretty tough job. Also, Lee and Tom were allowed to tour ATARI's manufacturing facilities and talked to many software development heads, including Chris Crawford. Details are forthcoming in our next issue, so don't *miss it!* □

CORRECTIONS

The gremlins of publishing were at work in the last issue, unfortunately. For those confused, here are the corrections to the last issue.

```
PAGE 15

220 Z=(SIN((X+Y-4)/4*30)+30
(Requires approx. 30 seconds)

220 Z=SQR(ABS(X-10.5)^2+ABS(Y-5.5)^2)^
1.7
(Requires approx. 2.25 minutes)

220 Z=(1/SQR(SQR(ABS(X-10.5)^2+ABS(Y-5
.5)^2)+4)^2)*800-50
(Requires approx. 2.75 minutes)


PAGE 34

20 I=PEEK(106)-16

PAGE 35

131 IF C=15 THEN 130

136 IF C=14 THEN FOR D=0 TO L:POKE PLA
YER0-1+Y+D,PEEK(PLAYER0+Y+D):NEXT D:Y=
Y-1


PAGE 45

130 POKE DISPLAY+6,2:POKE DISPLAY+7,2

PAGE 46

SCREEN
SCREEN+120
SCREEN+200
SCREEN+240


PAGE 55

110 FILE$="":? "K"

243 STATE$(LEN(STATE$)+1)=CHR$(XX):IF
LEN(STATE$)>2 THEN GOSUB 700:GOTO 234

3050 POSITION 4,21:? "S SAVE as shown"
:POSITION 4,20:? "E EXIT"
```

READER COMMENT...

Dear Editors:

After reading Rick William's article in A.N.A.L.O.G. #4 on Multi-Color Graphics 8, I started experimenting right away. I was really disappointed that I couldn't use the bottom half of the screen, so I omitted the **POKE** statement and tried it. Just as I thought, it turned out to be black and white. I then erased the program and started experimenting again. I came up with a program that looks like this:

```
5 T=1: Color 1: Gr. 8:
  Setcolor 2, 0, 0
10 For I=I to 319 Step 9:
   Setcolor 1, 0, 15
20 Plot I, T
30 Next I
40 T=T+1: If T=150 Then End:
   Goto 10
```

I ran this program and was amazed at the fact that instead of the color of the lines being white, they were red and blue! I then came up with a program that progressively added 2 to the step statement. The revised program looks like this:

```
10 Skip=9
20 Gr. 8
30 T=1
40 Color 1
50 K=1
60 Setcolor 2,0,0
70 For U=1 To 319 Step Skip:
   Setcolor 1, 0, 15
80 Plot U,T
90 Next U
100 K=K+1
110 If K>150 Then 130
120 T=T+1: Go to 70
130 Skip=Skip+1: Goto 30
```

I ran this program and it progressively changed the color of the lines coming down from the screen. It also displayed considerably more than four colors at the same time without use of display list interrupts or any complicated procedure. Another advantage was that it could use the full screen. I am 11 years old and am currently working on an educational program, making use of the ATARI graphics and sound, as a school project.

Sincerely,
Bill O'Connor
E. Setauket, N.Y.

Dear sirs,

I am enclosing here the program "Shooting Gallery" which is, apparently defective; no matter what I tried, it refuses to load.

When I paid today $21.95 for it, I did not expect this program to be on a really cheap cassette; to my dismay and disgust, you used a cheap, junk-type cassette. I have spent precious time trying to load the darn thing, but cheap cassettes were never intended to record digital material.

I subscribe to your magazine; maybe you should stick to publishing...

I am waiting for a replacement of this program in the return mail. Please, check first that the replacement is NOT defective.

Disappointedly yours,
Daniel Porecki, Ph.D.
Columbia, Maryland
P.S. Side B starts loading but screws up at 66 or around it.

We are sorry that you had a problem with your cassette, but when we received your copy, we loaded it and it worked fine. All of our cassettes are custom-made, and use high-quality, chromium dioxide tape. I understand that you found the replacement of Shooting Gallery to be very enjoyable — as did the woman in our next letter. ———— **JB**

Dear Sirs:

Three days ago I received SHOOTING GALLERY in the mail from you. Just one word to say how it is "FANTASTIC." The tape loaded flawlessly, and the game was captivating. I had played something very similar to this in arcades and never thought that I would be able to enjoy it in my own home. But thanks to you I can.

I also want to say that I find your magazine very interesting and helpful. Keep up the good work.

Sincerely,
Judy Silverman
Miller Place, New York

Dear Editor:

As a happy ATARI owner, I want to ask all you other happy owners to help spread the good word about ATARI computers.

In this hectic, competitive world only increasing sales can ensure the continued growth and development of a product. I would like to see ATARI become a dominant leader in the personal computer market, and I hope you do, too.

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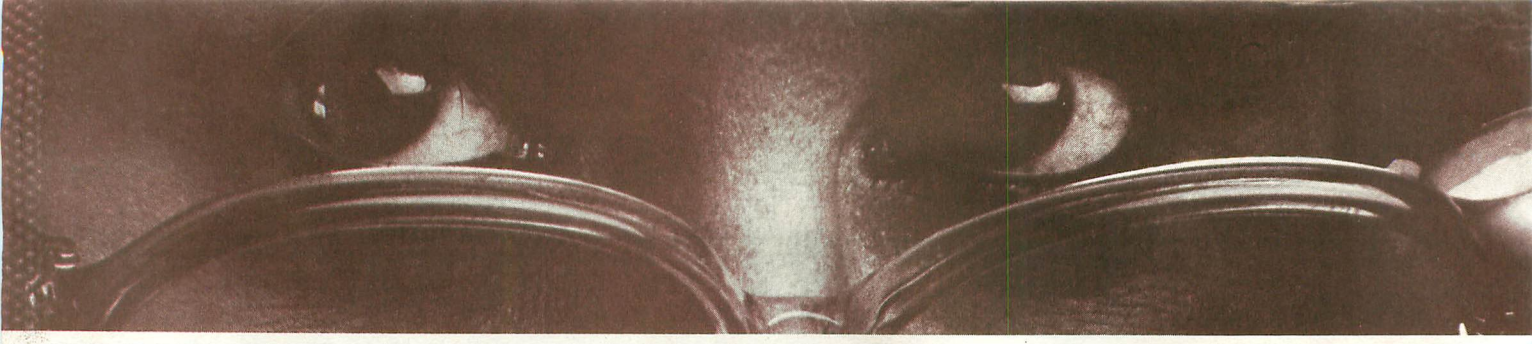
You made the right decision; help others to do the same. Boy, if everyone had an ATARI...

Also, if you have any legitimate gripes, inform ATARI. It will help to keep them on their toes.

A sincere ATARIan,
John Van Wagoner
Moab, Utah



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Fastgammon™ *(Quality Software) 8K* The best of the computer backgammon games. You can repeat games with the same dice rolls to try different strategies. You roll dice or let computer roll for you. This machine language program challenges experienced and beginners alike. Underutilizes ATARI® graphics but playing quality more than makes up. Cassette $19.95

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(New!) Rear Guard *(Adventure International) 16K-T, 24 K-D* This space battle puts you in charge of a speeding jet skimming on alien surface battling waves of enemy vessels. Advanced features include running high score, two player option, advanced difficulty levels. Full uses of ATARI graphics and sounds. Superb horizontal scrolling. Intro price $17.95 tape, $22.95 disc.

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Dear Sirs:

Would you please explain what a Mem. Save File is in your next issue? I'd like to know very much.

Thank you.
Jody Faulkner
Hurst, Texas

P.S. If you can't answer my request, then please write back giving a good explanation as to what a Mem. Save File is.

Your wish is our command, Jody. Check Charles Bachand's Non-Tutorial in this issue for an explanation of Mem. Save Files. **—JB**

Dear Editor:

Great magazine for a great computer! Below I include some comments/questions/and answers.

I recently purchased an 810 Disk drive and then I read your article p. 42, issue 4, about the recent upgrading (fast formatting, etc.) — I called ATARI to ask if there was some way to tell if one has the new upgraded version or not (they could not help me). Can you find out anything more about this?

Using the disk drive I came upon an annoying feature. That is, that when one looks at the Directory (and there are many programs on it) the titles just go flying by. Can't one fix it so that the first 24 titles would be on the screen and then (if one hits the space bar) any remaining titles would come onto the screen?

I have an older model ATARI 800 that came with two 8K RAM modules. There existed a problem though of interference bands coming and going the same as described by one of your readers p. 7, issue 5. Mine disappeared (hopefully forever) when I upgraded (by myself) my 8K boards to 16K boards using the method outlined in Creative Computing p. 72/March 1982/**New RAMS for OLD.** I still would be interested in finding out what caused them to appear.

How about an article on using the audio signal with the programming signal on the cassette recorder? (I'd like to synchronize speech with program.)

Stopwatch seems like an interesting program, issue 5, but I can't get it to work — after following the running the disk version steps, all I get out is READY (I've checked the listing and it seems all right) — I should say though that what I do is slightly different; I boot using the system master diskette/type DOS/then switch to the disk containing the program. (How can one boot the program disk directly?)
Bill Anschuetz
Union, New Jersey

Answer #1

There are three ways to check if you are in possession of a new ATARI 810 Disk Drive. The simplest way is to look at the box that the drive came in. If there are two stickers affixed to it ('C' for fast formatting ROM, and 'DS' for Data Separator) then you have a new drive. If, heaven forbid, you threw the box away, you can try using the second method. ATARI will probably not like the idea of opening up their Disk Drive to check for these same stickers on the controller board, but—— This practice (theoretically) voids the 90 day warranty. The final method entails formatting a disk with your Drive, putting a copy of DOS on it, and enabling the MEM.SAV feature. With this disk in your drive, and all cartridges removed, turn the computer off and then on, taking note of the amount of time it takes to display the DOS menu. If the time lapse is 38 seconds, your disk has been fast formatted. A time of 43 seconds signifies an older model.

Answer #2

Having the computer play "Dixie" while producing a Disk Directory would also be a nice feature, although highly unnecessary. There are currently two ways to stop a directory listing, hitting the BREAK key (that will do it every time!), or hitting CTRL/1 will start/stop a listing. Your request for an automatic stop after 24 lines would be a pain to implement, especially without the DOS source code to work from. Also, the code would have to be written to work only with the screen and not with the Printer.

Answer #3

The interference you mention is produced by the slightly marginal power supplies in the 400's and 800's (more so in the 400's). When you upgraded your 8K ram chips with 16K chips, they must have been low power devices! Another way of reducing power is to reduce the number of memory chips in the system. This is what Intec did with their 48K board for the ATARI 400. Only eight memory chips are used, whereas three 16K boards would have a total of 24 memory chips.

Answer #4

An article on using the 410 Recorder's sound track? Hmm. Maybe——

Answer #5

The Stopwatch program in Issue #5 really works! The BASIC program produces a machine language file that must be loaded from DOS. Once loaded, the time in hours, minutes, and seconds will appear in the top right corner of the screen in the form HH:MM:SS. Hit System Reset to return to BASIC.

—CB

WANT BACK ISSUES?

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ATARI (tm) GRAPHICS AND SOUND MADE EASY!

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★★★

Benioff At Large

On March 19-21, 1982, The 7th West Coast Computer Faire was held in San Francisco. During this show over 33 new ATARI Products were announced, many of them being released during the show. Some of the top names in Apple (Gebelli, Budge, Broderbund, On-Line, and Cavalier) also announced translations of their products to the ATARI.

Raster Blaster by Bill Budge has been completed, and is now being sold by Budge Co. Bill Budge, owner and sole programmer for Budge Co. has said, "It took me only one week, and the only difference is that the ATARI version is faster!" Bill Budge has also been quoted as saying, "Anything I do now will be translated for the ATARI." Known as the master of Apple Assembly Language, experts are now awaiting Budge's learning of Player-Missile graphics for what he says will be "A game better than Star Raiders." Raster Blaster was finished on March 3, 1982, and is selling with enthusiasm. Budge also said, "I will probably change the sound on the program at a later date to 4 channel synthesized music, but at this time the sounds are similar to the Apple Version." See a full review of Raster Blaster in the next issue of A.N.A.L.O.G.

DataSoft has released/announced 5 new products for the ATARI. Micro Painter, an incredible use of ATARI graphics in every extent, allows you to draw pictures on your computer. Micro Painter allows for fine details by zooming in on the picture in a graphics 5 mode. Bishop's Square allows the user to load in a picture from Micro Painter, and juggles it into a jigsaw puzzle for the user to unscramble. This program is very similar to Baa Baa Black Sheep by Thorn EMI. The difference here is that Bishop's Square allows you to make and load your own picture. Tumble Bugs is an outstanding variation on Pac-Man. In Tumble Bugs there is a huge maze with beetles scrambling around. The computer magnifies certain areas of the maze to show a large representation of the play area. When one of the bugs gets you, the computer speaks through the TV! It is incredible, it says, "WE GOT YA!" Graphics Master is another graphics maker program that allows you to withdraw certain parts of one picture, and put them on another, in memory! It uses two pages of graphics, and allows the saving of one or the other. Soon will also be released a Graphics generator program for making graphics characters. Datasoft makes a giant step in awesome programs for the ATARI at the West Coast Computer Faire.

Roklan Corporation, the creators of ATARI's soon-to-be-released Pac-Man, has announced 10 software/hardware products for the ATARI. Three are Software Games from popular arcades, as licensed through Midway; Gorf, Wizard of Wor, and Deluxe Invaders. All are excellent versions of the arcade games with super graphics and sound. These games are now being shipped to distributers. An Eprom Programmer and a Trac-Ball will be two hardware items released by Roklan this year. Programmer's tools for the VCS and HCS will also be released. Finpac is a financial software package for doing all financial calculations for the small businessman. It allows variables such as interest rates and payment schedules. A 6502 simulator will also be released. This program simulates the action of a 6502, and allows the teaching of 6502. A disk utilities package will also be released. This allows copy/verify, format/certify, and Absolute Disk Editor. Three Real Estate Packages will also be released. Mortgage Analysis, Property Investment Analysis, and Real Estate Property Appraising will be released by Roklan. A Telecommunications package will also be released. Tele Com allows everything you would need to communicate with Source, Compuserve, Micronet, Dow Jones, and IBM computers. It will sell for $69.95. Edugrammer is an interactive system for use with a VCR and an ATARI in a school for interactive study.

Arcade Plus, makers of Ghost Hunter, have announced three new games to be released. Night Rally, a driving game for the ATARI, Arcade Baseball, and Arcade Football will be released later this year. All of these will run on a 400 with 16K.

Broderbund Software, released an excellent new arcade game called Apple Panic. This game is similar to Donkey Kong. This game allows you to dig holes for apples to fall in, and then for you to kill the apples. Yea! Midnight Magic, a pinball game; Track Attack, an arcade game; and Star Blazer, a space game; will be available by June. These games are all very popular for the Apple Computer.

On-Line Systems, makers of Jaw Breaker, have released/announced 5 new programs for the ATARI: Threshold, Cross Fire, The Guns of Neburon, Frogger, (just completed by John Harris) and Time Zone. Time Zone is a 20 Disk Adventure to be released in about two months. This game is superb, and far exceeds Wizard And The Princess, and Mission Asteroid. The game has already been released for the Apple. There are 8 time periods, and 8 continents in each time period, including interplanetary, to explore. I truly look forward to seeing this on the ATARI!

Cavalier Computer announced that Bug Attack

will be ready for the ATARI presently. This is a Centipede-type game that is very popular for the Apple.

Strategic Simulations announced 3 new games for the ATARI, translated from the Apple. These are Battle of the Shiloh, Tigers in The Snow, and The Shattered Alliance.

Percom announced new drives for the ATARI. These drives will go for $799 for the first, and $400 for the second. They will allow double density storage, as well as single, and are fully compatible with the 810s.

Swifty Software showed Trivia Trek by Jerry White. They also announced a super new game called Space Shuttle soon to be released. Swifty also showed dust covers, and a new device allowing the user to write on write protected disks, called Disk Sentry.

Gebelli Software plans to release their first cartridge, a game called Embargo. Gebelli also plans on releasing Horizon 5 and Zenith, two three dimensional games for the Apple to the ATARI. Both of these games are superb. Pathfinder is also planned for release soon, as well as many other fine Assembly arcade games.

All of these are excellent new games and programs for the ATARI computers. I look forward to an awesome year for the ATARI in 1982. □

—Marc Russell Benioff
Hillsborough, CA

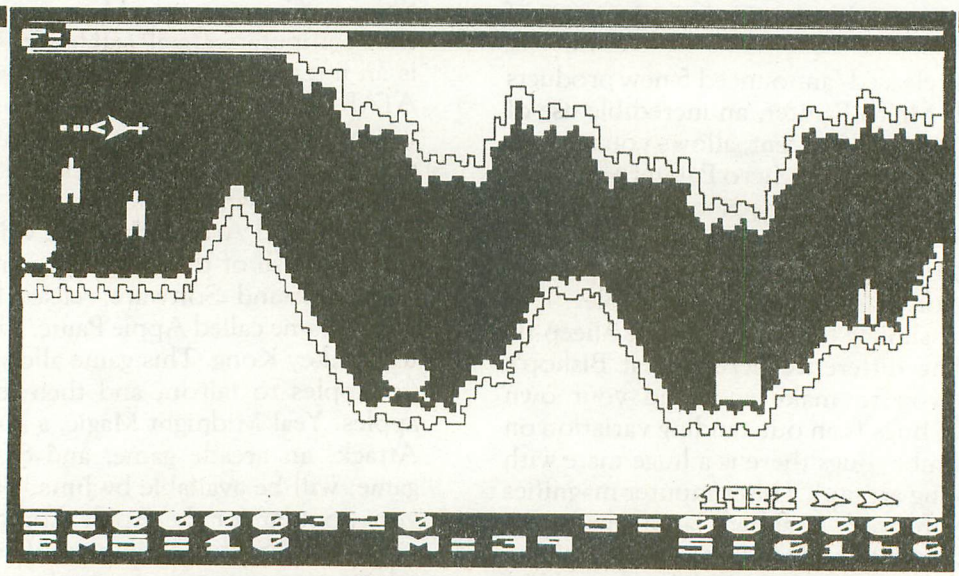
Roklan Software, 10600 West Higgins Road, Rosemont, Illinois, 60018, 312-297-4747.

Datasoft, 16606 Schoenborn Street, Sepulveda, CA 91343, (213) 894-9154.

On-Line Systems, 36575 Mudge Ranch Road, Coarsegold, CA, (209) 683-6858.

Broderbund Software, 1938 Fourth Street, San Rafael, CA, 94901, (415) 456-6424.

Swifty Software, 64 Broadhollow Road, Melville, NY, 11747, (516) 549-9141.



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NEW PRODUCTS...

DON'T ASK COMPUTER SOFTWARE

Don't Ask Computer Software announces the availability of ABUSE, a revolutionary new program that gives the home computer a wicked mind of its own. ABUSE transforms one of these mild-mannered machines into a rude, slightly demented smart-aleck whose whole purpose is to exchange insults with the operator. It forces the user to talk to it, responds creatively to whatever the user types in, and in the process comes up with potentially millions of unexpected new curses and obnoxious suggestions. ABUSE has special, ingenious ways to thwart the experienced operator, but can just as easily mistreat someone new to computing, even someone who has never seen a computer before. ABUSE is a real milestone in home software technology — the first program that fills people's widespread need to say what they really think.

The program has touched a nerve with computer owners. They love its off-beat humor, and keep finding new ways to use it. Unlike the shoot-em-up games, ABUSE can be used by many people at once for the amusement of all. This makes it a riot at parties or any time one wants to show off one's computer to a bunch of friends. Owners also find they can inflict ABUSE on their mother-in-law, boss, lecherous uncle, or the bill collector who knocks on their door — anyone who's got it coming. ABUSE will dish out the vicious remarks the owner wishes he could make himself, while he just stands innocently in the background. One owner says, "It's like having Don Rickles in your computer!" And owners find ABUSE relieves stress and promotes their mental health. After a frustrating day at work, nothing feels as good as sitting down at the computer and telling it, in no uncertain terms, just what it can do with itself.

In the optional game mode of ABUSE, players try to guess parts of the program's vocabulary in as few tries as possible, while all along the insult war continues. ABUSE keeps score and ranks players as anything from Inanimate Object (first through fifth class) to Master of Abuse. A really brilliant player may make the computer surrender and die.

ABUSE is loaded with surprises. Don't Ask is unwilling to divulge all of them, but does admit that besides the game and the huge variety of insults, users can usually expect to be subjected to a preposterous trivia quiz, and will occasionally be forced to watch while the computer takes over their side of the conversation and exchanges insults with itself. ABUSE will also produce some rather original curses.

The ATARI Home Computer version of ABUSE, which is now in the stores, has met with a very enthusiastic response. A version for the Apple II Computer will be available soon, Don't Ask reports, and in the works is a special version to be used with a speech snythesizer that will abuse owners aloud.

ABUSE is unpredictable because it actually creates its own insults from its large vocabulary each time the program is run. The hybrid BASIC/machine language program uses artificial intelligence techniques. Special random disk access methods developed for this program provide a virtual memory of some 80,000 bytes, nearly twice the memory usage normally available on such machines.

ABUSE for the ATARI 400 or 800 requires at least 40K RAM and the BASIC cartridge. It retails for $19.95. □

BRITAIN'S BEST ATARI SOFTWARE NOW AVAILABLE IN USA

CREATIVE COMPUTING AND THORN EMI SIGN PACT

SEVEN GREAT GRAPHICS GAMES FOR THE ATARI PERSONAL COMPUTER

Creative Computing Software and Thorn EMI Video Programmes Ltd. have entered into an agreement whereby Creative Computing will distribute under its label software for the ATARI Personal Computer developed by Thorn EMI. The first release consists of seven games available on both disk and cassette: Pool, Snooker, Billiards, Darts, Tilt, Dominoes and Cribbage. All seven games use spectacular high resolution graphics, color and sound.

Pool, Snooker, and Billiards, can be played by one or two players. In each, the angle and force of the stroke is controlled with simple joystick movements. Both direct and bank shots are possible and all balls ricochet off each other at the "correct" speed and direction. Pool has three variations: practice, 8-ball, and tournament pool. Pool is available alone on cassette for $14.95 and along with Snooker and Billiards on disk for $24.95.

Britain's most popular ATARI game, Darts, allows up to four players (or three players and the computer) to engage in a challenging game of Darts. Players may elect to throw their darts at any of nine different skill levels and ask the computer to play at a different level. The spectacular, high-resolution graphics show the player raising his arm to throw the

dart while in the bottom righthand portion of the screen a close-up of the dart board is displayed for careful aiming. All the standard rules such as doubling on and off are in effect and players may employ doubling and tripling strategies to attempt to win. Darts is available on cassette for $14.95 or, with Tilt on disk for $24.95.

Tilt is a one or two player game which involves rolling five balls through a labyrinth maze into five scoring holes. This challenging game has nine skill levels, nine speeds and continuous or discontinuous motion of the labyrinth. Available only on disk with Darts.

Dominoes and Cribbage are single-player games that provide an opponent that plays with aplomb and finesse. If a player can't make a move, it's back to the bone pile in Draw Dominoes. Both of these graphics games are available on cassette for $11.95 each or together on a disk for $19.95.

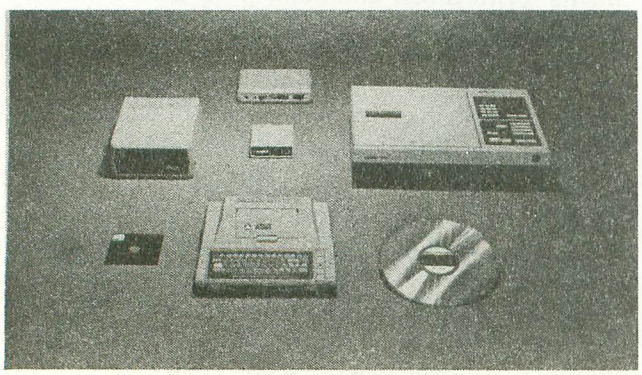
For more information, contact Creative Computing Software, 39 East Hanover Avenue, Morris Plains NJ 07950, (201) 540-0445. □

READY-TO-USE, REPROGRAMMABLE VIDEODISC SYSTEM

New Media Graphics Corporation, Cambridge, MA, announces the availability of DiscMaster 5000, a computer controlled, laser videodisc system complete with a **software library for videodisc** demonstrations and new application development.

The stand-alone DiscMaster 5000 incorporates an **ATARI 400 Computer**, Pioneer VP-1000 Laser Disc Player, and New Media Graphics interface with a built-in Z-80 microprocessor. Also included is 16K of memory, floppy disk drive, ATARI BASIC, all cabling, connectors, and user documentation for a package price of $3,000.

Martin Duhms, President of New Media Graphics states: "A lot has been said recently about the power of **interactive video** for applications in Training, Data Retrieval, Simulation, Exhibition, and Marketing, but most would-be users lack the staff of video engineers and software programmers to do anything with this concept. New Media Graphics has now done the necessary system integration to deliver a ready-to-use system at a price comparable to what videodisc players sell by themselves. Also, the DiscMaster 5000 allows complete reprogramming in BASIC of the videodisc playback, which the other players don't."



Every DiscMaster 5000 comes with a ready-to-show demonstration package that illustrates the obvious added flexibility of a disc player controlled by an external computer. To assist those planning to develop their own interactive videodiscs, a library of software utility programs and documentation is provided.

Customers may also use the components of the DiscMaster 5000 separately. The ATARI 400 can run video games or sophisticated software packages including ATARI Word Processor, Graph It, Stock Analysis, etc. Likewise, the Pioneer VP-1000 can show movies in its standalone model.

For further information contact:
Martin Duhms
New Media Graphics Corporation
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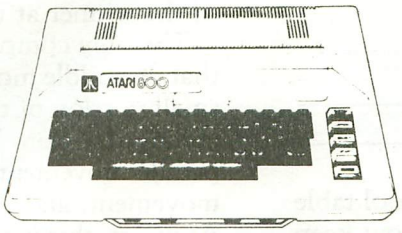


Air Traffic Controller

In this popular, fast-moving simulation you must successfully control the flight paths of 27 aircraft as they take off, land and fly over your airspace. You give orders to change altitude, turn, maintain a holding pattern, approach and land at two airports. With five different airport configurations and variable skill levels, you won't easily tire of this absorbing and instructive simulation. Cassette CS-7004 $14.95.

Original Adventure

Only the brave enter the Colossal Cave, and only the clever survive. The entire evil cast of this classic game, from deadly dragon to nasty dwarf, will try to stop your quest for treasures. Using English commands, you explore the cave, travel through more than 100 locations, gather treasures, and attempt to think your way out of dangerous situations. Every aspect of the game is faithfully reproduced from the Original Adventure born on large computer systems. For weary travelers, there is even a SAVE GAME feature. Add this classic to your software collection. Order CS-7504 for disk $24.95, CS-7009 for cassette $19.95.

*Dominoes

Take on your computer at a game of draw dominoes. With options for repeating or alternating draw, **Dominoes** gives the game player a tough opponent who's always ready. From Thorn/EMI. Order cassette CS-7007. $11.95.

*Cribbage

Can you be the first to peg twice around the board? Your computer will put up a tough fight in this head-to-head game of cribbage. A graphic display of board and cards highlight this game of skill. From Thorn/EMI. Order cassette CS-7008. $11.95.

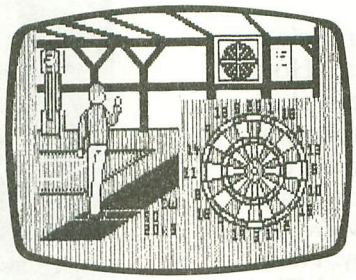
*Tilt

A favorite craze for years, the familiar wood labyrinth that tilts in all directions has entered the computer age. One or two players attempt to navigate balls through a maze and into scoring holes. With nine skill levels and nine speeds, **Tilt** will provide hours of fun. And, since each player can use a different skill level, **Tilt** is ideal for family play. From Thorn/EMI. Order cassette CS-7013 $11.95.

*Pool

Put a games room in your computer. Old pros and beginners alike will thrill to the challenge and realism of **Pool**. From the satisfying click of a tough combination shot to the acccuracy required for a three-cushion bank, **Pool** has it all. You control the angle and force of your stroke, then watch the object ball speed toward the pocket. It's so real you can almost feel the felt.

There is a practice mode for one player, and 8-Ball and Tournament Pool for two. Take a break with **Pool** today. From Thorn/EMI. Order cassette CS-7010 $14.95.



*Darts

Enter the pub, grab a pint of lager and a handful of darts, then try for a bull's eye in this amazing graphic game. One or two players can go at it, testing their aim at ten skill levels. Whether you want to throw a few, or just show your friends what the Atari computer can do, **Darts** is an ideal addition to your software library. This is Britain's most popular Atari game from Thorn/EMI. Order cassette CS-7011 $14.95.

*Billiards

This captivating British game is played with three balls on a standard pool table. Each player attempts to score by sinking a shot or hitting two balls with his cueball. From Thorn/EMI. Order cassette CS-7012 $14.95.

*Snooker

A tough British Game using 26 balls requiring the eye of sharpshooter and the strategy of a chess master. From Thorn/EMI. Not available on cassette.

Atari is a registered trademark of Atari, Inc.

Trucker

This program simulates coast-to-coast trips by an independent trucker hauling various cargos.

If all goes well, you can obey the speed limits, stop for eight hours of sleep each night and still meet the schedule. Bad weather, road construction or flat tires may put you behind schedule. You may try to increase your profit by skimping on sleep, driving fast or carrying an overweight load. Not available on cassette.

Streets of the City

During your tenure, you must construct streets and Interstate highways, repair existing streets, and improve traffic safety. For the Transit Authority you have to upgrade and replace a delapidated bus fleet, increase ridership, reduce maintenance downtime and improve on-schedule performance. Not available on cassette.

Outdoor Games

Fight a raging inferno in Forest Fire. User options allow for endless variety and skill levels. When the fire is out, relax with Fishing Trip, but watch out for sharks. The brave may wish to trek through the wilderness in Treasure Island I and II. Beware the sentinels—they're after you. Order cassette CS-7002 $11.95.

Haunted House

You are trapped in a mansion, alone except for the spirits that haunt the place eternally. Can you find the exit before midnight? This ever-changing game, complete with sound effects, is a perfect companion for dark evenings and rainy days. Order cassette CS-7003 $11.95.

Disk Packages

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SOFTWARE REVIEW: POOL 1.5

Innovative Design Software, Inc.
P.O. Box 1658
Las Cruces, NM 88004
(505)-522-7373
Diskette-$32.00

By Tom Hudson

If you're like me, you'd like to own a pool table but either don't have the space or somehow keep spending the money on computer equipment. POOL 1.5 is an outstanding machine -language pool simulation now available for any ATARI with 48K of RAM and a disk drive.

Even before POOL 1.5 is loaded one can tell it is a superior piece of software. Included with the diskette is a 12-page users' manual, quite a departure from the usual one-page photocopy. The manual contains information on every aspect of the program from game play to ball physics and even rules for the various types of pool that can be played on the computer. Seeing this type of documentation with a program is a rare experience.

As mentioned earlier, the program itself requires 48K of RAM. Once loaded, the program asks, "How MANY FOR POOL?". Up to four people can play. The program asks for the names of the players, which it displays both on the "score sheet" and at the beginning of each player's turn. The program automatically keeps score, and players can view the scores at any time by pressing the ESC key. Next, the program asks which game of pool is desired. The four types of pool available are eight ball, rotation, straight pool, and nine ball.

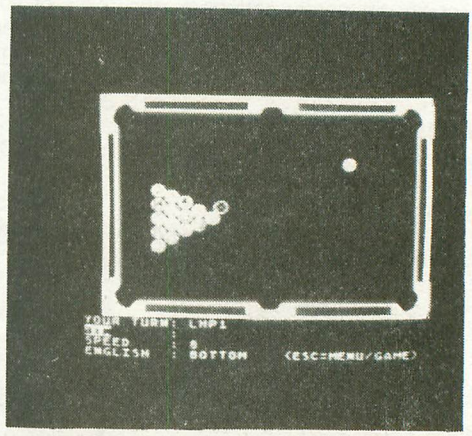
At this point, play begins. The game can be played using either the paddle controllers or the computer keyboard. These control the direction in which the cue ball will be shot, the speed at which it will travel, and even the english which is to be used (for example, in a particular situation a player may want to use speed 8, bottom left english when pocketing the 1 ball). These controls are extremely versatile, and bring an extraordinary amount of realism to the game. As if these controls were not enough, the program allows such options as changing table surface friction, changing ball movement speed, and even the chance to reposition the balls to where they were before the last shot!

