ARCADIAN

Vol.5 No.7 May 6, 1983

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Vol 5, No 7 May 6, 1983

HOT NEWS ON THE ADD-UNDER!!! Now we can identify the manufacturer for this up-coming product as our old friends at Alternative Engineering. Last December, the management at AE obtained rights to produce a Zgrass package from Dr. Tom DeFanti, its originator. They have been working out the myriad details of production and specification these past few months, and expect to have units on the street in July.

But this new Zgrass unit is much more than the device originally described in the ancient Bally literature. Those of us who were around in the old days will recognize the superior package now in view.

The specifications include: 64K of user accessible RAM, a 32K ROM package with the Zgrass language, a 4K chip containing the Arithmetic Math Microprocessor, 2 serial RS 232 ports for attachments, such as a printer, modem, voice attachment, bit tablet, etc.; two cassette I/O ports with motor control; a four channel disc drive controller; and the new 81-key keyboard mentioned here last time. You know that I am looking forward to the Zgrass Viper!

VIDEO GAMES articles on the Arcade story have appeared in the April and June issues. A summary:

The April issue discussed the CES in general, and had a fairly comprehensive article about Astrocade and its current problems covering about three pages. Included was a color photo of the Astrocade booth, with 4 of the 8 display towers illustrated. For those of you with that issue, seated at the left in the photo is Tom Meeks, product manager, and standing at the far tower, facing the camera but almost totally hidden behind a game player, is Jim Curran of Esoterica. The Astrocade booth also appears on p.43, with towers showing up at the lower right corner and middle bottom; and again on p. 46 with a tower in the center foreground and the very lower edge of the Astrocade promotional banner at the top of the picture, even though the picture is primarily to show the Imagic booth. The article is recommended for its background and outline of the situation as of January.

The June article discusses the support that we collectively have been giving the Arcade unit, through the ARCADIAN and the various vendors who have been providing us all with products usable on the Arcade. There is one scheduling fault in the article - it is about a month too early - in that it speaks to imminent availability of the Zgrass unit. As mentioned elsewhere, this should appear in the July time frame. The article also errs in stating that there is an included voice chip. There is no voice chip, but such a device can be added by the owner through one of the RS 232 ports that are available.

Both articles were authored by freelance writer Mark Brownstein.

MUNCHER FEEDBACK has started, and virtually every comment has been most favorable. There has been some complaint about the speed of the operation as one progresses through the screens, but we have a report of a 34,990 score by an 11 year old, so that means the rest of you just have to sharpen up!! There are a couple of rarely occurring bugs, which at this point we cannot 'fix', so by and large, the vast number of subscribers now playing the game are totally satisfied. We have testimonials full of such words as: "terrific", or "nothing short of superb", etc

Soon after the mailing of the last Arcadian, we received a spurt of orders that wiped out the stock on hand. We instituted another production run, and should have the next wave of cartridges ready for shipment by 15 May.

CONTEST REAPPEARS as promised last time. For those of you who started with Volume 5 and haven't run across our contests before - we have a very informal competition amongst subscriber/authors. Subscribers submit original programs of whatever type suits their fancy, along with directions and a listing. I make up a tape with the submitted programs, and send a copy to each of the five judges on the panel about a week before the ARCADIAN goes to press. Also included with the tape are any instructions that came with the program, and a copy of the listings (in case the tape doesn't load properly). The programs to the judges are anonymous, each is labelled, but the author is not known to them. Each judge rates each program on a 1 - 10 basis (ten is best), and calls me with the results. I add the scores and send the winner a $100 check. The winner displaces the 'oldest' judge on the panel so that the panel is continually changing and the winner is out of the running for a while. We do not set any criteria for the judges - each decides for himself on whatever basis he wants to set scores.

We invite your submission of programs for this contest - please send a tape and a copy of the listing, as well as any instructions or other data you deem helpful. The program should be submitted in AstroBasic. We also need a statement from you that the program is a product of your own efforts. That is, we don't want a carbon copy of some existing program.

CENTERING TITLES 2... Terry Lawrence moved out of the computer age back into the typewriter era to come up with this simple way to space your titles (first discussed on p. 100): Knowing that there are 5 pixels per letter-plus one for spacing, all one has to do is multiply the number of letters in the line by 6 (=total number of pixels) and divide by 2 (to get the half-width). Make this number a negative, and that's where your line starts. Such as CENTERING TITLES- has 16 letters (including the space), so that (16 x 6) ÷ 2 x -1 = -48, the value of CY.

ERRORS and Other Trivia... Trapshoot (p.93) in Line 60, add D=0 /// Blackjack (p.98) add a number of constant values directly after loading the program:: C=6 H=1010 P=1 R=48 S=0 T=0 V=6

CROWN OF ZEUS castle floor plan - Have you determined what the castle looks like? We have one idea here and would like to get other opinions, so send in your version.

