ARCADIAN

Vol 5 No 2 Dec 3, 1982

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ARCADIAN

Dec 3, 1982 Vol 5 No 2

STATEMENT The purpose of the ARCADIAN is to disseminate information. In order for it to get out, it has to come in. Textual material is now starting to flow - you can see the number of pages used for tutorial, etc., material in these two issues of Vol. 5. But the program submissions have fallen behind. We need programs of all types. There are no magic 'program-maker-uppers' around here, everything comes from the subscribers. Now that we are providing you with some understanding of what is going on - and what could take place with the Basic, we'd expect more program submissions. And we need such submissions to round out the ARCADIAN.

TROUBLESHOOTERS

In the last issue, we asked for some help in the line of persons to review tapes of programs which subscribers submit, programs that have problems of one sort or another. We have received three responses, as follows:

Phil Potter, 704 NW Avenue, Union, IA 52175

Ken Lill, 6608 South Campbell, Chicago, IL 60629

Mark Carlson, P.O. Box 2205, La Habra, CA 90631-1405

The procedure is as follows: If you are having difficulty with a program, make a tape of it and send it to one of the above. Also drop me a note that you did so. The Troubleshooter will review the tape and try to figure out what is wrong, and notify the subscriber. If the problem is interesting enough, he will write a short article for publication.

USER GROUPS

THE LA area users group meeting will be held at the Los Angeles Convention Center (Anaheim) at Booth 322. This will be at the Personal Electronics and Computer Expo on Dec 10 - 12. Discount tickets will be available from Mark Krivulka (213) 443-4189.

Bob Wood of Toronto, Canada, reports that his telephone number is 416-755-0161.

Niagara Falls area subscribers are invited to call K. O'Neill at 688-4595 after 3pm weeknights to learn about the Niagara-Regional BUG.

Both Dick Houser and I are planning to attend the LA meeting on December 11, Saturday. We will be bringing some hardware and software for a "Show and Tell".

SCOREKEEPER There has been some interest shown for a tabulation of high scores on the various Astrocade games. If you are interested in such a tabulation, contact Don Simpson, Box 229, Somers, NY 10589. He will keep track of the scores and let me know the latest "best" in time for a subsequent issue.

NEW SHOP in the South San Francisco Bay area is The Video Adventure, located at 910 Town & Country Village, San Jose. They plan to handle all the programmable video games, and will feature the Astrocade Arcade.

PROJECTS In the middle of our second year, we were involved with some budding schemes to increase the usability of the Arcade unit, and called these "PROJECTS". Only one of the four became 'real', the Blue Ram memory addition. One other sounded promising - to interface with the TRS80 - but lack of real interest caused that one to wither, and the work done has been destroyed. We are now publicizing two new ideas, Projects 5 and 6.

PROJECT 5: An Extended Color Graphics Processor Board.

This would be a printed circuit board containing a TMS9918A Video Display Processor and 16K dynamic RAM (the memory space will be outside the Arcade's address space). It would be compatible with existing memory additions but does not require them. The board would provide 256x192 pixels. The output would be NTSC composite video, for compatibility with outboard tv devices. There would be four display modes available:-

1. Multi-color lo-resolution::: 48 rows x 64 columns of 4x4 pixel blocks, each in any of the available 16 colors
2. Graphics I::: 24 rows x 32 columns of 8x8 pixel character blocks. 256 characters may be user-defined in two colors each (all 16 colors available in the display simultaneously)
2. Graphics II::: similar to Graphics I, but allows 768 different patterns to be defined, each using up to 16 colors; and 32 "sprites" are available, each in one of the 16 colors. Each "sprite" is either an 8x8 or 16x16 pixel block and is moved without the erase-and-redraw procedures needed in the Astrocade.
3. Text Mode::: 24 lines x 40 columns, similar to the Apple II and Atari 400/800 text modes. Each character is defined as a 6x8 pixel block, allowing standard 5x7 characters with normal spacing. Software will be supplied in both 300 and 2000 baud format to display the full ASCII character set, bith upper and lower case;- up to 256 characters can be defined by the user in each alternate set.

The normal Astrocade display may be shown as a background to the VDP, or hidden with a solid color "backdrop".

If you are interested in this idea, whose price is targeted at $300, assembled, tested, and with power supply, please let me know. We may also provide the p.c. board as a separate item, so let me know if you are interested there also.

PROJECT 6::: This will be the small package necessary to get suitable signals out of the Arcade unit to operate a serial printer. In essence, we will take the technology of the old Bally Cassette Interface package and retain only those parts needed for the printer function. We are targeting a cost of $20 for this unit.

RECORDER IDEAS

Some further words on techniques, etc., of recording programs...Dave Verdin writes that his combination of a Panasonic RQ209DAS plus Certron 90 tape has given him good service, with only dirty heads and capstan as problems.

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L.T.

Poor Little Terrestrial he just wants to go home but there are so many obstacles in his way. Can you help get him up the "STEPS", through the "PITS" the "ZAPPING GAPS" and the "STEPPING STONES"? Before the time runs out? Play L.T. and help him get home.
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PRESENTS:
Tape 14

ZAPPER

By Robert Rosenhouse

You won't be able to resist the tempesting challenge: advancing alien Stompers appear on the horizon to (appropriately enough) stomp you out of existence. Travelling down distinct pathways, these Stompers will eventually come within stomping distance of you. They become more difficult to zap at this level, for they are able to transport themselves unpredictably.

This program features superior sound effects and three-dimensional graphics, a first in Astro BASIC.

Help stomp out Stompers: $12.00

****
** Available only in **
** Astro BASIC **

****
*
* Have you ordered your copy of the *
*
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*
****

```
 11 T=0;NT=3
 12 FC=112:BC=134
 13 FOR W=1TO 5
 14 PRINT ;PRINT
 16 NEXT W
 18 PRINT "     M O R E    A R T"
 20 PRINT "         PROG. G-III"
 22 FOR A=-80TO 80
 26 T=T+RND (6)-3
 30 IF T>50 T=40
 34 LINE A,-44,0
 36 MU=T
 38 LINE A,T-44,3
 40 NEXT A
 48 . #2 BOX PATTERNS
 50 FOR B=1TO 60
 51 FC=51
 52 BOX RND (160)-80,RND (88)-44,1,1,1
 54 MU=B
 56 NEXT B
 58 BC=70;FC=81
 60 BOX -60,20,8,8,3
 62 BOX -48,20,8,1,3
 64 BOX -72, 20,8,1,3
 66 BOX -60,36,2,16,3
 68 BOX -60,4,2,16,3
 70 FOR Z=1TO 1000;NEXT Z
 71 CLEAR ;BC=143;FC=112
 72 NT=0;LIST 76,4
 76 . #1 RND BOX
 78 . #2 BOX PATTERNS
 80 . #3 WIERD BOX
 82 . #4 BOX 'S
 84 PRINT
 86 PRINT "PRESS GAME #"
 87 PRINT "   PRESS *'S #"
 88 IF KP=49 GOTO 100
 90 IF KP=50 GOTO 900
 92 IF KP=51 GOTO 300
 94 IF KP=52 GOTO 500
100 CLEAR ;NT=3
110 FOR Y=1TO 30
112 FC=RND (32)*8+4
114 BC=FC+4
120 B=RND (12)*10
130 C=RND (8)*10
132 MU=FC
140 BOX 0,0,B,C,3
142 BOX 0,0,C,B,3
150 FOR X=1TO 10
160 D=RND (24)*2
170 BOX -60,22,D,D,3
172 BOX -60,-22,D,D,3
180 BOX 60,22,D,D,3
182 BOX 60,-22,D,D,3
190 NEXT X
200 NEXT Y
210 GOTO 920
300 CLEAR ;NT=3;FC=8
310 FOR N=1TO 30
320 MU=RND (30)+30
330 BC=151;FC=153
340 BOX 0,0,88,88,3
350 A=RND (40)-20
360 B=RND (40)-20
370 C=RND (60)
380 BOX A,A,60,60,3
390 BOX B,B,60,60,3
392 BC=15;FC=9
400 BOX A,A,C,C,3
410 FOR P=1TO 50;NEXT P
420 NEXT N;GOTO 71
500 CLEAR ;NT=3
504 INPUT "# OF CYCLES"R
506 CLEAR
508 FOR Q=1TO R
510 A=RND (8)*20
520 B=RND (40)*2
522 BOX 0,0,A,B,3
530 BOX -44,22,A,B,3
532 BOX 0,22,A,B,3
540 BOX -44,-22,A,B,3
542 BOX 0,-22,A,B,3
550 BOX 44,-22,A,B,3
552 BOX 44,22,A,B,3
560 FC=RND (32)*8+4
570 BC=FC+4
580 MU=A
590 NEXT Q
600 GOTO 71
900 .BOX PATTERNS 4/81
910 CLEAR ;NT=3
920 FOR I=1TO 10
930 FC=RND (32)*8+4
940 MU=RND (80)
950 A=RND (40)*2
960 BOX 0,0,A,A,3
970 FOR J=1TO 10
980 B=RND (30)*2
990 FOR K=1TO 50
1000 NEXT K
1002 BOX -20,-20,B,B,3
1010 BOX 20,20,B,B,3
1012 BOX -20,20,B,B,3
1016 BOX 20,-20,B,B,3
1020 FC=RND (32)*8+4
1030 NEXT J
1040 NEXT I
1050 GOTO 71
```

A graphics demo of small boxes on the screen. Note the Menu scheme.

