

TO:

# COLOUR GENIE

## AUCKLAND DISTRICT USER GROUP NEWSHEET

ISSUE No. 6

ROMS, ROMS, ROMS — NEW ROMS FOR OLD ROMS.

This created it's fair share of discussion at the last meeting, and NOLA touches upon this subject a little further on.

Amongst the various bits and pieces collected, and so far not printed in any previous newsletters, is some information from LOWE COMPUTERS on the new ROMS, what the commands are together with brief explanatory notes. My apology for not having included this info before, but — something for a rainy day !

QUOTE ."

The new RomS add an extra line to the text display screen making it 40 x 25, and 8 lines to the Hi Res now 160 x 120. New commands have been added and a lot of the original ones speeded up, i.e. the plot command, etc. works a lot faster, the paint command will now paint intricate shapes.

One of the commands added is SWAP which allows variables, especially string variables, to be swapped without using temporary strings and without causing any string hang-ups.

Apart from adding commands and speeding certain operations up they will also allow you to use the Rom based disk operating system which is shortly to be released.

All the enhancements are upward compatible with the existing R.O.M.S.

The following features have been either added or improved:

1. The text screen is now 40 characters by 25
  2. The graphics screen is now 160 by 102. to keep compatible with the text screen.
  3. SHIFT-F2 now equals SYSTEM
  4. SHIFT-F4 now equals CSAVE "
  5. The paint command has been vastly improved to cope with difficult shapes. There is also now 3 modes of operation as follows:  
  
    PAINT X, Y, C  
    PAINT X, Y, C, B  
    PAINT X, Y, C, B, B  
  
    where X and Y = the start co-ordinates  
    C = the colour to print in  
    B = the Boundary colour
  6. The play command can now be used with expressions/commands within it, i.e. PLAY (1, KEYPAD1, KEYPAD2, (JOYIX-1) AND 15). To be able to take advantage of the various envelope shapes, you can now use the PLAY command with the volume equal to 16 which will allow whatever envelope shape has been set up to be used. E.G. SOUND 13,8 : set envelope to 8: PLAY (1,5,8,16) Further by adding 16 to the old note number a better C-Major scale can be produced.
  7. The Plot command has been speeded up.
  8. The Verify command can now be used with a program name, i.e. VERIFY "N"
  9. The &H and &O now allows spaces to follow the number within statements. Also it is now valid to use any Hex or Octal number without leading zeros, i.e. &HF.
  10. The FILL command is now replaced with FCLS n. n = 1 to 4.
  11. The SOUND command can now be used to read back the contents of the PSG chip, i.e. PRINT SOUND (n) where n = 0 - 15.
  12. The KEYPAD command can now be used with a variable, i.e. A = 1: PRINT KEYPAD (A).
  13. Scale now reads the scale factor in use, i.e. PRINT SCALE
- All the following are new commands added to the Colour Genie. The latter three are involved with Bit manipulation.
14. SWAP var, var: allows you to swap variables, which is especially useful for strings for use in sorts, etc. and doesn't cause any string "hang-ups", usually known as the "GARBAGE Collection Cycle".

- 15 SET ( b, addr ) Sets bit b in address addr
  - 16. RESET b, addr Resets bit b in address addr
  - 17 CHECK ( b, addr) Checks if bit b is set in address addr returns - 1 as true or set and 0 as false or reset.
- " UNQUOTE.

GRAPHICS:

It was unfortunate that one of our evenings Program Convenors was unable to attend, as a question arose on the very subject that both Ken and Andy were to demonstrate - Block graphics. However, something to look forward to next months meeting. Hope the family health is all O.K. now Andy.

There is always (so it seems) someone else on hand who has something to offer, and in this regard Chris BISHOP has over a period of time developed his own GRAPHICS PROGRAMMER. Chris has offered this listing for publication which you will find in this newsletter. I've tried it and it works just fine, better I think than the one in the Manual. Just one or two questions for you at the next meeting Chris.

MEMBERS TIPS:

BASIC KEYWORDS.

Single key entries BASIC can easily be achieved using the MODSEL key. Graphics will appear when you do this, but list the line afterwards and ..... SURPRISE !

CONTROL (MODSEL)

Q - INP    W - COS    E - \*    R - POS    T - RND    Y - TAN    U - LOG    I - OR    O - ASB  
 P - FRE    @ - THEN    A - NOT    S - SQR    D - -    F - /    G - [    H - \*    L - <  
 ; - INSTR    - - ERL    Z - ANT    X - SIN    C - +    V - EXP    B - STEP    N - INT    M - SGN  
 , - USR    . - ERR    / - STRING\$

CONTROL (MODSEL/SHIFT)

Q - ASC    E - LOC    R - CHR\$    T - RIGHT\$    U - MID\$    I - MKD\$    O - STR\$    P - VAL  
 @ - PEEK    A - CVI    S - LEFT\$    D - ECF    F - LOF    G - MKI\$    J - CINT    K - CSNG  
 L - CDBL    ; - VARPT    - - TIMES\$    C - CVD    V - '    B - CVS    N - LEN    M - FIX  
 , - POINT    . - MEM    / - INKEY\$

From ROSS KAY,  
 Glen Eden.

KEYBOARD MEMORY MAP

There was also a request for a reprint of the Keyboard Memory Layout.

KEYBOARD LAYOUT								
BIT NO	7	6	5	4	3	2	1	0
VALUE	128	64	32	16	08	04	02	01
ADDRESS								
FB01 (-2047)	G	F	E	D	C	B	A	@
FB02 (-2046)	O	N	M	L	K	J	I	H
FB04 (-2044)	W	V	U	T	S	R	Q	P
FB08 (-2040)	F4	F3	F2	F1		Z	Y	X
FB10 (-2032)	.	&	%	\$	#	"	!	
	7	6	5	4	3	2	1	0
FB20 (-2016)	?	>	=	<	+	*	)	(
	/	.	-	.	:	:	9	8
FB40 (-1984)	Space	→	←	↓	↑	BRK	CLR	ENTER
FB80 (-1920)				CTRL	RPT		Mod Sel	SHIFT

Meeting Held on 25th June, 1984

Another great crowd, there were 48 people at the meeting. Unfortunately, our Speaker for the evening, Andy, had a **domestic happening**, and was unable to come to the meeting. However, Olwen chaired the evening, and a discussion on software, new roms etc, was held.

Ralph Wesseling's mother was in Holland recently and brought back some German software for the Colour Genie. The two programs, Hektik and Wurm, are both available here, but we now have six 'dealer' addresses to write to. There is also a good chance that Holland will have a User's Group, so I will be asking the dealers if they can put us in touch with one.

Keith McGill is going to write to the German company for us, as I wrote to them a couple of months ago, and have had no answer. We reasoned that perhaps they don't understand English, so Keith is going to write to them in German. Hopefully, we will then get an answer.

