ARCADIAN
Volume 4, Number 6 April 9, 1982

WHAT'S NEW? Well, nothing definate, but there are rumors around. These are cropping up: The Add-Under has lost its voice but gained 64K of memory, and a new title - ZGRASS 100; The Arcade unit will now be called the ASTROCADE; The pacman derivative will be out the first of July; And that there will be aVideocade of John Perkins' ARTILLERY DUEL, with all the graphics, color, and sound available in a cartridge, plus a little humor.

GREMLINS TO THE LEFT OF US... Yes, there were a couple of errors in the last issue.

FUDD will not work with the new AstroBasic. There is a discussion under "DIFFERENCES", below.

page 46- The first of the Poke'd values should read 1779 instead of 1799.

page 52/53- line 960 should read 1000, and change the HOHO segment of line 8002 to read

HOOHOHHOONOLLOHHOFHOOO

In addition, Ken Springsteen suggests the following changes to his program on page 42:

add a new line 270 PRINT; PRINT; CX=-60; FOR B=K+1 TO Kc2

change line 510 to read:

:PRINT; LIST 1,13; GOSUB 550; LIST 100,14; GOSUB 550; LIST 285,8; GOSUB 550; LIST 349,9; GOSUB 550; LIST 425,7; PRINT "CLEAR; RUN

to load the program to tape (in Bally Basic), key in GOTO 500
start the recorder (RECORD), and press GO

DIFFERENCES between the old and new Basic Videocades: We are somewhat at a disadvantage by being outside the company because what we know of the Basic, beside that which is written in the small manuals, is primarily discovered material. That is, noone tells us all about the secrets, or tricks, or capabilities, and one or another of us has to find these out through research or luck. We were fortunate in receiving an unofficial set of brief notes that discusses these differences, much as the Bally Basic Hacker's Guide.

● The old Basic has a $ command which accesses the calculator routine resident in the on-board ROM. With this command, one could perform arithmetical calculations with 6 places either side of the decimal point. Not a very popular command, it was removed to make way for some of the useful features of the new system. Programs written using the $ command are not convertible for use with the new Basic. Unfortunately, this leaves out a couple of clever programs.

● :Return will not be understood by the new system, but it can usually just be forgotten from a program. It's purpose was to close off the tape input port.

● &(16) through &(23) commands controlled the variables of the noise system. These have been replaced as follows: old commands - &(16), &(17), &(18), &(19), &(20), &(21), &(22), &(23) are replaced by MO, TA, TB, TC, VD VC, VR.VF, VA,VB, NM,NV commands, respectively. If your Bally Basic program contains the &( ) notation, set NT=-1 to disable the sound, and experiment.

● SM series are commands only in AstroBasic, having to do with where/how screen printing appears. The old Basic has the equivalent of SM=0. SM is used for effect, and its elimination would not ruin a program (usually).

● Machine code problems which is the case of FUDD. Machine code is inserted into memory spaces ("poke'd") using the %( ) command. The location of this memory space is the Line Input Buffer, which now occupies a different location in the memory map, from 20180 - 20283 in the old Basic, to 20154 -20257 in the new Basic.

● *( ) is a new string system that is only available in the AstroBasic. A program with both string systems is not convertible to Bally Basic, one with only the *( ) might convert.