S.KENDALL
1945 WASHINGTON AVE
WILLMETTE, IL

BALLY CHRISTMAS "CARD"


```
1.
2.XMAS TREE
3.ED GROEBE
5 CLEAR ;NT=Ø
1Ø A=2Ø2ØØ
12 S=17684
2Ø &(Ø)=7
21 &(1)=7
22 &(2)=126
23 &(3)=179
24 &(9)=Ø
27 FOR V=1TO 5
28 S=S+Vx8Ø
3Ø FOR Y=STO S+2ØØxVSTEP 4Ø
4Ø Z=(Y-S)÷4Ø
6Ø FOR W=-(3xZ)÷4TO (3xZ)÷4
65 R=RND (16)
66 IF R<3GOSUB 4ØØ
67 IF R=3GOSUB 5ØØ
68 IF R>3GOSUB 6ØØ
7Ø GOSUB 2ØØ
8Ø NEXT W
9Ø NEXT Y
1ØØ NEXT V
11Ø CY=16
112 PRINT "  MERRY   CHRISTMAS  1982
113 BOX 2,1Ø,3,4,1
12Ø FOR K=1TO 2ØØ
13Ø &(2)=7
14Ø &(2)=129
15Ø NEXT K
19Ø IF KPGOTO 5
2ØØ %(A)=-43
21Ø %(A+2)=299
22Ø %(A+4)=X
23Ø %(A+6)=Y+W-B
24Ø %(A+8)=-13871
25Ø CALL A;RETURN
4ØØ X=-5374;B=4Ø;RETURN
5ØØ X=-1Ø494;B=4Ø;RETURN
6ØØ X=-255;B=Ø;RETURN
```

WHAT IS A VARIABLE?

DON GLADDEN

WHEN WE ARE WORKING WITH COMPUTERS, WE ARE ALWAYS WORKING WITH NUMBERS. IN FACT, ALL THAT COMPUTERS UNDERSTAND ARE NUMBERS. EVEN WHEN WE USE LETTERS, WORDS, AND CHARACTERS, THE COMPUTER ONLY UNDERSTANDS THE NUMBERS THAT STAND FOR THEM. SO BRINGS ABOUT THE VERY HANDY PROGRAMMING TOOL CALLED THE "VARIABLE".

WHAT IS A VARIABLE? IT IS A LETTER OR COMBINATION OF TWO LETTERS THAT WE CAN USE TO STORE A VALUE OR NUMBER IN. A GOOD WAY TO ILLUSTRATE THIS IS TO THINK OF A ROW OF MAILBOXES. EACH BOX EITHER CONTAINS SOMETHING, (IN OUR CASE A VALUE), OR IS EMPTY. (A ZERO.) WE CAN USE THE LETTERS A THROUGH Z AS 26 "MAILBOXES" TO STORE VALUES IN AS WE DESIRE. TO DO THIS ,WE SIMPLY TELL THE COMPUTER THE VARIABLE THAT WE WANT TO USE IS EQUAL TO THE VALUE THAT WE WANT STORED IN IT. LETS SAY THAT WE WANT "A" TO CONTAIN 50, "B" TO CONTAIN 25, AND "C" TO CONTAIN -10. SIMPLY KEY IN: A=50:B=25:C=-10 AND HIT "GO". YOU'VE DONE IT! TO PROVE THAT THESE VALUES ARE NOW STORED, KEY IN: PRINT A;PRINT B;PRINT C AND "GO", AND THERE ARE YOUR VALUES. AGAIN, AS WE DISCUSSED IN OUR LAST LESSON, WE CAN SET THESE VARIABLES INSIDE OUR PROGRAM, (INSIDE A LINE NUMBER), OR OUTSIDE OF IT USING A DIRECT COMMAND SUCH AS WE JUST DID. TRY THIS::::

```
>10 CLEAR
>20 A=50
>30 B=100
>40 C=-10
>50 PRINT A,B,C
```

AN EASIER WAY TO SET YOUR VARIABLES INSIDE A PROGRAM IS TO USE THE "INPUT" COMMAND. WHEN THE COMPUTER SEES AN "INPUT", IT STOPS AND WAITS FOR YOU TO INPUT A NUMBER OR VALUE, AND THEN PROCEEDS. CHANGE THE PROGRAM AS FOLLOWS:

```
>10 CLEAR
>20 INPUT A
>30 INPUT B
>40 INPUT C
>50 PRINT A,B,C
```

NOW "RUN" THE PROGRAM. YOU WILL SEE AN "A" PRINTED ON THE SCREEN. THE COMPUTER IS NOW WAITING FOR YOU TO INPUT A VALUE FOR THE VARIABLE "A". ENTER ANY NUMBER, AND PRESS "GO". THEN ENTER NUMBERS FOR "B" AND "C", AND THE COMPUTER WILL PRINT OUT YOUR THREE VALUES IMMEDIATELY. THERE ARE MANY DIFFERENT WAYS THAT WE CAN ASSIGN VALUES TO VARIABLES, AND ALSO WAYS THAT WE CAN HAVE THE COMPUTER DO IT FOR US, AS WE WILL BE LEARNING IN THESE LESSONS. TRY THESE SHORT PROGRAMS:

```
>10 INPUT A
>20 INPUT B
>30 C=A+B
>40 PRINT #1,A,"+",B,
"=",C
>50 RUN
```

```
>10 A=0
>20 A=A+1
>30 PRINT A
>40 IF A=10STOP
>50 GOTO 20
```

PRINTING OF NUMBERS *****AND VARIABLES*****

LAST MONTH WE LEARNED HOW TO PRINT TEXT ON THE SCREEN IN ANY LOCATION THAT WE WANTED USING "CX" AND "CY" TO SET OUR STARTING PRINT LOCATIONS. NUMBERS AND VARIABLES ARE HANDLED SOMEWHAT DIFFERENTLY, AS WE WILL NOW SEE.

WHEN WE PRINT A NUMBER, WE DO NOT USE QUOTATION MARKS. KEY IN: PRINT 100 AND "GO". THE COMPUTER RESPONDS BY PRINTING THE NUMBER TABBED OVER TO THE RIGHT OF THE CX VALUE. YOU CAN ALSO HAVE YOUR COMPUTER DO MATH IN THIS WAY.

```
PRINT 100+100  (GO)
    200
PRINT 50*10      ""
    500
PRINT 75/25      ""
      3
```

OR: USE VARIABLES.

```
A=50;PRINT A
      50
B=10;PRINT B
      10
PRINT A+B
      60
```

ONE MORE TIME: IF WE ARE USING QUOTATION MARKS AFTER OUR "PRINT" STATEMENT, THE COMPUTER WILL PRINT EXACTLY WHAT IS INSIDE THE QUOTATION MARKS. IF WE DON'T, WE MUST FOLLOW THE "PRINT" STATEMENT WITH: 1-A NUMBER, 2-A MATHEMATICAL PROBLEM (PRINT 2+2, ETC.) OR, 3-A VARIABLE. (WHICH THE COMPUTER UNDERSTANDS AS A VALUE.). THE VARIABLES THAT WE ARE CONCERNED WITH IN THIS LESSON HAVE BEEN "ONE-LETTER" VARIABLES, A THROUGH Z. "TWO-LETTER" VARIABLES, SUCH AS "CX" AND "CY", AND OTHER VARIABLES WILL BE COVERED IN A FUTURE ARTICLE.