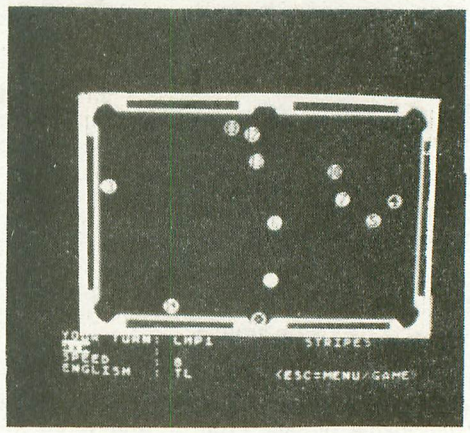
The game display is, of course, one of the most important aspects of a game of this type. POOL 1.5 uses high-resolution graphics to depict the pool table surface in three colors. The balls can either be viewed with their numbers super-imposed on them, or as solids and stripes. The ball physics are incredibly realistic, the movement is real-time and very smooth.

Unfortunately, a game such as pool does not present many opportunities for fancy sounds. POOL 1.5 has sound effects for the collision of the balls, the pocketing of the balls, and the declaration of the winner at the end of the game.

The only complaint I have regarding POOL 1.5 is that, in paddle mode, the programmer is only using a small portion of the paddle's range of travel for the aiming function. This results in a small amount of paddle movement causing a large amount of aiming movement, and can lead to some aiming difficulty. At worst, this is only a slight annoyance, and has no impact on the game's playability.

In conclusion, POOL 1.5 is a program which is well worth buying. It plays as well as the real thing, one doesn't need a pool table-sized room, and the money saved can be used for the purchase of a new disk drive!□





Pool 1.5 Rating Scale
(1 Unsatisfactory - 10 Ideal)

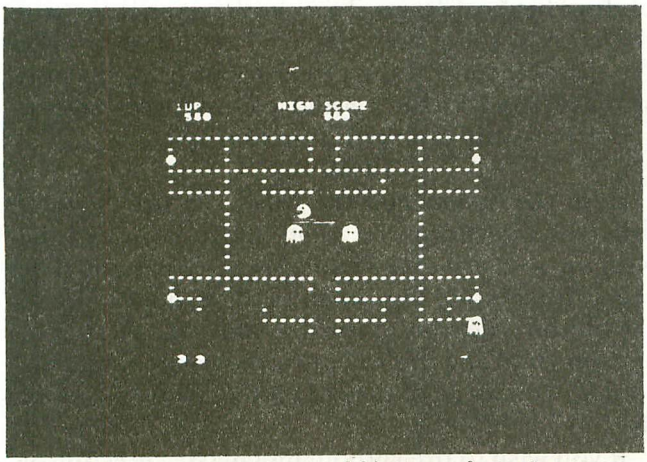
Concept	5
Originality	5
Challenge	9
Skill	9
Graphics/Sound	7
Overall Rating	7

Special Preview Review: ATARI's PacMan and Centipede

by Lee Pappas

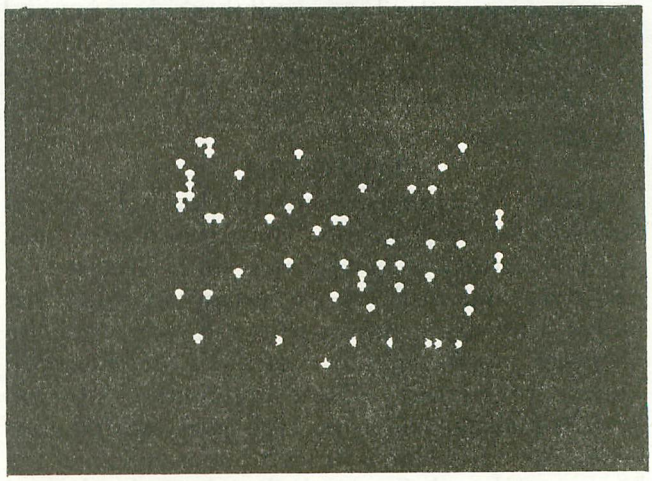
Two new games on cartridge for the 400 & 800 were announced last January at CES in Las Vegas. **PacMan*** to released in May, and **Centipede**(tm) due out in June will both run in 8K. Each can be played as either a one or two player game.

If you want to see a preview of PacMan just visit your local "family entertainment' center and play the coin-op version. The computer PacMan plays and sounds just like its multi-thousand dollar coin-op version. The graphics are identical, even down to the subtleties of the maze (i.e. the angled corners). The two player version of the game alternates one after the other as does the arcade PacMan (you can't have two players on the screen simultaneously). Early versions of the 400/800 PacMan included an intro as does the arcade version, however, to get the game into 8K this had to be deleted.



*PacMan is a trademark of Namco-America, Inc.

The Centipede computer cartridge game also resembles the still popular arcade version. The one disappointing feature is the lack of two color mushrooms, as appear in the coin-op Centipede. However, sound effects are identical and playability is similar. Those who have played the coin-op Centipede will have to go through the same change over as when Missile Command was released — that of going from the trackball to the joystick. For the most part the ATARI joystick is a good piece of hardware; the one drawback is that it's too X-Y coordinated. Moving an object up & down or at an approximately 45 degree angle is simple, however a more fluid movement is more difficult to achieve. As mentioned above, changing your playing strategy somewhat is required. More complete reviews of both these games will follow when they are available.□



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Maniac!

Requires 48K

by Rick Messner

Over the past several years many programs have been developed for the ATARI computers. Unfortunately, most of the game programs cost from $30 to $40 apiece. Taking pity on those who, like myself, cannot afford to buy all those great games, I programmed an arcade-style game called Maniac! This fast-action assembly language game is yours for the price of an hour or two of typing. You're going to like this game!!

THE GAME

Maniac! is set in a maze with eight levels. Each level is filled with crazed robots. These robots were once peaceful gardeners but became short-circuited by pesticides and now try to destroy anything that moves with their missile-firing shovels. You are dropped into the first level of this maze, equipped only with your trusty .45 and ammunition. Your job is to stop all the robots on each level. At first your task is not particularly difficult but as you enter the higher-numbered maze levels the job gets harder and harder. That's because the robots on the higher-numbered maze levels have been around longer and are covered with a protective layer of earth and bullrushes.

TO START

At the beginning of this game there is a short introduction (just to help you learn my name) and then the machine asks you if you are going to have a one or two player game. Enter your choice. A light grey maze appears on your monitor screen along with a green figure representing you and three red figures representing the robots. At the end of the maze opposite from where you start is a door. Your objective is to destroy all three robots and to run out the exit door. If you do this the computer automatically advances you to the next level of the maze. If, however, you exit without destroying all the robots you remain at your current level and must try again.

MOVEMENT

The computer moves the robots in a one-person game. In a two-person game one player controls the hunter and the other player controls the robots. Moving either the hunter or the robots is very simple. Hold the joystick in the normal position and push it in the direction you wish to move.

If a robot and the hunter collide either one or both are blown up. If either a robot or a hunter walks into a wall it will explode.

EARTH and BULRUSHES

Robots on the higher-numbered maze levels become increasingly covered with a layer of earth and bulrushes. This makes it rather hard for the hunter's .45 to hit one. To kill a robot the hunter must shoot it once for each level of the maze. Thus, on level six the hunter must shoot each robot six times before it is destroyed.

TWO-PLAYER VERSION

In the two-player game one person controls the hunter and the other person controls the robots. The hunter is controlled by the joystick in port zero and the robots are moved by the joystick in port one.

To start, the person with the robots moves only the leftmost robot. If it is killed control switches to the center robot. When that one is killed control moves to the rightmost robot.

As the player controlling the robots becomes more skilled he may want to switch control from robot to robot at will. This can be done by using one of three keyboard keys. To make the joystick control the leftmost robot press the semi-colon key; to make the joystick control the center robot press the plus sign key; to make the joystick control the rightmost robot press the multiplication sign key.

FIRING

Both the hunter and the robot can fire in many different directions. To rotate the arm — and the weapon — of either the hunter or the robot, do this: press the joystick button and hold it down. While the button is depressed you may move the joystick in any direction and this will cause the arm to rotate. As soon as you let go of the red button the weapon will fire.

If you wish to fire without moving the direction of the weapon simply press and release the red button on your joystick.

SCORING

Points are awarded to the hunter but not to the robots. The robots get their pleasure solely from frustrating the hunter. Scoring is as follows: the hunter gets ten points per level for each robot destroyed with a 1,000 point bonus for making it through all eight levels.

TYPING IN THE PROGRAM

The program listing follows these remarks. To use it, type the program in from BASIC and run it. Each line of numbers is followed by an additional number which checks on your typing. If you make a mistake on any line the computer will tell you so. To correct the mistake, retype the line that had an error.

A nice feature of this game is that I have built in a procedure to create a "boot" tape so you won't have to type all those numbers more than once. After typing in the numbers put a blank tape in your cassette recorder. Type RUN. You will hear a loud buzz. Press any key. The computer now creates a "boot" tape which contains your copy of Maniac!

To use this "boot" tape remove all cartridges from your machine. Hold down the start key and close the lid simultaneously. When the computer beeps press any key and the program will load and execute itself.

It is my sincere hope that, besides being an enjoyable game, Maniac! will prompt other programmers to submit assembly language games to this magazine. □

```
5 CLR
10 Q=0
20 LINE=4990
100 DIM X$(5100)
110 P=0
112 LINE=LINE+10
120 FOR I=1 TO 16
130 Q=Q+1
140 READ J
143 IF J=999 THEN 1000
145 X$(Q)=CHR$(J)
160 P=P+J
180 NEXT I
200 READ J:IF P=J THEN 110
220 ? "ERROR IN LINE";LINE
240 STOP
1000 OPEN #1,8,128,"C:"
1020 ? #1;X$
1040 CLOSE #1
5000 DATA 0,31,0,64,35,64,169,60,141,2
,211,169,119,141,231,2,1439
5010 DATA 133,14,169,79,141,232,2,133,
15,169,38,133,10,169,64,133,1634
5020 DATA 11,24,96,96,83,58,32,28,76,3
2,55,72,162,255,141,30,1251
5030 DATA 208,232,224,4,240,246,142,18
4,79,169,2,141,187,79,32,148,2317
5040 DATA 75,172,185,79,185,232,76,133
,176,133,180,185,233,76,133,177,2430
5050 DATA 133,181,189,127,79,24,201,3,
176,18,32,210,64,32,184,65,1718
5060 DATA 32,38,68,32,173,70,32,223,68
,32,17,71,189,159,79,201,1484
5070 DATA 0,240,6,32,108,70,32,179,69,
32,108,65,169,11,24,237,1382
5080 DATA 191,79,141,188,79,169,2,141,
190,79,32,189,75,173,188,79,1995
5090 DATA 141,181,79,32,61,65,32,253,7
3,32,178,64,32,180,71,32,1506
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5110 DATA 44,64,173,252,2,141,0,136,17
3,200,79,201,1,208,1,96,1771
5120 DATA 173,252,2,201,7,240,46,201,6
,240,34,201,2,240,22,76,1943
5130 DATA 250,64,189,135,79,24,233,47,
157,173,79,189,139,79,24,233,2094
5140 DATA 16,157,177,79,96,169,1,141,1
95,79,76,250,64,169,2,141,1812
5150 DATA 195,79,76,250,64,169,3,141,1
95,79,172,195,79,185,127,79,2088
5160 DATA 24,201,2,176,1,96,173,207,79
,24,201,0,176,5,169,2,1536
5170 DATA 141,207,79,206,207,79,173,20
7,79,201,1,240,1,96,169,0,2086
5180 DATA 141,207,79,160,1,185,127,79,
24,201,2,144,7,200,152,201,1910
5190 DATA 4,208,242,96,140,195,79,169,
255,141,252,2,96,142,182,79,2282
5200 DATA 140,183,79,162,255,232,236,1
81,79,240,11,160,255,200,152,201,2766
5210 DATA 255,208,250,76,69,65,174,182
,79,172,183,79,96,142,182,79,2291
5220 DATA 162,255,232,236,181,79,208,2
50,174,182,79,96,189,127,79,24,2553
5230 DATA 201,2,176,1,96,24,201,7,144,
1,96,24,105,10,141,187,1416
5240 DATA 79,169,15,141,184,79,32,148,
75,173,185,79,24,109,230,76,1798
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5310 DATA 185,79,144,1,96,189,139,79,2
4,205,139,79,144,50,24,233,1810
5320 DATA 1,24,205,139,79,176,35,169,1
5,141,114,3,189,135,79,24,1528
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,79,176,3,76,38,67,32,163,1576
5340 DATA 66,76,38,67,32,224,66,76,38,
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,133,85,189,177,79,24,233,1720
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,133,178,165,179,105,0,133,179,2122
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5910 DATA 128,137,96,222,159,79,188,14
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,153,128,137,189,143,79,157,4,1883
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,183,79,96,169,0,141,197,79,2158
6310 DATA 141,3,210,172,183,79,96,169,
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6320 DATA 46,141,47,2,169,3,141,29,208
,169,200,141,192,2,169,56,1715
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6350 DATA 169,16,162,0,157,167,79,232,
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6520 DATA 253,77,133,84,169,85,32,221,
75,200,185,253,77,133,85,200,2262
6530 DATA 185,253,77,133,84,169,85,32,
2,76,200,76,116,73,96,142,1799
6540 DATA 182,79,162,0,160,0,185,167,7
9,24,105,1,9,16,153,167,1489
6550 DATA 79,201,26,208,11,169,16,153,
167,79,200,152,201,6,208,230,2106
6560 DATA 232,24,236,181,79,208,221,17
4,182,79,32,206,73,96,160,86,2269
6570 DATA 173,48,2,133,180,173,49,2,13
3,181,177,180,24,105,7,133,1700
6580 DATA 178,200,177,180,133,179,142,
182,79,162,5,160,0,189,167,79,2212
6590 DATA 145,178,200,202,152,201,6,20
8,244,174,182,79,96,160,86,173,2486
6600 DATA 48,2,133,180,173,49,2,133,18
1,177,180,24,105,45,133,178,1743
6610 DATA 200,177,180,133,179,160,0,16
9,65,145,178,200,152,201,10,240,2389
6620 DATA 5,205,192,79,208,241,169,0,1
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6630 DATA 133,180,173,49,2,133,181,177
,180,133,178,200,177,180,133,179,2388
6640 DATA 160,0,185,118,78,201,255,240
,9,24,233,31,145,178,200,76,2133
6650 DATA 66,74,96,32,194,76,169,0,141
,181,79,32,82,73,169,0,1464
6660 DATA 141,198,2,170,157,0,208,157,
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6670 DATA 232,224,4,208,239,160,0,185,
37,79,24,201,255,240,9,24,2121
6680 DATA 233,31,145,88,200,76,119,74,
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6690 DATA 88,136,232,224,6,208,245,32,
184,74,160,30,162,0,189,201,2171
6700 DATA 79,145,88,136,232,224,6,208,
245,169,255,141,252,2,173,252,2607
6710 DATA 2,201,255,240,249,76,38,64,1
60,5,185,167,79,24,233,0,1978
6720 DATA 24,217,201,79,176,15,24,105,
1,217,201,79,144,6,136,152,1777
6730 DATA 201,255,208,230,96,160,0,185
,167,79,153,201,79,200,152,201,2567
6740 DATA 6,208,244,96,162,0,169,0,157
,4,208,157,0,208,157,0,1776
6750 DATA 210,157,1,210,232,224,4,208,
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6760 DATA 201,0,208,3,238,191,79,173,1
91,79,24,201,8,144,33,169,1942
6770 DATA 1,141,191,79,160,0,169,200,1
41,181,79,140,183,79,32,159,1935
6780 DATA 73,172,183,79,200,140,183,79
,152,201,5,208,241,238,192,79,2425
6790 DATA 32,127,72,76,44,64,169,175,1
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6800 DATA 178,165,89,133,179,32,86,75,
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6820 DATA 24,109,193,79,133,178,165,17
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6860 DATA 8,10,46,186,79,14,187,79,144
,9,24,109,184,79,144,3,1305
6870 DATA 238,186,79,202,208,235,141,1
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6880 DATA 169,0,162,8,14,188,79,42,205
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6900 DATA 142,182,79,140,183,79,169,11
,141,114,3,169,0,141,120,3,1676
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6930 DATA 162,48,32,86,228,174,182,79,
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6950 DATA 61,133,178,165,89,105,0,133,
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6960 DATA 240,9,24,233,31,145,178,200,
76,59,76,32,205,76,32,205,1821
6970 DATA 76,32,205,76,32,205,76,32,20
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6980 DATA 61,65,32,61,65,32,61,65,32,6
1,65,32,61,65,32,61,851
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7010 DATA 78,201,255,240,9,24,233,31,1
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7020 DATA 76,169,255,141,252,2,173,252
,2,24,201,30,240,14,24,201,2056
7030 DATA 31,240,3,76,166,76,169,1,141
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7040 DATA 79,96,169,12,141,114,3,162,4
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7050 DATA 196,79,32,180,71,169,2,141,1
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7060 DATA 201,0,208,238,96,51,242,76,0
,138,128,138,0,139,128,139,1922
7070 DATA 128,137,140,92,76,44,28,12,1
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7080 DATA 12,12,28,12,204,124,12,12,12
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7090 DATA 12,28,12,12,28,108,204,12,12
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7100 DATA 58,50,52,56,48,48,48,48,48,3
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7110 DATA 48,51,62,48,48,48,48,48,32,3
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7120 DATA 48,56,54,51,48,48,48,32,32,3
2,32,48,140,92,76,44,881
7130 DATA 28,12,12,12,12,12,10,10,9,9,
27,12,28,12,204,124,533
7140 DATA 12,12,12,12,12,10,10,9,9,27,
12,28,12,12,28,108,325
7150 DATA 204,12,12,12,10,10,9,9,27,49
,58,50,52,56,48,48,666
7160 DATA 48,48,48,80,80,144,144,216,4
8,56,48,51,62,48,48,48,1217
7170 DATA 48,48,80,80,144,144,216,48,5
6,48,48,56,54,51,48,48,1217
7180 DATA 48,80,80,144,144,216,128,4,2
,8,64,0,10,128,4,32,1092
7190 DATA 2,4,8,4,0,2,1,4,0,128,0,5,0,
2,0,64,224
7200 DATA 1,2,4,2,0,2,0,0,0,0,2,0,1,0,
128,0,142
7210 DATA 0,1,2,1,0,0,0,0,0,1,0,0,0,0,
0,0,5
7220 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0
7230 DATA 0,0,0,0,3,0,6,7,0,7,3,7,6,0,
0,159,198
7240 DATA 0,159,0,159,28,159,52,159,78
,159,78,0,78,0,78,0,1187
7250 DATA 50,0,30,0,0,40,0,40,40,40,40
,80,40,110,78,110,698
7260 DATA 64,100,0,100,40,100,40,130,4
0,255,192,48,12,3,51,75,1250
7270 DATA 112,176,51,96,160,192,51,58,
128,192,51,72,120,128,51,51,1689
7280 DATA 91,154,51,112,160,192,51,51,
136,192,51,24,50,72,50,32,1469
7290 DATA 38,38,50,64,64,72,50,32,64,5
6,50,18,69,64,50,18,797
7300 DATA 18,18,50,58,72,48,50,24,72,5
0,50,24,24,69,3,12,642
7310 DATA 48,192,1,2,4,8,83,67,79,82,6
9,58,32,48,48,48,869
7320 DATA 48,48,48,32,32,32,32,32,32,3
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7330 DATA 32,32,32,32,32,32,32,32,32,3
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7340 DATA 78,58,255,32,32,32,32,32,77,
65,78,73,65,67,33,32,1041
7350 DATA 32,32,32,32,32,32,32,32,32,3
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7360 DATA 32,32,32,32,32,32,32,32,32,3
2,32,32,32,82,73,67,638
7370 DATA 75,32,77,69,83,83,78,69,82,2
55,80,82,69,83,83,32,1332
7380 DATA 49,32,79,82,32,50,32,32,32,3
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7390 DATA 32,32,32,32,32,32,32,32,32,3
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7400 DATA 32,32,49,32,45,32,79,78,69,3
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7410 DATA 32,32,32,32,32,32,50,32,45,3
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7420 DATA 65,89,69,82,255,83,67,79,82,
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7430 DATA 32,32,32,32,72,73,45,83,67,7
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7440 DATA 32,32,32,32,32,32,32,32,32,3
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7450 DATA 32,32,32,32,80,82,69,83,83,3
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7460 DATA 89,32,84,79,32,67,79,78,84,7
3,78,85,69,255,0,6,1190
7470 DATA 52,101,199,167,54,162,176,52
,49,155,138,27,59,59,1,49,1500
7480 DATA 57,54,44,55,57,44,51,50,44,4
9,56,48,44,55,49,44,801
7490 DATA 49,54,57,44,50,44,49,52,49,4
4,49,56,49,44,55,57,802
7500 DATA 44,51,50,44,54,49,44,54,53,4
4,49,55,51,44,49,57,792
7510 DATA 54,44,55,57,155,148,27,59,59
,1,50,48,49,44,48,44,942
7520 DATA 50,48,56,44,50,51,56,44,57,5
4,44,48,44,50,52,50,798
7530 DATA 44,55,54,44,48,44,49,51,56,4
4,49,50,56,44,49,51,788
7540 DATA 56,44,48,44,49,51,57,44,49,5
0,56,44,49,51,57,155,904
7550 DATA 158,27,52,52,1,49,50,56,44,4
9,51,55,44,49,52,48,837
7560 DATA 44,57,50,44,55,54,44,52,52,4
4,50,56,44,49,50,44,789
7570 DATA 49,50,44,49,50,44,49,50,44,4
9,50,44,52,44,52,44,764
7580 DATA 52,44,52,155,168,27,51,51,1,
49,50,44,49,50,44,50,937
7590 DATA 56,44,49,50,44,50,48,52,44,4
9,50,52,44,49,50,44,775
7600 DATA 49,50,44,49,50,44,49,50,44,4
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7610 DATA 52,44,52,44,49,50,155,178,27
,51,51,1,49,50,44,50,947
7620 DATA 56,44,49,50,44,49,50,44,50,5
6,44,49,48,56,44,50,783
7630 DATA 48,52,44,49,50,44,49,50,44,4
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7640 DATA 52,44,52,44,49,50,44,52,57,1
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7650 DATA 56,44,53,48,44,53,50,44,53,5
4,44,52,56,44,52,56,803
7660 DATA 44,52,56,44,52,56,44,52,56,4
4,51,50,44,51,50,44,790
7670 DATA 51,50,44,51,50,44,52,56,44,5
2,56,44,53,54,155,198,1054
7680 DATA 27,53,53,1,52,56,44,53,49,44
,54,50,44,52,56,44,732
7690 DATA 52,56,44,52,56,44,52,56,44,5
2,56,44,51,50,44,51,804
7700 DATA 50,44,51,50,44,51,50,44,52,5
6,44,52,56,44,53,54,795
7710 DATA 44,52,56,155,208,27,54,54,1,
52,56,44,53,54,44,53,1007
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7730 DATA 44,51,50,44,51,50,44,51,50,4
4,52,56,44,49,52,48,780
7740 DATA 44,57,50,44,55,54,44,52,52,1
55,218,27,53,53,1,50,1009
7750 DATA 56,44,49,50,44,49,50,44,49,5
0,44,49,50,44,49,50,771
7760 DATA 44,49,48,44,49,48,44,57,44,5
7,44,50,55,44,49,50,776
7770 DATA 44,50,56,44,49,50,44,50,48,5
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7780 DATA 27,52,52,1,49,50,44,49,50,44
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7790 DATA 49,50,44,49,48,44,49,48,44,5
7,44,57,44,50,55,44,776
7800 DATA 49,50,44,50,56,44,49,50,44,4
9,50,44,50,56,44,49,778
7810 DATA 48,56,155,238,27,52,52,1,50,
48,52,44,49,50,44,49,1015
7820 DATA 50,44,49,50,44,49,48,44,49,4
8,44,57,44,57,44,50,771
7830 DATA 55,44,52,57,44,53,56,44,53,4
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7840 DATA 44,52,56,44,52,56,155,248,27
,56,56,1,52,56,44,52,1051
7850 DATA 56,44,52,56,44,56,48,44,56,4
8,44,49,52,52,44,49,794
7860 DATA 52,52,44,50,49,54,44,52,56,4
4,53,54,44,52,56,44,800
7870 DATA 53,49,44,54,50,44,52,56,44,5
2,56,44,52,56,155,2,863
7880 DATA 28,56,56,1,52,56,44,52,56,44
,56,48,44,56,48,44,741
7890 DATA 49,52,52,44,49,52,52,44,50,4
9,54,44,52,56,44,53,796
7900 DATA 54,44,52,56,44,52,56,44,53,5
4,44,53,52,44,53,49,804
7910 DATA 44,52,56,44,52,56,155,12,28,
53,53,1,52,56,44,56,814
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7920 DATA 48,44,56,48,44,49,52,52,44,4
9,52,52,44,50,49,54,787
7930 DATA 44,49,50,56,44,52,44,50,44,5
6,44,54,52,44,48,44,775
7940 DATA 49,48,44,49,50,56,44,52,44,5
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7950 DATA 1,50,44,52,44,56,44,52,44,48
,44,50,44,49,44,52,718
7960 DATA 44,48,44,49,50,56,44,48,44,5
3,44,48,44,50,44,48,758
7970 DATA 44,54,52,155,32,28,39,39,1,4
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7980 DATA 44,48,44,50,44,48,44,48,44,4
8,44,48,44,50,44,48,740
7990 DATA 44,49,44,48,44,49,50,56,44,4
8,155,42,28,37,37,1,776
8000 DATA 48,44,49,44,50,44,49,44,48,4
4,48,44,48,44,48,44,740
8010 DATA 48,44,49,44,48,44,48,44,48,4
4,48,44,48,44,48,155,848
8020 DATA 52,28,37,37,1,48,44,48,44,48
,44,48,44,48,44,48,663
8030 DATA 44,48,44,48,44,48,44,48,44,4
8,44,48,44,48,44,48,736
8040 DATA 44,48,44,48,155,62,28,39,39,
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8050 DATA 48,44,51,44,48,44,54,44,55,4
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8060 DATA 55,44,54,44,48,44,48,44,49,5
3,57,155,72,28,53,53,901
8070 DATA 1,48,44,49,53,57,44,48,44,49
,53,57,44,50,56,44,741
8080 DATA 49,53,57,44,53,50,44,49,53,5
7,44,55,56,44,49,53,810
8090 DATA 57,44,55,56,44,48,44,55,56,4
4,48,44,55,56,44,48,798
8100 DATA 155,82,28,51,51,1,53,48,44,4
8,44,51,48,44,48,44,840
8110 DATA 48,44,52,48,44,48,44,52,48,4
4,52,48,44,52,48,44,760
8120 DATA 52,48,44,56,48,44,52,48,44,4
9,49,48,44,55,56,44,781
8130 DATA 49,49,48,155,92,28,57,57,1,5
4,52,44,49,48,48,44,875
8140 DATA 999
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PRICE . . . . . **$15.95** cassette **$19.95** diskette

☐ **THE PREDICTOR** by Thomas Barker (Apple, Atari, TRS-80, North Star and CP/M (M-BASIC).

This is a complete package that covers least squares fitting of parameters for two or more variables. THE PREDICTOR can be used for predicting sales and process behavior, trend analysis, model building and many other uses calling for multilinear regression techniques. Each option in the program is prompted with simple YES/NO commands making it **very** easy to use.

PRICE . . . . . **$29.95** diskette

☐ **PILOT:** by Michael Piro (Atari, 16K)

Pilot your small airplane to a successful landing using both joysticks to control throttle and attack angle. PILOT produces a true perspective rendition of the runway, which is constantly changing. Select from two levels of pilot proficiency.

PRICE . . . . . **$16.95** cassette **$20.95** diskette

☐ **TEACHER'S PET:** by Arthur Walsh (Atari, Apple, TRS-80, PET, North Star and CP/M (MBASIC) systems).

This is an introduction to computers as well as a learning tool for the young computerist (ages 3-7). The program provides counting practice, letter-word recognition and three levels of math skills.

PRICE . . . . . **$14.95** cassette **$18.95** diskette

☐ **MAIL LIST 3.0:** (Atari, Apple and North Star)

The very popular MAIL LIST 2.2 has now been upgraded. Version 3.0 offers enhanced editing capabilities to complement the many other features which have made this program so popular. MAIL LIST is unique in its ability to store a maximum number of addresses on one diskette (typically between 1200 and 2500 names!). Entries can be retrieved by name, keyword(s) or by zip codes. They can be written to a printer or to another file for complete file management. The program produces 1, 2 or 3-up address labels and will sort by zip code (5 or 9 digits) or alphabetically (by last name). Files are easily merged and MAIL LIST will even find and delete duplicate entries! The address files created with MAIL LIST are completely compatible with **ARTWORX** FORM LETTER SYSTEM.

PRICE . . . . . **$49.95** diskette

☐ **THE VAULTS OF ZURICH:** by Felix and Greg Herlihy (Atari, 24K, PET)

Zurich is the banking capital of the world. The rich and powerful deposit their wealth in its famed impregnable vaults. But you, as a master thief, have dared to undertake the boldest heist of the century. You will journey down a maze of corridors and vaults, eluding the most sophisticated security system in the world. Your goal is to reach the Chairman's Chamber to steal the most treasured possession of all: THE OPEC OIL DEEDS!

PRICE . . . . . **$21.95** cassette **$25.95** diskette

☐ **BRIDGE 2.0** by Arthur Walsh (Atari (24K), Apple TRS-80, PET, North Star and CP/M (MBASIC) systems)

Rated #1 by Creative Computing, BRIDGE 2.0 is the only program that allows you to both bid for the contract and play out the hand (on defense or offense!). Interesting hands may be replayed using the "duplicate" bridge feature. This is certainly an ideal way to finally learn to play bridge or to get into a game when no other (human) players are available.

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☐ **ENCOUNTER AT QUESTAR IV:** by Douglas McFarland (Atari, 24K)

As helmsman of Rikar starship, you must defend Questar Sector IV from the dreaded Zentarians. Using your plasma beam, hyperspace engines and wits to avoid Zentarian mines and death phasers, you struggle to stay alive. This BASIC/Assembly level program has super sound, full player missile graphics and real time action.

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NEW PROGRAMS!

HAZARD RUN: by Dennis Zander (Atari, 16K)

The sheriff has spotted you and you must make the treacherous run through Crooked Canyon past Bryan's Pond to the jump at Hazard Creek and safety. You can even put the joystick-controlled GEE LEE car up on two wheels to make it through some tight spots. A lead foot is not always the answer as you dodge trees, rocks and chickens in this nerve-racking game. HAZARD RUN employs full use of player/missile graphics, re-defined characters and fine scrolling techniques to provide loads of fast action and visual excitement.

PRICE. . . . . .**$27.95** cassette **$31.95** diskette

BETA FIGHTER: by Douglas McFarland (Atari, 16K)

See who will be the ace gunner in this action game set on a spectacular Martian landscape. BETA FIGHTER can be played with one or two players and uses player/missile graphics and delightful sound effects.

PRICE. . . . . .**$16.95** cassette **$20.95** diskette

DRAWPIC: by Dennis Zander (Atari 16K)

DRAWPIC provides the user with an unbelievably easy way to create screens in graphics modes 3-7. Just sit back with your joystick and use POINT PLOT, DRAW LINE, RUBBER BAND fill and COLOR SET to create beautiful images on your Atari. Full or partial screen images are saved as string data in the program and can be instantly recalled and combined into new images using machine language subroutines. These graphic images can be easily incorporated into your own programs. The images of HODGE PODGE and the landscape of BETA FIGHTER were made using DRAWPIC.

PRICE . . . . . .**$29.95** cassette **$33.95** diskette

T: A TEXT DISPLAY DEVICE: by Joseph Wrobel (Atari 16K)

T: is an auto-loading, co-resident assembly language routine which greatly expands the display capabilities of the Atari. It allows you to freely intermix both text and graphics without the use of modified display lists, PEEKS or POKES. This is done by defining a new device ("T:"); printing to that device puts text onto the screen. The size of the text is determined by the graphics mode used.

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The Program Doctor

SOFTWARE REVIEW: MATCH RACER

by Gebelli Software
1771 Tribute Rd., Suite A
Sacramento, CA 95815

Requires 16K with disk drive
Disk $29.95

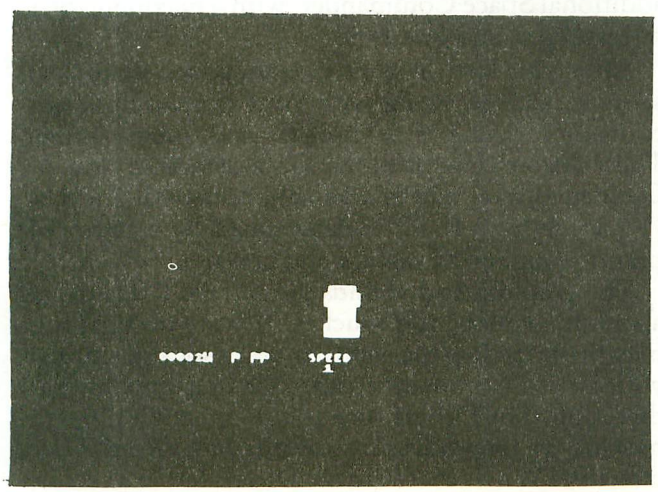
Review By The Program Doctor

Many of you have seen the Indy 500 race game for the VCS or the Mattel Intellivision Auto Racing Cartridge, and wondered when there would be a car game that utilized all of the ATARI's capabilities. Well, race fans, here it is!!!

Picture yourself driving on a two-lane blacktop with your best friend or enemy, attempting to navigate a vertically scrolling, randomly changing course with oil slicks, ice patches, rocks, tunnels, barricades and curves, constantly battling for position.

This 16K machine language program, only available at this time on disk, has been developed by Bill Hooper of Gebelli Software. The graphics and sound depict a realistic car race. When you bump a car on the oil slicks the cars slide from side to side, and you hear a whoosh simulating the sound of cars traveling over oil. On the ice patches if you are hit you can lose control of your car. You can even lock wheels and force your opponent into a wall. Some of the sections are bordered by bricks, and when driving over them the cars bounce up and down, and you hear the effect of your spinning wheels traveling over them. This is one of the nicest effects of this game.

Upon loading the game you are greeted by a very snappy tune. Odometers keep track of the mileage, which is important to watch because of the speed. At 5 miles you increase to Novice level, at 15 miles to Expert level and at 45 miles the speed reaches Freeway level. You may also use the Option key to select one of these speeds to begin. It is a 1 or 2 player game, but the 1 player version is not very challenging. Every 10 miles you receive a bonus car.



It is hard to find anything wrong with this program without sounding really picky, but here goes. There is no announcement of who wins — you can only tell by looking at the odometers, and you cannot restart a race in the middle. You must either play through or crash out your cars.

This is a great game for taking out your frustrations on each other. Gebelli has two other releases, **Andromeda** and **Pathfinder**. These will also be on disk and possibly cartridges, but no cassettes. The realism of Match Racer, along with its vertically scrolling screen, hi-res graphics and sounds make this game an excellent addition to your program library, and at $29.95 it is well worth the money. □

Match Racer Ratings Chart
(1 Unsatisfactory - 10 Ideal)

Concept	8
Originality	8
Challenge	7
Skill	6
Graphics/Sound	9
Overall Rating	7.6

SOFTWARE REVIEW: SOFTPORN ADVENTURE

by On-Line Systems
36575 Mudge Road
Coarsegold, CA 93644

Requires 40K and disk drive
Disk $29.95

What red-blooded American computer freak would not jump at the chance to go to "Lost Vagueness" with the sole purpose of seducing three girls? This is your task as you make your way through **Softporn Adventure**, the first of several adventures to be released for the ATARI by On-Line.

You travel through the city in the year 2020, visiting sleazy bars, hookers, pimps, casinos and much, much more. Although the program is written in Basic, response time is fast, and descriptions are full paragraphs. The addition of clever graphics in what is basically a text adventure adds to the fun. However, the casino graphics could have been done with more pizazz. Also, if the prompt questions were in inverse, it would make for easier reading.

The major criticism is that, once again, we are forced to translate Apple instructions. WHEN WILL THEY LEARN?? To save a game in progress, ignore the Apple directions and simply type "SAVE GAME". You will be prompted by the program on how to continue.

This is a good party adventure, which has proven to be entertaining and funny. Many hours of enjoyment will be spent solving this delightful fantasy, to which a sequel is already in the works. □

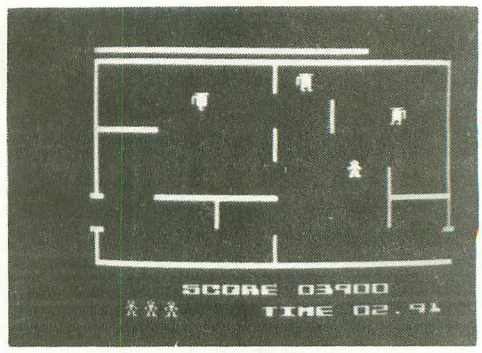
Softporn Adventure Ratings Chart
(1 Unsatisfactory - 10 Ideal)

Concept	8
Originality	6
Challenge	5
Skill	5
Graphics/Sound	1
Overall Rating	5

K-Razy Shoot-Out
from K-Byte A Division of Kay Enterprises
P.O. Box 456
1705 Austin Street
Troy, Michigan 48099
Cartridge $49.95

The sign of a good fix for a true video game junkie is a game so addictive that he is totally obsessed with it. He doesn't eat, doesn't talk, doesn't sleep and plays and plays until his hands hurt and even then he does not stop. And so I sit here, bleary-eyed, with my left hand so sore that I cannot hold a joystick, relaxing for the first time in four days after a massive binge with K-Razy Shout-Out.

The object of the game is to advance your Space Commander into the Alien Control Sectors, eliminate the Alien forces and escape from the sector. The sectors are created at random with millions of combinations of barriers and escape routes, so no two games or game levels are identical. There are seven sectors, each one more challenging. You must destroy all Alien Droids in a sector before advancing to the next sector. The Droids can be destroyed by being shot by you or by each other, or by colliding into a barrier or each other. The first sector is manned by simple unarmed Droids. As you advance to sector 2 they become more numerous and sophisticated, and return your laser fire. By the time you reach sector 5 the Droids move and shoot very fast.



You have three Space Commanders as you begin. You can lose a commander several ways; if you run into a barrier, if you are hit by Alien fire, if you come in contact with a Droid or with the radioactive debris that follows the elimination of an Alien Droid.

To complicate matters, there is a sector countdown bar at the top of the screen. At the start of each sector this bar is green. It moves left, as the game proceeds, and turns yellow then red. If you can eliminate all Droids and escape while in the green, you receive 1000 bonus points and in the yellow, 300 bonus points. If the bar is red you receive no bonus points for that sector. If you leave the sector before all Droids are eliminated, you may be forced to replay the sector gaining no additional points before you can advance. The penalty for running is severe.

You receive points for each Droid destroyed - 10 points if a Droid collides with a barrier or another Droid, 50 points if shot by another Droid and 100 points if shot by you in sector 1-3 and 200 points in sector 4-7. For each 10,000 points you receive an additional Space Commander, with a maximum of 4 in reserve at any one time.

After you lose all your Commanders, your final score is shown, along with your time, number of casings (1 casing = 50 bullets) and your ranking. There are six classifications: Goon, Rookie, Novice, Gunner, Blaster and Marksman, each with 5 levels. (1-high/5-low) Rank is determined by number of points, number of casings and speed.

The graphics and sounds are terrific!!! There are also lots of nice little touches. When you fire (you may fire in each of the eight major joystick positions) your Space Commander kneels and points in that direction. The Droids turn to the direction they are moving as they advance towards you, simple but effective. When there are six Droids left in a sector,

you turn green. This is helpful, because only 3 Droids are in sight at any given time and as 1 is destroyed another pops up at random around the edges of the sector.

The game comes as a ROM cartridge, the only third party software to be sold this way. No cassettes that won't load,no disks with bad sectors or missing parts, just pop the cartridge in and it works first time, every time. The game comes from a newcomer into the ATARI market, K-Byte, a division of Kay Enterprises. K-Byte has told this reviewer that they will totally support that ATARI, and at least for now, only the ATARI. Hooray!!! They have four more programs scheduled for release within the next 30 to 60 days, 3 more ROM cartridges and 1 disk, and I for one am anxiously awaiting them. The only criticism of this program is its price, $49.95, which I feel is a little steep, even for so much fun. Hopefully, as their volume of sales increases, which I guarantee it will, the prices will come down.

All in all, this is a great game and I highly and with no reservations recommend it to you all.□

K-Razy Shoot-Out Rating Scale
(1 Unsatisfactory - 10 Ideal)

Concept	10
Originality	7
Challenge	10
Skill	10
Graphics/Sound	8
Overall Rating	9.3

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Using A DLI To Twinkle A Starfield

by Joseph T. Trem
Amulet Enterprises

For many years there have been powerful computers on the market which performed multi-tasking functions. Not until a few years ago did the home computer acquire this capability. At last!! ATARI!!!

Having a 6502 microprocessor for its brain, your ATARI computer has the capability of using interrupts. An interrupt is a tricky way of freezing the state of the microprocessor while performing some other function, then moving on when completed. Here is an example. On a raster scan TV the picture you see is drawn sixty times a second. The beam starts in the upper lefthand corner and eventually ends up in the lower righthand corner. Remember, this is done sixty times a second. The time taken for the beam to travel from the bottom of the screen back to the top is called vertical blank. During vertical blank, there is plenty of time for other processing. Using an interrupt, one could check for vertical blank. When vertical blank occurs, perform some other function, then continue on. Some of the more common functions would be moving player/missiles, updating score counters, changing colors . . . all between Vblank, as it is more commonly called. If these functions are performed during Vblank there is no unsightly flicker on the screen. Besides, Vblank is processing time to kill, right? ATARI goes a step further by implementing a display list interrupt or DLI. On a raster scan TV the beam sweeps across the screen, from left to right, moves down one line, then does it again. One sweep of the beam is one scan line. It takes 262 sweeps of that beam to create a single frame on your TV, all done sixty times a second. In other words, there are 262 scan lines available on your TV.

ATARI designed their computer to evolve around the architecture of your TV set. Even better, the display list uses all combinations of the scan line from graphics 0 to graphics 8 and allows you to set up a DLI on any line. For example, one could draw a scan line, change the background color, and so on. The final picture will appear to have a different color on each line. To set up a DLI, there are a few steps which have to be taken. First, we have to create a DLI routine in machine language that will do what we want. This is called a service routine. Then we must let the microprocessor know where to find that routine by vectoring through $200 (low byte) and $201 (high

Standard Graphics 7 Display List		New Graphics 7 Display List with DLI Set	
70	8 Blank lines	70	8 Blank lines
70	8 Blank lines	70	8 Blank lines
70	8 Blank lines	70	8 Blank lines
4D	Antic Mode 13 (Basic mode 7)	4D	Antic Mode 13 (Basic mode 7)
60		60	
70		70	
0D		8D	Antic Mode 13 with DLI set
0D		8D	
0D		8D	
0D		8D	
0D		8D	

FIG.-1

byte). That's 512 and 513 decimal. Next we set the display list lines that we want the service routine to occur after with a DLI instruction. Finally, we must enable the DLI. Because the concept of the DLI is a hard one to follow and needs some understanding of assembly language, I have presented an example . . . a picture is worth a thousand words. This program, written in BASIC, twinkles a starfield while running player/missiles . . . both appearing independent of one another. The program is well documented. In the example, the service routine is located at $600. Every display list line has been set in the graphics 7 mode with a DLI instruction (Fig.-1). This was determined by using the chart in Fig.-2. The DLI instruction for graphics 7 is 141 decimal. Included with the basic program is the assembled listing of the service routine which simply stuffs colors in the color register. Hopefully this program will help you gain a better understanding of the DLI. It is among the most powerful programming tools you can use. Take some time to understand the concept and you will greatly increase your programming expertise. □

Display List Interrupt Instruction Chart

Graphics Mode		DLI Instruction	
Basic	Antic	Hex	Decimal
0	$02	$82	130
None	$03	$83	131
None	$04	$84	132
None	$05	$85	133
1	$06	$86	134
2	$07	$87	135
3	$08	$88	136
4	$09	$89	137
5	$0A	$8A	138
6	$0B	$8B	139
None	$0C	$8C	140
7	$0D	$8D	141
None	$0E	$8E	—
8	$0F	$8F	143

FIG.-2

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```
10 REM FLICKERING STARFIELD
15 REM BY JOE TREM (c) 1982
16 REM
19 REM SETS GRAPHICS 7 FULL SCREEN, DR
AWS SURFACE WITH SOUND
20 GRAPHICS 23:POKE 708,136:COLOR 1:FO
R X=0 TO 159:SOUND 0,10,X,4:PLOT X,95:
DRAWTO X,80+RND(0)*5:NEXT X
29 REM CALCULATES DISPLAY LIST, SETS S
PEED OF PLAYER TO 0
30 SP=0:DLST=PEEK(560)+PEEK(561)*256
39 REM SETS UP DLI FOR EACH GRAPHICS 7
 SCAN LINE
40 FOR L=6 TO 84:POKE DLST+L,141:NEXT
L
49 REM READS MACHINE LANGUAGE ROUTINE
INTO PAGE 6
50 FOR J=0 TO 3:READ A:POKE 1536+J,A:N
EXT J
60 COLOR 3:REM SETS COLOR TO FLICKER
69 REM PLOTS STARS WITH SOUND
70 FOR X=1 TO 50:SOUND 0,X,X,4:PLOT RN
D(0)*159,RND(0)*75:NEXT X
79 REM SETS STARTING ADDRESS FOR DLI (
PAGE 6) AND ENABLES DLI
80 POKE 512,0:POKE 513,6:POKE 54286,19
2
99 REM SETS UP PLAYER/MISSILE 0
100 YP=0:POKE 559,62:PMBAS=PEEK(106)-3
2:POKE 54279,PMBAS:POKE 53277,3:PM0=PM
BAS*256+1024
200 GOSUB 300
209 REM PLAYER/MISSILE COLOR, MOVE RIG
HT
210 POKE 704,INT(RND(0)*15)*16+8:FOR X
=30 TO 230 STEP SP:POKE 53248,X:SOUND
0,X,8,4:NEXT X
220 GOSUB 300
229 REM PLAYER/MISSILE COLOR, MOVE LEF
T
230 POKE 704,INT(RND(0)*15)*16+8:FOR X
=230 TO 30 STEP -SP:POKE 53248,X:SOUND
 0,X,8,8:NEXT X:GOTO 200
299 REM ROUTINE ERASES OLD PLAYER, DET
ERMINES SPEED, AND VERTICAL LOCATION O
F PLAYER 0
300 SP=SP+1:FOR X=YP TO YP+4:POKE PM0+
X,0:NEXT X:IF SP>15 THEN SP=1
310 YP=30+RND(0)*150:POKE PM0+YP,24:PO
KE PM0+YP+1,255:POKE PM0+YP+2,255:POKE
 PM0+YP+3,24:RETURN
399 REM MACHINE LANGUAGE DATA
400 DATA 142,24,208,64
410 REM NOTE TO ASSEMBLY PROGRAMMERS..
WSYNC WAS NOT USED FOR MORE ERRATIC FL
ICKERING
```