There was a lot of discussion on the new roms that will be available shortly. I have a set in my machine, and I have found that the differences are: **Catch** cannot be played on my machine at all, **Colour Genie Golf** also has to have a special version for the new roms. There is a **SWAP** command that is included, so some of the programs from the UK User's Group magazine will have to be changed, if you have the old ROMS, i.e. **SWAP A,B** swaps the variables around, so a short line e.g. **A=C,B=A, and C=B** would have to replace this command. My F6 key also when pressed looks like this:

SYSTEM

■ ?

All that has to be added for System tapes, is the initial for the name, then press RETURN. Depends how lazy you are as to how much value that has, I must be very lazy, because I find it very handy indeed!

A bulk postage rate from the post office is to be sought for the newsletters. Apparently, if we are able to get the bulk rate, the postage goes down from 24c to 15c per envelope, which would be a good saving. I am writing to the post office today.

It was also mentioned that a lot of the programs that Rakon have got, have next to no instructions with them, i.e. PCG Edit, Orgel, Andromeda, Hektik, etc. Is there some intelligent person out there who could write instructions for these tapes that could be published in the newsletter as they are done?

Another magazine to add to the two last month, **Computer Input**. How could I forget this magazine when our own Chairman, Olwen, has a column for the Colour Genie in it. One interesting tip in the latest Computer Input - when you are scrolling through a listing, you can slow it down by pressing the REPEAT key.

The UK Users' Group's magazine **Chewing Gum** is going to be available from now on as we have now joined their Group. This magazine can be copied for any member for a blank rate of \$2.50 per copy. We also have all the back issues available for anyone that wants them. I have noted that several members at the meeting have requested copies of this magazine from now on.

Mr Goldie also brought along a terrific bag made of a sacking material to hold all your bits and pieces in. It has **I'm a Colour Genie Fan** in glorious colour emblazoned across it, and it is a good size. It will do for either males or females, and costs \$3.00. Put your order in to the Committee, and if you require it to be posted, please add another 50c. Mrs Goldie is making these bags and they look really good. Two were sold at the meeting.

Alan Clarke talked about the programs (mentioned in last months' newsletter) that he could make available. PERT is for people in the building trade, I believe PERT stands for Program and Evaluation Renew Technique.

PILOT is an authoring language program. (No, I don't really know what that means either!) I believe it is something to do with creating a program.

The STATISTICS program has mean, standard deviation, analysis of variants, and multiple regression lines, whatever they are!!

PROGRAM SEARCH is for finding a string, variable or word in a basic program.

GENERAL UTILITY PROGRAM does several things: Screen Dump, sends the whole screen to the printer, Move Memory, shifts blocks of memory to other locations, Auto Edit keeps the program in an Edit Mode, and moves from line to line instead of leaving the Edit Mode at the end of one line. This also works the opposite way, so that you can scroll backward in the Edit Mode. Renumbr Program will even work with one line or the lot. Single Keyword Entry is available too (now you can have a ZX81 !!) With a Find command, a Merge command and also being able to Recover a BASIC program, this would be an extremely handy program.

Allan also has a lot of Technical Information (including circuit diagrams) available for the TRS-80. If anyone is interested in this just let him know, his address is: 47 Marsden Street, Takapuna 9.

Software:- Since Mohammed wouldn't come to the mountain, I took along a pile of copies of the software list from the May newsletter, and got members to fill them out. We have now heard from 3 software companies in the UK and have ordered several masters from Gumboot, J. Brier, and J.D. Tronics. However, we needed to know what programs everyone was interested in before we ordered. As a matter of interest, The Word, Genie Calc and Double Agent are the most popular. The Word will definitely be available shortly. We haven't heard from the software company that has Genie Calc yet. Algray, who have Double Agent, seem to be 'going under', but as Rakon (and Nola and Olwen) have the Double Agent program, this will be able to be distributed. However, it looks at the moment as if we won't be able to get any other programs from Algray. More on this later, when I have heard from the U.K. Users' Group. You will find enclosed with this newsletter, five pages on software which is now available from the Group. You will note that a lot of the programs so far available, are also available from Rakon, but our prices are a lot better!! To order, just detail what you require, and send your cheque in. Country members, please add \$1.00 to any order to cover postage. We have purchased some of the 'bubbly bags' which will be used on all country orders. There will be more software pages next month, with new programs, as by that time, more new tapes should have arrived from overseas.

We will not be publishing a Members List in this month's magazine. As we now have 73 members/family members, it is two pages that the list takes up that can be used for programs etc. so a list will be published every two or three months.

Well, that's my lot for this month, in case Ernie forgets to put it on, remember that the next meeting will be on the

23rd June 1984

so we will see you then.

8.0 P.M

Nola Huggins

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**AUCKLAND COLOUR GENIE USERS GROUP**


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P. Q. Box 27-387,  
AUCKLAND, 4.

05 July 1984

SOFTWARE NOW AVAILABLE TO MEMBERS OF THE COLOUR GENIE GROUP

Please note: a brief review of each tape is included where possible

GAMES

COLOUR GENIE POKER	\$10.00
A very difficult game. Good graphics. Winning bets start with two pair, not one pair.	
COLOUR GENIE GOLF	\$10.00
AVAILABLE FOR EITHER NEW ROMS OR CURRENT MACHINES Good graphics. Plays nine rounds.	
KONG	\$12.00
Same as the arcade game.	
PUNKTE	\$12.00
A very good game, along the style of 'Pacman' games. Only one 'ghost' chasing you, no 'ghosts' in the middle.	
RUBIKS CUBE	\$10.00
Same, more or less, as the actual cube.	
OTHELLO	\$12.00
Also known as Reversi. A very good game, and the computer makes a good oponent.	
HEKTIK	\$12.00
A game where you have to dig holes in the 'walls' to stop the foxes from getting the eggs. (Well, I think they are foxes anyway!!) Good graphics.	
METEOR	\$12.00
A good arcade game from the German company.	
WURM	\$12.00
A very enjoyable game, apparently like 'Centipede' on other computers, where you have to shoot the worm, and he breaks up	

Software Lists - Page Two

MOTTEN- \$12.00  
 Another very good game from the German company, where you fire at moths coming towards you in a figure-eight pattern. Good sound and graphics.

FIREBIRD \$12.00  
 Another German arcade style game, with good graphics.

FUSS \$12.00  
 Another German game, similar to Snake where you grow bigger and cannot touch the sides, or the purple dots, however, this game is very difficult, and a great challenge.

BLITZ \$10.00  
 Clear a landing site for your damaged craft by bombing buildings.

WINDSCALE \$10.00  
 You have to hit little 'blobs', and the screen doesn't change until you have hit them all. Your scoring depends on how many you get, and how many times you run over your 'discharge' which is a line of white 'blobs'. Depending on what level of difficulty you choose, the line of white 'blobs' following you will either be spasmodic, or a continuous line.