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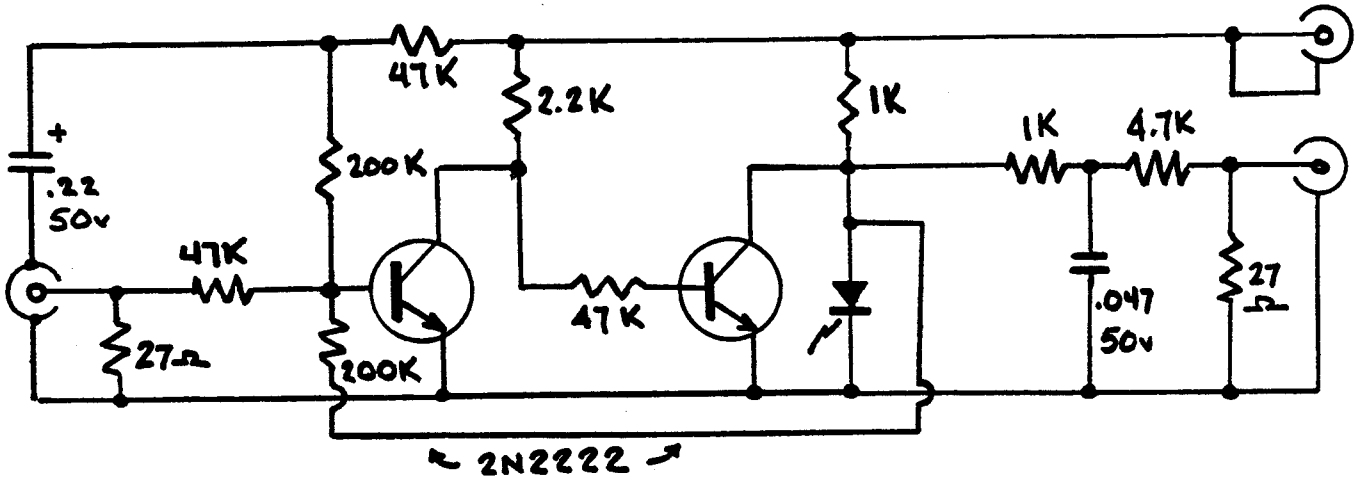
TAPE DUPLICATION 2 Perkins Engineering sent this circuit which is to be used between two inexpensive recorders for the duplication of tapes. The LED should be a 'bright' one, such as a suggested RShack 276-033, and if you can measure the transistors, the one with the lower gain is at the left.



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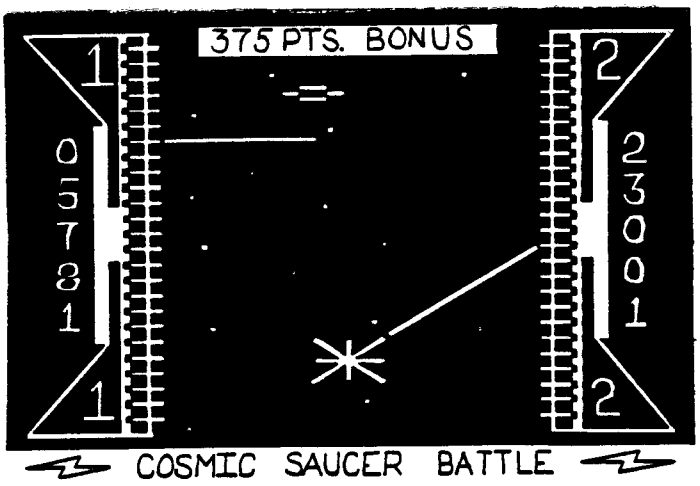

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TAPE DUPLICATION 3 Wavemakers is making custom duplication available. The cost is $1.50 per cassette (C-12), including cost of the cassette, with a 50 piece minimum order. Contact them at 312- 893- 4192.

GOLDFISH is a program that was developed by Andy Guevara by the use of his Machine Language Monitor program. He displayed it to us at the Faire and it is a cute demonstration piece. A fishtank appears, a number of fish swim back and forth - continuous motion, no jerks - and a little pussy cat looks longingly. A clock is included, and every minute, the cat meows. Andy has the listings for $3., and a tape that can be loaded into either Basic (:RUN), or the MLM cartridge, at $5. Check the address in their full page ad.

ELECTRONIC GAMES, May issue (released March 15!) has numerous mentions of Bally/Astrovision. The magazine is primarily directed towards company-produced games, either for full-size arcade units, or for home game units such as Atari,etc. A two-page article includes an interview with Bob Ogdon, programmer for Dave Nutting Associates, outlining some of the games he produced. An interesting magazine if you want the 'big picture' of the game universe.

