

ROM

The Magazine That Brings The ATARI™ Computer to Life!



- CAPTAIN CAMPSITE (MACHINE LANGUAGE)
- SLOT MACHINE
- SID MEIER INTERVIEW
- HIGH SCORE SAVER
- NEW DOS
- WHY BUY AN ATARI?



ATARI SINGS YOUR FAVORITE SONGS!!!

THE Original VOICE BOX Speech Synthesizer by the ALIEN GROUP has received rave reviews:

MICRO COMPUTING—"The VOICE BOX injects an endearing personality to your computer. The possibilities are enormous."

COMPUTE—"The VOICE BOX offers more human-like tones and does not blank out the screen."

CREATIVE COMPUTING—"English text and phonetic code may be freely intermixed rather than requiring separate modes as is the case without exception with every other speech system. A mode called talking face displays an animated face with impressive lip sync animation."

ANTIC—"There is a great potential for teaching children to spell and an added dimension to games overall. I believe the VOICE BOX is well worth the price tag."

ANALOG—"For ATARI owners who want to add speech to their programs, the Alien Group VOICE BOX is probably the best choice."

POPULAR SCIENCE—"The speech quality is excellent. Besides creating speech, the software has a bit of fun with graphics."

and on the new VOICE BOX II.....

TIME MAGAZINE—"Machine of the Year" "The VOICE BOX by the Alien Group enables an ATARI to say aloud anything typed on its keyboard in any language. It also sings "Amazing Grace" and "When I'm 64" or anything else that anyone wants to teach it."



INCORPORATE THE SINGING HUMAN FACE
INTO YOUR PROGRAMS AND GAMES



VOICE BOX II
Speech & Singing Synthesizer

To order by mail send a check or money order to the ALIEN GROUP for \$169. Then, try the VOICE BOX II for 10 days, and if it isn't the finest value you've ever seen in a computer peripheral, the most challenging and provocative addition you've ever made to your system, return it in its original condition for a full refund.

THE ALIEN GROUP
27 West 23rd Street (212) 741-1770
New York, NY 10010

The New VOICE BOX II for ATARI plugs into the serial port of the ATARI 400/800 with sound coming out of the TV/monitor. 48K DISK is required. It has all of the features of the original VOICE BOX plus many exciting new hardware and software features:

- The ability to sing with voice and 3 part music.
- A library of 30 famous songs.
- A comprehensive music system that allows the user to easily enter or modify new songs.
- Software that can convert the bottom two rows of the ATARI keyboard into a piano with a range of 3 1/2 octaves using the shift and control keys.
- Programmable musical sound effects such as tremolo, vibrato, glissando and click track.
- A singing human face with lip-sync animation designed by Jerry White.
- A talking or singing ALIEN face with software that allows the user to change the face and 8 mouth patterns as he sees fit.
- The ability to speak with inflection and feeling.
- Can speak in a foreign language with correct foreign spelling as input.
- A talk and spell program by Ron Kramer. Users can program any vocabulary for this spelling game. In fact, this program can even speak in a foreign language like French, where the user must spell the correct word in English, or vice versa.
- GREEN GOBLINS—A talking arcade game by John Wilson.
- Random Sentence Generator—An amusing grammar game that helps teach school children to identify parts of speech and recognize a variety of sentence structures.
- NUMBER SPEAK—A subroutine by Scott Matthews that converts up to a 9 digit number into normal English pronunciation. Ideal for building your own math games.
- STUD POKER—A talking poker game by Jerry White.
- The screen never blanks out while talking or singing.
- Singing or speaking subroutines can be incorporated into your programs, requiring as little as 100 bytes of RAM plus 5 bytes for each word.
- Entries into the \$5000 talking or singing game contest can be written using the VOICE BOX II—send for contest information.
- Price \$169.00 includes VOICE BOX II and all of the above software.
- Inquire about our discounts for educational institutions.

ALSO AVAILABLE AT LEADING COMPUTER STORES THROUGHOUT THE WORLD.

Atari is a registered trademark of Warner Communications.

NOTE: ATARI(TM) is a registered trademark of Atari,INC., a Warner Communications Company and all references to ATARI(TM) should be noted.

FEATURES/ARTICLES

Interview:SID MEIER.....	Peter Ellison	12
Display List Interrupts-PART II.....	Bob Cockcroft	6
Adventure Games Part III.....	Peter Ellison	25
NEW DOS(DOS-MOD).....	Peter Ellison	17

PROGRAMS

Captain Campsite.....	Bob Cockcroft	32
Slot Machine.....	Tuong Tran	20
High Score Saver.....	Tuong Tran	28

Columns

Editorial.....	Peter Ellison	2
Starting Page.....	Geoff Corry	3
The Raving Reviewer.....	Tim Reekie	5
Jake The Software Dude.....	Jason Cockcroft	9
The War Zone.....	Bob Cockcroft	15
Books On The Shelf.....	Peter Ellison	22
Yellow Brick Road.....	Peter Ellison	13
Why Buy An ATARI?.....	Peter Ellison	24
Listing Conventions.....		11
New Products.....	ROM	29

Domestic Subscriptions: 1 yr. 6 issues(bimonthly) \$12;12 issues \$22;18 issues \$32. 1 yr. cassette & magazine \$25; 1 yr. disk & magazine \$40. Send subscription orders to ROM P.O.BOX 252,Maple Ridge,B.C. V2X 7G1,TEL.(604) 462-9309 or 462-9177.

Nothing in this magazine may be reproduced without the written permission of the publisher. Program listings should be in printed form. Articles should be as a typed copy in upper and lower case with double spacing. By submitting articles to ROM authors are able to collect royalties. All articles accepted for publication will become exclusive the property of ROM. If the article is not accepted, the only way it will be returned is; if a self-addressed envelope is enclosed.



VOLUME 1,ISSUE 3

ROM STAFF

Editor/Publisher
Peter Ellison

Art Director
Paul Slevin

Technical Division
Bob Cockcroft

Photographer
Jason Cockcroft

Contributors:
Tim Reekie
Geoff Corry
Tuong Tran

ROM Magazine
Corp. is in no way
affiliated with
Atari. Atari is a
trademark of
Atari,Inc.

Editorial

Have we got an issue for you. This issue contains an Arcade game called "Captain Campsite", and interview with software programmer 'Sid Meier', Character Graphics Part II, Adventure Games Part III, Slot Machine, Beginner's Section, the Raving Reviewer, and a whole lot more. We have kept our promise as I said in the last editorial because we once again have the entire BASIC and assembly language listing of "Captain Campsite", a very excellent arcade game. This very original game combines everything from fast-action player/missile graphics, animated animals, character graphics, and enough fun to keep you playing it for hours to come. This game has the option of players(1-4) and that of lives(1-6). We at ROM promise to have an arcade-quality, machine-language game in every issue that is so good it could be marketed, but we want to serve the user and help him to become proficient at programming!

We at ROM know how hard it is to type in a program from a magazine without making a mistake, so we are offering a new price on our Disk and Cassette subscriptions. Our Disk version and magazine is reduced by \$10.00 to \$40.00 per year and our Cassette version and magazine is reduced \$5.00 to make it \$25.00 per year. It is hard starting out as a new magazine so we hope are lower rates might produce a few more subscriptions.

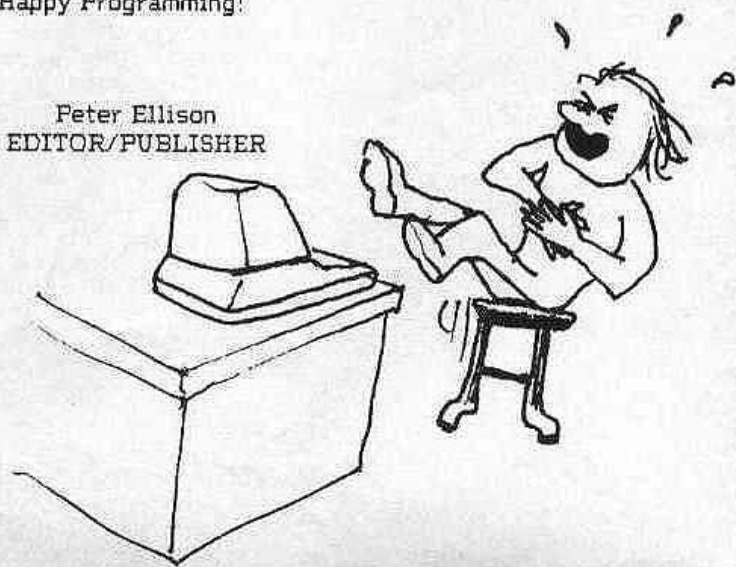
Another thing that we will be introducing this issue is section called "Why Buy an ATARI?" This section is exactly what the title says, "Why buy one?" It will give the prospective buyer or new buyer reasons why he should or did buy an ATARI. From this issue explaining simple ATARI graphics to next issue outlining player/missile graphics to give good reasons and explanations on what makes the ATARI so special. One more new section this issue is "The War Zone". This section each issue will review exclusively computer wargames with a few hints at how to win!

Because of all the letters we've been receiving asking questions, a special letter section will begin this issue. This section will try to answer any of the questions sent in asking about the ATARI. Also we want suggestions on what we can do to improve our magazine so we can make it the No. 1 ATARI magazine. To give you shy ones some incentive to drop us a line, for every 20th letter we receive, that person will get a one-year subscription absolutely FREE! So send in those letters and you have a chance of winning just by writing.

One more thing before I sign off. This is very important!! Whenever you see an ad in this magazine and want to buy the product, tell the company where you saw their ad so they know someone is seeing their ad in our magazine. That will be very much appreciated.

Happy Programming!

Peter Ellison
EDITOR/PUBLISHER



Starting Page Character Graphics - Part II

by Geoff Corry

Here we are again. In the last issue we copied the ATARI character set down into a safe area of memory. We plan to modify some of the characters to make up the elements of a picture we want to display.

The program so far is:-

```
10 RAMTOP=106:CHBAS=756:CHORG=57344
20 GRAPHICS 0
30 RAMNEW=PEEK(RAMTOP)-8
40 START=RAMNEW*256
50 FOR CH=0 TO 1023
60 POKE START+CH,PEEK(CHORG+CH)
70 NEXT CH
80 POKE CHBAS,RAMNEW
```

Those of you who typed in the program and ran it probably thought "so what, nothing happened". This issue will correct one typo that got into the listing and will generate a little magic to show that, indeed, something DID happen.

First the BOO BOO. Line 80 had a letter 'R' creep into CHBAS. So the computer, being a very literal fellow, looked at CHRBAS and said hmm - a new variable, no value given. So I will call it location 0 in memory and I will put the value of 'RAMNEW' there. Well we wanted the value of 'RAMNEW' to go into location 756, where it becomes a signpost to tell the computer where to get the relocated character set. See how careful we all have to be!

This column is called STARTING PAGE and is intended to help those of you who want to know something about how the machine operates and maybe develop something you can call your own. The series on character graphics is written with this view in mind. Looking at the last issue, I felt that some of the terms we have used may need some explanation, so here goes:

PEEK(address) -Get the computer to find out what is stored in a certain memory location (or address). In this program we asked it to 'peek' into memory location 106, which we called RAMTOP (the TOP of Random

Access Memory). We also asked it to peek into 1024 memory locations, from 57344 to 58377, to find the coding required for the ORiGinal CHaracter set (CHORG to CHORG+1023).

POKE address,value -Get the computer to put a specified value into a specified memory address. Try this:- type POKE 82,5 and press return. You will see that the cursor and 'READY' have moved over to the right. Normally memory location 82 has a value of 2 in it, so all text starts two columns in from the left. In this program, we asked the computer to copy the values it 'peeked' into memory locations 57344 to 58377 down into our new area starting at page 'RAMNEW'.

PAGE -To simplify addressing the memory field in the computer we use a similar idea as postal addressing. Our favorite computer store may be in the 23 hundred block Jackson Ave., which is O.K. for us to tell someone where to find it. But if we want to mail a letter to the store, we should use the correct address, say 2023 Jackson Ave. Blocks in the computer are called PAGES and each consist of 256 individual memory locations. A fully equipped ATARI has a total of 256 pages of memory, each page having again 256 memory locations, giving a grand total of 65536 memory cells. About 18 thousand of these are Read Only Memory or ROM, which cannot be altered, leaving less than 46 thousand for house-keeping and program development. To turn a PAGE number into an actual memory location, we have to multiply by 256, as we did in line 40.

Meanwhile, back at the program. Type in lines 10 to 80, or fix up line 80 (remember, old CHBAS). Now we are going to do some magic. Type in the following:-

```
12 Y=(PEEK(RAMTOP)-8)*256
14 FOR X=Y TO Y+1023:POKE X,255:NEXT X
```

Now move the cursor up to line 80, (what again!), and type '42' and return. Type 'L.' (the quick way to type LIST). Lo and behold, line 80 has been repeated as line 42. Check that lines 12 and 14 are O.K. This copying of lines is a

Starting Page cont'd.

good trick to use when you get to a lot of similar lines when typing in a program. Type the first line of the bunch, hit RETURN, and move back up, change the line number, and then make any small changes and hit RETURN. Repeat this process until all the similar lines are done.

Back to our program to set up the magic act. Type in:-

```
44 PRINT " THE CHARACTER SET IS NOW  
BEING MOVED (7 CTRL ,) (9 CTRL P) (9 CTRL  
,) (8 CTRL ;)"
```

Hey, what's going on here? Well, after you type 'MOVED', hit the space bar twice, then hold down the 'CTRL' key and hit the comma key seven times. Another space and then 'CTRL P' nine times, space again, 'CTRL ,', nine times, another space, 'CTRL ;', and finally the closing quotes. Whew! If this came out right, after the text you should have two spaces, seven hearts, space, nine clubs, space, nine diamonds, space, eight spades. Rummy anyone? With a hand like that, you could clean up.

Now line 44 can be introduced on the poor person, (you), trying to type it in. ANTIC has 'Listing Conventions', A.N.A.L.O.G. COMPUTING has 'Control Characters', COMPUTE! has 'How to Type COMPUTE!'s Programs', and SOFTSIDE has a section called 'Line Listings' in the back of the small Printed Game Software booklet included in each magazine issue. The CODE WORKS produced a program back in the early years of ATARI, (almost 3 years ago), called 'IRIDIS 2' which deals with altered character sets or fonts. This is an excellent program because the authors took time to fully document the program, and also it is liberally sprinkled with helpful programming tips. The last page of the IRIDIS 2 booklet deals with listing conventions, and are often accepted as the standard.

O.K. before you run this magic addition to our program, you had better save it. Wrong POKES may send the computer to never never

land, and I would hate to see you go through all this again, especially line 44.

Here we go. Your full program is on the screen, if not, type 'L.' and RETURN. Now finally type 'RUN' and RETURN. Wait for about 12 seconds for the magic to generate. Hey! Your listing has been wiped out and white blocks have appeared at the top of the screen (lines 12 and 14 did this). Keep looking. The white blocks are being replaced in alphabetical order by the text you wrote in line 44. Here come the hearts, clubs, diamonds, and finally the spades. This is a visual demonstration that the character set has been copied down into your new memory area. If you look at Table 9.6 on page 55 of the ATARI Basic Reference Manual you will see the order follows the code listing, capital letters from numbers 33 to 58, the heart symbol is 64, club is 80, diamond 96, and the spade symbol near the end at 123.

Now for more magic. List the program again. Now type 'RUN' and RETURN. Wow, the screen turned white and all your characters are changing into white blocks (That's lines 12 and 14 again). Now the rest of the program will go through the same process as before. Call in the folks, they will be impressed with the magic you can get out of your ATARI.

See if you can figure out everything that went on here. If you are having problems let us know. We want to make this magazine as useful as possible. If you feel confident with all this, then you can hardly wait to get onto the next installment of the continuing saga of Character Graphics.

P.S. By the way, the Spring and Summer Issues of the ATARI CONNECTION have been carrying a series of articles called Cartoon Computer Animation that gets into the same stuff as we are doing here.

The Raving Reviewer

by Tim Reekie

ARCHON

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403

On the one hand, we have a strategic game; on the other hand, a shoot-em-up game. In both of the hands there is excellent graphics, imaginative sound, and exotic, fantastic creatures. And thus, joining hands as it was, Electronic Arts has given us 'ARCHON'.

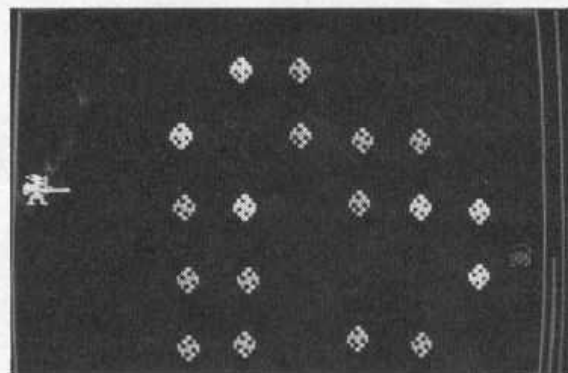
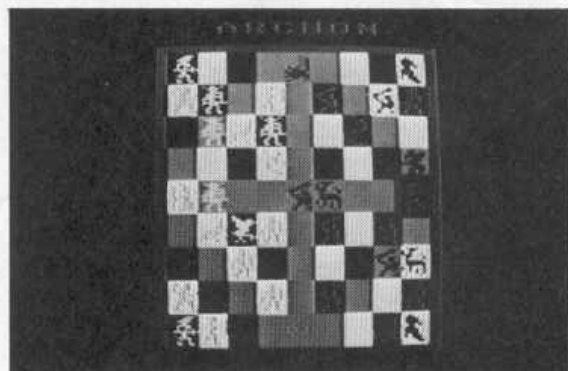
The Game

And now, we separate the hands. The first hand is played on "The strategy Screen". This screen resembles a chess board, except for the individual squares themselves! There is, indeed, white and black squares, as on any chess board, but there is also "luminance squares", which fluctuate throughout the game in a cycle-Black-Dark-Barely Dark-Barely Light-Light-White. Dark players are the strongest on dark squares and white players are the strongest on white squares. There is also "power points" where characters can recover faster. But I'm getting ahead of myself. Recover from what? you may well ask! That brings us to...

On the other hand-"The Combat Arena". Each player is endowed with a variety of monsters(hereafter called "icons"), each with attributes of their own. If an Icon lands on a square occupied by an Icon of the opposing army, a fight begins in the 'Combat Arena.' Weapons vary from clubs and swords to balls of fire and flaming breath. The Combat Arena is a fight to the death with each Icon's life-line displayed on either side of the screen. If this isn't enough, each army has a Wizard/Socress with equivalent spells ranging from Shift time to Imprisonment. The game is won when one whole army is wiped out or when one army occupies all five power points. This is a rather hasty glossing over of the rules of the game but every aspect of the game is explained in detail in the excellent documentation.

This game is easy to play after the rules are read and the abilities and limitations of each Icon is understood. Mastering the game depends on your opponent. The computer is a

tricky opponent until you develop a strategy. The Challenge of the game is where I register my first complaint. This would be an extraordinarily challenging game except that a person with good skills in shoot-em-up games can easily defeat an opponent with less skills of his own. Therefore, the game may be dictated by one player's ability to 'out-draw' the other.



The graphics are superb in that each Icon has its own shape and character. A good example is the Golem(from the light side). When moved(with the joystick), it doesn't merely slide along to its appointed square but its' arms swing, its' head weaves, and it generally golumphs along slowly making a low golumphing sound. All of the Icons make

Continued on page 16

Display List Interrupts - Part II

Using Player/Missile Graphics

by Bob Cockroft

Display list interrupts allow the computer to have multi-colored players and missiles. Rising above the limitations of basic programming one is able to make far more interesting objects through different colors. The possibilities become almost endless for the (artistry) created by this technique.

The display list is a program in the computer that is used by the Antic chip to display the screen. Despite varying slightly with each graphic mode, the display list basic format remains constant. The display list's base (or lowest) address can be determined by its location pointers (560,561 dec.) in the following manner.

`DISBASE=PEEK(560)+256*PEEK(561)`

The first 3 bytes of the display list, places 24 blank lines at the top of the screen. The next 3 bytes(LMS) give the beginning address of where the screen data is located. Following this is a string of uniform bytes. This string of bytes is known as the instruction register(IR) mode bytes. Each byte controls the graphic mode of one horizontal line on the screen. By controlling each horizontal line of graphics, starting from the top to the bottom, there is an opportunity for extra color creation. The (IR) mode bytes change in value with each particular graphic mode. The table below gives the possible (IR) mode byte values and the corresponding graphic mode:

Table 1

0	2
1	6
2	7
3	8
4	9
5	10
6	11
7	13
8	15

In this second article in a series on display list interrupts, I will present a program that creates (multi) colored players or missiles. Displaying player(0) as a long

vertical line, I will divide it with a color into sections. It is important to note with display list interrupts one can only print color in horizontal rows. As you will notice with the first program, one cannot color only a section of a horizontal line of player(0) data. Only a complete line of a player or missile can be colored.

There are four steps to create a display list interrupt. First the color for the highest(highest on the screen) part on the player must be set. This can be done by poking a value into the color shadow register for the player(see table two). For example, for player(0) this location would be 704 dec.

Second, one must determine where vertically to change the color. Remembering that each (IR) mode byte represents one line of graphics from top to bottom, one can find his desired dividing point by counting the number of graphic lines that is above this location. Then, located this (IR) mode byte in the display list. To indicate to the Antic chip that this is the place where you wish the interrupt to take place, add 128 to the byte. For example, if the dividing point were to be in the middle of the screen, the programmer would need to add 128 to the middle (IR) mode byte.

As you may already know color controls are operated by two types of registers; hardware and shadow registers. Hardware registers are 'write only' locations. In other words, one can only poke these locations not peek 'at' them. Hardware registers are updated by the value in their corresponding shadow register everytime the Antic draws a screen. Each hardware register has a corresponding shadow registers. These registers are both 'read' and 'write' locations, in other words operate in the manner most memory locations do. Below is a table of hardware and shadow registers that are relevant to player/missile color.

Table 2

Player	Hardware Register	Shadow Register
player(0)	53266	704
player(1)	53267	705

graphic mode Value in (IR) mode byte

Display List Interrupts cont'd.

player(2)	53268	706
player(3)	53269	707

In other words every time the Antic draws a screen, the hardware register is updated with the value stored in its corresponding shadow register. The value stored in the hardware register is used to create a player's color. The following machine-language subroutine interrupts the process mentioned above. As the Antic moves down the display list it will be interrupted and forced to go to the machine code. Here the hardware register is changed during the process of creating a screen, before the hardware register can be updated by its corresponding shadow register. In other words, we have changed the color before the Antic has completed drawing the screen. The result is one player with two colors that meets at the pointer where the modified (IR) mode byte is.

Machine Language Subroutine

Mem.	Loc	Value	Assembly ;Comment
1536	72	PHA	;PUSH 'A' ON THE STACK
1537	169	LDA	;LOAD 'A'
1538	1	#1	;WITH ANY NO.
1539	141	STA	;AVOID CHANGE
1540	10	\$0A	;IN MIDDLE OF LINE
1541	212	\$D4	
1542	169	LDA	;LOAD 'A'
1543	50	#50	;WITH NEW COLOR
1544	141	STA	;STORE NEW COL.
1545	18	\$12	;IN HARDWARE
1546	208	\$D0	;REGISTER
1547	104	PLA	;REPLACE 'A'
1548	64	RTS	;RETURN

The next thing we need to do is to tell the Antic where to go during the interrupt. As the Antic moves down the display list it will come to the byte that has been modified to force a interrupt.(IR mode byte+128 remember?) When this happens the Antic will look at the interrupt pointers to see where it is to go. Our destination is the machine-language subroutine above. Therefore we poke the location of the code into these addresses. It is important to realize that the location store in the pointer(512,513) is in LSB/MSB

form.(Therefore 1536 decimal would be '0' and '6'; see below)

1536/256=6
Therefore:
POKE 512,0;POKE 513,6

The last step would be to enable a non-maskable interrupt.(NMI) This can be done by POKEing 54286 dec. with 192

Program 1 contains all the steps I have mentioned. After successfully typing and RUNning it, you will see player(0) as a long vertical line which is divided by two colors. Use the joystick to change the colors and move the point of division.

Program 2 is practical application of what you have read. It consists of a red man, created by player(0), which has a black hat. This is perhaps not the most interesting program you have ever seen. However, it should show you what is possible, and could help you get started.

The third thing we need to do is to create a machine language subroutine which the Antic chip is to go to during the interrupt.

90	REM *
92	REM *MULTIPLE COLORED
	PLAYER/MISSIE *
94	REM * PROGRAM 1
96	REM *
99	REM *LOAD IN THE MACHINE
	SUBROUTINE
100	FOR X=1536 TO 1536+12
115	READ D
120	POKE X,D
130	NEXT X
132	V=50
135	REM LOAD LOCATION FOR THE
	INTERRUPTS JUMP
140	POKE 512,0
150	POKE 513,6
195	REM * SET UP MISSILE GRAPHICS
200	GRAPHICS 8
210	POKE 559,62
220	POKE 53248,120
230	POKE 704,88
240	I=PEEK(106)-8
250	POKE 54279,I

Display List Interrupts cont'd.

```

260 POKE 53277,3
270 J=I*256+1024
275 REM * DRAW PLAYER(0) AS A LONG
LINE *
280 FOR X=1 TO 255:POKE J+X,255:NEXT X
290 DL=PEEK(560)+256*PEEK(561)
292 POKE 54286,192
295 REM * ADD 128 TO INTERRUPT BYTE
299 POKE DL-1+V,15
300 POKE DL+V,15+128
301 POKE DL+1+V,15
302 POKE DL+99,79:POKE DL+100,0:POKE
DL+101,144
305 REM * ENABLE (NMI)
320 REM * CHANGE THE VALUE PLACED IN
THE HARDWARE REGISTER *
330 IF STICK(0)=11 AND P<255 THEN P=P+1
340 IF STICK(0)=7 AND P>9 THEN P=P-1
342 IF STICK(0)=14 AND V>0 THEN V=V-1
344 IF STICK(0)=13 AND V<150 THEN V=V+1
350 POKE 1543,P
390 ? "COLOR NO. ":"P;" VERTICAL POS
"IV;" "
400 GOTO 299
499 REM * MACHINE CODE DATA *
500 DATA 72,169,1,141,10,212,169
510 DATA 12,141,13,208,104,64

```

```

50 REM *
60 REM * MULTIPLE COLORED
PLAYER/MISSILE *
64 REM * PROGRAM 2
66 REM *
80 REM * LOAD IN THE MACHINE
SUBROUTINE
100 FOR X=1536 TO 1536+12
115 READ D
120 POKE X,D
130 NEXT X
135 REM LOAD LOCATION FOR THE
INTERRUPTS JUMP
140 POKE 512,0
150 POKE 513,6
195 REM * SET UP MISSILE GRAPHICS
200 GRAPHICS 8
205 DL=PEEK(560)+256*PEEK(561)
210 POKE 559,62
220 POKE 53248,120
230 POKE 704,65
240 I=PEEK(106)-8
250 POKE 54279,I

```

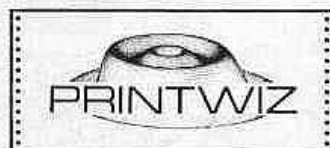
```

260 POKE 53277,3
270 J=I*256+1024
275 REM * DRAW THE PLAYER(0)
280 FOR X=1 TO 17
282 READ D
284 POKE J+90+X,D
286 NEXT X
290 POKE DL+68,15+128
292 POKE 1543,88
900 POKE 54286,192
999 REM * MACHINE CODE DATA
1000 DATA 72,169,1,141,10,212,169
1010 DATA 12,141,13,208,104,64
1015 REM * DATA TO DRAW PLAYER(0)
1020 DATA 28,28,28,28,127,28,20, 28,8,127,
93,28,28,28,20,20,54

```

EPSON*, NEC*, PROWRITER*, GEMINI*, OKIDATA 92*

NEW!
Atari*



The only self-booting grafix handler for dumps in **horizontal** format — all mach. lang. — **Lister** incl. — all modes — mixed modes — change aspect ratios, etc. while running other programs — assem ed — basic or no cartridge — demos, utilities, fonts, included — dump, create forms, stationery, calendars, requires interface. **ONLY \$26⁹⁵**

diskwiz

Map, search, repair, duplicate, fix link pointers, alter, speedcheck, bad sectoring (810 only), block move, trace, manual, special print capabilities, disassembler, and more! — the best disk repair/editor **\$28⁹⁵** at any price — and at the lowest price!