SNAKE \$10.00  
 Supposed to be a good game for the younger children. Your snake grows bigger each time you swallow a frog, which keep jumping out of the lily pond. Enjoyable.

RODEO \$ 8.00  
 A game where you have to trap a ball in the top lefthand corner, by building walls to stop it bouncing. Like 'Breakout'.

MISSILE STRIKE \$10.00  
 Another arcade game, where you are above the N.M.E. shooting down on them, for a change. Supposed to be for younger children, but I feel there is quite a knack to actually hitting the N.M.E. with your laser gun. Maybe I'm not terribly good at arcade games. Yes, that's probably it.

GENIE INVADERS \$12.00  
 Another German game, exactly as a 'space invader' arcade game. Good game.

INVASION \$12.00  
 This, to my mind, is the best version of 'Space Invaders' I have seen.

CATCH \$12.00  
 Another German game, this time a 'pacman' game. Supposed to be a very good game, but is not available for the new roms.

Software Lists - Page Three

MAUSI - - - - - \$12.00  
 Another German game, this time, a mouse running across the bottom of the screen trying to reach the cheese. Pressing the figure '1' sets up umbrellas for the mouse to hide under so he doesn't have a bomb rained down on him. However, the umbrella only lasts a short time.

MAU-MAU \$12.00  
 Another German game, of the English game of '21'. However, the german version uses other cards than the ones we know, i.e. instead of an Ace to change the suit, the german version uses a Jack. Good graphics.

EAGLE \$10.00  
 Another German arcade game, which has been translated into English by Olwen

EIS \$12.00  
 An extremely good game, where you have to melt icecubes to get rid of 'ghosts' behind them. Need quick reactions. Another German game.

ANDROMEDA \$12.00  
 Another German 'arcade-style' game. Two different screens.

SAUG \$12.00  
 A different German game, this time you are at the top of the screen, and below you is a maze with 'moles' hidden. Using the arrow keys you have to send your 'pipe' in through the maze to catch these moles, and they 'suck up the pipe' very realistically. There are several screens to this, and the graphics are good.

BANK ROBBER \$10.00  
 This is another arcade style game, the object of which is to manoeuvre a man from the left to the right hand side of the screen to get a bag of money, and to re- turn to the left hand side, avoiding falling bombs. The player is helped by three barricades, which are gradually destroyed by the bombs, but which are built up again when a bag is returned to the left hand side. Each bag contains a random amount of money which is added to the player's score, and the barricades are strengthened by random amounts, and randomly selected. Totally machine code. Good game.

INVADERS \$10.00  
 A space invaders game all in machine code.

Software Lists - Page FourADVENTURE GAMES

DOUBLE AGENT	\$15.00
A very good 3-D adventure game, with sound and graphics.	

COLOUR QUEST 1 - FIND THE DIAMOND OF BALMARLON	\$10.00
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COLOUR QUEST 2 - THE VEGAN INCIDENT	\$10.00
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COLOUR QUEST 4 - CAMELOT	\$10.00
There are two versions of this, one for old roms, one for new roms.	

COLOUR QUEST 5 - SHIPWRECK	\$10.00
There are two versions of this, one for old roms, one for new roms.	

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→ NEXT MEETING            23 JULY 84

ALL SAINTS CHURCH HALL :    8 .00 PM.

PLEASE NOTE CHANGE FROM NORMAL TIME ::

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UTILITY PROGRAMS

ORGEL \$12.00  
Turn your computer into an organ. Instructions with this.

DISASSEMBLER \$15.00  
Generates assembly listings of machine code for any memory location in the Genie. Programme will disassemble any section of memory location between 0 and 65535, and print out the assembly listing.

ZEN \$20.00  
You have to have this to write machine code programmes. Contains a Monitor, Assembler, and debugger. 16 page instruction manual with this.

THE LINK \$12.00  
This programme enables you to load TRS-80 and System 80 programmes into your computer, by altering the baud rate. Once these programmes are in the computer, you then have to alter screen layout, and other differences between the machines before the programmes will run. This would be fairly easy to do with basic, providing there are not too many pokes involved, but it would be difficult with machine code, unless you had a good working knowledge of that language.

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CS-666  
DATA RECORDER**



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WILL LOAD ALL  
GENIE PROGRAMS  
G. Pinkney*

**ONLY  
\$129.50**

**CP 80  
PRINTER \$595**

Printer type: Dot-matrix, bidirectional, logic seeking  
Print speed: 80 cps  
Head format: 9x8 dots  
Graphics modes: 640/1280 dots per line  
Std chars/line: 80  
Max chars/line: 142  
Paper feed: Friction/sprocket  
Max paper width: 10in  
Std interface: Centronics parallel  
Ribbon type: Cartridge  
Options: RS232C interface

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GOTO SYSTEMS 1990 GOTO SYSTEMS 1990

# Conversion chart

sent in by David Donaldson.

This quick reference chart shows some of the variations in the BASIC used by the machines in this book. It does not include instructions for graphics, sound or colour as these vary so enormously from machine to machine. Note also that although most computers (except the BBC) use PEEK and POKE, they do not use the same system of memory addresses, so the numbers used with PEEK and POKE must be changed for each computer.

	BBC	VIC/Pet	Apple	TRS-80	ZX Spectrum	ZX81
Select random number between 0 and 0.9999999	RND(1)	RND(1)	RND(1)	RND(0)	RND	RND
Select random number between 1 and N	RND(N)	RND(1)*N+1	RND(1)*N+1	RND(N)	RND*N+1	RND*N+1
Select random letter between A and Z	CHR\$(RND*(26)+64)	CHR\$(INT(RND(1)*26+65))	CHR\$(INT(RND(1)*26+65))	CHR\$(RND*(26)+64)	CHR\$(INT(RND*26+65))	CHR\$(INT(RND*26+38))
Clear screen	CLS	PRINT CHR\$(147)	HOME	CLS	CLS	CLS
Check keyboard to see if key being pressed	INKEY\$(N)	GET XS	XS=" " IF PEEK(-16384) > 127 THEN GET XS	INKEY\$	INKEY\$	INKEY\$
Convert characters into code numbers	ASC("X") (using ASCII code)	ASC("X") (using ASCII code)	ASC("X") (using ASCII code)	ASC("X") (using ASCII code)	CODE("X") (using ASCII code)	CODE("X") (using ZX81 code)
Move cursor up	PRINT CHR\$(11)	PRINT CHR\$(145)	CALL -908	PRINT CHR\$(27)	PRINT CHR\$(11)	PRINT CHR\$(112)
Move cursor down	PRINT CHR\$(10)	PRINT CHR\$(17)	PRINT CHR\$(10)	PRINT CHR\$(26)	PRINT CHR\$(10)	PRINT CHR\$(113)
Move cursor left	PRINT CHR\$(8)	PRINT CHR\$(157)	PRINT CHR\$(8)	PRINT CHR\$(24)	PRINT CHR\$(8)	PRINT CHR\$(114)
Move cursor right	PRINT CHR\$(9)	PRINT CHR\$(29)	PRINT CHR\$(21)	PRINT CHR\$(25)	PRINT CHR\$(9)	PRINT CHR\$(115)
Take 1st N characters of string	LEFT\$(A\$,N)	LEFT\$(A\$,N)	LEFT\$(A\$,N)	LEFT\$(A\$,N)	AS(1 TO N)	AS(1 TO N)
Take last N characters of string	RIGHT\$(A\$,N)	RIGHT\$(A\$,N)	RIGHT\$(A\$,N)	RIGHT\$(A\$,N)	AS(N TO )	AS(N TO )
Take middle N characters of string	MID\$(A\$,N1,N2)	MID\$(A\$,N1,N2)	MID\$(A\$,N1,N2)	MID\$(A\$,N1,N2)	AS(N1 TO N2)	AS(N1 TO N2)