GHOST FLEET

```
  1 Z=-1;NT=0;BC=0;&(16)=69
  2 Q=0
  4 CLEAR ;F=-48;G=50;H=56;I=-G;J=45;K=0
  5 FOR A=129TO 145STEP 4;BOX 0,0,A,H,3;H=H+2;NEXT A;GOSUB 6;GOSUB 9;GOTO 90
  6 FC=7;BOX 0,0,132,58,2;FOR A=0TO 70;B=RND (128)-64;C=RND (58)-29;BOX B,C,1,1
,1;NEXT A;RETURN
  7 BOX C,D,24,5,1;RETURN
  8 &(21)=0;&(22)=0;RETURN
  9 CX=-39;CY=36;PRINT "_GUNS    B0MBSa";CX=-39;CY=-37;PRINT "_SHIELDS FUELa
 10 C=58;D=36;GOSUB 7;C=-C;GOSUB 7;D=-37;GOSUB 7;C=-C;GOSUB 7;RETURN
 20 BOX F,36,2,3,2;F=F-4;IF F<-70CX=-67;CY=36;PRINT "DEAD",
 30 C=22;FC=89;N=5;U=-4;FOR D=0TO 1;FOR B=56TO 12STEP -C;&(19)=N;&(23)=Z;&(21)=
U;BOX -B,0,C,Bc11,3;BOX B,0,C,Bc11,3
 40 N=N+5;U=U-2;NEXT B;NEXT D;GOSUB 8;RETURN
 50 BOX G,36,6,3,2;G=G+8;IF G>70CX=49;CY=36;PRINT "AWAY",
 60 FC=117;FOR N=1TO 2;C=14;D=Z;FOR B=-27TO -3STEP 4;&(19)=D;&(23)=Z;&(21)=Z;BO
X 0,B,C,4,3;C=C-2;D=D+15;NEXT B;NEXT N
 70 B=2;FOR N=2TO 132STEP 10;BOX 0,0,N,B,3;B=B+4;D=34;FC=154;FOR V=1TO 4;&(19)=
D;D=D-10;NEXT V;FC=122;NEXT N;GOSUB 8;RETURN
 90 L=RND (2)-1;IF K>999IF J>68Q=Q+K;FOR A=4TO 132STEP 4;BOX 0,0,A,Ac3,1;BOX 0,
0,Ac2,Ac4,2;NEXT A;GOSUB 210;GOSUB 230;GOTO 4
100 IF (K<0)+(I<-78)GOTO 240
110 Y=RND (58)-29;FOR A=0TO 1;X=65;E=(RND (9)>6);IF L X=-X
120 LINE X,Y,4;LINE 0,0,3;NEXT A;GOSUB 250;FOR A=5TO 38;V=0;&(17)=Z-(Ab6)+6;&(2
2)=Z
130 IF (A=RND (11)+5)+(A=RND (11)+22)FC=-6;V=1;FOR M=0TO 1;D=34;FOR T=22TO 132S
TEP 10;&(19)=D;&(23)=Z;&(21)=Z
135 IF VBOX 0,0,T,2,3;D=D-2;IF MGOSUB 8
140 IF TR(1)IF F>-70GOSUB 20;GOSUB 260;GOSUB 6;GOTO 180
150 IF JX(1)IF G<70GOSUB 50;GOSUB 290;GOSUB 6;GOTO 180
160 IF VNEXT T;NEXT M;FC=7;IF A>25GOSUB 300
165 IF EBOX 0,0,A,A,1;BOX 0,0,Ab3,Ac5,1;BOX 0,-2,A-4,A-4,3
170 NEXT A;GOSUB 290;GOSUB 6
180 FOR A=1TO 50;IF JY(1)=-1IF J<65IF F<-48IF F>-70F=F+4;BOX F,36,4,5,1;GOSUB 2
20
190 IF JY(1)=1IF J<65IF I<-52IF I>-70I=I+8;BOX I,-37,8,5,1;GOSUB 220
200 NEXT A;GOSUB 8;GOTO 90
210 CX=-27;CY=0;PRINT #0,"SC0RE:",Q,;RETURN
220 FOR R=1TO 3;GOSUB 250;NEXT R;RETURN
230 CY=8;CX=-25;PRINT #0,"TRY AGAIN!",;FOR A=0TO 999;NEXT A;RETURN
240 GOSUB 8;Q=Q+K;CX=-25;CY=8;PRINT "GAME 0VER!";GOSUB 210;PRINT ;CX=-27;PRINT
"TR(1)=RUN
242 FOR A=0TO 9999;IF TR(1)RUN
245 NEXT A;FC=0;GOTO 240
250 J=J+1;BOX J,-37,1,3,2;IF J>69IF F<-70IF G>70GOTO 240
255 GOTO 310
260 IF A<30IF A>15K=K+100
270 IF A>30K=K+75
280 GOTO 310
290 IF A<25K=K+100;GOTO 310
300 GOSUB 320;BOX I,-37,6,3,2;I=I-8;K=K-50;IF I<-70CX=-67;CY=-37;PRINT #0,"G0NE
",
310 FOR D=19TO 22;&(D)=0;NEXT D;RETURN
320 D=20;FOR B=DTO 120STEP 10;&(19)=B;&(23)=B;&(21)=Z;FC=B+55;FOR C=0TO 9;NEXT
C;D=D+10;NEXT B;FOR B=15TO 0STEP -1;&(21)=B;NEXT B
400 FC=7;RETURN
```

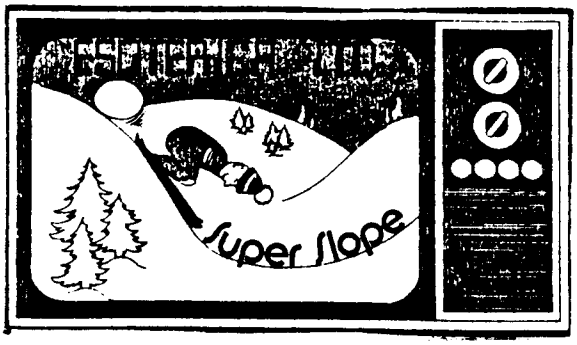
CONTEST WINNER!

Ken Lill
6608 S. Campbell
Chicago, IL 60629

GHOST FLEET instructions p.111

ON SALE

$12.95



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#2012	Space Fortress	$15.50
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#4002	Letter Match/Spell 'N' Score/Crosswords	$12.50
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I am interested in: __ZGRASS Specs. __Coleco __Vic-20 __Atari, Apple, IBM

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```
  2 CLEAR ;M=0
  3 E=5;B=-5;Q=-3
  4 P=0
  5 O=RND (10);U=RND (7)
  6 FC=7;BC=0
  7 I=R
  8 H=N;L=+5
  9 J=4
 31 X=60;Y=RND (35)
 32 R=60;N=-20
 50 FOR Z=1TO 45;BOX RND (160)-80,RND (80)-40,1,1,1;NEXT Z
 86 I=R;H=N
 87 NT=0;CX=-65;CY=40;PRINT #0,J," SHIPS LEFT
 88 IF J=0GOTO 10300
 89 S=S+JY(1)b7;W=-60
 90 BOX X+2,Y+1,1,1,2
 91 X=X+B;Y=Y+Q
 92 BOX X,Y, 5,3,1
 94 IF X<RND (20)+10 Q=3;IF X<-20Q=-3
 96 BOX X+2,Y+1,1,1,2;BOX X+2,Y-1,1,1,2
 97 BOX X-2,Y+1,1,1,2;BOX X-2,Y-1,1,1,2
101 IF R<-55 IF R>-65 IF N<S+3IF N>S-3 GOTO 9999
102 IF X<-55IF X>-65IF Y<S+3IF Y>S-3GOTO 9998
103 IF H>20L=-3
104 NT=3;IF H<-20 L=+3
105 IF I<-55IF I>-65IF H<S+3IF H>S-3GOTO 9999
106 IF I<-68I=R;T=0;H=N
107 FOR A=1TO 5
110 BOX W,S,10,2,1
120 BOX W+4,S,1,1,2
130 BOX W-3,S+1,4,4,1
140 BOX W-1,S+1,1,1,1
141 NEXT A;IF I#RGOTO 143
142 IF RND (10)>2GOTO 300
143 I=I-15;H=H+L
144 FOR @(1)=1TO 10
145 BOX I,H,2,2,1
146 BOX I,H,2,2,2
148 T=1
299 NEXT @(1)
300 R=R-O;N=N+U;IF R<20 N=N-U;IF R<-20N=N+U
301 IF T=0I=R;H=N
310 BOX R,N,3,3,1;BOX R-2,N,1,1,1;BOX R+2,N,1,1,1;BOX R-1,N,1,1,2;BOX R+1,N,1,1
,2
700 IF Y<K+3IF Y>K-3IF X<-55IF X>-63GOTO 10000
1005 CX=20;CY=60;PRINT #1,"SCORE=",P
1006 IF M=1 GOTO 1170
1010 LINE -20,-26,1
1020 LINE -25,-17,1
1030 LINE -30,-22,1
1040 LINE -45,-27,1
1050 LINE -55,-35,1
1060 LINE -79,0,1
1070 LINE -79,-40,1
1080 LINE 79,-40,1
1090 LINE 79,0,1
1100 LINE 65,-40,1
1120 LINE 55,-25,1
1140 LINE 20,-10,1
1160 LINE 0,0,1
1165 M=1
```

INSTRUCTIONS

Defender II Use the joysticks to move your ship up and down, and use the trigger to fire a shot. Your ship cannot move back or forth. The smallest enemy ship releases and indestructible sattelite ship that you must dodge.

Dave Mei
1420 Spring Dr.
Brookfield,WI 53005