1st Class Postage Paid

California Residents add 6%, Foreign Orders add \$2.50

C.O.D. add \$2.00 — No credit cards

Prices subject to change

(213) 376-4105

ALLEN
MACROWARE

P.O. Box 2205

Redondo Beach, CA 90278

* Indicates Trademark of non-related company

Jake The Software Dude

by Jason Cockroft

Allright here I am again. By the way my name is ah?, Jake the Software Dude. You'll have to excuse my present condition, I just had a wild software party and my circuits are running kind of slow. Anyways, to give you guys an idea of the kind of thing that went on last night, I will tell you what happened, or at least how it got started.

It all started yesterday afternoon when I was coming home from the unemployment office, when I decided to stop in at the local software store. I took a quick browse around staring at all the usual software when this new game "Jumpman" caught my eye. Well I had a few bucks left in pocket so I decided to go for it. Yah, just as I bought that last little disk, a whole bunch of bright-eyed people came busting in hollering for that game. Well I just chuckled as I told them it was the last one but...(what a BIG mistake!)... I told them to "come over" and have a game, but bring your own 'Joysticks'(B.Y.O.J. Party). Well now, I guess they kind of agreed.

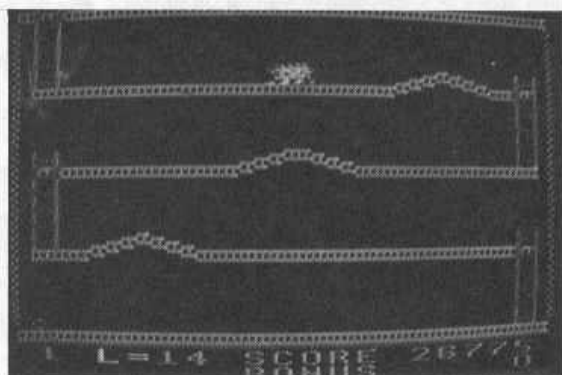
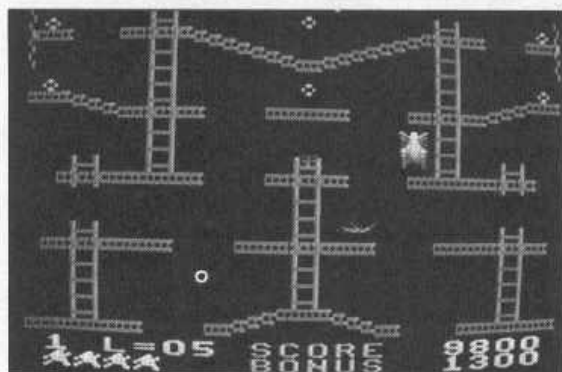
By the time I got home I knew something was different. People were bringing there own computers, (ATARI's of course), disk drives, TV's and a few crazies were even bringing their cassette players. There was plenty of extra joysticks and potato chips to boot. I loaded in the first game and that's when things got out of hand.

To totally understand what went on at this here place you'll probably have to buy the game yourself. But to give you readers a clue of what it is all about, I will give you a quick description!

Jumpman is the name, action-packed excitement is the game! Here's the quick make over! The game has 30 different levels in which you try to solve. You can play the game on 5 different skill levels which include: Beginner, Intermediate, Advanced, Grand Loop and Randomizer. Your goal of each level is to touch several different tokens placed on 4 or 5 different floors of the screen. After solving one screen your on to the next. Sound easy Aye!

Well let me tell you something, those darn levels are tricky, even for JAKE THE SOFTWARE DUDE. Even then, if your good

enough to master one level, you've got 29 to go. But in the meantime on a particular level you'll have Robots chasing you, vampires flying after you, guns shooting you, and even have the floor give out. While on another level you may be completely blind or have a puzzle to solve. And to make the game even more challenging, it is time oriented. The more time you take, the less points you get.



Now let me remember, ah yes, it was 3:00 AM, there was young Software Dudes passed out all over floor, a few blurry-eyed survivors still attempting the 10th level on Grand Loop, when I was in a fierce combition with THE, and let me re-emphasize, THE RAVING REVIEWER. It was rough. I had just completed fighting off the dragons on the 14th

level, (I must admit, it was with a lucky throw of the spear), with no men left, and it was THE RAVING REVIEWER'S turn. By now the few remaining conscious people were gathering around the one lonely screen. I can remember the look, the sweat and the chilling frustration of THE REVIEWER'S face. This was it. THE REVIEWER made his way down to the 2nd level of the screen, there was only 1 level to go. The crowd drew silent. He jumped off the ladder, ... missed timed his throw ... and it was all over! Now let me see, I've got a smashed TV, an impression of a Joystick in the wall, several lumps on top of my head, and no sign of the, and let me re-emphasize, THE RAVING REVIEWER. Gee, I wondered what had happened.

As I cleaned up this morning I kind of wondered, was this game really worth it. But my obvious conclusion was YES. The playability, the graphics, and of course, the challenge were all perfect in this game. I'll give this game the honourable award of Jake the Software Dude's Game of the Year! P.S. Please don't complain about my lousy spelling.



JUMPMAN
 Playability:10
 Challenge:10
 Graphics:10
 Sound:9
 Documentation:8
 Overall:9.8

Epyx
 1043 Kiel Court
 Sunnyvale, CA 94086

NEW THE MONKEY WRENCH II A PROGRAMMERS AID FOR ATARI 800 NEW AND IMPROVED — 18 COMMANDS

If you are a person who likes to monkey around with the ATARI 800, then THE MONKEY WRENCH II is for you! Make your programming tasks easier, less time-consuming and more fun. Why spend extra hours working on a BASIC program when the MONKEY WRENCH can do it for you in seconds. It can also make backup copies of boot type cassette programs. Plugs into the right slot and works with ATARI BASIC cartridge.

THE MONKEY WRENCH provides 18 direct mode commands. They are: AUTO LINE NUMBERING — Provides new line numbers when entering BASIC program lines. RENUMBER — Renumbers BASIC's line numbers including internal references. DELETE LINE NUMBERS — Removes a range BASIC line numbers.

VARIABLES — Display all BASIC variables and their current value. Scrolling — Use the START & SELECT keys to display BASIC lines automatically. Scroll up or down BASIC program. FIND STRING — Find every occurrence of a string. XCHANGE STRING — Find every occurrence of a string and replace it with another string. MOVE LINES — Move lines from one part of program to another part of program. COPY LINES — Copy lines from one part of program to another part of program. FORMATTED LIST — Print BASIC program in special line format and automatic page numbering. DISK DIRECTORY — Display Disk Directory. CHANGE MARGINS — Provides the capability to easily change the screen margins. MEMORY TEST — Provides the capability to test RAM memory. CURSOR EXCHANGE — Allows usage of the cursor keys without holding down the CTRL key. UPPER CASE LOCK — Keeps the computer in the upper case character set. HEX CONVERSION — Converts a hexadecimal number to a decimal number. DECIMAL CONVERSION — Converts a decimal number to a hexadecimal number. MONITOR — Enter the machine language monitor.

In addition to the BASIC commands, the Monkey Wrench also contains a machine language monitor with 18 commands used to interact with the powerful features of the 6502 microprocessor.



\$59.95

ATARI AND PET EPROM PROGRAMMER



Programs 2716 and 2532 EPROMs. Includes hardware and software. PET = \$75.00 — ATARI (includes sophisticated machine language monitor) = \$119.95

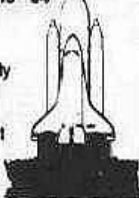
Eprom Cartridge — A.P.C. board and case which can be used in the ATARI 400 or 800 in the left or right slot. Uses 2532, 2732, or 2716 EPROMs. May contain up to 8K bytes. \$19.95

Memory Test — Make sure your RAM memory is normal. \$6.95 or \$9.95 on disk.

Typing Exercise — A typing drill program for beginners and experts. On disk. \$12.95

More than just an Assembler/Editor! Now for the "64"

It's a
 Professionally
 Designed
 Software
 Development
 System



MAE
 for
 PET
 APPLE
 ATARI
 \$109.95
 New
 Price
 \$99.95

Blast off with the software used on the space shuttle project!

- Designed to improve Programmer Productivity
- Similar syntax and commands — No need to relearn peculiar syntaxes and commands when you go from PET to APPLE to ATARI
- Consistent Assembler/Editor — No need to load the Editor then the Assembler then the Editor, etc.
- Also includes Word Processor, Relocating Loader, and much more
- Options: EPROM Programmer, unimplemented opcode circuitry
- STILL NOT CONVINCED? Send for free spec sheet!

5 1/4 INCH SOFT SECTORED DISKETTES

Highest quality. We use them on our PETs, APPLES, ATARIs, and other computers. \$22.50/10 or \$44.50/20

EPROMS 2716 = \$4.50 2532 = \$7.50

Eastern House

3239 Linda Dr.
 Winston-Salem, N.C. 27106
 (919) 924-2889 (919) 748-8445
 Send for free catalog!

VISA*

MasterCard

Listing Conventions

This section each issue will be just a reference guide for typing in those programs that contain control(CTRL) characters. Make sure you understand this section completely before you type in either 'High Score Saver' or 'Slot Machine' in this issue of ROM. Remember if some words are in parantheses within the quotes it means to refer to the 'listing convention' page.

Below are just a few example of what we mean:

"(4*SP)"-this means to press the Atari logo inverse key and then press the space bar 4 times.

"(|*4)"-this means to push the escape key, then control down arrow four times.

"(----)"-this means to just press the space bar 4 times.

"((CTRL Y)(3*SP)(CTRL Y))*3)"-this means to do everything in the parantheses three times. First Control Y then inverse space bar three times, and then Control Y again.

Remember if you have any trouble typing in the programs, give us a call.

Normal Video

␣	(CTRL ,)	␣	(CTRL T)
␣	(CTRL A)	␣	(CTRL U)
␣	(CTRL B)	␣	(CTRL V)
␣	(CTRL C)	␣	(CTRL W)
␣	(CTRL D)	␣	(CTRL X)
␣	(CTRL E)	␣	(CTRL Y)
␣	(CTRL F)	␣	(CTRL Z)
␣	(CTRL G)	␣	(ESC ESC)
␣	(CTRL H)	␣	(ESC CTRL -)
␣	(CTRL I)	␣	(ESC CTRL =)
␣	(CTRL J)	␣	(ESC CTRL +)
␣	(CTRL K)	␣	(ESC CTRL *)
␣	(CTRL L)	␣	(CTRL .)
␣	(CTRL M)	␣	(CTRL ;)
␣	(CTRL N)	␣	(SHIFT -)
␣	(CTRL O)	␣	(ESC
␣	(CTRL P)	␣	SHIFT
␣	(CTRL Q)	␣	CLEAR)
␣	(CTRL R)	␣	(ESC DELETE)
␣	(CTRL S)	␣	(ESC TAB)

Inverse Video

␣	(INV CTRL ,)	␣	(INV CTRL X)
␣	(INV CTRL A)	␣	(INV CTRL Y)
␣	(INV CTRL B)	␣	(INV CTRL Z)
␣	(INV CTRL C)	␣	(ESC
␣	(INV CTRL D)	␣	SHIFT
␣	(INV CTRL E)	␣	DELETE)
␣	(INV CTRL F)	␣	(ESC
␣	(INV CTRL G)	␣	SHIFT
␣	(INV CTRL H)	␣	INSERT)
␣	(INV CTRL I)	␣	(ESC
␣	(INV CTRL J)	␣	CTRL
␣	(INV CTRL K)	␣	TAB)
␣	(INV CTRL L)	␣	(ESC
␣	(INV CTRL M)	␣	SHIFT
␣	(INV CTRL N)	␣	TAB)
␣	(INV CTRL O)	␣	(INV CTRL .)
␣	(INV CTRL P)	␣	(INV CTRL ;)
␣	(INV CTRL Q)	␣	(INV SHIFT -)
␣	(INV CTRL R)	␣	(ESC CTRL 2)
␣	(INV CTRL S)	␣	(ESC
␣	(INV CTRL T)	␣	CTRL
␣	(INV CTRL U)	␣	DELETE)
␣	(INV CTRL V)	␣	(ESC
␣	(INV CTRL W)	␣	CTRL
		␣	INSERT)

Atari® Users!!

NOW AVAILABLE...

MIGHTY BYTE™ Disk Copier. A backup copier that allows you to select sectors, identify and write bad format. Copy almost any disk. The most powerful copy system available today on Atari® 400/800 computers.

Only \$29.95 + \$2 shipping

VISA & MASTERCARD call now
(815) 968-2228 for fast delivery

Software Authors and Users: call or write for further information on our complete line of Atari® compatible backup systems and services.

Can't slow that new drive below 250rpm?
We modify your drive \$10.00
You modify with our parts \$5.00

MIGHTY BYTE COMPUTER
828 Green Meadow Ave., Dept. R
Rockford, Illinois 61107

Interview: Sid Meier

Interviewed by Peter Ellison

MicroProse software has only been going for just over a year and has to its credit five excellent games for the ATARI computer. They are *Hellcat Ace*, *Spitfire Ace*, *Floyd of the Jungle*, *Wingman*, and *Nato Commander*. Soon these games will also be available for the Commodore 64 and IBM personal computers.

Q. Sid, when did you first become interested in computer programming?

A. It was in college, the University of Michigan. I took a few courses and it seemed like a lot of fun so I pursued it. It was on an IBM 360 multi-terminal.

Q. What was the first computer that you ever owned?

A. It was an ATARI 800.

Q. What was the first program that you wrote for the commercial market?

A. The first program which I sold commercially was called 'Formula-One Racing', a race car game. This I sold to ACORN software about a year and a half ago.

Q. Where did you get the idea for 'Floyd of the Jungle'?

A. I had just finished 'Hellcat Ace' and I was looking around for ideas for a new game and there was this movie on T.V., the latest Tarzan movie with Bo Derek, and I was also working at the time with some animation tools that I'd been developing, animation effects with multiple characters and multiple player/missile images, and the two just merged together.

Q. What new things have you added to 'Floyd of the Jungle II'?

A. We've added some computer competition, in other words, all of the players are active and if only two people are playing the computer will control the other two 'Floyds' against you. There is also a demonstration mode to give the first-time player an idea of how the game goes. We've also cleaned up a few of the screens to make it easier to hit the pygmies. The major change was to make the game a 100% assembly-language game and the computer controlled 'Floyds'.

Q. How difficult was it to incorporate the three-dimensional feeling in 'Hellcat Ace'?

A. 3D games is something that I've been interested in for a long time. I've put together

quite a few tools for developing games and the language that I use includes all sorts of trigonometric functions, and some fairly complex functions that you don't find in assembly-language type games. All of these were incorporated into 'Hellcat Ace'. One of the goals of that game was to get the real 3D fighter-pilot feeling. I spent a fair amount of time on that and was pretty pleased on how it turned out.

Q. Who was the company MicroProse formed by?

A. The company started as a partnership between myself and Bill Staling and has been incorporated, but the two of us are the founders of the primary principals of the company.

Q. How large is the organization of MicroProse at this time?

A. We have a programming staff of eight people that are working on original games and we have an administration staff of four.

Q. Is MicroProse seeking outside programmers?

A. We're interested in original games for a number of machines. We take outside games but we also have our own internal programming staff.

Q. What Assembler do you use?

A. On the ATARI I use the ATARI Macro Assembler however we do very little programming directly in assembly-language. We drew up our own language for game development.

Q. Is your language, which you use for your own programming, available for the private user?

A. No it isn't. One of the nice things about it is we can change it whenever we want to. That kind of makes it difficult to keep the documentation and everything up to date. We essentially use that tool along with BASIC drivers to do our program development and we compile everything when we're done. And this is the final game.

Q. Do you ever see yourself writing computer software other than arcade-type games?

A. I would really like to do that. I think the ATARI, by its hardware orientation, is a very good computer for arcade-type games. There

is lots of hardware support for those types of games. One of the games we just put out called 'Nato Commander' is a little different game, a little more strategic than an arcade game, although it is quite fast and it is not as slow as alot of wargames. What I would like to do, is some things with music and some more involved games. We also like to keep up with the rest of the market and arcade games seems to be what people are most interested in. I would like to see the market move to more complexed games and things like that.

Q.Can you give our readers a hint on what program or programs your are working on at this time?

A.We have a new game coming out, that I'm just finishing up called 'Solo Flight', which we think is the first real-quality flight simulator for the ATARI. It uses some pretty elaborate three-dimensional graphics in the top half of the screen to show the runways and all the terrain objects as you are flying around and passing through. In the bottom of the screen is the complete instrumentation showing the altimeter, fuel gauge, radio direction finder, and alot of different pieces of information. It is a real-time flight simulator and we think from what we've seen form the ATARI market is the best yet.

Q.What direction do you yourself see arcade games going?

A.I'm not an avid arcader, but I've seen the new video-disk driven game which I liked alot and was also very impressed with the new ATARI's 'STAR-WARS' vector graphics. I would see the arcade market slow down a bit as more people purchase home computers and start to play some of the games they can spend more time with and spend more time at home then in the arcades.

Q.What do you see for MicroProse in the future?

A.Our plans are to continue with some of the mainstream games, but also to get into some educational software, possibly some business oriented software with a home flavour to it. Maybe a small database package that someone in the home can use. A simple type of integrated word processing, file management type of thing. These things are still in the brain-storming stage and not

definite plans at this point in time. We're looking to branch out but we're also still interested in games in the home computer market.

NEW
FOR YOUR
ATARI

MAGIC MAIL*

An exciting New Data Base Mailing and Personal Information System for your Atari 400/500** Personal Computer. Never before have all these features been designed into a single Mailing and Information System, so easy to use and so powerful.

COMPARE THESE FEATURES:

- Data Fields: Name, Address, City, State, Zip Code, Area Code, Phone Number, Birthday (m/d/y), and Entry Type.
- Up to 1027 records per Diskette!
- Less than 1 second Search Time over 95% of your Data, and 2-4 seconds over the other 5%***
- Up to 62 SEPARATE and UNIQUE files permitted per Diskette
- Single or Double Disk Drive Capability
- Built in SORT, capable of Sorting ANY Data File by ANY Field with up to 10 Sub-fields
- Command-Driven with simple English-like commands: FIND, MODIFY, PRINT, ADD, SORT, etc.
- Position Independent & Position Dependent Fields
- Files compatible with Atari DOS II**
- Recorded on High-Quality Verbatim Diskettes
- Every Diskette Pre-tested for Bad Sectors and recording integrity
- Versions for: Epson MX-80, Promoter, Centronics
- Print Single-width Mailing Labels or Directory Listing
- 100% Machine Language
- 16 K Minimum Memory
- 60-Page User Manual
- 90 Day Buyer Protection Guarantee

Call or write for FREE additional information.

*MAGIC MAIL is a Trademark of A-BIT-BETTER Software

**ATARI is a Registered Trademark of Atari Inc.

***Search time is for an Indexed File.

ABBS
A-BIT-BETTER Software

P.O. BOX 2452
Syracuse, New York
13220

ONLY
\$59.95
*Plus tax, shipping and handling

EXPERIENCE the MicroProse Challenge for ATARI and Commodore 64 Computers !!!



Lead Blue Flight of 2, armed with bombs, cannon or air-to-air missiles, in dogfighting loops, bombing, and strafing to defend your territory and destroy Red Flight territory. Split Screen, scrolling action with options for solo, head-to-head, or cooperative flying for 1-4 simultaneous players ... ATARI, Commodore 64, Disk or Cassette ... \$34.95.



Fly combat in a three-dimensional aerial dogfight over the Pacific during WWII ... Requires real fighter pilot skills and maneuvers to survive to become an Ace or a W.G.F.P.I. ... Try "SPITFIRE ACE" for aerial combat over Europe ... 1-4 player combat ... ATARI, Commodore 64: Disk or Cassette ... \$29.95.



Version II — Race human or computer controlled Floyds through the dangerous jungle avoiding the elephants, alligators, pygmies with poison darts and other jungle perils to be the first to rescue the lovely Janice! ... A zany footrace for 1-4 simultaneous players ... ATARI, Commodore 64: Disk or Cassette ... \$29.95.



Scrolling, real time strategic wargame simulation requiring the NATO COMMANDER to defend Europe from East Bloc invasion. Battle plays in accelerated real time and demands realistic decisions and command actions to repel the enemy in five different battle situations ... ATARI, Commodore 64: Disk or Cassette ... \$34.95

Other Great Flying Challenges from MicroProse:

MIG ALLEY ACE—Exciting flying combat game simulation using 3-D, on-the-cockpit views, split screen, and player versus player options to provide realistic aerial combat challenge over Korea in an F-86 Sabre Jet! Requires real fighter pilot skill and cunning!!!

SOLO FLIGHT—Outstanding flight simulator using 3-D terrain graphics to provide actual takeoffs, landings, and x-country navigation between eight multiple runway airports. Practice real pilot flying skills and survive to get the air mail through!!!

MicroProse Software 10616 Beaver Dam Road, Hunt Valley, MD 21030
(301) 667-1151

ATARI is the registered trademark of ATARI, Inc.
Commodore 64 is the registered trademark of Commodore Business Machines, Inc.

The War Zone

by Bob Cockroft

Legionnaire by Chris Crawford is a game of ancient warfare which recreates the conflicts between Rome and the barbarian tribes of Gaul. The human player being Caesar, must be able to deploy and maneuver his legions in order to defeat the computer-controlled barbarian tribes. Fast-action battles provides not only an opportunity for strategic thinking, but also a truly entertaining experience. Like a good movie Legionnaire has the ability to captivate its audience with narrow escapes, daring maneuvers and military units with personality.

What makes this game different, realistic, and great, is the game operates in real-time. There is not any long boring turn sequences to go through, it all happens as if it would on the actual battle-field. Chris Crawford has used the same method of predetermined movement as he did in 'Eastern Front'. To set a route for a unit one first moves the joystick controlled square over a legion, then while pressing the button move the joystick in the direction you want the legion to move. This predetermined route can be as long as 8 spaces. After the direction of movement is assigned to a legion, it will automatically begin to travel down its route. Every legion is moved in the same way. However, at the same time the human player is giving orders to his legions, the computer is moving or possibly attacking with his barbarian tribes. Therefore, using this method game turns are eliminated and the speed of play is accelerated. In fact, the human player often does not have time to execute detailed and complex strategies. This is a game where only a quick and pragmatic commander will succeed.

The graphics in this game has to be a disappointment. Chris Crawford after setting the standard of graphics in war-games with Eastern Front, has seemed to take a step backward. Although the screen scrolls both horizontally and vertically, the scenery is not done with the detail or care that would be expected from this programmer. The mountains are displayed using the topographical method. However, the topographical lines are too thick, making the background look second class. The graphics of the military units can

best be describe as adequate, but not entertaining. The infantry units, for example, are displayed as a sword standing up-right. This type of uninspiring presentation does not exploit the graphic capabilities of the Atari computer. The over all presentation of Legionnaire reveals that the graphics were not made with the care or detail they could have been.

This game is reasonable but not overly flexible. Although the human player is confined to commanding only the Rome legions, a wide variation of skill levels have been developed. By choosing which barbarian tribe you are wanting to fight, numerous scenarios can be created. From the ineffective tribes like the Aedui and the Auscu to the most dangerous Helveti and Huns, competitive situations can be created for even the most skillful war-gamers. The number of legions under the human players command is also selectable, although there is no way to select which particular legions you wish to have in your army, anywhere from one to ten legions can be chosen.



An important aspect that makes this game entertaining is that each legion has its own particular characteristics. Unlike many war-games where units of a particular class have uniform characteristics, in this game every legion and barbarian tribe has its own personality. In addition to providing more realism, individuality allows further strategy.

The War Zone cont'd.

For example, a unit like Plancus legion would be less suited for an offensive role than Galba's legion. With time, one becomes accustomed with the strengths and weaknesses of each legion. A personality of your fighting force develops. You begin to know each of the legions the same way you would know each one of your friends. Familiarity adds to an entertaining qualities of this game.

One problem I have had with many war-games in the past is that the design only allowed for a few or sometimes one practical strategy to exist. A game of this type seems to develop basically the same way every time one plays it. Legionaire does not have this problem because your legions are randomly placed on the playfield and the enemy does not always come from the same direction. Each tribe has its own characteristic, therefore they all cannot be handled in the same way. The result is each game is a totally different battle. After playing this game approximately ten times, I have never had the same battle twice.

Legionnaire is a revolutionary new war-game. By using real time instead of the tradition turn-sequence not only is the advantage of the computer over board games exploited, but has opened a totally new field in war-games. Despite the questionable graphics, I found this game very enjoyable. It is flexible and the basic design seemed to promote both interesting and varied strategies. Although this game has some weaknesses, it is quite exciting and would be one I would recommend. Next issue 'Nato Commander' from MicroProse Software will be reviewed.

The Avalon Hill Game Co.
4517 Harford Road
Baltimore, MD 21214

Legionnaire
Graphics:7.7
Challenge:9.5
Documentation:9.8
Strategic Value:8.4
Excitement:8.4
Realism:8.2
Use of Computer:8.5
Overall:8.6

Raving Reviewer cont'd.

interesting sounds of some nature on both "The Strategy Screen" and the "Combat Arena".

The documentation is, by far, the best I have seen with any game. It entails in-depth explanations of both screens(strategy & combat) all Icons(including abilities, limitations, background of each and specifics of each in the combat arena such as speed, lifespan and 'reload' speed.) It (explains) each of the two opposing Magicians eight spells, and includes a question/answer page to clear up any specific questions that you may have. All-in-all this is the documentation that I will personally compare all others with.(It indeed deserves a hand).

This is most definitely an original game with (but a tad) of the famous 'Star-Wars' chess game (players actually having it out for the privilege of taking a square). I recommend this game to anyone who is perhaps getting a trifle bored with playing the run-of-the-mill quick-draw- McGraw games; to anyone with a flair for the medieval, if not the fanciful, and to anyone (who can combine brain with brawn(not braun!) and emerge on top.

The Ratings

Archon

Playability:9.3

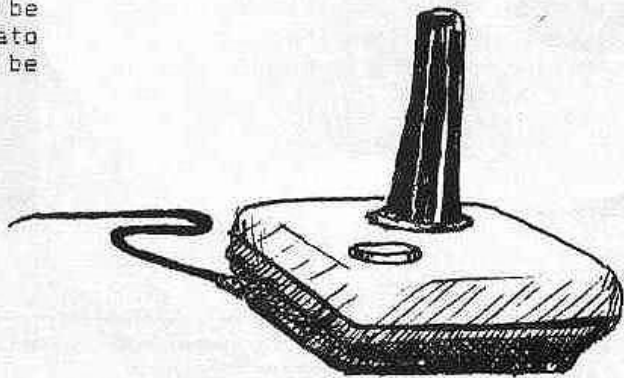
Challenge:8.8

Graphics:10

Sound:9.0

Documentation:10

Overall Rating:9.6



New Dos! (Dos-Mod)

Reviewed by Peter Ellison

Wow! This was my first impression when I set eyes on this new 'DOS' (Disk Operating System). DOS-MOD comes in a very attractive plastic case with a double-sided disk containing 'DOS-MOD' on one side of the disk and a tutorial on the other. Actually the tutorial is very helpful to anyone that is interested in finding out about programming, making this tutorial worth the price of the disk.

The first thing that really impressed me was the full use of the screen when accessing the new DOS (DOS-MOD). Instead of just using four lines like ATARI's 2.0 DOS, DOS-MOD uses the whole ATARI screen, all 22 lines, making it very easy to remember what you did four lines before. When I couldn't remember what I did four lines ago I would have to go and look back at the directory to find out what I had deleted. Also many times in the old ATARI DOS (see I'm already calling it old) I would hit return by mistake wiping out all the history that I had on the screen. This problem was also fixed in DOS-MOD. Instead of just typing return for the MENU one must type a 0.

For all of you ATARIans that don't have the new OSB-ROM, I recommend that you get it because there are a few features that you won't be able to use unless you have it. One of these is the Dup-Resident feature which allows the entire DOS to remain in memory, similar to the earlier version of ATARI DOS (1979). It does take 5513 Bytes, but for those who access the DOS alot, isn't time worth some memory? If you're not sure whether or not you have the OSA or OSB-ROM, DOS-MOD will tell you when you boot up. Another thing that will save time is the ability of doing everything on one line. For example; if you wanted to know what was on your disk you just need to type in A *.* return instead of A (return;return). You can also do the same thing with any command by just writing it out on the same line.