## ASCII chart

Code number	ASCII character	Code number	ASCII character
32	space	62	>
33	!	63	?
34	"	64	("
35	#	65	A
36	\$	66	B
37	%	67	C
38	&	68	D
39	'	69	E
40	(	70	F
41	)	71	G
42	*	72	H
43	+	73	I
44	,	74	J
45	-	75	K
46	.	76	L
47	/	77	M
48	0	78	N
49	1	79	O
50	2	80	P
51	3	81	Q
52	4	82	R
53	5	83	S
54	6	84	T
55	7	85	U
56	8	86	V
57	9	87	W
58	:	88	X
59	;	89	Y
60	<	90	Z
61	=		

## ZX81 code chart

Code number	ZX81 character	Code number	ZX81 character
11	"	41	D
12	£	42	E
13	\$	43	F
14	:	44	G
15	?	45	H
16	(	46	I
17	)	47	J
18	>	48	K
19	<	49	L
20	=	50	M
21	+	51	N
22	-	52	O
23	*	53	P
24	/	54	Q
25	:	55	R
26	.	56	S
27	.	57	T
28	0	58	U
29	1	59	V
30	2	60	W
31	3	61	X
32	4	62	Y
33	5	63	Z
34	6		
35	7		
36	8		
37	9		
38	A		
39	B		
40	C		



...We'd like to put two bucks on "Happy Daddy" running in the seventh today...



"Quick, Charliel How much is 27 minus 6?"

"CREATIVE COMPUTING"

## Chart of screen sizes

	Max. number of characters across (or number of columns)	Max. number of lines down (or number of rows)
VIC 20	22	23
TRS-80	64	16
BBC	20/40/80	16/24/32
ZX81	32	22
ZX Spectrum	32	22
Apple	40	25

Most (if not all) members have programs that have taken a little locating. In general many of these relate to the more technical or internal memory of the computer. You will probably recognise the value of the three programs that follow. Well worth the effort of putting on tape and adding to your own library.

```
10 ' MICROSOFT BASIC FUNCTIONS
    NAME LIST IN LEVEL 11 ROM
15 '
20 CLS:FORN=5712T06175:Y=PEEK(N):IFY>127THENY=Y-128:M=N
25 Z=N+1:IFPEEK(Z)>127THENPRINTCHR$(Y);TAB(7)"=";ELSEGOTO35
30 PRINT TAB(8)M::GOTO40
35 PRINTCHR$(Y);
40 NEXT
10 ' PROGRAM TO MATCH BASIC FUNCTIONS
    WITH CALL ADDRESSES
15 '
20 CLS:PRINT"FUNCT"TAB(8)"=ADDRESS      LSB-MSB"
25 A=6176:FORX=5712T06175:Y=PEEK(X):IFY>127THENY=Y-128
30 Z=X+1:IFPEEK(Z)>127THENPRINTCHR$(Y);TAB(8)"=";ELSEGOTO45
35 A=A+2:IFA=6352THENA=5640
40 PRINTA,PEEK(A);"-";PEEK(A+1);:PRINT:GOTO50
45 PRINTCHR$(Y);
50 NEXT
```

```
10 PR=17462:X=4069
20 CLS:PRINT@0,TAB(18);"MENU"
30 FORL=17426T017430:POKEL+&HAC00,11:NEXT
40 POKE16419,7:PRINT@07,"TYPE 1 FOR DECIMAL TO HEX"
50 PRINT@127,"TYPE 2 FOR HEX TO DECIMAL"
60 PRINT:PRINT:INPUTR
70 IFR=1THEN100
80 IFR<>2THEN40
90 GOTO210
100 COLOUR1:CLS:PRINT@0,"Input Decimal Number ";:INPUTDEC:IF NOT(DEC>0)OR NOT(DEC<65536) THEN PRINT@0,CHR$(30);:GOTO100
110 DC1=DEC:DEC=DEC/X:GOSUB160
120 CNV=H1:GOSUB170:CNV=H2:GOSUB170:CNV=H3:GOSUB170:CNV=H4:GOSUB170
130 PRINT@280,"AGAIN ? (Type 'Y' to continue else 'N')":INPUTR#
140 IFR#="Y"THEN GOTO100ELSEGOTO200
150 .
160 H1=INT(DEC):DEC=H1*X:A=DC1-DEC:B=A:H2=INT(A/256):H4=B-(H2*256):H3=INT(H4/16)
:H4=H4-(H3*16):RETURN
170 CNV=CNV+48:IFCNV>57 CNV=CNV+7
180 IFCNV<48THENCNV=48
190 COLOUR4:PRINT@40,"Hexidcimal =":POKEPR,CNV:CP=PR+&HAC00:POKECP,08:PR=PR+1
200 FORL=1T050:NEXT:RETURN
210 CLS:COLOUR2:
220 PRINT@0,"ENTER Hexidcimal Number":INPUTHX#
230 IF LEN(HX#)<>4:PRINT@0,CHR$(30);:GOTO220
240 F1=ASC(LEFT$(HX#,1)):F2=ASC(RIGHT$(HX#,3)):F3=ASC(RIGHT$(HX#,2)):F4=ASC(RIGHT$(HX#,1))
250 IF F1>57THENF1=F1-7 ELSE IF F1<0THEN F1=0
260 IF F2>57THENF2=F2-7ELSEIFF2<0THENF2=0
270 IFF3>57THENF3=F3-7ELSEIFF3<0THENF3=0
280 IFF4>57THENF4=F4-7ELSEIFF4<0THENF4=0
290 F1=F1-48:IF F1<0THENF1=0
300 F2=F2-48:IF F2<0THENF2=0
310 F3=F3-48:IF F3<0THENF3=0
320 F4=F4-48:IF F4<0THENF4=0
330 F1=F1*4096:F2=F2*256:F3=F3*16
340 HX=F1+F2+F3+F4
350 COLOUR7:PRINT@40,"Decimal Number = ";HX
360 MSB=INT(HX/256)
370 LSB=HX-(MSB*256)
380 COLOUR3:PRINT@335,"MSB = ";MSB
390 COLOUR2:PRINT@375,"LSB = ";LSB
400 PRINT:PRINT
410 COLOUR4:PRINT"ANOTHER ? ('Y' for another go else 'N')"
420 X#=INKEY#:IFX#=""THEN420
430 IFX#<>"Y"THEN20
440 GOTO210
450 END
```