```
1170 BOX -60,S,10,3,3
1177 BOX -60 ,7,13,60,2
1180 BOX X,Y,5,3,1
1200 BOX X,Y,5,5,2
1300 BOX R,N,5,6,2
1400 BOX X,Y,5,5,2
1500 IF X<-68X=60;Y=RND (30)
1600 IF R<-68R=60;N=RND (30)-30
2000 IF TR(1)=0 GOTO 87
3000 NT=25;MU=317;NT=3
3010 BOX X,Y,5,5,2
5000 K=S;BOX 10,K,130,1,1;BOX 10,K,135,1,2
5001 IF K<Y+3IF K>Y-3 GOTO 6000
5002 K=S;BOX X,Y,5,5,2
5010 IF K<N+3IF K>N-3 GOTO 9000
5060 GOTO 87
6000 NT=3;MU="IF ";MU="RETURN ";MU="GOSUB "
6010 BOX X,Y,5,5,2
6999 Q=-3
7000 X=60;Y=RND (27)+10
7720 NT=0
7730 P=P+5;CX=20;CY=60;PRINT #1,"SCORE=",P
7740 NT=3
8000 GOTO 87
9000 NT=3;MU="GOSUB ";MU="RETURN ";MU="GOTO "
9010 R=60;N=-20
9020 P=P+8;NT=0;CX=20;CY=60;PRINT #1,"SCORE=",P
9030 NT=3
9100 GOTO 87
9998 X=60;Y=RND (30);GOTO 10000
9999 R=60;N=RND (30)-30;I=R;H=N
10000 NT=3;MU="GOSUB ";MU="RETURN ";MU="LIST ";MU="CLEAR ";J=J-1
10001 BOX X,Y,5,5,2
10010 IF J=0GOTO 10300
10020 GOTO 87
10300 CX=-10;CY=0;PRINT #0,"GAME OVER"
10310 IF P>500CX=-10;CY=-10;PRINT #0,"GREAT SCORE!!"
10320 GOTO 1
```

GHOST FLEET
INSTRUCTIONS

The object is to score 1000 points per round by destroying enemy ships. One big problem is that most of them are invisible!! However you do have a warning siren that let's you know how close the enemy is. You use only Joystick #1 and this is only a one player game. JX(1) [left OR right] will fire a "Torpedo Bomb". These are NOT refillable UNLESS you score the minimum of 1000 points in that round. To fire your "Laser Guns" just squeeze the trigger! To refill the "GUNS", just pull back on the joystick [JY(1)=-1] JUST AFTER the stars appear and BEFORE the next ENEMY ship appears. This is the ONLY TIME you can refill either your "GUNS" or your "SHIELDS" during round play. EVERYTHING gets refilled when you make)999 points in the round! To refill your "SHIELDS" push your joystick FOWARD [JY(1)=1]! This game has an AUTOMATIC "Black-out" feature in case you leave it running. To restart the game just squeeze TR(1)!

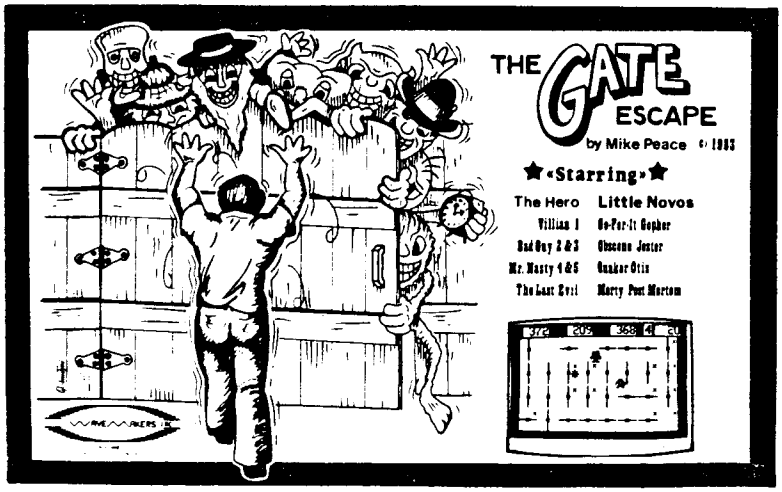
POINTS: GUNS:When Enemy is too far away (Out Of Range)0pts
When Enemy is not too close ———— 100pts
When Enemy IS too close ———— 75pts

BOMBS:When Enemy is NOT too close ———— 100pts
When Enemy IS too close -50pts & loss of a SHIELD unit

GAME OVER is when you get a negative score for a round OR if you fail to get 1000 points in any round! To restart the game use TR(1)!

BALLY/ASTRO BASIC DIFFERENCE: In line 1 B/B should have NT=0! A/B should have NT=2! Everything else in this program wil be the same!!

(ref p. 107)



TAPE 18
THE GATE ESCAPE

Use your skill to turn the tables on the bad guys, grab what you can and run. Our villians are very clever and have very little trouble maneuvering through the maze. You can put the odds in your favor by closing the gates behind you to block off entire sections and keeping the villians out, while you make off with the loot. But beware! These guys have a trick or two up their sleeves. They are carrying a time activated hyperspace transporter and once ti's set it will begin to track your moves and then transport **Gofer-it Gopher, Obscene Jester, Quaker Otis,** or **Morty Post-mortem** to your location. That is, unless you are clever and quick enough to steal it away from him before he can get your coordinates and make the jump to hyperspace and YOU. Lots of action as you make ***THE GATE ESCAPE.*** 1 to 4 players, good sound, increasing levels, and machine graphics.

$15.95 ASTRO BASIC
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Vol 5, No 7

ARCADIAN

May 6, 1983

HOW TO USE "STRING" ARRAYS

(@( ) & *( ))

DON GLADDEN

WHAT IS A "STRING" ARRAY? HOW ARE THEY USED? WELL, IF YOU READ THE TUTORIAL IN VOL. #5, NO. 2 ON VARIABLES, YOU SHOULD HAVE NO TROUBLE UNDERSTANDING ARRAYS.

IF YOU RECALL, A VARIABLE IS A LOCATION (WITH A 'LABEL'...A LETTER...TWO LETTERS... ETC.) THAT WE USE TO STORE VALUES IN. AN "ARRAY" IS, IN FACT, EXACTLY THE SAME AS A LETTER VARIABLE, EXCEPT FOR THE 'LABEL'. INSTEAD OF A LETTER OR COMBINATION OF LETTERS, ARRAYS ARE LABELED WITH NUMBERS. THIS GIVES US MANY ADVANTAGES IN ACCESSING THEIR VALUES AS WE SHALL SEE LATER.

AN ARRAYS' "LABEL" USES EITHER THE '@' SIGN OR THE "*", (ASTRO-BASIC ONLY), ALONG WITH ITS NUMBER OR "ADDRESS" ENCLOSED IN PARENTHESES. KEY IN: @(1)=5;@(2)=6;@(3)=7 AND "GO". YOU HAVE JUST SET THREE ARRAYS. TO PROVE IT, ENTER: PRINT @(1),@(2),@(3) (GO), AND THERE THEY ARE!!! NOW, TO SHOW WHAT WE MEAN WHEN WE SAY HOW EASY IT CAN BE TO GET THEIR VALUES, LETS DO IT WITH A FOR-NEXT LOOP. DO NOT RESET YOUR COMPUTER, BUT KEY IN THIS SHORT PROGRAM:

```
>10 FOR A=1TO 3
>20 PRINT @(A),
>30 NEXT A
```

RUN IT, AND WHAT DO YOU KNOW! THERE ARE OUR THREE VALUES. THESE VALUES CAN BE CHANGED, READ, OR USED IN A PROGRAM JUST LIKE WITH A LETTER VARIABLE. YOU CAN EVEN USE AN ARRAY IN A FOR-NEXT LOOP IF YOU WISH. TO GET MORE INFO ON ADVANTAGES AND APPLICATIONS OF ARRAYS, READ THE INTERMEDIATE TUTORIAL BY MIKE SKALA IN THIS ISSUE.

LET'S TAKE A MINUTE HERE TO GIVE A WORD OF CAUTION! IF WE ARE STORING A NUMBER OF VALUES THAT WE WISH TO KEEP IN A "STRING" OF ARRAYS WHILE WE ARE WRITING A PROGRAM, WE HAVE TO BE CAREFUL. WHY? WELL, TO EXPLAIN, LETS SEE JUST WHERE OUR VARIABLES AND ARRAYS ARE LOCATED IN MEMORY. ALL OF OUR LETTER VARIABLES HAVE A DESIGNATED SPOT IN OUR COMPUTERS MEMORY WHICH NEVER CHANGES. THEY ARE LOCATED IN A SAFE PLACE AFTER THE 1800 BYTES ALLOTED FOR OUR BASIC PROGRAMS. (SEE FIG. 1) THIS, UNFORTUNATELY, IS NOT TRUE OF ARRAYS!

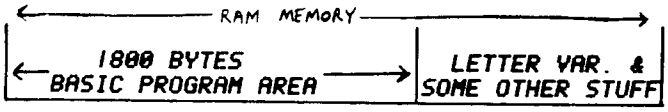

FIG. #1

ARRAYS USE THE AREA FOLLOWING THE BASIC PROGRAM THAT WE CURRENTLY HAVE IN MEMORY, BUT CANNOT EXTEND BEYOND THIS 1800 BYTE AREA. IN OTHER WORDS, YOU HAVE TO GIVE UP TWO BYTES FROM THE 1800 FROM YOUR PROGRAM FOR EVERY @( ) OR *( ) USED. (ALL VARIABLES OR ARRAYS USE TWO BYTES EACH). THE @( ) ARRAY STARTS WITH @(0) LOCATED TWO BYTES AFTER THE END OF YOUR CURRENT PROGRAM, AND WORKS ITS WAY TO THE END OF THE 1800 BYTE AREA. (SEE FIG. #2). BUT...THE VALUES STORED THERE DO NOT ADJUST THEIR LOCATIONS IF YOU ADD TO YOUR PROGRAM. SO YOU CAN "STEP ALL OVER" THESE VALUES AND LOSE THEM VERY EASILY. THE *( ) ARRAY IN ASTRO BASIC IS A BIT SAFER. IT STARTS, (*(0)), AT THE END OF THE 1800 BYTE PROGRAM AREA AND WORKS ITS WAY BACKWARDS

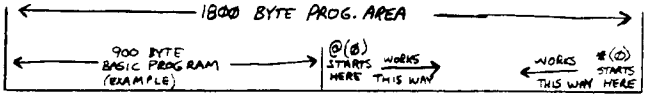

FIG. #2

TOWARD THE END OF YOUR CURRENT PROGRAM. SO THESE VALUES WILL NOT BE CLOBBERED UNLESS YOU USE TOO MUCH MEMORY FOR YOUR PROGRAM AND "OVERLAP" THEM. JUST REMEMBER TO SAVE TWO BYTES FOR EACH ARRAY USED STARTING WITH @(0) AND *(0). ALSO, IF YOU ARE USING BOTH THE @( ) AND *( ) IN A PROGRAM, THEY CAN RUN INTO EACH OTHER AND MESS YOU UP, SO BE CAREFUL!! REMEMBER---TWO BYTES FOR EACH @( ) PLUS TWO MORE BYTES FOR EACH *( ) USED!!!

##

WE HAVE HAD A COUPLE OF LETTERS GIVING SUGGESTIONS FOR OUR GAME THAT WAS PUBLISHED LAST MONTH. ONE FROM DAVID TRUFANT SUGGESTS ADDING THE FOLLOWING LINES TO MAKE OUR MOVING DASH INTO A "SPIDER".

```
>61 X=X+JX(1)
>62 Y=Y+JY(1)
>63 CX=X;CY=Y;PRINT "Y
>64 CX=X;CY=Y;PRINT "x (MULTIPLY)
>65 CX=X;CY=Y;PRINT "*
```

THIS ADDS SOME INTERESTING GRAPHICS USING THE CHARACTERS AVAILABLE ON OUR KEYPAD. WE CAN ELIMINATE LINE #70 BECAUSE WE ARE DOING THE SAME THING IN LINE #62. NOW WE CAN ALSO MOVE (SOMEWHAT) HORIZONTITALLY TOO. HE ALSO SUGGESTED CHANGING LINE #130 TO:

```
>130 B=B÷2+15
```

THIS WILL KEEP A FEW MORE BOXES ON THE SCREEN FOR US TO ELIMINATE. NOW, WHAT ELSE CAN WE DO? WELL, NOTICE THAT OUR "SPIDER" IS LEAVING GLITCHES ON THE SCREEN AS HE MOVES. LETS SEE WHO CAN FIGURE OUT HOW TO GET RID OF THEM. SEND IN YOUR SUGGESTIONS/IDEAS!!!!! MAYBE THE BOXES COULD BE FLIES OR INSECTS THAT OUR "SPIDER" CAN CONSUME, OR WHO KNOWS? KEEP THOSE SUGGESTIONS COMING IN, AND WE'LL SEE WHAT WE CAN DO TO MAKE THIS A GOOD GAME WRITTEN BY ALL SUBSCRIBERS.

DON GLADDEN
59400 NINE MILE ROAD
SOUTH LYON, MICHIGAN
48178
(313) 437-3984

****

ARCADIAN

Vol 5, No 7 May 6, 1983

THE BIT FIDDLER'S CORNER
BY
ANDY GUEVARA

Hello again! Time to forge ahead in our quest for Z-80 knowledge. Last time we went over the Hexadecimal number system. Today we're going to cover the Z-80 registers and a few of the instructions, so we can get a feel for how the little monster is programmed.

I'm sure you're all aware of the variables A thru Z as used in BASIC. Well, the Z-80 has several internal storage places of its own that are not unlike the BASIC variables. These are the registers. They are 8 bits wide, meaning they can hold values from 0 to FF (255 for you decimal types). Most are general purpose, but a few are reserved for special uses.

The registers are used primarily for storing information for quick access, and for doing most of the arithmetic functions of the instruction set. Another use is to hold an address for accessing data from memory. In this case, two registers are paired together to form a 16 bit address word.

The names of the registers are: A,B,C,D,E,H, and L. Clever huh? Any of these can be used to hold an 8 bit value. The A register is the most often used because the answers to 8 bit additions, subtractions, and other computations end up in the A register. For 16 bit manipulations, the pairs BC, DE, and HL are used, with the answers going to the HL pair.

The HL pair is important for another reason. When moving data from one location in memory to another, or loading one of the other registers with data from memory, the HL pair can be used as an intermediate addressing register. That is, I can put an address in HL, and load the A register with the data located at the address held in HL. Further, if I need a string of values, like in a table, I could put the starting address of the table in HL and load A from (HL). The parentheses mean "the location addressed by". Remember that. Getting the rest of the values from the table is then just a matter of incrementing the value in H and L and performing the same load instruction.

The H and L registers are so named because they hold the High and Low bytes of an address in memory. The other names were simply done for convenience.

Well, that ought to be enough on the registers. Let's see how the instructions look. Going back to the small example above, we loaded the A register from a place in memory addressed by the HL register pair. The instruction for this looks like:

```
LD  A,(HL)
```

This is the standard format for Load type instructions. The destination of the data comes first, then the source. In this case, the above instruction is read "Load A from the memory location addressed by H and L."

There are other ways to put data into a regist. We can get it from another register:

```
LD  A,B
```

or we can get it from memory directly:

```
LD  A,(4A00H)
```

or we can load the value immediately:

```
LD  A,4
```

These are what are referred to as "addressing modes". Let's do this the right way:

LD A,4 is the IMMEDIATE mode
LD A,B and
LD A,(4A00H) are the DIRECT mode
LD A,(HL) is the INDIRECT mode.

In the IMMEDIATE mode, we get the data from the program itself. It's like A=4 in BASIC. In the DIRECT mode, we get the data from another place, either another register or a memory location (in this case memory address 4A00H). This is like A=B, or A=%(18944). The INDIRECT mode of addressing takes us one step further away by having to know what is in the HL pair first. This is like A=%(B), where we had set B sometime earlier. There is also an INDEXED INDIRECT mode, but I don't want to overload you just now.

Remember that our Z-80 only recognizes numbers. That means that we can't use the shorthand instructions above directly. What we have to do instead is supply the Hex numbers that correspond to the instructions.

For instance,