THE AUTOMATIC "TAB" FUNCTION WORKS SOMETHING LIKE THIS: WHEN WE TELL OUR COMPUTER TO "PRINT A ", HE WILL TAKE THE LAST DIGIT OF THE NUMBER THAT IS STORED IN "A", AND PRINT IT EIGHT SPACES TO THE RIGHT OF OUR CURRENT "CX" VALUE. TO ILLUSTRATE, USE THIS PROGRAM:

```
>10 CLEAR
>20 INPUT A
>30 PRINT A
>40 GOTO 20
```

WHEN THE COMPUTER ASKS FOR "A", INPUT FIRST A ONE-DIGIT NUMBER, THEN A TWO-DIGIT NUMBER, ETC., AND NOTICE HOW HE PRINTS THEM.

```
A 1    (GO)
       1
A 12
       12
A 123
       123
A 1234
      1234
```

EACH TIME, THE FIRST DIGIT IS SHIFTED TO KEEP THE LAST DIGIT IN THE SAME COLUMN. THIS CAN BE VERY HANDY IN BUSINESS-TYPE PROGRAMS THAT NEED VALUES PRINTED IN NICE, NEAT COLUMNS.

NOW, WHAT IF WE DO NOT WANT OUR VALUE(S) TABBED EIGHT SPACES? SIMPLE. WE JUST TELL OUR COMPUTER HOW MANY SPACES OVER THAT WE WANT THE LAST DIGIT. IF WE HAVE TOO MANY DIGITS IN OUR VALUE, HE WILL AUTOMATICALLY SHIFT EVERYTHING OVER TO THE RIGHT AS MANY SPACES AS NEEDED TO FIT THE WHOLE NUMBER IN. WE DO THIS LIKE SO:

```
>10 CLEAR
>20 INPUT A
>30 PRINT #3,A  (3 SPACES INSTEAD OF 8.)
>40 GOTO 20
```

NOW "RUN", AND NOTICE THE DIFFERENCE.

```
A 1
  1
A 12
 12
A 123
123
A 1234
1234
```

NOTICE WHEN WE ENTERED A FOUR DIGIT VALUE FOR "A", HE SHIFTED TO THE RIGHT TO ALLOW THE WHOLE VALUE (4 DIGITS) TO BE PRINTED. CHANGE THE VALUES AFTER THE "#" IN LINE #30 TO EXPERIMENT.

AN EXAMPLE OF WHERE WE MIGHT USE THIS: LET'S SAY WE ARE WRITING A GAME PROGRAM THAT IS SHOWING A PLAYERS SCORE. WE WOULD BE USING VARIABLES TO KEEP THE SCORES IN, AND ALSO THE PLAYER#. KEY THIS SHORT PROGRAM IN:

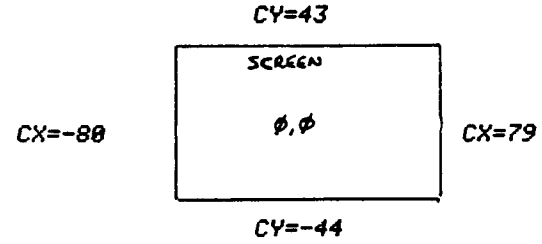
```
>10 CLEAR
>20 P=1     (PLAYER NO.)
>30 S=1000  (SCORE)
>40 PRINT "PLAYER=",P," SCORE=",S
```

IN AN ACTUAL GAME PROGRAM, THE VALUES FOR "P" AND "S" WOULD BE CONSTANTLY CHANGING, BUT FOR ILLUSTRATIVE PURPOSES, WE ARE SETTING THEM IN LINES 20 AND 30. RUN THE PROGRAM. WE CAN SEE THE "AUTOMATIC TAB" WORKING. EACH VALUE THE COMPUTER IS PRINTING IS TABBED THE EIGHT SPACES, WHICH LOOKS KIND OF FUNNY FOR OUR PURPOSE HERE. SO, SIMPLY CHANGE LINE#40 TO READ:

```
>40 PRINT #1,"PLAYER=",P," SCORE=",S
```

NOW RUN THE PROGRAM AND SEE THE DIFFERENCE.

THE TAB FUNCTION ONLY WORKS WITH VALUES PRINTED, NEVER WITH TEXT. USE THE CX AND CY TO MOVE YOUR TEXT AND/OR VALUES AROUND THE SCREEN TO PRINT ANYWHERE YOU WISH. REMEMBER, THE CX CAN BE ANYWHERE FROM -80 TO 79, AND CY FROM -44 TO 43, WITH ZERO BEING THE CENTER OF THE SCREEN.



USE THE FOLLOWING PROGRAMS TO GET THE HANG OF PRINTING BOTH TEXT AND VALUES.

```
>10 INPUT X,Y
>20 CLEAR
>30 CX=X;CY=Y
>40 PRINT "HI THERE"
>50 GOTO 10
```

```
>10 CLEAR
>20 A=0
>30 PRINT #A,10
>40 A=A+1
>50 GOTO 30
```

```
>10 CLEAR
>20 INPUT A,B
>30 PRINT #A,B
>40 GOTO 20
```

```
>10 CLEAR
>20 A=-80
>30 CY=0;CX=A
>40 PRINT " HELLO!"
>50 A=A+1
>60 IF A>40GOTO 20
>70 GOTO 30
```

HERE IS A PROGRAM THAT LETS THE COMPUTER DO ALL OF THE WORK FOR YOU:

```
>10 INPUT "CX VALUE?"X
>20 INPUT "CY VALUE?"Y
>30 INPUT "TAB VALUE?"T
>40 INPUT "VALUE?"V
>50 CLEAR
>60 CX=X;CY=Y;PRINT #T,V
```

(WHEN YOU FOLLOW AN "INPUT" COMMAND WITH TEXT, HE WILL PRINT THE TEXT, THEN WAIT FOR INPUT.)

OUR NEXT TUTORIAL WILL DISCUSS RANDOM NUMBERS AND LOOPS. (FOR-TO-STEP-NEXT AND RND)

COMMAND WORDS COVERED SO FAR:

PRINT-TELLS THE COMPUTER TO PRINT TEXT AND/OR VALUES ON THE SCREEN.
GOTO-TELLS HIM WHAT LINE NUMBER TO GO TO IF WE WANT HIM TO CHANGE HIS SEQUENCE OF DOING THINGS.
IF-TELLS HIM IF A STATEMENT IS TRUE TO FINISH DOING WHAT IS ON THAT LINE. IF NOT, GO ON TO THE NEXT LINE.
CLEAR-CLEAR THE SCREEN.
LIST-SHOW US THE WHOLE PROGRAM THAT IS IN MEMORY.
RUN-RUN THE PROGRAM IN MEMORY.
GO-EXECUTE THE COMMAND JUST GIVEN OR ENTER THE LINE JUST KEYED IN INTO THE CURRENT PROGRAM IN MEMORY.

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PLAIN BASIC TALK by Ken Lill

AN EDITORIAL SERIES FOR NON-HACKERS THAT WANT TO KNOW HOW & WHY

Article #2: IF's , IF/OR's and TRUE/FALSE Statements and Commands.

An IF statement or command means:

If this command is "true" then do the rest of the statement. If it is NOT true, jump to the next line in the program!

I am greatful to George Moses for his permission to use his program "Astro Zap 2000" for most of my examples in this atricle! Astro Zap 2000 can be found in the ARCADIAN #4-9 Page# 88, Issued 7-6-82.

Line # 21 has the first example of an IF command. The statement is:

)21 etc., ;If @(F)=0PRINT #1,"00"

Let's break this down. It says " If the string location at the number that is currently in memory "F" is 0 then PRINT on the screen "00" where the current CX and CY locations are! When the string @(F) is NOT = 0 then go to the next line (22 in this case) and continue from there!

Lines 26 thru 32 also have IF statements that we will look at:

```
)26 N=N+1;IF N=MGOTO 70
)27 IF B=VGOSUB 2
)30 GOSUB 3;ect,;IF E=94B=-40;GOTO 60
)31 IF E=95B=64;C=-C
)32 IF E=96B=40;C=-C;GOTO 60
```

Now let's break all of this down! Line # 26 says to add 1 to N. IF the number in N = the number in M then go to Line # 70 and continue on with the program! IF N in NOT = M then jump to the next line (27). Line # 27 says: IF B = V then go to subroutine # 2, return from there, and go to the next line. IF B is NOT = V then DO NOT go to subroutine # 2! Line 30 has an IF at the end and 2 statements follow it. It says: IF E=94B=-40;GOTO 60.