Three new commands are also added to the menu in DOS-MOD. They are P-RUN PROGRAM, Q-COMMAND FILE, and R-READ/STORE MEMORY. The first enables you to RUN a program at a given hex-address. The second being the Command File which I

don't know how I programmed without. By using # or \$ it is possible to have no input after a question or input telling yes or no. For example; I could copy GAME1 to GAME2 by:

```
#
C GAME1,GAME2/Q
Y
```

By doing this I don't have to respond to the computer whether or not I want to copy GAME1 to GAME2. Or I could have instead of using a '#' put a '\$', meaning I would have to respond to the computer's question. Richard Bennett says that to remember the two, just think that a computer would respond to numbers(#) and a human to dollars(\$). The last new command is READ/STORE MEMORY. This allows one to store new values of bytes. The 'R' command is only available if you have the OSB-ROM. This new command is used to examine and change bytes in memory. Hex notation is used throughout, for addresses and byte values. The 'R' command will display the given address followed by the contents of the eight bytes of data and that location in memory. The data is displayed in both hex and ATASCII.

Two more new features that are offered in this new DOS: One is called the "HELLO" File and second, a MEMORY MAP. The "HELLO" File will automatically be executed (as a command file), when you boot-up a disk or press SYSTEM-RESET. You can make a HELLO file to set or clear flags. You can also make a HELLO file to display the disk name, say, or special messages or instructions, when the disk on which it resides is booted up. This can be very useful to keep track of what is on each disk. The second feature is a Memory map with the Binary Load "L" command. This feature allows you to see what areas of memory are being loaded.

One more thing about this program, is that the people at ECLIPSE SOFTWARE are very friendly and willing to help you with any problem that you come across with DOS-MOD. The only thing that I didn't like about DOS-MOD, was that I had to change all of my disks over.

DOS-MOD is available on single or double density from:

ECLIPSE SOFTWARE
1058 MARIGOLD COURT
SUNNYVALE, CALIFORNIA 94806

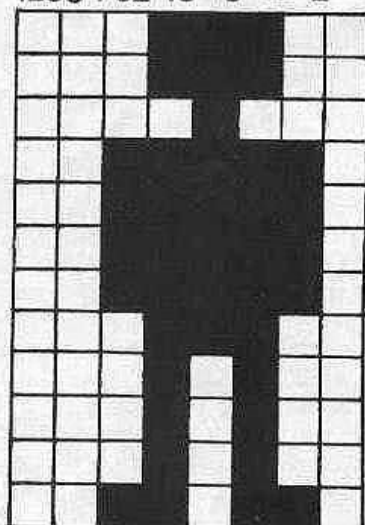
Yellow Brick Road

by Peter Ellison

Last issue of ROM I took a brief look at the three yellow console buttons and the cursor. In this issue I'm going to try and give, I hope, all of the locations needed to use player/missile graphics. I know this topic has been done over and over again in almost every computer magazine but this will be more of a reference guide than really a tutorial. The next few pages can be used along side the computer when using player/missile graphics.

For those of you that want to make games but don't know how to animate a player, player/missile graphics are for you. Drawing a player is very easy because all you need is a pencil and some graph paper (to draw your player). Then you translate what you've drawn, into either binary code or decimal (if programming in basic). The player can only be eight pixels wide, but by combining two or more players the image can be larger. You must now store the image data into RAM, with the byte at the top of the player image going first, followed by the other image bytes in top to bottom sequence. Below is a short program which displays a small player on the screen!

128 64 32 16 8 4 2 1



28
28
8
62
62
62
62
28
20
20
20
54

10 REM LOCATION TO STORE OUR PLAYER
IMAGE

```
20 I=PEEK(106)-8:POKE 54279,I
30 REM PLAYER MISSILE BASE ADDRESS
40 PMBASE=I*256
50 REM PREPARE THE MEMORY AREA
60 FOR L=PMBASE+512 TO
PMBASE+640:POKE L,X,0:NEXT L
70 REM HORIZONTAL AND VERTICAL
LOCATION OF PLAYER
80 X=100:Y=80
90 REM COLOR OF THE PLAYER
100 POKE 704,60
110 REM ENABLE DOUBLE LINE
RESOLUTION
120 POKE 559,46:POKE 53277,3
130 REM POKE HORIZONTAL POSITION OF
PLAYER 0
140 POKE 53248,X
150 STORE PLAYER IMAGE
160 FOR L=0 TO 11
170 READ P
180 POKE PMBASE+512+Y+L,P
190 NEXT L
200 DATA 28,28,8,62,62,62,62,28,20,20,20,54
```

I said this wasn't going to be a tutorial, but some reference sheets. The reason I gave a short explanation of player/missile graphics is so that the sheets will be used! I'm not going to explain how to animate a player because in this magazine there are already two adventure games that animate an image using player/missile graphics. (Refer to them if you want to know more). Below are all the addresses needed for making your own game using player/missile graphics.

Color and luminance of player/missile 0-708
Dec.

Color and luminance of Player/missile 1-709
Dec.

Color and luminance of Player/missile 2-710
Dec.

Color and luminance of Player/missile 3-711
Dec.

Graphic Control to enable Player/missile
graphics-53277 Dec.

Horizontal Position of player 0-53248 Dec.

Horizontal Position of player 1-53249 Dec.

Horizontal Position of player 2-53250 Dec.

Horizontal Position of player 3-53251 Dec.

Horizontal Position of missile 0-53252 Dec.
 Horizontal Position of missile 1-53253 Dec.
 Horizontal Position of missile 2-53254 Dec.
 Horizontal Position of missile 3-53255 Dec.
 Missile 0 to playfield collisions-53248 Dec.
 Missile 0 to player collisions-53256 Dec.
 Missile 1 to playfield collisions-53249 Dec.
 Missile 1 to player collisions-53257 Dec.
 Missile 2 to playfield collisions-53250 Dec.
 Missile 2 to player collisions-53258 Dec.
 Missile 3 to player collisions-53251 Dec.
 Missile 3 to player collisions-53259 Dec.
 Player 0 to playfield collisions-53252 Dec.
 Player 0 to player collisions-53260 Dec.
 Player 1 to playfield collisions-53253 Dec.
 Player 1 to player collisions-53261 Dec.
 Player 2 to playfield collisions-53254 Dec.
 Player 2 to player collisions-53262 Dec.
 Player 3 to playfield collisions-53255 Dec.
 Player 3 to player collisions-53263 Dec.
 Player missile base address-54279 Dec.
 Priority select-623 Dec.

example: POKE 623,1 selects the following ranking: Player 0,player 1,player 2,player 3,playfield 0,playfield 1,playfield 2,playfield 3,background.

or POKE 623,8 selects the following rankings PF0,PF1,P01,P1,P2,P3,PF2,PF3,BAK

Size for missiles-53260 Dec.

example: POKE 53260,1 makes missile 0 twice normal size

or : POKE 53260,255 makes all four missiles times normal 1.

Size of player 0-53256 Dec.

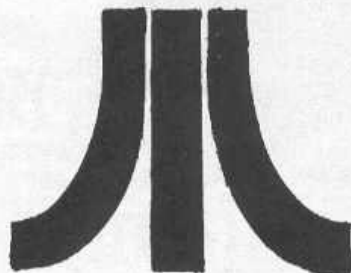
example: POKE 53256,1 twice

or: POKE 53256,3 four times normal size

Size of player 1-53257 Dec.

Size of player 2-53258 Dec.

Size of player 3-53259 Dec.



Until next time have fun with Player/Missile graphics and if there are any memory addresses or locations that you'd like covered, drop us a line.

That ends the list of Player/Missile locations and below is the Player/Missile RAM area layout:

	double line	single line	
PMBASE	unused	unused	
+ 384	M3 M2 M1 M0		
+ 512	Player 0		
+ 640	Player 1		
+ 768	Player 2		+ 768
+ 896	Player 3	M3 M2 M1 M0	
+ 1024			+ 1024
		Player 0	+ 1280
		Player 1	+ 1536
		Player 2	+ 1792
		Player 3	+ 2048

The First and Only System to Backup Diskettes Protected by Bad Sectoring without modification to your drive.



ATARI DISK BACKUP SYSTEM #49"

Superclone is the *only* ATARI diskette copier system that lets you backup just about ANY 'copy protected' diskette. . . Including those protected by 'bad sectoring.' Bad tracks and sectors are created *without* modifications to or adjustments of your hardware. Each backup diskette generated by Superclone functions *exactly like the original*. . . self-booting, etc. (In fact, we suggest that you use the backup and save the original.)

Superclone includes:

SCAN ANALYSIS - Map of diskette contents (Location of data, bad sectors, etc.)

FORMATTING/BAD SECTORING - Non-ATARI DOS formatting and bad track/sector creation.

BACKUP - Copies just about everything we can find. . . regardless of protection scheme.

Superclone is user-friendly and simple to use.

PIRATES TAKE NOTE: SUPERCLONE only allows two copies to be made of any specific diskette. . . Sorry!!!

SYSTEM REQUIREMENTS:

Atari 400 or 800 Computer / 48K Memory
 One Atari 810 Disk Drive / Printer Optional

Available at your computer store or direct from FRONTRUNNER. DEALER INQUIRIES ENCOURAGED.

TOLL FREE ORDER LINE: (24 Hrs.) 1-800-648-4780

In Nevada or for questions Call: (702) 786-4800

Personal checks allow 2-3 weeks to clear.

M/C and VISA accepted.

Include \$2.00 (\$5.00 Foreign orders) for shipping.

FRONTRUNNER - 318 California Ave., Suite #712

Reno, Nevada 89509 - (702) 786-4800

Others Make Claims. . . SUPERCLONE makes copies!!!

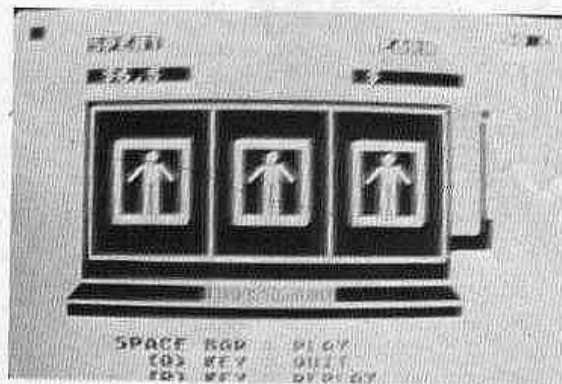
ATARI is a Trademark of ATARI, Inc.

Slot Machine

by Tuong (Tom) Tran

The program below is a slot machine that works through the use of ATARI's built in (special) character set. This program uses special control characters that don't show up on our printer. For this reason we have made our own listing conventions in this issue. These will be used in any program that we use special characters. Before you type in the program below you should first make yourself familiar with the listing conventions. The game is very simple! Push the space bar and the one-arm bandit begins to turn. After a few seconds it will stop and give you the three objects. If all three are the same you win! There are four different objects. They are a man, a woman, a sundae and an alien. Each time you press the space bar you lose fifty cents but have the chance of winning alot more. To start your money at zero just pressed 'R'.

If you have any problems with the program feel free to drop us a line. Also if you have any changes that you feel should be added to this program, please write us. If you have a look a lines 210 to 230 you will notice that they say repeat line 200. This means to do the same thing as you did in line 200.



```
10 REM *****
20 REM *      SLOT MACHINE      *
30 REM *    BY (TOM) TUONG TRAN  *
40 REM *    ROM MAGAZINE        *
50 REM *****
60 SETCOLOR 2,16,1
```

```
70 DIM V(3),A(16),B(16):POKE 752,1:?"
":SCREEN=PEEK(88)+256*PEEK(89)
80 X=10:FOR D=1 TO 16:READ
A,B:A(D)=A:B(D)=B:NEXT D
90 FOR Q=0 TO 24:V=39:D=0:S=-1:IF
INT(Q/2)=Q/2 THEN V=0:D=39:S=1
100 FOR W=V TO D STEP S:POKE
SCREEN+W+40*Q,128:NEXT W:NEXT Q
110 REM
120 REM ---DRAW-A-SLOT-MACHINE-----
130 REM
140 POKE 85,35:?"50 C↓|←←←||↓←||↑
↑↑"
150 ? "(4*SP)SPENT":POKE 85,26:?"EARN"
160 ? "↓(4*SP) $" :POKE 85,24:?" $ "
170 ? "↓(4*SP) (CTRL Q)(CTRL R*7)(CTRL
W)(CTRL R*7)(CTRL W)(CTRL R*7)(CTRL
E)(2*SP)(CTRL T)"
180 ? "(4*SP) | | | (2*SP)(CTRL B)"
190 ? "(4*SP) | (CTRL N*5) | (CTRL N*5) |
(CTRL N*5) (2*SP)(CTRL B)"
200 ? "(4*SP) | (CTRL Y---Y)|(CTRL
Y---Y)|(CTRL Y---Y)|(2*SP)(CTRL Y)"
210 ? "***REPEAT THE SAME AS LINE 200"
220 ? "***REPEAT THE SAME AS LINE 200"
230 ? "***REPEAT THE SAME AS LINE 200"
240 ? "(4*SP)|(ESC CTRL U*5 |)*3) (2*SP)"
250 ? "(4*SP)| | | "
260 ? "(4*SP)(CTRL Z)((CTRL R*7)(CTRL
X)*2)(CTRL R*7)(CTRL C)"
270 ? "(4*SP)(CTRL N*25)(3*SP)"
280 ? "(3*SP)(ESC CTRL H)(25SP)(ESC CTRL
J)(2*SP)"
290 ? "(3*SP)(CTRL M*27)(2*SP)"
300 POKE 85,8:?"↑SPACE BAR = PLAY
:POKE 85,10:?"(Q) KEY = QUIT":POKE 85,10:?"
(R) KEY = REPLAY"
310 ? "(↑*15)"
320 POKE 764,255
330 IF PEEK(764)=33 THEN FOR W=1 TO
10:SOUND 0,100,10,10:NEXT W:GOTO 370
340 IF PEEK(764)=47 THEN 540
350 IF PEEK(764)=40 THEN EA=0:SP=0:POKE
85,8:?"(↑*5)-----":POKE 85,26:?"-----↓
*4":POKE 764,255
360 GOTO 330
370 SOUND 0,0,0,0:SP=SP+0.5:POKE 85,8:?"(↑
* 5) - - - - (← * 5) " : S P ; " (↓
*4):HANDLE=SCREEN+33+40*5:VO=15
380 FOR L=1 TO 6:POKE HANDLE,128:POKE
HANDLE+40,212
```

Continued on page 23



DATUM
COMPUTER CENTRE

A DIVISION OF DATUM ELECTRONICS INC.

We've
Brought the
Computer Age
Home...

ATARI 600XL™

ATARI HOME COMPUTER PROGRAMS LET YOU PLAY AS HARD AS YOU WORK.

Thanks to the ever-growing selection of ATARI software programs, owners of ATARI Home Computers can make sure they play as hard as they work.

Choose from nearly 40 different inexpensive, yet invaluable, ATARI programs including sophisticated business-related programs, languages, and the very latest in entertaining and challenging computer games.

Plus, there's no limit to what the future holds. Because the best minds at ATARI are working night and day on new software programs, all of which can be utilized with your **ATARI 600XL** Home Computer.

So add to your ATARI program library today. Because no home computer should be all work and no play.

© 1982 ATARI INC. All rights reserved.
Stock analysis available only on the
ATARI 600XL Home Computer.



A Warner Communications Company



Available now at:



DATUM
COMPUTER CENTRE

A DIVISION OF DATUM ELECTRONICS INC.

PERSONAL AND BUSINESS COMPUTERS

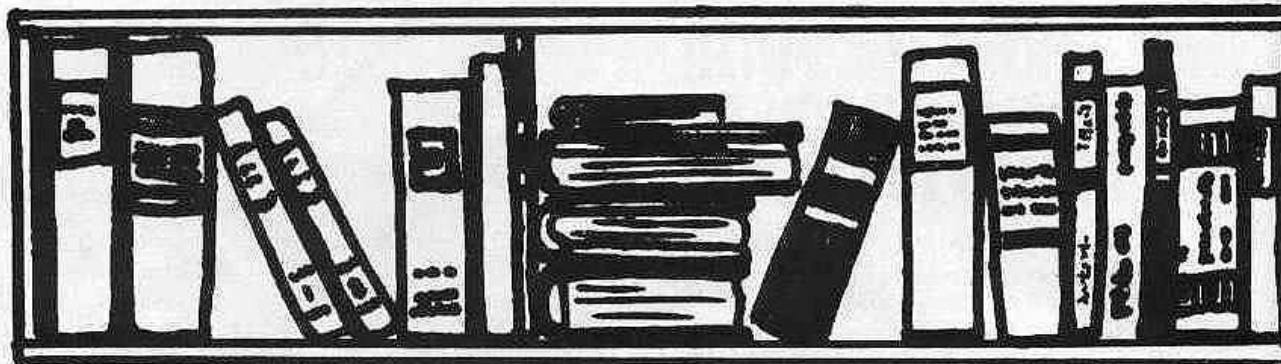
Authorized
- ATARI Service Center

WESTWOOD MALL
No. 11-3000 Lougheed Hwy.
Port Coquitlam, B.C.
Canada V3B 1C5

(604) 464-4424

Books on the Shelf

by Peter Ellison



In this issue I will review two books that teach 'a language' and a 'QUICK REFERENCE GUIDE' for ATARI Basic from John Wiley and Sons, Inc. The name of the two books are "the ATARI Assembler" from Reward books and "Starting FORTH" from FORTH, Inc. Each book teaches the fundamentals of the language and have a few short programs for examples.

THE ATARI ASSEMBLER

When I first saw this book in the computer store I thought that I was dreaming. Who would make a book exclusively for learning assembly language on the ATARI. Every book that I had read before on the subject was either for the APPLE or just on 6502 machine language. This book starts out very well because it assumes you have no assembly language background and only some Basic language background. It uses the little Basic background that you have to make its starting point.

The book written by Don and Kurt Inman has a very excellent layout as it has a little self-test at the end of each chapter making you apply what you have just learned. The questions aren't easy as are ones that are found in many Basic language books. These self-tests, which are called exercises, are each two or three pages long with the answers coming a page after the test so one doesn't have to shuffle through the back pages looking for an answer. Another thing that makes this book a little better than other books on assembly language is the nice clear diagrams that paint a clear image in one's mind. These illustrations range from what a stack is to a cute picture of a bug getting sprayed by a debugger.

With just this book and a few hours on the computer one could become proficient at programming assembly language on the ATARI computer. Everything is right there needed to learn assembly language. All that is needed is the assembler and many hours of practice. The book does have a few errors but I'm not going to pick the whole book apart. One last thing I'm going to say is that it has six excellent appendixes at the end of the book ranging

From 6502 Instructions-Flags Affected to the ATASCII Character Set. For \$12.95 this book is worth it and more.

Reston Publishing
11480 Sunset Hills Rd.
Reston, VA 22090

Starting FORTH

This book isn't written specifically for any one computer, but for any computer that has a FORTH compiler. The ATARI has many such compilers from many different companies. This book, I've found to be the best on the subject of learning FORTH. It is humorous with its cartoons, illustrations, and excellent with its way of explaining the different vocabulary. It too has a self-test (problems) after each chapter but you have to hunt around at the back if you wish to find the answer.

Every three or four pages there is an illustration or cartoon which makes the book quite amusing just to look through and read the pictures. For the term EXECUTE the author (Leo Brodie) has a picture of a hooded man holding an axe. Each picture is used in a good way as to use picture association with

Slot Machine cont'd.

terms. The book starts out very well by first having a look at other high-level languages to lead up to a definition of FORTH. Another good thing that is included at the end of each chapter is a list of the FORTH words that have been covered in the previous chapter. This makes it able to go back if there are any words you are still not sure of.

When first going through the book with my ATARI and my FORTH I found it a little difficult because the book isn't written right for the ATARI, but with a little experimentation I was able to make the book work for me. In the last chapter of the book it gives three examples helping to put into practice what you were suppose to have learn by reading the book. All the examples run fine and help you to understand what is happening. This book with over 348 pages is well worth the money to anyone interested in learning FORTH on any computer.

Prentice-Hall, Inc.
Englewood Cliffs
New Jersey 07632

ATARI BASIC QUICK REFERENCE GUIDE

This isn't a book, but can be more useful than many books that you buy. This reference guide contains almost all of the reference sheets needed for BASIC programming. From a picture of the Joystick's eight positions to a full piano keyboard containing all of the values for each key. The sound register parameters are there and all of the graphics screen formats are presented. One thing that dissapointed me was the sheets never said anything about Player/Missile graphics but for \$2.95 how can I complain.

John Wiley & Sons

```

390 IF INT(L/2)=L/2 THEN GOSUB 520
400 HANDLE=HANDLE+40:NEXT L
410 POKE 85,33:? "###(INV CTRL T)↓←((INV
CTRL Y)←-)*4)###"
420 VO=6:FOR P=1 TO 6:GOSUB 520:NEXT P
430 X=9:N=1:GOSUB 500:X=17:N=2:GOSUB
500:X=25:N=3:GOSUB 500:FOR P=1 TO
20:SOUND 0,10+P*5,10,10:NEXT P:SOUND
0,0,0
440 IF V(1)=V(2) AND V(2)=V(3) THEN 590
450 GOTO 320
460 ? "(CTRL Q)↓←(CTRL T)↓←←(CTRL
Q)(CTRL P)(CTRL E)↓←←←(INV CTRL
J)(1*SP)(INV CTRL H)###":RETURN
470 ? " (CTRL T)↓←←(CTRL F)(1*SP)(CTRL
G)↓←←(INV J)↓←←(INV J)###":RETURN
480 ? " ↓(CTRL Q*3)↓←←←(CTRL
T*3)↓←←←(CTRL M*3)###":RETURN
490 ? " (CTRL T)↓←←(CTRL F)(1*SP)(CTRL
G)↓←←←(CTRL H)(INV CTRL M)(CTRL
J)↓←←(INV J)###":RETURN
500 POKE 85,X:V(N)=1+INT(RND(0)*4):ON V(N)
GOSUB 460,470,480,490
510 RETURN
520 SOUND 0,180,4,VO:FOR Q=1 TO 4:
"(4*SP)|(((CTRL Y)(3*SP)(CTRL Y))*3)|":NEXT
Q:? "###":SOUND 0,0,0
530 FOR Q=1 TO 4:?(4*SP)|(CTRL
Y)---(CTRL Y))|(CTRL Y)----(CTRL Y)*2)
":NEXT Q:? "###":RETURN
540 ? "### YOU EARN....$";EA
550 ? " ↓ YOU SPENT...$";SP
560 IF EA>SP THEN ? "↓↓ YOU
WIN....$";EA-SP
570 IF SP>EA THEN ? "↓↓ YOU
LOSS....$";SP-EA
580 POKE 764,255:POKE 752,0:END
590 REM -GOOD-ONE-----
600 ? "(Q*8)";
610 FOR D=1 TO 16:SOUND 0,B(D),10,10
620 FOR W=1 TO A(D):POKE 85,14:
"LUCKY-YOU";FOR L=1 TO 5:NEXT L:
"←←←←←"? :NEXT W:NEXT D
630 SOUND 0,0,0,0
640 POKE 85,14:?" $";5*V(N);"? "
(Q*9):EA=EA+5*V(N):POKE 85,26:?"(Q*5)
←←←←←";EA;"(Q*4)"
650 GOTO 320
660 REM ---SONG-DATA-----
670 DATA 1,182,3,153,1,153,3,173,
1,173,3,204,1,204,3,173,1,173,
3,153,1,153,3,204,1,204,3,173,1,153,3,204

```

Why Buy An ATARI?

by Peter Ellison

This new column that begins this issue will be directed to those either thinking of buying an ATARI or to those people who have just bought an ATARI and are asking themselves, "How come I bought an ATARI?" In this column I will tell you things the ATARI has better than other micro-computers on the market and the things about it that aren't as good. (As few of these as possible.)

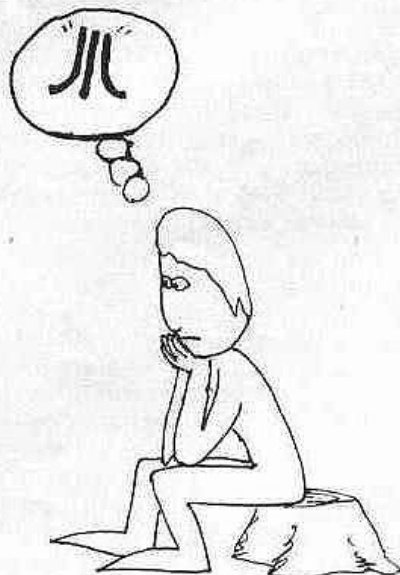
When I first bought my ATARI it was for, what else, GAMES. I saw 'STAR RAIDERS(tm)' on the ATARI and was hooked. Little did I know that when I bought my ATARI 'Star Raiders' this was about the only good machine-language game available. This isn't the case now because there are many new games out for the ATARI that at least match the quality of 'STAR RAIDERS'. In this first article I'm going to speak a little about ATARI'S GRAPHICS. Most people know the ATARI has excellent Graphics for a micro-computer but not many people know how easy they can be accessed through ATARI BASIC. Many computers have graphics, but if they can't be used by the novice programmer, what good are they? That is my argument, the ATARI's graphics are so easy to access even a child can become quite proficient at the use of them.

ATARI BASIC allows you to use three different text modes (numbered 0-2) and any one of eight different graphic modes (modes 3-11) for the ATARI 400 or 800 Home Computer. These modes are also available on the whole new line of ATARI's, the 600XL, 800XL, 1200XL, 1400XL, and the 1450XL so don't worry because everything I will say is for the whole line of ATARI's. Each graphic mode, in effect, turns your TV screen into a graph paper on which you can draw. The Atari has the capability of having a 128 different colors on the screen at one time. Isn't that wonderful! The highest resolution that can be shown on the screen is like having a graph that is 160 wide by 320 tall.

To plot a point on the ATARI is as easy as typing in: GRAPHICS (whatever graphic mode you want (from 3 to 11), PLOT 10,10, and that is it. Suppose we wanted the point to be a different color? All we would have to do is

before the PLOT put a SETCOLOR A,B,C where A=color register 0-4, depending on mode, B=color hue 0-15 (0=Gray, 1=Gold, 2=Orange, 3=Red-Orange, 4=Pink, 5=Purple, 6=Purple-Blue, 7=Blue, 8=Blue, 9=Light Blue, 10=Turquoise, 11=Green-Blue, 12=Green, 13=Yellow-Green, 14=Orange-Green, 15=Light Orange), C=color luminance 0-14, the higher the brighter. Now that we know how easy it is to PLOT something on the screen now is time to draw a line. This can be done by just adding to the end of our little program DRAWTO X,Y where X=the x coordinate and Y=the Y coordinate.

Owning a computer isn't as scary as many people make it out to be. People are afraid of them because they don't exactly understand what a computer is. A computer is a device or machine that can be programmed by a programmer to carry out some type of task. These tasks can range from balancing your books to shooting down little aliens. A computer is so versatile that it is up to the programmer's imagination what use he or she can get out of the machine. A computer doesn't destroy the way a person thinks, but enhances it. That is the end of this little talk on computers. Be with us next issue when we have a look at ATARI's special graphic capabilities of Player/Missile graphics.



Adventure Games - Part III

by Peter Ellison

This issue was suppose to contain the entire listing to "Black Knight". Since I didn't want to make a lousy job on what the monsters look and move like, I have extended this column for two more issues(Sorry). In this issue I have created Lancelot with sword in hand and the movement with a joystick. A short assembly-language subroutine was made to move Lancelot up and down smoothly. Lancelot moves left, right, up and down, similar to the movement in Ali Baba(TM). This short program below won't have to be changed at all in order to continue with the next installment of 'Adventure Games'.

```

00010 *ASSEMBLER UPCODE
00020 VPOS      .EQ $601
00030 PMBASE    .EQ $7800
00040          PLA
00050          LDA VPOS
00060          SEC
00070          SBC #9
00080          STA VPOS
00090          LDY VPOS
00100          LDA #0
00110          STA PMBASE+$209,Y
00120          STA PMBASE+$20A,Y
00130          STA PMBASE+$20B,Y
00140          STA PMBASE+$20C,Y
00150          STA PMBASE+$20D,Y
00160          STA PMBASE+$20E,Y
00170          STA PMBASE+$20F,Y
00180          STA PMBASE+$210,Y
00190          STA PMBASE+$211,Y
00200          LDA #49
00210          STA PMBASE+$200,Y
00220          LDA #50
00230          STA PMBASE+$201,Y
00240          LDA #36
00250          STA PMBASE+$202,Y
00260          LDA #56
00270          STA PMBASE+$203,Y
00280          LDA #32
00290          STA PMBASE+$204,Y
00300          LDA #32
00310          STA PMBASE+$205,Y
00320          LDA #56
00330          STA PMBASE+$206,Y
00340          LDA #232
00350          STA PMBASE+$207,Y
00360          LDA #140

```

```

00370          STA PMBASE+$208,Y
00380          RTS
OK.