●

```
0100 ; FLICKERING STARFIELD
0110 ; DLI SERVICE ROUTINE
0120 ;
0130 ; ADDRESS $D018 IS THE
0140 ; COLOR/LUMINANCE REGISTER
0150 ; OF PLAYFIELD 2
0160 ;
0170 COLPF2=$D018
0180 ;
0190  *=$600
0200 ;
0210 ; SAVE WHATEVER IS IN THE
0220 ; X-REGISTER INTO PLAYFIELD
0230 ; COLOR2 HARDWARE REGISTER
0240 ;
0250  STX COLPF2 ; STORE COLOR
0260  RTI ; RETURN FROM INTERRUPT
0270 ;
0280  .END
```

●

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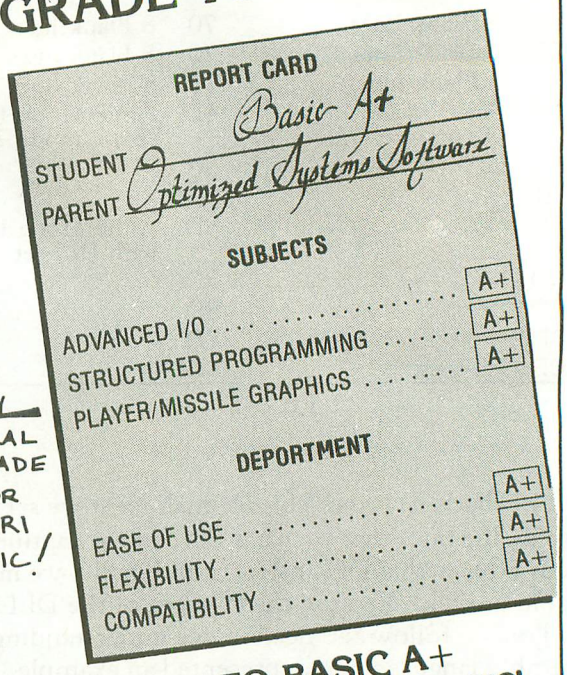

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TYPING TRAINER

by Regena

"Typing Trainer" is a program written in BASIC for the ATARI 800 computer (16K) and utilizes color graphics and sound to help a typing student practice typing sentences for accuracy. There are 40 different 30-stroke sentences that are chosen randomly for the drills. Each drill consists of ten different sentences.

A sentence is shown on the screen. The student types and enters it. If it is incorrect, an "uh-oh" sounds and a "wrong" score is posted. The student has time to review the sentence before continuing. If the typed sentence is correct, a "right" score is posted, the train whistle sounds, and there are two blasts of steam from the engine's smokestack.

The running total score is displayed on the screen after each sentence. After ten sentences, the final score is displayed and a tune is played.

After each drill of ten sentences the student may choose whether to try again or not. If "N" for "no" is entered, the program ends. If "Y" for "yes" is entered, the drill is repeated with ten different sentences. Each drill chooses the sentences randomly, and the drill may be performed four times without sentences being repeated. After that, the sentences are all available for four more drills. The drills will be different each time because the sentences are chosen randomly. This process continues as long as the student wishes to continue.

Programming Techniques

ATARI does not allow arrays of string variables, so an array of sentence numbers is used. The sentences are numbered 1 through 40, where J is the number. Initially all A(J) are set to zero. After a sentence is used, A(J)=1.

To print a sentence, first a number J is chosen as a random integer from 1 through 40 (Line 220). If A(J)=1 the sentence has been used before and may not be chosen again so another J is chosen (Line 230). If A(J)=0, SEN$ is set equal to the Jth sentence and the program branches to the drill (Lines 232-250, 4000-4390).

After the drill has been performed four times (using FLAG as a counter), all A(J) are reset to zero so the sentences are all available for use in the next drill (Line 180).

To avoid the possibility of the student "crashing" the program during responses, an INPUT procedure is avoided. Instead, the program looks at what key is pressed by using B=PEEK(764). Yes or no responses are received by the student pressing "Y" or "N". Any other key pressed is ignored.

When sentences are typed, the characters are printed as each key is pressed until "RETURN" is pressed (which indicates the student is finished typing the sentence). The control keys or SHIFTing are not allowed since a typist practicing sentences should not backspace and type over letters nor type capital letters in the middle of the sentence (actually the student types all capital letters in the standard computer mode but does not SHIFT). If a control key or SHIFT is pressed, an asterisk is printed in that character position of the student's sentence.

To avoid scrolling, the student is permitted to type only 34 characters in the sentence (Line 2005). The student's sentence is compared with the given sentence either after "RETURN" is pressed or after 34 characters have been pressed.

To print the characters, the ASCII code of the character is necessary. However, the B value returned in B=PEEK(764) is NOT the ASCII code. By experimentation, the B value for each key pressed on the keyboard and for each key pressed with SHIFT depressed was determined. All of the SHIFTed keys had a B value greater than 63. The following table was used to relate the ASCII code to each key pressed and the corresponding B value. These ASCII values for L(B) are read in as data in Lines 1000-1050. The zero values are used for B values that do not appear or control keys that won't print. An asterisk is printed for any B value greater than 63.

Explanation of the Program

Variables Used

J	Sentence number.
A(J)	=0 for available sentence, =1 if sentence has been used.
FLAG	Counter for number of times drill is performed.
WS	Wrong score.
RS	Right score.
PROB	Counter for number of sentences
R	=1 if sentence is typed correctly; =0 if sentence is typed incorrectly.
D	Counter in delay loop for SOUND.
B	Value in PEEK(764) for key pressed.
BB	=1 for "yes" response; =0 for "no" response.
I	Counter in loop.
C, L	ASCII value

SEN$	Typing sentence.
OLDB	Holding variable for B value.
K	Counter for number of characters printed in student's sentence
C$	Character for key pressed.
T$	Student's typed sentence.
X,X1,Y,Y1,II, X2,Y2,X3,Y3	Coordinates for graphics.

Line Numbers	Procedure
10	Prints title screen and plays music.
30	Prints instruction screen.
100	Dimensions variables.
120	Reads in data for ASCII codes related to key pressed.
180-200	Initializes variables.
202	Draws train.
205	Initializes score to be zero.
210	Performs the drill for 10 sentences.
220-230	Randomly chooses a sentence; if the sentence has been used previously, chooses another one.
232-250	Depending on the J chosen, prints the corresponding sentence and prints the student's sentence; compares sentences.
255-280	If sentence is incorrect, sounds "uh-oh" and increments wrong score.
300-310	If sentence is correct, train toots whistle and blows steam; increments right score.
320	Prints running score.
330-345	Short delay for correct sentence, longer delay for incorrect sentence.
350	A(J)=1 indicates sentence J has been used and will not be available to use again.
355-360	Clears text screen and goes to next sentence.
370	After ten sentences prints total score on full screen and plays music.
400-495	Asks the student "try again?" and waits for the student to press "Y" or "N".
496	If the student pressed "N", ends program.
510-530	If the student pressed "Y", increments the number of times the drill was performed. If the drill has been performed 4 times, resets all sentences to be available; branches to beginning of drill.
999	End.

Subroutines

1000-1060	Subroutine reads DATA for assigning ASCII code to key pressed for use in printing.
1900-2500	Subroutine prints the sentence and accepts student's sentence.
1905	Prints the sentence.
1910-1930	Sounds a "beep" to indicate the student's turn to type.
2000	Initializes variables.
2005	Allows student to input up to 34 characters.
2010-2400	Prints each character as the student types it. If the student tries to press a control or SHIFTed character, "*" is printed. The student presses "RETURN" to end the sentence.
2410-2500	Sets R=1 if the sentence typed matches the given sentence, otherwise R=0, then returns.
4000-4390	The given 30-stroke typing sentences.
5000-6840	Subroutine draws the train and coal car.
7000-7490	Subroutine prints title screen and plays music.
8000-8160	Subroutine prints instructions and waits for student to press "RETURN" to continue.
9000-9080	Subroutine prints score and plays music. □

```
10 GRAPHICS 18:GOSUB 7000
30 GOSUB 8000
100 DIM A(40),L(63),SEN$(30),T$(35),C$
(1),N$(1)
120 GOSUB 1000
180 FOR J=1 TO 40:A(J)=0:NEXT J
200 FLAG=0
202 GOSUB 5000
205 WS=0:RS=0
210 FOR PROB=1 TO 10
220 J=INT(40*RND(1))+1
230 IF A(J)=1 THEN 220
232 IF J>30 THEN 248
234 IF J>20 THEN 244
236 IF J>10 THEN 240
238 ON J GOSUB 4000,4010,4020,4030,404
0,4050,4060,4070,4080,4090
239 GOTO 255
240 JJ=J-10
242 ON JJ GOSUB 4100,4110,4120,4130,41
40,4150,4160,4170,4180,4190
243 GOTO 255
244 JJ=J-20
245 ON JJ GOSUB 4200,4210,4220,4230,42
40,4250,4260,4270,4280,4290
```

```
246 GOTO 255
248 JJ=J-30
250 ON JJ GOSUB 4300,4310,4320,4330,43
40,4350,4360,4370,4380,4390
255 IF R=1 THEN 300
260 SOUND 0,84,10,14
264 FOR D=1 TO 40:NEXT D
268 SOUND 0,101,10,14
270 FOR D=1 TO 40:NEXT D
275 SOUND 0,0,10,0
280 WS=WS+1:GOTO 320
300 GOSUB 3000
310 RS=RS+1
320 PRINT :PRINT RS;" RIGHT",WS;" WRON
G"
330 IF R=1 THEN 345
340 FOR D=1 TO 500:NEXT D
345 FOR D=1 TO 500:NEXT D
350 A(J)=1
355 PRINT :PRINT :PRINT
360 NEXT PROB
370 GOSUB 9000
400 GRAPHICS 0
410 PRINT :PRINT :PRINT
420 PRINT "DO YOU WANT TO TRY AGAIN?"
430 PRINT :PRINT "PRESS 'Y' FOR YES"
440 PRINT "       'N' FOR NO"
450 B=PEEK(764)
460 IF B=43 THEN BB=1:GOTO 490
470 IF B=35 THEN BB=0:GOTO 490
480 GOTO 450
490 SOUND 0,23,10,8
492 FOR D=1 TO 10:NEXT D
494 SOUND 0,0,10,8
495 POKE 764,255:B=255
496 IF BB=0 THEN 999
500 PRINT " "
510 FLAG=FLAG+1:IF FLAG=3 THEN 180
530 GOTO 202
999 END
1000 FOR I=0 TO 63
1010 READ C:L(I)=C:NEXT I
1040 DATA 76,74,59,0,0,75,43,42,79,0,8
0,85,0,73,45,61,86,0,67,0,0,66,88,90,5
2,0,51,54,0,53,50
1050 DATA 49,44,32,46,78,0,77,47,0,82,
0,69,89,0,84,87,81,57,0,48,55,0,56,60,
62,70,72,68,0,0,71,83,65
1060 RETURN
1900 POKE 764,255:B=255
1905 PRINT SEN$
1910 SOUND 0,47,10,14
1920 FOR D=1 TO 60:NEXT D
1930 SOUND 0,0,10,0
2000 OLDB=-1:T$=""
2005 FOR K=1 TO 34
2010 B=PEEK(764):IF B=255 THEN 2010
2020 IF B=OLDB THEN 2100
2030 OLDB=B
2040 IF B=12 THEN 2400
2050 IF B>63 THEN C$="*":GOTO 2065
2060 C$=CHR$(L(B))
2065 PRINT C$;
2070 T$(LEN(T$)+1)=C$
2080 NEXT K
2090 GOTO 2400
2100 I=INT(PEEK(53775)/4):IF (I/2)=INT
(I/2) THEN 2010
2110 POKE 764,255:OLDB=-1
2120 GOTO 2010
2400 POKE 764,255:B=255
2410 IF T$=SEN$ THEN R=1:GOTO 2500
2420 R=0
2500 RETURN
3000 FOR II=1 TO 2
3010 SOUND 0,50,10,14:SOUND 1,63,10,14
3025 COLOR 2
3030 GOSUB 3500
3040 FOR D=1 TO 100:NEXT D
3050 SOUND 0,0,10,0:SOUND 1,0,10,0
3070 COLOR 0:GOSUB 3500
3090 NEXT II:RETURN
3500 PLOT 121,3
3510 PLOT 125,14:DRAWTO 126,10
3530 PLOT 124,14:DRAWTO 125,0
3550 PLOT 123,14:DRAWTO 123,0
3570 PLOT 122,11:DRAWTO 121,4
3590 RETURN
4000 SEN$="HE FEELS SHE HAS A SAFE LEA
SE.":GOTO 1900
4010 SEN$="ANDY MUST GIVE MY BAND A HA
ND.":GOTO 1900
4020 SEN$="SHE IS STILL AT THE LAKE SI
TE.":GOTO 1900
4030 SEN$="THERE IS A QUICK QUIZ FOR H
IM.":GOTO 1900
4040 SEN$="JUST SOME OF US HAVE TO DO
IT.":GOTO 1900
4050 SEN$="TWO OF THE GIRLS ARE HERE N
OW.":GOTO 1900
4060 SEN$="JANE STARTS HER TALK AT THR
EE.":GOTO 1900
4070 SEN$="TRY NOT TO LOOK AT YOUR HAN
DS.":GOTO 1900
4080 SEN$="HE DID SEEK AID FOR THE TRU
CK.":GOTO 1900
4090 SEN$="CHECK THE PAPER FOR ANY MAR
KS.":GOTO 1900
4100 SEN$="IT IS THIS DESK FILE HE SEE
KS.":GOTO 1900
4110 SEN$="HE KNOWS HE MUST KEEP WORKI
NG.":GOTO 1900
4120 SEN$="WE WOULD GIVE HIM A GOOD WA
GE.":GOTO 1900
4130 SEN$="BRING ALL BOOKS TO THE TABL
ES.":GOTO 1900
4140 SEN$="I HOPE THAT TAX DOES NOT PA
SS.":GOTO 1900
4150 SEN$="GREG BROUGHT IN A LARGE CHE
CK.":GOTO 1900
4160 SEN$="IT IS UP TO THEM TO WORK HA
RD.":GOTO 1900
4170 SEN$="PUT A LITTLE MORE EFFORT HE
RE.":GOTO 1900
4180 SEN$="HAVE A GOAL; WORK TO REACH
IT.":GOTO 1900
4190 SEN$="ALL GLAD DADS HAD A GLASS J
AR.":GOTO 1900
4200 SEN$="IT IS HOW WE WORK THAT COUN
TS.":GOTO 1900
4210 SEN$="TOM WAS QUICK TO SEND THE B
OX.":GOTO 1900
4220 SEN$="REX WILL HAVE MUCH MORE TO
DO.":GOTO 1900
4230 SEN$="I WILL GO TO TOWN TO GET TH
EM.":GOTO 1900
```

```
4240 SEN$="HE CAN LEND A HAND TO THE B
OY.":GOTO 1900
4250 SEN$="I PAID THE MEN FOR THEIR WO
RK.":GOTO 1900
4260 SEN$="THE WORKER SAID HE STRUCK O
IL.":GOTO 1900
4270 SEN$="SHE SAID WE NEED A NEW CAMP
ER.":GOTO 1900
4280 SEN$="I BOUGHT THE BIG BOX OF BOO
KS.":GOTO 1900
4290 SEN$="WE SHOULD SET A GOAL FOR TH
EM.":GOTO 1900
4300 SEN$="TRY TO TYPE ALL THE BIG WOR
DS.":GOTO 1900
4310 SEN$="WE MAY QUIT THIS WORK AT FI
VE.":GOTO 1900
4320 SEN$="YOU HAVE TO WORK FOR TWO DA
YS.":GOTO 1900
4330 SEN$="TRY TO GET ONE OR TWO OF TH
EM.":GOTO 1900
4340 SEN$="YOUR BEST MEN WILL HELP DO
IT.":GOTO 1900
4350 SEN$="HAVE THE BOYS DO THE WORK N
OW.":GOTO 1900
4360 SEN$="LET HIM PROVE THE RIGHT THI
NG.":GOTO 1900
4370 SEN$="THEY SHOULD READ MY GOOD BO
OK.":GOTO 1900
4380 SEN$="SHE CAN DO A BIG JOB THE BE
ST.":GOTO 1900
4390 SEN$="DAVE MADE A CAGE FOR HIS PE
TS.":GOTO 1900
5000 GRAPHICS 7:COLOR 1
5005 COLOR 1
5010 FOR Y=20 TO 25
5020 PLOT 55,Y:DRAWTO 88,Y
5040 NEXT Y
5050 FOR Y=26 TO 37
5060 PLOT 60,Y:DRAWTO 65,Y
5080 PLOT 83,Y:DRAWTO 88,Y
5100 NEXT Y
5110 FOR Y=38 TO 58
5120 PLOT 60,Y:DRAWTO 130,Y
5140 NEXT Y
5150 FOR Y=34 TO 37
5160 PLOT 97,Y:DRAWTO 103,Y
5180 NEXT Y
5190 PLOT 98,33:DRAWTO 102,33
5210 PLOT 100,32:PLOT 122,38
5230 DRAWTO 118,18
5240 DRAWTO 122,15
5250 DRAWTO 126,15
5260 DRAWTO 130,18
5270 DRAWTO 126,38
5280 COLOR 2
5290 PLOT 59,58:DRAWTO 50,58
5310 FOR X=49 TO 19 STEP -1
5320 PLOT X,40:DRAWTO X,58
5340 NEXT X
5350 COLOR 3
5360 X1=120:Y1=56
5370 GOSUB 6000
5380 X2=80:Y2=48
5390 GOSUB 6500
5392 X3=37:Y3=59:GOSUB 6200
5395 X3=27:Y3=59:GOSUB 6200
5400 FOR II=2 TO 4
5410 PLOT II*10,39
5420 DRAWTO II*10+8,39
5430 PLOT II*10+2,38
5440 DRAWTO II*10+7,38
5450 PLOT II*10+3,37
5460 DRAWTO II*10+7,37
5470 PLOT II*10+5,36
5480 NEXT II
5490 RETURN
6000 PLOT X1,Y1
6010 DRAWTO X1+4,Y1
6020 DRAWTO X1+7,Y1+3
6030 DRAWTO X1+7,Y1+7
6040 DRAWTO X1+4,Y1+10
6050 DRAWTO X1,Y1+10
6060 DRAWTO X1-3,Y1+7
6070 DRAWTO X1-3,Y1+3
6080 DRAWTO X1,Y1
6090 RETURN
6200 COLOR 3
6205 PLOT X3,Y3
6210 DRAWTO X3+4,Y3
6220 DRAWTO X3+6,Y3+2
6230 DRAWTO X3+6,Y3+6
6240 DRAWTO X3+4,Y3+8
6250 DRAWTO X3,Y3+8
6260 DRAWTO X3-2,Y3+6
6270 DRAWTO X3-2,Y3+2
6280 DRAWTO X3,Y3
6290 PLOT X3+2,Y3+4
6300 RETURN
6500 PLOT X2,Y2
6510 DRAWTO X2+6,Y2
6520 PLOT X2+7,Y2+1
6530 PLOT X2+8,Y2+1
6540 PLOT X2+9,Y2+2
6550 PLOT X2+10,Y2+3
6560 PLOT X2+11,Y2+4
6570 PLOT X2+11,Y2+5
6580 PLOT X2+12,Y2+6
6590 DRAWTO X2+12,Y2+12
6600 PLOT X2+11,Y2+13
6610 PLOT X2+11,Y2+14
6620 PLOT X2+10,Y2+15
6630 PLOT X2+9,Y2+16
6640 PLOT X2+8,Y2+17
6650 PLOT X2+7,Y2+17
6660 PLOT X2+6,Y2+18
6670 DRAWTO X2,Y2+18
6680 PLOT X2-1,Y2+17
6690 PLOT X2-2,Y2+17
6700 PLOT X2-3,Y2+16
6710 PLOT X2-4,Y2+15
6720 PLOT X2-5,Y2+14
6730 PLOT X2-5,Y2+13
6740 PLOT X2-6,Y2+12
6750 DRAWTO X2-6,Y2+6
6760 PLOT X2-5,Y2+5
6770 PLOT X2-5,Y2+4
6780 PLOT X2-4,Y2+3
6790 PLOT X2-3,Y2+2
6800 PLOT X2-2,Y2+1
6810 PLOT X2-1,Y2+1
6820 PLOT X2+3,Y2+9
6830 DRAWTO X1+2,Y1+5
6840 RETURN
7000 POSITION 3,3:PRINT #6;"TYPING"
```