Let's say that E=96. When the program gets to the IF in that line, it sees that E is NOT = 94 so it goes to the next line (31). Once again it checks E and it finds out it is NOT = 95. It goes on to the next line (32). Now when it checks E it finds it equal to the number you're looking for so it executes the rest of the line. It makes B=-40 and then makes C = -C. One thing to remember, 2 "like" signs will always give you a positive number! (2 minuses will give you a plus!). On the other hand, 2 opposite signs will give you a MINUS, in a statement like C=-C!!!

Line # 500 has the only IF/OR statement in this program. It is at the end of the line and it says: ;IF (G(1)+(G)4)RUN

This works a little different than a regular IF statement. The parentheses, or brackets, around the 2 statements makes them TRUE or FALSE!! What happens is, when the program gets to the (G(1) it checks the number in G. If it IS less than 1 it then sets up a "1" 'flag'. If it is)0 it sets up a "0". Then it checks the other statement (G)4) to see if it is)4.Then it adds the numbers together (1+0=1). If there is ANY number other than 0 for a IF/OR statement, that statement or command will be executed!!

One little trick you can use an IF/OR statement for is checking to see if so many out of so many statements are "true". Goerge Moses didn't use any of these in his program. Here is one example:

)3000 IF (A=2)+(B=3)+(C=4)=2 GOTO 100

This means that if A=2 and B=3 and C is NOT equal to (#) 4 OR A=2 and C=4 but B#3 OR A#2 and B=3 and C=4 then go to line 100. ONLY these 3 ways will make the program go to 100! If any 2 of these are not "true" or if ALL of these are "true" then the program will go to the next line! This type of line could replace "double", "triple",etc.,IF's. Let's change line # 50 in Astro Zap 2000 for example. The "double-IF" is after the statement TV=E;

IF (JX(F))+(JY(F)=0)=2XY=0;etc.

This statement will work but it has 2 drawbacks. One is it uses more BYTES, 24 for our example, 18 for the "double-IF". And it is slightly slower if JX(F)=0 because it still has to check JY(F) and add the two together before it assumes that the statement is "FALSE". With the "double-IF" when it gets to IF JX(F) and it is false it will jump to the next line right away!

REMEMBER: The more IF statements that are in the main running portion of your program, the slower your program will run because the computer HAS to check EVERY ONE to see whether or not it is "TRUE"!!! So, choose your IF statements very carefully and try to use the

majority of them to do more than one command, if possible!!

One more example is the TRUE/FALSE (No IF's) statement. Because they don't use an IF, they usually "run" faster. The major drawback is they sometimes use more BYTES. One example of this is to combine lines 98 and 99 and make them line 98. Let's do it this way:

)98 GOTO((M)+(N)=0)x125+75

This example means to check M, and if any number other than 0 is there, set up a "1" flag. Then do the same for N. If there are NO "1" flags the whole TRUE/FALSE statement is "true", so then there is a "1" flag set up. It then multiplies that by 125. If it is "false" it will multiply 0 x 125 and come up with 0. Then it adds 75 to that number and then it goes to that line! Another way to do the same thing, but use more BYTES is like this:

)98 GOTO (M=0)x(N=0)x125+75

This works the SAME WAY, except that you are using 2 multiply commands instead of 2 add commands. It uses 2 more BYTES. In BOTH cases, if either M or N have any number in them other than 0, the TRUE/FALSE statement(s) will = 0. Zero x 125 = 0. 0+75 = 75. The computer will then go to line 75. If BOTH M and N are = 0, then the statements are true. 1 x 125 = 125. 125 + 75 = 200. So the computer will go to line 200!!! Our first example uses the same number is that it is on 1 line and it will "run" faster because it doesn't have an IF!!!

One VERY IMPORTANT thing to remember when using an IF inside of a "loop" is that you MUST put your "NEXT n" in a line AFTER the IF statement! If you don't, then the computer will never reach the NEXT. One other thing to be careful about is when you have a "GOTO" inside of a loop, and within the IF, you MUST first "end" the loop. This is done like this:

)5000 FOR A=0TO 9;IF A=5A=9;NEXT A;GOTO 500

If you omit "A=9;NEXT A" the computer will still be set up in a loop. If it hits this same point 3 times, your program will BOMB! There is only 1 way around this, if line 500 has a statement in it that says "FOR A=",etc. This will reset the "flag" for the A loop. Please make SURE that the loop will reset, so that it will save you MANY hours of trying to find out exactly what went wrong!!!

I hope this article has helped you understand the types of IF IF/OR and TRUE/FALSE statements so that you can use them more easily and efficiently in your programs. If you have any questions about any of my articles, or any other "tips" I can possibly help you on, please write to the ARCADIAN. They will try to put all of these questions in print,(If possible) and then I will try to have the answer for you within the next 2 issues.

NITRON NEWS

This is the latest word on the Nitron situation - The Artillery Duel and Pirate's Chase Videocades have been appearing in local stores, and more will be on the way.

> CUPERTINO, CALIFORNIA, NOVEMBER 2, 1982 . . . NITRON, INC. (NASDAQ:NITR), has reached final agreement for obtaining banking accommodations that permit substantial shipments of Astrocade video-game cartridges and consoles commencing immediately.
>
> Nitron also announced that following discussions an agreement was executed whereby Nitron was confirmed as the technological arm and primary manufacturing source for Astrocade. Subject to approval by Boards of Directors, other unnamed parties will acquire control of Astrocade. The transaction, when finalized, will involve an exchange of shares and will provide additional funds for Astrocade working capital, marketing and other corporate purposes. According to the terms of the executed Agreement, the finalization of all necessary documentation and various approvals, including completion of audit and appropriate arrangements with Astrocade creditors, is expected during November 1982.

```
  2 .ATTACK
  3 .
 10 CLEAR :BC=66;FC=6;P=0:Q=10;CX=P;CY=Q;Z=430;GOSUB 540
 15 NT=0;CX=-21;CY=10;PRINT " ATTACK
 20 CY=-39;PRINT " NUMBER OF WALLS?:
 30 U=KN(1)+10+13;CX=28;CY=-39;PRINT U;IF TR(1)=0GOTO 30
 40 IF TR(1)=1U=U+6;GOTO 60
 50 A=RND (99)
 60 @(1)=RND (99);FOR A=2TO U
 70 L=RND (99);N=A-1;FOR B=1TO N;NT=3;MU=L+B;NT=0;IF L=@(B)GOTO 70
 80 NEXT B
 90 @(A)=L;NEXT A
100 P=RND (98)-49;Q=RND (10)-5;CLEAR ;BC=6;FC=9;GOSUB 540;P=P-28;Q=Q-23;FOR A=7
TO U;GOSUB 470;GOSUB 490;NEXT A
110 FOR A=2TO 6;GOSUB 470;GOSUB 510;NEXT A;X=@(1);Y=(X-1)+10;X=X-Y*10;GOSUB 520

120 CX=-36;CY=40;PRINT "> YOUR MOVE <
130 IF TR(1)#0GOTO 155
140 K=JX(1);J=JY(1);IF K=0IF J=0GOTO 130
150 GOSUB 460;BOX H,I,5,5,1;X=X+RND (2)*K;Y=Y+RND (2)*J
155 GOSUB 520;IF X<1GOTO Z
160 IF X>10GOTO Z
170 IF Y<0GOTO Z
180 IF Y>5GOTO Z
190 C=Y*10+X;FOR A=2TO U;IF C=@(A)GOTO Z
200 NEXT A
210 FOR A=2TO 6;L=@(A);IF L<1GOTO 350
220 T=(L-1)+10;S=L-T*10;V=X-S;W=Y-T;FOR B=2TO 6;IF A=BGOTO 240
230 IF L=@(B)GOTO 250
240 NEXT B;GOSUB 480;BOX H,I,5,5,1
250 IF V=0GOTO 280
260 IF V<0S=S-1
270 IF V>0S=S+1
280 IF W=0GOTO 310
290 IF W<0T=T-1
300 IF W>0T=T+1
310 GOSUB 500;D=T*10+S;@(A)=D;IF D=CGOTO 440
320 FOR B=7TO U;IF D#@(B)GOTO 340
330 @(A)=-1;GOSUB 530;GOTO 350
340 NEXT B
350 NEXT A
360 FOR A=2TO 5;L=@(A);IF L<1GOTO 390
370 FOR B=A+1TO 6;IF L=@(B)@(A)=-1
380 NEXT B
390 NEXT A
400 FOR A=2TO 6;IF @(A)>0GOTO 120
410 NEXT A;FOR A=1TO 5;GOSUB 520;NEXT A
420 BC=202;FC=7;CY=40;PRINT " ALL ATTACKERS DESTROYED!";FOR E=1TO 30;NT=5;MU=70
;NEXT E;RUN
430 BC=1;FC=118;CY=40;PRINT "YOU ZAPPED YOURSELF,TURKEY";GOTO 450
440 FC=98;CY=40;PRINT " YOU ARE  Z A P P E D !!!
450 NT=2;FOR A=1TO 15;MU=44;X=FC;MU=46;FC=BC;MU=48;BC=X;MU=46;NEXT A
452 FOR T=1TO 5;&(17)=31;&(19)=37;&(21)=47;&(22)=31;FOR S=35TO 15STEP -1;&(16)=
S;NEXT S;FOR S=15TO 35;&(16)=S;NEXT S;NEXT T
```

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Plano TX 75074

This is somewhat like BOTS - you have to keep walls between yourself and the ever-oncoming attackers. Use JX and JY to maneuver, TR if you want to stand fast.