PROGRAMMABLE GRAPHIC GENERATOR

```
10 AD=-3072:L=128
20 GOTO 1630
30 REM::SCREEN DISPLAY::
40 A$="E1234567812345678E"
50 CLS:COLOUR1:PRINT@85,A$
60 J=124
70 FOR N=1TO8
80 PRINT@J,N:PRINT@J+17,N
90 J=J+40
100 NEXT N
110 J=444
120 FOR N=1 TO 8
130 PRINT@J,N:PRINT@J+17,N
140 J=J+40
150 NEXT N
160 PRINT@765,A$
170 COLOUR7
180 PRINT@243,"A":PRINT@265,"B":PRINT@603,"C":PRINT@625,"D"
190 COLOUR2
200 PRINT@920,"PRESS -D- WHEN GRAPHICS ARE COMPLETE"
210 GOTO 1680
220 REM::PRINT DATA::
230 COLOUR4:CLS
240 PRINT@400,"A= DATA":A1:","A2:","A3:","A4:","A5:","A6:","A7:","A8
250 PRINT@480,"B= DATA":B1:","B2:","B3:","B4:","B5:","B6:","B7:","B8
260 PRINT@560,"C= DATA":C1:","C2:","C3:","C4:","C5:","C6:","C7:","C8
270 PRINT@640,"D= DATA":D1:","D2:","D3:","D4:","D5:","D6:","D7:","D8
280 GOTO 1760
290 REM::TITLE & DESCRIPTION :
300 CLS:COLOUR8
310 PRINT" PROGRAMMABLE GRAPHIC"
320 PRINT" GENERATOR -"
330 PRINT:PRINT:PRINT" BY C.BISHOP 1980"
340 PRINT:PRINT:PRINT:PRINT" THE PROGRAM PRODUCES PROGRAMABLE"
350 PRINT" CHARACTERS IN BLOCKS OF 4 AT A TIME "
360 PRINT" IN SEQUENTIAL NOS STARTING AT CHR$(128)
370 FOR J=1 TO 800:NEXT J
380 PRINT:PRINT:PRINT"PRESS -S- START OR PRESS -?- FOR INST
RUCTIONS"
390 A$=INKEY$
400 IF A$="" GOTO 390 ELSE 410
410 IF A$="/" GOTO 1740
420 IF A$="S" GOTO 1660
430 GOTO 380
440 REM::CURSOR MOVEMENT::
450 C=686:PRINT@C,"█"
460 K$=INKEY$
470 IF K$="" GOTO 460
480 IF K$="D" GOTO 490 ELSE 530
490 COLOUR8:PRINT@805,"TYPE -Y- TO CONFIRM"
500 PRINT@845,"GRAPHICS ARE FINISHED"
510 K$=INKEY$:IF K$="" GOTO 490 ELSE 520
520 IF K$="Y" THEN GOTO 1700 ELSE GOTO 530
530 FOR B=804TO879:PRINT@B," ";
540 NEXT B
550 IF K$=" " THEN PRINT@C," "
560 IF K$="C" THEN PRINT@C," "
570 IF PEEK(16444)=8 THEN C=C-40:PRINT@C,"█"
580 IF PEEK(16444)=32 THEN C=C-1:PRINT@C,"█"
590 IF PEEK(16444)=64 THEN C=C+1:PRINT@C,"█"
600 IF PEEK(16444)=16 THEN C=C+40:PRINT@C,"█"
610 GOTO 460
620 REM::DATA CALC'S::
630 COLOUR1
640 FOR S=P TO P+7
650 G=PEEK(S)
660 IF G=202 THEN V=V+X ELSE V=V+0
670 X=X/2
680 NEXT S
690 RETURN
700 REM::INSTRUCTIONS::
710 CLS:COLOUR4
720 PRINT:PRINT:PRINT"CURRENT POSITION OF CURSOR IS SHOWN"
730 PRINT" BY ( █ )"
740 PRINT:PRINT:PRINT"THIS IS MOVED BY USING THE ARROW KEYS"
750 PRINT:PRINT:PRINT"PRESSING THE SPACE BAR WILL PRODUCE "
760 PRINT" THIS WILL BE RECORDED AS PART OF"
```

```

770 PRINT" YOUR CHARACTER"
780 PRINT:PRINT:PRINT"IF YOU GO OVER A THEN ■ WILL APPEAR"
790 PRINT" & YOU MUST PRESS THE SPACE BAR AGAIN"
800 PRINT:PRINT" PRESS ANY KEY TO CONTINUE"
810 REM:
820 K$=INKEY$:IF K$="" THEN GOTO 810 ELSE GOTO 1660
830 REM::DATA CALCULATIONS::
840 PRINT@390,"WORKING"
850 V=0:X=128:P=17494:GOSUB 630
860 A1=V:POKEAD,A1
870 V=0:X=128:P=17534:GOSUB 630
880 A2=V:POKEAD+1,A2
890 V=0:X=128:P=17574:GOSUB 630
900 A3=V:POKEAD+2,A3
910 V=0:X=128:P=17614:GOSUB 630
920 A4=V:POKEAD+3,A4
930 V=0:X=128:P=17654:GOSUB 630
940 A5=V:POKEAD+4,A5
950 V=0:X=128:P=17694:GOSUB 630
960 A6=V:POKEAD+5,A6
970 V=0:X=128:P=17734:GOSUB 630
980 A7=V:POKEAD+6,A7
990 V=0:X=128:P=17774:GOSUB 630
1000 A8=V:POKEAD+7,A8
1010 V=0:X=128:P=17502:GOSUB 630
1020 B1=V:POKEAD+8,B1
1030 V=0:X=128:P=17542:GOSUB 630
1040 B2=V:POKEAD+9,B2
1050 V=0:X=128:P=17582:GOSUB 630
1060 B3=V:POKEAD+10,B3
1070 V=0:X=128:P=17622:GOSUB 630
1080 B4=V:POKEAD+11,B4
1090 V=0:X=128:P=17662:GOSUB 630
1100 B5=V:POKEAD+12,B5
1110 V=0:X=128:P=17702:GOSUB 630
1120 B6=V:POKEAD+13,B6
1130 V=0:X=128:P=17742:GOSUB 630
1140 B7=V:POKEAD+14,B7
1150 V=0:X=128:P=17782:GOSUB 630
1160 B8=V:POKEAD+15,B8
1170 V=0:X=128:P=17814:GOSUB 630
1180 C1=V:POKEAD+16,C1
1190 V=0:X=128:P=17854:GOSUB 630
1200 C2=V:POKEAD+17,C2
1210 V=0:X=128:P=17894:GOSUB 630
1220 C3=V:POKEAD+18,C3
1230 V=0:X=128:P=17934:GOSUB 630
1240 C4=V:POKEAD+19,C4
1250 V=0:X=128:P=17974:GOSUB 630
1260 C5=V:POKEAD+20,C5
1270 V=0:X=128:P=18014:GOSUB 630
1280 C6=V:POKEAD+21,C6
1290 V=0:X=128:P=18054:GOSUB 630
1300 C7=V:POKEAD+22,C7
1310 V=0:X=128:P=18094:GOSUB 630
1320 C8=V:POKEAD+23,C8
1330 V=0:X=128:P=17822:GOSUB 630
1340 D1=V:POKEAD+24,D1
1350 V=0:X=128:P=17862:GOSUB 630
1360 D2=V:POKEAD+25,D2
1370 V=0:X=128:P=17902:GOSUB 630
1380 D3=V:POKEAD+26,D3
1390 V=0:X=128:P=17942:GOSUB 630
1400 D4=V:POKEAD+27,D4
1410 V=0:X=128:P=17982:GOSUB 630
1420 D5=V:POKEAD+28,D5
1430 V=0:X=128:P=18022:GOSUB 630
1440 D6=V:POKEAD+29,D6
1450 V=0:X=128:P=18062:GOSUB 630
1460 D7=V:POKEAD+30,D7
1470 V=0:X=128:P=18102:GOSUB 630
1480 D8=V:POKEAD+31,D8
1490 GOTO 1720