```
LD  A,4
```

converts to

```
3E 04
```

Simple, right? I didn't think so. Every instruction the Z-80 knows is represented by numbers that are 1, 2, 3, or 4 bytes long. All told, there are 696 instructions in the set, so you can see why the shorthand notation is used.

From here you can see the need for a good list of the Z-80 instructions (or OP-CODES as they're called). Most (if not all) of the books on the Z-80 have a list in alphabetical order of the Op-codes (also known as mnemonics, the first "m" is silent), and a list in numerical order of the corresponding Hex numbers.

In future columns, I will explain groups of instructions rather than try to go through all 696 of them. And in cases where I show a program, I will also include the Hex numbers (Object code) for the instructions I use.

See you next time.

Andy Guevara
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P.O. Box 11023
San Diego, CA 92111-0010

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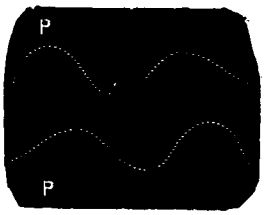

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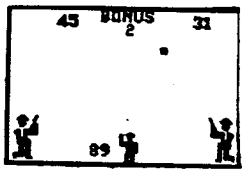

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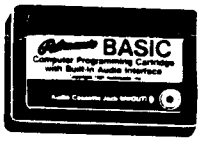

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```
 2 S=-78;O=-80;M=-77;F=0;BC=235;FC=136
 7 IF A>40A=40
10 BOX 0,15,160,1,1;BOX -46,24,7,15,1;BOX -44,38,6,10,1;BOX -44,40,14,1,1;BOX -4
0,37,2,2,1;BOX -43,38,1,1,2;BOX -36,27,10,4,1
11 BOX -75,-10,10,68,1;BOX 75,-10,10,68,1;BOX 0,-42,160,4,1
12 BOX 60,15,40,4,1
15 BOX -27,27,4,4,1;BOX -37,18,10,4,1;BOX -31,19,3,6,1;BOX -43,35,3,1,2
16 IF TR(1)GOSUB 3000
18 A=A+JX(1)b(5+X);IF A<-23A=-23
19 IF A>40A=40
20 B=B+JY(1)b(5+X);IF B>36B=36
22 IF B<-40B=-40
28 X=0
30 LINE -27,27,4;LINE A,39,1;LINE A,B,1
50 S=S+9;Q=RND (4);BOX S,Q,12,2,1;BOX S,Q,8,4,1;BOX S,Q,4,6,1;BOX S+3,Q,1,1,2;BO
X S-6,Q,1,3,1;BOX S-7,Q,1,5,1
51 IF S>72S=-75
52 FOR U=1TO 180;NEXT U;MU="7";MU="4";MU="7";BOX S,Q,20,10,2
53 IF A<S+7IF A>S-5IF B<Q+6IF B>Q-6;GOSUB 500
55 W=RND (35)-24;L=RND (4);FOR V=-75TO 70STEP 18
56 BOX V,W,3,1,1;BOX V+L,W,3,1,1;BOX V-L,W,3,1,1;BOX V,W+L,3,1,1
57 BOX V,W-L,3,1,1;MU="2"
58 BOX V,W,3,1,2;BOX V+L,W,3,1,2;BOX V-L,W,3,1,2;BOX V,W+L,3,1,2;BOX V,W-L,3,1,2

59 NEXT V
60 P=RND (20)-29;O=O+9;BOX O,P,12,2,1;BOX O,P,10,4,1;BOX O+2,P,1,1,2;BOX O-6,P,2
,3,1;BOX O-7,P,1,5,1;BOX O,P,2,6,1
62 FOR U=1TO 165;NEXT U;MU="?";MU="<";MU="%";BOX O,P,18,10,2
63 IF O>75O=-77
65 IF A<O+9IF A>O-7IF B<P+6IF B>P-6GOSUB 511
69 BOX -76,-9,9,60,1;BOX 76,-9,9,60,1;BOX 0,-39,160,6,1
70 M=RND (140)-75;N=RND (15)-45;BOX M,N,10,2,1;BOX M+3,N,5,4,1;BOX M+3,N,1,1,2;B
OX M-4,N-2,4,1,1;BOX M-4,N+1,4,1,1
75 FOR U=1TO 200;NEXT U;MU="6";MU="9";MU="6";BOX M,N,15,5,2
77 IF A<M+9IF A>M-7IF B<N+6IF B>N-6GOSUB 503
80 C=RND (160)-80;D=RND (55)-62;BOX C,D,4,4,1;BOX C,D-2,7,1,1;BOX C,D,9,1,1;BOX
C,D+2,11,1,1;BOX C+8,D+4,2,4,1;BOX C,D+2,2,2,1
85 FOR U=1TO 165;NEXT U;MU="↑";MU="`";MU="↑";BOX C,D,22,12,2
87 IF A<C+8IF A>C-7IF B<D+6IF B>D-6GOTO 504
90 LINE A,39,2;LINE -27,27,2
95 GOTO 1000
500 FOR Z=BTO 23;BOX A,Z,2,12,1;BOX A,Z,5,4,1;BOX A,Z-4,3,1,1;BOX A,Z-6,5,1,1;BO
X A,Z,10,20,2;NEXT Z
501 F=F+2;GOTO 550
503 FOR Z=BTO 23;BOX A,Z,2,9,1;BOX A,Z+1,4,4,1;BOX A,Z-4,5,1,1;BOX A,Z,5,10,2;NE
XT Z;F=F+4;GOTO 550
504 F=F-2;CX=12;PRINT "CRAB",F;GOTO 1000
511 FOR Z=BTO 23;BOX A,Z,2,9,1;BOX A,Z-5,4,1,1;BOX A,Z,5,2,1;BOX A,Z,9,18,2;NEXT
 Z;F=F+3;GOTO 550
550 CX=12;CY=32;PRINT "FISH",F
600 IF F>10GOTO 1010
610 RETURN
1000 GOTO 16
1010 CLEAR ;NT=4;BC=117;PRINT "  FISHED US DRY!!!
1015 PRINT "VIOLATORS WILL BE SHOT!!!!
1018 CLEAR ;CX=0;CY=0;PRINT "BANG!
1050 STOP
3000 X=15;RETURN
```

FISHIN' HOLE

Michael Montauck
1542 East 32 St
Brooklyn, NY 11234

FISHIN' HOLE instructions p.120

ARCADIAN

Vol 5, No 7 May 6, 1983

QUESTIONS FROM READERS

THIS MONTH, WE ARE DEVOTING THIS ENTIRE COLUMN TO ONE QUESTION, SINCE WE HAVE HEARD IT SO MANY TIMES.

COULD YOU TELL ME MORE ABOUT THE "&( )" FUNCTIONS? JUST EXACTLY WHAT DO THEY DO? HOW CAN I USE THEM? WHY CAN'T I SAVE THEIR VALUES ON TAPE?

THE "&" (AMPERSAND) SIGN IS USED BY THE ASTROCADE BASIC TO DIRECTLY ACCESS THE INPUT/OUTPUT PORTS, WHICH IN TURN CONTROL DIFFERENT THINGS SUCH AS COLOR, SOUND, MONITORING HAND CONTROL AND KEYPAD INPUT, AND MANY OTHER FUNCTIONS. THE REASON THAT THEY CANNOT BE SAVED ON TAPE CALLS FOR A SHORT EXPLANATION ON JUST EXACTLY WHAT WE ARE DOING WHEN WE SAVE DATA ON TAPE. WHEN WE KEY IN A ":PRINT @(0),20" COMMAND, WE ARE TELLING THE COMPUTER TO DUMP TO TAPE THE DATA IN RAM STARTING WITH @(0), AND ENDING WITH @(19). (TWENTY 'WORDS' OR FORTY BYTES OF RAM). WE'VE BEEN ASKED WHY SOMETHING LIKE: ":PRINT &(16),8" WILL NOT DO THE SAME THING WITH THE "&( )" VALUES. THE REASON FOR THIS IS THAT THE VALUES ARE NOT STORED ANYWHERE IN RAM. WHEN YOU KEY IN: "&(9)=84", YOU ARE DIRECTLY SETTING THE PHYSICAL PORT INSIDE THE ARCADE TO THAT VALUE, AND IT CANNOT BE READ OR DUMPED TO TAPE. A DESCRIPTION OF ALL THE PORTS CAN BE FOUND ON PAGE #102 OF THE BASIC MANUAL. SOME OF THE FUNCTIONS ARE:

OUTPUT PORTS:

&(0)-&(7)	COLOR REGISTERS. (SEE LAST MONTHS QUESTIONS FOR HOW TO USE).
&(9)	L/R BOUNDARY FOR ABOVE PORTS.
&(10)	ACTS AS A 'CURTAIN' FROM THE BOTTOM OF THE SCREEN WORKING UP. TRY SETTING IT TO DIFFERENT VALUES FROM 0 TO 204. AND CHECK RESULTS.
&(11)-&(15)	CONTROL ASSORTED THINGS NOT VERY PRACTICAL FOR BASIC USE..
&(16)-&(23)	SOUND PORTS.

INPUT PORTS:

&(8)	INTERCEPT FEEDBACK REGISTER. AGAIN, NOT TOO USEFUL IN BASIC.
&(14)-&(15)	LIGHT PEN POSITION COORDINATES.
&(16)-&(19)	JOYSTICK AND TRIGGER SWITCHES 1,2,3, AND 4.
&(20)-&(23)	KEYPAD COLUMN 4,3,2, AND 1.
&(24)-	KNOB VALUES 1,2,3, AND 4.

AN 'INPUT' PORT CAN ONLY BE READ, AND NOT WRITTEN TO. VICE VERSA WITH THE 'OUTPUT' PORTS. YOU CAN ONLY SET THEM, AND NOT READ THEIR VALUES.