```

```

00005 *ASSEMBLER DOWNCODE
00010 VPOS      .EQ $601
00020 PMBASE    .EQ $7800
00030          PLA
00040          LDA VPOS
00050          CLC
00060          ADC #9
00070          STA VPOS
00080          LDY VPOS
00090          LDA #0
00100          STA PMBASE+$1F7,Y
00110          STA PMBASE+$1F8,Y
00120          STA PMBASE+$1F9,Y
00130          STA PMBASE+$1FA,Y
00140          STA PMBASE+$1FB,Y
00150          STA PMBASE+$1FC,Y
00160          STA PMBASE+$1FD,Y
00170          STA PMBASE+$1FE,Y
00180          STA PMBASE+$1FF,Y
00190          LDA #49
00200          STA PMBASE+$200,Y
00210          LDA #50
00220          STA PMBASE+$201,Y
00230          LDA #36
00240          STA PMBASE+$202,Y
00250          LDA #56
00260          STA PMBASE+$203,Y
00270          LDA #32
00280          STA PMBASE+$204,Y
00290          LDA #32
00300          STA PMBASE+$205,Y
00310          LDA #56
00320          STA PMBASE+$206,Y
00330          LDA #232
00340          STA PMBASE+$207,Y
00350          LDA #140
00360          STA PMBASE+$208,Y
00370          RTS
OK.

```

```

4900 GRAPHICS 0:SETCOLOR 2,16,1
4950 REM PLAYER POSITION
5000 X=100:Y=60
5050 REM SET UP PLAYER/MISSILE ADDRESS
5100 I=PEEK(106)-8:POKE
54279,I:PMBASE=I*256

```

```

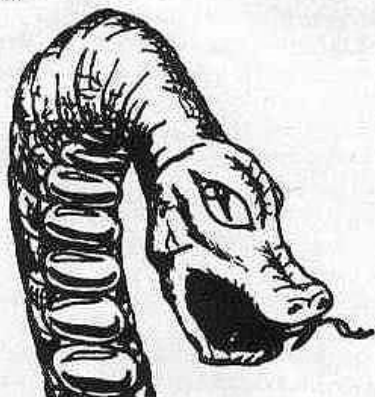
5200 FOR Z=PMBASE+512 TO PMBASE+640
5300 POKE Z,0
5400 NEXT Z
5500 POKE 559,46:POKE 53277,3
5600 POKE 53248,X
5700 POKE 704,135
5800 FOR Z=0 TO 8:READ W:POKE
PMBASE+512+Y+Z,W
5900 NEXT Z
5950 REM CHARACTER DATA
6000 DATA 49,50,36,56,32,32,56,232,140
6100 GOTO 6800
6200 A=STICK(0):IF A=11 THEN Y=Y-9:POKE
53279,0
6250 REM JOYSTICK FOR PLAYER
MOVEMENT
6300 IF A=11 THEN X=X-9:POKE
53279,0:POKE 53248,X:A=15:FOR P=1 TO
100:NEXT P:IF A=15 THEN
MOVE=MOVE-1:GOTO 6300
6400 IF A=7 THEN X=X+9:POKE 53279,0:POKE
53248,X:A=15:FOR P=1 TO 100:NEXT P:IF
A=15 THEN MOVE=MOVE-1:GOTO 6400
6500 IF A=13 THEN R=USR(1700):POKE
53279,0:A=15:FOR D=1 TO 100:NEXT D:IF
A=15 THEN MOVE=MOVE-1:GOTO 6500
6600 IF A=14 THEN Q=USR(1600):POKE
53279,0:A=15:FOR E=1 TO 100:NEXT E:IF
A=15 THEN MOVE=MOVE-1:GOTO 6600
6700 GOTO 6200
6800 FOR Q=1 TO 88:READ W:POKE
1600+Q-1,W:NEXT Q
6850 REM UPCODE
6900 POKE 1537,Y
7000 DATA 104,173,1,6,56,233,9,141,1,6,
172,1,6,169,0,153,9,154,153,10,154,153,
11,154,153,12,154,153,13,154
7100 DATA 153,14,154,153,15,154,153,16,
154,153,17,154,169,49,153,0,154,169,50,
153,1,154,169,36,153,2,154,169,56
7200 DATA 153,3,154,169,32,153,4,154,
169,32,153,5,154
7300 DATA 169,56,153,6,154,169,232,153,7,
154,169,140,153,8,154,96
7400 FOR R=1 TO 88:READ S:POKE
1700+R-1,S:NEXT R
7450 REM DOWNCODE
7500 DATA 104,173,1,6,24,105,9,141,
1,6,172,1,6,169,0,153,247,153,153,
248,153,153,249,153,153,250,153,153,251,153
7600 DATA 153,252,153,153,253,153,153,

```

```

254,153,153,255,153,169,49,
153,0,154,169,50,153,1,154,
169,36,153,2,154,169,56
7700 DATA 153,3,154,169,32,153,4,
154,169,32,153,5,154
7800 DATA 169,56,153,6,154,169,
232,153,7,154,169,140,153,8,154,96
7900 GOTO 6200

```



*** ATTENTION ATARI OWNERS ***

DYNASTY ENGINEERING PRESENTS

THE CARTRIDGE EMULATOR™

- * simulate and execute any Atari™ compatible cartridge (4,8 or 16K)
- * indispensable for development and testing of ROM-able software without the hassle of burning ROMs
- * no modifications necessary
- * requires 48K RAM
- * operates on both Atari 400 and 800
- * optional extender board eliminates insertion glitches and ensures reliable cartridge reads

CARTRIDGE EMULATOR UTILITIES PACKAGE

- * no programming experience necessary
- * backs up any Atari compatible cartridge to disk in DOS II compatible format
- * menu driven / user friendly
- * utilities package included at no extra cost

US ORDERS	CANADIAN ORDERS	
US\$29.99	\$49.99	CARTRIDGE EMULATOR
US\$29.99	\$39.99	OPTIONAL EXTENDER BOARD
US\$79.00	\$99.00	## INTRODUCTORY SPECIAL ##
		CARTRIDGE EMULATOR AND
		OPTIONAL EXTENDER BOARD

ALL ORDERS ADD \$5 SHIPPING
(LC RESIDENTS ADD 7% PST)

SEND MONEY ORDER OR BANK CHECKS TO:

DYNASTY ENGINEERING
PO BOX 47728
STATION D
VANCOUVER, BC, CANADA
V6M 3J2

* ATARI is a trademark of ATARI Inc.



SIGN LANGUAGE FUN

AN ADVANCED FINGERSPELLING PROGRAM

This colorfully animated person does everything from helping a pre-schooler to sign, to improving the skills of a sign language interpreter. Signs your sentences or its own sentences *at the speed you choose*. Also, play the exciting signing games, view the graph which shows your progress, and much more!

32K DISK or CASS • INTRODUCTORY PRICE • **\$24.95**

FANTASTIC FOR THE PRACTICE OF READING FINGERSPELLING... THE GRAPHICS ARE TRULY SUPER AND THE EASE OF OPERATION IS VERY GOOD. THE MANUAL IS GOOD AND LEAVES NO QUESTIONS IN YOUR MIND.

—Allan Coker, PAC Newsletter, July 1983



Enjoy one of the Atari's most exciting word and phrase games!

THE MIDAS TOUCH

The exciting and challenging word game for one to four players. Full of animation, color, and sound, THE MIDAS TOUCH is notorious for keeping parties going into the early morning hours.

Spin the wheel and guess the letters in the phrase, win FREE SPIN tokens, buy vowels, and much more. Don't land on LOSE TOUCH or your money will fade away. You may set the timer for fast, exciting games, or for relaxing games full of strategy.

32K DISK or CASS • **\$17.95**

AN EXCELLENT GAME, SLIGHTLY EDUCATIONAL, BUT MORE THAN ENOUGH FUN TO DISTRACT FROM THAT... VERY IMPRESSIVE FROM A PROGRAMMING STANDPOINT AND PLAYABILITY...

—Andee White, Atari Club Oklahoma City Newsletter, May 1983

... A VERY ENTERTAINING GAME, AN EXCELLENT EDUCATIONAL TOOL, AND GREAT FOR PARTIES...

—Joe Richter, PAC Newsletter, June 1983



BADSECTORING BACK-UP SYSTEM

Back up your valuable software with the **BADSECTORING BACK-UP SYSTEM**. Sit back and watch your 810 write badsectors without having to hassle with changing drive speeds or doing strange things to your disks. Powerful program allows extensive control over the copying process. Requires two easy solder points. Includes system-on LED. **\$34.00.**

WRITE PROTECT OVERRIDE SWITCH

Make life easier with our **WRITE PROTECT OVERRIDE SWITCH**.

Write to disks which are not notched. No need to hassle with write protect tapes.

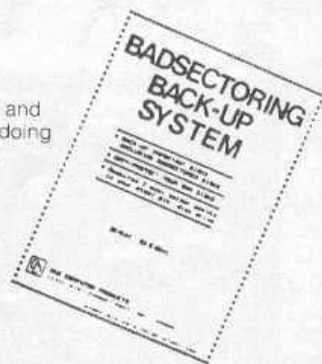
SWITCH ON: Write to both sides of most disks

SWITCH OFF: All disks protected against writing to, or, normal 810 write protect function.

Requires one easy solder point. Includes system-on LED. **\$29.00**

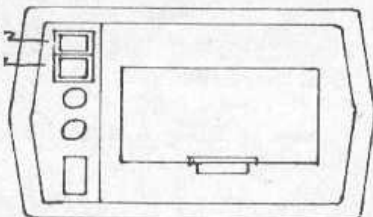
We pay shipping and handling.
DEALER INQUIRIES INVITED

BADSECTORING SWITCH
WRITE PROTECT SWITCH



D&D COMPUTER PRODUCTS

11441 N.E. FARGO
PORTLAND, OREGON 97220
(503) 255-4742



ATARI is a trademark of Atari Inc.

High Score Saver

by Tuong Tran

The program below is a very useful one for anyone who makes games in BASIC. This program can be stuck at the front and end of any of your BASIC programs in order to save the top ten high scores of the day. First you enter your score. Then with your joystick you enter your name. If you want, you could even have your BASIC game program enter the score and all you need to do is enter your name. Again this program uses ATARI's special character set that doesn't show up on our printers, so before you type in the program make sure you check the page titled 'Listing Conventions'. Until next issue, Have Fun!

```

1 DIM S$(1), C$(300), B$(15),
  SCORE(15):SCREEN=PEEK(89)+PEEK(89):POKE
  752,1
2 POKE 710,96:FOR W=15 TO 190:
  C$(W,W+1)="-"NEXT W
3 POKE 752,0: "(ESC CTRL CLEAR) INPUT
  YOUR SCORE PLEASE":INPUT SCORE:POKE
  752,1:GOSUB 8000
4 GOTO 3
5 REM
8000 GOSUB 8050:IF SCORE(10)<SCORE THEN
  SCORE(10)=SCORE:GOTO 8100
8010 RETURN
8020 REM
8030 REM -SORTING-SUBROUTINE-----
8040 REM
8050 FOR W=1 TO 9:MAX=SCORE(W):H=W:FOR
  E=W+1 TO 10:IF MAX<SCORE(E) THEN
  MAX=SCORE(E):H=E
8060 NEXT E
8070 T=SCORE(W):B=C$(15*W,15*W+14):
  SCORE(W)=SCORE(H):C$(15*W,15*W+14)=C$
  (H*15,15*H+14):SCORE(H)=T
8080 C$(15*H,15*H+14)=B:NEXT W:RETURN
8090 REM --OUTPUT-THE-ENTRY-TABLE---
8100 ? "ENTER - NAME:"
8110 ? "(CTRL Q)((CTRL R*3)(CTRL
  W))*5(CTRL R*3)(CTRL E)"
8120 ? " |A|B|C|D|E|F|"
8130 ? "(CTRL A)((CTRL R*3)(CTRL
  S))*5(CTRL R*3)(CTRL D)"
8140 ? " |G|H|I|J|K|L|"
8150 ? "(CTRL A)((CTRL R*3)(CTRL
  S))*5(CTRL R*3)(CTRL D)"
8160 ? " |M|N|O|P|Q|R|"
8170 ? "(CTRL A)((CTRL R*3)(CTRL

```

```

S))*5(CTRL R*3)(CTRL D)"
8180 ? " |S|T|U|V|W|X|"
8190 ? "(CTRL A)((CTRL R*3)(CTRL
  S))*5(CTRL R*3)(CTRL D)"
8200 ? " |Y|Z|_|-| |DEL|"
8210 ? "(CTRL A)((CTRL R*3)(CTRL
  S))*3(((CTRL R*3)(CTRL X))*2)(CTRL
  R*3)(CTRL C)"
8220 ? " |END|LIS|GAM|"
8230 ? " (CTRL Z)((CTRL R*3)(CTRL
  X))*2(CTRL R*3)(CTRL C)"
8240 POKE 85,20: ? ";(CTRL Q)(CTRL
  R*11)(CTRL E)"
8250 POKE 85,20: ? "; |"
8260 POKE 85,20: ? ";(CTRL Z)(R*11)(CTRL C)"
8270 PL=SCREEN+20+40*21:B*="SP*15"
8280 X=10:Y=7:A=SCREEN+X+40*Y
  B=PEEK(A):POKE A,B+128
8290 S=STICK(0)
8300 IF S<7 AND S<11 THEN 8390
8310 IF S=7 THEN X=X+4
8320 IF S=11 THEN X=X-4
8330 IF X=6 THEN X=30:Y=Y-2
8340 IF X=34 THEN X=10:Y=Y+2
8350 IF Y>15 AND X=22 THEN X=10:Y=7
8360 IF Y<7 THEN X=18:Y=17
8370 POKE A,B:A=SCREEN+X+40*Y
  B=PEEK(A):POKE A,B+128
8380 FOR W=1 TO 50:NEXT W:GOTO 8290
8390 IF STRIG(0)=0 THEN C=C+1:GOTO 8410
8400 GOTO 8290
8410 IF X=14 AND Y=17 THEN
  C$(150,185)=B$:GOSUB 8050:GOTO 8510
8420 IF X=18 AND Y=17 THEN
  C$(150,185)=B$:GOSUB 8050:GOTO 8610
8430 IF X=30 AND Y=15 THEN 8480
8440 IF C=12 THEN C=C-1:GOTO 8470
8450 IF X=10 AND Y=17 THEN FOR W=C TO
  11:POKE PL+W,128:B$(W)="SP*1":NEXT
  W:C=11:GOTO 8470
8460 B$(C)=CHR$(B+160):POKE
  PL+C,B+128:GOTO 8380
8470 FOR W=1 TO 30:NEXT W:GOTO 8290
8480 IF C<=1 THEN C=0:GOTO 8380
8490 C=C-1:POKE PL+C,0:C=C-1:GOTO 8470
8500 REM -OUTPUT-THE-TOP-TEN-SCORES--
8510 ? "|||| (CTRL Q)(CTRL R*29)(CTRL E)"
8520 ? " |TOP TEN SCORES|"
8530 ? "(CTRL A)(CTRL R*16)(CTRL W)(CTRL
  R*12)(CTRL D)"
8540 ? " | NAME | SCORE |"

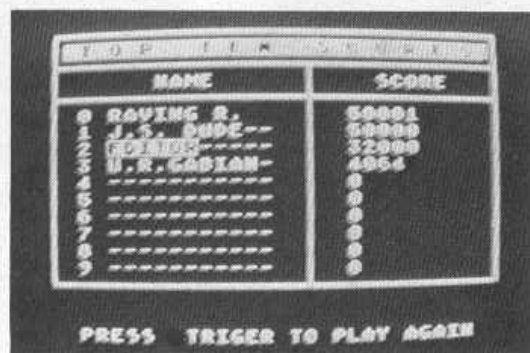
```

Basic Listing cont'd.

```

8550 ? "(CTRL A)(CTRL R*16)(CTRL S)(CTRL
R*12)(CTRL D)"
8560 FOR W=1 TO 10: ? " |
|":NEXT W
8570 ? "(CTRL Z)(CTRL R*16)(CTRL X)(CTRL
R*12)(CTRL C)"
8580 ? "⏏ PRESS TRIGGER TO PLAY AGAIN"
8590 ? "⏏*15)"
8600 FOR W=1 TO 10:POKE 85,6: ? W-1;" ";?
C$(15*W,15*W+10):POKE 85,24: ?
;SCORE(W):NEXT W
8610 FOR W=15 TO 185:S$=C$(W,W+1):IF
ASC(S$)>ASC(" (SP*1)") THEN
C$(W,W+1)=CHR$(ASC(S$)-(ASC("(")-ASC("A")))
8620 NEXT W
8630 IF STRIG(0)⏏ THEN 8630
8640 C=0:RETURN

```



NEW PRODUCTS

OPERATION WHIRLWIND

This new war game puts you in World War II and it's up to you to muster up courage, polish your knowledge of military strategy, and move your battalion through a series of skirmishes and battle actions. Using your joystick through the many phases of computer battle action, including Command, Movement, Combat, Assault Order, and Assault. This game lasts from one to three hours with numerous cycles or skirmishes. Your victory can be designated in one of five different

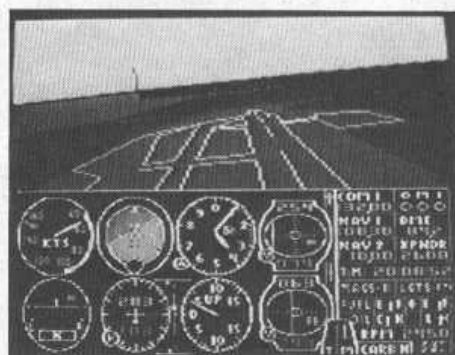
ways: Questionable, Marginal, Tactical, Strategic, and Breakthrough. Operation Whirlwind features Broderbund's excellent graphics and sound effects, and is ideal for both the novice and advance players and carries a suggested list price of \$39.95.

Broderbund Software
17 Paul Drive
San Rafael, CA 94903

LODE RUNNER

This best seller for the Apple is now available for the ATARI computer. It features up to 150 original game screens, each requiring strategic problem solving and quick thinking in addition to lightning-fast reflexes. Another feature also attributing to its popularity is the feature that allows arcade game enthusiasts to create an unlimited number of additional game screens. The suggested retail list price for disks is \$34.95, and \$39.95 for cartridges.

Broderbund Software
17 Paul Drive
San Rafael, CA 94903



FLIGHT SIMULATOR

SubLOGIC's new 'Flight Simulator II lets you practice takeoffs, landings, even complicated aerobatics. The program features over 80 airports in four scenery areas: New York, Chicago, Seattle, and Los Angeles. Complete navigation facilities are included.

Continued on page 32

Captain Campsite

by Bob Cockroft

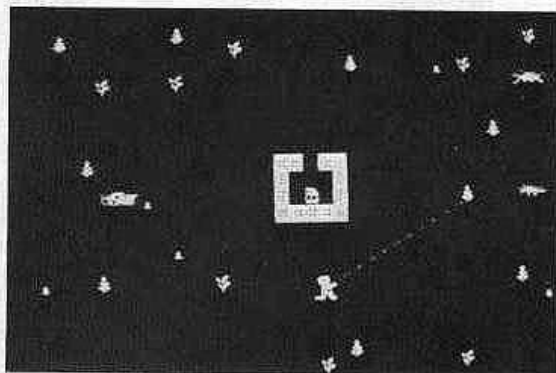
Imagine yourself in a sub-tropical forest enjoying the peace and tranquility of the natural surroundings. The sounds of the woods are all around you as you sit in the long green grass in front of your cabin. With only your favorite comic book and a limited supply of food you are isolated from the rest of the world.

Suddenly, out of the trees come various types of carnivorous animals that are running with alarming speed toward the cabin. Realizing that it is the food supply they want, you grab your automatic tranquilizer gun and prepare to defend what is yours. Shooting upon the aggressive intruders, you watch them fall into a deep sleep. As you race from one side of the cabin to the other, your shooting skills are put to the limit. Remembering that it is important to avoid getting too close to those dangerous animals, you are forced to skillfully maneuver yourself in order not to be eaten. In addition, trees, stumps and the cabin are also deadly hazards if run into. Your shooting does not seem to discourage them. From all directions they come with increasing speed and fury. The situation is beginning to seem hopeless. This is a job for CAPTAIN CAMPSITE!

Although speed and accuracy in shooting are the qualities that will determine success in this game, some words on tactics may prove to be helpful. To make the game realistic, the animals were designed to have a chance to withstand certain hits on their body making the animals sometimes very tricky to put to sleep. What this means in terms of tactics is that hits to the thickest sections of an animal's body are most likely to be effective. Therefore head-on hits, parallel to the horizontal plain of their body are usual most devastating. It is also important not to venture far away from your cabin. Remember that the food container in the center of the cabin is the target of the animals, not you. In addition, by getting too far away, the chance of an animal getting between you and the food is increased. Also, the trees will sometimes impede the way back to the cabin. If all of what I have said does not seem to be helpful, maybe it will be best to just practice. GOOD

LUCK!

If you find the program seems too long to type in you can send \$5.00 to: ROM, P.O. BOX 252, Maple Ridge, B.C. V2X 7G1. Specify whether you want disk or cassette.



```
2 REM * REQUIRES 48K OF MEMORY
3 REM * CAPTAIN CAMPSITE *
4 REM *
5 DIM RAN$(17),YN$(4)
10 LEVEL=1:LIVES=1:PLAY=1:LIVES1=1
:SECOND=0
12 RESTORE
15 POKE 752,1
20 SCORE1=0:SCORE2=0:SCORE3=0:SCORE4=0
30 SPEED=100
80 GRAPHICS 0
90 RAMT=PEEK(106)-4
150 CHBASE=57344
170 NSET=RAMT*256
180 POKE 106,PEEK(106)-5
185 GRAPHICS 0
186 POSITION 13,8:? "Captain Campsite"
188 POSITION 15,10:? "LOADING
DATA":POSITION 15,11:? "Please Wait"
189 POSITION 15,12:? "2:06 minutes"
190 REM * MOVE ROM SET TO NEW
LOCATION *
200 FOR W=1 TO 1024:POKE
NSET+W-1,PEEK(CHBASE+W-1)
```


Basic Listing

```

210 NEXT W
220 FOR NUM=33 TO 40
230 SET=NSET+NUM*8
240 FOR L1=0 TO 7
245 READ D
250 POKE SET+L1,D
260 NEXT L1
265 NEXT NUM
270 IF SECOND=1 THEN 500
299 REM * LOAD MACHINE CODE *
300 FOR X=34000 TO 37571
305 READ D
310 POKE X,D
315 NEXT X
499 REM * OPTION SECTION *
500 GRAPHICS 1:SETCOLOR 2,16,1
520 POSITION 1,2:?"use OPTION & SELECT
  buttons to change the skill level"
525 POSITION 1,4:?"use START button to
  continue"
528 POSITION 0,4:?"#6;"WHAT SKILL
  LEVEL?";? #6;LEVEL
530 IF PEEK(53279)=3 AND LEVEL<7 THEN
  LEVEL=LEVEL+1
540 IF PEEK(53279)=5 AND LEVEL>0 THEN
  LEVEL=LEVEL-1
545 FOR X=1 TO 100:NEXT X
550 IF PEEK(53279)=6 THEN 570
560 GOTO 528
570 POSITION 0,6:?"#6;"HOW MANY
  LIVES?";? #6;LIVES
580 IF PEEK(53279)=3 AND LIVES<6 THEN
  LIVES=LIVES+1
590 IF PEEK(53279)=5 AND LIVES>0 THEN
  LIVES=LIVES-1
595 FOR X=1 TO 100:NEXT X
600 IF PEEK(53279)=6 THEN 620
610 GOTO 570
620 POSITION 0,8:?"#6;"HOW MANY
  PLAYERS?";? #6;PLAY
630 IF PEEK(53279)=3 AND PLAY<4 THEN
  PLAY=PLAY+1
640 IF PEEK(53279)=5 AND PLAY>1 THEN
  PLAY=PLAY-1
645 FOR X=1 TO 100:NEXT X
650 IF PEEK(53279)=6 THEN 662
660 GOTO 620
662 IF PLAY>0 THEN LIVES1=LIVES
664 IF PLAY>1 THEN LIVES2=LIVES
666 IF PLAY>2 THEN LIVES3=LIVES
668 IF PLAY>3 THEN LIVES4=LIVES

670 IF LIVES1<1 AND LIVES2<1 AND
  LIVES3<1 AND LIVES4<1 THEN 1500
675 REM *
676 REM * MAIN LOOP *
679 PL=0
680 PL=PL+1
682 IF PL=1 AND LIVES1<1 THEN 1200
684 IF PL=2 AND LIVES2<1 THEN 1200
686 IF PL=3 AND LIVES3<1 THEN 1200
688 IF PL=4 AND LIVES4<1 THEN 1200
770 REM * PRE SCREEN SECTION *
782 IF PL=1 THEN LIV=LIVES1
784 IF PL=2 THEN LIV=LIVES2
786 IF PL=3 THEN LIV=LIVES3
788 IF PL=4 THEN LIV=LIVES4
800 GRAPHICS 1:COLOR 1:SETCOLOR 2,16,1
810 POSITION 6,8:?"#6;"LEVEL ";? #6;LEVEL
820 POSITION 6,10:?"#6;"PLAYER ";? #6;PL
830 POSITION 6,12:?"#6;"LIVES ";? #6;LIV
835 FOR X=1 TO 300:NEXT X
839 REM * DRAW THE SCREEN *
840 GRAPHICS 0:SETCOLOR 2,12,1
842 POKE 752,1
845 POKE 756,NSET/256
850 FOR Y=10 TO 13:POSITION 17,Y:?"
  "I":POSITION 21,Y:?"L":NEXT Y
860 FOR X=17 TO 21:POSITION X,10:?"
  "K":POSITION X,13:?"J":NEXT X
865 POSITION 19,10:?" " "
870 POSITION 10,5:?"F":POSITION 35,2:?"
  "F":POSITION 13,17:?"F":POSITION 20,22:?"
  "F"
880 POSITION 5,5:?"F":POSITION 30,4:?"
  "F":POSITION 30,22:?"F":POSITION 14,3:?"F"
890 POSITION 30,12:?"G":POSITION 32,8:?"
  "G":POSITION 5,17:?"G":POSITION 4,10:?"G"
900 POSITION 10,2:?"G":POSITION 22,21:?"
  "G":POSITION 22,4:?"G":POSITION 34,17:?"
  "G"
910 POSITION 8,12:?"H":POSITION 10,15:?"
  "H":POSITION 36,18:?"H":POSITION 28,4:?"
  "H":POSITION 1,17:?"H"
920 POSITION 2,2:?"G":POSITION 38,10:?"H"
922 POSITION 19,12:?"M"
924 POKE 1577,7+INT(LEVEL/2)
925 POKE 33999,104
930 X=USR(33999)
999 REM * AFTER BATTLE STATUS *
1000 IF PEEK(1575)=0 THEN 1050
1010 IF PL=1 THEN LIVES1=LIVES1-1
1020 IF PL=2 THEN LIVES2=LIVES2-1

```

Basic Listing cont'd.

```

1030 IF PL=3 THEN LIVES3=LIVES3-1
1040 IF PL=4 THEN LIVES4=LIVES4-1
1049 REM * SCORE *
1050 PSCORE = PEEK(1576) *
LEVEL+INT(RND(0)*10)
1060 IF PL=1 THEN SCORE1=SCORE1+PSCORE
1070 IF PL=2 THEN SCORE2=SCORE2+PSCORE
1080 IF PL=3 THEN SCORE3=SCORE3+PSCORE
1090 IF PL=4 THEN SCORE4=SCORE4+PSCORE
1100 GRAPHICS 0
1102 POKE 53248,0;POKE 53249,0;POKE
53250,0;POKE 53251,0;POKE 53252,0;POKE
53253,0;POKE 53254,0
1110 POSITION 19,4: "SCORE"
1120 POSITION 2,6: "PLAYER 1:
";SCORE1
1130 IF PLAY>1 THEN POSITION 2,8:
"PLAYER 2: ";SCORE2
1140 IF PLAY>2 THEN POSITION 2,10:
"PLAYER 3: ";SCORE3
1150 IF PLAY>3 THEN POSITION 2,12:
"PLAYER 4: ";SCORE4
1160 POSITION 2,15: " press START button
to continue"
1170 IF PEEK(53279)=6 THEN 1190
1180 GOTO 1170
1190 SPEED=100-(LEVEL*5)
1195 IF SPEED<1 THEN SPEED=1
1196 IF SPEED>255 THEN SPEED=255
1197 POKE 1563,SPEED
1200 IF PL<>PLAY THEN 680
1205 LEVEL=LEVEL+1
1210 GOTO 670
1499 REM * FINAL STATUS SECTION *
1500 GRAPHICS 0
1510 COLOR 1:SETCOLOR 2,16,1
1520 POSITION 15,4: "FINAL RESULTS"
1530 POSITION 12,6: "SCORE RANK"
1590 FOR TL=1 TO 4
1592 IF TL=1 THEN SC=SCORE1
1594 IF TL=2 THEN SC=SCORE2
1596 IF TL=3 THEN SC=SCORE3
1598 IF TL=4 THEN SC=SCORE4
1600 IF SC<400 THEN RAN$="PEST"
1610 IF SC>399 THEN RAN$="BROWN"
1620 IF SC>500 THEN RAN$="BOY SCOUT"
1630 IF SC>600 THEN RAN$="CAMPER"
1640 IF SC>700 THEN RAN$="WOODSMAN"
1650 IF SC>800 THEN RAN$="EXPLORER"

```

```

1660 IF SC>1000 THEN RAN$="CAPTIAN
CAMPSITE"
1670 IF TL=1 THEN POSITION 2,8: "PLAYER
1 ";SCORE1;" ";RAN$
1680 IF TL=2 THEN POSITION 2,10:
"PLAYER 2 ";SCORE2;" ";RAN$
1690 IF TL=3 THEN POSITION 2,12:
"PLAYER 3 ";SCORE3;" ";RAN$
1700 IF TL=4 THEN POSITION 2,14:
"PLAYER 4 ";SCORE4;" ";RAN$
1705 NEXT TL
1800 ? : "press the RESET button before
restarting program"

```

New Products cont'd.