```

```

1 COLOUR7:CLS:PRINTTAB(13)"DOORS"
2 PRINTTAB(10)"CREATIVE COMPUTING"
3 PRINTTAB(9)"MORRISTOWN, NEW JERSEY"
4 PRINT
5 PRINT
6 PRINT
25 DIM K(20)
31 X=0
32 FOR X=0 TO 6:READ R$(X):NEXT X:X=0
33 FOR X=0 TO 6:READ S$(X):NEXT X
35 D=1:T=RND(14):N=RND(4):K3=(RND(11))-1
37 IF T>(K3*N) THEN GOTO 35
40 PRINT"THERE ARE "N:"LOCKED DOORS"
41 PRINT"AND THERE ARE"K3:"KEYS(0-"K3-1)"
42 PRINT"YOU WILL HAVE "T-1:"TRIES TO OPEN THEM ALL"
43 PRINT"(SOME KEYS MAY OPEN MORE THAN ONE DOOR)"
65 FOR X=2 TO N:K(X)=RND(K3)-1:NEXT X
70 T=T-1:IF T=0 THEN 150
80 PRINT"TRIES LEFT "T:" DOOR #":D:"KEY":
90 INPUT K2
100 IF K2<>K(D) THEN 70
110 PRINT S$(RND(7)-1):D=D+1
120 IF D<N+1 THEN 70
125 PRINT
130 PRINT"YOU DID IT, BEHIND DOOR #":N:"IS
140 PRINT R$(RND(7)-1) "!!":GOTO 170
150 PRINT"YOU LOSE, THE REST OF THE KEYS ARE:"
160 FOR X=D TO N:PRINT"DOOR":X:"KEY"K(X):NEXT X
170 PRINT"DO YOU WANT TO PLAY AGAIN(YES SIR! OR NO SIR!)"
171 INPUT Q$
180 IF Q$="YES SIR!" THEN 35
181 IF Q$="NO SIR!" THEN 999
190 PRINT"I WAS NOT BORN YESTERDAY YOU KNOW !! GET IT RIGHT THIS TIME !!!"
195 PRINT:PRINT
200 GOTO 170
500 DATA "A POT OF GOLD","A BEAUTIFUL MAIDEN","A MAN EATING TIGER"
505 DATA"NOTHING","$22.59","A ROLLS ROYCE","THE KEYS TO THE WORLD"
600 DATA"OPEN SESAME!","C-R-E-E-E-E-A-A-K!","WA LAH!","TA-DAH!"
605 DATA"ABRACADABRA!","CLICK !!!!!!!????????!!!!!!","SURPRISE!"
607 RESTORE
999 END