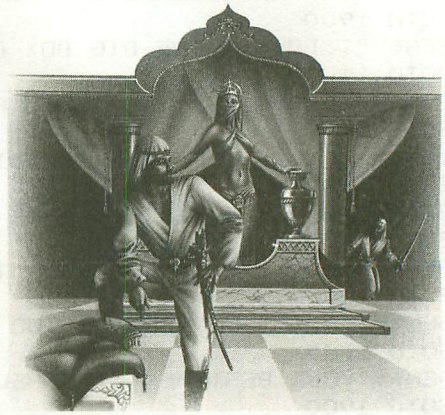
```
7020 POSITION 3,5:PRINT #6;"TRAINER"
7040 SOUND 0,50,10,8
7060 FOR D=1 TO 50:NEXT D
7090 SOUND 0,0,10,8
7100 SOUND 0,50,10,8
7120 FOR D=1 TO 25:NEXT D
7130 SOUND 0,0,10,8:SOUND 0,50,10,8
7140 FOR D=1 TO 25:NEXT D
7150 SOUND 0,42,10,8
7170 FOR D=1 TO 50:NEXT D
7200 SOUND 0,0,10,0
7210 SOUND 0,42,10,8
7230 FOR D=1 TO 25:NEXT D
7240 SOUND 0,50,10,8
7260 FOR D=1 TO 25:NEXT D
7270 SOUND 0,63,10,8
7290 FOR D=1 TO 25:NEXT D
7300 SOUND 0,0,10,8:SOUND 0,63,10,8
7310 FOR D=1 TO 25:NEXT D
7320 SOUND 0,56,10,8
7340 FOR D=1 TO 25:NEXT D
7350 SOUND 0,0,10,8:SOUND 0,56,10,8
7360 FOR D=1 TO 25:NEXT D
7370 SOUND 0,50,10,8
7410 FOR D=1 TO 50:NEXT D
7420 SOUND 0,63,10,8
7430 SOUND 1,127,10,2
7440 SOUND 2,101,10,2
7450 FOR D=1 TO 100:NEXT D
7460 SOUND 0,0,10,0
7470 SOUND 1,0,10,0
7480 SOUND 2,0,10,0
7490 RETURN
8000 GRAPHICS 0
8010 PRINT :PRINT
8020 PRINT "YOU WILL SEE A SENTENCE"
8030 PRINT "ON THE SCREEN."
8040 PRINT :PRINT "TYPE AND ENTER IT."
8050 PRINT :PRINT "IF IT IS CORRECT,"
8060 PRINT "THE TRAIN WHISTLE WILL BLO
W."
8065 PRINT :PRINT "IF IT IS INCORRECT,
 YOU WILL"
8066 PRINT "HAVE TIME TO CHECK YOUR TY
PING."
8070 PRINT :PRINT "YOU WILL BE SHOWN Y
OUR SCORE"
8080 PRINT "AFTER EACH SENTENCE."
8090 PRINT :PRINT "AFTER TEN SENTENCES
"
8100 PRINT "YOUR FINAL SCORE IS SHOWN.
"
8120 PRINT :PRINT
8130 PRINT "PRESS 'RETURN' TO CONTINUE
."
8140 B=PEEK(764):IF B<>12 THEN 8140
8145 SOUND 0,23,10,8
8146 FOR D=1 TO 10:NEXT D
8147 SOUND 0,0,10,0
8150 POKE 764,255:B=255
8160 RETURN
9000 GRAPHICS 18
9010 POSITION 2,3
9020 PRINT #6;"RIGHT",RS
9030 POSITION 2,5
9040 PRINT #6;"WRONG",WS
9070 GOSUB 7040
9080 RETURN
```

●

Fantasy for your ATARI

Ali Baba
and the forty thieves

By Stuart Smith



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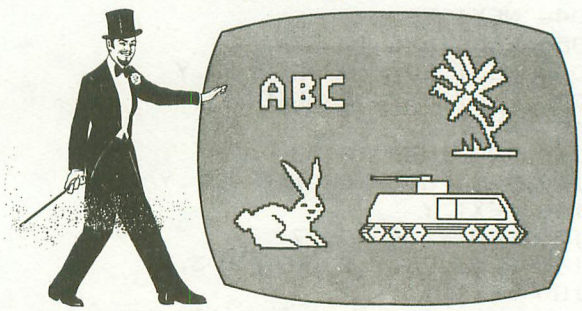
Graphics for your ATARI

Character Magic

By Chris Hull



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Run BASIC Automatically

Indy ATARI Club
Indianapolis, Indiana

Have you ever wanted to load and run a BASIC program automatically when the disk is turned on? We do this for some games which display a menu and instructions. The user never speaks "computer talk." This is also a nice feature if you display your computer to "non-experts." Here is a 100 byte AUTORUN.SYS to boot and run a BASIC program of your choice. Some commercial programs do this but the ones we have seen seem unnecessarily long. Our idea is very simple. In fact, so simple you may want to use it for other functions as well. BASIC reads the screen and stores the ASCII in RAM before it is acted upon. You just load the proper RAM with a statement and jump to BASIC.

The catch with an AUTORUN.SYS program is that you have to set some of BASIC's pointers since you jump in cold. We describe these with comments in the program. We can explain the pointers to anyone who asks since there seems to be no documentation on ATARI BASIC. If you use the idea in some other application where BASIC has been run once, you can skip all this preparation.

You have several options. SYS/RST will call a subroutine pointed to by [$C,$D]. We change this to point to our AUTORUN.SYS to reboot the BASIC program but not DOS. If you don't have DOS 2.OS, get it. In the meantime, check these locations and change JSR $1540 to call the Subroutine pointed to by your version of DOS. If you just leave $C,$D alone, SYS/RST will return to the cartridge. Typing DOS will reset $C,$D in any case.

LINE 510-600 loads the statement you wish into the buffer at $580. Change it as desired but load the proper length plus 1 at LINE 550. □

```
0390  STY $80        ;BASIC MEMLO
0400  INC $88        ;Program storage
0410  INC $8A        ;DIRECT storage
0420  INC $91        ;BASIC MEMTOP
0430  LDY #01
0440  LDA #$80
0450  STA ($8A),Y    ;Indicates DIRECT
0460  INY
0470  LDA #$03
0480  STA ($8A),Y    ;# bytes
0490  JSR $DA51      ;Set [$F3]=$580
0500 ;BASIC is happy now:READ SCREEN
0510  LDY #$00
0520 LP LDA ASC,Y    ;Fake readins
0530  STA $580,Y     ; the Screen
0540  INY
0550  CPY #18
0560  BCC LP
0570  JMP $A076
0580 ASC .BYTE "RUN "       ;note $22="
0590     .BYTE $22,"D:PROG.BAS",$22
0600     .BYTE $9B ;EOFILE
0610 ;
0620 ;(K) AUTORUN.SYS,600,663,600
```

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Assembler Code Subroutine Adder

by Sol Guber

Having just purchased the ATARI Assembler, I was very eager to start machine language subroutines that would speed up my BASIC programs. However, there is a serious bug in the assembler manual when the assembler is used with a cassette recorder. The program is loaded onto the cassette with no problems, but it is difficult to get the program back and to put it into a BASIC program. The assembler manual states that to put the assembled program on tape, you just type ASM,, "C:" and to get it off, you put the BASIC cartridge into the system and just type CLOAD. This does not work. Having checked the tape, it is loaded properly, but there is no way to load it into memory properly. This error is known to ATARI, and there is a simple program to put an assembler subroutine into memory from the cassette tape.

This program uses several of the features of the ATARI that have not yet been fully documented. It reads the assembled code off the tape, determines the memory locations of the code, and puts the program into data statements that can be used permanently. The data statements are now part of the program and can be saved or stored as part of the program. This way, the program does not have to be loaded manually every time it is run. Thus, a BASIC program writes another BASIC program which is a part of it and then runs itself. The addition is put into lines 100-200 and becomes a permanent part of the program.

One of the difficulties with the use of long subroutines written using the Assembler Cartridge and stored on a cassette is the necessity of loading it every time it is used. However, loading the subroutine into memory is time consuming. The alternate possibility is to put the subroutine into DATA statements and poking it into the proper memory. This will make it a permanent part of a program and make the subroutine easy to load. This involves a translation from hexadecimal into decimal and putting it properly into DATA. However, there is an easier way to do this.

The following program assures that you have an assembled subroutine on tape and you wish to put it into an existing program. The program is written to reside at the end of a program and an IF / GO SUB statement is needed before line 100 to ask if the subroutine needs loading. If the answer is no, then the program just continues. If yes, then the subroutine is put into DATA statements and added to the program. It is assumed that lines 100-200 are empty and that the program is no more than 320 memory units long.

Lines 20000-20020 just ask if the system is ready. Line 20030 prevents read errors. Lines 20040-20060 read the first four bits of the tape, throws away the first two bytes, and translates the high and low bytes of the start location of the subroutine. Lines 20070-20080 get the bytes of the end of the subroutine. Lines 20090-20120 clear the screen, put the cursor at location 2,4, and then writes a line of code on the screen. Another line is written, then the word "CONT", before the cursor is put back at the top of the screen. Location 842 signals the system if return is pressed, and a 13 in that location is a signal that return has been pressed. A 12 turns off the signal. Thus, a 13 is packed into 842 and the system thinks that a line of code has been written. The system will then stop and read the continue line and then continues onto the next line of the program which turns off the return signal by poking a 12 842. This is again repeated in lines 20130-20160.

The next part of the program starts writing data statements which contain the information on the cassette. Lines 20180-20260 take line numbers, add the word data to the line, read a byte of the cassette, print the byte, and separate the bytes by commas. After eight bytes are read, the last comma is deleted, and the line is printed and stored in the program. This is done until all of the cassette has been read. Then another line is read and the cassette is closed. Lines 21000-21080 then write a for-next loop that will read the numbers in the data statements and poke them into the right locations. When the program returns from the subroutine, the data statements are in place, and the for/next loop loads the data statements into memory and the subroutine is ready to be run with a USR statement starting at location substart. □

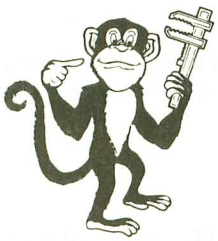
```
20000 PRINT "THIS WILL ADD YOUR SUBROU
TINE TO LINES 100-200. PLEASE BE SURE
THAT THERE IS NOTHING THERE."
20020 PRINT "POSITION THE TAPE TO THE
START OF YOUR PROGRAM AND PRESS PLAY A
ND RETURN WHEN NEEDED."
20030 TRAP 21000
20040 OPEN #1,4,0,"C:":GET #1,X:GET #1
,X
20050 GET #1,X:GET #1,Y
20060 SUBSTART=X+256*Y
```

```
20070 GET #1,X:GET #1,Y
20080 SUBEND=X+256*Y
20090 PRINT CHR$(125):POSITION 2,4
20100 PRINT "105 SUBSTART=";SUBSTART
20140 PRINT "108 SUBEND=";SUBEND:PRINT
 :PRINT "CONT":POSITION 2,0
20150 POKE 842,13:STOP
20160 POKE 842,12
20170 A=INT((SUBEND-SUBSTART)/8+1)
20180 FOR LINE=110 TO 110+2*A STEP 2
20190 PRINT CHR$(125):POSITION 2,4
20200 PRINT LINE;" DATA ";
20210 FOR J=1 TO 8
20220 GET #1,X:PRINT X;",";:NEXT J
20230 PRINT CHR$(158):PRINT :PRINT "CO
NT":POSITION 2,0
20240 POKE 842,13:STOP
20250 POKE 842,12
20260 NEXT LINE
21000 PRINT :PRINT "CONT":POSITION 2,0
:POKE 842,13:STOP
21003 POKE 842,12
21005 CLOSE #1:PRINT CHR$(125):POSITIO
N 2,4
21010 PRINT "190 FOR X=SUBSTART TO SUB
END"
21050 PRINT "193 READ Y:POKE X,Y:NEXT
X":PRINT :PRINT "CONT":POSITION 2,0
21060 POKE 842,13:STOP
21070 POKE 842,12
21080 RETURN
```

ABOUT THE COVER...

The design for the cover was created as follows: 35mm slides were taken of various large-format circuit negatives which were illuminated from behind on a light table. The slides were developed and projected onto "The Face;" a piece of sculpture prepared from a styrofoam wig stand. The wig stand head was sliced down the middle and then mounted on a white sheet of plastic. A glaze was applied to both the head and the plastic board, then both were painted flat white, to enhance the reflectivity for the projection of the circuitry pattern. Thin pieces of plexiglas were then painted black, leaving clear patterns in the shape of small ATARI logos. These plexiglas pieces were mounted in the eyes of the head and were back-lit to reveal the ATARI logo. As with the last cover, the exposures of the elements were "piled up" on the same frame of film (the background and face exposed as one element, then the eyes as a second exposure). These elements were shot with different color filters for the final effect — the cover to issue #6 of A.N.A.L.O.G.

7 ATARI PRODUCTS



THE MONKEY WRENCH

The Monkey Wrench is a machine language ROM cartridge which extends the operating capability of the ATARI 800 computer. The Monkey Wrench provides 9 new BASIC commands. They are:

- Auto Line Numbering – Provides new line numbers when entering BASIC program lines.
- Delete Line Numbers – Removes a range of BASIC line numbers.
- Renumber – Renumbers BASIC's line numbers including internal references.
- Cursor Exchange – Allows usage of the cursor keys without holding down the CTRL key.
- Change Margins – Provides the capability to easily change the screen margins.
- Memory Test – Provides the capability to test RAM memory.
- Hex Conversion – Converts a hexidecimal number to a decimal number.
- Decimal Conversion – Converts a decimal number to a hexidecimal number.
- Monitor – Enter the machine language monitor. In addition to the BASIC commands, the Monkey Wrench also contains a machine language monitor with 15 commands used to interact with the powerful features of the 6502 microprocessor

Cartridge and Manual – $49.95

TYPING EXERCISE FOR ATARI

Typing Exercise is a great educational program for those who wish to improve their typing skills. Typing Exercise consits of two programs. TYPING 1 contains 13 typing drills; 9 drills progress thru alphabet and 4 thru numerics. TYPING 2 is a timed typing test. Time and words per minute are calculated for you. . . . . **810 Diskette – $12.95**

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The EPROM cartridge is a specially designed printed circuit board which will allow the user to install his or her own EPROM software. Uses 2716, 2532, 2732, type EPROMs

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Commodore UIC-20 Computer $265.00
Syncom or Memorex 5¼" disks . . . . . 10 for $30.00
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Starwriter 25 cps printer with tractors Parallel Interface $1645.00

MAE (Macro Assembler Editor)

MAE contains the most powerful 6502 assembler and test editor currently on the market. If you are looking for a professional development tool that can greatly increase the productivity of your programming staff, then MAE may be the answer. The following are just some of MAE's features – Write for detailed spec sheet:

- MAE was written entirely in machine language – not in Basic like some assemblers we know of. Thus you get very fast and accurate assemblies.
- Contains a machine language monitor with numerous commands for debugging machine code.
- 38 error codes, 27 commands, 26 pseudo ops, and 5 conditional assembly operators.
- Contains a word processor, example files, and learning aid.
- Requires at least 32K of memory.
- All commands oriented for disk operation with ATARI 810 disk drive.
- Macro, Conditional Assembly, and Interactive Asembly capability.
- Sorted Symbol Table.
- Optionally creates executable object code in memory or relocatable object code on disk.
- 50 page manual.

810 Diskette and Manual – $169.95
(requires license agreement)

MACRO ASSEMBLER AND TEXT EDITOR (ASSM/TED)

ASSM/TED is a high powered Macro assembler and text editor for use with ATARI 800 computers with at least 40K of memory.

- Written entirely in Machine Language – Not in Basic like some we know of. Thus you get very fast and accurate assemblies.
- 36 Error Codes, 26 Commands, 22 Pseudo ops.
- Macro and Conditional Assembly Capability.
- Input/Output of source files to cassette deck.
- Multiple source files on cassette may be assembled.
- Built-in machine language monitor. . . . . **Cassette and Manual – $49.95**

810 Diskette and Manual – $53.95

MACHINE LANGUAGE MONITOR FOR ATARI

The Machine Language Monitor for ATARI provides 21 commands which allows the user the ability to interact with the 6502 microprocessor. It is compatible with ATARI BASIC and (once loaded) is ready for your use at anytime. The monitor comes on cassette or on diskette for the ATARI 810 disk.

Cassette version – $24.95 Diskette version – $29.95

MEMORY TEST FOR ATARI

When you purchase a new ATARI or add on new RAM modules, you need to be sure that the memory is working properly. Remember, you only have a short guarantee on your memory. Memory Test performs the most extensive memory check available. . . . . **Cassette and Manual – $6.95**

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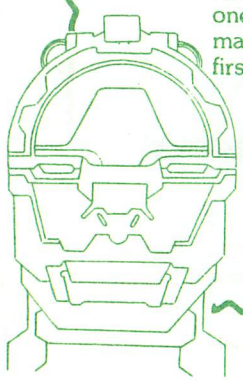
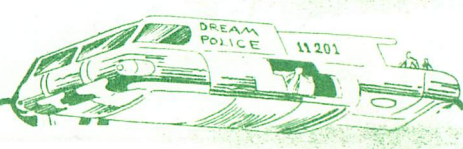
King Arthur—You are Sir Lancelot in the days of King Arthur. You have been called to find and rescue Guinevere from an evil sorcerer who has stolent her away. You must buy armor and supplies and find the bottomless cave in the Emerald Mountain.
Olympus—Prepare to embark on a great sea odyssey as the captain of the Argos. With a group of brave warriors you seek the golden fleece.
Captain Nemo—You lead an expedition to find the lost city of Atlantis. You are the captain of a new experimental diving apparatus . . . with a few bugs to be checked out.
Dante's Inferno—You stand at the gate of Hades. A wise old magus approaches you and offers help and advice. He spreads out 8 tarot cards and warns of hideous demons and bottomless pits . . . Dante's Inferno awaits you!

TREASURE ISLAND $39.95 You must navigate the treacherous seas using an old treasure map and seek out which island the pirates have buried their treasure on. There are over 21 islands and 128 hires screens. This is not a screen scrolling game but also uses static graphics and understands more than 100 input commands.

BERMUDA EXPERIENCE $39.95 Off the coast of Florida near the Carribean the icy blue waters of the Atlantic are particularly menacing. It is within this area that many aircraft and ships have mysteriously disappeared, never to be heard from again! Some credit these phenomena to tricky currents, strange weather changes, and even to unexplainable magnetic fields which change with little or no warning. Many fishing boats have been found floating in undisturbed waters, half eaten food, unfinished beers, and no evidence of struggle—totally deserted. In this action-packed game, we try to capture some of the flavor of this mysterious area. It features our scrolling techniques and some fine hires graphics and sound.

HAUNTED PALACE $49.95 There has been a murder. It all started with the grisly discovery of a charred body in the furnace. The corpse was so badly burned that the mortician couldn't even tell which sex it was. You can choose to become any one of the six characters in this game. Your role is to find out who is responsible for the murder. There are over 640 views in the mansion. All views are in 3-D perspective and movement is controlled by joystick in the Atari 800. There is a $500 prize for the first to solve the mystery!





Recently Crystalware released some promotional material which contained a review attributed to *Analog* magazine. This credit was in error as that review was actually done by another party. Crystalware regrets the mistake and apologizes for any inconvenience caused because of it.

ZARDON $49.95 In the far reaches of space is an asteroid called Zardon. It is held by a fierce race of Cybords—highly sophisticated androids. This space rock is honeycombed with countless caves. In the center is the rare Simian Jewel from the place of the Meshim on Mars. The passage ways are guarded by banks of lasar gunners, scramble fields, high energy voeres. To win, you must safely navigate your vessel to the center of Zardon and figure out to get the jewel.

THUMPER $39.95 This little rabbit is stranded 10 miles from his burrow and must cross several roads, a treacherous stream, avoid lethal traps, and avoid the wily fix to find his way home. Features vertical scrolling and a 4-way sound.

WATERLOO $49.95 This is a two-player game with your opponent commanding the opposition and you taking the part of Napoleon. As you approach this final battle, you are equipped with the same forces, face the same enemies, and survey the same terrain as Napoleon did. The game includes a high resolution scrolling map.

CLONUS II $39.95 You wander into a city of the future in the year 2086. You have no money or belongings, but you have the task of somehow manufacturing a clone of yourself. You may sell any parts of your body except for your head and you may gamble in one of the craziest casinos you will ever encounter in this lifetime. The object is to build a clone but the city is more extensive.

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Moonbase Io combines three exciting arcade adventures in one exciting game. The machine-language program by John Konopa uses advanced graphics and sound effects. Action is fast and exciting—varying levels of skill required to go from one part of the game to the next.

BEYOND SOFTWARE

BEYOND SOFTWARE's arcade-adventures are the next generation in computer games for the ATARI™ computer. A voice-activated program will help you meet and overcome the challenge—it may be an alien invasion, a fiendish murderer preying on a country village or a treasure trove buried deep in the shark-infested sea.

Moonbase Io is available at fine computer dealers. Or, directly from PDI for $29.95 plus $2.00 shipping and handling.

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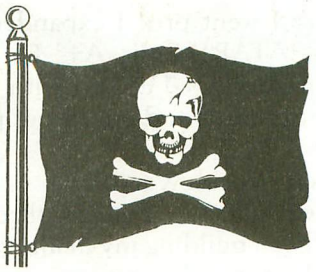
Pirating!!!



This is your captain B.B. ROBERTS speaking. Those of you who are crew (pirates or would be pirates) and those of you who are passengers (the 'good' guys who wouldn't 'dream' of being a software pirate), hear me and hear me well. If ye have the common sense God gave a barnacle, ye shall heed the lesson I'm about to give.

If not, make ready for your personal damnation! It is coming!

Those of you who have heard the name B.B. Roberts are aware that I am the infamous software pirate who advertised software by ATARI and others for sale at ridiculously low prices. Those of you who had a chance but didn't order 'know' that I am a fradulent thief who was going to take your money and run without delivering as advertised.

Come join me, ye knowledgeable ones, as we journey through the world of underground blasphemy. Let us sail the waters of a troubled industry, troubled mostly because of the 'good' people. Accept, if you dare, with the closed minds being what they are, the admission of responsibility and the awareness of reality as told through a channel of an unfamiliar media — the truth! For what you are about to read is just that — the total truth! With the enclosed bitterness, fears, justifications, hypocrisies, and all — it is the truth!

Let's begin with some history.

I am a relatively decent person — family, middle class home and neighborhood, etc. Being human, I suffer the same maladies that are inherent in ALL humans. One of them is the presence of larceny in my soul. Some let this larceny control their lives (you see their pictures on post office walls). Some allow it to surface upon opportunity (some legitimate professions, find a wallet, income tax time, etc.) and some slip once or twice in their lifetime (ala B.B. Roberts). I choose to accept that only one person has ever existed who didn't have this characteristic.

About a year ago, I slipped. At the time I belonged to a very small group of men who were into a joint venture called 'buy one piece of software and dupe a few for the group'. You, of course, have barely heard of the existence of these little sub-organizations, but you don't personally know of any. Well, they do exist. And they all have the same primary hypocritical justification we had — we weren't hurting the software people 'that much'. Just a few copies for us guys. Besides they sure were charging a lot and 75% of what we bought was rotten software, etc.

At the time our duping capabilities were limited. We could only dupe what DOS would handle. This was before the dupe disks available today were so prevalent (Mirror Image, Superdup, etc.)

Then, all of a sudden, we had access to a duper that made short work of Visicalc! Slammed it out as if it were melted butter! How about that — Visicalc for the price of a disk!

That's where I slipped! I then began to formulate my brilliant master-plan! It didn't matter that the duper would ONLY dupe Visicalc and nothing else. There was a decent market out there for that one.

Sure, I had my own perfect justifications for the slip! I made the mistake of listening to the complaints of non-support from ATARI, over priced items from everyone and the software companies shipping bad merchandise. Hell, the whole world would be on my side and everyone would buy from me. Brilliant idea!

I then set up the operation. I started getting a P.O. Box outside of my area with a forwarding address that wasn't even mine and a few other 'intelligent' tricks to prevent my being caught. Boy, was I one sharp cookie!

I sent out one small mailer on Visicalc alone of about 50 pieces. It was a crude photocopied piece, one page. I received a smattering response for a freebie I offered and one order for two Visicalc — CHECK enclosed. The only problem was that the order came from an area 500 miles away from where I sent the 50 pieces and it was from a person I didn't even mail an offering to!!!

Tricky devils! Personal Software (producers of Visicalc) had an employee send in the order with her personal check. Easy enough to see through. Boy, was I smart! I tore the check up and threw it away. I had a system to cash the checks without being traced, but this one probably had to stop payment and bank alert on it anyway. Why bother with it?

I let the master plan slide for awhile while I waited to obtain a master duper for everything and to see what developed from the first mailer. Aha! Just as I thought — not too much heat. Didn't stir up the waters too much. This would be a piece of cake! (Little did I know!)

Here's where I went pro! I expanded to include other items — ATARI, Basic A+, Forth and Text Wizard. I even developed a logo with a cartooned pirate. I had letterheads and envelopes printed up. I really went pro!

I then created World War III.

I sent out exactly 200 mailers throughout the country. I had been building my mailing list over the last few months through magazines, user's groups newsletters, etc. My list was far from comprehensive. I didn't even know if they had disk drives and disks were the only things I offered — no cassettes.

At this point something happened. Something that is important to me regardless of whether anyone else accepts it. About three days after I mailed out the 200 pieces, it dawned on me. Good old smart me wasn't so smart! In fact, I was downright stupid!

"I could see where the available GOOD programs weren't overpriced at all."

First, I didn't need to stoop to such a low level to make bucks. Secondly, I had started to do some serious programming and I could see where the available GOOD programs weren't over priced at all. I now KNOW that Visicalc is a steal at anything it's retailing for — not just for what it took to develop it, but also and mostly for what it does for the user. What power!

Basic A+, Forth, and Text Wizard are bargains at any price.

Thirdly, ATARI released Scram for $19.95 (the instruction manual alone is worth that — it's a damned good book!) and their ATARI Exchange not only is issuing programs at unbelievably low prices, it is even pointing out the good and bad points of each. This kind of marketing and pricing is as fair as you can get.

So — with this revelation or return to the norm — MY norm — the B.B. Roberts project died a natural death. The response to my last mailer remained in the P.O. Box in Las Vegas via my instructions to hold onto them until I had a new forwarding address. I have no idea who ordered what — never did personally receive a one. Never did open an envelope or cash a check. Never made a dime!

This is why I started earlier in this statement that those of you who ordered from me 'know' I don't exist. For all I know, your orders and checks may still be in the box in Las Vegas. This I do know — not a one of you has a cancelled check in your hands!

I don't know how long dead letter situations take, but if you haven't received your letter back, have patience — it's coming someday.

For whatever this is worth, I lost more money on this venture than meets the eye. I'd tell you how much, but you wouldn't believe me; you'd insist on details, and the details don't matter.

I lost a bundle!

But I had to accept that because I created that. I also accepted it because the trade-off was in my favor; I'd lost a crummy thing called money but I'd found a more important thing — ME!

And if this sounds schmaltzy and melodramatic to you, that's okay. Because I have one over one most of you — I KNOW where I'm coming from. After you read the rest of this, you'll have trouble saying the same thing!

If this is beginning to sound as if I'm burned at you, please forgive me. I'm not! I don't even know you. What I am bitter about is the hypocritical attitude of some people I do know and with the way reaction has gone towards this thing, it's becoming evident to me that this attitude isn't too uncommon!

Anyway, back to the main theme.

Enter World War III.

At first just a couple of sneak attacks — a small notice in a San Diego user's group and Michigan Users group newsletters. There were undoubtedly other notices in other newsletters, but those were the only two I saw.

Then the major attacks — a couple of LARGE articles in a couple of major computer magazines. Info World was one and I don't know the name of the other. I had just heard in passing about a second and I, of course, didn't want to sound too interested so I didn't push it. (I would like to commend Paul Freiberger on his writing of the article in Info World — great piece of OBJECTIVE coverage. I'd like to meet him someday.)

My God! What had I created? A lousy 200 piece mailer with no sales had turned into major coverage. I began to become a little concerned.

Then the major invasion hit!

I received a phone call from one of the two unforeseens who represented the other unforeseen. A private investigator hired by ATARI!

Let this be Lesson No. 1 for those of you who are paying attention! And this is not a new lesson for me learned through this incident. Anyone with any intelligence has to know this: You definitely cannot hide for long if TWO factors are involved. (1) If you have to depend on response to your activity and (2) if there is a dedicated effort to find you. With only one of these factors taking place, it is possible to hide, if you're sharp enough. Both together — not a chance!

With my awareness of Lesson No. 1, had I known anyone would concentrate on finding me, I'd have

never started it. I had assumed it would just be 'another' case of piracy and be put in the book with the others.

Oh, well, we'll see if we can trip him, her, or them up by tracing a cashed check or something. Sure!

If you get nothing else from this statement, get this — ATARI, at least, will stop you! They will throw the Howitzers at you, unleash the Vikings, roll out the tanks, spring the mad dogs, spare NO expense! Take it from me, I KNOW!

And they'll do most of this with one simple phone call! They'll call Dennis!

If you ever have anyone after your body, pray it isn't Dennis. If it is, just sit down and light up. He'll be there before you snuff it out.

Maybe you're one of the people who goes to work each day because, what the hell, it is a job and it does feed you. If you're lucky, you go to an enjoyable job! If you're really lucky, you look forward to going to work.