SCHEDULE FOR PUBLICATION- for the remainder of the year is currently planned as follows: The last day for me to receive material to be included in the next issue is essentially the last Friday of the month, specifically: April 23, May 28, Jun 25, Jul 23, Aug 27, Sep 24. The issue should then be in the mails the following Friday. The cutoff date for any programs submitted for the co ntest is the Friday prior to ones identified above. If anyone plans on a full- or half-page ad, I'd like to know about it early, so as to block out the space. Your continued cooperation in sending in programs and text material will help me keep pumping the paper out for our mutual enjoyment and learning.

VIDEOCADES AT CLOSE-OUT PRICES: these are left-overs from the West Coast Computer Faire, and I'd rather not be in the mail order business. Galactic Invasion, Bally Pin, Space Fortress, Astro Battle - at $26.each including shipping. New Basic at $46. including shipping. We also have a real 'deal' on the old Basic at $21. including shipping. These prices are good until April 30.

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CHANGE INSERT DELETE

These Three Programs will change, insert or delete a character or command word in a Bally Basic Program. Please include a stamped self-addressed envelope. (904) 492-1470

```
  6          S=0;A=400;B=700;C=0;X=0;Y=0;U=0;V=0;G=5;I=0;H=300;CLEAR ;BC=0;FC=1
17;J=32;M=44
  9 FOR W=0TO 3;GOSUB 150+W;NEXT W;GOSUB 800;GOSUB 705
 20 FOR N=1TO 4;GOSUB H+N;@(N)=K;@(N+4)=L;GOSUB A;NEXT N;BOX X,Y,4,4,2
 30 FOR W=1TO 5;IF ABS(X)<24IF ABS(Y)<20GOTO 38
 34 FOR N=1TO 4;IF ABS(X-@(N))<8IF ABS(Y-@(N+4))<5IF PX(@(N),@(N+4))GOSUB 780;G
OSUB H+N;@(N)=K;@(N+4)=L;GOTO 40
 36 NEXT N;GOTO 39
 38 IF ABS(X)<20IF ABS(Y)<12GOTO 120
 39 IF (ABS(X)>28)+(ABS(Y)>20)GOTO 56
 40 FOR P=-1TO 1STEP 2;IF PX(X+3bP,Y)GOTO 500