ARCADIAN™

```
454 FOR O=22TO 16STEP -1;&(O)=0;NEXT O;RUN
460 H=P+X*5:I=Q+Y*5;RETURN
470 S=@(A);T=(S-1)÷10;S=S-T*10
480 H=P+S*5;I=Q+T*5;RETURN
490 BOX H,I,5,5,2;NT=2;MU=H;MU=I;NT=0;RETURN
500 GOSUB 480
510 BOX H,I,5,1,2;BOX H,I,1,5,2;BOX H,I,3,3,2;NT=2;MU=55;MU=53;MU=51;MU=53;MU=5
5;NT=0;RETURN
520 GOSUB 460;BOX 0,40,160,8,2;BOX H,I,3,3,2;BOX H,I,1,1,1;NT=3;FOR E=1TO 9;MU=
80;NEXT E;NT=0;RETURN
530 BOX H,I,5,5,1;BOX H,I,3,3,3;BOX H,I,5,5,2;BOX H,I,3,3,3;BOX H,I,1,1,3;BOX H
,I,3,3,2;BOX H,I,1,1,3
535 NT=2;FOR E=1TO 15;MU=33;NEXT E;NT=0;BOX H,I,5,5,2;RETURN
540 BOX P,Q,62,62,3;BOX P,Q,60,60,3;BOX P,Q,50,50,3;RETURN
```

DUE TO THE HOLIDAYS LATER THIS MONTH, WE MAY BE DELAYED IN GETTING THE JANUARY ISSUE PRINTED.

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CHRDIS II

HOW TO USE HOME MADE GRAPHICS

BY MIKE SKALA

BUILDING YOUR OWN GRAPHICS FOR USE WITH OUR CHRDIS ROUTINE IS A FAIRLY SIMPLE TASK. THE "GRAPHIC CHARACTER MAKER" PUBLISHED IN THE ARCADIAN (VOL.3 PP.82-84) COULD BE MODIFIED READILY IF YOU KNOW WHAT YOU ARE DOING. IF YOU DON'T, THEN READ ON...

THE "CHRDIS" WILL LOOK AT YOUR CHARACTER IN BLOCKS ONE PIXEL HIGH BY EIGHT PIXELS WIDE, WITH EACH PIXEL BEING EITHER "OFF" (BC) OR "ON" (FC). YOU MUST FIGURE OUT THE VALUE OF EACH BLOCK BY TOTALLING THE "PIXEL VALUES"

128	64	32	16	8	4	2	1

FIG. 1

(REFER TO FIG.1). IF A PIXEL IS "ON", IT'S VALUE IS ADDED TO THE TOTAL. FOR EXAMPLE, ALL EIGHT PIXELS "ON" WOULD HAVE A BLOCK VALUE OF 255, ALL "OFF", A VALUE OF ZERO, OR JUST THE FOUR ON THE RIGHT HAND SIDE "ON" WOULD EQUAL 15.(8+4+2+1=15) LET'S CREATE A SMALL GRAPHIC TO ILLUSTRATE. LOOK AT FIG.#2 TO SEE HOW WE GOT OUR BLOCK VALUES. YOU CAN GO EITHER HIGHER, WIDER, OR BOTH, AND BLOCK VALUES WILL BE READ FROM LEFT TO RIGHT,(IF MORE THAN ONE BLOCK WIDE), AND TOP TO BOTTOM.

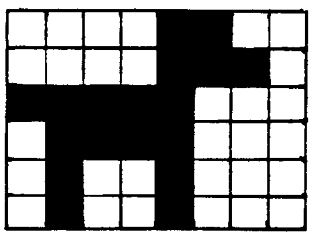

FIG. 2

SO NOW THAT YOU HAVE SOME BLOCK VALUES, WHERE DO THEY GO? WELL, WITHOUT EXTERNAL MEMORY, (E.G. A BLUE RAM, ETC.), YOU HAVE TWO CHOICES. EITHER WE STORE THEM IN THE LINE INPUT BUFFER WITH THE REST OF OUR MACHINE CODE, OR AT THE VERY BOTTOM OF OUR SCREEN. THE FORMER GETS RATHER CROWDED IN A HURRY, THE LATTER CAN GET WIPED OUT BY CLEARING THE SCREEN OR RUNNING GRAPHICS INTO THE BOTTOM. DIRECTLY FOLLOWING THE LINE INPUT BUFFER IS A MEMORY AREA CALLED THE "STACK". THIS IS SORT OF A "PARKING LOT" FOR BASIC TO STORE AND RETRIEVE DATA. SELDOM DOES THIS AREA GET FILLED UP, SO WE CAN GENERALLY RUN A FEW DOZEN BYTES INTO THIS AREA WITHOUT PROBLEMS. THE BEST APPROACH HERE IS TO PUT OUR GRAPHIC INFO IN THE DEEP END, AND OUR MACHINE CODE ROUTINE UP IN THE SAFE END. THIS WAY, IF THE STACK RUNS OVER OUR GRAPHICS, WE GET FUNNY LOOKING CHARACTERS, WHEREAS RUNNING OVER OUR MACHINE CODE ROUTINE WOULD CAUSE OUR PROGRAM TO BOMB.

WHAT WE ARE DOING HERE IS CREATING AN ALTERNATE CHARACTER FONT WITH THE MUTT BEING OUR FIRST AND ONLY CHARACTER. WE START OUR LIST OF CHARACTERS WHERE ASCII CODES END, SO HE WILL BE CHARACTER NUMBER #128. TO USE THIS FONT, WE NOW HAVE A NEW RESPONSIBILITY. WE MUST CONSTRUCT A TABLE IN MACHINE CODE THAT TELLS OUR COMPUTER ALL ABOUT THIS NEW FONT, AND LET IT KNOW WHERE WE HID THIS TABLE. LOAD THE DECIMAL VALUES BELOW WITH THIS DIRECT COMMAND:

```
FOR A=20237TO 20270;CY=0;PRINT A,;
INPUT "   ",%(A);BOX 0,0,160,20,2;
NEXT A
```

```
              DEC   HEX
%(20237)=221 }  DD }              } LOAD IX WITH ADDR
%(20238)= 33 }  21 } LD IX,nn     } OF OUR ALTERNATE
%(20239)= 34    22   n            } FONT TABLE.
%(20240)= 79    4F   n            } (20258)
%(20241)=213    D5   PUSH DE   }
%(20242)=255    FF   SYSSUK    }
%(20243)= 51    33   CHRDIS    }
%(20244)= 00    00   E (HOR)   }
%(20245)= 00    00   D (VER)   }
%(20246)= 40    28   C         }
%(20247)= 00    00   A (CHAR#) }   SAME AS
%(20248)= 00    00   NOP       }   "CHRDIS"
%(20249)=255    FF   SYSSUK    }
%(20250)= 51    33   CHRDIS    }
%(20251)= 00    00   E (HOR)   }
%(20252)= 00    00   D (VER)   }
%(20253)= 40    28   C         }
%(20254)= 00    00   A (CHAR#) }
%(20255)= 00    00   NOP       }
%(20256)=209    D1   POP DE    }
%(20257)=201    C9   RET       }
%(20258)=128    80 - # OF OUR ALT. CHARACTER
%(20259)= 00    00 } UPDATE VALUES
%(20260)= 00    00 } (WE DON'T USE 'EM)
%(20261)=  1    01 - CHR SIZE WIDTH (x8 PIXELS-1 BLOCK)
%(20262)=  6    06 - CHR SIZE HEIGHT
%(20263)= 41    29 } STARTING ADDR. OF
%(20264)= 79    4F } BLOCK VALUES (20265)
%(20265)= 12    0C }
%(20266)= 14    0E }
%(20267)=248    F8 }  (BLOCK VALUES
%(20268)=120    78 }  FOR OUR PUP.)
%(20269)= 72    48 }
%(20270)= 72    48 }
```

NOW ENTER THE FOLLOWING BASIC PROGRAM:

```
>10 %(20244)=-9999;V=0;H=0;C=128;%(20247)=C;
%(20254)=C
>20 V=V-JY(1);H=H+JX(1)
>30 IF V<0V=0
>40 IF V>82V=82
>50 IF H<0H=0
>60 IF H>152H=152
>70 %(20251)=Vx256+H
>80 CALL20237
>90 %(20244)=%(20251)
>100 GOTO 20
```

THE GAME PLAYER

by Michael Prosise

. . . tries his hand at

EXITOR'S REVENGE
L&M Software, Tape #16

and . . .