Dennis is none of the above. His work isn't work! It's his fix! I honest to God think he would do it for free! But he doesn't. He's very expensive and very much in demand because he's very effective. Put those arguments in your ATARI and they only come out one way — RESULTS!

When Dennis breaks loose, from minute one, it's a challenge to him as to who's smarter, you or him. Believe me, he is!

Here are a few tidbits to consider:

(1) He's far more experienced at finding people than they are at hiding. The normal hider tries to hide once, Dennis has found hundreds!

(2) He has the freedom to utilize any service or method in existence on his end. He can even turn to the underground for help. The hider can turn to no one. The minute the hider trusts one person, he's put up a billboard about his activities. I know! I trusted G.S. and it's the biggest price I'm paying! (G.S. is not his real initials — that stands for Girl Scout which is what G.S. turned out to be — at MY expense.)

(3) Dennis is a network! No — I don't mean the police, FBI, postal authorities or the other formal agencies.They're good and Dennis can use their services just by a phone call, but they're just not fast enough for him. I'm talking about THE 'NETWORK'! The select few HUNDRED other Dennis's throughout the country. They're the tightest knit family in the world. Take one of them on and you take them all on! The hider can only work alone. He has to go to Pittsburgh to hide in Pittsburgh. (How profound) Dennis has to just spend $1.20 on a phone call and the Pittsburgh division of Mad Dogs of America is unleashed to see who gets to you first! Try to visualize 37 angry, egotistical Dobermans after you at the same time in a small bathroom. That's exactly what it's like and exactly what your odds are!

(4) And Dennis — all 200 of him (or whatever the number is) — is GOOD! He doesn't work cheap, because he's good! He's very good!

Combine Dennis's ability, experience, and contracts with ATARI's vindictiveness and money and bang! You're dead!

It took Dennis less than 48 hours to find me. By his own admission, I was one of the sharper ones. I only made 9 or 10 little mistakes.

When Dennis called me, he claimed I wasn't under suspicion and that he was calling me because the trail had led to my area and I was 'just' one of the computer fellas in the area. Right!

He told me he was at the airport and he was catching a plane into my area in a few minutes and asked if he could call on me the next day. If you want a small idea of his joy, he was calling from Las Vegas and it was night time when he called. He is not an eight to fiver!

"I knew it was only a matter of time, a short process of elimination before he had me...ATARI hadn't been messing around."

I told him I would expect his call the next day.

I then called the airport to check on the flights coming into the area from Las Vegas. When it was time for his arrival, I went to the airport to meet him. I knew it was only a matter of time, a short process of elimination before he had me. I had a pretty good feeling he already had me. Might as well get it over with. And after all, I really hadn't done anything wrong, had I? Hadn't sold one piece or accepted one dime.

When I finally tracked him down at the airport, I was a bit surprised to find he didn't look like Jim Rockford. In fact, my first impulse was to ask where his bear was. He's a mountain man! At least in appearance. Full beard, rope for a belt and all. It took about three minutes to see behind that image. This guy was an investigator!

I told him I was B.B. Roberts before we were even in the car. His response was, "Yes, I know." And those three words were not stated in a tone of trying to impress. If anything, there was a touch of sadness in his voice. I'm not sure if it was because he'd met a fellow man who had done a stupid thing or because my admission had deprived him of the final kill!

He went right to the house. He met my family. He began to hear the total story of B.B. Roberts.

We then spent the next hours in a coffee shop while he asked me questions and I answered them.

He told me about the various formal agencies looking for me and some of the methods used to track me down (network, etc.). The only agency not involved was the Daughters of the American Revolution! Everyone else was into the act! And as I'm writing this right now, I know he didn't tell me any more than was safe to tell. I'm sure he didn't disclose any of the fancy methods used in his work. Why tell me. I may just open a new office next week and he might as well save the good stuff for then.

Was he telling the truth about all the people involved in this? Or was he just trying to scare me? Well, I stood by the phone while he made no less than eight phone calls THROUGHOUT THE COUNTRY to call off the dogs! And he was hauling some of them out of a night's sleep to tell them. It was that important!

ATARI hadn't been messing around. I was beginning to feel lucky I hadn't been shotgunned!

I asked him not to divulge my name since it would accomplish nothing. He stated he was under contractual obligation to tell ATARI but, after having met me and my family, he would recommend non-disclosure. To my knowledge, he's kept his word.

The only good thing for me that has come out of this was to meet Dennis. Helluva man!

A few days later I received a call from ATARI's attorneys about the situation. They weren't too thrilled about what I had done and their initial impulse was to publicly crucify me. Can't say that I blame them. About the only thing that MAY prevent that is the fact that I didn't sell anything or accept any money. Hopefully, what plea bargaining has taken place will hold.

And did you catch that key word 'MAY'? ATARI could blow the whistle and they, of course, have the right to do so. If they do, I can hold no vindictiveness, because I created the situation, they didn't.

There is one point I would like to get across before I conclude the history section and get into the lesson section.

I'm not writing this statement out of my fear of consequences because it is not any kind of guarantee that I'm safe from anything. I've been told that I broke a few laws by just writing the letter and I'm going to accept that without any research because I don't care to convince anyone or even feel that what I did was okay. Or even remotely justified!

I'm not saying I don't fear any consequences, I'm saying that is NOT why I'm writing this statement.

I'm writing it because I did a stupid, wrong thing! I cost some people some expense and I had no reason to do that. I'm also writing it in the hopes that anybody reading it might think twice about trying it! If you are, the entire point of this statement, which can be summarized in six words, will have been lost! You'll lose! No one will win!

The price to pay at this point of writing is having to live with what my escapade cost ATARI. (Not to mention the dollars it cost me) I don't know the exact figure they've spent but I'd hate to have to pay it back. I feel bad enough about their expending those monies. Needless to say, I'd feel even worse if they decided to come after me for it. And they CAN come after me for those monies.

More price — the disclosure! It's already had it's effect. Remember G.S.? Well, he knew about the B.B. Roberts thing at its conception and when Dennis talked to him on the phone (Dennis called a few people in this area), good old G.S. panicked and decided he didn't want anything to do with a low-lifer like me! That part's okay because there was no loss on my part. What did matter to me is that in his panic he decided to tell a few other 'good' people about the inquiry about me. He, of course, didn't bother to disclose that he knew about B.B. a year ago. That would be self-incriminating.

"I cost some people some expense and I had no reason to do that."

The price? Not one of the 'good' people had whatever it takes to call me and ask me if G.S.'s 'opinions' were correct! You see, G.S. couldn't tell them he 'knew', he could only express an opinion. If he told them he knew, they'd wonder how he knew and then his half-truth would be no truth and so on. So, he just told them about Dennis's call and that I was under suspicion. (I know for a fact Dennis didn't tell him that — he just threw that in to make a good story). So the rest of the 'good' guys bought it! INSTANT leprosy. Real fun to live with. I don't know about you, but I consider that one enormous price to pay!

Shall we throw in the price of hypocrisy? Back to good old G.S. He's a real technical genius when it comes to the ATARI and it seems he's spending his time developing an even better duper than the last duper he developed. He had plans to market this one until he found out someone has already beat him to it.

Now that, of course, is okay! Putting a duper out to market. It's LEGAL! Morality? What the hell's that? Everyone else is doing it, so why shouldn't I? (Justification #132)

Piracy? How dastardly? How low-life can you get?

Now wait a minute there! Of course it's okay to dupe a few for our friends (we will hide our head in the sand about the five friends duping for five friends duping for five friends, ad infinitum). But it's NOT okay to sell them.

Your honor, I only held up an orphanage with a knife, NOT a bank with a gun! That's criminal! I wouldn't do that!

Do yourself a favor, reader. DON'T, for one minute, think your 'friends' won't crack under the slightest pressure for the slightest reason. They'd rather kiss you off than sink with you if they think you're being shot down by the authorities. It's a bitter lesson to learn.

The price is just too high!

In the same issue of Info World that had the article on B.B. Roberts there also appeared an article by the company that produces Basic A+. The gentleman who wrote that article took great care in outlining the profit structure on a $150 Basic A+ package. I have to concur with the entire article. The one major point he stated and I have to endorse — if you were one of the people who ordered from B.B. Roberts, you could count on a no-service situation. When your $50 disc (the price I was charging) went south on you — you'd have nowhere to turn for service or update. It isn't that I wouldn't do it out of policy. It's because I wouldn't be around to help you. I would have either been caught by then or made my million and gone south myself cause us smart criminal minds know the longer we stick around the higher the odds of getting nailed. (Anything over 48 hours is trouble).

You do get what you pay for in this life.

Well, that's the B.B. Roberts thing. Dug up from the grave, told from the source, and buried one final time at sea — for good! B.B. Roberts is no more!

By the way, I'm asked where I got the name. Ever hear of Black Bear? Know who he is? Well, it seems there was a Bartholemew Roberts a while back who used to cavort on English waters in his little boat with a few buddies — guys like Henry Morgan, Blackbeard, etc...

Do something! Sit down right now and write a sincere thank you letter to your favorite software company for the uphill running they're doing.

Because, you see, the B.B. Roberts are NOT the problem the software companies have to deal with. Not even remotely!

Go ahead. Find a place right now where you can 'buy' a pirated copy of software. Not too easy to do.

About the only reason I created World War III was because I charged a price and I advertised it.

No — the hundreds or maybe even thousands of 'good' people out there are the major problem. And they are spawned by the greed of the companies who buy (or steal) the dupe programs from the 'moles'.

The sequence goes something like this:

First the moles — these are the little guys who are technical geniuses and rarely, if ever, touch their computers until a new and more effective protect system come out. Then they remove the moth balls and go to work digging away at pokes and bytes until they find a way to crack the new product system. That in itself is okay in a way if they just used it for themselves but a thing called ego or 'I need strokes' enters the picture.

"See how smart I am Fred! I built a new duper to dupe the new 'non-duper'."

"Wow, John, you're sure smart! Can I have a dupe of the duper?"

"Sure. If you promise not to dupe the duper."

"Sure. I promise."

Sure!

Enter the greed. Normally the company who markets the duper hasn't, collectively, the brains to create it. The mind that creates it is not a marketing mind. The marketing entities either steal it or pay a royalty for it. The 'who did what' doesn't matter.

It is marketed. A few 'good' people buy dupers and dupe the dupers for their friends — other 'good' people. Now all the 'good' people have dupers.

The cycle goes on! And where does it end? It doesn't! The moles, the greed and the 'good' people will always be there.

There is only one small consolation to this problem. The 'collectors'? More ego! These are the ones who 'collect' everything to show how neat their library is.

I know a number of people who own some good software and the ratio goes something like this: 1 out of 12 of each program, on the average, is an original issued by the producing companies. About 1 out of 20 of each program is being utilized by the owner!

The consolation — those 'collectors' wouldn't have bought those programs anyway!

But then — there are the games!

I am sincerely pleased that you are not guilty of this type of activity. I am even seriously pleased that you are offended that I might even remotely begin to think that you might be.

Tell you what.

Since I'm so cool and since I have such a neat library and since I have a duper that will dupe all these good things (see how cool I am), send me your address and I'll come over. In a few minutes, you'll have Visicalc, Fantasy 2041, Jawbreakers and a few more.

Well, hell yes, I have 'Missile Command'. I told you I was good, didn't I?

Golly, Ralph. Since you're my friend, it'll cost you a beer.

HOW ARE YOU GOING TO HANDLE THAT ONE 'GOOD' PEOPLE? YOU JUST SAVED OVER $200!!!!!

Yes, I'm sure you'll pass! □

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Speeding Up BASIC

by Robert Rochon

The ATARI is a very powerful computer with many hidden features not available on other micros. If you're like me you want to use the ATARI to its limits in every program. The limiting factor, however, always seems to be the execution time (speed) of the program. What a pity you can't use STATIC RAM on the ATARI.

There are however many tricks to dramatically increase the speed of the program. Although some of the savings seem small (eg.1/120 sec.) they are frequently used often enough to bring noticable changes. One real time routine of mine has been sped up 3X faster by using simple tricks. Here are some of my tricks I use to speed up my programs.

-1- Avoid using simple exponents (eg.64 2). Use 64*64 instead. This is my biggest saver. It saves ¼ second every time it is used. Also avoid SIN and COS if possible.

-2- My favorite speed up is eliminating FOR NEXT loops. The FOR NEXT part of the loop requires about .003 to .006 (1/350 to 1/175) seconds to execute. If you eliminate 10 or more loops the savings will be enormous.

-3- Put your critical routines at the beginning of the program. Loops and Branches execute faster there. This is because the computer searches each line starting from the lowest to find the FOR TO command or the line # the computer will GOTO.

-4- Using 30 * RND(0) rather than the more common RND(0) * 30 saves about .008 (1/250) of a second. Since it uses no extra memory it should be used always.

-5- When doing animation in GR.0 use CHR$(29) rather than the command GR.0 to clear the screen. This saves .009 (1/110) seconds.

-6- When using GR.0 to display changing data note that it takes ½ as long as print on the top line of the screen rather than the bottom line. This is also true for drawing in the graphics modes.

-7- Using a GOSUB and a RETURN rather than two GOTO's saves about .0015(1/700) seconds.

-8- Using a lower resolution mode will save time in program execution. Every line in the program will run faster. GRAPHICS1 and GRAPHICS2 run about 15% faster than GRAPHICS0. GRAPHICS3 and GRAPHICS5 run about 10% faster than GRAPHICS7.

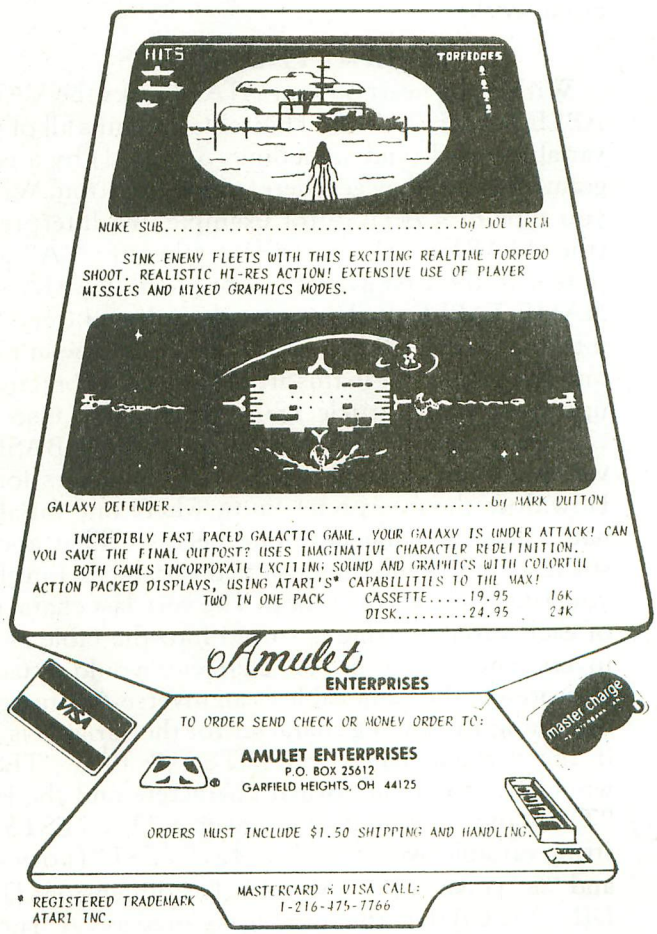
-9- When using all 9 positions in a joystick routine use

```
100 GOTO STICK (0) + 100
105 X = 5: GOTO 120
106 X = 6: GOTO 120
107 X = 7: GOTO 120
109 X = 9: GOTO 120
110 X = 10: GOTO 120
111 X = 11: GOTO 120
113 X = 13: GOTO 120
114 X = 14: GOTO 120
115 X = 15: GOTO 120
```

```
100 ST = STICK (0)
105 IF ST = 5 THEN X = 5
106 IF ST = 6 THEN X = 6
107 IF ST = 7 THEN X = 7
109 IF ST = 9 THEN X = 9
110 IF ST = 10 THEN X = 10
111 IF ST = 11 THEN X = 11
113 IF ST = 13 THEN X = 13
114 IF ST = 14 THEN X = 14
115 IF ST = 15 THEN X = 15
```

This routine saves about .016(1/70) seconds every time it is executed. It also uses a lot less memory by avoiding 9 IF THEN statements.

-10- Using PLAYER - MISSILES for animation is typically 3 - 10 X faster than using PLOT and DRAWTO.□



UTILITY#1: VARIABLE LISTER

By Tony Messina

Have you ever written a program and then tried to go back and document all of the variables that were used? If you're one of the elite 10% who are organized, you probably wrote down all of your variables and their meanings as you wrote the program. If you're like the other 90% of us who write a program and then spend several agonizing hours documenting it, then help has arrived. The following utility was written to help me keep track of my variables. It doesn't tell me what I used them for, but it does tell me what I used. This utility is just the start of another utility I'm working on (a cross-reference program). You can run out and spend anywhere from $9.00 to $45.00 for any of a multitude of utilities, but I don't have much money — and writing the things myself has taught me more about the inner workings of the ATARI than any listing could. Let me explain how your ATARI stores variable names. It will help you to understand how and why the program works.

BEHIND THE SCENES

Within the heart of your ATARI lurks the VARIABLE NAME TABLE. This table contains all of the variables used (and sometimes not used) by a program. How do they get there? Good question. When you type in < A=10 > for example, the interpreter (the ATARI BASIC cartridge) takes the "A" and puts it in the first available slot of the VARIABLE NAME TABLE. It also stores the value of our "A" into the VARIABLE VALUE TABLE. (I won't get into the value table in this article, but look for it in an upcoming utility article.) SOUNDS SIMPLE so far ...now enters THE CURVE. In ATARI BASIC, variable names can be up to 128 characters long. How does the interpreter know where one variable name ends and the next one begins? What about string variables and dimensioned variables?? I'm glad you asked. Here's the scoop. The very last character of each variable name is stored into the table as an inverse character. Our "A" character would actually be stored in the name table as an inverse A, since the beginning and ending character for the variable is A. If the variable name were "TEST", then "TES" would be stored as normal characters and the last "T" would be stored as an inverse "T". TEST$, a string variable, would be stored as "TEST" (normal) and "$" (inverse). If a variable has dimensions [i.e. DIM A (26)] then the variable is stored as "A" (normal) and "(" (inverse). I know some of you out there are saying, "AWWW, Messina's full of donkey dust!! There ain't no characters stored out there nowhere!!" Yes folks, that's true. What is actually stored in the VARIABLE NAME TABLE is the ASCII numbers of the characters I was speaking of. So for all of the technical folks reading this article, I would like to say EXCUUUUSE *ME!!!* Anyway... knowing what we do and knowing where the VARIABLE NAME TABLE starts, we should be able to go in and pick out all the variables in any given program.

How do we stop? Ooops. The end of the table is denoted by a blank byte following the last character of the last variable name. For the purpose of our utility, however, we want to stop picking off variables when we encounter the first variable of the utility program. Armed with this information, let's try our first experiment.

EXPERIMENT #1

```
5 REM TYPE A CONTROL COMMA BETWEEN THE
 QUOTES IN LINE 70 TO PRODUCE A HEART.
10 ? CHR$(125):REM * CLEAR SCREEN *
20 ? "ASCII","CHAR","ADDRESS":REM * HE
ADINGS *
30 A=10:TEST1=10:DIM B$(1),YES(5,5):RE
M * SAMPLE VARIABLES *
40 START=PEEK(130)+PEEK(131)*256:REM *
 GET DECIMAL START ADDRESS OF VAR NAME
 TABLE *
50 ? " ";PEEK(START)," ";CHR$(PEEK(STA
RT))," ";START:REM * PRINT ASCII, LETT
ER AND ADDRESS *
60 START=START+1:REM * GET NEXT ONE *
70 IF PEEK(START)=ASC("♥") THEN END :R
EM * IF BLANK THEN END *
80 GOTO 50:REM * GO PRINT NEXT CHARACT
ER *
```

As you can see, the variables for the program itself were printed to your screen. This was just a sample for the non-believers out there. The variables presented are representative of all types used by the ATARI: Regular, String and Dimensioned. Another thing you will notice is that the variables follow the order in which they were typed. Line 30 is the first place variables were typed in. If we look at the output of our program, we see that the variables follow the same order as line 30: A,TEST1,B$,YES and START. The address of each letter is also printed in the last column. This will be helpful when we conduct our other experiments, so type in this program. I also hope this little demo illustrated the points I made in the BEHIND THE SCENES section. Here is an explanation of how the utility operates.

THE PROGRAM

Listing 2 is the utility program. Program flow is as follows:

32500 clears the decks and initializes the utility variables. 32502 clears the screen and outputs a message to the printer. 32504 takes the contents of the current address and stores it in TEMP. A check is then made to see if TEMP is an inverse character (i.e. >=128) or if it is a blank. If one of the conditions is true, the program goes to the subroutine at line 32514 to find out what the character is. If neither condition is true, we drop through and store the value from TEMP and store it into the appropriate location in VAR$. We are building our variable name in VAR$ for output to the printer. A check is made of the error flag ERRER. If set, an asterisk is appended to our variable name in VAR$. If clear, then SKIP is checked. If it is set (set meaning it is equal to 1), then it's time to print our variable name. If clear (clear meaning it's equal to zero), we increment the current address CURADD, the character count CHARCNT and then go back for the next byte.

32514-32522 are the subroutine lines used to determine the type of variable. We get here if the value in TEMP was an inverse character or a blank. If the contents of TEMP is an ASCII Blank, then the program goes to line 32512, prints out some information and stops. If TEMP contains an inverse $, then we change it to a normal $ (TEMP-128) and Goto 32522. If TEMP contains an inverse (, then it is changed to a normal (and we go to 32522. If all of the above fail, then we assume an ASCII number or letter. It is changed to a normal character and a check is made to see if the new number falls between 48 and 90. If you look in APPENDIX C of the ATARI manual, you see that ASCII 48-90 contains the numbers, some other characters and then the letters A-Z. If the value in TEMP does not fall between any of these values, we have an error and the error flag is set. If everything is OK, line 32522 increments the number of variables VACNT, sets the skip flag SKIP to 1 and returns.

32524 appends an asterisk to our variable if an error occurred, sets ERRER back to 0 and returns.

32526-32528 check what is in the string VAR$. If the actual name VAR$ is there, then the program ends. If not, then the variable name and its address in RAM is printed. The character count CHARCNT is cleared (set to zero), SKIP is cleared, VAR$ is cleared and we return to build the next variable name.

32512 prints the start and end address of the name table. It also prints out the number of variables in the target program.

HOW TO USE IT

Type the program in exactly as shown in the listing. When you've finished, check everything and then save it using the LIST"D:VARLST" for disk or LIST"C:" for cassette commands. The reason we use LIST rather than CSAVE or SAVE"D:filename" is so that we can merge the utility with your target programs without disturbing anything. Once the program is saved you can load in any BASIC target program. By target program I don't mean a program that has targets in it, I mean any program you want to obtain a variable listing from, utilizing the utility. Once the target program is loaded, use the following commands to merge the utility. If you have a cassette, cue up the utility and type ENTER"C:" and hit RETURN. After the beeps, hit RETURN again and the program will load. For disk users, type in ENTER"D:VARLST". The program will then load from disk. Once the utility is loaded, type in (using direct mode), GOTO 32500 and the utility will do its thing. This utility is set up to output to the printer. If you don't have one, simply replace all LPRINT'S with PRINT'S. Be prepared to hit CONTROL 1 to stop the screen listing so you can copy the variable names. Hit CONTROL 1 again to resume output.

DIGGING DEEPER

You are probably wondering why I have the address printed out. If you don't want it printed, REPLACE line 32528 with the following:

```
32528 LPRINT VAR$: CHARCNT=0:
SKIP=0: VAR$="":RETURN
```

This will prevent the address from being printed and leave you with a clean piece of paper to document your program. There is a method to my madness in printing the address.

THE METHOD TO MY MADNESS

Consider this...if we know the address locations of our variable names, it would follow that if we POKE different characters into the table, we could change our variable names. This is not only true but offers other potential benefits and (if the reader is not careful) problems. BEWARE!! The following experiments should be tried after reading the following paragraph.

The interpreter does not care about variable names other than when they are initially defined. After that, it doesn't care. WHY? Well, once you define a variable, it is assigned a number from 128-255. The first variable is assigned 128, the second variable is assigned 129, etc....up to 255. In the tokenized version of your program these variable **NUMBER** assignments become important, not the names. When you list your program the interpreter scans the tokenized form of your program in memory, and matches all the numbers with KEYWORDS such as GOTO, REM, COLOR, etc. When he hits a variable number, 128 for example, it says "OH...This is a variable; its number is 128, but to me that's variable number 1. Let me go into the Variable Name Table and get the name. Since it's number 1, it is the first name in the table." Once the name is retrieved, it is put up on the display. All of

this happens in mere micro-seconds, but that's what your interpreter does. If we happen to change the names in the table, the interpreter will blindly go in and grab whatever is or isn't there. He grabs the variable name based on the NUMBER not the NAME. Remember the inverse character at the end of each variable name? Joe Interpreter uses this as a signal to tell him when he has gotten the whole thing. Enough theory, next experiment.

EXPERIMENT #2

Let's try changing some names. If you haven't done so, type in the short little example program at the beginning of this article. If you did type it in, then load it. RUN the program and follow along with me. On the screen you should see the variable A in inverse. Let's change it to Z. In direct mode type the following:

```
POKE ADDRESS,ASC("Z")
```

Make sure the Z is an inverse Z. The address will vary with the amount of RAM you have and the configuration, so use the address that is on the screen (i.e. the address given for variable A). Hit RETURN and when READY appears, LIST the program. The former statement A=10 will magically be replaced by Z=10...TRY IT!!! Let's try one more. Let's change TEST1 to BLAH1. First re-run the program, then in direct mode type the following:

```
POKE ADDRESS,ASC("B"):POKE ADDRESS+1,
ASC("L"):POKE ADDRESS+2,ASC("A"):POKE
ADDRESS+3,ASC("H")
```

Again, we have the starting address of TEST1. Since each letter occupies one byte, then T begins at the address listed in your output, E is located at the address+1, etc. Since the 1 is already there and in inverse, we don't have to use inverse letters in our POKE statements above. Use the regular old everyday non-inverse letters between the quotes. Hit RETURN and list the program. If you did everything right TEST1 will no longer be there, but is replaced by BLAH1. Of course, we only replaced variable names with those that had the same length. For experimenting use the same length name because you can really make a mess out of things. If you are adventurous, try anything!! Just remember that the variable names must end in an inverse character.

I've seen a program out there that does what we just did (and a little more) selling for $15.00!! YES, $15.00!!! Knowing what we know now, we should be able to write our own and use the $15.00 for something else. OK, you adventurous souls, here are the last experiments.

EXPERIMENT #3

Run the program again, then in direct mode type the following:

```
FOR Z=FIRSTADDR TO LASTADDR:
POKE Z,155: NEXT Z
```

Substitute the appropriate addresses on the screen for FIRSTADDR and LASTADDR. When READY appears, LIST the program. SURPRISE!!! All you see now is KEYWORDS. Not a variable in sight!! Now ya believe me when I say the interpreter doesn't care!! Run the program — yes, just type RUN!! SURPRISE II. It works just like normal. Except where the variables once were is now filled with empty space. WAHAPPENED?? The 155 poked into the NAME TABLE is a non-printing character. The interpreter picked up the name and even printed it on the screen... we just couldn't see it. You could do this to that SECRET program of yours and let your friend borrow it to test. When he lists it to learn all of your secrets, BOY... will he get a surprise! TRY IT!!! I have, and what a ruckus it caused. Be sure to save a copy of the original for yourself or YOU may be the one who is surprised!

THE LAST EXPERIMENT

For our last trick, try this. First load the program, or if you didn't save it, type it in again (SAVE it THIS TIME). Now RUN it. In direct mode, type the following:

```
FOR A=FIRSTADDR TO LASTADDR:
POKE A, ASC("CNTRL COMMA"):NEXT A
```

Again use the addresses that are on the screen. When READY appears, LIST the program. Check out all of the GARBAGE!! I'll let you figure it out for yourself. (HINT — The interpreter searches for inverse characters.)

FINAL NOTES

VARLST will interfere if your target program has the same line numbers as the utility. I started at 32500 as all of my program line numbers fall way below that figure. If necessary, change the line numbers higher or lower, but remember to change all of the GOSUBS and GOTO'S. Also, if your target has more than 119 variables in it, VARLST will not load. I've never seen a program with that many variables, but it is possible. If you have any variable names longer than 30 characters, VARLST will not work*. I hope I have aroused some interest out there without scaring you off. There is a lot more coming if you want it. Tell LEE PAPPAS how you feel. If I bored you to death, let him know (he'll let me know for sure). If you have any ideas for utilities you would like to see, let him know. If you have questions, comments, curses, etc....let him know. Other things I hope to present are a Cross Reference Utility, a little program that will change your variable names automatically (I won't charge you 15 buck, either), a make-your-own character set utility, and a line renumbering utility. If you have something you would like to present, submit it. DON'T WAIT ...DO IT!! Have fun experimenting. □

*Dimension VAR$ larger this case.

```
32500 CLR :DIM VAR$(30):TABLESTART=PEE
K(130)+PEEK(131)*256:CURADD=TABLESTART
:CHARCNT=1:VACNT=0:ERRER=0:INV=128
32502 SKIP=0:? "5":LPRINT "THE FOLLOWI
NG VARIABLES ARE IN THIS PROGRAM":FOR
X=1 TO 50:NEXT X
32504 TEMP=PEEK(CURADD):IF TEMP)=INV O
R TEMP=ASC("♥") THEN GOSUB 32514
32506 VAR$(CHARCNT,CHARCNT)=CHR$(TEMP)
:IF ERRER THEN GOSUB 32524
32508 IF SKIP THEN GOSUB 32526
32510 CURADD=CURADD+1:CHARCNT=CHARCNT+
1:GOTO 32504
32512 LPRINT :LPRINT "TABLESTART= ";TA
BLESTART:LPRINT "TABLE END = ";CURADD-
4:LPRINT "# OF VARIABLES= ";VACNT-1
32513 END
32514 IF TEMP=ASC("♥") THEN POP :GOTO
32512
32516 IF TEMP=ASC("[redacted]") THEN TEMP=TEMP-
128:GOTO 32522
32518 IF TEMP=ASC("[redacted]") THEN TEMP=TEMP-
128:GOTO 32522
32520 TEMP=TEMP-128:IF TEMP(48 OR TEMP
)90 THEN ERRER=1
32522 VACNT=VACNT+1:SKIP=1:RETURN
32524 VAR$(CHARCNT+1,CHARCNT+1)="[redacted]":ER
RER=0:RETURN
32526 IF VAR$="VAR$" THEN POP :GOTO 32
512
32528 LPRINT VAR$,,,"  ADDRESS= ";CURA
DD-CHARCNT+1:CHARCNT=0:SKIP=0:VAR$="":
RETURN
```

●

VCS UPDATE...

by Lee Pappas

April 3, 1982 was officially touted as **PacMan Day**. The ATARI PacMan & The Ghost made public appearances that weekend in Worcester, Massachusetts, then proceeded to Boston to make visits at a local orphans home and walk the historic Freedom Trail.

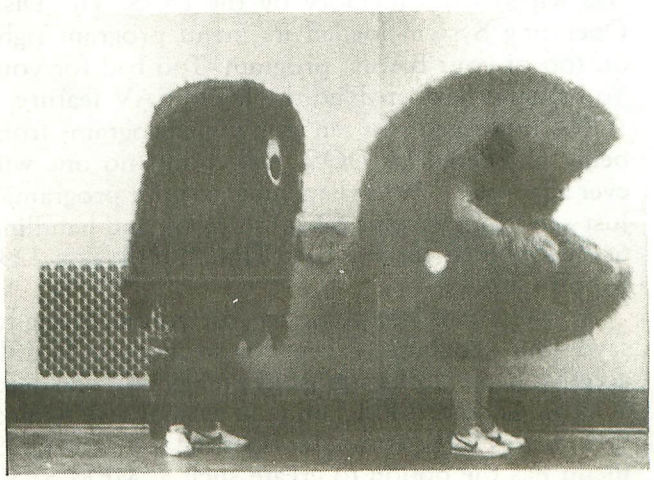
A new VCS game from Imagic, **Star Voyager**, puts you in a space ship armed with lasers and photon torpedos, and the ability to hyperspace. Your mission: to clear a free path through space. Another game, **Trick Shot**, is the first pool game for the VCS.