AS FOR STORING PORTS ON TAPE, TRY THE METHODS OUTLINED IN THE LAST TWO ISSUES OF THE ARCADIAN. THESE METHODS DO NOT ACTUALLY STORE THE VALUES, BUT SET THEM BEFORE YOUR PROGRAM RUNS. IT'S A SNEAKY WAY OF ADDING A LINE TO A PROGRAM WITHOUT USING ANY MEMORY.

@<HURRAY>
OR...HIP HIP ARRAY!!!
BY MIKE SKALA

DO YOU FIND YOURSELF RUNNING OUT OF VARIABLES? DO YOU SHY AWAY FROM MULTI-PLAYER GAMES BECAUSE JUGGLING DATA FOR FOUR PLAYERS IS TOO BIG A HEADACHE AND MEMORY WASTE? PERHAPS, MY FRIEND, YOU ARE NOT TAKING FULL ADVANTAGE OF THOSE HANDY LITTLE MEMORY SLOTS CALLED 'ARRAYS'. MAYBE YOU'VE USED A COUPLE OF @( )'S HERE AND THERE WHEN YOU'VE WASTED ALL THE LETTER VARIABLES, BUT THE REAL VALUE OF THESE LITTLE RASCALS ISN'T REALIZED UNTIL YOU WORK IN 2 OR 3 DIMENSIONS. WHAT? READ ON

A MULTI-DIMENSION ARRAY IS SIMPLY A BLOCK OF MEMORY ACCESSED LIKE A GRAPH OR MATRIX. LET'S USE AN EXAMPLE BEFORE THIS GETS TOO CONFUSING. SAY YOU'RE WRITING A GAME FOR FOUR PLAYERS, WITH LOTS OF THINGS TO KEEP TRACK OF FOR EACH PERSON. FIRST, MAKE A LIST OF WHAT YOU NEED TO MONITOR, (SEE FIG. 1), AND MAKE A MATRIX FOR 4 PLAYERS AS SHOWN. NOW FILL UP THE MATRIX WITH @( )'S, STARTING WITH @(1). NOW WE'RE GOING TO USE A ONE-LETTER VARIABLE, ("P" IS NICE), TO KEEP TRACK OF WHICH PLAYER IS CURRENTLY UP, OR ACTIVE. (YOU WOULD USE TR(P), JX(P), ETC. IN YOUR PROGRAM FOR HAND CONTROL REFERENCE). SO FAR, SO SIMPLE. NOW, HOW DO WE ACCESS THESE THINGS? THE EASIEST ONE HERE IS: SCORE-@(P)= THE SCORE OF THE CURRENT PLAYER. GOING ON, STATUS-@(P+4) ; BULLETS-@(P+8) ; SHIELDS-@(P+12) ; SPEED-@(P+16). WE DID NOT USE @(0). BUT WE DID ALLOCATE A SLOT IN MEMORY FOR IT JUST BY USING THE ONES BEHIND IT, SO USE IT FOR SOMETHING. (E.G. HIGH SCORE, ETC)

VARIABLE	PLAYER # 1	2	3	4
SCORE	@(1)	@(2)	@(3)	@(4)
STATUS	@(5)	@(6)	@(7)	@(8)
BULLETS	@(9)	@(10)	@(11)	@(12)
SHIELD STRENGTH	@(13)	@(14)	@(15)	@(16)
SPEED FACTOR	@(17)	@(18)	@(19)	@(20)

FIG. 1

LET'S LOOK AT THE PROS & CONS OF USING A MULTI-DIMENSION ARRAY. PRO: IT FREES UP MOST OF YOUR LETTER VARIABLES, IT SIMPLIFIES MULTI-PLAYER INFORMATION ACCESSABILITY, IT MAKES REINITIALIZING OR ZEROING OUT SPECIFIC VARIABLES A SNAP WITH A LOOP. CON: IT DOES USE UP MEMORY SPACE, SINCE EACH @( ) TAKES UP TWO BYTES OF MEMORY, AND REFERRING TO @(P+4) TAKES UP FIVE BYTES MORE THAN A SIMPLE LETTER VARIABLE IN YOUR TEXT, AND IT TAKES SLIGHTLY LONGER FOR YOUR ARCADE TO PICK UP A VALUE IN THE ARRAY.

IN SUMMARY, THE MULTI-DIMENSIONAL ARRAY IN MANY INSTANCES CAN BE A VERY VERSATILE TOOL AT THE EXPENSE OF A LITTLE MEMORY SPACE. THIS INFO APPLIES TO THE *( ) ARRAY IN THE ASTRO BASIC AS WELL. LET'S START EXPLOITING THE ASTROCADE'S FOUR-PLAYER GAME CAPABILITIES! LIKE THE SONG SAYS, "WE'RE THE ONE, THE ONLY ONE"!!!

MIKE SKALA 544 E. OVERLOOK
EASTLAKE, OHIO 44094 (216) 951-2564

ARCADIAN

May 6, 1983 Vol 5, No 7

THE GAME PLAYER

by Michael Prosise

kills some toads and tries
to phone home with . . .

1) ROAD TOAD
Esoterica, Ltd.

2) L.T.
Wavemakers

ROAD TOAD

Similar to the coin-op game FROGGER, ROAD TOAD is a very colorful home version based on the familiar goal of trying to maneuver from one side of the road to the other, without getting hit by traffic.

It is a one player game, with machine language graphics and programing.* The player uses his joystick to prod a toad from one side of the road to the other, across 5 lanes of traffic. If he reaches the other side, he will suddenly reappear at the bottom of the screen, to do it all again. This goes on time after time until all 3 toads have been killed by traffic.

THE GAME PLAYER has seen and played dozens of different cassette tape games, and ROAD TOAD is without a doubt the most colorful game to date. The graphics are so well detailed that the cars, trucks and motorcycles seem real. The many colors used by ESOTERICA are surprisingly brilliant. The opening artwork is attractive and quite cute, and the toad caught the affection of all of us. There are some fair sound effects, although the sound of traffic does not begin until the first toad is squashed.

Opinions of the game itself were not as applauding however. Adult players tired rapidly of this repetitive type game play, which lacked sufficient variety to hold their interest. Younger players were more favorable towards the game, although some of them also grew bored somewhat quickly.

It is not that ROAD TOAD is a "bad" game. Indeed, many will find it sufficiently enjoyable, but on the other hand, many will find its type of game play rather pointless. The opinion on this is that it would be more interesting if, like in FROGGER, you crossed each toad one at a time to the other side, where he would sit, awarding you points. After getting all three to the other side, a new screen would appear, and you would try again. The degree of difficulty would of course increase with each screen.

Scoring is accomplished by sucessfully crossing all lanes. One point is awarded for each crossing. The score is unfortunately not known until the game is over, when it is then displayed at the top of the screen. However, if there happens to be a car or truck in that position at game's end, the score will be blotted out by it.