DUNGEONS OF DRACULA
Wavemakers, Tape #16

EXITOR'S REVENGE

With the assistance of Andy Guevera of Bit Fiddlers, the innovative folks at L&M Software have brought forth what may be the finest sci-fi space invasion game on tape.

EXITOR'S REVENGE, their latest release, is an exciting one-player game of skill that finds you, the player, as guardian of a planet that is about to be attacked by a Battle Star. Your defense is the force field above you, and your offense is the MX missles that you can fire upwards, steering them with your joystick towards the colorful but awesome warriors of Exitor. Your mission is to destroy the five warriors as they scout out your planet, all the while trying to avoid the photon lasers of the Battle Star. It's not easy, but it is fun!

The machine graphics, smoothness of motion, brilliant colors, continuous sound effects, and 3-D effect all combine to make EXITOR'S REVENGE a cartridge quality game.

As the game unfolds upon your TV screen, you see before you in the foreground, a city, with mountains to the side and behind. In the upper left corner, hovering in space, is an ominous looking Battle Star. Below the city, underground, is a missle launcher which you can move left and right across the width of the playfield by rotating the knob of your joystick. The trigger fires your missle left and right.

Basically the game goes something like this: From the Battle Star is launched a capsule, accompanied by an appropriate sound effect, which moves across and down (in excellent 3-D) to a point just above the city on the right. Here then emerges the first of five warriors, all of which will move back and forth across the screen, each warrior moving faster than the previous one. You must move your launcher into position and fire, directing the projectile at the warrior.

During all this, the Battle Star is firing directly at you, but you are protected by a force field. However, and here's the catch, each hit upon the force field destroys a small part of it. Therefore, if you keep your launcher in one position too long, it will eventually be hit. The player must stay on the move to survive. Three hits on your launcher and you lose. As time goes on, the force field is slowly destroyed, and Exitor's aim becomes more accurate.

EXITOR'S REVENGE is a good game, and those who choose to purchase it will probably be pleased. There is, however, only one minor item that may be a small problem for some players. The projectile launched at the warriors is so tiny it can at times be hard to follow. L&M is aware of this situation, and say they may increase the size of it in the very near future. In addition to EXITOR'S REVENGE, L&M has included one of their old favorites, THE MUMMY'S TREASURE, an interesting treasure hunt type game that has been upgraded to handle up to four players.

Also worth mentioning, is an attractive tape storage album that L&M has made available, that can store up to four tape cassettes. With a nice item like that, plus a fine game such as EXITOR'S REVENGE or their recent release SECRET OF PELUCITAR (a very graphic, excellent Sci-fi maze game), one can be well on their way to many satisfying hours of game playing.

DUNGEONS OF DRACULA

Well, Mike Peace of WAVEMAKERS has done it again: another cartridge quality game that will glue you to your TV screen for hours.

DUNGEONS OF DRACULA is an adventure-strategy type game that pits you against the computer, a computer that in this game takes the form of seven separate monsters who are out to get you.

The game consists of 10 separate and different"mazes", (not mazes in the traditional sense, but large and/or small geometric solids in various designs which you must avoid), through which you must maneuver a chain and try to capture each monster by surrounding him with your chain. At the left is where you, the chain, enter; at the right is where you want to exit, and somewhere in the maze you will see a stationary key which you must first obtain in order to get out that door on the right. However, you cannot have the key until the monster is captured. Once you have the key, the door will open and you exit to the next and naturally more difficult maze, where you face a new monster.

The joystick controls your direction, and squeezing the trigger makes you go faster, (quite fast indeed). Caution must be exercised not to touch anything, or you will disintegrate. Even the key is deadly until the monster is captured. The monsters, by the way, will be floating throughout the playing area, and vary in their aggressiveness from maze to maze. With a time clock ticking away at your playing time, you must waste no time in blocking the monsters' chances for escape and ultimately boxing them in with the chain.

Rich in color and non-stop with sound effects, this player found DUNGEONS OF DRACULA to be both challenging and enjoyable. It will, however, probably require quite a bit of practice for most players in order to reach the more advanced mazes. (CHECKMATE may be a good game to practice with in regards to maneuvering your chain at high speed in close quarters.) And like most of the WAVEMAKER games, this one can also be played by one player or up to four players.

DUNGEONS OF DRACULA . . . a good game, a fun game, and at a bargain price, too!

For Bally/Astrocade

EXITORS REVENGE

Smooth Motion *Machine Graphics*

You are the commander of the underground MX missile, defense for the top secret facility, which is code named Akreon. This is where our first interstellar star drive is being constructed. You are alerted to the presence of an object coming in from outer space. You immediately recognize it as a battle star of alien origin. You take control of the MX system, positioning the launcher, firing the missiles and guiding them to target, destroying the warriors before they can radio important data to the enemy battle star. LOOKOUT!!! The battle star will fire back.

Exitor smiled to himself as he settled the huge ship into a parking orbit, well above the sprawling complex. It will be easy, he thought, as he armed the triple photon lazers. First release the reconnaisance pods, the warriors survey the area, then destroy the star drive factory.

Exitor yearned for revenge. He and his crew had suffered heavy damage on an earlier earth scouting mission when his ship collided with an earth sattelite, causing a gigantic explosion.

Exitor had journeyed several hundred light years to stop the development of a star drive, by which the earth people could travel to distant galaxies. BUT!! he doesn't realize your underground MX system is there.

Can you save Akreon from destruction and in so doing, pave the way for travel to the stars?

Normally, a picture this detailed in 3-dimension would require more memory than is available in the Astrocade program section. We have utilized a special arcade feature called mass screen memory. There is almost 4K of memory available in this way. The game operation is contained in the 1.8K program memory section, while the machine graphic utilize specially encoded memory sections. By using all three in a unique way this game, with expanded graphics and smooth flowing motion, is possible. It is equivalent to about 6K of memory.

A special note of thanks to Andy Guevera of Bit Fiddlers, without whose help this game could not have been.