 42 NEXT P;X=X+JX(1)bR
 44 FOR P=-1TO 1STEP 2;IF PX(X,Y+3bP)GOTO 550
 46 NEXT P;Y=Y+JY(1)bR;GOTO 62
 56 IF PX(X,Y)=0MU=59;MU=61;C=2;S=S+1;GOSUB 800;I=I+1;IF I=60GOSUB 110;S=S+8;GO
SUB 800;M=M-1;J=J-1;I=1;FOR D=1TO 3;GOSUB 150+D;NEXT D
 57 IF J=27 J=28;M=40
 58 X=X+JX(1)bR;Y=Y+JY(1)bR
 59 IF ABS(X)>52 X=-X+(Rb(ABS(X)cX))
 60 IF ABS(Y)>36 Y=-Y+(Rb(ABS(Y)cY))
 62 BOX U,V,4,4,C;BOX X,Y,4,4,3;C=3;U=X;V=Y;MU=52;E=E-1;IF E=16BC=88
 72 IF E=0R=2
 75 NEXT W
 80 FOR N=1TO 4;K=@(N);L=@(N+4);BOX K,L,8,4,2;GOTO 200+Nb2
 90 @(N)=K;@(N+4)=L;NEXT N;GOTO 30
110 BC=0;R=4;E=48
112 NT=9;FOR Z=1TO 2;MU=68;MU=76;MU=68;MU=73;NEXT Z;FOR Z=1TO 2;MU=68;MU=75;MU=
68;MU=72;NEXT Z;MU=68;MU=73;NT=3;RETURN
120 IF PX(X,Y)=0C=2;GOSUB 110
125 GOTO 58
150 FOR Z=-1TO 1STEP 2;BOX 24bZ,0,4,28,1;BOX 0,16bZ,44,4,1;BOX 24bZ,0,4,4,2;BOX
 0,16bZ,4,4,2;NEXT Z;RETURN
151 FOR Z=-1TO 1STEP 2;BOX 16bZ,0,2,18,1;BOX 16bZ,0,2,14,2;BOX 12bZ,0,2,18,1;BO
X 12bZ,0,2,14,2;NEXT Z;RETURN
152 FOR Z=-52TO 52STEP 104;FOR T=-28TO 28STEP 4;BOX Z,T,2,2,1;NEXT T;NEXT Z;RET
URN
153 FOR Z=-36TO 36STEP 72;FOR T=-28TO 28STEP 4;BOX T,Z,2,2,1;NEXT T;NEXT Z;RETU
RN
202 L=L-1;GOSUB A;IF L=16GOSUB B;GOSUB H+N
203 GOTO 90
204 L=L+1;GOSUB A;IF L=-16GOSUB B;GOSUB H+N
205 GOTO 90
206 K=K-1;GOSUB A;IF K=26GOSUB B;GOSUB H+N
207 GOTO 90
208 K=K+1;GOSUB A;IF K=-26GOSUB B;GOSUB H+N
209 GOTO 90
301 K=(RND (4)-3)b11+5;L=J-RND (3);RETURN
302 K=(RND (4)-3)b11+5;L=-J+RND (3);RETURN
303 K=M-RND (3);L=(RND (4)-3)b8+4;RETURN
304 K=-M+RND (3);L=(RND (4)-3)b8+4;RETURN
400 BOX K,L-1,8,1,1;BOX K+3,L,1,4,3;BOX K-4,L,1,4,3;BOX K,L-1,4,3,3;RETURN
500 IF JX(1)=-P X=X+JX(1)bR
510 GOTO 44
550 IF JY(1)=-P Y=Y+JY(1)bR
560 GOTO 62
700 BOX K,L,8,4,2;FOR Z=1TO 8;FC=8;MU=56;MU=52;FC=117;NEXT Z;GOSUB 150
705 G=G-1;CX=-40;CY=40;PRINT #1,G;IF G=0GOSUB 110;FOR Z=1TO 8;NEXT Z;CX=-24;CY=
```