Flight Simulator II includes color-filled 3D graphics and weather conditions that are user-adjustable, from clear blue skies to grey cloudy conditions. The suggested retail price is \$49.95 for a 48K disk.

subLOGIC Corporation
713 Edgebrook Drive
Champaign, IL 61820

NATO COMMANDER

This is a scrolling, Real-Time wargame that requires Joint Chief's-of Staff thinking and arcade speed decisions to stop the Soviet Bloc invasion of Europe.

This Real-Time simulation of events as they might take place in a European conflict, requires the NATO commander to analyze continuous radio, teletype and combat communication reports of battlefield conditions, and respond with his own strategy. Air Power, Multiple Combat units including Armor, Mechanized Infantry and attack Helicopters. As a last resort, the Commander has at his disposal Tactical Nuclear Weapons. The simulation takes place in accelerated Real-Time, with numerous activities taking place simultaneously, including command entry, unit movement, combat, and battlefield updates.

This is now available on 48K disk or 40K cassette and has a suggested retail value of \$34.95.

MicroProse Software
One Caribou Court
Parkton, MD 21120

Basic Listing

10000 DATA 4, 156, 208, 90, 78, 120, 16, 16
10010 DATA 16, 56, 16, 124, 56, 254, 124, 16
10020 DATA 0, 0, 0, 0, 0, 24, 24, 60
10030 DATA 255, 235, 255, 235, 255, 235, 255, 255
10040 DATA 255, 255, 213, 255, 213, 255, 255, 255
10050 DATA 255, 255, 255, 213, 255, 213, 255, 255
10060 DATA 255, 215, 255, 215, 255, 215, 255, 255
10080 DATA 116, 46, 127, 85, 73, 85, 127, 0
12000 DATA 169, 62, 141, 47, 2, 169, 110, 141, 192, 2, 169, 88, 141, 193, 2, 169, 28, 141, 194, 2, 1
69, 63, 141, 195
12005 DATA 2, 165, 106, 169, 112, 141, 7, 212, 169, 3, 141, 29, 208, 169, 120, 141, 1, 6, 169, 100,
141, 0, 6, 169
12010 DATA 0, 141, 5, 6, 141, 8, 6, 141, 9, 6, 169, 0, 169, 1, 141, 30, 208, 169, 0, 141, 40, 6, 169, 0
12015 DATA 162, 0, 157, 0, 116, 157, 0, 117, 157, 0, 118, 157, 0, 119, 157, 0, 115, 232, 224, 255, 2
08, 236, 162, 0
12020 DATA 157, 19, 6, 232, 224, 4, 208, 248, 173, 10, 210, 141, 43, 6, 169, 0, 133, 77, 238, 28, 6,
169, 0, 141
12025 DATA 3, 210, 141, 39, 6, 173, 28, 6, 205, 27, 6, 208, 8, 169, 0, 141, 28, 6, 76, 66, 140, 173, 9
208
12030 DATA 201, 0, 208, 47, 173, 10, 208, 201, 0, 208, 40, 173, 11, 208, 201, 0, 208, 33, 173, 4, 20
8, 201, 0, 240
12035 DATA 3, 76, 138, 146, 173, 12, 208, 201, 0, 240, 7, 201, 1, 240, 3, 76, 138, 146, 173, 40, 6, 2
05, 41, 6
12040 DATA 208, 7, 96, 169, 200, 141, 39, 6, 96, 174, 132, 2, 224, 0, 208, 3, 76, 170, 136, 173, 5, 6
201, 0
12045 DATA 240, 3, 76, 170, 136, 173, 42, 6, 201, 10, 240, 6, 238, 42, 6, 76, 147, 138, 169, 0, 141,
42, 6, 173
12050 DATA 120, 2, 141, 3, 6, 201, 14, 240, 35, 201, 10, 208, 3, 76, 167, 135, 201, 11, 208, 3, 76, 1
67, 135, 201
12055 DATA 15, 208, 3, 76, 105, 136, 201, 13, 240, 43, 201, 9, 208, 3, 76, 167, 135, 76, 223, 134, 1
72, 0, 6, 174
12060 DATA 1, 6, 142, 0, 208, 192, 25, 240, 3, 206, 0, 6, 173, 3, 6, 201, 14, 240, 7, 201, 13, 240, 3,
76
12065 DATA 134, 138, 76, 43, 134, 172, 0, 6, 174, 1, 6, 142, 0, 208, 192, 225, 240, 3, 238, 0, 6, 173
3, 6
12070 DATA 201, 14, 240, 7, 201, 13, 240, 3, 76, 134, 138, 162, 0, 236, 2, 6, 240, 23, 232, 224, 4, 2
08, 246, 236
12075 DATA 2, 6, 240, 10, 232, 224, 8, 208, 246, 169, 0, 141, 2, 6, 76, 148, 134, 76, 76, 134, 238, 2
6, 172
12080 DATA 0, 6, 169, 0, 153, 255, 115, 153, 13, 116, 153, 0, 116, 153, 12, 116, 169, 28, 153, 1, 11
6, 153, 3, 116
12085 DATA 153, 8, 116, 169, 20, 153, 2, 116, 169, 8, 153, 4, 116, 153, 7, 116, 169, 62, 153, 5, 116
169, 40, 153
12090 DATA 6, 116, 169, 52, 153, 9, 116, 169, 4, 153, 10, 116, 169, 6, 153, 11, 116, 76, 220, 134, 2
38, 2, 6, 172
12095 DATA 0, 6, 169, 0, 153, 13, 116, 153, 0, 116, 153, 12, 116, 153, 255, 115, 169, 28, 153, 1, 11
6, 153, 3, 116
12100 DATA 153, 8, 116, 169, 20, 153, 2, 116, 169, 8, 153, 4, 116, 153, 7, 116, 169, 62, 153, 5, 116
169, 10, 153
12105 DATA 6, 116, 169, 48, 153, 11, 116, 169, 22, 153, 9, 116, 169, 16, 153, 10, 116, 76, 220, 134
76, 134, 138, 172

Basic Listing

12110 DATA 0,6,174,1,6,142,0,208,224,240,240,3,238,1,6,162,0,236,4,6,240,23,232,224
12115 DATA 3,208,246,236,4,6,240,10,232,224,6,208,246,169,0,141,4,6,76,86,135,76,16,135
12120 DATA 238,4,6,172,0,6,169,0,153,0,116,153,12,116,153,13,116,153,153,115,169,28,153,1
12125 DATA 116,153,3,116,153,8,116,169,20,153,2,116,169,8,153,4,116,153,6,116,153,7,116,169
12130 DATA 52,153,9,116,169,6,153,11,116,169,36,153,10,116,169,30,153,5,116,76,147,135,238,4
12135 DATA 6,172,0,6,169,0,153,0,116,153,12,116,169,28,153,1,116,153,3,116,153,8,116,169
12140 DATA 20,153,2,116,169,22,153,9,116,169,8,153,4,116,153,6,116,153,7,116,169,12,153,3
12145 DATA 116,169,16,153,10,116,169,24,153,11,116,173,3,6,201,6,208,3,76,236,13,3,201,5,208
12150 DATA 3,76,13,134,76,134,138,172,0,6,174,1,6,142,0,208,224,20,240,3,206,1,6,162
12155 DATA 0,236,4,6,240,23,232,224,3,208,246,236,4,6,240,10,232,224,6,208,246,169,0,141
12160 DATA 4,6,76,24,136,76,216,135,238,4,6,172,0,6,169,0,153,0,116,153,12,116,169,28
12165 DATA 153,1,116,153,3,116,153,8,116,169,60,153,5,116,169,20,153,2,116,169,5,2,153,9,116
12170 DATA 169,8,153,4,116,153,6,116,153,7,116,169,12,153,11,116,169,4,153,10,116,76,85,136
12175 DATA 238,4,6,172,0,6,169,0,153,0,116,153,12,116,169,28,153,1,116,153,3,116,153,8
12180 DATA 116,169,20,153,2,116,169,8,153,4,116,153,6,116,153,7,116,169,22,153,9,116,169,18
12185 DATA 153,10,116,169,48,153,11,116,169,24,153,5,116,173,3,6,201,10,208,3,76,236,133,201
12190 DATA 9,208,3,76,13,134,76,134,138,172,0,6,174,1,6,142,0,208,169,0,153,11,116,153
12195 DATA 12,116,153,0,116,169,28,153,1,116,153,3,116,153,8,116,169,20,153,2,116,153,9,116
12200 DATA 169,8,153,4,116,153,7,116,169,62,153,5,116,169,42,153,6,116,169,54,153,10,116,76
12205 DATA 134,138,174,5,6,224,0,208,6,173,120,2,141,25,6,173,25,6,201,15,208,3,76,105
12210 DATA 136,169,220,141,2,210,169,204,141,3,210,173,25,6,201,14,208,3,76,244,136,201,13,208
12215 DATA 3,76,55,137,201,6,208,3,76,120,137,201,7,208,3,76,120,137,201,5,208,3,76,120
12220 DATA 137,76,0,138,172,0,6,174,1,6,142,0,208,172,0,6,169,0,153,0,116,153,11,116
12225 DATA 169,28,153,1,116,153,8,116,169,20,153,2,116,153,9,116,169,29,153,3,116,169,9,153
12230 DATA 4,116,169,15,153,5,116,169,8,153,6,116,153,7,116,169,54,153,10,116,76,164,138,172
12235 DATA 0,6,174,1,6,142,0,208,172,0,6,169,0,153,0,116,153,11,116,169,28,153,1,116

Basic Listing

12240 DATA 153,3,116,153,8,116,169,20,153,2,116,153,9,116,169,8,153,4,116,169,15,153,5,116
12245 DATA 169,9,153,6,116,153,7,116,169,54,153,10,116,76,164,138,172,0,6,174,1,6,142,0
12250 DATA 208,172,0,6,169,0,153,0,116,153,153,115,153,12,116,153,11,116,169,28,153,1,116,153
12255 DATA 3,116,169,20,153,2,116,169,8,153,7,116,169,14,153,8,116,169,10,153,9,116,169,59
12260 DATA 153,10,116,173,25,6,172,0,6,201,7,208,3,76,202,137,201,6,208,3,76,218,137,76
12265 DATA 238,137,169,8,153,4,116,153,6,116,169,15,153,5,116,76,164,138,169,9,153,4,116,169
12270 DATA 14,153,5,116,169,8,153,6,116,169,56,76,164,138,169,8,153,4,116,169,14,153,5,116
12275 DATA 169,9,153,6,116,76,164,138,173,0,6,174,1,6,142,0,208,172,0,6,169,0,153,0
12280 DATA 116,153,153,115,153,12,116,153,11,116,169,28,153,1,116,153,3,116,169,20,153,2,116,169
12285 DATA 8,153,7,116,169,56,153,8,116,169,40,153,9,116,169,110,153,10,116,173,25,6,172,0
12290 DATA 6,201,11,208,3,76,82,138,201,10,208,3,76,98,138,76,116,138,169,8,153,4,116,153
12295 DATA 6,116,169,120,153,5,116,76,164,138,169,72,153,4,116,169,56,153,5,116,169,8,153,6
12300 DATA 116,76,164,138,169,8,153,4,116,169,56,153,5,116,169,72,153,6,116,76,164,138,173,5
12305 DATA 6,201,0,240,3,76,164,138,76,147,138,160,0,162,0,232,224,255,208,251,200,192,5,208
12310 DATA 251,76,56,133,173,5,6,201,0,208,17,169,1,141,5,6,172,0,6,140,6,6,174,1
12315 DATA 6,142,7,6,173,25,6,201,14,208,3,76,236,138,201,13,208,3,76,10,139,201,11,208
12320 DATA 3,76,97,139,201,10,208,3,76,97,139,201,9,208,3,76,97,139,201,15,208,3,76,147
12325 DATA 138,76,40,139,173,6,6,201,10,240,10,206,6,6,173,25,6,201,14,208,10,169,6,141
12330 DATA 9,6,169,0,141,26,6,76,150,139,173,6,6,201,245,240,10,238,6,6,173,25,6,201
12335 DATA 13,208,10,169,6,141,9,6,169,10,141,26,6,76,150,139,169,5,141,26,6,174,7,6
12340 DATA 169,6,141,9,6,238,8,6,224,225,240,7,224,224,240,3,238,7,6,173,25,6,201,6
12345 DATA 208,8,169,3,141,26,6,76,236,138,201,5,208,8,169,7,141,26,6,76,10,139,76,150
12350 DATA 139,169,5,141,26,6,174,7,6,169,0,141,9,6,224,25,240,3,206,7,6,173,25,6
12355 DATA 238,8,6,201,10,208,8,169,3,141,26,6,76,236,138,201,9,208,8,169,7,141,26,6
12360 DATA 76,10,139,76,150,139,169,1,141,5,6,173,6,6,24,109,26,6,168,173,7,6,24,109
12365 DATA 9,6,141,4,208,169,0,153,3,115,153,255,114,153,1,115,169,1,153,0,115,173,0,208

Basic Listing

12370 DATA 201,0,208,10,238,8,6,173,8,6,201,80,208,11,169,0,141,8,6,141,5,8,153,0
12375 DATA 115,173,8,208,141,29,6,173,29,6,168,192,0,208,3,76,58,140,192,1,208,3,76,58
12380 DATA 140,192,8,208,3,76,42,140,192,4,208,3,76,26,140,192,2,208,3,76,10,140,136,76
12385 DATA 227,139,162,1,56,233,2,141,29,6,169,0,157,19,6,76,0,146,162,2,56,233,4,141
12390 DATA 29,6,169,0,157,19,6,76,46,146,162,3,56,233,8,141,29,6,169,0,157,19,6,76
12395 DATA 92,146,169,1,141,30,208,76,147,138,152,0,169,9,141,24,6,232,224,4,208,3,76,93
12400 DATA 133,189,19,6,201,0,208,3,76,94,140,76,199,140,160,0,169,0,224,1,208,1,1,153,255
12405 DATA 116,200,192,255,208,248,76,139,140,224,2,208,11,153,255,117,200,192,2,55,208,248,76,139,140
12410 DATA 183,255,118,200,192,255,208,248,76,139,140,169,1,157,19,6,172,43,6,48,12,160,5,173
12415 DATA 10,210,48,17,160,250,76,173,140,160,5,173,10,210,48,18,160,250,76,186,140,152,157,10
12420 DATA 6,173,10,210,157,14,6,76,91,140,152,157,14,6,173,10,210,157,10,6,76,91,140,169
12425 DATA 0,221,10,6,208,11,254,10,6,169,2,141,24,6,76,249,140,168,189,10,6,201,120,208
12430 DATA 3,76,249,140,152,24,105,1,201,121,208,221,222,10,6,169,0,169,1,141,24,6,76,249
12435 DATA 140,169,0,221,14,6,208,15,254,14,6,173,24,6,24,105,10,141,24,6,76,37,141,24
12440 DATA 105,1,201,126,208,229,222,14,6,173,24,6,24,105,20,141,24,6,76,37,141,238,23,6
12445 DATA 189,10,6,201,120,208,10,189,14,6,201,125,208,3,76,138,146,189,10,6,157,0,208,189
12450 DATA 14,6,168,173,23,6,201,2,208,5,169,0,141,23,6,224,2,208,3,76,218,142,2,24,1
12455 DATA 208,3,76,96,141,76,111,144,169,0,153,255,116,153,0,117,153,10,117,153,11,117,173,24
12460 DATA 6,201,20,208,3,76,162,141,201,10,208,3,76,0,142,169,0,153,1,117,153,2,117,153
12465 DATA 8,117,153,9,117,173,24,6,201,1,240,11,201,11,240,7,201,21,240,3,76,94,142,76
12470 DATA 156,142,173,23,6,201,0,208,3,76,214,141,169,2,153,1,117,169,7,153,2,117,153,6
12475 DATA 117,169,14,153,3,117,153,5,117,169,6,153,4,117,169,4,153,7,117,169,8,153,8,117
12480 DATA 153,9,117,76,253,145,169,4,153,1,117,169,14,153,2,117,153,6,117,169,7,153,3,117
12485 DATA 153,5,117,169,6,153,4,117,169,2,153,7,117,169,1,153,8,117,153,9,117,76,253,145
12490 DATA 173,23,6,201,0,208,3,76,52,142,169,8,153,1,117,153,2,117,169,4,153,3,117,169
12495 DATA 7,153,4,117,153,8,117,169,14,153,5,117,153,7,117,169,6,153,6,117,169,2,153,9

Basic Listing cont'd.

12500 DATA 117,76,253,145,169,1,153,1,117,153,2,117,169,2,153,3,117,169,14,153,4,117,153,8
12505 DATA 117,169,7,153,5,117,153,7,117,169,6,153,6,117,169,4,153,9,117,76,253,145,173,23
12510 DATA 6,201,0,208,3,76,130,142,169,4,153,3,117,169,158,153,4,117,169,127,153,5,117,169
12515 DATA 34,153,6,117,153,7,117,76,253,145,169,4,153,3,117,169,30,153,4,117,169,255,153,5
12520 DATA 117,169,20,153,6,117,153,7,117,76,253,145,173,23,6,201,0,208,3,76,192,142,169,32
12525 DATA 153,3,117,169,120,153,4,117,169,255,153,5,117,169,40,153,6,117,153,7,117,76,253,145
12530 DATA 169,32,153,3,117,169,121,153,4,117,169,254,153,5,117,169,68,153,6,117,153,7,117,76
12535 DATA 253,145,169,0,153,254,117,153,255,117,153,10,118,153,11,118,173,24,6,201,20,208,3,76
12540 DATA 28,143,201,10,208,3,76,135,143,169,0,153,1,118,153,2,118,153,8,118,153,3,9,118,173
12545 DATA 24,6,201,1,240,11,201,11,240,7,201,21,240,3,76,239,143,76,47,144,173,23,6,201
12550 DATA 0,208,3,76,90,143,169,34,153,0,118,169,20,153,1,118,153,6,118,169,8,153,2,118
12555 DATA 169,14,153,3,118,153,5,118,169,28,153,4,118,153,6,118,169,4,153,7,118,169,2,153
12560 DATA 8,118,169,1,153,9,118,76,253,145,169,4,153,0,118,153,1,118,153,2,118,169,28,153
12565 DATA 3,118,153,5,118,169,14,153,4,118,153,6,118,169,8,153,7,118,169,16,153,8,118,169
12570 DATA 32,153,9,118,76,253,145,173,23,6,201,0,208,3,76,194,143,169,2,153,1,118,169,1
12575 DATA 153,0,118,169,4,153,2,118,169,28,153,3,118,153,5,118,169,14,153,4,118,153,6,118
12580 DATA 169,8,153,7,118,169,20,153,8,118,169,34,153,9,118,76,253,145,169,16,153,1,118,169
12585 DATA 32,153,0,118,169,8,153,2,118,169,14,153,3,118,153,3,118,169,28,153,4,118,153,6
12590 DATA 118,169,4,153,7,118,153,8,118,153,9,118,76,253,145,173,23,6,201,0,208,3,76,19
12595 DATA 144,169,1,153,3,118,153,7,118,169,158,153,4,118,169,124,153,5,118,169,42,153,6,118
12600 DATA 76,253,145,169,0,153,3,118,169,128,153,7,118,169,12,153,4,118,169,63,153,5,118,169
12605 DATA 84,153,6,118,76,253,145,173,23,6,201,0,208,3,76,83,144,169,128,153,3,118,153,7
12610 DATA 118,169,121,153,4,118,169,62,153,5,118,169,84,153,6,118,76,253,145,169,0,153,3,118
12615 DATA 169,1,153,7,118,169,48,153,4,118,169,252,153,5,118,169,42,153,6,118,76,253,145,169
12620 DATA 0,153,255,118,153,0,119,153,10,119,153,3,119,173,24,6,201,20,208,3,76,177,144,201
12625 DATA 10,208,3,76,21,145,169,0,153,1,119,153,2,119,153,8,119,153,9,119,173,24,6,201

Basic Listing

12630 DATA 1,240,11,201,11,240,7,201,21,240,3,76,121,143,76,187,145,173,23,6,201,0,208,3
12635 DATA 76,233,144,169,4,153,1,119,153,3,119,169,14,153,2,119,169,7,153,4,119,169,1,153
12640 DATA 5,119,169,63,153,6,119,169,32,153,7,119,169,48,153,8,119,169,16,153,9,119,76,253
12645 DATA 145,169,16,153,1,119,153,3,119,169,56,153,2,119,169,48,153,4,119,169,32,153,5,119
12650 DATA 153,6,119,169,62,153,7,119,169,2,153,8,119,169,126,153,9,119,76,253,145,173,23,6
12655 DATA 201,0,208,3,76,77,145,169,16,153,1,119,169,48,153,2,119,169,32,153,3,119,169,63
12660 DATA 153,4,119,169,1,153,5,119,169,7,153,6,119,169,4,153,7,119,153,9,119,169,14,153
12665 DATA 8,119,76,253,145,169,126,153,1,119,169,2,153,2,119,169,62,153,3,119,169,32,153,4
12670 DATA 119,153,5,119,169,48,153,6,119,169,56,153,8,119,169,16,153,7,119,153,9,119,76,253
12675 DATA 145,173,23,6,201,0,208,3,76,159,145,169,56,153,3,119,169,40,153,4,119,169,233,153
12680 DATA 5,119,169,10,153,6,119,169,14,153,7,119,76,253,145,169,131,153,3,119,169,130,153,4
12685 DATA 119,169,186,153,5,119,169,170,153,6,119,169,238,153,7,119,76,253,145,173,23,6,201,0
12690 DATA 208,3,76,225,145,169,28,153,3,119,169,20,153,4,119,169,212,153,5,119,169,87,153,6
12695 DATA 119,169,112,153,7,119,76,253,145,169,1,153,3,119,169,193,153,4,119,169,93,153,5,119
12700 DATA 169,85,153,6,119,169,119,153,7,119,76,253,145,76,68,140,189,14,6,168,169,8,153,0
12705 DATA 117,153,1,117,153,8,117,153,3,117,153,4,117,153,5,117,153,6,117,153,7,117,169,62
12710 DATA 153,3,117,169,0,153,9,117,238,40,6,76,223,139,189,14,6,168,169,8,153,0,118,153
12715 DATA 1,118,153,2,118,153,4,118,153,5,118,153,6,118,153,7,118,153,8,118,169,62,153,3
12720 DATA 118,238,40,6,169,0,153,9,118,76,223,139,189,14,6,168,169,8,153,0,119,153,1,119
12725 DATA 153,2,119,153,4,119,153,5,119,153,6,119,153,7,119,153,8,119,169,62,153,3,119,169
12730 DATA 0,153,9,119,238,40,6,76,223,139,162,0,189,0,6,168,169,8,153,0,116,153,1,116
12735 DATA 153,2,116,153,4,116,153,5,116,153,6,116,153,7,116,153,8,116,169,62,153,3,116,169
12740 DATA 0,153,9,116,153,10,116,153,12,116,153,11,116,169,10,141,39,6,96,0