```

```

1500 COLOUR8:PRINT@40,"THE CHARACTERS YOU HAVE JUST DRAWN"
1510 PRINT@80,"HAVE BEEN ENTERED AS CHR$(:L:) TO"
1520 PRINT@120,"CHR$(:L+3:)"
1530 PRINT@160,"THESE CHR'S WILL STAY IN THE MEMORY"
1540 PRINT@200,"EVEN AFTER ( NEW ) IS TYPED"
1550 PRINT@240,"UNTIL THE COMPUTER IS SWITCHED OFF"
1560 PRINT@280,"OR THEY ARE REPLACED BY RUNNING THIS"
1570 PRINT@320,"PROGRAM FROM START."
1580 PRINT@760,"NOTE THE DATA FOR FUTURE REFERENCE"
1590 PRINT@800,"BEFORE CONTINUING. "
1600 COLOUR7:PRINT@880,"PRESS ANY KEY TO CONTINUE"
1610 K$=INKEY$
1620 IF K$="" GOTO 1610 ELSE GOTO 1780
1630 REM::MAIN MENU::
1640 REM::TITLE & DESCRIPTION @ 290::
1650 GOTO 290
1660 REM::SCREEN DISPAY @ 30::
1670 GOSUB 30
1680 REM::CURSOR MOVEMENT @ 440::
1690 GOSUB 440
1700 REM::DATA CALC'S @ 830::
1710 GOTO 830
1720 REM::PRINT DATA @ 220::
1730 GOTO 220
1740 REM::INSTRUCTIONS @ 700::
1750 GOTO 700
1760 REM::FINAL INSTRUCTIONS @ 1500::
1770 GOTO 1500
1780 REM ::OPTIONS::
1790 CLS:COLOUR4:PRINT:PRINT:PRINT
1800 PRINT" SELECT ONE OF THE OPTIONS BELOW"
1810 PRINT:PRINT:PRINT
1820 PRINT" 1. RUN PROGRAM FROM START"
1830 PRINT" 2. CREATE ADDITIONAL CHR'S"
1840 PRINT" 3. VIEW CHARACTERS"
1850 PRINT" 4. REVIEW LAST DATA SET"
1860 PRINT" 5. EXIT PROGRAM"
1870 PRINT:PRINT:PRINT" PRESS < No > & < RETURN >"
1880 INPUT R
1890 ON R GOTO 10,1900,1910,230,2290
1900 AD=AD+32:L=L+4:GOTO 30
1910 CLS:PRINT:PRINT:PRINT:PRINT
1920 PRINT" YOU CAN HAVE :-"
1930 PRINT:PRINT
1940 PRINT" 1. CHARACTERS IN BLOCKS OF 4"
1950 PRINT:PRINT:PRINT"  "
1960 PRINT"  "
1970 PRINT:PRINT:PRINT
1980 PRINT" 2. CHARACTERS IN LINE"
1990 PRINT:PRINT:PRINT"  " " " " "
2000 K$=INKEY$
2010 IF K$="" GOTO 2000 ELSE GOTO 2020
2020 IF K$="1" GOTO 2040 ELSE GOTO 2030
2030 IF K$="2" GOTO 2210 ELSE GOTO 2000
2040 REM CHR'S (1)::
2050 P=128
2060 CLS:COLOUR1
2070 PRINT@139,CHR$(P)
2080 PRINT@140,CHR$(P+1)
2090 PRINT@179,CHR$(P+2)
2100 PRINT@180,CHR$(P+3)
2110 COLOUR4
2120 PRINT@130,P:PRINT@150,P+1:PRINT@170,P+2:PRINT@190,P+3
2130 PRINT@242,"PRESS -M- FOR NEXT SET OF CHARACTERS"
2140 PRINT@330," OR"
2150 PRINT@410,"-K- TO RETURN TO OPTIONS"
2160 K$=INKEY$
2170 IF K$="M" THEN GOTO 2190 ELSE GOTO 2180
2180 IF K$="K" THEN GOTO 1780 ELSE GOTO 2160
2190 P=P+4
2200 GOTO 2060
2210 REM::CHR'S (2)::
2220 CLS:FOR Q=128 TO L+3
2230 PRINTCHR$(Q),
2240 NEXT Q
2250 GOTO 2260
2260 PRINT@760,"PRESS K TO RETURN TO OPTIONS"
2270 K$=INKEY$
2280 IF K$="K" GOTO 1780 ELSE GOTO 2270
2290 CLS:COLOUR2:PRINT@100,"H A V E"
2300 COLOUR4:PRINT@140," A"
2310 COLOUR7:PRINT@180,"R O T T E N"
2320 COLOUR5:PRINT@220," D A Y"
2330 COLOUR1::END

```

```

5 CLEAR 1000
10 CLS:DIR$(91):COLOUR7
20 PRINT:RANDOM
30 PRINT$(15) "SCRAMBLED EGGS"
40 PRINT
45 GOSUB 4000
50 PRINT"THIS IS THE GAME OF SCRAMBLED EGGS."
60 PRINT"WHERE YOU WILL SOON SEE THAT A BOSS"
70 PRINT"FITTING TITLE WOULD BE SCRAMBLED"
80 PRINT"FINCERS YOU WILL BE GIVEN QUESTIONS"
90 PRINT"SELECTED FROM FOUR CATEGORIES."
100 PRINT"THE CATEGORY IS SELECTED RANDOMLY."
120 GOSUB 5000
130 CLS:PRINT:COLOUR6
140 PRINT "ANSWERS WILL BE ENTERED USING"
150 PRINT"ONLY THE LETTERED KEYS."
160 PRINT"THE RETURN KEY WILL NOT BE USED."
170 PRINT"YOU HAVE ROUGHLY 30 SECONDS PER"
180 PRINT"QUESTION.EACH POINT IS WORTH $1.00"
190 PRINT"AND FIGURED AS FOLLOWS : "
200 PRINT"EACH LETTER PER ANSWER IS WORTH 1 POINT"
210 PRINT"IF YOU ANSWER INCORRECTLY(YOU ONLY"
230 PRINT"GET ONE CHANCE PER QUESTION),YOU"
240 PRINT"WILL BE CHARGED THAT MANY POINTS "
250 PRINT"AGAINST THE CORRECT ANSWER IN MEMORY."
255 PRINT"PLUS THE SECONDS YOU TOOK TO ANSWER IT"
260 GOSUB 5000:CLS:COLOUR1
270 PRINT
280 PRINT"CORRECT ANSWERS : "
290 PRINT"YOU CAN OBTAIN THE HIGHEST POINTS BY"
300 PRINT"ANSWERING CORRECTLY WITHIN 10 SECONDS"
310 PRINT"EXAMPLE:IF YOUR ANSWER IS CORRECT WITHIN"
320 PRINT"10 SECONDS YOU WILL GAIN 20 POINTS(TIME"
330 PRINT"REMAINING),AND A POINT FOR EACH LETTER."
340 PRINT"OTHERWISE A CORRECT ANSWER WILL GAIN YOU"
350 PRINT"A POINT FOR EACH LETTER IN THE ANSWER."
360 PRINT"IF YOUR ALLOTTED TIME EXPIRES AND YOU DO"
370 PRINT"NOT ANSWER,YOU LOSE 30 POINTS(TIME TAKEN"
380 PRINT"AND A POINT FOR EACH LETTER IN THE "
390 PRINT"CORRECT ANSWER IN MEMORY."
395 GOSUB 5000:CLS:PRINT:COLOUR4
397 PRINT"REMEMBER,ENTER THE ANSWER USING ONLY THE"
398 PRINT"LETTER KEYS.THEN PRESS THE ONE(1)"
400 PRINT"TO STOP THE CLOCK AND COMPARE YOUR"
405 PRINT"ANSWER.YOU WILL SOON CATCH ON..."
410 GOSUB 5000:CLS:COLOUR8
415 FOR Z=1 TO 4:N(Z)=2:NEXT
420 P=30:T=350:E=10:TP=0:R=0:D=0:F=0:J=0
430 I=INT(SHRND(0)+1)
435 IF N(I)=0ANDN(2)=0ANDN(3)=0ANDN(4)=0THEN 1200
440 IFN(I)=0THEN 430
445 ON I GOTO 450,460,470,480
450 C="ANIMALS":Z="268.00":N=1:GOTO 490
460 C="MIXED":Z="1265.00":N=2:GOTO 490
470 C="INSECTS":Z="1254.00":N=3:GOTO 490
480 C="DICTIONARY":Z="1278.00":N=4:GOTO 490
490 IF R>0 THEN 790
500 FOR A=1 TO 40:READ$(A):NEXT
505 DATA ELEPHANT,GIRAFFE,CHEETAN,HIPPOTAMUS,RHINOCEROS,DOG,TIGER,COW,GORILLA,MOA
515 DATA RABBIT,HOAX,ENDURE,DIET,MECHANISM,SOUTH ISLAND,TRANSISTOR,GAMES,TUBE,APPLE
5 ASPIDER,FLEA,FLY,ANT,TICK,LOCUST,CENTIPEDE,LADYBIRD,BUTTERFLY,TERMITE
535 DATA IMPOSTER,COEFFICIENT,BETRAY,STORAGE,VOCATION,TRINAL,SUPPOSE,POSTSCRIPT,MEASURE,AFFIDAVIT
580 REM READ CATEGORY QUESTIONS
590 FOR Q=51 TO 90:READ$(Q):NEXT
600 DATA LARGEST LAND ANIMAL,TALLEST OF ALL QUADRUPEDS
610 DATA HUNTING LEOPARD OF INDIA,THE RIVER HORSE
620 DATA ONE OR TWO HORNS ON THE SNOUT,A DOMESTICATED ANIMAL
630 DATA A LARGE FIERCE RAPACIOUS QUADRUPED,GIVES MILK
640 DATA LARGEST APE KNOWN,EXTINCT BIRD
650 DATA ABSURD,PRACTICAL JOKE,PUT UP WITH,SPECIAL REFERENCE TO FOOD
660 DATA PARTS OF A MACHINE,THE MAINLAND ?
670 DATA A SMALL COMPONENT REPLACING THE VALVE,FUN-FROLIC
680 DATA A PIPE,A RED FRUIT TREE
690 DATA HAS EIGHT LEGS,BLOOD SUCKING PARASITIC,A TWO WINGED INSECT
700 DATA INVADERS PICNICS,ANOTHER BLOOD SUCKING PARASITIC
710 DATA DESTRUCTIVE WINGED INSECT,SUPPOSED TO HAVE ONE HUNDRED LEGS
720 DATA MARKED WITH BLACK SPOTS,AN ADULT CATERPILLAR
730 DATA A WOOD EATING INSECT
740 DATA AN ASSUMED CHARACTER,COOPERATING WITH ANOTHER
750 DATA DECIEVE,SPACE FOR GOODS,OCCUPATION,PERTAINING TO THREE
760 DATA TO IMAGINE,PARAGRAPH ADDED TO THE END OF A LETTER
770 DATA VOLUME OR EXTENT OF ANYTHING COMPARED
780 DATA SWORN STATEMENT IN WRITING
790 REM PRINT - QUESTION START LOOP
795 PRINT"DON'T TYPE TOO FAST AND DON'T BACKSPACE"
796 PRINT
797 PRINT"CATEGORY : ":C
798 PRINT"WIN UP TO ":Z:" IN THIS CATEGORY."
800 PRINT