From Parker Brothers this summer comes **The Empire Strikes Back** and **Frogger**. The latter based on the arcade game of the same title. Later this year look for **Spiderman** and other releases.

From Coleco (are you ready for this!) comes:

Donkey Kong
Turbo
Venture
Lady Bug
Mousetrap
Carnival
Zaxxon
Cosmic Venger
Smurf Action Game

Mattel Electronics has announced that it, too, will make available cartridges for the ATARI VCS. □



Pac-Man and The Ghost visit The Home Show in Worcester, Mass on April 2.

NON-TUTORIAL V
by Charles Bachand

PROGRAM PROTECTION

A DOS option known as a MEM.SAV file allows your BASIC program and the Disk Operation System to share the same memory space. It is in a sense a form of Time-Sharing as practiced on large computer systems. This new Disk Operating System, DOS II, loads into the computer's memory in two parts. The first file, DOS.SYS, is loaded and initialized, and control is then transferred to the cartridge if one is inserted; otherwise DOS proceeds to load in part two, file DUP.SYS into memory. DOS.SYS allows your BASIC program to do I/O (Input/Output) to disk files, but if you need to copy a disk or an individual file, write DOS files to a disk, get a directory listing, or do anything that cannot be done from BASIC, then you will have to go into the DOS menu. This is accomplished by typing the word 'DOS' followed by a [return].

DOS 1 came up in the menu mode almost instantly after the user typed 'DOS' [return] because the menu part of the program was always resident in the computer's memory. This used up a lot of the computer's memory space, which meant that you had less room left for your program. Since DOS 1 also had a few bugs in it, like not being able to use random access files or not being able to boot up the ATARI 850 Interface Module, the programmers at ATARI decided to rewrite the software, fixing any bugs and incorporating a few enhancements.

Normally, when one is using DOS II and needs access to the DOS menu options, you type 'DOS' [return], do what you have to do, type the 'B' [return] (Run Cartridge option), and re-enter BASIC. But something nasty has happened to your program. It's GONE!!

Now, you are probably wondering, "What the %#$& did this computer do with my program?" It was wiped from memory by the DOS. The Disk Operating System loaded its menu program right on top of your BASIC program. Too bad for you. You should have enabled the MEM.SAV feature.

Yes, now even you can stop your programs from being clobbered by DOS. Just think, no one will ever again ask, "What happened to your program?" Just send $29.95 plus $2.00 shipping and handling to "Clobbered for the Last Time," P.O. Box 123, Ripoff City...

Actually, it is not going to cost you anything to save your programs, except for an increase in disk access time. It works almost like magic! All you need is a file, 45 sectors long, on your system disk named 'MEM.SAV'. The computer does the rest. The DOS menu has the option to create such a 'MEM.SAV' file for you. Once enabled, the operating system automatically makes use of it.

Now, every time you call up DOS, the system checks for a 'MEM.SAV' file. If there is one on the disk, the computer will save a part of your BASIC program (the part that would normally be overwritten by DOS) to the 'MEM.SAV' file. The DOS menu program is then loaded and executed. When you want to get back into BASIC, the system first reads the part of your program stored in the 'MEM.SAV' file, back to where it first found it. Your BASIC program is now in its original state and can be edited or executed. And this feature is not limited to the BASIC cartridge. You can use it with the Assembler/Editor, the Music Composer or the Pilot cartridge.

HUNGRY FOR A BIG MACRO

There are certain types of utility software that can get an assembly language programmer really excited. It's akin to buying a new car, and discovering what all the little buttons do. This is how I feel about two new machine language programs, the ATARI Macro Assembler and Program-Text Editor™. These two programs brought back all the fun of Christmas, and they are not even games!

Programs of this nature do what they were designed to do, but they are still loaded with extra 'Bells and Whistles'. These are not really needed but are certainly welcome, and are a sight for these sore eyes. The preliminary documentation that I received for the Macro Assembler ran just over sixty pages. When you consider that this documentation was on the skimpy side, you have an idea as to the size of the final manual. The same holds true for the text editor manual.

PROGRAM-TEXT EDITOR

Programmers whose source files tended to become very lengthy (yeah, like six thousand lines is a lot, eh!), ran into problems with the ATARI Assembler Editor cartridge. In order to edit a file with this cartridge, the entire file must be able to reside in the computer's memory. Even with all the comments removed, two thousand lines of code tend to fill the memory. Progress past this point can be made with the enhanced Assembler/Editor package by 'Optimized Systems Software, Inc.', in that you can now use many small files and have the Assembler sequentially access them during the assembly process. This surely works, but turns out to be a pain to edit.

Having the graphics routines on 'D:FILE1', the variable assignments on 'D:FILE2', system equates on 'D:FILE3', etc. sometimes becomes confusing. After a while, it is hard to keep 'What goes where?' straight in your mind. And let's not forget those so called 'necessary' line numbers! In a six thousand

line program, these numbers can use up at least 24K of disk space! What a waste.

ATARI's new 'Program-Text Editor' gets around the above mentioned problems. Line numbers are optional. BASIC seems to be the only language that really needs line numbers. This conserves both disk and memory space. Another place to conserve is in the implementation of the TAB key. Every program that I have seen that uses the TAB key has merely added extra spaces into the program. The Assembler cartridge does not need all these extra spaces, but programmers tend to include them to make the source code more readable. It was up to you whether to waste memory space, or get eye strain! The new 'Program-Text Editor' package can insert an actual TAB instruction in the code that when listed will tell the Editor to expand to the next defined tab column, thus saving even more memory space. Plus, as an added feature, your programs can now exceed the memory limits of your machine. You will now be able to edit a 200K-300K program, letting the editor swap the text into and out of the computer's memory. The program will also automatically update the files and maintain a backup copy of your last editing session.

Next time, I will discuss ATARI's 'Program-Text Editor' in greater depth along with talking about some of the many features of ATARI's new 'Macro Assembler'. □

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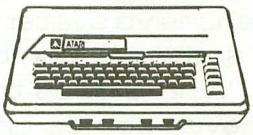

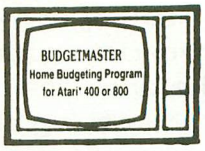

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HARDWARE REVIEW:

The INTEC 48K RAM Board For the ATARI 400

by Tom Hudson

You may recall that in A.N.A.L.O.G. #2, I reviewed a memory upgrade kit for the ATARI 400 computer that would increase the standard 8K memory to 16K. Since that time I have made two additional memory increments, to 32K and finally to 48K. Only a year ago this operation would have been impossible, but several companies are now marketing high-capacity memory boards. These boards are nothing less than a godsend to us '400' owners involved in software development, word processing and other memory-gobbling applications. In this article, I will review the INTEC 48K RAM board, one of the higher capacity boards available.

The INTEC 48K RAM board is a fully-assembled unit. It comes with a small printed Circuit 'jumper' board and full instructions. The jumper board is a flexible plastic piece which must be soldered to the underside of the 400's motherboard. If you're not experienced with a soldering iron, it may be a good idea to have your local computer store repair center do the job. Since it only takes a few minutes, the cost will be minimal, and having an experienced technician do the soldering will prevent any problems with poor connections. Also, remember that regardless of who does the modification, your warranty will be rendered void. Of course, after the 90-day warranty period has expired, the modification will have no effect. If you choose to do the installation yourself, just remember to take your time with the disassembly of the comput. particularly the removal of the keyboard connector.

I have had an INTEC 48K memory board in my ATARI 400 for roughly six months now, without a single problem. The board is nicely constructed, with gold-plated contacts. INTEC's first version of the 48K RAM board had the 'vertical line' problem common in many non-ATARI memory boards, but I recently tested their new version, and it showed little evidence of screen interference. The new boards use fewer components, resulting in lower power consumption. High power demands of the new large-capacity memory boards has been blamed for the screen interference.

In summary, for those ATARI owners who require more memory than standard ATARI boards can provide, I can heartily recommend the INTEC 48K RAM board.□

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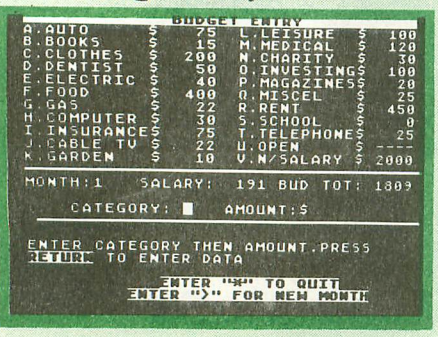
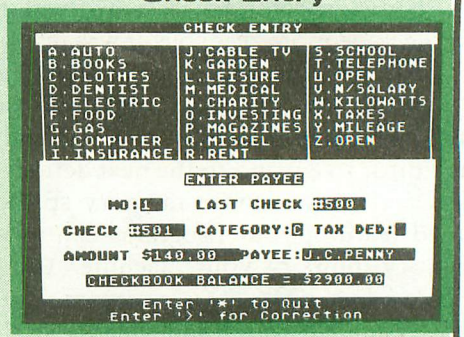
Budget Projections



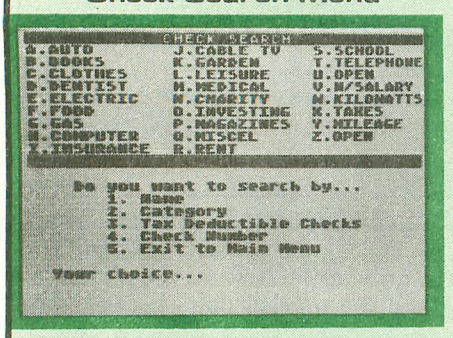
You are given 21 categories for which you enter a monthly plan and your anticipated income. The categories can be modified by name or amount at any time by you. The program prompts you every step of the way.

Check Entry



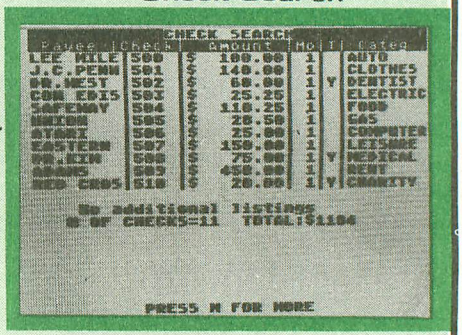
Enter data . . . month, check #, amount, y or n for tax deductibility, payee. Enter bank deposits and interest. Record up to ninety-six checks per month in amounts up to $99,999.00.

Check Search Menu

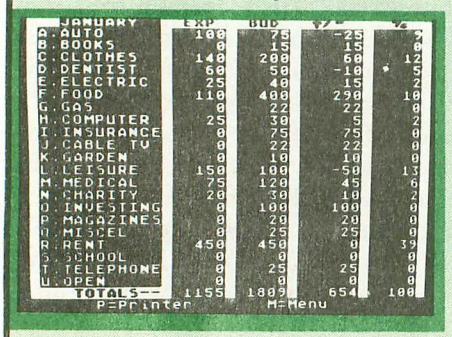


Your checks can be sorted and displayed in four different ways: Name, Category, Tax Deductibility, Number. This can be done on a monthly or annual basis. The checks, deposits and interest data are automatically filed for access by the Bank Statement Reconciliation Program.

Check Search

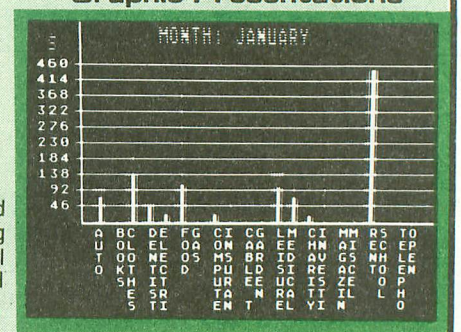


Expense Comparisons



Detailed comparisons are displayed on a monthly or categorical basis which show ± and percentage relationships. You can then identify and analyze obvious and not-so-obvious relationships of the entered factors.

Graphic Presentations



Colored bar charts are generated rapidly via machine language comparing the amounts projected with actual expenditures. Chart displays are produced for both months and categories.

Also included in the system are:

- Printout options—all popular 40/80 col. printers.
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- User-friendly operation and full documentation.

The system is designed for Atari* computers having a minimum of 24K and operating from a disk drive.

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Software Review
"Assem/ted"

NAME: Assem/Ted
PRICE: $53.95 DISK - $49.95 Cass.
PUBLISHER: Eastern House Software
3239 Linda Drive
Winston-Salem, N.C. 27106
APPLICATION: Macro Assembler/Editor
SYSTEM REQUIREMENTS: ATARI 400/800 40K Cass./DISK. Printer optional

by Tony Messina

Assem/Ted or Assembler and Text Editor came to my attention, amidst many similar items, during my last visit to the A.N.A.L.O.G. offices. It had one major difference which separated it from the other software assemblers available... Macro capability. There was a rumor running around the A.N.A.L.O.G. shop that Charlie was going to do an in depth article on Macros and their usefulness. I won't steal his thunder, but I will digress long enough to say that Macros allow the assignment of a keyboard to a series of source code. Let me give a brief example. The 6502 processor doesn't have a neat move instruction like the Z80. Moving a block of data with the 6502 requires you to know (1) where the date to be moved starts, (2) where it will be moved and (3) how many bytes will be moved. The Z80 assembly language instruction for this would be LDIR. YES!! one instruction!! Of course you must set up the Z80 registers prior to implementing this instruction where the HL pair points to the source, the DE pair points to the destination and the BC pair contains the number of bytes to move. We could develop a Macro which does the same thing for the 6502. Our instruction could be called MOVE (ST,LOC,BYTES) where ST=start of data to move, LOC=beginning address of where we are moving it to and BYTES=number of BYTES to move. ST,LOC and BYTES are known as parameters which are passed to the Macro similar to those you could pass on a USR call from BASIC. Once the Macro is written and defined as MOVE, it can be stored away in a Macro library file. This file could contain many different Macros for various purposes. An example of source code utilizing this Macro could be as follows:

```
0010 BEGIN RJ  INIT; GO INITIALIZE
0020       LDX  #10; GET 10 LETTERS
0030       RJ   TITLE; PUT UP TITLE
0040 DOIT  MOVE (ST,LOC,BYTES); MOVE
                GRAPHICS (MACRO)
0050 MAIN  LDY #COUNT; START PROGRAM
0060 .....
     .....
     .....
     ETC.....
```

Notice we used MOVE in the operation field. Upon assembly, MOVE will expand to the proper 6502 instructions that will do the move. The instructions will be expanded based on the values assigned to ST,LOC and BYTES prior to executing the instruction MOVE.

This brief explanation is only a scratching of the surface on Macros but I hope I gave you some feeling of what they are capable of doing. (SORRY CHARLIE!!) With that digression out of the way...I picked up a disk version of **Assem/Ted** and for the past three months have thoroughly used, tested and reviewed this software. The results follow.

DOCUMENTATION

A 39 page document accompanies the **Assem/Ted** package. In this authors opinion it is not written in a clear, logical order. Some sections are incomplete, and some items are not clearly explained but assume the reader will know the consequences. It is not written with a beginner in mind. I believe even an expert would have some difficulty in understanding the power of this program if he only read the documentation. The user must do a lot of experimentation with the software in order to understand how to do a particular item or the results of a particular command. I read the manual five times. The sixth time I executed all commands within the editor and still found myself flipping through pages trying to find additional information and explanations. Overall, I believe the documentation leaves much to be desired... This does not mean the software is not good even though I believe a program is only as good as its documentation. After experimenting on my own, I did find the software to be quite powerful in most areas while in other areas I found it cumbersome.

Some documentation errors I found or items which were not clear follow to support my evaluation. I have the disk version of **Assem/Ted**. The Machine Language Monitor (MLM) section states to enter the MLM from Basic type X=USR (38804) and hit Return or to run from DOS use Run at Address and type $9794. Using the Run at Address feature I got a console speaker beep informing me to load from cassette!! After rereading the book I was stumped. Upon looking at the screen I saw item 0 of the DOS menu which said Monitor. Nothing in the manual said anything about selecting the 0 option from DOS. The manual states there is a manuscript function which allows you to compose letters and documents but fails to give a clear example of how to do it.

THE SOFTWARE

Assem/Ted consists of basically three parts. A Machine Language Monitor, a Text Editor and an Assembler. Not wishing to be a bearer of constant bad tidings, I'll discuss the very good parts of the software first as it is really not that bad in most areas.

NICE THINGS

The Machine Language Monitor is nice. There are basically 9 commands to aid in the assembly and de-bug of machine code. One can Display Memory, Display Registers, Alter Registers, Alter Memory, Change Memory, Exit the Monitor to Basic, Save Memory to Casette, Load Memory from Cassette or Goto an address and start program execution. The Alter Memory differs from the Change Memory command in that you can alter several locations at once. The Change Memory allows you to change memory locations one at a time. All commands are entered by pushing a single letter. There are other items which would improve the Monitor but those are covered under the WISH-LIST section of this review.

The Text Editor and Assembler have some very good points. The Assembler is very quick and allows an option to continue assembly even if certain error conditions are encountered. There is a format feature which automatically adjusts the fields of the source code. You don't have to worry about spacing when entering your source code, just leave at least one space between each field. When output to the printer, the code will be neatly printed (well, almost-see BUGS section). The Macro feature is extremely nice and works like a champ without problems. This could save much development time with the proper Macros stashed away in a Macro library file. The Assembler allows conditional assembly for both source and Macros. This is both nice and extremely powerful. Charlie wrote about Conditional Assembly in issue #3 so I won't go into it again. Long label names are allowed with this Assembler. A label can be up to 31 characters in length with a default option of 10 characters. This makes it nice to assign meaningful labels to your code. Another nice feature is that numbers can be expressed in Binary as well as Hex and Decimal. It makes it nice when setting up some strange mask words. Instead of converting your mask to Hex, just type it in Binary. Another really neat ASSEM feature is the ability to immediately load or store the high or low part address of a label. Assuming we have a label call DATA whose address was equated to 3E4F,executing LDA #H,DATA would load the A register with 3E. This is nice when text display data needs to be addressed. No more need to strip off low or high nibbles or shift things to get the upper or lower part of an address. In the same vein, the ASCII addressing mode is another convenience. To load the ASCII value of the letter P into the A register, simply type LDA #'P.Comparisons etc. are also handled through this addressing mode and it really cuts down on having to either look up the Hex codes for a letter or having unnecessary equates such as ASCIP+$0050. Without too much fanfare, the other features of the **Assem/Ted** I thought to be quite nice include Auto line numbering, Renumber source file, Delete one or more lines command, Load and save source files, Append source files to the current file, and a status summary after each source file load. This summary tells you in length (in Bytes) of the file just loaded plus the range of addresses where it was loaded.

The editing features of the **Ted** are very good and extremely powerful. There are basically two forms of the EDIT command. Form 1 allows string search/replace capability. This form also allows many options within the command. One can search and replace a particular item by issuing a command such as: EDIT/THIS/THAT/10-50. This command would replace all occurrences of THIS with the string THAT between lines 10-50. All lines which are affected will be displayed to the screen or dumped to the printer if that function is operational. At the end of the operation the number of replacements is output in the form //XXXX where XXXX is a decimal number. Selective replacement can also be accomplished where some occurrences of a string can be changed while others will not be. The entire Form 1 method is extremely powerful and takes some experimentation to get used to all of its power. The Form 2 edit capability is used for line editing. EDIT 10 will display line 10 of the text file. Changing text is a simple matter of utilizing the ATARI screen edit features and hitting RETURN.

Now that I've discussed the good points, I'd like to give my Wish-List and explain why the items therein are needed or wanted.

WISH-LIST

I'll start with the wishes for the Monitor. I'd like a set and clear breakpoints capability, a disassembler to screen and/or printer aid, an op-step and trace function. These additions would add considerably to the de-bug capability of the MLM. Items for improvements in the Editor and Assembler follow.

I'd like a Rep card containing the pseudo-ops error codes and commands peculiar to this assembler. All pseudo-ops are non-standard. They take getting used to, and it's time-consuming having to flip through the manual to track them down. I have the disk version of this program but it does not support the saving or loading of object or source code to the disk. Everything is tied down to cassette. Needless to say, this causes extreme heartburn. There is a feature to Assemble multiple files, identical to the Include function Charlie mentioned in his article in issue #4. With cassette format, however, this is a pain, especially if you have a string of files,

assemble them and then find a bug in, let's say, the third file. First you have to load the third file (if you can find it), fix the bug, then resave it to the same place. If you have to make significant changes, you risk wiping out any files which follow. You can patch the object code and save it but your source listing would then be virtually meaningless unless you comment it...but then it will be a mess!! You could also do the cassette shuffle. Save each module on a separate cassette then copy all modules on one cassette. If you find a bug, fix it, resave the module on the separate cassette then copy all modules back to one cassette. This whole mess is not practical if your development schedule is tight. Needless to say, Disk I/O is a must for a good assembler to handle multiple file assemblies. Moving right along, we need a true-cross-reference at the end of the assembly listing. **Assem/Ted** provides a list label table (i.e. prints out the address locations or values if they are variables of the labels) but does not give a cross-reference that identifies where all these labels are used. Admittedly, for short programs it's not a necessity, but for 3000 line source code assemblies from multiple files, it is needed. Now that I've presented my wishes it's time for the Program Bugs.

BUGS

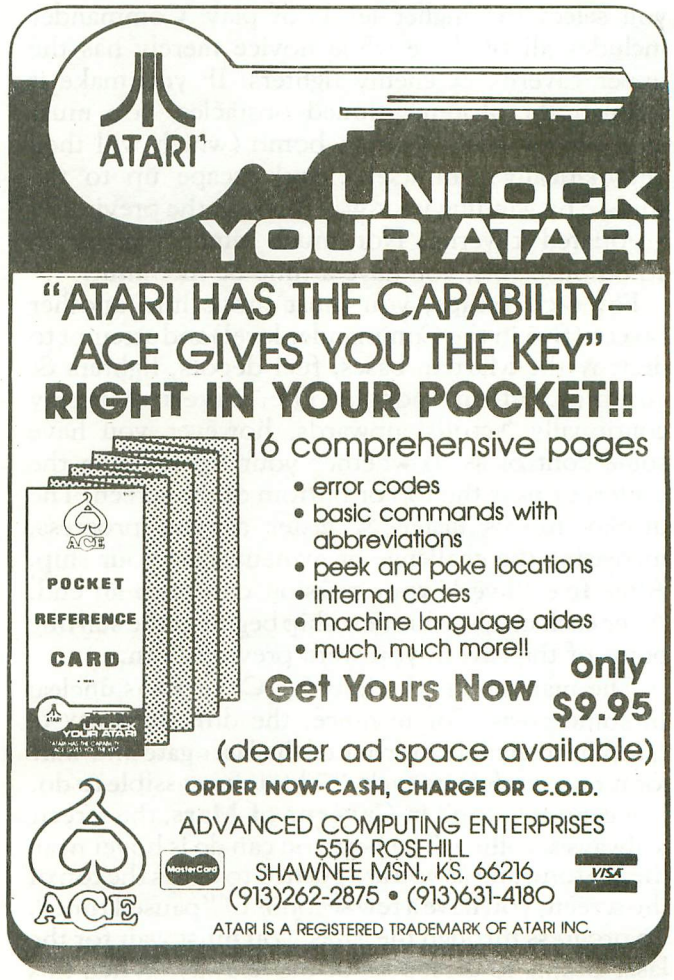
There were only two Bugs which I caught. Of these, one was repeatable while one occurs now and then. Both of them deal with the functioning of the following commands: Asm and Format.

Assem — This command causes the text file to be Assembled and printed to the screen and/or printer. The printer routine occasionally hangs up the system. Pushing break recovers from this but your listing gets messy. This is the once in awhile bug I mentioned.

Format — The Format statement has the form of Format W N where W can equal set or clear and N specifies the number of characters per label. N is usually set to the largest label name and has a default of 10. The purpose of the command is to format the output of your assembly listing in order to line up all of the fields for a neat appearance. Everything works fine except for the comment fields of one byte op-codes I.E. TAY,TXS,TAX,INX,INY,etc... Comments for these op-codes always appear two spaces after the op-code regardless of the spacing in the source code. The listings produced appear erratic and messy. The simple solutions are (1) Don't comment your one byte op-codes or (2) fix the format function. Considering the complexity of the functions, and the power of this program, two small bugs aren't bad at all.

THE VERDICT

Assem/Ted has a variety of very good functions especially the Macro feature, the EDIT commands and some nice addressing modes. It is usable once you experiment and learn its little quirks and drawbacks. The package is not aimed at the beginning assembly language programmer but rather the intermediate to advanced wizards. Using this package in the development of any large modules is counter productive due to its cassette limitation. I've tried...and wiped out many modules following the ones I've fixed on the tape. The package would be good to develop small assembly language routines to interface with Basic and it is really nice to play around with Macros and develop a Macro library for use with your small routines. I wouldn't recommend this package for anything other than experimenting with the afore-mentioned items. I do believe that if the minor bugs were erradicated, Disk I/O was added and the manual were drastically overhauled, **Assem/Ted** would be a super value. I give it a B, since there is no other Macro-Assembler for the ATARI with all the features of **Assem/Ted** that even comes close to the price of $53.95.□



Software Review: Caverns of Mars

Caverns of Mars
$39.95 diskette
Requires 16K & 810 disk drive
ATARI, Inc.

by Shimane Oderkirk

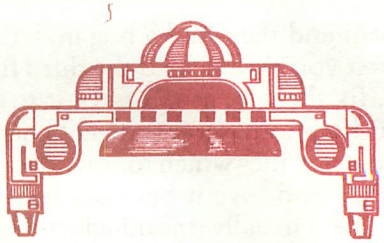
Caverns of Mars, by Greg Christensen, combines all the elements needed for an exciting and challenging game. There are four skill levels, ala Star Raiders; Novice, Pilot, Warrior, and Commander. Each achieve different levels of difficulty through the adding of additional caverns.

The premise of the game: You are the only ship to escape Terra IV after the Martian Fleet surrounds the planet. The Martians demand unconditional surrender! You escape in your fighter and go off to Mars singlehandedly. Yours is the only fighter equipped to go deep into the **Caverns of Mars**", sabotaging the Martian's defenses as you fly through "laser gates", then "space mines", and mazes.

The above mentioned dangers appear only when you select the higher levels of play. Commander includes all of these while novice merely has the upper caverns & enemy fighters. IF you make it through the aforementioned obstacles, you must land on the giant Martian bomb (which will then automatically arm itself), and escape up to the surface by winding your way through the previously negotiated caverns. Not much time is given to accomplish this; you have a time & fuel limit.

For each escape, you must move into another cavern (five in the Commander level) and attempt to destroy the Martian bases, fuel depots, fighters & communication posts. The cavern display continually 'scrolls' upwards, however you have some control as to whether your fighter is in the center, or near the top or bottom of the screen. The display moves faster & faster as you progress, increasing the challenge of maneuvering your ship. After five "lives" your mission comes to an end. After each crash, your new ship begins at the starting point of the cavern you were previously in.

The manual/instructions for **Caverns** is unclear in some areas. For instance, the directions say to "stop immediately in front of the laser gate and wait for it to complete its cycle." This is impossible to do. You cannot "stop" in **Caverns of Mars**; the screen is always scrolling. The best you can do is hover near the bottom, and as you are pushed towards the top of the screen, you have a few seconds of "paused time". To progress through the gates, you must wait for the laser beams to disappear or move away. When this happens you must race through the gate as quickly as possible. On several of the gates, you move through them by pausing your ship at several key points, then proceeding.



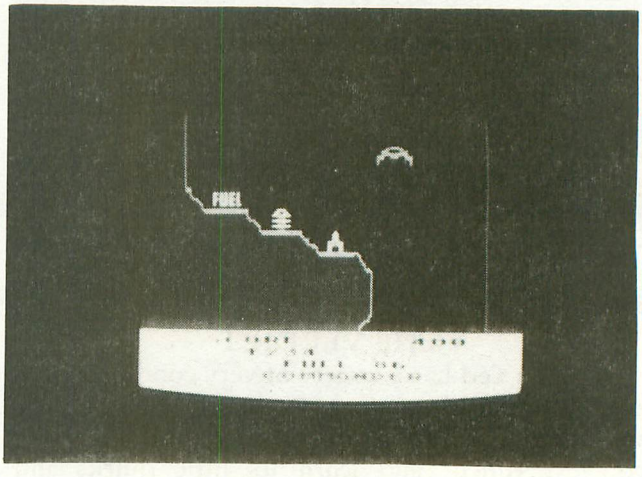
One other helpful hint. Push the joystick forward all the way when fighting your way amidst the Martian fighters. This enables you to stay at the top of the screen and have a greater lead time for firing & dodging the enemy ships. Also, shoot as many of the fuels depots and fuel ships as possible, as the fuel residue is drawn into your fighter and adds to whatever fuel you already have.

THE RATINGS

The concept of **Caverns** earns a ten. This game works very well on the home computer. Originality gets a seven. It's a wonderful idea (though based on a few arcade games) with many features. This game is something new and different for the ATARI computers and has a lot to offer. The challenge is a definite ten. **Caverns of Mars** pulls every fiber of your brain towards your mission. Skill received a nine. The player can easily adapt to the game after 4 or 5 tries; plus the added difficulty levels let you proceed to more exasperating times after you master the easier levels. The graphics were colorful, however, I felt the sounds could have been expanded upon somewhat. I gave graphics/sound an eight.

This is by far the most frustrating game I have ever played on the computer. It's an addictive game; more than most. Playing, it is very hard not to get angry and frustrated (hitting the computer is quite possible; venting your anguish on a nearby pillow would be a much better idea.)

Caverns of Mars is a delightful game requiring a lot of skill to play the more advanced levels (the space mines hold ME back!) However it's quite possible to play the level of Commander and survive!



Caverns of Mars Rating Scale
(1 Unsatisfactory - 10 Ideal)

Concept	10
Originality	7
Challenge	10
Skill	9
Graphics/Sound	8
Overall Rating	8.8

Cheat Note: On the more difficult levels (try Commander) press the **SHIFT & CONTROL & TAB** keys on the left hand side of the keyboard simultaneously. This will "skip" you to the next level. Try it!

Software Review
"Dodge Racer"

NAME: Dodge Racer
PRICE: $21.00
PUBLISHER: Synapse Software
820 Conventry Road
Kensington, CA 94707
APPLICATION: Arcade Crash Game
SYSTEM REQUIREMENTS: ATARI 400/800 16K with Disk Drive and 1-4 Joysticks

By Tony Messina

Dodge Racer is the first Arcade entry into the software market by Synapse Software. I was impressed with their other program FILE MANAGER 800, which I reviewed in issue #5, so I grabbed **Dodge Racer**. I've seen the arcade version and even played it once. I found myself being smashed just as quickly with the SYNAPSE version. Let's take a look at this devil.

DOCUMENTATION

The documentation is clear and concise. Everything you need to know is in the five page manual. (Everything except how to beat this game that is.) There are some hints included which may or may not help you, but the game requires skill and quick reflexes.

THE PROGRAM

Booting up the disk is very easy. Insert the BASIC cartridge, insert the disk and turn on the computer. The program will auto-boot with a fanfare, an introduction and then the screen display appears. Your car is on the right, the computer car on the left. Touch the joystick and the race is on. If your car is too slow, push the red fire button to increase your speed. At low speed your car will change only one lane at a time. Two lanes can be negotiated in the fast speed mode. The computer car moves at a constant speed (see variations) and can change only one lane at a time. Even in this basic, simple, uncomplicated version, play becomes intense. Even the slow speed seems fast!! If you avoid being hit and scoop up the 96 dots, you receive 50 bonus points, a fanfare with flashing screen, and the opportunity to do it all over again. This time, however, the computer car becomes more aggressive. Don't worry...after all, you do have five cars to demolish before ending the game.

PROGRAM VARIATIONS

One would think there would be enough problems associated with trying to avoid one crunch crazy car. Our friends at SYNAPSE had to throw more wrenches into the gearbox. There are four more variations to the basic game. Restore, One-Two Car, Two-Car, and Speedup. The basic game has the non-restore variation. That is, upon crashing, no dots are restored until you have cleared the screen. With the restore mode, all dots are restored upon crashing with the computer car. The opportunity exists for accumulating more points this way, but OOOHHHH...the frustration of crashing with just one dot remaining!! One saving grace of this option is that the aggressiveness of the computer car remains constant rather than increasing with each screen cleared. If you feel that is too easy, The One-Two Car mode provides more challenging horizons. In the first two screens of play, only one car is attempting to crush you into oblivion. If you survive, you are pursued by two cars for the next two screens. Then back to one car etc. This cycle continues to alternate until you have crashed 5 times. The Two Car mode is another KILLER!!!!! Two cars pursue you, making for very short games. The cars become more aggressive with each screen you clear (at least that's what the documentation claims.) I've never made it to the second screen for verification, but I trust their word. The last variation is Speedup. If you don't think the pursuit cars are fast enough to avoid your quick reflexes and cunning skill, try this jewel of a variation. The cars start out at a normal speed but after eight seconds they blast off at a frenzied pace. If you happen to select the Two-Car, Speedup options, be prepared to meet your doom rather quickly. The software folks at SYNAPSE are not ALL cruel monsters and have provided the game with Player options.