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SOFTWARE

8599 Framewood Dr.
Newburgh, IN 47630

An enhanced version of the popular Othello, this takes advantage of some of the effects available only in the Extended Basic language.

```
  1 .O-JELLO
  3 .BY CLYDE PERKINS
  5 .JAN.,'82
 10 GOTO 440
 60 GOSUB 180:E=3:F=4:GOSUB 120:GOSUB 410
 70 BOX E,F,7,6,1:G=E:H=F:E=E+JX(P)*10:F=F+JY(P)*9:FOR Z=0TO 99:NEXT Z:BOX G,H,7,6,1:IF TR(P)=(
GOTO 70
 80 X=(G+90)\10*10-85:Y=(H+90)\9*9-85:IF (ABS(X)>35)+(ABS(Y)>32)GOTO 140
 90 IF PX(X+3,Y)GOTO 110
100 S=-10:GOSUB 210:IF Q P=(P=1)+1:GOSUB 180:GOTO 150-90*(I#0)
110 GOSUB 130:PRINT "OOPS",:FOR N=0TO 1000:NEXT N:GOSUB 120:GOTO 70
120 GOSUB 130:BOX CX+9,CY,27,9,4:RETURN
130 CX=120*P-189:CY=0:NT=3:RETURN
140 GOSUB 130:PRINT "PASS",:GOSUB 170:P=2-(P#1):IF (P=1)+(I#0)GOTO 60
150 P=2:GOSUB 410:GOSUB 200:P=2:IF U#0X=C:Y=D:S=-10:GOSUB 210:P=1:GOTO 420
160 GOTO 140
170 IF PX(-69,0)=PX(51,0)GOTO 190
180 IF @(0)+@(1)#64RETURN
190 BOX 0,0,59,17,6:CX=-23:CY=0:PRINT "GAME OVER",:K=KP:RUN
200 P=0:U=0:FOR Y=32TO -31STEP -9:S=0:FOR X=-35TO 35STEP 10:M=10:IF PX(X+3,Y)M=-10:GOTO 240
210 Q=0:FOR U=X+STO X+10STEP 10:FOR W=Y-9TO Y+9STEP 9:IF PX(U+3,W)IF PX(U,W)=(P=1)*3GOTO 250
220 NEXT W:NEXT U:IF PRETURN
230 IF Q A=X:B=Y:GOSUB 390:Q=Q+R:IF U<Q U=Q+RND (9)-7:C=X:D=Y
240 S=M:NEXT X:NEXT Y:RETURN
250 Z=0:IF U<XGOTO 270
260 IF M>=U-X M=U-X-10
270 GOSUB 400:MU=RND (26)+64:A=X:B=Y:FOR L=1TO 8:A=A+U-X:B=B+W-Y:IF PX(A+3,B)=0GOSUB 400:GOTO 2
20
280 IF PX(A,B)=3b(P#1)GOTO 320
290 IF P=0GOSUB 390:Z=Z+R:NEXT L
300 IF ZGOSUB 360
310 NEXT L
320 IF P=00=Q+Z+99*(Q=0):GOSUB 400:GOTO 220
330 IF ZGOTO 220
340 IF Q=0A=X:B=Y:GOSUB 370
350 Z=1:Q=1:GOTO 270
360 T=2-P:N=-1:BOX A,B-1,7,6,4:GOSUB 380
370 T=P-1:N=1:FOR E=3TO 7STEP 2:BOX A,B-1,E,9-E,3:NEXT E:BOX A,B-1,2*P+1,2*P,3*P+1:NT=3:MU=90
*4
380 CX=120*T-63:CY=20:@(T)=@(T)+N:NT=0:PRINT #2,@(T),:RETURN
390 Q=ABS(B)\9b4+ABS(A)\10+2+32*(B<0)+16\(A<0):R=@(Q):RETURN
400 BOX X,Y-1,9,8,(P=0)*2:RETURN
410 BOX 0,-40,160,7,4;GOSUB 120:CY=-40:PRINT " ^",:RETURN
420 GOSUB 180:FOR B=-31TO 32STEP 63:FOR A=-35TO 35STEP 70:IF PX(A,B)GOSUB 390:@(Q-5)=0
430 NEXT A:NEXT B:GOTO 60
440 CLEAR :INPUT "HOW MANY PLAYERS ?"I:I=I-1:IF I>1GOTO 440
450 CLEAR :FOR N=-4TO 4:BOX N*10,0,1,73,7:BOX 0,N*9,81,1,7:NEXT N:@(0)=-1:@(1)=-1
460 FOR P=1TO 2:A=120*P-181:B=10:GOSUB 370:FOR B=-4TO 5STEP 9:A=(P*2-3)*6\ABS(B)*5:GOSUB 370:NE
XT B:NEXT P:IF I P=1:GOTO 60
470 @(2)=3:@(3)=5:@(4)=1:@(5)=8:@(7)=9:@(8)=0:@(9)=15:@(12)=-15:@(13)=2:@(17)=99
480 FOR X=0TO 3:FOR Y=0TO X:FOR Z=2TO 50STEP 16:FOR W=1TO 4STEP 3
490 @(X*W+Y*(5-W)+Z)=@(X+Y*4+2):NEXT W:NEXT Z:NEXT Y:NEXT X:P=1
500 GOTO 60
```

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ESOTERICA LTD. SOFTWARE

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The Great American Jigsaw/Big City Slick — $15.95

1. Everybody knows where California, Texas and Florida are located, but can you identify the state which the computer has selected at random and drawn in the lower left hand corner of the map? It is surely easy with seven choices from which to pick, but if you really need help the computer will assist you by showing its exact location. 10 pts for the geographer and 5 pts. for the duffer. We give you the three easy states and the other 45 go together like a jigsaw puzzle.
2. Side 2 gives you topographic features and asks for major cities. Red, White, and Blue graphics for a patriotic effect.

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1. You are sitting at the helm of the 400,000 metric ton starship looking through the front viewing screen into deep space. It is a weary ship. You have already destroyed a Klingon outpost and have just done battle with a Class 1 Cruiser. Suddenly a siren sounds "Red Alert". "Klingon Battle Cruiser" flashes accross the sensor read out and suddenly the vessel appears on the screen, very small at first, but getting bigger as he approches. He's attacking at warp factor 6! Before you react the enemy fires! An alarm sounds! Engineering reports the hit damaged the photon torpedoes. The forward sheild is still weakened from the last battle. Another blast fills the screen as its about to hit. You must act quickly! You are not yet in phaser range. What willyou do???

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The old proverbial chicken may have crossed the road to get to the other side but the road toad has slightly different motives. In the tradition of Angels Camp you will prod the toad with the use of your joystick skillfully guiding him through several lanes of traffic that becomes increasingly congested. But watch out for the speed demon in lane 3. He often comes without warning and definitely does not break for toads. (In Smooth Action Machine Language Graphics)

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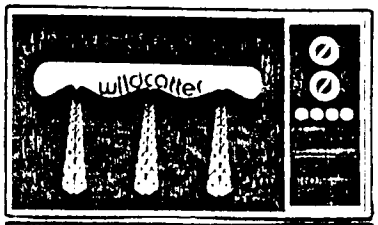
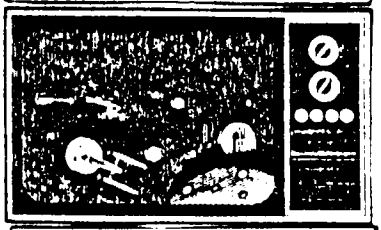
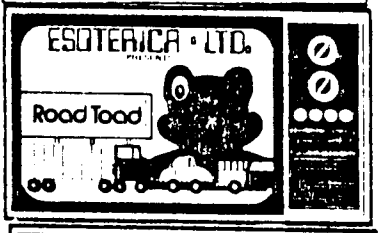
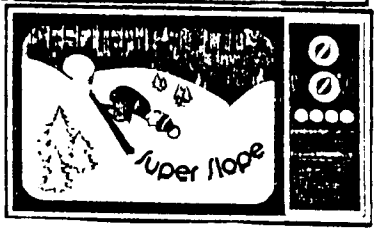
2. This complete home budget program allows you to store 12 months of financial records on a single 60 minute cassette. Written by George Moses, Distributed by Esoterica Ltd.









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ARCADIAN

THE BIT FIDDLER'S CORNER
BY
ANDY GUEVARA

Hi there! This is the first installment of what I hope will be a long and prosperous relationship between you, me, and the ARCADIAN.

The aim of this column is simple--to dispense as much "inside" knowledge as possible about the workings of the Astrocade. This means down to the bit level if necessary. I plan to cover a lot of the material referred to in the on-board subroutines manual put out by the ARCADIAN. You might want to pick up a copy. By the time we're done, we ought to be able to do just about anything a microcomputer is supposed to be able to do.

First, some preliminaries: I won't be using BASIC very much in my examples. The reason for this is that the Astrocade innards are not programmed in BASIC. BASIC as a language, is itself a program and a series of subroutines that sits between us and the Z-80 microprocessor. So, as a rule, I will be talking primarily in Z-80 machine language. I know there's not a lot of you who will understand it right off, so the first couple of installments are set up to familiarize you with the terminology and conventions used in programming at the byte level.

I see that it's time for a sales pitch...Since I won't be using BASIC, how am I going to try out examples, you might ask? Well, the answer is simple. We at The Bit Fiddlers have developed a cartridge we call the Machine Language Manager.

So as to help explain what it is, let me first explain what it isn't. The MLM is not a language cartridge like BASIC is. As I said earlier, BASIC is a program. It translates your BASIC statements to machine code (that is, instructions the Z-80 can understand) on a line-by-line basis, interpreting each statement as it goes. This is why there are line numbers; so the interpreting process doesn't get lost. This also explains why BASIC programs are relatively slow.