STAR SIEGE
Tom McConnell
3858 Kenwood Dr.
Stow OH 44224

A Space Invader type game, where your laser cannon is moved by the KNob, and the TRigger fires the laser beam. The mother ship has six aliens craft that drop bombs, while the mother ship also has a few. Shields can protect against these bombs until they are depleted. Available shield units are displayed on the U/L screen area.

```
0;NT=0;PRINT "GAME 0VER";NT=26;MU=61;NT=0;IF KPRUN
 710 RETURN
 780 BOX @(N),@(N+4),8,4,2;S=S+2;C=2;GOSUB 150;FOR Z=1TO 4;MU=64;MU=61;NEXT Z
 800 NT=0;CX=40;CY=40;PRINT #1,S,#1,"00";NT=3;RETURN
```

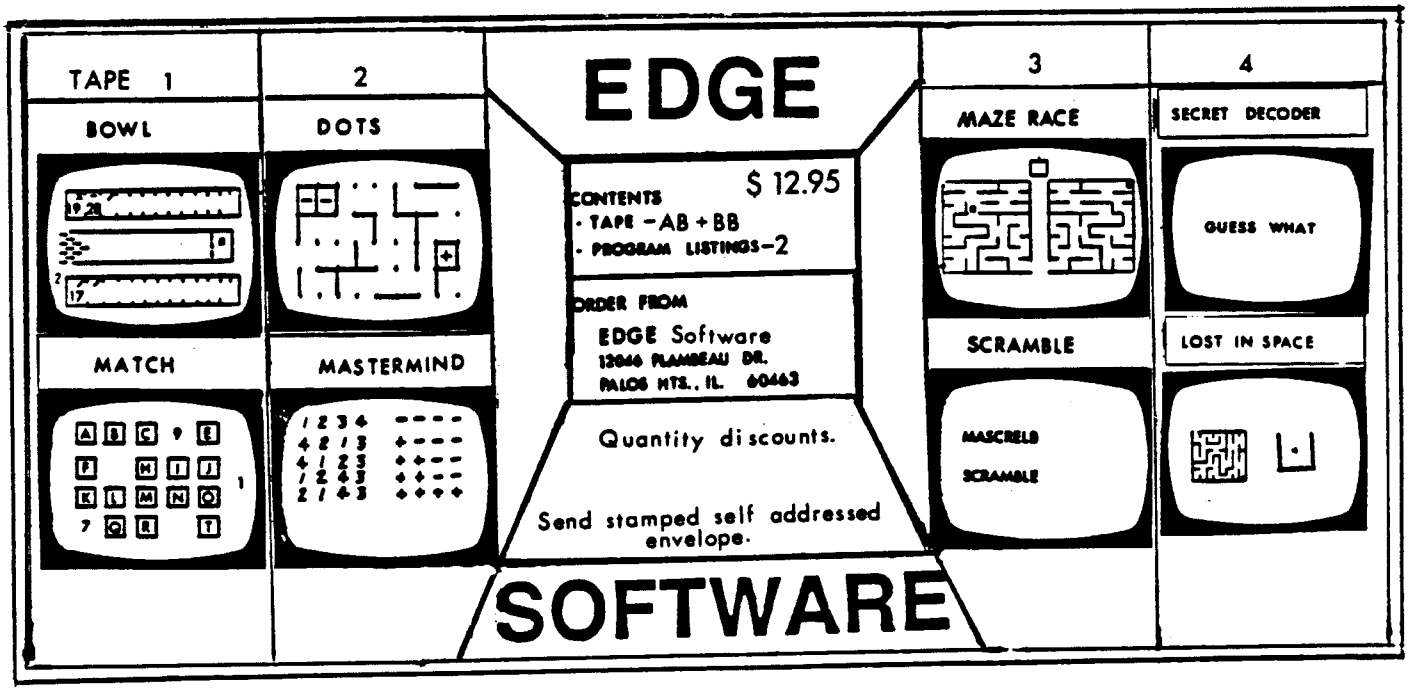
CARTRIDGE SWAPPING - 2: continuing Dave Ibach's scheme with some explanation -

- o The routine is "relocatable", meaning that if you already have something residing in location 19900, you can change the address.
- o Once the routine has been entered, do not allow scrolling, or it will be destroyed.
- o For a shorter delay loop,(about 10 sec.) change 8480 to 8464.
- o Only the program and other occupants of the screen are (string variables) are preserved. Contents of the variables (A, B, etc., and RM, FC, etc., are unpredictable. SZ Will be correct, however
- o If you want to erase the routine after the swap, POKE in values of zero, as: FOR N=19900 TO 19915; %(N)=0; NEXT N

This is the machine language routine, with comments:

```
F3            DI          ; disable interrupts
06  20        LD   B,32   ; time-wasting loop
21  00  00    LD   HL,0
23            INC  HL
CB  7C        BIT  7,H
28  FB        JR   Z,-5
10  F6        DJNZ   -10

C3  03  25    JP   2503H  ; branch to new cartridge
   or
C3  61  24    JP   2461H  ; branch to old cartridge
```



TOP 5 TODAY by Steve Walters

This program keeps track of the 5 best scores of the day, and displays them with 3 initials selected by the player making one of the 5 best scores, just like in the commercial arcade games. It can be added to any game which involves competition for best score.