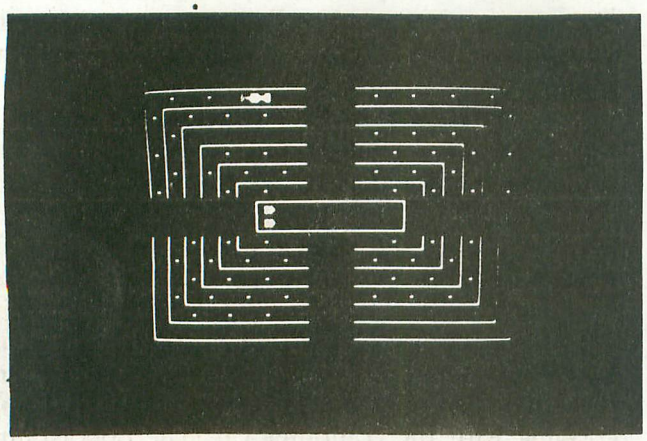
PLAYER OPTIONS

Up to four players can compete, each player alternating after crashing. Players can also choose to control the crash car in competing with each other. This is the 2A option and is fun.

THE VERDICT

The game is frustratingly addictive!! The sound, color and fast paced real-time action are all combined very well. The Newport Software

Conglomerate has given this game a thumbs up. They did prefer using the 2A option of competing against each other. When I asked them why they told me "It's more fun killing each other than letting the computer kill us!!", Needless to say this game tests your hand-eye coordination to the limit and is worth the $21.00 price. If you'll excuse me now, I've got to try my luck again...CRASH!!! Oh Well...



Dodge Racer Rating Scale
(1 Unsatisfactory - 10 Ideal)

Concept	7
Originality	6
Challenge	6
Skill	5
Graphics/Sound	8
Overall Rating	6.4

Software Review
"Nuke Sub/Galaxy Defender"

NAME: Nuke Sub/Galaxy Defender
PRICE: $19.95 cassette, $24.95 disk
PUBLISHER: Amulet Enterprises
P.O. Box 25612
Garfield Heights, Ohio 44125
APPLICATION: Arcade Games
SYSTEM REQUIREMENTS: ATARI 400/800 24K with Disk Drive and 1 Joystick

By Tony Messina

The past six months has seen a variety of new software houses springing up to march to the tune of the ATARI drummer. Many have produced some of the poorest software in existence, while others have finally realized that an ATARI owner will NOT put up with lack of sound, action, color and the use of Player/Missile Graphics. Amulet Enterprises, I'm glad to say, has met the challenge very well with their premier package **Nuke Sub/Galaxy Defender**. I will not tell you that the graphics are ultra dazzling and these are the greatest games in the world. That would be stretching things a bit. What impresses me though, are the clean, uncluttered graphics, clever color with sound routine and the hassle free challenging objectives of each game.

BOOTING-UP

Getting started is a simple matter of inserting the BASIC cartridge in the computer, placing the diskette in the drive and turning on the computer. A menu and introductory fanfare will appear with a prompt "MAKE SELECTION". Pressing (1) will load in **Nuke Sub** while (2) will load in **Galaxy Defender**. Wait till the disk drive stops before making a selection. If you fail to wait, an error 138 may appear. This is the only BUG I have seen and can be avoided by simply waiting.

NUKE SUB

Selecting this option loads in...**Nuke Sub** of course!! A clever tune segment introduces the game and a prompt for directions appears. I'd suggest getting directions first, even though they are quite simple. While you are reading them, a little cruiser made from PM Graphics goes chugging along at the bottom of the screen. The plot is simple. You are a Nuclear Submarine commander whose orders are to sink anything in sight. (A little dramatic huh?) Actually, you've got to get as many points as you can. You are given ten torpedoes and will have ten ships presented to sink. The ships come in three sizes. Small (worth 40 pts), Medium (worth 20 pts) and Large (worth 10 pts). The ships may travel at various speeds and directions across the sight of your periscope. If you get 100 points or better during the initial round, you are given Bonus rounds. During Bonus rounds you are given only five torpedoes and only five ships will appear. Bonus rounds will continue as long as you get 60 or more points per bonus round. When you fail to do this, the game ends and your score along with the high score is displayed. The prompt Another game (Y/N) appears and allows you to either try again or go back to the initial menu. The play screen is very simple. You see everything through your periscope complete with range/speed lines. Ships travel either right or left across the horizon line. At the appropriate moment, you launch your torpedo. You can observe the wake of the torpedo as it travels to its intended target. Hitting the victim causes a flash, explosion and mushroom cloud to appear. In the background the hum of the nuclear power plant can be heard. This game is challenging. Trying to hit a small fast ship is very difficult. Other items which make this game fun are the bonus round announcements. The letters of the announcement are cycled through color changes, accompanied by a little tune. Meanwhile, at the bottom of the display, a torpedo chases a cruiser across the screen with some interesting sound

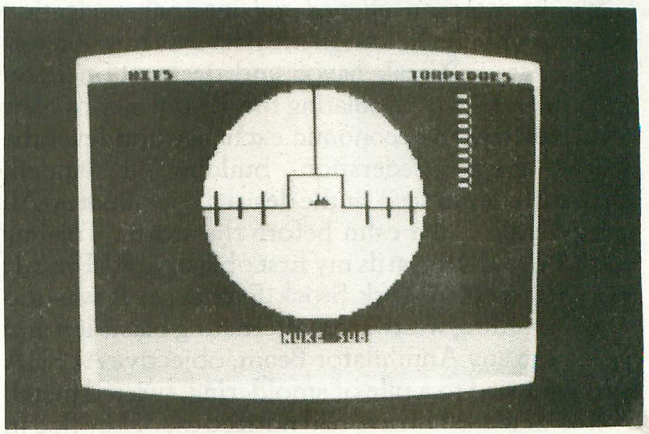
effects. After each bonus round, the ships increase their speed and it becomes most difficult to hit them. One last nice feature is the movement of the targets. They seem to bob up and down on the horizon as they travel across your periscope view. This game gets a B+ overall rating.

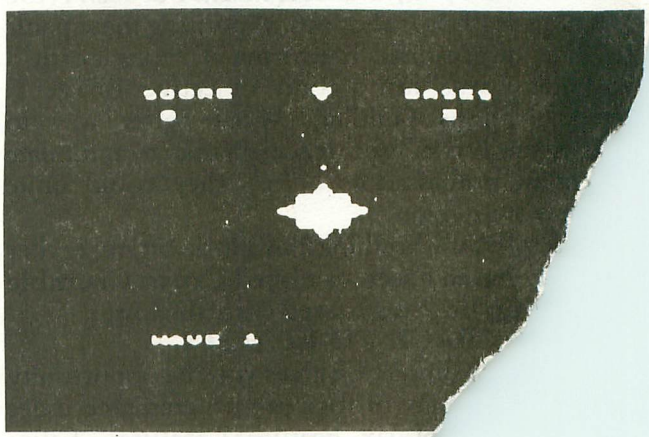
GALAXY DEFENDER

Option (2), from the main menu, selects **Galaxy Defender**. Upon initialization the title, with a little tune, appears on the screen. The text window flashes with different colors, accompanied by an unearthly combination of sounds. After this, the instructions appear. In the background a deep chord of music, reminiscent of something from the CLOSE ENCOUNTERS movie, drones. The instructions, again, are simple. You have four starbases with which to defend the galaxy from an onslaught of alien invaders. Each invader hit gains you one point. Having four starbases destroyed or reaching 500 points ends the game. Pushing the fire button, after reading the directions, blanks the screen. Your space station appears in the center of the flashing red display, the warning klaxons scream and the onslaught begins. Enemy ships appear in only four directions. (Left, Right, Top or Bottom of the screen). Only one enemy ship will appear at a time. Fortunately, your four laser cannons point in these directions. To fire them, simply push the joystick in the direction of the enemy. The laser cannon for that direction will recoil back and forth as it spits out a deadly ray. The fire button has no function. Enemy ships will appear in waves, 20 ships for the first two waves and then 40 ships each for subsequent waves. Completing each wave earns you 10 bonus points. Extra starbases are secured upon reaching 250 and 400 points, which is a difficult feat. This game can become tense, especially during the higher waves where enemy ships appear at random in any of the four directions and their torpedoes get faster. After the completion of each wave your current score is displayed along with the number of starbases remaining. The program will then wait till you push the fire button to continue. At the higher levels this is a welcome break. After all your bases have been destroyed, your score and the high score are displayed. To play again, hit the fire button. You can't go back to the main menu from this game unless you power down and re-boot. This, however, is only a minor inconvenience. As with **Nuke Sub/ Galaxy Defender** does not dazzle you with the ultimate in graphics. It is however, a challenging well thought out game due to the clever use of colors, sounds and screen action. I'm getting close to reaching that 500 points!! My high score is 438 and hopefully...soon...I'll reach my goal. The trick in playing this game is to look at your starbase and catch the aliens with your peripheral vision. Of course having good hand-eye coordination helps. One feature that really made me feel like I had accomplished something was the message NICE GAME at the end of my 438 point fiasco. The starbase appeared, firing his laser cannon in all directions, along with the little doodle. This game also gets a B+.

THE VERDICT

I give this package a solid B+. It is worth the $20.00 price. Both games are challenging, clever, simple and provide good clean fun for all ages. The local Conglomerate had a ball with both games...so did I as a matter of fact!! I'm looking forward to more AMULET products in the future as they appear to be heading in the right direction with their ATARI software.□





Nuke Sub/Galax
Rating S
(1 Unsatisfacto
Concept .....
Originality .....
Challenge .....
Skill .....
Graphics/Sou
Overall Ratin

Software Review
"Crush Crumble and Chomp"

NAME: Crush, Crumble and Chomp
PRICE: $32.00
PUBLISHER: Automated Simulations
P.O. Box 4247
Mountain View, CA 07960
APPLICATION: Fantasy Game
SYSTEM REQUIREMENTS: ATARI 800 32K
cassette or disk

By Tony Messina

As I entered the Earth's atmosphere and headed towards my pre-programmed target, I readied my battle circuits and aligned my internal navigation registers with Terra's magnetic field. My mission was quite clear...Wreak havoc and destruction upon the human forms populating the Terran city of New York, destroy the economic exchange and level the United Earth Federation building. I landed, apparently unnoticed, at the desired coordinates. All seemed still...the calm before the storm. Turning West, I moved towards my first objective ALPHA 1: Wall Street/New York Stock Exchange. It was too easy. Travelling westwards, alternating blasts left and right from any Annihilator Beam, objective ALPHA 1 was reduced to a pile of smoldering, twisted metal. By this time the humans had noticed me. They fled in all directions by any available means but alas...too late. Blue death rays shot out, vaporizing these panic stricken, disorganized life forms. Turning north, I moved towards my second objective BETA 1: United Nations Building. What better way to analyze the Terran Worlds society than to annihilate leading ambassadors before they could unite t our invasion...

se of you who think I'm a little off my rocker ly haven't seen or played **Crush Crumble mp** by **Automated Simulations**.

BACK TO REALITY

y simulation gives you the opportunity any of four pre-programmed cities f six Feature Creatures. Cities possible destruction include New Bay Area, Washington D.C. or lable are Mantra (The Flyer),), Arachnis (The Spider), topus), The Glob (no our old friend Goshilla. inherent capabilities and particular attributes. As nust have a script to m of a scenario choice rior to the beginning ectives available for

1.) BALANCED: Get points for anything you do.
2.) KILLER: Get most points for killing humans, some for buildings.
3.) COMBAT: Kill combat units, not civilians.
4.) DESTRUCTION: Get most points for destroying buildings and bridges and some for killing human units.
5.) SURVIVAL: Get points for remaining alive as long as possible.

This gives you a total of 120 configurations to choose from if we include all city, monster and objective combinations. That's enough to keep you gainfully employed for a long time. The Disk version, however, allows you to create your own monster from eight possible carcasses. Each carcass is assigned a number of available Crunch Credits. Available powers are presented along with their Crunch Credit Cost. Select your powers and away you go.

It's not all that easy to wreak havoc upon mankind...they fight back. The human arsenal includes Police, Infantry, Tanks, Artillery, Helicopter Gun-Ships, and the dreaded Mad Scientist. How does the game stack up? Let's find out.

DOCUMENTATION

The 47 page manual is complete, fun to read and explains everything nicely. Included are charts, city maps with landmarks and detailed explanations of all powers available. Being clever fellows, these **Automated Simulations** documentation bards, there are quick-reference cards included for each monster. These cards explain all powers and the associated keys which enable the use of these powers. Very Nice!!...Now that they all have big heads in Mountain View, there is one slight item (actually two) they forgot to mention. The manual claims you can save a game in progress. Possibly the APPLE and TRS-80 versions allow this but not the ATARI version. I was ripping away and it was getting late. Time to hit the sack...Save Game??? OH... yes...here it is...HIT Q AND ANSWER YES TO ALL QUESTIONS. Let's see...Q...Yes (click) — YOU HAVE 1320 POINTS...TIME 80 MINUTES...WHAT!!!?? I immediately loaded the Goshilla, Golden Gate, Killer scenario. There it was (well I pretended). **Automated Simulations** Headquarters. The programmers saw me coming and ran. After atomizing the building, then jumping up and down on it for extra measure, I turned towards John Freeman, Documentation Chief, and slapped him with my tail!!! GOT EM was my reward. The rest of the group, trying to escape over the San Francisco-Oakland Bay Bridge, was instantly turned to Crispy Critters by my Atomizer...Seriously though friends...the save feature needs to be either (1) implemented or (2) explained as unavailable for the ATARI version.

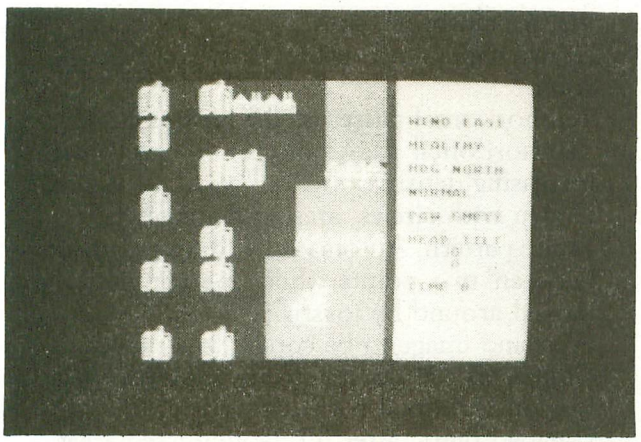
THE GAME

I've already explained most of the details and objectives. The monster you choose executes his movement by pushing various keys on the keyboard. As long as you keep your monster well fed and in good health, he/she will execute the desired maneuvers. Movement is somewhat slow, especially if there are a lot of human units on the screen. This is liveable and you must remember that your huge carcass is not designed to be the swiftest of creatures.

The graphics of this game are appealing. Buildings, Tanks, People etc. all look as they should. Altered character sets are used to make the human units, rubble etc. Monsters utilize Player Missile graphics. The sounds are also very well done. Each unit has its own particular sound effect. Only one-sixteenth of the city appears on the screen at a time. When you (The Monster) walk off the screen, a new portion of the city appears. There are boundaries to the city and attempting to leave across a boundary causes the YOU CANNOT message to be displayed.

THE SCORE

This game is well written and very enjoyable. I love it, The Conglomerate loves it...even my Mother loves it!! There are so many Monsters and scenarios available you're bound to have many hours of fun. Needless to say I give this game an A for originality and laughs. It is well worth the $32.00 price. Meanwhile...The United Nations building was no match for my Atomizer. Within seconds, it too was burned out of existence...Slowly I turned to meet a new nemesis, primitive as it was...



Crush, Crumble and Chomp Rating Scale

(1 Unsatisfactory - 10 Ideal)

Concept	8
Originality	9
Challenge	8
Skill	8
Graphics/Sound	8
Overall Rating	8.2

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Graphics Composer

by Versa Computing, Inc.
3541 Old Conejo Rd.
Newbury Park, CA 91320
(805) 498-1956
$39.95

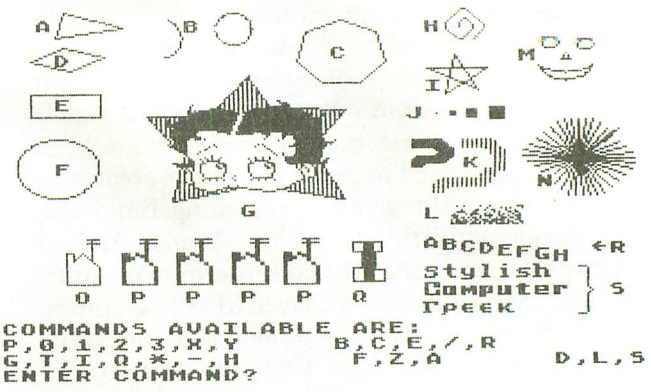
Review by Phil Mork

Creating a display on the ATARI computers can be done a number of ways. One way is to write a BASIC program which does the necessary PLOTs, DRAWTOs, and so on required to generate the desired display. However, if the display contains more than a few simple elements, this process can be tedious for the programmer as well as slow during execution.

One alternative is to generate the desired scene, then save it on disk or tape, so it can be loaded back when needed. Graphics Composer is a software tool to help the programmer do this. It allows the user to generate high resolution (GR.8) or medium resolution (GR.7) pictures using a joystick or paddles. It appears to be similar in many ways to the software which comes with another Versa product, the Versa Writer (see A.N.A.L.O.G. #4 for review), except that no special hardware is required.

The normal drawing mode consists of a cursor dot which can be moved about on the screen without damaging any existing image. Pressing the trigger button causes the dot to leave a trail behind as it is moved. The space bar causes a straight line to be drawn to the dot from the last plot position. A paint option replaces the dot with a box of variable size to allow drawing in broad strokes. The color of the dot may be selected from four colors, and the colors themselves may be changed (as in SETCOLOR). An air brush mode causes the cursor dot to "twinkle" as it moves, thus leaving a randomly broken line. A fill command provides semi-automatic color fill of a closed figure. Three other programs on the disk allow adding text to pictures (high resolution only), automatic drawing of geometric shapes, and the creation of player/missile graphics. This last program is interesting in the way it works: a rectangle representing a player is moved around the screen until it encloses any desired image on the screen. When the trigger is pressed, the image inside the rectangle is copied to player. Now the player can be moved elsewhere on the screen and a "clone" of the original image copied back to the screen, or it can be saved on disk or tape. Players may also be edited one bit at a time on an enlarged view. Also included is a routine which is to be merged into the user's program to load images from disk.

Believing that a picture is worth 1024 words, I refer you to the diagram, which illustrates most of Graphics Composer's features. (Note: The illustration was done with Graphics Composer in high resolution mode and printed on an Epson MX-70).



- A-F Automatically generated geometric shapes.
- A Triangle (specify vertices)
- B Arcs (specify ends and any point on the arc).
- C Polygon (specify # of sides, center, and 1 vertex).
- D Parallelogram (specify 3 vertices).
- E Rectangle (specify diagonal).
- F Circle (specify center, any point on circle).
- G Drawn with a variety of techniques. Most outline done with short line segments, hair and star colored with fill, circles for eyes, individual plotted points for detail.
- H Drawn freehand with joystick. Note "octagonal" look.
- I Done with draw command (space bar).
- J The 4 paintbrush sizes.
- K Drawn with paintbrushes. Curve on right is in color.
- L Ten horizontal passes of the air brush.
- L Ten horizontal passes of the air brush, with increasing density.
- M Drawn with circles, arcs, and a triangle.
- N Moire pattern. Automatically draws segments between two points while one (or both) is moved around by joystick.
- O Freehand image to be copied to a player.
- P Clones of O, copied from a player. Note loss of horizontal resolution.
- Q I-shaped figure after fill. Note missed areas.
- R Text (ATARI font). Note fine vertical positioning.
- S Other fonts included with Graphics Composer.

One of the features I enjoyed was the multi-speed cursor. When you first start to move the CURSOR with the joystick, it creeps along one dot at a time. As it continues to move, the speed quickly increases. This allows rapid access to different portions of the screen, while still allowing detailed work. The high-resolution mode supports four colors, using the fact

that points plotted in every other column take on a color other than the foreground color. The player/missile "clone" feature is useful for repetitive designs and is fun to use, and the ability to add text (in several fonts) makes labeling diagrams easy. I found the manual clearly written and the programs fairly user-proof.

On the negative side, the program sometimes seems a bit on the slow side, being written in BASIC. Freehand drawings tend to look "octagonal" owing to the fact that the joystick has only 8 directions. The fill command usually requires several tries in order to completely color an area. Colored paintbrushes tended to leave a ragged edge on diagonals. Shading with the airbrush was somewhat tedious; there should have been options to enlarge its size. Information on using player-missile graphics is very sketchy.

On the whole, the package does its job well. It does most of the things the more expensive Versa Writer package can do, plus a few more tricks (P/M graphics), at a fraction of the cost. Anyone interested in a convenient means of generating graphic displays without spending a lot of money would do well to give Graphics Composer a try.□

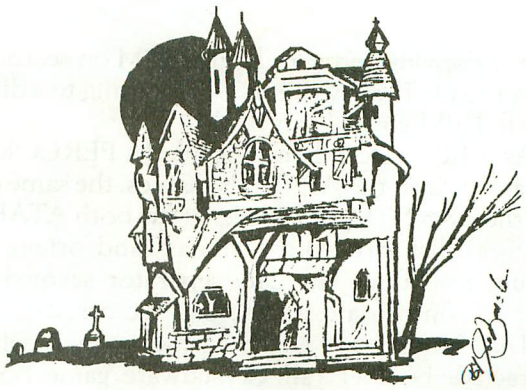
Software Review:

House of Usher
System Requirements: ATARI 800, 40K
Disk $29.95
Manufacturer: Crystal Computer
17429 Bluejay Drive
Morgan Hill, California 95020

Review by David & Sandy Small

I've put off doing this review for quite some time now, because it is a difficult review to do. This game is "not so hot", and yet, it has many interesting features. If forces a reviewer to look back and ask if he or she is not being too critical.

For instance, some of the people I have talked to have said they rather enjoyed this game and its many derivatives that Crystal computer sells. (Many of their games use the coarse scrolling and animation found in this game) therefore, I should point out that in all fairness I'm reviewing this game from the standpoint of a jaded view of ATARI games; after seeing Star Raiders and Jawbreaker, I'm used to extremely high speed, machine language games. This one is neither. By this measure this review may be a bit unfair, as not all of us demand extreme excellence in computer programming. Those who have never owned a computer or played Adventure previously would probably like this game a lot. It has some neat ideas. These people would not be concerned with its



HOUSE of USHER

relatively slow execution time and the known bugs. I suspect Crystal sells to a lot of satisfied customers in this category. On the other hand, there are a number of really excellent, high speed games available for the ATARI. In the line of adventuring, there's always The Wizard and the Princess. For reflexes, Star Raiders or Jawbreaker. If you've been spoiled by those and by the awesome speed the ATARI is capable of with its dual processors and such, then you'd better not buy this game.

To begin with, Crystal has had a lot of problems with quality control. A great number of their disks (particularly Fantasyland 2041 and Sands of Mars) simply will not load, no matter how hard you try. A number of dealers in town have had such problems with Crystal ATARI disks that they no longer will stock them — the return rate is quite high.

I finally tracked down the problem (or what I believe to be a fundamental problem) with a Fantasyland 2041 disk that kept bombing on load up. (ERROR 12 AT LINE 0). I ran the disk through a sector copier and found that a number of disk sectors just wouldn't read. However, when I set the program to continually retry a given bad sector, and then varied the disk RPM while the read process was occurring then I could read it. Apparently the Crystal manufactured ATARI disks have RPM fluctuation problems. (This is not an uncommon problem with ATARI disks and has caused a large amount of read problems.) Some sectors were written at near 310 RPM, others lower than 270 RPM, well outside the range of what the ATARI drive can read and compensate for.

I finally made a fresh copy of Fantasyland with the sector copier, with all sectors at a fixed RPM, and it worked just fine. My first suggestion to Crystal is to have their disks thoroughly checked out and possibly replaced; from what I have seen, they are not maintaining a stable, constant speed, and need to be fixed. Perhaps they have worn out; I have heard that disk drives last about six months under heavy use, which I would think they are under the Crystal.

For those of you with bad Crystal disks, and the know-how, I would suggest doing what I did —.

sector copying and varying the RPM on sectors that won't read. Then, write the whole thing to a disk at a stable RPM so you can read it.

As a side note, when I installed a PERCOM data separator into the ATARI drive (yes, the same one as for the TRS-80 Model I disks; it fits both ATARI and TRS-80 disk drives) the Fantasyland original disk would read fine. The data separator seemed to be able to compensate for the bad sectors.

The House of Usher game comes with an attractive booklet (all Crystalware game booklets have really dynamite art in them; someone quite good does the illustrations) that consists of nearly zilch directions and a number of ads. *Sigh*. Figure it out as you go, in other words. The trouble is, there is much I haven't figured out. Part of the important "clue" is written in French, which I don't happen to know.

The disk boots up, and it starts off with a display of lightning flashing over a mansion. This is fine, but it gets old after the fiftieth time — and you must sit through it each time you die. Then you are moved to the outside of the mansion.

The game from that point consists of a top-view room plot, done with reprogrammed characters, with various doors. If you go out the door, the room changes to another room. There is coarse scrolling implemented; i.e., if you near the edge of a room, the screen will scroll the visible "window" to let you see more. No fine scrolling was used, which is a shame.

At the bottom of the screen, various stats, such as time left (real time clock), vitality, etc, are plotted. These update from time to time in a manner I have yet to understand.

Every now and then something attacks you, or the room becomes infested with critters. These are plotted all over the room. You move a character (a stick figure) through the room with a joystick, and press the button to fire an arrow (or whatever) in the direction last pressed. In the meantime, the attacking figure is jumping around, moving your way.

The movement is quite slow, being implemented in BASIC, so don't expect tremendous speed. In fact, it gets rather frustrating after awhile, but remember, I'm spoiled by machine language games.

Well, first time I played this game, I entered a room infested with, uh, hamsters. No kidding. They were deadly hamsters (or something). So, I attacked with my joystick button, and hit them four times. This was easy enough to do, they were all around me. After the fourth attack the screen cleared and I was told I had won through courage. (My courage had been going up, I noticed, each time I attacked a hamster). Big deal, I mean, I had WON this game through attacking hamsters? Let's be serious. It then asked me if I would like to play again ("YES"), and boom, execution error occurs.

In fact, no matter WHAT you type at the "Would you like to play again" question, you get an exec error. Nor is this a problem just with my copy; Crystal plays around with DOS with various POKE commands, and managed to foul it up somewhere else in the program such that it couldn't re-RUN the beginning program segment. All this managed to prove to me is that no one at Crystal had sat through the game to the "Would you like to play again" question and tested it. Shoddy quality control indeed. At this point, I removed the disk, put it away, and didn't play the game again for a least a month. I finally had to force myself to sit down and give it a longer reveiw.

I found other bugs. When a treasure was plotted in a room in an inaccessible place, I could exit the room, and re-enter, and the treasure would be in a different location. From what I could gather, the program knows which rooms have treasure, but re-sets the location randomly each time you enter. This makes cheating quite easy. The same goes for monsters or the randomly laid-out "secret passages"; just go out, then back in, if they're too close or you don't get the layout you want.

From time to time you find treasures, and are allowed to pick them up. They plot on an inventory list. Now let's say, I have a "VORPAL BLADE" as treasure #1 (as plotted on the list). I then drop the vorpal blade, and treasure #1 is now ARMOR. The display reads: ARMORAL BLADE. (I can hear the programmers out there moan). Yes, they use a fixed length memory area for the treasure name, and yes they forgot to blank-fill it, so any of the previous entry not overwritten by the current entry shows through. In all fairness, this is an easy mistake to make — but again, as I said, poor quality control. This one should have been caught.

Well, eventually I mapped all the rooms — sort of a linked list, with each room going to different rooms, and gathered clues more or less unwillingly. There were a few very novel ideas — in one room, the walls move in on you until you are crushed, and they are difficult to outrun. And in another room (the torture chamber) if you touch anything, the doors disappear. Interesting. I assume something can be found somewhere which will "short circuit" all these spells, but I ran out of interest before going and trying them all.

I was also attacked in a room infested with ticks (which made me win again . . . big deal), several weird monsters which had to be fought with the joystick as they moved, and so on. The fight routines, everything in the game as a matter of fact, are agonizingly slow . . . the result of ATARI BASIC being the implementation language and no assembly subroutines.

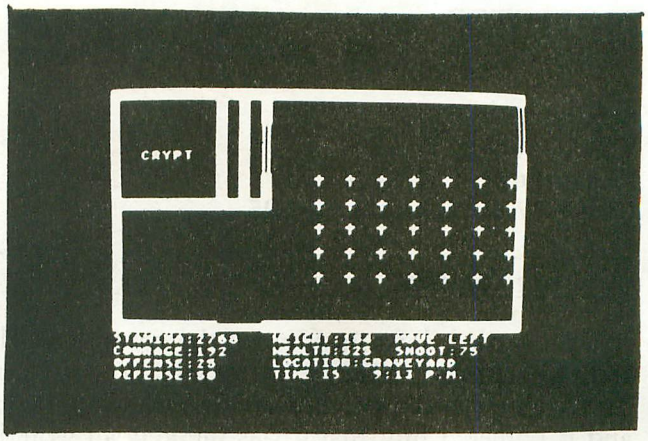
I could go on about the misspellings and poor

grammar ("Your Dead", one message reads, informing me I've just been killed), but that's being too picky. This game needs a THOROUGH cleanup, machine language subroutines, and someone to sit through, play it, and debug it. Until then, in my opinion, it shouldn't be sold.

Sadly, some manufacturers rush out a product before its time. I have heard an estimate that one month of time is required to thoroughly debug 100 lines of computer code; from my experience, this is true. The problem is, that while the manufacturer may make the sale, they also get a very poor reputation. Crystal now has to overcome all of the users who have played House of Usher, found the execution error, found the inventory table bug, the slow speed, and so on.

My conclusion? After this game is debugged, it might not be too bad. If it was speeded up, it would be a lot of fun. It has a lot of good ideas, interesting scrolling, and someone obviously put in a lot of work, yet they seemed to miss the "final cleanup" type of work that is needed.

Until then, I can see only those people who have not been exposed to higher quality games enjoying and playing this game. At $29.95 — which will darn near get you three Scott Adams adventures (text only, sadly) or the Wizard and the Princess — this game just can't compete.□



House of Usher Rating Scale
(1 Unsatisfactory - 10 Ideal)

Concept	7
Originality	6
Challenge	6
Skill	5
Graphics/Sound	8
Overall Rating	6.4

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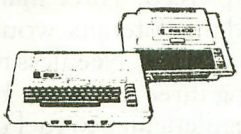

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PROTECTOR

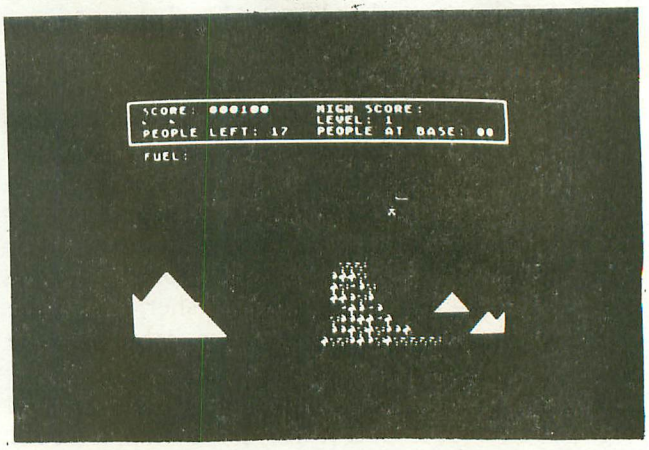
A Different Kind of Review

Synapse Software
820 Coventry Road
Kensington, CA 94707
Disk $27.50, cassette $24.95

By Craig Patchett

Jason settled down in front of the control panel and took a deep breath. He knew only too well that the lives of eighteen people were depending on him, and it bothered him that it was unlikely all would survive. For ages the colony of Potera had resisted attempts to move it away from the danger of the nearby volcano, and as a result their numbers had rapidly diminished. Now the survivors had agreed to leave, but Jason knew it was only because of the new danger from the Fraxullan intruders. Eager to make the planet Kronos their own, the aliens had decided to start with Potera, and had sent down a mothership that was now in the process of disposing of the Poterans before the volcano had a chance to do the same. Jason had to move quickly.