Assembler Listing

```

00008 .LI OFF
00009 .LR $B400
00010 .TA $2600
00011 .TF "D:ADVENT17.QB3"
00012 VERT .EQ $600
00013 HORZ .EQ $601
00014 VDIR .EQ $602
00018 STICK .EQ $603
00020 HDIR .EQ $604
00022 STRIBO .EQ $284
00024 PLAYER1 .EQ $7000
00026 PLAYER1 .EQ $7100
00028 PLAYER2 .EQ $7200
00030 PLAYER3 .EQ $7300
00032 NIP .EQ $605
00034 MVERT .EQ $606
00036 MHDIR .EQ $607
00038 MCOUNT .EQ $608
00040 MAJUST .EQ $609
00042 MSTICK .EQ $619
00044 MAJUSTV .EQ $61A
00046 MPOSE .EQ $60A
00048 MPOSE .EQ $60E
00050 MLIVEN .EQ $613
00052 MRND .EQ $D20A
00054 MENDP .EQ $617
00056 MEND .EQ $618
00058 MENSF .EQ $61B
00060 MCONCN .EQ $61C
00062 MCON .EQ $61D
00068 MLIVES .EQ $627
00070 MSORE .EQ $628
00072 MNRN .EQ $629
00074 MSLOW .EQ $62A
00076 MRANG .EQ $62E
00078 MREIN .EQ $62
00080 STA $22F
000810 LDA #110
000815 STA $2C0
000818 LDA #88
000819 STA $2C1
000818 LDA #28
000819 STA $2C2
000820 LDA #63
000822 STA $2C3
000825 LDA #6A
000830 LDA /PLAYER0
000835 STA $D407
000840 LDA #3
000845 STA $D01D
000850 STA $D01E
000855 STA $D01F
000860 STA $D020
000865 STA $D021
000870 STA $D022
000875 STA $D023
000880 STA $D024
000885 STA $D025
000890 STA $D026
000895 STA $D027
000900 STA $D028
000905 STA $D029
000910 STA $D030
000915 STA $D031
000920 STA $D032
000925 STA $D033
000930 STA $D034
000935 STA $D035
000940 STA $D036
000945 STA $D037
000950 STA $D038
000955 STA $D039
000960 STA $D040
000965 STA $D041
000970 STA $D042
000975 STA $D043
000980 STA $D044
000985 STA $D045
000990 STA $D046
000995 STA $D047
001000 STA $D048
001005 STA $D049
001010 STA $D050
001015 STA $D051
001020 STA $D052
001025 STA $D053
001030 STA $D054
001035 STA $D055
001040 STA $D056
001045 STA $D057
001050 STA $D058
001055 STA $D059
001060 STA $D060
001065 STA $D061
001070 STA $D062
001075 STA $D063
001080 STA $D064
001085 STA $D065
001090 STA $D066
001095 STA $D067
001100 STA $D068
001105 STA $D069
001110 STA $D070
001115 STA $D071
001120 STA $D072
001125 STA $D073
001130 STA $D074
001135 STA $D075
001140 STA $D076
001145 STA $D077
001150 STA $D078
001155 STA $D079
001160 STA $D080
001165 STA $D081
001170 STA $D082
001175 STA $D083
001180 STA $D084
001185 STA $D085
001190 STA $D086
001195 STA $D087
001200 STA $D088
001205 STA $D089
001210 STA $D090
001215 STA $D091
001220 STA $D092
001225 STA $D093
001230 STA $D094
001235 STA $D095
001240 STA $D096
001245 STA $D097
001250 STA $D098
001255 STA $D099
001260 STA $D0A0
001265 STA $D0A1
001270 STA $D0A2
001275 STA $D0A3
001280 STA $D0A4
001285 STA $D0A5
001290 STA $D0A6
001295 STA $D0A7
001300 STA $D0A8
001305 STA $D0A9
001310 STA $D0AA
001315 STA $D0AB
001320 STA $D0AC
001325 STA $D0AD
001330 STA $D0AE
001335 STA $D0AF
001340 STA $D0B0
001345 STA $D0B1
001350 STA $D0B2
001355 STA $D0B3
001360 STA $D0B4
001365 STA $D0B5
001370 STA $D0B6
001375 STA $D0B7
001380 STA $D0B8
001385 STA $D0B9
001390 STA $D0BA
001395 STA $D0BB
001400 STA $D0BC
001405 STA $D0BD
001410 STA $D0BE
001415 STA $D0BF
001420 STA $D0C0
001425 STA $D0C1
001430 STA $D0C2
001435 STA $D0C3
001440 STA $D0C4
001445 STA $D0C5
001450 STA $D0C6
001455 STA $D0C7
001460 STA $D0C8
001465 STA $D0C9
001470 STA $D0CA
001475 STA $D0CB
001480 STA $D0CC
001485 STA $D0CD
001490 STA $D0CE
001495 STA $D0CF
001500 STA $D0D0
001505 STA $D0D1
001510 STA $D0D2
001515 STA $D0D3
001520 STA $D0D4
001525 STA $D0D5
001530 STA $D0D6
001535 STA $D0D7
001540 STA $D0D8
001545 STA $D0D9
001550 STA $D0DA
001555 STA $D0DB
001560 STA $D0DC
001565 STA $D0DD
001570 STA $D0DE
001575 STA $D0DF
001580 STA $D0E0
001585 STA $D0E1
001590 STA $D0E2
001595 STA $D0E3
001600 STA $D0E4
001605 STA $D0E5
001610 STA $D0E6
001615 STA $D0E7
001620 STA $D0E8
001625 STA $D0E9
001630 STA $D0EA
001635 STA $D0EB
001640 STA $D0EC
001645 STA $D0ED
001650 STA $D0EE
001655 STA $D0EF
001660 STA $D0F0
001665 STA $D0F1
001670 STA $D0F2
001675 STA $D0F3
001680 STA $D0F4
001685 STA $D0F5
001690 STA $D0F6
001695 STA $D0F7
001700 STA $D0F8
001705 STA $D0F9
001710 STA $D0FA
001715 STA $D0FB
001720 STA $D0FC
001725 STA $D0FD
001730 STA $D0FE
001735 STA $D0FF
001740 STA $D100
001745 STA $D101
001750 STA $D102
001755 STA $D103
001760 STA $D104
001765 STA $D105
001770 STA $D106
001775 STA $D107
001780 STA $D108
001785 STA $D109
001790 STA $D10A
001795 STA $D10B
001800 STA $D10C
001805 STA $D10D
001810 STA $D10E
001815 STA $D10F
001820 STA $D110
001825 STA $D111
001830 STA $D112
001835 STA $D113
001840 STA $D114
001845 STA $D115
001850 STA $D116
001855 STA $D117
001860 STA $D118
001865 STA $D119
001870 STA $D11A
001875 STA $D11B
001880 STA $D11C
001885 STA $D11D
001890 STA $D11E
001895 STA $D11F
001900 STA $D120
001905 STA $D121
001910 STA $D122
001915 STA $D123
001920 STA $D124
001925 STA $D125
001930 STA $D126
001935 STA $D127
001940 STA $D128
001945 STA $D129
001950 STA $D12A
001955 STA $D12B
001960 STA $D12C
001965 STA $D12D
001970 STA $D12E
001975 STA $D12F
001980 STA $D130
001985 STA $D131
001990 STA $D132
001995 STA $D133
002000 STA $D134
002005 STA $D135
002010 STA $D136
002015 STA $D137
002020 STA $D138
002025 STA $D139
002030 STA $D13A
002035 STA $D13B
002040 STA $D13C
002045 STA $D13D
002050 STA $D13E
002055 STA $D13F
002060 STA $D140
002065 STA $D141
002070 STA $D142
002075 STA $D143
002080 STA $D144
002085 STA $D145
002090 STA $D146
002095 STA $D147
002100 STA $D148
002105 STA $D149
002110 STA $D14A
002115 STA $D14B
002120 STA $D14C
002125 STA $D14D
002130 STA $D14E
002135 STA $D14F
002140 STA $D150
002145 STA $D151
002150 STA $D152
002155 STA $D153
002160 STA $D154
002165 STA $D155
002170 STA $D156
002175 STA $
```


Assembler Listing

```

01530 RTS
01540 XOL LDR #200
01550 STA LIVES
01560 RTS
01570 L207 LDX STRIG0
01580 CPX #0
01590 BNE L70
01600 JMP SHOOT
01610 L70 LDX L10
01620 CMP #10
01630 BEQ L10
01640 L10 LDX L10
01650 CMP #10
01660 BEQ L10
01670 L10 LDX L10
01680 CMP #10
01690 BEQ L10
01700 L10 LDX L10
01710 CMP #10
01720 BEQ L10
01730 L10 LDX L10
01740 CMP #10
01750 BEQ L10
01760 L10 LDX L10
01770 CMP #10
01780 BEQ L10
01790 L10 LDX L10
01800 CMP #10
01810 BEQ L10
01820 L10 LDX L10
01830 CMP #10
01840 BEQ L10
01850 L10 LDX L10
01860 CMP #10
01870 BEQ L10
01880 L10 LDX L10
01890 CMP #10
01900 BEQ L10
01910 L10 LDX L10
01920 CMP #10
01930 BEQ L10
01940 L10 LDX L10
01950 CMP #10
01960 BEQ L10
01970 L10 LDX L10
01980 CMP #10
01990 BEQ L10
02000 L10 LDX L10
02010 CMP #10
02020 BEQ L10
02030 L10 LDX L10
02040 CMP #10
02050 BEQ L10
02060 L10 LDX L10
02070 CMP #10
02080 BEQ L10
02090 L10 LDX L10
02100 CMP #10
02110 BEQ L10
02120 L10 LDX L10
02130 CMP #10
02140 BEQ L10
02150 L10 LDX L10
02160 CMP #10
02170 BEQ L10
02180 L10 LDX L10
02190 CMP #10
02200 BEQ L10
02210 L10 LDX L10
02220 CMP #10
02230 BEQ L10
02240 L10 LDX L10
02250 CMP #10
02260 BEQ L10
02270 L10 LDX L10
02280 CMP #10
02290 BEQ L10
02300 L10 LDX L10
02310 CMP #10
02320 BEQ L10
02330 L10 LDX L10
02340 CMP #10
02350 BEQ L10
02360 L10 LDX L10
02370 CMP #10
02380 BEQ L10
02390 L10 LDX L10
02400 CMP #10
02410 BEQ L10
02420 L10 LDX L10
02430 CMP #10
02440 BEQ L10
02450 L10 LDX L10
02460 CMP #10
02470 BEQ L10
02480 L10 LDX L10
02490 CMP #10
02500 BEQ L10
02510 L10 LDX L10
02520 CMP #10
02530 BEQ L10
02540 L10 LDX L10
02550 CMP #10
02560 BEQ L10
02570 L10 LDX L10
02580 CMP #10
02590 BEQ L10
02600 L10 LDX L10
02610 CMP #10
02620 BEQ L10
02630 L10 LDX L10
02640 CMP #10
02650 BEQ L10
02660 L10 LDX L10
02670 CMP #10
02680 BEQ L10
02690 L10 LDX L10
02700 CMP #10
02710 BEQ L10
02720 L10 LDX L10
02730 CMP #10
02740 BEQ L10
02750 L10 LDX L10
02760 CMP #10
02770 BEQ L10
02780 L10 LDX L10
02790 CMP #10
02800 BEQ L10
02810 L10 LDX L10
02820 CMP #10
02830 BEQ L10
02840 L10 LDX L10
02850 CMP #10
02860 BEQ L10
02870 L10 LDX L10
02880 CMP #10
02890 BEQ L10
02900 L10 LDX L10
02910 CMP #10
02920 BEQ L10
02930 L10 LDX L10
02940 CMP #10
02950 BEQ L10
02960 L10 LDX L10
02970 CMP #10
02980 BEQ L10
02990 L10 LDX L10
03000 CMP #10
03010 BEQ L10
03020 L10 LDX L10
03030 CMP #10
03040 BEQ L10
03050 L10 LDX L10
03060 CMP #10
03070 BEQ L10
03080 L10 LDX L10
03090 CMP #10
03100 BEQ L10
03110 L10 LDX L10
03120 CMP #10
03130 BEQ L10
03140 L10 LDX L10
03150 CMP #10
03160 BEQ L10
03170 L10 LDX L10
03180 CMP #10
03190 BEQ L10
03200 L10 LDX L10
03210 CMP #10
03220 BEQ L10
03230 L10 LDX L10
03240 CMP #10
03250 BEQ L10
03260 L10 LDX L10
03270 CMP #10
03280 BEQ L10
03290 L10 LDX L10
03300 CMP #10
03310 BEQ L10
03320 L10 LDX L10
03330 CMP #10
03340 BEQ L10
03350 L10 LDX L10
03360 CMP #10
03370 BEQ L10
03380 L10 LDX L10
03390 CMP #10
03400 BEQ L10
03410 L10 LDX L10
03420 CMP #10
03430 BEQ L10
03440 L10 LDX L10
03450 CMP #10
03460 BEQ L10
03470 L10 LDX L10
03480 CMP #10
03490 BEQ L10
03500 L10 LDX L10
03510 CMP #10
03520 BEQ L10
03530 L10 LDX L10
03540 CMP #10
03550 BEQ L10
03560 L10 LDX L10
03570 CMP #10
03580 BEQ L10
03590 L10 LDX L10
03600 CMP #10
03610 BEQ L10
03620 L10 LDX L10
03630 CMP #10
03640 BEQ L10
03650 L10 LDX L10
03660 CMP #10
03670 BEQ L10
03680 L10 LDX L10
03690 CMP #10
03700 BEQ L10
03710 L10 LDX L10
03720 CMP #10
03730 BEQ L10
03740 L10 LDX L10
03750 CMP #10
03760 BEQ L10
03770 L10 LDX L10
03780 CMP #10
03790 BEQ L10
03800 L10 LDX L10
03810 CMP #10
03820 BEQ L10
03830 L10 LDX L10
03840 CMP #10
03850 BEQ L10
03860 L10 LDX L10
03870 CMP #10
03880 BEQ L10
03890 L10 LDX L10
03900 CMP #10
03910 BEQ L10
03920 L10 LDX L10
03930 CMP #10
03940 BEQ L10
03950 L10 LDX L10
03960 CMP #10
03970 BEQ L10
03980 L10 LDX L10
03990 CMP #10
04000 BEQ L10

```

Assembler Listing

```

01940 * MOVEMENT DOWN
01950 *
01960 DOWN LDY VERT      ;LOAD VERT
01970 LDY HORZ          ;SET HORZ
01980 STX $D000
01990 CPY #225
02000 BEQ L5
02010 INC VERT
02020 L5 LDA STICK
02030 CMP #14
02040 BEQ L7
02050 CMP #13
02060 BEQ L7
02070 JMP SLOW
02080 L7 LDX #0
02090 L74 CPX VDIR
02100 BEQ A2
02110 INX
02120 CPX #4
02130 BNE L74
02140 L76 CPX VDIR
02150 BEQ L75
02160 INX
02170 CPX #8
02180 BNE L76
02190 LDX #0
02200 STA VDIR
02210 L75 JMP VERT1
02220 A2 JMP VERT2
02230 *
02240 *
02250 *
02260 * VERTICAL MOVEMENT
02270 *
02280 VERT2 INC VDIR
02290 LDY VERT
02300 LDA #0
02310 STA PLAYER0+$3FF,Y
02320 STA PLAYER0+$400,Y
02330 STA PLAYER0+$400,Y
02340 STA PLAYER0+$40C,Y
02350 LDA #28
02360 STA PLAYER0+$401,Y
02370 STA PLAYER0+$403,Y
02380 STA PLAYER0+$408,Y
02390 LDA #20
02400 STA PLAYER0+$402,Y
02410 LDA #8
02420 STA PLAYER0+$409,Y
02430 STA PLAYER0+$404,Y
02440 STA PLAYER0+$407,Y
02450 LDA #62
02460 STA PLAYER0+$405,Y
02470 STA PLAYER0+$406,Y
02480 LDA #52
02490 STA PLAYER0+$409,Y
02500 LDA #4
02510 STA PLAYER0+$40A,Y
02520 LDA #5

03120 *
03130 *
03140 *
03150 RIGHT1 INC HDIR
03160 LDY VERT
03170 LDA #0
03180 STA PLAYER0+$400,Y
03190 STA PLAYER0+$40C,Y
03200 STA PLAYER0+$40D,Y
03210 STA PLAYER0+$399,Y
03220 LDA #28
03230 STA PLAYER0+$401,Y
03240 STA PLAYER0+$403,Y
03250 STA PLAYER0+$408,Y
03260 LDA #20
03270 STA PLAYER0+$402,Y
03280 LDA #8
03290 STA PLAYER0+$404,Y
03300 STA PLAYER0+$406,Y
03310 STA PLAYER0+$407,Y
03320 LDA #52
03330 STA PLAYER0+$409,Y
03340 LDA #6
03350 STA PLAYER0+$40B,Y
03360 LDA #36
03370 STA PLAYER0+$40A,Y
03380 LDA #30
03390 STA PLAYER0+$405,Y
03400 JMP A6
03410 *
03420 *
03430 *
03440 RIGHT2 INC HDIR
03450 LDY VERT
03460 LDA #0
03470 STA PLAYER0+$400,Y
03480 STA PLAYER0+$40C,Y
03490 LDA #28
03500 STA PLAYER0+$401,Y
03510 STA PLAYER0+$403,Y
03520 STA PLAYER0+$408,Y
03530 LDA #20
03540 STA PLAYER0+$402,Y
03550 LDA #22
03560 STA PLAYER0+$409,Y
03570 LDA #8
03580 STA PLAYER0+$404,Y
03590 STA PLAYER0+$406,Y
03600 STA PLAYER0+$407,Y
03610 LDA #12
03620 STA PLAYER0+$405,Y
03630 LDA #16
03640 STA PLAYER0+$40A,Y
03650 LDA #24
03660 STA PLAYER0+$40B,Y
03670 A6 LDA STICK
03680 CMP #6
03690 BNE L10
03700 JMP UP

```

; INCREMENT FRAME COUNTER
 ; LOAD VERT
 ; DRAW

; INCREMENT FRAME COUNTER
 ; LOAD VERT
 ; DRAW

; CHECK FOR DIAGONAL

; DETERMINING WHICH PICTURE TO DRAW

; DRAW VERTICAL FRAME
 ; LOAD VERT
 ; DRAW

Assembler Listing

```

04560 STA PLAYER0+$408,Y
04560 JMP SLOW
04570 * SHOOTING
04570 *
04570 SHOOT LDX MIP
04580 CPX #0
04580 BNE L154
04580 LDA #278
04580 STA MIST LK
04580 L154 LDA MIST LK
04581 CMP #15
04582 BNE L154
04583 JMP REMOVE
04584 L34 LDA #220
04585 STA #D202
04586 LDA #204
04587 STA #D203
04588 LDA MIST LK
04590 LMP #14
05000 BNE L150
05010 JMP SUP
05020 L30 CMP #15
05030 BNE L131
05040 JMP SLOW
05050 L31 CMP #5
05060 BNE L132
05070 JMP SKIGHT
05080 L32 CMP #7
05090 BNE L133
05100 JMP BRIGHT
05110 L33 CMP #5
05120 BNE L132
05130 JMP BRIGHT
05140 L103 JMP SLEET
05150 *
05160 *
05170 *
05180 *
05190 *
05200 *
05210 SUP LDX VERT
05220 LDX HORZ
05230 STX #D000
05240 LDX VERT
05250 LDA #0
05260 *DRAW
05270 STA PLAYER0+$400,Y
05280 LDA #28
05290 STA PLAYER0+$401,Y
05300 STA PLAYER0+$408,Y
05310 LDA #20
05320 STA PLAYER0+$402,Y
05330 STA PLAYER0+$409,Y
05340 LDA #29
05350 STA PLAYER0+$403,Y
05360 LDA #9
05370 STA PLAYER0+$404,Y
05380 LDA #12
05390 STA PLAYER0+$405,Y
05400 LDA #8
05410 STA PLAYER0+$406,Y
05420 STA PLAYER0+$407,Y

```

DRAW PLAYER0 SHOOTING UP

:LOAD VERT POS

:SET HORZ POS

:LOAD VERT
:SET HORZ POS

MOVE LEFT
:DETERMINE WHICH P1

:INCKEMENT FRAME COUNTER
:LOAD VERT POS
:DRAW

```

03710 L10 CMP #5
03720 BNE L11
03730 JMP DOWN
03740 L11 JMP SLOW
03750 *
03760 *
03770 *
03780 *
03790 *
03800 LEFT LDX VERT
03810 LDX HORZ
03820 STX #D000
03830 CPX #20
03840 BNE L15
03850 DEC HORZ
03860 L15 LDX #0
03870 L30 CPX HORZ
03880 BNE #4
03890 INX
03900 CPX #3
03910 BNE L30
03920 L31 CPX HORZ
03930 BNE L32
03940 INX
03950 CPX #6
03960 BNE L31
03970 LDA #0
03980 STA HORZ
03990 L32 JMP LEFT2
04000 RA JMP LEFT1
04010 *
04020 *
04030 *
04040 LEFT1 INC HORZ
04050 LDX VERT
04060 LDA #0
04070 STA PLAYER0+$400,Y
04080 STA PLAYER0+$400,Y
04090 LDA #28
04100 STA PLAYER0+$401,Y
04110 STA PLAYER0+$403,Y
04120 STA PLAYER0+$408,Y
04130 LDA #20
04140 STA PLAYER0+$402,Y
04150 LDA #20
04160 STA PLAYER0+$402,Y
04170 LDA #22
04180 STA PLAYER0+$402,Y
04190 LDA #8
04200 STA PLAYER0+$404,Y
04210 STA PLAYER0+$406,Y
04220 STA PLAYER0+$407,Y
04230 LDA #12
04240 STA PLAYER0+$408,Y
04250 LDA #4
04260 STA PLAYER0+$405,Y
04270 JMP #5
04280 *
04290 *

```


Assembler Listing

```

043200 *
043210 LEFT2 INC HDJK
043220 LDY VERT
043230 LDA #0
043240 STA PLAYER0+$400,Y
043250 STA PLAYER0+$40C,Y
043260 LDA #28
043270 STA PLAYER0+$401,Y
043280 STA PLAYER0+$403,Y
043290 STA PLAYER0+$408,Y
043300 LDA #20
043310 STA PLAYER0+$402,Y
043320 LDA #8
043330 STA PLAYER0+$404,Y
043340 STA PLAYER0+$405,Y
043350 STA PLAYER0+$407,Y
043360 LDA #22
043370 STA PLAYER0+$409,Y
043380 LDA #18
043390 STA PLAYER0+$40A,Y
043400 LDA #48
043410 STA PLAYER0+$40E,Y
043420 LDA #24
043430 STA PLAYER0+$405,Y
043440 AS LDA STICK
043450 CMF #10
043460 BNE L20
043470 JMP UP
043480 L20: CMF #9
043490 BNE L21
043500 JMP DOWN
043510 L21: JMP SLOW
043520 *
043530 *
043540 *
043550 *
043560 *
043570 *
043580 *
043590 *
043600 *
043610 *
043620 *
043630 *
043640 *
043650 *
043660 *
043670 *
043680 *
043690 *
043700 *
043710 *
043720 *
043730 *
043740 *
043750 *
043760 *
043770 *
043780 *
043790 *
043800 *
043810 *
043820 *
043830 *
043840 *
043850 *
043860 *
043870 *
043880 *
043890 *
043900 *
043910 *
043920 *
043930 *
043940 *
043950 *
043960 *
043970 *
043980 *
043990 *
044000 *
044010 *
044020 *
044030 *
044040 *
044050 *
044060 *
044070 *
044080 *
044090 *
044100 *
044110 *
044120 *
044130 *
044140 *
044150 *
044160 *
044170 *
044180 *
044190 *
044200 *
044210 *
044220 *
044230 *
044240 *
044250 *
044260 *
044270 *
044280 *
044290 *
044300 *
044310 *
044320 *
044330 *
044340 *
044350 *
044360 *
044370 *
044380 *
044390 *
044400 *
044410 *
044420 *
044430 *
044440 *
044450 *
044460 *
044470 *
044480 *
044490 *
044500 *
044510 *
044520 *
044530 *
044540 *
044550 *
044560 *
044570 *
044580 *
044590 *
044600 *
044610 *
044620 *
044630 *
044640 *
044650 *
044660 *
044670 *
044680 *
044690 *
044700 *
044710 *
044720 *
044730 *
044740 *
044750 *
044760 *
044770 *
044780 *
044790 *
044800 *
044810 *
044820 *
044830 *
044840 *
044850 *
044860 *
044870 *
044880 *
044890 *
044900 *
044910 *
044920 *
044930 *
044940 *
044950 *
044960 *
044970 *
044980 *
044990 *
045000 *
045010 *
045020 *
045030 *
045040 *
045050 *
045060 *
045070 *
045080 *
045090 *
045100 *
045110 *
045120 *
045130 *
045140 *
045150 *
045160 *
045170 *
045180 *
045190 *
045200 *
045210 *
045220 *
045230 *
045240 *
045250 *
045260 *
045270 *
045280 *
045290 *
045300 *
045310 *
045320 *
045330 *
045340 *
045350 *
045360 *
045370 *
045380 *
045390 *
045400 *
045410 *
045420 *
045430 *
045440 *
045450 *
045460 *
045470 *
045480 *
045490 *
045500 *
045510 *
045520 *
045530 *
045540 *
045550 *
045560 *
045570 *
045580 *
045590 *
045600 *
045610 *
045620 *
045630 *
045640 *
045650 *
045660 *
045670 *
045680 *
045690 *
045700 *
045710 *
045720 *
045730 *
045740 *
045750 *
045760 *
045770 *
045780 *
045790 *
045800 *
045810 *
045820 *
045830 *
045840 *
045850 *
045860 *
045870 *
045880 *
045890 *
045900 *
045910 *
045920 *
045930 *
045940 *
045950 *
045960 *
045970 *
045980 *
045990 *
046000 *
046010 *
046020 *
046030 *
046040 *
046050 *
046060 *
046070 *
046080 *
046090 *
046100 *
046110 *
046120 *
046130 *
046140 *
046150 *
046160 *
046170 *
046180 *
046190 *
046200 *
046210 *
046220 *
046230 *
046240 *
046250 *
046260 *
046270 *
046280 *
046290 *
046300 *
046310 *
046320 *
046330 *
046340 *
046350 *
046360 *
046370 *
046380 *
046390 *
046400 *
046410 *
046420 *
046430 *
046440 *
046450 *
046460 *
046470 *
046480 *
046490 *
046500 *
046510 *
046520 *
046530 *
046540 *
046550 *
046560 *
046570 *
046580 *
046590 *
046600 *
046610 *
046620 *
046630 *
046640 *
046650 *
046660 *
046670 *
046680 *
046690 *
046700 *
046710 *
046720 *
046730 *
046740 *
046750 *
046760 *
046770 *
046780 *
046790 *
046800 *
046810 *
046820 *
046830 *
046840 *
046850 *
046860 *
046870 *
046880 *
046890 *
046900 *
046910 *
046920 *
046930 *
046940 *
046950 *
046960 *
046970 *
046980 *
046990 *
047000 *
047010 *
047020 *
047030 *
047040 *
047050 *
047060 *
047070 *
047080 *
047090 *
047100 *
047110 *
047120 *
047130 *
047140 *
047150 *
047160 *
047170 *
047180 *
047190 *
047200 *
047210 *
047220 *
047230 *
047240 *
047250 *
047260 *
047270 *
047280 *
047290 *
047300 *
047310 *
047320 *
047330 *
047340 *
047350 *
047360 *
047370 *
047380 *
047390 *
047400 *
047410 *
047420 *
047430 *
047440 *
047450 *
047460 *
047470 *
047480 *
047490 *
047500 *
047510 *
047520 *
047530 *
047540 *
047550 *
047560 *
047570 *
047580 *
047590 *
047600 *
047610 *
047620 *
047630 *
047640 *
047650 *
047660 *
047670 *
047680 *
047690 *
047700 *
047710 *
047720 *
047730 *
047740 *
047750 *
047760 *
047770 *
047780 *
047790 *
047800 *
047810 *
047820 *
047830 *
047840 *
047850 *
047860 *
047870 *
047880 *
047890 *
047900 *
047910 *
047920 *
047930 *
047940 *
047950 *
047960 *
047970 *
047980 *
047990 *
048000 *
048010 *
048020 *
048030 *
048040 *
048050 *
048060 *
048070 *
048080 *
048090 *
048100 *
048110 *
048120 *
```