The first listing uses the keypad to minimize memory space requirements. It uses 311 bytes for the program, plus 40 bytes for the string variable, for a total of 351 bytes.

```
970 Z=0; PRINT "YOUR SCORE=",S; PRINT;
    PRINT "TOP 5 TODAY:"; PRINT; FOR
    N=0 TO 19; Q=Nd4; IF Z=1 GOTO 974
972 IF RM=0 IF S>@(N+3) GOSUB 984
974 IF RM#3 TV=@(N)
976 IF RM=3 PRINT @(N)
978 NEXT N
980 IF TR(1)GOTO NNN (next game cycle)
982 GOTO 980
984 FOR Q=19 TO N+4 STEP-1; @(Q)=
    @(Q-4); NEXT Q; @(N+3)=S; Z=1
986 CY=-40; PRINT "YOUR CODE:s",;
    FOR Q=0 TO 2; L=KP; TV=L; @(N+Q)=L;
    NEXT Q; PRINT "sY=OKsN=NO",; L=KP;
    GOSUB 998; IF L#89 GOTO 986
988 CY=8-Nm2; RETURN
998 BOX 0,-40,160,7,2; CX=-80; RETURN
```

Note: the letter O is not used as a variable; d=divided by; s=a space; m=multiplied by

If you have memory space for 393 bytes (+40 for the string), the following modification (from Line 986 on) will allow the initials to be selected by the hand control:

```
986 CY=-40; PRINT "CODE:s",; FOR Q=0
    TO 2; L=64
987 L=L+JY(1); IF L<64 L=90
988 IF L>90 L=64
990 TV=L; IF TR(1) IF L#64 @(N+Q)=L;
    NEXT Q; GOTO 994
992 CX=CX-6; GOTO 987
994 PRINT "sTR=OKsJY=NO",
995 IF JY(1) GOSUB 998; GOTO 986
996 IF TR(1) GOSUB 998; CY=8-Nm2;
    RETURN
997 GOTO 995 (one more line)
998 BOX 0,-40,160,7,2; CX=-80; RETURN
```

This program can be modified for New Astrovision Basic to use less memory: For the keypad version, in Line 986 change GOSUB 998; to PRINT; and eliminate Line 998.

For the hand control version, in Line 995 and 996 change GOSUB 998; to PRINT; and eliminate Line 998.

You must set SM=2 for these, and you may want to change string @ to string *.

The New Astro Basic uses 282 bytes for the keypad version and 361 bytes for the hand control version, plus 40 bytes for the string in either case.

If you want to see TOP 5 TODAY run by itself, add Line 10 and revise Line 980:

```
10 CY=-40;'INPUT "NEXT SCORE="S; CLEAR
980 GOTO 10
```

Then run it. Input a score, vary the letters with JY and select them with TR.

* * * * *

The following must be considered in making TOP 5 TODAY compatible with your program:

(1) the program uses @(0) thru @(19) to store the scores and initials; these should all be at zero when the program is loaded each time.

(2) variables L, N, Q and Z are used but do not retain permanent values from one game cycle to the next.

(3) variable S is used for the current player's score from the last game.

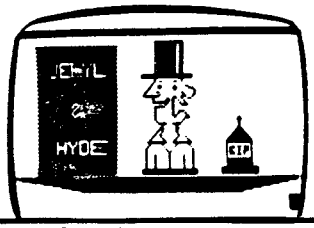
(4) variable RM is calculated in Line 982.

(5) TR(1) and JY(1) result in hand control No. 1 always being functional; if you want to use 2 or more hand controls, you will have to change these to the player-number variable.

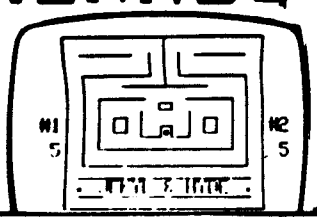
(6) in the New Astro Basic versions, SM=2 is required.

software by...