Pulling himself closer to the console, Jason reached forward and took hold of the black, padded stick. Instantly the screen in front of him snapped to life, showing him a view of the Omicron Needlefighter base he had control of. Only three fighters remained at this base, but at least there was plenty of fuel. Still, he would have to be careful, as he knew from experience how easily the fighter's outer skin could be pierced. Three maneuvering mistakes on his part and the Poterans would lose their chance for continued survival. Needless to say, Jason did not plan on making three mistakes. He waited patiently for the first needlefighter to fuel up, and then set the stick into motion. As he flew the fighter over the two monitoring stations, and they signaled the main computer to begin scrolling the screen image in order to keep up with his fighter, he noticed that he had already broken into a sweat. Flying towards the entrance of the cave in which the base was hidden, Jason came across his first "obstacle" and quickly paused to wipe the sweat from his hands. Below the hovering needlefighter were two arrays of side gunners, designed to keep out intruders. Unfortunately, they were also a danger to inexperienced needlefighter pilots. The needlefighter was highly maneuverable, and could make it past with a little effort, but Jason did not want to take any chances. He poised his thumb over the red button beside the stick and gently began to lower the fighter. With almost forgotten reflexes he swiveled his craft back and forth, firing rapidly to destroy the gunners before they had a chance to do the same to him. Only with the last one gone did he dare to breathe again and, after once more wiping the sweat from his hands, Jason flew out into the open, past the pyramid ruins, on to the colony of Potera.



As the first buildings came into sight, Jason could see that he had arrived just in time. All the Poterans had assembled outside, on the buildings and on the ground, with arms upraised in preparation for the needlefighter. Jason maneuvered the fighter down and delicately brought it within reach of the first Poteran, who confidently grabbed hold of the rescue bar at the rear. Swinging the fighter around, Jason started toward the city of New Hope of Potera, long since deserted because of the danger of lava flow. Suddenly, he jolted the stick forward, signaling the needlefighter to rise. It was not in time; he had forgotten about the Poteran hanging below, and had flown him right into another, killing the second. Jason silently swore to himself — accidental deaths were not to be tolerated. The unmistakable sound of the alien mothership gave him little time for feeling sorry, however, as it flew into view and picked up a Poteran with its tractor beam. Jason could do nothing at this point but watch, since the mothership's shields were too strong for the needlefighter's lasers to penetrate. He did have one chance to prevent another wasted life though, and was determined to make it work. With the original Poteran still hanging on, Jason went into action, a look of sheer determination on his face, his hand moving the stick with a sense of control he had long since forgotten. He watched the screen as the needlefighter flew past the first city, under the mothership, and past the volcano, until finally the city of New Hope appeared. With one swift movement he dropped down, safely deposited his passenger on the ground, and started back toward the volcano. As the lava-baked slopes came onto the screen, Jason saw that he was just in time. The mothership was hovering over the volcano, the Poteran falling toward the fiery lava below. Jason swooped in and caught the falling body just in time with the rescue bar, a skill that had taken him years to learn. He smiled, as the mothership methodically

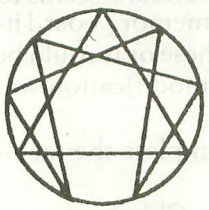
started back for another "victim", and turned the needlefighter back for the city of New Hope again, narrowly *missing* a Xytonic pulse-tracker on the way. "Xyton slime," he thought, "I'll get you on the way back."

In what seemed like hours later, Jason watched pensively as the needlefighter flew towards the second city with the last survivor. It had been a long struggle so far, and he had lost another four Poterans in the process; three to the mothership, and the fourth to his guns after the intruder he was firing at dodged away at the last minute. He was now controlling his second while trying to dock for more fuel. All told though, Jason felt quite good about the way things were going. He dropped the last Poteran off and immediately cursed; the speaker beside the screen had unexpectedly started emitting the distinctive sound of a volcano erupting. A quick flight back over the volcano confirmed his fears; already lava was beginning to flow toward the second city. Jason now had to get as many of the survivors as possible to the pneumatic tubes (that would send them safely to the base) before the lava engulfed the city. Not feeling quite so good anymore, he flew back to the first Poteran, picked him up, and started toward the tubes. Suddenly, without warning, a group of flaming meteorites started falling around him, and Jason tried frantically to stay out of their paths. It was to no avail, however, and he watched helplessly as the needlefighter crashed to the ground, taking its passenger with it. Jason felt his stomach drop. "At least I'll know to expect them next time," he muttered, to no-one in particular. But there would be no next time. In his remorse he had forgotten about the stick, which he was still pushing forward. As the computer transferred control to the last needlefighter, Jason heard, and swore he felt, the sickening crunch as his last chance for success hit the wall of the docking bay and fell, lifeless, to the ground. He momentarily buried his face between his palms, collected his thoughts, and looked up with renewed vigor. "You've had it this time," he declared, apparently to the console before him. "After all, I am the PROTECTOR." Jason dwelled on this for a moment, apparently not very convinced, but then a new look of confidence crossed his face and he reached eagerly for the console button marked "START".

By now you're probably on the edge of your seat, preparing to bound down to the nearest computer store and buy your copy of PROTECTOR. Before you do, let me fill you in on a few missing details. First of all, notice the title of this review. It's called a "different kind of review." What I attempted to do here was give a feeling of what it's like playing the game, letting your imagination run wild. Unfortunately, it doesn't give a feel for the long run effect of the game. PROTECTOR, when I first started playing it, was the best game I'd seen for the ATARI. It still is one of the better ones, and you'll be dazzled when you first see it. You probably won't be after you've played it for a while. With all that it has going for it, PROTECTOR just doesn't have that certain something that makes you want to come back and play it over and over again. To be perfectly honest, it went from the front of my game collection to the back in less than three months. It is, however, something I still bring out and show to friends, who all enjoy playing it. Those who have a chance to sit down and play it for a while eventually become bored with it, as I did. The question, then, comes down to whether or not it's worth the price for three months of fun (your mileage may vary.) Your budget will be the deciding factor for you.□

Protector Rating Scale
(1 Unsatisfactory - 10 Ideal)

Concept	10
Originality	8
Challenge	9
Skill	9
Graphics/Sound	10
Overall Rating	9.2



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A Low Bucks Memory Upgrade

by Robert Meyer

This article will allow you to upgrade your ATARI 400 with 8K of RAM, or ATARI 800 8K memory modules to 16K for a little more than the cost of eight 4116 200NS Dynamic Ram Chips.

If you have a soldering iron, solder, and some strapping wire you will be able to complete the upgrade for the cost of the 4116s. My total cost was about twenty-three dollars.

It should not be necessary for me to inform you that this will **void** your warranty. You should take great care and proceed slowly and deliberately.

The ATARI 800 memory modules are easier to remove for modification than the ATARI 400 memory board. You only need to open the access door and remove the module. Having removed the memory module you will need to gain access to the circuit board inside the case.

Remove the two screws holding the case together. Carefully pry the case apart just enough that the memory board can be slipped out. You are now ready to proceed with the modification.

There are several different versions of the memory board. All versions will have the number C012987 on them. You will also find a revision number on the board. Mine was a revision F1. I know of a revision (3) board that was upgraded using this conversion also. The basic difference between versions seems to be in the strapping resistors on the memory board itself. Your version could be one of these or it could be some other version. I believe this modification will work on all versions.

This is what you will need to complete the memory upgrade:

A. 8 - 4116 200NS Dynamic Ram Chips.
B. 1 - Three-inch piece of fine insulated wire.
C. 4 - Short pieces of bare wire (26 ga., or leads clipped from low wattage resistors or small capacitors).
D. A phillips screwdriver.
E. A small wattage soldering iron.
F. Resincore solder.
G. A very sharp knife.
H. A large, well lit work area.

To upgrade your ATARI 400 you will have to gain access to the memory board. You will find it deep inside your computer. Unplug the power supply and remove the plug from your power jack on your computer. Remove any other connections to the TV set or peripheral devices.

Place your computer in front of you with the keyboard facing you. Now turn your computer over so that it is laying on its top with the bottom of the keyboard facing you.

Remove the four screws holding on the bottom of the case and remove it. Be sure to note the position and routing of the RF lead. This is the lead that goes to the TV switch.

After you have removed the cover you will note that there is a rather large metal plate held on with phillips screws. Note that some of these screws are of different sizes. After you have removed *this plate and* the fiber board insulator beneath it you will have exposed the mother board.

Before proceeding, let's look at the mother board. On the left side and to the front there is a ribbon cable. A little further towards the back you will find what appears to be a row of pins connecting the mother board to the Personality board. These pins are actually a male connector. You will have to separate this connection by lifting the mother board. As you lift the Mother up and out of the metal container you will see two boards plugged into it.

The memory board will be the second one from the end. Remove the memory board by rocking it length-ways in its socket as you pull it out. Be sure the number on the board is C012987.

If you have disconnected the mother board from the ribbon cable just lay it aside, if you did not,return the mother board to the position you found it inside the metal case.

Lay the memory board on your work area component side up with the pins towards you. Note the row of Integrated Circuits at the top of the board. These eight integrated circuits (IC's) are the ones you are going to replace with your 4116 200NS Dynamic Ram Chips (IC's) you have purchased.

You will replace one IC at a time. This will prevent you from installing them backwards. The key to installing them correctly is the small notch in just one end of the IC. The old IC's contain these notches also. As long as the new IC's have their notches facing the same direction as the old ones they will be installed correctly. This notch is used to designate the location of pin number one.

You may use a small screwdriver or pen knife to remove the old IC's. Slide the blade under the body of the IC between the rows of pins. Lift slightly until the IC starts to free itself. Now go to the opposite end and repeat this procedure. Continue swapping ends until the IC frees itself completely without bending the pins.

Carefully insert one of your new IC's into the empty socket. Be certain all of the pins are entering the socket by sighting down its length inside and out. Be sure the notch is on the correct end. Replace all of the IC's using this procedure. When you have them

all inserted check them again to be sure they are all properly seated.

The next step in the upgrade is very important, do not omit it to save time. Insert the memory board back into the Mother board (be sure it is facing the correct direction) and re-assemble your computer up to the point where you removed the four screws from the plastic case.

Carefully power up your computer and connect the RF lead to your television. Turn on your computer and television and insert the BASIC cartridge. Type PRINT FRE(0) and press the ENTER key. If your computer responds with anything but 5134, you will have to remove the memory board and check your new 4116 200NS Dynamic Ram Chips. If the response was 5134 you can proceed.

Take your computer apart again and remove the memory board. Lay it down in front of you, component side down with the pins facing you.

If you are upgrading an ATARI 800 memory module you should proceed as we did with the memory board in the ATARI 400. You need not put the memory module into its case to test it. If the computer response is 5134 you are ready to proceed.

Place your tested memory board or module in front of you component side down. Arrange it so that the pins are facing you. Before proceeding study figure one very carefully.

Using a very sharp knife make four double cuts. Each double cut will consist of two separate cuts about one sixteenth of an inch apart. You will then remove the portion of the coppertrace between the cuts. These double cuts are labeled one through four on figure one.

After the four double cuts are completed we will add four straps. These four straps are labeled A through D on figure one. Just lay the bare wire across the two pins and solder it in place.

The next step will be to solder wire E in place. This is the insulated piece of wire on the list. It will run from pin seven to the hole labeled F on the component side of the board.

The last step in your memory upgrade will center around the six strapping positions near the center of the board. These six strapping positions will contain two resistors, and you will have to remove one of these. It is possible you will have to remove both resistors and re-insert one. The important thing to remember is that when you are done there should be a resistor across position C. This should be the only position containing a resistor.

Carefully check your work for errors. Hold your board up to a bright light and look through it for solder bridges. Be sure your cuts are completely through the traces.

Your memory board, or memory module, is now ready to be re-inserted and re-tested. It should now respond with 13326.

Be sure all of the screws on the metal shield of your 400 are replaced and tightened well.

I would be interested in hearing from you as to problems and successes with this upgrade. I will answer all responses which include a self-addressed and stamped envelope. □

Robert Meyer
7315 Turkey Run
Fort Wayne, Indiana 46815

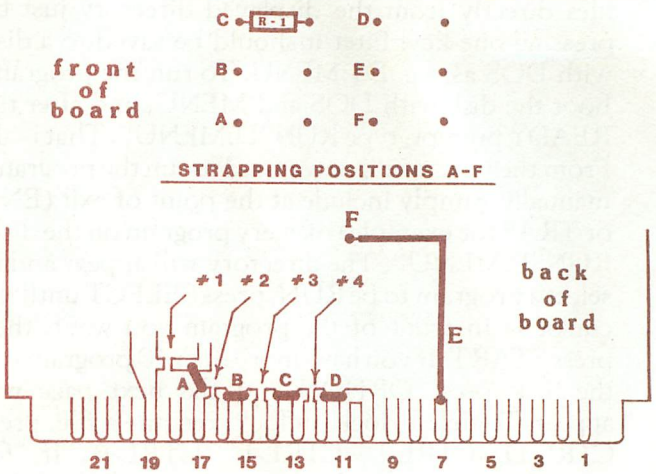

FIGURE 1

COMPUTER Calligraphy?

Well, not really! But with **FONTEDIT** you can design your own character sets for the ATARI. You can create special graphic symbols for use in games, or even make a Russian alphabet. After you design a new set of characters, save them on disk or tape for later use. We provide a subroutine that you can use in your own programs to load a custom character set.

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Disk Menu

by Henrique Veludo

This program will display a disk directory and also enable you to delete, lock, unlock, and rename all files directly from the displayed directory just by pressing one key! First it should be saved to a disk with DOS as, e.g.:D1:MENU. To run the program, boot the disk with DOS and MENU, and after the READY prompt, type RUN"D:MENU". That is all! From then on, you'll never need to run the programs manually. Simply include at the point of exit (END or TRAP for example) of every program on the disk: RUN"D:MENU". The directory will appear and to select a program to be RUN, press SELECT until the cursor is in front of the program you want, then press START. If you have more than 40 programs on the disk press OPTION and the next page will appear. To delete, lock, unlock, rename a file, press CTRL-D, CTRL-L, CTRL-U, CTRL-R. If, for example, you try to delete or rename a file that is locked (which would cause an error message), the program will tell you to check your filespaces and try again. Press OPTION every time you want to read the directory of a (different) disk.

The program is set to work with DOS II and drive 1. For DOS I, change the IF in line 30030 to: IF LEN(FA$) 5 THEN . . .?FA$; "FREE SECTORS"; . . .For multiple drives, you could set a prompt at lines 30015, 30020 to input the drive#. I'll let you devise this one!, and hope that this "MENU" will make your lives a little easier. . .□

```
30000 CONSOL=53279:NAME=30160:LINE=301
70:KEY=764:V=3:H=0:R=0:K=0
30005 GRAPHICS 0:POKE 709,32:POKE 710,
40:POKE 712,40:POKE 82,2:POKE 752,1:PO
KE 65,0:POKE KEY,255
30010 DIM FA$(17),FB$(28),A$(16),C$(39
):FOR I=1 TO 39:C$(I,I)=" ":NEXT I
30015 FB$="D1:";? "■K":POSITION 13,0:?
 "   DISK  MENU   ":? :?
30020 OPEN #1,6,0,"D1:*.*"
30025 TRAP 30060:IF R=40 THEN 30070
30030 INPUT #1,FA$:IF FA$(5,8)="FREE"
THEN POSITION 12,1:? FA$;:POSITION H,V
:GOTO 30060
30035 ? FA$(1,1);:FOR I=3 TO 10:IF FA$
(I,I)<>" " THEN ? FA$(I,I);:NEXT I
30040 IF FA$(11,11)<>" " THEN ? ".";:?
 FA$(11,13);:FOR I=I TO (LEN(FA$)-6):?
 " ";:NEXT I:? FA$(15,17):GOTO 30050
30045 FOR I=I TO LEN(FA$)-2:? " ";:NEX
T I:? FA$(15,17)
30050 R=R+1:IF R>19 THEN POKE 85,22:PO
KE 84,R-17
30055 GOTO 30025
30060 K=1:CLOSE #1:GOTO 30070
30070 TRAP 30180:POKE 752,0:POSITION 1
,23:? "Press SELECT,START(or OPTION fo
r more)";
30075 FOR LOOP=0 TO 0 STEP 0:IF V>22 A
ND H=0 THEN H=20:V=3
30080 IF R>19 THEN IF V>=R-17 AND H=20
 THEN V=3:H=0
30085 IF R<=19 THEN IF V>=R+3 THEN V=3
:H=0
30090 POSITION H,V:? " ";:IF PEEK(CONS
OL)=5 THEN V=V+1:FOR I=1 TO 50:NEXT I
30095 IF PEEK(CONSOL)=6 THEN GOSUB NAM
E:GOTO 30135
30100 IF PEEK(CONSOL)=3 AND R=40 THEN
FOR I=2 TO 22:POSITION 0,I:? C$:NEXT I
:R=0:POSITION 2,3:GOTO 30025
30105 IF PEEK(CONSOL)=3 AND K=1 THEN R
UN
30110 IF PEEK(KEY)=186 THEN GOSUB NAME
:A$="Deleting =>  ":P=8:GOSUB LINE:XIO
33,#1,0,0,FB$:RUN
30115 IF PEEK(KEY)=128 THEN GOSUB NAME
:A$="Locking =>  ":P=8:GOSUB LINE:XIO 3
5,#1,0,0,FB$:RUN
30120 IF PEEK(KEY)=139 THEN GOSUB NAME
:A$="Unlocking =>  ":P=8:GOSUB LINE:XIO
 36,#1,0,0,FB$:RUN
30125 IF PEEK(KEY)=168 THEN GOSUB NAME
:A$="New name for=>":P=0:GOSUB LINE:GO
SUB 30175:XIO 32,#1,0,0,FB$:RUN
30130 NEXT LOOP
30135 IF FB$(4,6)="DOS" OR FB$(4,6)="D
UP" THEN DOS
30140 IF FB$(4,4)=" " THEN RUN
30145 FOR I=4 TO LEN(FB$):FB$(I,I)=CHR
$(ASC(FB$(I,I))+128):NEXT I
30150 POSITION 0,23:? "  Loading  ";FB$(
4,LEN(FB$));:FOR I=LEN(FB$) TO 15:? "■
";:NEXT I:? "Please stand by..";:POSIT
ION H,V
30155 FOR I=4 TO LEN(FB$):FB$(I,I)=CHR
$(ASC(FB$(I,I))-128):NEXT I:RUN FB$
30160 FOR H=H+3 TO H+14:LOCATE H,V,X:I
F X<>32 THEN FB$(LEN(FB$)+1)=CHR$(X):N
EXT H
30165 POSITION H,V:PUT #6,X:RETURN
30170 POKE 752,1:POSITION 0,23:? C$;:P
OSITION P,23:? A$;FB$(4,LEN(FB$));:POK
E KEY,255:FOR I=1 TO 500:NEXT I:RETURN
30175 ? "■";:INPUT A$:? "■":FB$(LEN(FB
$)+1)=",":FB$(LEN(FB$)+1)=A$:RETURN
30180 POKE 752,1:? "■■":POSITION 17,10
:? "  SORRY!  ":POSITION 5,12:? "UNABLE
TO FOLLOW INSTRUCTIONS..."
30185 POSITION 2,14:? "PLEASE CHECK  D
RIVE  AND/OR  FILESPECS↓   THEN   PRES
S  OPTION  FOR MENU."
30190 IF PEEK(CONSOL)<>3 THEN 30190
30195 RUN
```

Users' Group

Atari Anonymous — A Users' Group
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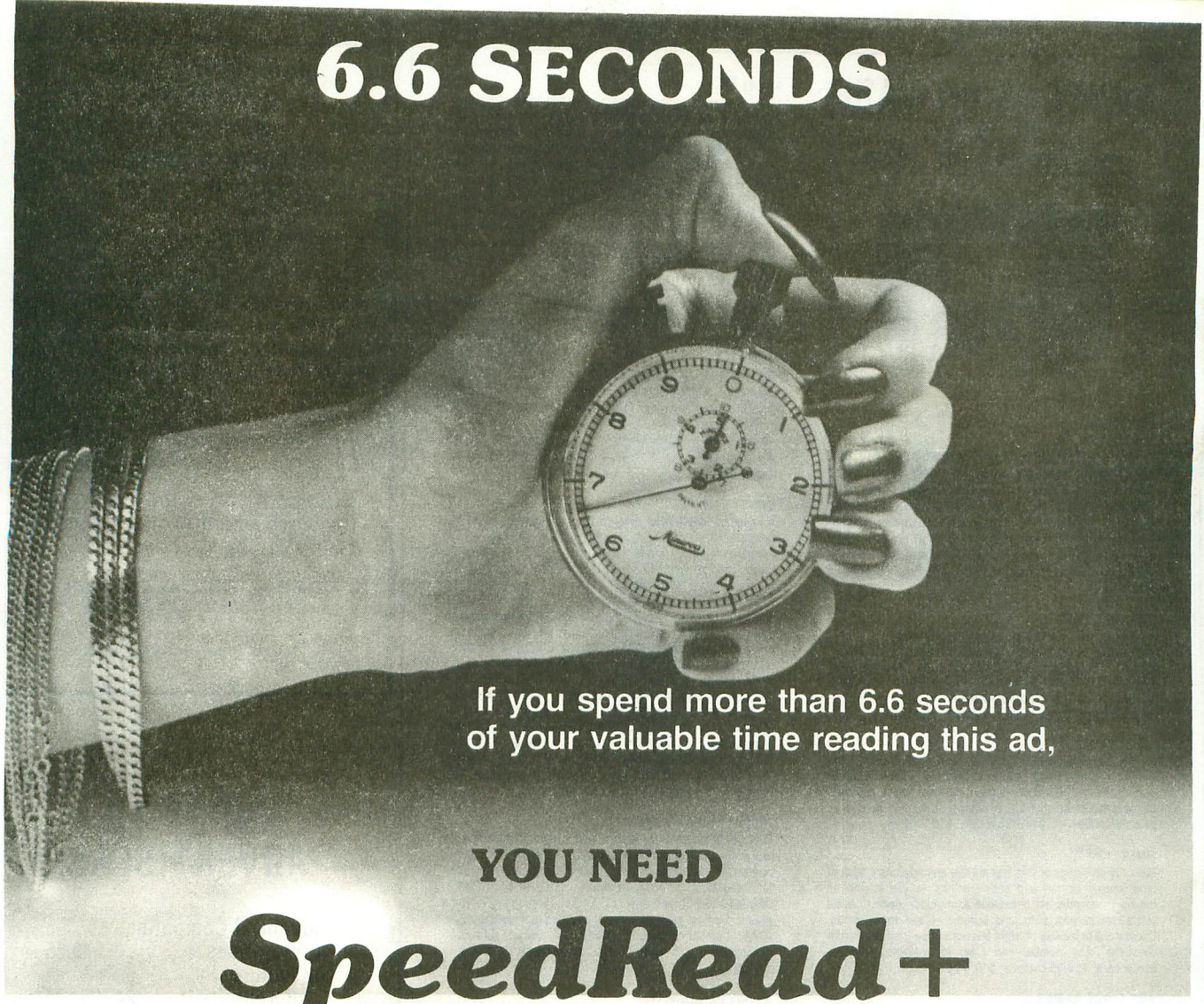
Upland, CA 91786
Gordon Larson
(714) 981-6427

6.6 SECONDS



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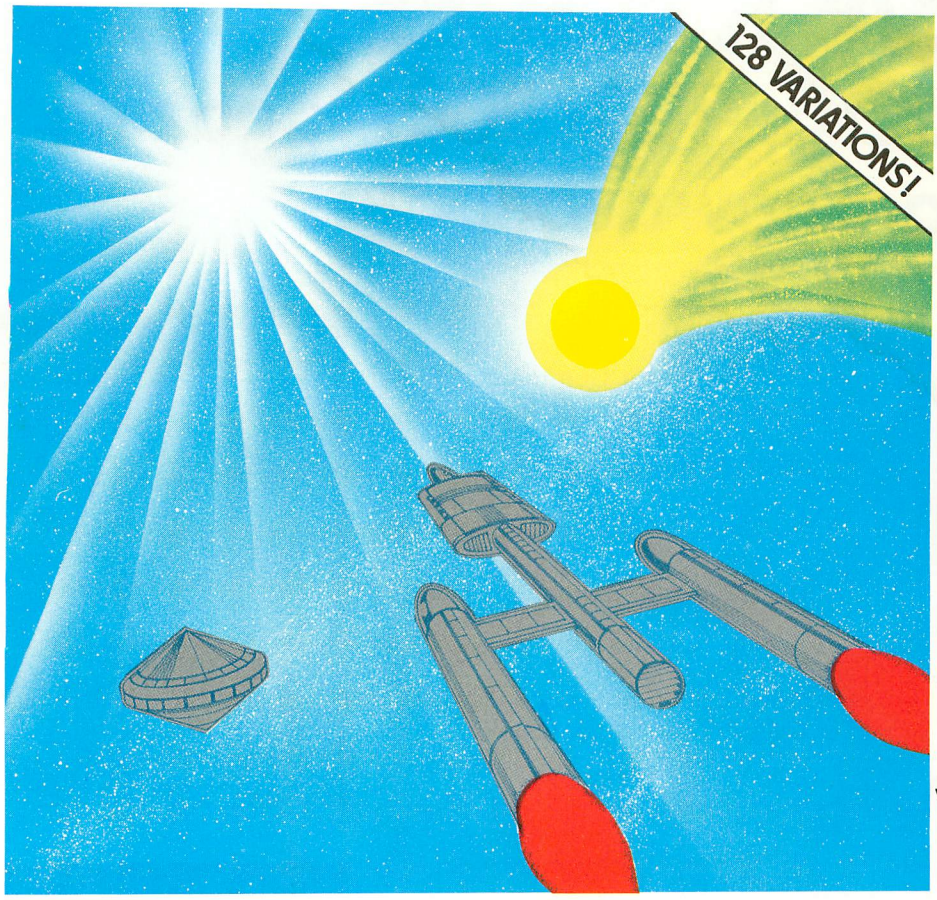

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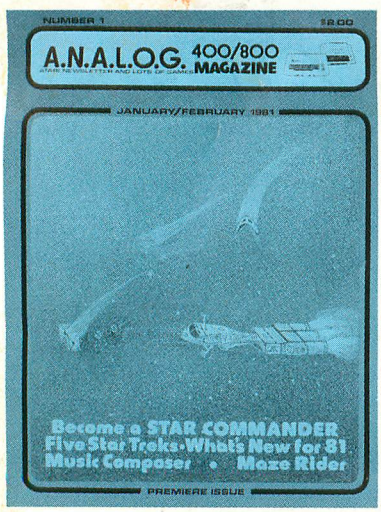

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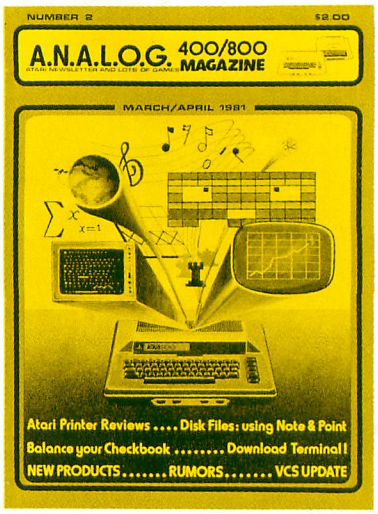

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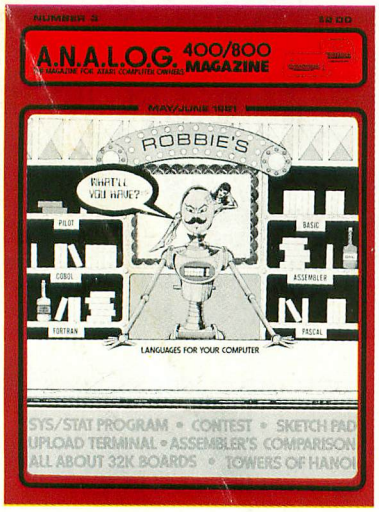

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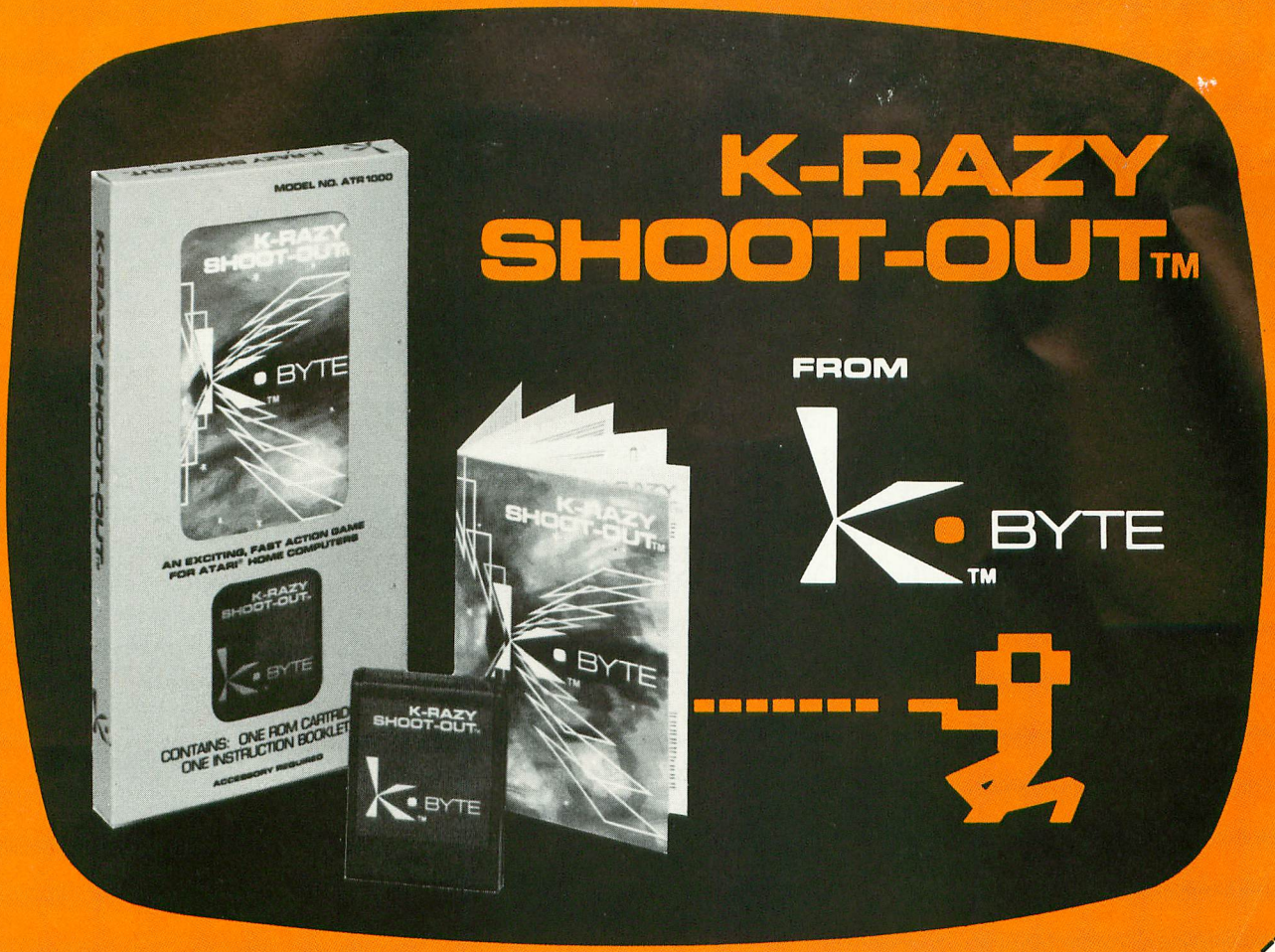

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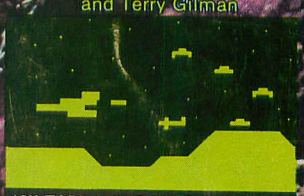

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