44

```

060200 JMP S10
060300 L51 JMP S9
DRAW PLAYER0 SHOOTING RIGHT STRAIGHT
060400 S11 LDA #6
060500 STA PLAYER0+$04.Y
060600 STA PLAYER0+$06.Y
060700 STA PLAYER0+$08.Y
060800 LDA #15
060900 STA PLAYER0+$05.Y
061000 STA PLAYER0+$07.Y
061100 JMP MISSM
DRAW PLAYER0 SHOOTING RIGHT UP
061200 S10 LDA #9
061300 STA PLAYER0+$04.Y
061400 LDA #14
061500 STA PLAYER0+$05.Y
061600 STA PLAYER0+$07.Y
061700 STA PLAYER0+$09.Y
061800 LDA #55
061900 STA PLAYER0+$06.Y
062000 LDA #56
062100 JMP MISSM
DRAW PLAYER0 SHOOTING RIGHT DOWN
062200 S9 LDA #8
062300 STA PLAYER0+$04.Y
062400 LDA #14
062500 STA PLAYER0+$05.Y
062600 STA PLAYER0+$07.Y
062700 STA PLAYER0+$09.Y
062800 LDA #55
062900 STA PLAYER0+$06.Y
063000 LDA #56
063100 JMP MISSM
DRAW PLAYER0 SHOOTING LEFT
063200 SLEF LDA VERT
063300 LDA HORIZ
063400 STA $D000
063500 LDA VERT
063600 STA $D000
DRAW
063700 STA PLAYER0+$09.Y
063800 STA PLAYER0+$05.Y
063900 STA PLAYER0+$07.Y
064000 STA PLAYER0+$08.Y
064100 STA PLAYER0+$01.Y
064200 STA PLAYER0+$03.Y
064300 LDA #20
064400 STA PLAYER0+$02.Y
064500 STA PLAYER0+$04.Y
064600 STA PLAYER0+$07.Y
064700 LDA #28
064800 STA PLAYER0+$01.Y
064900 STA PLAYER0+$03.Y
065000 STA PLAYER0+$05.Y
065100 STA PLAYER0+$07.Y
065200 STA PLAYER0+$09.Y
065300 STA PLAYER0+$06.Y
065400 STA PLAYER0+$08.Y
065500 STA PLAYER0+$01.Y
065600 STA PLAYER0+$03.Y
065700 STA PLAYER0+$05.Y
065800 STA PLAYER0+$07.Y
065900 STA PLAYER0+$09.Y
066000 STA PLAYER0+$06.Y
066100 STA PLAYER0+$08.Y
066200 STA PLAYER0+$01.Y
066300 STA PLAYER0+$03.Y
066400 STA PLAYER0+$05.Y
066500 STA PLAYER0+$07.Y
066600 STA PLAYER0+$09.Y
066700 STA PLAYER0+$06.Y
066800 STA PLAYER0+$08.Y
066900 STA PLAYER0+$01.Y
067000 STA PLAYER0+$03.Y
067100 STA PLAYER0+$05.Y
067200 STA PLAYER0+$07.Y
067300 STA PLAYER0+$09.Y
067400 STA PLAYER0+$06.Y
067500 STA PLAYER0+$08.Y
067600 STA PLAYER0+$01.Y
067700 STA PLAYER0+$03.Y
067800 STA PLAYER0+$05.Y
067900 STA PLAYER0+$07.Y
068000 STA PLAYER0+$09.Y
068100 STA PLAYER0+$06.Y
068200 STA PLAYER0+$08.Y
068300 STA PLAYER0+$01.Y
068400 STA PLAYER0+$03.Y
068500 STA PLAYER0+$05.Y
068600 STA PLAYER0+$07.Y
068700 STA PLAYER0+$09.Y
068800 STA PLAYER0+$06.Y
068900 STA PLAYER0+$08.Y
069000 STA PLAYER0+$01.Y
069100 STA PLAYER0+$03.Y
069200 STA PLAYER0+$05.Y
069300 STA PLAYER0+$07.Y
069400 STA PLAYER0+$09.Y
069500 STA PLAYER0+$06.Y
069600 STA PLAYER0+$08.Y
069700 STA PLAYER0+$01.Y
069800 STA PLAYER0+$03.Y
069900 STA PLAYER0+$05.Y
070000 STA PLAYER0+$07.Y
070100 STA PLAYER0+$09.Y
070200 STA PLAYER0+$06.Y
070300 STA PLAYER0+$08.Y
070400 STA PLAYER0+$01.Y
070500 STA PLAYER0+$03.Y
070600 STA PLAYER0+$05.Y
070700 STA PLAYER0+$07.Y
070800 STA PLAYER0+$09.Y
070900 STA PLAYER0+$06.Y
071000 STA PLAYER0+$08.Y
071100 STA PLAYER0+$01.Y
071200 STA PLAYER0+$03.Y
071300 STA PLAYER0+$05.Y
071400 STA PLAYER0+$07.Y
071500 STA PLAYER0+$09.Y
071600 STA PLAYER0+$06.Y
071700 STA PLAYER0+$08.Y
071800 STA PLAYER0+$01.Y
071900 STA PLAYER0+$03.Y
072000 STA PLAYER0+$05.Y
072100 STA PLAYER0+$07.Y
072200 STA PLAYER0+$09.Y
072300 STA PLAYER0+$06.Y
072400 STA PLAYER0+$08.Y
072500 STA PLAYER0+$01.Y
072600 STA PLAYER0+$03.Y
072700 STA PLAYER0+$05.Y
072800 STA PLAYER0+$07.Y
072900 STA PLAYER0+$09.Y
073000 STA PLAYER0+$06.Y
073100 STA PLAYER0+$08.Y
073200 STA PLAYER0+$01.Y
073300 STA PLAYER0+$03.Y
073400 STA PLAYER0+$05.Y
073500 STA PLAYER0+$07.Y
073600 STA PLAYER0+$09.Y
073700 STA PLAYER0+$06.Y
073800 STA PLAYER0+$08.Y
073900 STA PLAYER0+$01.Y
074000 STA PLAYER0+$03.Y
074100 STA PLAYER0+$05.Y
074200 STA PLAYER0+$07.Y
074300 STA PLAYER0+$09.Y
074400 STA PLAYER0+$06.Y
074500 STA PLAYER0+$08.Y
074600 STA PLAYER0+$01.Y
074700 STA PLAYER0+$03.Y
074800 STA PLAYER0+$05.Y
074900 STA PLAYER0+$07.Y
075000 STA PLAYER0+$09.Y
075100 STA PLAYER0+$06.Y
075200 STA PLAYER0+$08.Y
075300 STA PLAYER0+$01.Y
075400 STA PLAYER0+$03.Y
075500 STA PLAYER0+$05.Y
075600 STA PLAYER0+$07.Y
075700 STA PLAYER0+$09.Y
075800 STA PLAYER0+$06.Y
075900 STA PLAYER0+$08.Y
076000 STA PLAYER0+$01.Y
076100 STA PLAYER0+$03.Y
076200 STA PLAYER0+$05.Y
076300 STA PLAYER0+$07.Y
076400 STA PLAYER0+$09.Y
076500 STA PLAYER0+$06.Y
076600 STA PLAYER0+$08.Y
076700 STA PLAYER0+$01.Y
076800 STA PLAYER0+$03.Y
076900 STA PLAYER0+$05.Y
077000 STA PLAYER0+$07.Y
077100 STA PLAYER0+$09.Y
077200 STA PLAYER0+$06.Y
077300 STA PLAYER0+$08.Y
077400 STA PLAYER0+$01.Y
077500 STA PLAYER0+$03.Y
077600 STA PLAYER0+$05.Y
077700 STA PLAYER0+$07.Y
077800 STA PLAYER0+$09.Y
077900 STA PLAYER0+$06.Y
078000 STA PLAYER0+$08.Y
078100 STA PLAYER0+$01.Y
078200 STA PLAYER0+$03.Y
078300 STA PLAYER0+$05.Y
078400 STA PLAYER0+$07.Y
078500 STA PLAYER0+$09.Y
078600 STA PLAYER0+$06.Y
078700 STA PLAYER0+$08.Y
078800 STA PLAYER0+$01.Y
078900 STA PLAYER0+$03.Y
079000 STA PLAYER0+$05.Y
079100 STA PLAYER0+$07.Y
079200 STA PLAYER0+$09.Y
079300 STA PLAYER0+$06.Y
079400 STA PLAYER0+$08.Y
079500 STA PLAYER0+$01.Y
079600 STA PLAYER0+$03.Y
079700 STA PLAYER0+$05.Y
079800 STA PLAYER0+$07.Y
079900 STA PLAYER0+$09.Y
080000 STA PLAYER0+$06.Y
080100 STA PLAYER0+$08.Y
080200 STA PLAYER0+$01.Y
080300 STA PLAYER0+$03.Y
080400 STA PLAYER0+$05.Y
080500 STA PLAYER0+$07.Y
080600 STA PLAYER0+$09.Y
080700 STA PLAYER0+$06.Y
080800 STA PLAYER0+$08.Y
080900 STA PLAYER0+$01.Y
081000 STA PLAYER0+$03.Y
081100 STA PLAYER0+$05.Y
081200 STA PLAYER0+$07.Y
081300 STA PLAYER0+$09.Y
081400 STA PLAYER0+$06.Y
081500 STA PLAYER0+$08.Y
081600 STA PLAYER0+$01.Y
081700 STA PLAYER0+$03.Y
081800 STA PLAYER0+$05.Y
081900 STA PLAYER0+$07.Y
082000 STA PLAYER0+$09.Y
082100 STA PLAYER0+$06.Y
082200 STA PLAYER0+$08.Y
082300 STA PLAYER0+$01.Y
082400 STA PLAYER0+$03.Y
082500 STA PLAYER0+$05.Y
082600 STA PLAYER0+$07.Y
082700 STA PLAYER0+$09.Y
082800 STA PLAYER0+$06.Y
082900 STA PLAYER0+$08.Y
083000 STA PLAYER0+$01.Y
083100 STA PLAYER0+$03.Y
083200 STA PLAYER0+$05.Y
083300 STA PLAYER0+$07.Y
083400 STA PLAYER0+$09.Y
083500 STA PLAYER0+$06.Y
083600 STA PLAYER0+$08.Y
083700 STA PLAYER0+$01.Y
083800 STA PLAYER0+$03.Y
083900 STA PLAYER0+$05.Y
084000 STA PLAYER0+$07.Y
084100 STA PLAYER0+$09.Y
084200 STA PLAYER0+$06.Y
084300 STA PLAYER0+$08.Y
084400 STA PLAYER0+$01.Y
084500 STA PLAYER0+$03.Y
084600 STA PLAYER0+$05.Y
084700 STA PLAYER0+$07.Y
084800 STA PLAYER0+$09.Y
084900 STA PLAYER0+$06.Y
085000 STA PLAYER0+$08.Y
085100 STA PLAYER0+$01.Y
085200 STA PLAYER0+$03.Y
085300 STA PLAYER0+$05.Y
085400 STA PLAYER0+$07.Y
085500 STA PLAYER0+$09.Y
085600 STA PLAYER0+$06.Y
085700 STA PLAYER0+$08.Y
085800 STA PLAYER0+$01.Y
085900 STA PLAYER0+$03.Y
086000 STA PLAYER0+$05.Y
086100 STA PLAYER0+$07.Y
086200 STA PLAYER0+$09.Y
086300 STA PLAYER0+$06.Y
086400 STA PLAYER0+$08.Y
086500 STA PLAYER0+$01.Y
086600 STA PLAYER0+$03.Y
086700 STA PLAYER0+$05.Y
086800 STA PLAYER0+$07.Y
086900 STA PLAYER0+$09.Y
087000 STA PLAYER0+$06.Y
087100 STA PLAYER0+$08.Y
087200 STA PLAYER0+$01.Y
087300 STA PLAYER0+$03.Y
087400 STA PLAYER0+$05.Y
087500 STA PLAYER0+$07.Y
087600 STA PLAYER0+$09.Y
087700 STA PLAYER0+$06.Y
087800 STA PLAYER0+$08.Y
087900 STA PLAYER0+$01.Y
088000 STA PLAYER0+$03.Y
088100 STA PLAYER0+$05.Y
088200 STA PLAYER0+$07.Y
088300 STA PLAYER0+$09.Y
088400 STA PLAYER0+$06.Y
088500 STA PLAYER0+$08.Y
088600 STA PLAYER0+$01.Y
088700 STA PLAYER0+$03.Y
088800 STA PLAYER0+$05.Y
088900 STA PLAYER0+$07.Y
089000 STA PLAYER0+$09.Y
089100 STA PLAYER0+$06.Y
089200 STA PLAYER0+$08.Y
089300 STA PLAYER0+$01.Y
089400 STA PLAYER0+$03.Y
089500 STA PLAYER0+$
```

Assembler Listing

```

06510 L61 JMP S55          :DRAW PLAYER0 SHOOTING LEFT STRAIGHT
06520 S57 LDA #0
06530 S57 LDA #0
06540 STA PLAYER0+$404.Y
06550 STA PLAYER0+$406.Y
06560 LDA #120
06570 STA PLAYER0+$405.Y
06580 JMP MISSM
06590 *
06770 S56 LDA #72
06780 STA PLAYER0+$404.Y
06790 LDA #56
06790 STA PLAYER0+$405.Y
06740 LDA #8
06750 STA PLAYER0+$406.Y
06760 JMP MISSM
06770 *
06770 S55 LDA #8
06780 STA PLAYER0+$404.Y
06790 LDA #56
06800 STA PLAYER0+$405.Y
06810 LDA #72
06820 STA PLAYER0+$406.Y
06830 JMP MISSM
06840 *
06850 S54 LDA #8
06860 STA PLAYER0+$404.Y
06870 LDA #56
06880 STA PLAYER0+$405.Y
06890 LDA #72
06900 STA PLAYER0+$406.Y
06910 JMP MISSM
06920 L140 JMP SLOW1
06930 *
06940 S53 LDA #8
06950 STA PLAYER0+$404.Y
06960 LDA #56
06970 STA PLAYER0+$405.Y
06980 LDA #72
06990 STA PLAYER0+$406.Y
07000 JMP MISSM
07010 *
07020 S52 LDA #72
07030 STA PLAYER0+$404.Y
07040 LDA #56
07050 STA PLAYER0+$405.Y
07060 STA PLAYER0+$406.Y
07070 JMP MISSM
07080 *
07090 S51 LDA #72
07100 STA PLAYER0+$404.Y
07110 LDA #56
07120 STA PLAYER0+$405.Y
07130 STA PLAYER0+$406.Y
07140 JMP MISSM
07150 *
07160 S50 LDA #72
07170 STA PLAYER0+$404.Y
07180 LDA #56
07190 STA PLAYER0+$405.Y
07200 STA PLAYER0+$406.Y
07210 JMP MISSM
07220 *
07230 S49 LDA #72
07240 STA PLAYER0+$404.Y
07250 LDA #56
07260 STA PLAYER0+$405.Y
07270 STA PLAYER0+$406.Y
07280 JMP MISSM
07290 *
07300 S48 LDA #72
07310 STA PLAYER0+$404.Y
07320 LDA #56
07330 STA PLAYER0+$405.Y
07340 STA PLAYER0+$406.Y
07350 JMP MISSM
07360 *
07370 S47 LDA #72
07380 STA PLAYER0+$404.Y
07390 LDA #56
07400 STA PLAYER0+$405.Y
07410 STA PLAYER0+$406.Y
07420 JMP MISSM
07430 *
07440 S46 LDA #72
07450 STA PLAYER0+$404.Y
07460 LDA #56
07470 STA PLAYER0+$405.Y
07480 STA PLAYER0+$406.Y
07490 JMP MISSM
07500 *
07510 S45 LDA #72
07520 STA PLAYER0+$404.Y
07530 LDA #56
07540 STA PLAYER0+$405.Y
07550 STA PLAYER0+$406.Y
07560 JMP MISSM
07570 *
07580 S44 LDA #72
07590 STA PLAYER0+$404.Y
07600 LDA #56
07610 STA PLAYER0+$405.Y
07620 STA PLAYER0+$406.Y
07630 JMP MISSM
07640 *
07650 S43 LDA #72
07660 STA PLAYER0+$404.Y
07670 LDA #56
07680 STA PLAYER0+$405.Y
07690 STA PLAYER0+$406.Y
07700 JMP MISSM
07710 *
07720 S42 LDA #72
07730 STA PLAYER0+$404.Y
07740 LDA #56
07750 STA PLAYER0+$405.Y
07760 STA PLAYER0+$406.Y
07770 JMP MISSM
07780 *
07790 S41 LDA #72
07800 STA PLAYER0+$404.Y
07810 LDA #56
07820 STA PLAYER0+$405.Y
07830 STA PLAYER0+$406.Y
07840 JMP MISSM
07850 *
07860 S40 LDA #72
07870 STA PLAYER0+$404.Y
07880 LDA #56
07890 STA PLAYER0+$405.Y
07900 STA PLAYER0+$406.Y
07910 JMP MISSM
07920 *
07930 S39 LDA #72
07940 STA PLAYER0+$404.Y
07950 LDA #56
07960 STA PLAYER0+$405.Y
07970 STA PLAYER0+$406.Y
07980 JMP MISSM
07990 *
08000 S38 LDA #72
08010 STA PLAYER0+$404.Y
08020 LDA #56
08030 STA PLAYER0+$405.Y
08040 STA PLAYER0+$406.Y
08050 JMP MISSM
08060 *
08070 S37 LDA #72
08080 STA PLAYER0+$404.Y
08090 LDA #56
08100 STA PLAYER0+$405.Y
08110 STA PLAYER0+$406.Y
08120 JMP MISSM
08130 *
08140 S36 LDA #72
08150 STA PLAYER0+$404.Y
08160 LDA #56
08170 STA PLAYER0+$405.Y
08180 STA PLAYER0+$406.Y
08190 JMP MISSM
08200 *
08210 S35 LDA #72
08220 STA PLAYER0+$404.Y
08230 LDA #56
08240 STA PLAYER0+$405.Y
08250 STA PLAYER0+$406.Y
08260 JMP MISSM
08270 *
08280 S34 LDA #72
08290 STA PLAYER0+$404.Y
08300 LDA #56
08310 STA PLAYER0+$405.Y
08320 STA PLAYER0+$406.Y
08330 JMP MISSM
08340 *
08350 S33 LDA #72
08360 STA PLAYER0+$404.Y
08370 LDA #56
08380 STA PLAYER0+$405.Y
08390 STA PLAYER0+$406.Y
08400 JMP MISSM
08410 *
08420 S32 LDA #72
08430 STA PLAYER0+$404.Y
08440 LDA #56
08450 STA PLAYER0+$405.Y
08460 STA PLAYER0+$406.Y
08470 JMP MISSM
08480 *
08490 S31 LDA #72
08500 STA PLAYER0+$404.Y
08510 LDA #56
08520 STA PLAYER0+$405.Y
08530 STA PLAYER0+$406.Y
08540 JMP MISSM
08550 *
08560 S30 LDA #72
08570 STA PLAYER0+$404.Y
08580 LDA #56
08590 STA PLAYER0+$405.Y
08600 STA PLAYER0+$406.Y
08610 JMP MISSM
08620 *
08630 S29 LDA #72
08640 STA PLAYER0+$404.Y
08650 LDA #56
08660 STA PLAYER0+$405.Y
08670 STA PLAYER0+$406.Y
08680 JMP MISSM
08690 *
08700 S28 LDA #72
08710 STA PLAYER0+$404.Y
08720 LDA #56
08730 STA PLAYER0+$405.Y
08740 STA PLAYER0+$406.Y
08750 JMP MISSM
08760 *
08770 S27 LDA #72
08780 STA PLAYER0+$404.Y
08790 LDA #56
08800 STA PLAYER0+$405.Y
08810 STA PLAYER0+$406.Y
08820 JMP MISSM
08830 *
08840 S26 LDA #72
08850 STA PLAYER0+$404.Y
08860 LDA #56
08870 STA PLAYER0+$405.Y
08880 STA PLAYER0+$406.Y
08890 JMP MISSM
08900 *
08910 S25 LDA #72
08920 STA PLAYER0+$404.Y
08930 LDA #56
08940 STA PLAYER0+$405.Y
08950 STA PLAYER0+$406.Y
08960 JMP MISSM
08970 *
08980 S24 LDA #72
08990 STA PLAYER0+$404.Y
09000 LDA #56
09010 STA PLAYER0+$405.Y
09020 STA PLAYER0+$406.Y
09030 JMP MISSM
09040 *
09050 S23 LDA #72
09060 STA PLAYER0+$404.Y
09070 LDA #56
09080 STA PLAYER0+$405.Y
09090 STA PLAYER0+$406.Y
09100 JMP MISSM
09110 *
09120 S22 LDA #72
09130 STA PLAYER0+$404.Y
09140 LDA #56
09150 STA PLAYER0+$405.Y
09160 STA PLAYER0+$406.Y
09170 JMP MISSM
09180 *
09190 S21 LDA #72
09200 STA PLAYER0+$404.Y
09210 LDA #56
09220 STA PLAYER0+$405.Y
09230 STA PLAYER0+$406.Y
09240 JMP MISSM
09250 *
09260 S20 LDA #72
09270 STA PLAYER0+$404.Y
09280 LDA #56
09290 STA PLAYER0+$405.Y
09300 STA PLAYER0+$406.Y
09310 JMP MISSM
09320 *
09330 S19 LDA #72
09340 STA PLAYER0+$404.Y
09350 LDA #56
09360 STA PLAYER0+$405.Y
09370 STA PLAYER0+$406.Y
09380 JMP MISSM
09390 *
09400 S18 LDA #72
09410 STA PLAYER0+$404.Y
09420 LDA #56
09430 STA PLAYER0+$405.Y
09440 STA PLAYER0+$406.Y
09450 JMP MISSM
09460 *
09470 S17 LDA #72
09480 STA PLAYER0+$404.Y
09490 LDA #56
09500 STA PLAYER0+$405.Y
09510 STA PLAYER0+$406.Y
09520 JMP MISSM
09530 *
09540 S16 LDA #72
09550 STA PLAYER0+$404.Y
09560 LDA #56
09570 STA PLAYER0+$405.Y
09580 STA PLAYER0+$406.Y
09590 JMP MISSM
09600 *
09610 S15 LDA #72
09620 STA PLAYER0+$404.Y
09630 LDA #56
09640 STA PLAYER0+$405.Y
09650 STA PLAYER0+$406.Y
09660 JMP MISSM
09670 *
09680 S14 LDA #72
09690 STA PLAYER0+$404.Y
09700 LDA #56
09710 STA PLAYER0+$405.Y
09720 STA PLAYER0+$406.Y
09730 JMP MISSM
09740 *
09750 S13 LDA #72
09760 STA PLAYER0+$404.Y
09770 LDA #56
09780 STA PLAYER0+$405.Y
09790 STA PLAYER0+$406.Y
09800 JMP MISSM
09810 *
09820 S12 LDA #72
09830 STA PLAYER0+$404.Y
09840 LDA #56
09850 STA PLAYER0+$405.Y
09860 STA PLAYER0+$406.Y
09870 JMP MISSM
09880 *
09890 S11 LDA #72
09900 STA PLAYER0+$404.Y
09910 LDA #56
09920 STA PLAYER0+$405.Y
09930 STA PLAYER0+$406.Y
09940 JMP MISSM
09950 *
09960 S10 LDA #72
09970 STA PLAYER0+$404.Y
09980 LDA #56
09990 STA PLAYER0+$405.Y
10000 STA PLAYER0+$406.Y
10010 JMP MISSM
10020 *
10030 S9 LDA #72
10040 STA PLAYER0+$404.Y
10050 LDA #56
10060 STA PLAYER0+$405.Y
10070 STA PLAYER0+$406.Y
10080 JMP MISSM
10090 *
10100 S8 LDA #72
10110 STA PLAYER0+$404.Y
10120 LDA #56
10
```



```

08760 LDA #0
08770 STA LIVEN,X
08780 JMP DCS3
08790 DEAD LDA #1
08800 STA $D01E
08810 LXA2 JMP SLOW1
08820
08830
08840
08850
08860
08870
08880
08890
08900
08910
08920
08930
08940
08950
08960
08970
08980
08990
09000
09010
09020
09030
09040
09050
09060
09070
09080
09090
09100
09110
09120
09130
09140
09150
09160
09170
09180
09190
09200
09210
09220
09230
09240
09250
09260
09270
09280
09290
09300
09310
09320
09330
09340
09350
09360
09370
09380
09390
09400
09410
09420
09430
09440
09450
09460
09470
09480
09490
09500
09510
09520
09530
09540
09550
09560
09570
09580
09590
09600
09610
09620
09630
09640
09650
09660
09670
09680
09690
09700
09710
09720
09730
09740
09750
09760
09770
09780
09790
09800
09810
09820
09830
09840
09850
09860
09870
09880
09890
09900
09910
09920
09930
09940
09950
09960
09970
09980
09990
10000
10010
10020
10030
10040
10050
10060
10070
10080
10090
10100
10110
10120
10130
10140
10150
10160
10170
10180
10190
10200
10210
10220
10230
10240
10250
10260
10270
10280
10290
10300
10310
10320
10330
10340
10350
10360
10370
10380
10390
10400
10410
10420
10430
10440
10450
10460
10470
10480
10490
10500
10510
10520
10530
10540
10550
10560
10570
10580
10590
10600
10610
10620
10630
10640
10650
10660
10670
10680
10690
10700
10710
10720
10730
10740
10750
10760
10770
10780
10790
10800
10810
10820
10830
10840
10850
10860
10870
10880
10890
10900
10910
10920
10930
10940
10950
10960
10970
10980
10990
11000
11010
11020
11030
11040
11050
11060
11070
11080
11090
11100
11110
11120
11130
11140
11150
11160
11170
11180
11190
11200
11210
11220
11230
11240
11250
11260
11270
11280
11290
11300
11310
11320
11330
11340
11350
11360
11370
11380
11390
11400
11410
11420
11430
11440
11450
11460
11470
11480
11490
11500
11510
11520
11530
11540
11550
11560
11570
11580
11590
11600
11610
11620
11630
11640
11650
11660
11670
11680
11690
11700
11710
11720
11730
11740
11750
11760
11770
11780
11790
11800
11810
11820
11830
11840
11850
11860
11870
11880
11890
11900
11910
11920
11930
11940
11950
11960
11970
11980
11990
12000
12010
12020
12030
12040
12050
12060
12070
12080
12090
12100
12110
12120
12130
12140
12150
12160
12170
12180
12190
12200
12210
12220
12230
12240
12250
12260
12270
12280
12290
12300
12310
12320
12330
12340
12350
12360
12370
12380
12390
12400
12410
12420
12430
12440
12450
12460
12470
12480
12490
12500
12510
12520
12530
12540
12550
12560
12570
12580
12590
12600
12610
12620
12630
12640
12650
12660
12670
12680
12690
12700
12710
12720
12730
12740
12750
12760
12770
12780
12790
12800
12810
12820
12830
12840
12850
12860
12870
12880
12890
12900
12910
12920
12930
12940
12950
12960
12970
12980
12990
13000
13010
13020
13030
13040
13050
13060
13070
13080
13090
13100
13110
13120
13130
13140
13150
13160
13170
13180
13190
13200
13210
13220
13230
13240
13250
13260
13270
13280
13290
13300
13310
13320
13330
13340
13350
13360
13370
13380
13390
13400
13410
13420
13430
13440
13450
13460
13470
13480
13490
13500
13510
13520
13530
13540
13550
13560
13570
13580
13590
13600
13610
13620
13630
13640
13650
13660
13670
13680
13690
13700
13710
13720
13730
13740
13750
13760
13770
13780
13790
13800
13810
13820
13830
13840
13850
13860
13870
13880
13890
13900
13910
13920
13930
13940
13950
13960
13970
13980
13990
14000
14010
14020
14030
14040
14050
14060
14070
14080
14090
14100
14110
14120
14130
14140
14150
14160
14170
14180
14190
14200
14210
14220
14230
14240
14250
14260
14270
14280
14290
14300
14310
14320
14330
14340
14350
14360
14370
14380
14390
14400
14410
14420
14430
14440
14450
14460
14470
14480
14490
14500
14510
14520
14530
14540
14550
14560
14570
14580
14590
14600
14610
14620
14630
14640
14650
14660
14670
14680
14690
14700
14710
14720
14730
14740
14750
14760
14770
14780
14790
14800
14810
14820
14830
14840
14850
14860
14870
14880
14890
14900
14910
14920
14930
14940
14950
14960
14970
14980
14990
15000
15010
15020
15030
15040
15050
15060
15070
15080
15090
15100
15110
15120
15130
15140
15150
15160
15170
15180
15190
15200
15210
15220
15230
15240
15250
15260
15270
15280
15290
15300
15310
15320
15330
15340
15350
15360
15370
15380
15390
15400
15410
15420
15430
15440
15450
15460
15470
15480
15490
15500
15510
15520
155
```