It is obvious that considerable time and planning went into the creation of ROAD TOAD. But it seems that too much emphasis was placed on the visual aspect, and not enough on the gameplay.

L.T.

Completely different from Atari's hum-drum game "E.T.", and 1000 times better, WAVEMAKERS "L.T." game is quite challenging and well thought out.

In "L.T."(Little Terrestial), a telephone rests at the top of the T.V. screen. Poor little L.T. must struggle through four different screens (playfields) to reach the phone. In screen #1, L.T. must jump up a set of stairs. One missed step and ... oh no, down L.T. falls, but gently thanks to his parachute. Once at the top, screen #2 appears, in which L.T. must jump up through horizontally moving slots. Completing those, L.T. must run from left to right through vertically moving slots in screen #3. And finally, in #4, he will need all his skill and daring to climb up by jumping from one moving step to another. It's not easy, folks!

This is a game for one to four players. Each player starts off with four chances. The trigger and joystick are utilized simultaneously to jump and move L.T. This game is best described as a DONKEY KONG and MONKEY KONG type of game, in the sense that you climb your character up steps and through slots by jumping and horizontal moves. DONKEY and MONKEY KONG fans will probably love WAVEMAKERS "L.T." People who do not care for DONKEY and MONKEY KONG or who have difficulty playing those type of games may not like L.T.

Like other games from WAVEMAKERS, L.T. is rich in color with good graphics. It is, like all BASIC games should be these days, in machine language.* There are some very unusual but far-out sound effects. And if your L.T. completes all four screens, something really neat happens. I won't reveal what occurs, but will only say that there is a fifth screen "show" for you to sit back and watch. You'll like it, for sure!

*The term "machine language"(ML) is frequently seen nowadays in advertisements and in this column. For those unfamiliar with it, here is a brief explanation. Games on cassette tape that are programed in ML, as compared to games that are not, will generally have more detailed graphics, more and richer colors, smoother and faster movement of objects on the screen, and an all-around better quality. Objects will not blink/flicker and debris should not be found lying around the playfield. For the consumer, a ML programed game is the better buy. ML games are to non-ML games, what stereo records are to old 78's. ML programing helps give cassette tape games a near cartridge quality. A non-ML game is not a "bad" game; indeed there are many more non-ML games available, and many of those are fine. However, most would be better if they were upgraded to ML. Hopefully, our software (game) manufacturers will begin upgrading their earlier games to ML. Currently, only WAVEMAKERS has undertaken the task to up-grade its earlier games.

COMING UP next month in THE GAME PLAYER, we shall review L&M's sequal to EXITOR'S REVENGE, entitled NAUTILUS, and we'll have a look at GAMMA WARS from the Tiny Arcade.

SCROLLING II: We issued a challenge last year, to develop programs that would scroll the screen in different directions. In Volume 4, p.98 and 105, we presented some schemes to shift the screen sideways. Now we have a general method to scroll the screen in any of the four directions using four subroutines. (We will provide the other three routines in future issues.) The method provides a routine to be loaded in any unused area of the system RAM or add-on memory. In this issue we will scroll the screen downward, using the bottom of the AstroBasic stack, as an example. load as follows:

```
FOR A=20258 TO 20297; INPUT %(A); NEXT A
```

Then input the decimal values in the second column.

To scroll once, type in CALL 20258

To scroll n pixels, type in

```
FOR A= 1 TO n; CALL 20258; NEXT A
```

SUBROUTINE TO SCROLL SCREEN DATA 1 PIXEL DOWN

BYTE #	DECIMAL	HEX	MNEMONICS	LABELS	COMMENTS
0	213	D5	PUSH DE	START	Save BASIC pointer.
1	175	AF	XOR A		Clear the A register.
2	33	21	LD HL, nn		Set pointer to bottom
3	15	0F			of screen RAM.
4	78	4E	DW 19983_{10}		
5	17	11	LD DE, nn		Address of next byte up.
6	231	E7			
7	77	4D	DW 19943_{10}		
8	14	0E	LD C, n		Set # lines to scroll.
9	89	59	DB 89_{10}		
10	6	06	LD B, n	LOOP 2	Set # bytes per line
11	40	28	DB 40_{10}		to scroll.
12	126	7E	LD A, (HL)	LOOP 1	Get a byte.
13	230	E6	AND n		Mask out screen data.
14	85	55	DB 85_{10}		
15	119	77	LD (HL), A		Save program data.
16	26	1A	LD A ,(DE)		Get next byte.
17	230	E6	AND n		Mask out program data.
18	170	AA	DB 170_{10}		
19	174	AE	XOR (HL)		Move down one line and mix
20	119	77	LD (HL), A		with program there.
21	27	1B	DEC DE		Next pair of
22	43	2B	DEC HL		bytes' addresses.
23	16	10	DJNZ, dis		Decrement B; if not 0,
24	243	F3	DB -13_{10}		jump to LOOP 1; else
25	13	0D	DEC C		Decrement C;
26	32	20	JRNZ, dis		if C#0, jump to
27	238	EE	DB -18_{10}		LOOP 2; else
28	209	D1	POP DE		Restore BASIC pointer.
29	201	C9	RET		Return to BASIC.

ADS

For Sale Year old Bally Computer system in perfect condition. 2 controllers plus ABasic,BPin, Z80 Zzap, SBattle, Clowns, LMatch, EMath, GInvasion, plus tapes: CHorror, MJump, ASampler, plus Vols 4 & 5 of ARCADIAN, latest Sourcebook, plus related documentation all in binders. Will ship this $700 value in its original packaging for the first $350 money order or certified check. John Scehovic 2905 Kaufmann, Dubuque, IA, 52001. 319-556-3131 weekdays.

Astrocade: Excellent condition, 2 controllers plus Spectre System controller: ABasic, 10 carts including Wizard, Art Duel, Space Fort, many cassette games and extras. $225 Steve Swafford, 4 Bradley Ct., Apt 4, Mineola, NY 11501 eves- 516-742-5518

FOR SALE: Bally Arcade, 2 StroBasic,Galaxian, ABattle, SFortress, BPin, SBattle, plus Vol 4 of ARCADIAN Best offer over $10. Ro Sedlak, 15 Howell Ave., Piscataway, NJ 08854. 201-560-0139

SPECIAL NOTICE Ed Horger reports that the dust covers he has been making for the Arcade unit have been discontinued.

Fishin' Hole: The joystick controls the depth of the line and the length of the pole. For fine adjustments, hold the trigger while moving the joystick. Movement is sporadic - you move after all the fish appear, one at a time. To catch fish, get the hook to touch a fish (different fish have different point values, except minnows - no points, while crabs subtract points) Ten points maximum.

(ref p. 116)

ASTROCADE CARTRIDGES
TO BE RELEASED
THIS MONTH? ?

ARCADIAN
Robert Fabris, fleet-ing
3626 Morrie Drive
San Jose, CA 95127

the SOURCE TCD 959