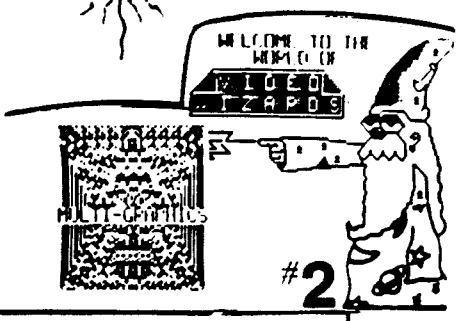
VIDEO WIZARDS



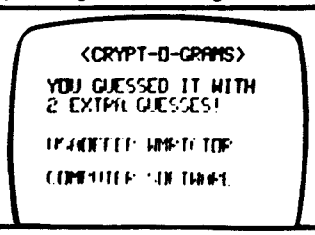
#1 **Jekyl & Hyde**



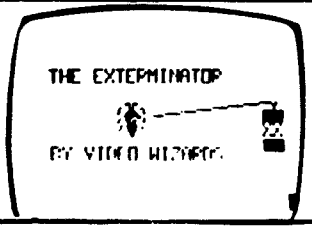
#1 **Jekyl & Hyde**



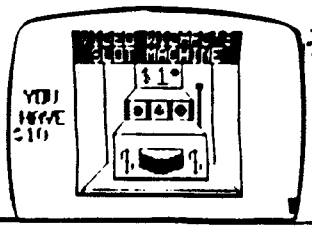
#2 **Multi-Graphics**



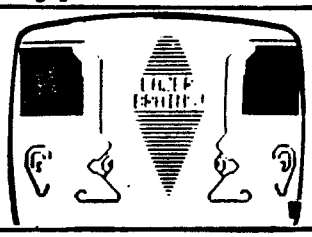
#3 **Crypt-O-Grams**



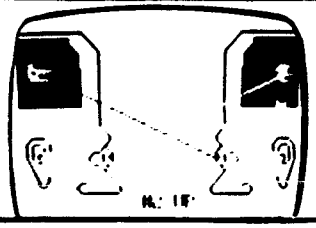
#4 ***The Exterminator***



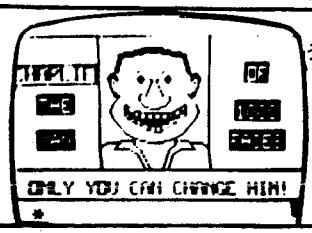
#5 **Slot Machine**



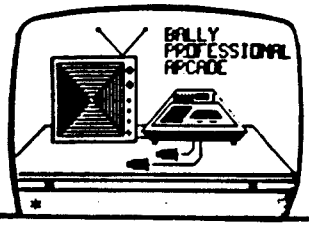
#6 *Lazer Brains*



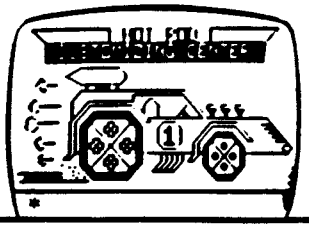
#6 *Lazer Brains*



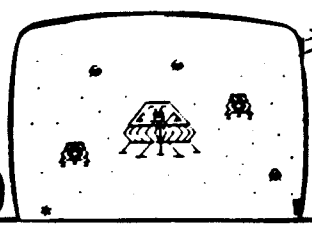
#7 **Charlie**



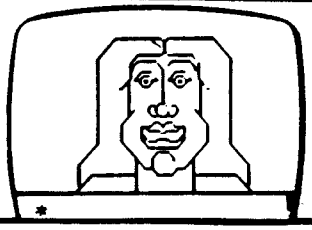
#8 **Arcade**



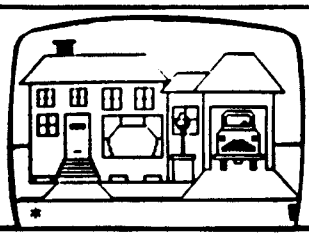
#9 **Hot Rod Customizing**



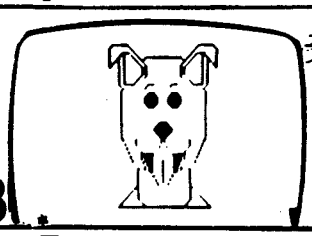
#10 **Space Creatures**



#11 **Susie**



#12 **Home Sweet Home**



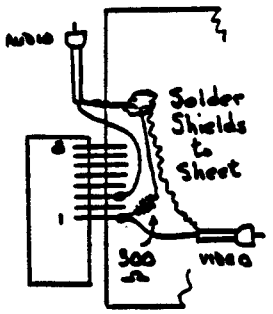
#13 **Puppy-Vision**

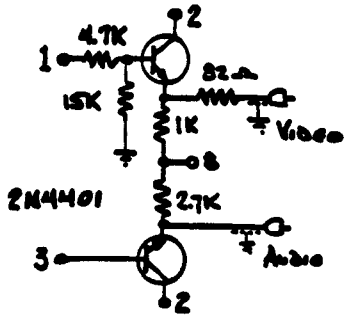
The programs pictured above are now available from VIDEO WIZARDS. All programs (#1-#6) are $5 each. The G.P.'s (graphic pictures), indicated by an asterisk, are $1 each. When you "RUN" the G.P. programs the computer will prompt you to input BOX dimensions & modes. By moving the boxes with the joystick & freezing them with the trigger you can customize your own picture in your own creative way! Then you can save your picture on any blank tape! Minimum order per tape is $10.

Send order to: VIDEO WIZARDS 1935 WINDING HILL Rd. #1008
DAVENPORT, IOWA 52807

All programs are in Astro-Basic only!

COLOR MONITOR CIRCUIT - $0.10: We provided a circuit in Volume One which allowed the Arcade to be connected directly to a TV monitor (bypassing the rf link). It was only good for black and white. We thought... With some clues from John Perkins and a little experimentation with 100 ohm resistors, the following simple circuit developed. The Video signal is taken from the video output line and ground, and a 300 ohm resistor shunted across as well. The rf modulator must remain connected, as the signal appears, after conversion, on the input side as well as the output side. This circuit works very well with my NEC monitor (purchased for my Apple, but now...) YOUR monitor may require a bufferring circuit, and an effective one is shown:





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Machine Language Manager

What it is:

Many of today's peronal computers, and in fact many business computers, have inside them the same microprocessor as the Astrovision (Bally) Arcade--the Z-80. This is a powerful microprocessor, capable of much more than simple games and other programs presently written for the Arcade. The Machine Language Manager is a cartridge designed to take advantage of the Z-80's power by allowing the user to program the Z-80 directly in its own native language.

What it does:

The MLM allows greater control of graphics and input/output functions than Basic does by using Z-80 machine language. Using machine code, greater program sophistication can be achieved. This means programs like word processors, business programs, device controllers, and multi-colored high speed graphics.

How it works:

The Machine Language Manager works with the Arcade's keypad in much the same way that Basic does, but rather than entering Basic statements, the user now enters his program in Z-80 Hexadecimal code. By using the MLM, the user can create, edit, list, run, or store his machine language program on cassette tape at the push of a button.

Why machine code:

The primary difference between Basic and machine code lies in the instruction set. Where Basic is a "high level language", Z-80 machine code is the most rudimentary (nitty-gritty) level of programming. This means a far greater number of instructions are available for use, giving the user more flexibility. For example, all the Bally game cartridges, and even Basic itself, are written in Z-80 machine language.

What you need to work with it:

A working knowledge of Z-80 machine language (or not being afraid to learn it), will suffice. This information can be found in almost any bookstore or computer store. To work with a cassette tape deck, you will need the old Bally Basic 300 baud interface (unfortunately no longer in production).

What it will work with:

The MLM will work with anyone's memory extension and any and all external hardware you may want to hang on the Arcade.

What we provide:

The Machine Language Manager comes with its own keypad overlay, and a 96 page manual. The manual is written in tutorial fashion, and once completed should only be needed for occasional reference.

How much:

The Machine Language Manager retails for $54.95. We pay the postage. If you're in California, you get to pay the tax.

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