The MLM, not being a language, doesn't need line numbers. It works directly on the Z-80 memory. It's what is known in the trade as a Monitor program. Its purpose is to directly enter and change values or instructions the Z-80 will understand. This way you get to tell the Z-80 precisely what to do.

What this means is, in order for you to use the MLM, you're going to have to learn to use Z-80 machine language. But then, that's why this column is here...to show how the Astrocade works--in machine language.

A little more on the MLM. We've put in a few helpful capabilities, such as a formatted listing, ability to change the register contents, cassette tape storage routines for use with the original 300 Baud interface, and a print routine for those of you who have connected a printer to your unit. There are also routines in the cartridge to clear the screen, change the amount of memory available for your programs, and output single characters or whole lines to the screen or printer.

So these are the advantages:

1. You get faster-running programs
2. Programs take up less space than their BASIC equivalents
3. Memory can be rearranged to allow over 3K Bytes of storage
4. You get 4 colors for either side of the Right/Left boundary instead of 2
5. You get direct access to the on-board subroutines for animation, character generation, graphic effects, timing, and sound effects.

In other words, you have the capability to produce cartridge-quality programs that are storeable on cassette tape! Trust me.

But back to what I set out to do.

The Z-80 talks in, and responds to Bytes. Fine, what's a Byte? Well, a Byte is made up of 8 Bits. Bit is short for Binary Digit. So the Z-80 talks in Binary.

Think of it this way: At the Z-80 data port there are 8 ON-OFF switches lined up side by side. There are only two states each switch can be in: ON or OFF. This is how Binary (Base 2) arithmetic works.

To give the Z-80 a particular instruction code, we can set the switches to a particular combination of ON and OFF states. Let's assign the number 1 to the ON state and 0 to the OFF state. Now we can do it in terms of a binary code, such as 01100110.

Well, there's a better way yet. We can translate this binary number into one we can better understand. For example, 00000001=1 Base 10. Simple enough. Let's drop the leading zeros for now. OK, let's add 1+1 in Base 2: 1+1= ? Since values can only be 1's and 0's, we have to put a 0 and carry a one into the next column. The answer then is 10 in Binary, 2 in Base 10.

Well what's all this mean? It means we don't have to keep track of Z-80 instructions in configurations of 8 individual bits. We can do it by converting to numbers.

Binary goes like this:

0000	0
1	1
10	2
11	3
100	4
101	5
110	6
111	7
1000	8

and so on, to 255 for all 3 bits being turned ON. But this is a little unwieldy if we have to go back and forth to the Binary form. So let's try a different approach.

Break the 8 bit configuration into two 4-bit subcodes, like 0110 0110. Now each subcode, called a Nibble (honest!), can be a number from 0 to 15. Let's further constrain it by saying each nibble can only have a 1-digit representation. That would make 0110 0110=66 in the new code.

But what about the numbers 10 to 15? Well, since we can't have 2-digit nibbles, we'll assign the letters A through F for these values. Welcome to the Hexadecimal world!

In this system, each four bits represents one Hexadecimal column. That is: F+1=10 in Base 16. It equals 16 in Base 10.

The reason for all of this is that almost every book ever written for the Z-80, or any other microprocessor, leans heavily on Hex numbers. At 2 digits per byte you can see why, in terms of printer's ink alone!

OK, we know that Z-80 instructions are coded in Bytes made up of 2 Hex digits. But how do we get the codes into memory? And where do we put them? How does the Z-80 know where to go to get at them? Answers to these and other burning questions will be in next month's column.

One last thing. I'd like to hear from you and what you think about the column. Is it at too low a level or too high? Also, are there any requests? Do you have a particular problem or application that you would like addressed? Drop me a line!

The format of the column is still flexible and YOU are the ones to benefit. See you next time.

Andy Guevara
c/o The Bit Fiddlers
P.O. Box 11023
San Diego, CA 92111-0010

PRINTING WITH THE ASTROBASIC CARTRIDGE is now possible - if you have the old Cassette Interface modified for the printer output. In the old Bally Basic Videocade, the command *PRINT was used to pass data out through hand controller port 3. The old cassette interface was then home-modified to tap off the proper signals that would operate a serial printer. The following scheme by Al Rathmell directs the new Astro Basic to perform the same function. Remember, you must have the modified cassette interface to utilize this.

Al Rathmell writes:" A small machine language routine (45 words) is loaded from tape, in a few seconds, to a normally unused portion of RAM memory (bottom of stack area). Two simple instructions enable or disable the PRINT function.
"In order to make the routine as small as possible, the conversion of tokens (WORDS commands) to the appropriate character string is accomplished by CALLS to the Basic ROM routines.

"The note time (NT=X) can be used to slow down the average print rate just as with Bally Basic.
"To load the print routine the first time, use the direct Basic statement:

```
FOR A= 20258 TO 20344 STEP 2: PRINT A,: INPUT
%(A): NEXT A
```

"Press GO and the computer will put the first value of A on the screen. Now enter the first value of the following column of entries and press GO. The computer will then ask for the second input - and so forth. The entries are:

-9739	15882	-13367
10957	15808	6153
-3761	-736	224
-13863	10245	-12934
30974	-9448	11539
1072	24338	-12855
26878	4827	12074
13104	-6485	-6530
22272	10242	-6785
-13494	31737	13005
-9471	-6487	-7857
-6638	10242	9086
10242	-9470	12295
1786	-13550	16115
		-15584
		20274

"To save the print routine on tape for future use, type the following :PRINT %(20258),45
"Start the recorder in its RECORD mode, and press GO on the Arcade. The routine will load on the tape in a very short time, It would be a good idea to place it at the beginning of a tape, to be followed by the program of interest.
"For future use of the routine, load it into the computer from the tape with the following command

```
:INPUT %(20258)
```

"Start the recorder in PLAY, and then press GO on the Arcade.
"Two instructions are used to enable or disable the function -
1 To Enable (the equivalent of *PRINT)

```
%(20124) = 20258
```

2 To Disable (the equivalent of :RETURN)

```
%(20124) = 11531
```

"These instructions may be used in a direct Basic statement. For example, to print the entire Basic program you may have in the Arcade, and then to disable the function, use

```
%(20124)=20258:LIST:%(20124)=11531
```

This is the same as the Bally Basic's statement

```
*PRINT:LIST::RETURN
```

There is a possibility of our producing a small gadget which would be the equivalent of the old cassette interface box, but with only the insides necessary to perform the output function in conjunction with the above routine. If you are interested in joining in on such a project - a device that may cost - say $20 - let me know of

ADS

FOR SALE Bally computer system like new. 2 controllers, AstroBasic, FBall, SFortress. GPrix, 280 Zzap, GInvasion, ABattle, Incr. Wizard, ElMath, Various games on cassettes. Vol 4 of ARCADIAN $425. Steve Roach, 1016 Mockingbird Dr., Grapevine, TX 76051 817-488-9434

R&D Enterprises reports that they are no longer providing any software, and the post office will return any mail addressed to R&D.

SC-1 Suitcase to hold Astrocade and all accessories. Constructed of 1/4" plywood lined with foam and covered with vinyl to protect equipment. Hinged top with locks and keys. Measures 28-1/4 x 12-7/8 x 5-7/8 Please state size of your recorder. Custom made, $5 additional. Now cut $5! Shp wt 12# $38 ppd. Robert Pease 340 East 4 Ave, Stanley, WI 54768

For Sale Bally Arcade, 3 controllers, BBasic & Interface. ABattle & Seawolf. Complete set of ARCADIAN and some Cursor newsletters. $325 negotiable George Willis 1724 W 6 St Erie, PA 16505 *814-456-6441 evenings/weekends

For Sale Arcade in excellent condition, 4 controllers, MLM, Wizard,BJack,SFortress,GInvasion,Basic. Oak Stand & Dust Cover Vol 4 ARCADIAN $450 - all items sold as a lot. Peter Purcell 410 Windsor Ridge Dr. Westboro MA 01581 (617) 366-7024 even/weekends

For Sale Astrocade with Basic& auto cassette connector. SInvader & SFortress $250. Jayne Burdeshaw 828 Carnegie Akron OH 44314

FOR SALE Checkers III, plusThe Treasure of Cathy, for $10 - and select two of the following bonus games: Bally's Alley, Chess Board, Bowling, Hangman, O-Hello, and Inspector Clueso. All in AstroBasic. John Collins, 713 Bradford Dr. Ft. Walton Beach, FL 32548

Robert Fabris,still stuffed
3626 Morrie Dr.
San Jose, CA 95127-9990

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