48

```

10570 JMP RSD1      ;SD01 RIGHT 1
10580 LL14 JMP LSD1 ;SD02 LEFT 1
10590
10600 * PLAYER1 UP
10610 USD1 LDA ENCF
10620 CMP #0
10630 BNE LL15
10640 JMP USD11
10650 LL15 LDA #2
10660 STA PLAYER1+$401.Y
10670 LDA #7
10680 STA PLAYER1+$402.Y
10690 STA PLAYER1+$406.Y
10700 STA PLAYER1+$407.Y
10710 LDA #14
10720 STA PLAYER1+$403.Y
10730 STA PLAYER1+$405.Y
10740 LDA #6
10750 STA PLAYER1+$404.Y
10760 STA PLAYER1+$407.Y
10770 LDA #8
10780 STA PLAYER1+$408.Y
10790 STA PLAYER1+$409.Y
10800 JMP NPLA
10810
10820 * USD11 LDA #4 ;DRAW UP FRAME 11
10830 STA PLAYER1+$401.Y
10840 LDA #14
10850 STA PLAYER1+$402.Y
10860 STA PLAYER1+$406.Y
10870 LDA #7
10880 STA PLAYER1+$403.Y
10890 STA PLAYER1+$405.Y
10900 LDA #6
10910 STA PLAYER1+$404.Y
10920 STA PLAYER1+$407.Y
10930 LDA #8
10940 STA PLAYER1+$408.Y
10950 STA PLAYER1+$409.Y
10960 JMP NPLA
10970
10980 * PLAYER1 DOWN
10990 LSD1 LDA ENCF ;DRAW DOWN SIDE 1
11000 CMP #0
11010 BNE LL16
11020 JMP USD11
11030 LL16 LDA #8
11040 STA PLAYER1+$401.Y
11050 STA PLAYER1+$402.Y
11060 STA PLAYER1+$406.Y
11070 LDA #4
11080 STA PLAYER1+$403.Y
11090 LDA #7
11100 STA PLAYER1+$404.Y
11110 STA PLAYER1+$406.Y
11120 LDA #14
11130 STA PLAYER1+$405.Y
11140 STA PLAYER1+$407.Y
11150 LDA #6
11160 STA PLAYER1+$408.Y
11170 STA PLAYER1+$409.Y
11180
11190 * DRAW UP FRAME 2
11200 STA PLAYER1+$405.Y
11210 LDA #40
11220 STA PLAYER1+$436.Y
11230 STA PLAYER1+$407.Y
11240 JMP NPLA
11250
11260 * LSD11 LDA #32 ;DRAW LEFT FRAME 11
11270 STA PLAYER1+$403.Y
11280 LDA #121
11290 STA PLAYER1+$404.Y
11300 LDA #254
11310 STA PLAYER1+$405.Y
11320 LDA #68
11330 STA PLAYER1+$406.Y
11340 STA PLAYER1+$407.Y
11350 JMP NPLA
11360
11370 * DRAW PLAYER2
11380 LDA #0 ;CLEAR ABOVE AND BELOW
11390 STA PLAYER1+$3FE.Y
11400 STA PLAYER1+$3FF.Y
11410 STA PLAYER1+$40A.Y
11420 STA PLAYER2+$40B.Y
11430 LDA ENDD
11440 CMP #20
11450 BNE LL50
11460 JMP USD2
11470 LL50 CMP #10
11480 BNE LL51
11490 JMP USD2
11500 LL51 LDA #0 ;CLEAR MOVE ABOVE AND BELOW
11510 STA PLAYER2+$401.Y
11520 STA PLAYER2+$402.Y
11530 STA PLAYER2+$408.Y
11540 STA PLAYER2+$409.Y
11550 LDA ENDD
11560 CMP #1
11570 BEO LL52
11580 CMP #1
11590 BEO LL52
11600 CMP #11
11610 BEO LL52
11620 CMP #21
11630 BEO LL52
11640 CMP RSD2
11650 JMP LSD2
11660 LL52 JMP LSD2
11670
11680 * PLAYER3 UP
11690 USD2 LDA ENCF
11700 CMP #0
11710 BNE LL54
11720 JMP USD21
11730 LL54 LDA #24
11740 STA PLAYER2+$400.Y
11750 LDA #20
11760 STA PLAYER2+$401.Y
11770 STA PLAYER2+$406.Y
11780 STA PLAYER2+$407.Y
11790
11800 *
11810
11820
11830
11840
11850
11860
11870
11880
11890
11900
11910
11920
11930
11940
11950
11960
11970
11980
11990
12000
12010
12020
12030
12040
12050
12060
12070
12080
12090
12100
12110
12120
12130
12140
12150
12160
12170
12180
12190
12200
12210
12220
12230
12240
12250
12260
12270
12280
12290
12300
12310
12320
12330
12340
12350
12360
12370
12380
12390
12400
12410
12420
12430
12440
12450
12460
12470
12480
12490
12500
12510
12520
12530
12540
12550
12560
12570
12580
12590
12600
12610
12620
12630
12640
12650
12660
12670
12680
12690
12700
12710
12720
12730
12740
12750
12760
12770
12780
12790
12800
12810
12820
12830
12840
12850
12860
12870
12880
12890
12900
12910
12920
12930
12940
12950
12960
12970
12980
12990
13000
13010
13020
13030
13040
13050
13060
13070
13080
13090
13100
13110
13120
13130
13140
13150
13160
13170
13180
13190
13200
13210
13220
13230
13240
13250
13260
13270
13280
13290
13300
13310
13320
13330
13340
13350
13360
13370
13380
13390
13400
13410
13420
13430
13440
13450
13460
13470
13480
13490
13500
13510
13520
13530
13540
13550
13560
13570
13580
13590
13600
13610
13620
13630
13640
13650
13660
13670
13680
13690
13700
13710
13720
13730
13740
13750
13760
13770
13780
13790
13800
13810
13820
13830
13840
13850
13860
13870
13880
13890
13900
13910
13920
13930
13940
13950
13960
13970
13980
13990
14000
14010
14020
14030
14040
14050
14060
14070
14080
14090
14100
14110
14120
14130
14140
14150
14160
14170
14180
14190
14200
14210
14220
14230
14240
14250
14260
14270
14280
14290
14300
14310
14320
14330
14340
14350
14360
14370
14380
14390
14400
14410
14420
14430
14440
14450
14460
14470
14480
14490
14500
14510
14520
14530
14540
14550
14560
14570
14580
14590
14600
14610
14620
14630
14640
14650
14660
14670
14680
14690
14700
14710
14720
14730
14740
14750
14760
14770
14780
14790
14800
14810
14820
14830
14840
14850
14860
14870
14880
14890
14900
14910
14920
14930
14940
14950
14960
14970
14980
14990
15000
15010
15020
15030
15040
15050
15060
15070
15080
15090
15100
15110
15120
15130
15140
15150
15160
15170
15180
15190
15200
15210
15220
15230
15240
15250
15260
15270
15280
15290
15300
15310
15320
15330
15340
15350
15360
15370
15380
15390
15400
15410
15420
15430
15440
15450
15460
15470
15480
15490
15500
15510
15520
15530
15540
15550
15560
15570
15580
15590
15600
15610
15620
15630
15640
15650
15660
15670
15680
15690
15700
15710
15720
15730
15740
15750
15760
15770
15780
15790
15800
15810
15820
15830
15840
15850
15860
15870
15880
15890
15900
15910
15920
15930
15940
15950
15960
15970
15980
15990
16000
16010
16020
16030
16040
16050
16060
16070
16080
16090
16100
16110
16120
16130
16140
16150
16160
16170
16180
1
```


Assembler Listing

```

11160 STA PLAYER1+$406,Y
11170 LDA #2
11180 STA PLAYER1+$409,Y
11190 JMP NPLA
11200 *
11210 DSD11 LDA #1 ;DRAW DOWN SIDE 11
11220 STA PLAYER1+$401,Y
11230 STA PLAYER1+$402,Y
11240 LDA #2
11250 STA PLAYER1+$403,Y
11260 LDA #14
11270 STA PLAYER1+$404,Y
11280 STA PLAYER1+$408,Y
11290 LDA #7
11300 STA PLAYER1+$405,Y
11310 STA PLAYER1+$407,Y
11320 LDA #6
11330 STA PLAYER1+$406,Y
11340 LDA #4
11350 STA PLAYER1+$409,Y
11360 JMP NPLA
11370 *
11380 * PLAYER1 RIGHT
11390 RSD1 LDA ENCF ;DRAW RIGHT FRAME 1
11400 CMP #0
11410 BNE LL18
11420 JMP RSD11
11430 LL18 LDA #4
11440 STA PLAYER1+$403,Y
11450 LDA #158
11460 STA PLAYER1+$404,Y
11470 LDA #127
11480 STA PLAYER1+$405,Y
11490 LDA #34
11500 STA PLAYER1+$406,Y
11510 STA PLAYER1+$407,Y
11520 JMP NPLA
11530 *
11540 RSD11 LDA #4 ;DRAW RIGHT FRAME 11
11550 STA PLAYER1+$403,Y
11560 LDA #20
11570 STA PLAYER1+$404,Y
11580 LDA #255
11590 STA PLAYER1+$405,Y
11600 LDA #20
11610 STA PLAYER1+$406,Y
11620 STA PLAYER1+$407,Y
11630 JMP NPLA
11640 *
11650 * PLAYER1 LEFT
11660 LSD1 LDA ENCF ;DRAW LEFT FRAME 1
11670 CMP #0
11680 BNE LL19
11690 JMP LSD11
11700 LL19 LDA #32
11710 STA PLAYER1+$403,Y
11720 LDA #120
11730 STA PLAYER1+$404,Y
11740 LDA #255
11750 *
12340 LDA #14
12350 STA PLAYER2+$403,Y
12360 STA PLAYER2+$405,Y
12370 LDA #28
12380 STA PLAYER2+$404,Y
12390 STA PLAYER2+$406,Y
12400 LDA #4
12410 STA PLAYER2+$407,Y
12420 LDA #2
12430 STA PLAYER2+$408,Y
12440 LDA #1
12450 STA PLAYER2+$409,Y
12460 JMP NPLA
12470 *
12480 DSD21 LDA #4 ;DRAW UP FRAME 21
12490 STA PLAYER2+$400,Y
12500 STA PLAYER2+$401,Y
12510 STA PLAYER2+$402,Y
12520 LDA #28
12530 STA PLAYER2+$403,Y
12540 STA PLAYER2+$405,Y
12550 LDA #14
12560 STA PLAYER2+$404,Y
12570 STA PLAYER2+$406,Y
12580 LDA #8
12590 STA PLAYER2+$407,Y
12600 LDA #16
12610 STA PLAYER2+$408,Y
12620 LDA #32
12630 STA PLAYER2+$409,Y
12640 JMP NPLA
12650 *
12660 * PLAYER2 DOWN
12670 DSD2 LDA ENCF ;DRAW DOWN FRAME 2
12680 CMP #0
12690 BNE LL58
12700 JMP DSD21
12710 LL58 LDA #2
12720 STA PLAYER2+$401,Y
12730 LDA #1
12740 STA PLAYER2+$400,Y
12750 LDA #4
12760 STA PLAYER2+$402,Y
12770 LDA #28
12780 STA PLAYER2+$403,Y
12790 STA PLAYER2+$405,Y
12800 LDA #14
12810 STA PLAYER2+$404,Y
12820 STA PLAYER2+$406,Y
12830 LDA #8
12840 STA PLAYER2+$407,Y
12850 LDA #20
12860 STA PLAYER2+$408,Y
12870 LDA #34
12880 STA PLAYER2+$409,Y
12890 JMP NPLA
12900 *
12910 DSD21 LDA #16 ;DRAW DOWN FRAME 21
12920 STA PLAYER2+$401,Y

```


Assembler Listing

```

13520 *
13530 LSD21 LDA #0 ;DRAW LEFT FRAME 21
13540 STA PLAYER3+$403,Y
13550 LDA #1
13560 STA PLAYER2+$407,Y
13570 LDA #48
13580 STA PLAYER2+$404,Y
13590 LDA #252
13600 STA PLAYER2+$405,Y
13610 LDA #42
13620 STA PLAYER2+$406,Y
13630 JMP NPLA
13640 *
13650 *
13660 * DRAW PLAYERS
13670 *
13680 PLAS LDA #0 ;CLEAR ABOVE AND BELOW PLAYER
13690 STA PLAYERS+$3FF,Y
13700 STA PLAYERS+$400,Y
13710 STA PLAYERS+$40A,Y
13720 STA PLAYERS+$403,Y
13730 LDA ENDD
13740 CMP #20
13750 BNE LL62
13760 JMP USD3
13770 LL62 CMP #10
13780 BNE LL63
13790 JMP USD3
13800 LL63 LDA #0
13810 STA PLAYERS+$401,Y
13820 STA PLAYERS+$402,Y
13830 STA PLAYERS+$408,Y
13840 STA PLAYERS+$409,Y
13850 LDA ENDD ;LOAD DIRECTION
13860 CMP #1
13870 BEQ LL64
13880 CMP #11
13890 BEQ LL64
13900 CMP #21
13910 BEQ LL64
13920 JMP USD3
13930 LL64 JMP LSD3
13940 *
13950 * PLAYERS UP
13960 USD3 LDA ENCF ;DRAW UP FRAME 3
13970 CMP #0
13980 BNE LL65
13990 JMP USD31
14000 LL65 LDA #4
14010 STA PLAYERS+$401,Y
14020 STA PLAYERS+$403,Y
14030 LDA #14
14040 STA PLAYER3+$402,Y
14050 LDA #7
14060 STA PLAYERS+$404,Y
14070 LDA #1
14080 STA PLAYERS+$405,Y
14090 LDA #53
14100 STA PLAYERS+$406,Y
14110 *

14700 LDA #48
14710 STA PLAYER3+$406,Y
14720 LDA #56
14730 STA PLAYER3+$408,Y
14740 LDA #16
14750 STA PLAYER3+$407,Y
14760 STA PLAYER3+$409,Y
14770 JMP NPLA
14780 *
14790 * PLAYERS RIGHT
14800 RSD3 LDA ENCF ;DRAW DOWN FRAME 3
14810 CMP #0
14820 BNE LL68
14830 JMP RSD31
14840 LL68 LDA #56
14850 STA PLAYERS+$403,Y
14860 LDA #40
14870 STA PLAYERS+$404,Y
14880 LDA #235
14890 STA PLAYERS+$405,Y
14900 LDA #10
14910 STA PLAYERS+$406,Y
14920 LDA #14
14930 STA PLAYERS+$407,Y
14940 JMP NPLA
14950 *
14960 RSD31 LDA #131 ;DRAW RIGHT FRAME 31
14970 STA PLAYERS+$403,Y
14980 LDA #130
14990 STA PLAYERS+$404,Y
15000 LDA #186
15010 STA PLAYERS+$405,Y
15020 LDA #170
15030 STA PLAYERS+$406,Y
15040 LDA #238
15050 STA PLAYERS+$407,Y
15060 JMP NPLA
15070 *
15080 * PLAYERS LEFT
15090 LSD3 LDA ENCF ;DRAW LEFT FRAME 3
15100 CMP #0
15110 BNE LL69
15120 JMP LSD31
15130 LL69 LDA #28
15140 STA PLAYERS+$403,Y
15150 LDA #20
15160 STA PLAYERS+$404,Y
15170 LDA #212
15180 STA PLAYERS+$405,Y
15190 LDA #87
15200 STA PLAYERS+$406,Y
15210 LDA #112
15220 STA PLAYERS+$407,Y
15230 JMP NPLA
15240 *
15250 LSD31 LDA #1 ;DRAW LEFT FRAME 31
15260 STA PLAYERS+$403,Y
15270 LDA #193
15280 STA PLAYERS+$404,Y

```



```

15680 LDA #0
15690 STA PLAYER3+$405,Y
15900 INC SCORE
15910 JMP LXX10
15920 DCS0 LDX #0 ;PLAYER0 DEATH
15930 LDA VERT,X
15940 TAY
15950 LDA #B ;DRAW CROSS
15960 STA PLAYER0+$400,Y
15970 STA PLAYER0+$401,Y
15980 STA PLAYER0+$402,Y
15990 STA PLAYER0+$403,Y
16000 STA PLAYER0+$404,Y
16010 STA PLAYER0+$405,Y
16020 STA PLAYER0+$406,Y
16030 STA PLAYER0+$407,Y
16040 LDA #62
16050 STA PLAYER0+$408,Y
16060 STA PLAYER0+$409,Y
16070 STA PLAYER0+$40A,Y
16080 STA PLAYER0+$40B,Y
16090 STA PLAYER0+$40C,Y
16100 STA PLAYER0+$40D,Y
16105 LDA #10
1610B STA LIVES
16110 RTS
    OR.

```

! TELL BASIC PROGRAM THAT PLAYER IS DEAD

ADVERTISERS

ABBS.....	13
ALLEN MACROWARE.....	8
THE ALIEN GROUP.....	IFC
COMPUTER PALACE.....	IBC
D+D COMPUTER PRODUCTS.....	27
DATUM ELECTRONICS.....	21
DYNASTY ENGINEERING.....	26
EASTERN HOUSE.....	10
ECLIPSE SOFTWARE.....	OBC
FRONTRUNNER.....	19
MICROPROSE.....	14
MIGHTY BYTE.....	11

```

15290 LDA #93
15300 STA PLAYER3+$405,Y
15310 LDA #85
15320 STA PLAYER3+$406,Y
15330 LDA #117
15340 STA PLAYER3+$407,Y
15350 JMP NPLA
15360 NPLA JMP MOVEN1
15370 T
15380 T
15390 T
15400 T
15410 DCS1 LDA VPOSE,X ;LOAD VERT POS
15420 TAY
15430 LDA #B ;DRAW CROSS
15440 STA PLAYER1+$400,Y
15450 STA PLAYER1+$401,Y
15460 STA PLAYER1+$402,Y
15470 STA PLAYER1+$403,Y
15480 STA PLAYER1+$404,Y
15490 STA PLAYER1+$405,Y
15500 STA PLAYER1+$406,Y
15510 STA PLAYER1+$407,Y
15520 LDA #62
15530 STA PLAYER1+$408,Y
15540 LDA #0
15550 STA PLAYER1+$409,Y
15560 INC SCORE
15570 JMP LXX10
15580 DCS2 LDA VPOSE,X ;LOAD VERT POS
15590 TAY
15600 LDA #B ;DRAW CROSS
15610 STA PLAYER2+$400,Y
15620 STA PLAYER2+$401,Y
15630 STA PLAYER2+$402,Y
15640 STA PLAYER2+$403,Y
15650 STA PLAYER2+$404,Y
15660 STA PLAYER2+$405,Y
15670 STA PLAYER2+$406,Y
15680 STA PLAYER2+$407,Y
15690 LDA #62
15700 STA PLAYER2+$408,Y
15710 INC SCORE
15720 LDA #0
15730 STA PLAYER2+$409,Y
15740 JMP LXX10
15750 DCS3 LDA VPOSE,X ;LOAD VERT POS
15760 TAY
15770 LDA #B ;DRAW CROSS
15780 STA PLAYER3+$400,Y
15790 STA PLAYER3+$401,Y
15800 STA PLAYER3+$402,Y
15810 STA PLAYER3+$403,Y
15820 STA PLAYER3+$404,Y
15830 STA PLAYER3+$405,Y
15840 STA PLAYER3+$406,Y
15850 STA PLAYER3+$407,Y
15860 STA PLAYER3+$408,Y
15870 LDA #62
15880 STA PLAYER3+$409,Y

```

COMPUTER PALACE

Over 1000 Items
For Your Atari!



We Know ATARI
Computers... Call
Us For The Latest
Info: (503) 683-5361

Pole Position



\$44.90

The reviews are coming in on this one, and it sounds like another Winner From Atari!!! Super Scrolling Screen... Fast Speedway Action! 16K Cartridge



48K DISK
\$49.95

- Store 500-2000 files per disk.
- Fast machine language sorts.
- Works on single or double density.
- Automatic delete of duplicates.
- Special coding feature.
- Official state abbreviations are built in.
- Re-label fields for unlimited uses.
- Merge files. • Create sub-files.
- Search files on any field.

FREE Catalog

With any order, or send \$1 (refundable with purchase). Send us your name & address for FREE QUARTERLY FLYERS with SPECIALS!

Over 1000 Items for your Atari...

- Mosaic • Pericom
- Broderbund • APX
- Roklan • Datassoft
- Synapse • A.I.
- On-Line • Atari
- Hayes • Epson
- VisiCalc • More!



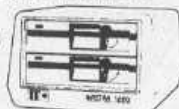
Use Your Credit Cards!

We honor VISA, American Express, & MasterCard.

24 & 48 Hour Shipping Is Available... CALL!

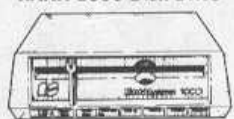
ASTRA 1620 Disk Drive

\$488.00
Plus Freight



Double Density x 2 Drives = 4 Atari 810's

RANA 1000 Disk Drive



Double Density **\$349.00** Plus Freight

Baseball

Super Sharp Colorful and Smooth Graphics, with 2-Player Option make this a Great Entertainer.

32K DISK or TAPE



From GAMESTAR **\$28.90**

Welcome To Computer Palace...



When you are in Eugene, Oregon, please visit our well-stocked store and talk with our experienced, helpful Atari Experts. We have the largest selection of Atari Software & Hardware in the Northwest! We specialize in Atari... So we know what works best!!!



\$54.00

The Monkey Wrench II

A cartridge for the right-hand Slot of your Atari 800!

This is a BASIC & Machine language Programmer's Aid for the 800. It plugs into the right slot, and works with Atari BASIC to add 16 new direct-mode commands (Auto line numbering, Delete lines, Rename BASIC Hex-Dec conv., Find string, Move lines, Exchange string, Disk directory from BASIC, Mem test, More...). Also includes a monitor with 15 commands to interact with the 6502. This has been proven to be a very helpful tool when writing your own programs!

ALL-TIME FAVORITES

Star Raiders(C)	38.20
Eastern Front (D,T)	27.90
Pacman (C)	39.50
Temple of Apshi (D,T)	35.10
Zork I, II, or III (D)	each 35.10
Centipede (C)	39.50
Missile Command (C)	29.70
Shamus (D,T)	31.50
Ghost Hunter (D)	34.95
Ghost Hunter (T)	29.95

TOP-TEN GAMES

Zaxxon (D,T)	35.10
Donkey Kong (C)	44.90
Choplifter (C)	39.50
Astro Chase (D,T)	26.90
Miner 2049er (C)	44.90
Football (D,T)	29.60
Pharaoh's Curse (D,T)	31.50
Dig Dug (C)	39.50
Way Out (D)	35.10
Ultima II (D)	52.50

SUPER SPECIALS... Up To 70% Off!

Retail	Special	Retail	Special
Dog Daze(D,T)	9.95	Ricochet(D)	29.95 9.95 Deal!
Pacific Coast Hwy(D)	29.95 15.95	Platter Mania(C)	39.95 17.95 A Steal!
Protector(D,T)	34.95 19.95	Alien Swarm(D)	29.95 15.95
KStar Patrol(C)	39.95 19.95	Survival of the Fittest(C)	17.95 Wow!
KRazy Kritters(C)	39.95 19.95 Value!	Atari Mailing List(T)	24.95 9.95
Number Blast(D,T)	9.95	6502 Disassembler(T)	9.95 Look!
Bug Off	29.95 14.95	Apple Panic(D,T)	29.95 9.95 Low!
Baseball(C)	49.95 29.95	Stellar Shuttle(D,T)	29.95 9.95
Picnic Paranoia(D,T)	34.95 19.95	Clown's & Balloon's(T)	29.95 12.95
Dr.Goodcodes Cavern(D)	29.95 9.95 Wow!	Megalets(T)	29.95 9.95 Look!
Match Races(D)	29.95 9.95 Look!	Magic Mail(D)	59.95 29.00
Nautilus(D)	34.95 19.95	Gorf(D)	40.00 19.95 Super!
Chicken(D,T)	34.95 19.95	K-Dos(D)	59.95 19.95 A Steal!
Slime(D,T)	34.95 19.95	Alien Swarm(D)	29.95 12.95
Rear Guard(D)	29.95 9.95	SNAKE Byte(D)	29.95 12.95
Totti-Fruti(D)	29.95 9.95 Wow!	Turmoil(C)	34.95 14.95
Rescue at Riguel(D)	29.95 12.95	Shattered Alliance(D)	39.95 14.95

LIMITED QUANTITIES—WHILE SUPPLIES LAST!

HARDWARE

Astra Disk Drive	488.00
Micromainframe Disk Drive	499.00
Atari 1020 Printer	279.00
Atari 1010 Recorder	86.00
Atari 1025 Disk Drive	399.00
Panasonic Monitor (Gm Scn. w/sound)	199.00
Dust Covers (400/800/410/810)	each 8.95
Prostick II joystick	23.50

SOFTWARE

Archon (D,T)	35.10
Pinball Construction (D)	35.10
Microsoft Basic II (C)	79.10
Diskey Utility (D)	44.90
Pinhead (D,T)	26.90
Murder on the Zinderneuf (D)	35.10
Blue Max (D,T)	31.50
Odessa Chess (D)	59.50
Frogger (T)	23.95
Pharaoh's Pyramid (D)	31.50
Rally Speedway (C)	44.90



OPEN Monday-Saturday, 9 to 6
2160 W. 11th Avenue Eugene, Oregon 97402



USE YOUR CREDIT CARD & CALL
Toll Free 1-800-452-8013
(Orders Only, Please)
For Information Call (503) 683-5361

Shipping Note: UPS & Parcel Post \$2.00—UPS Air \$3.90
Shipping on hardware & paper supplies extra—Call for \$
24 & 48 hour shipping available... Call (503) 683-5361

We specialize in ATARI Compatible Products
So we know what works best!!!
Call for the latest info... (503) 683-5361

ATARI DOS 2.0S

DOS-MOD

```
DISK OPERATING SYSTEM II VERSION 2.0S
COPYRIGHT 1988 ATARI
```

```
A. DISK DIRECTORY I. FORMAT DISK
B. RUN CARTRIDGE J. DUPLICATE DISK
C. COPY FILE K. BINARY SAVE
D. DELETE FILE (S) L. BINARY LOAD
E. RENAME FILE M. RUN AT ADDRESS
F. LOCK FILE N. CREATE MEM.SAV
G. UNLOCK FILE O. DUPLICATE FILE
H. WRITE DOS FILES
```

```
COPY--FROM, TO?
PROGRAM?.BAS,*.BAK
COPYING---D1:PROGRAM1.BAS
OPTION NOT ALLOWED
SELECT ITEM OR RETURN FOR MENU
```

Six Lines of Work Space

```
C PROGRAM2.BAS,P:
COPY - D1:PROGRAM2.BAS
SELECT ITEM OR 0 FOR MENU
C PROGRAM3.BAS,P:
COPY - D1:PROGRAM3.BAS
SELECT ITEM OR 0 FOR MENU
C PROGRAM4.BAS,P:
COPY - D1:PROGRAM4.BAS
SELECT ITEM OR 0 FOR MENU
C PROGRAM5.BAS,P:
COPY - D1:PROGRAM5.BAS
SELECT ITEM OR 0 FOR MENU
C PROGRAM6.BAS,P:
COPY - D1:PROGRAM6.BAS
SELECT ITEM OR 0 FOR MENU
C PROGRAM7.BAS,*.BAK
COPY - D1:PROGRAM1.BAS
COPY - D1:PROGRAM2.BAS
COPY - D1:PROGRAM3.BAS
COPY - D1:PROGRAM4.BAS
COPY - D1:PROGRAM5.BAS
COPY - D1:PROGRAM6.BAS
COPY - D1:PROGRAM7.BAS
SELECT ITEM OR 0 FOR MENU
```

Twenty-Four Lines of Work Space

```
DELETE D1:PROGRAM3.BAK
SELECT ITEM OR 0 FOR MENU
D UPDATE.CMD
C PROGRAM1.BAS,P:
COPY - D1:PROGRAM1.BAS
C PROGRAM2.BAS,P:
COPY - D1:PROGRAM2.BAS
C PROGRAM3.BAS,P:
COPY - D1:PROGRAM3.BAS
C PROGRAM4.BAS,P:
COPY - D1:PROGRAM4.BAS
C PROGRAM5.BAS,P:
COPY - D1:PROGRAM5.BAS
C PROGRAM6.BAS,P:
COPY - D1:PROGRAM6.BAS
C PROGRAM7.BAS,*.BAK/M
COPY - D1:PROGRAM1.BAS
COPY - D1:PROGRAM2.BAS
COPY - D1:PROGRAM3.BAS
COPY - D1:PROGRAM4.BAS
COPY - D1:PROGRAM5.BAS
COPY - D1:PROGRAM6.BAS
COPY - D1:PROGRAM7.BAS
SELECT ITEM OR 0 FOR MENU
```

None

Command Files

Upgrade your ATARI DOS 2.0S with the modifications, enhancements, and new features of DOS-MOD.

DOS-MOD makes ATARI DOS an even more useful operating system, yet it is completely compatible with all your existing programs. DOS-MOD has features you would expect to find in more sophisticated systems. Compare them and see.

FULL SCREEN USE. DOS-MOD allows you four times more workspace on your screen. One-line commands and queries, a compressed menu, and a minimum of screen-clearing lets you see more of what you've been doing.

COMMAND FILES. Execute a whole sequence of commands in one easy operation. DOS-MOD's new commands and expanded functions give you a more powerful system.

EXPANDED WILDCARD CAPABILITY. In DOS-MOD, the wildcard conventions are more general and provide you greater control over COPY, DELETE, and RENAME operations.

BUGS ELIMINATED. Eleven bugs in ATARI DOS 2.0S have been fixed. And the BREAK instruction has been trapped, facilitating recovery when your program gets lost.

FRIENDLY TUTORIAL. DOS-MOD's on-screen interactive tutorial helps you learn the features and uses of ATARI DOS and DOS-MOD.

GREAT PRICE. NO RISK. Only \$35 for single-density and \$50 for double-density version includes

diskette with tutorial. DOS-MOD is guaranteed to make your ATARI DOS a more useful tool, or you may return it within 30 days for a full refund.

Order your DOS-MOD today. Send a check or money order to Eclipse, 1058-R Marigold Court, Sunnyvale, California 94086. Or call (408) 246-8325.

ECLIPSE



ATARI is a registered trademark of Atari, Inc. DOS-MOD is a trademark of Eclipse Software. Prices are subject to change without notice. We pay shipping charges. California residents add 6.5% sales tax (Single-density \$35 + 2.28 = \$37.28; Double-density \$50 + 3.25 = \$53.25).