```

```

805 PRINT"IF READY? ":GOSUB 5000:CLS:PRINT
810 ON R GOTO 820,1050,1070,1090
820 Q=51:S=1:A=1:Q=0
830 PRINT
835 PRINT$(Q):R
840 X=INKEY$:IF X="1"THEN SS=INT(S/10):GOTO 890
850 N=0
870 L=L+X:Q=RID$(L,1,1)
875 N=N+X:PRINT N:
880 S=S+1:IF S>10 THEN 840
885 Q=LEN(A$(A)):GOSUB 4100:GOSUB 4200:GOTO 940:REM OUT OF TIME
890 Q=L:Q=LEN(A$(A)):Q=LEN(Q)
900 REM COMPARE STRINGS
910 IF Q=A$(A) THEN 930
920 GOSUB 4050:GOSUB 4200:GOSUB 7000:PRINT$(A):GOTO 940:REM INCORRECT
930 GOSUB 4000:GOSUB 4200:GOSUB 8000:REM CORRECT
940 S=1:A=A+1:Q=Q+1
950 IF N=1 AND Q<61 THEN 830
960 IF N=2 AND Q<71 THEN 830
970 IF N=3 AND Q<81 THEN 830
980 IF N=4 AND Q<91 THEN 830
1020 N(I)=0:R=1: GOTO 420:REM ANOTHER CATEGORY
1050 Q=61:S=1:A=11:Q=0:L=0
1060 GOTO 830
1070 Q=71:S=1:A=21:Q=0:L=0
1080 GOTO 830
1090 Q=81:S=1:A=31:Q=0:L=0
1100 GOTO 830
1200 GOSUB 5000:CLS:PRINT
1210 PRINT"OUT OF 40 QUESTIONS,"
1220 PRINT"THE TOTAL AMOUNT OF MONEY YOU"
1230 PRINT"ACCUMULATED WAS : ":D:
1240 PRINT PT:F:
1250 PRINT
1255 HP=1065
1260 PRINT"HIGHEST POSSIBLE AMOUNT WAS : ":D:HP:F:
1270 PRINT
1280 PRINT"WOULD YOU FEEL LIKE SOME MORE?. (YES OR NO) ":
1290 INPUT IN:
1300 IF IN("N") THEN 1320
1310 GOTO 1330
1320 RESTORE:R=0:PP=0:GOTO 410
1330 PRINT
1340 PRINT"SO LONG....."
1350 PRINT"END OF GAME."
1355 PRINT:PRINT"PLEASE TRY ME AGAIN....SOON"
1360 END
4000 PRINT:PRINT
4010 PRINT"CORRECT !!"
4020 IF SS<10 THEN TP=TP+Q+20:PT=PT+Q+20:GOTO 4040
4030 TP=TP+Q
4040 L=0:Q=0:RETURN
4050 PRINT:PRINT
4060 PRINT"INCORRECT RESPONSE"
4070 TP=TP-Q-SS
4075 PT=PT-Q-SS
4080 L=L+Q:Q=0:RETURN
4100 PRINT:PRINT
4105 SS=30
4120 TP=TP-Q-Q-SS:PT=PT-Q-Q-SS
4125 IF TP=0 THEN TP=TP+Q+SS:PT=PT+Q+SS
4130 L=L+Q:Q=0
4140 RETURN
4200 REM AMOUNT ACCRUED
4210 IF TP=0 THEN PRINT"AMOUNT ACCRUED : ":D:TP:F:GOTO 4230
4220 PRINT"AMOUNT LOST : ":D:TP:F:
4230 RETURN
5000 PRINT "PRESS ANY KEY..."
5010 X=INKEY$:IF X=" "THEN 5010
5020 RETURN
6000 PRINT "DO YOU WANT INSTRUCTIONS ?"
6005 PRINT:PRINT"FOR YES TYPE 'Y':PRINT "FOR NO TYPE 'N' "
6010 GOSUB 5000
6020 IF X="Y" THEN RETURN ELSE IF X="N" THEN GOTO 410 ELSE PRINT "Y OR N PLEASE. ":GOTO 6000
7000 REM EXPLOSION
7010 SOUND6,0
7020 SOUND7,7
7030 SOUND8,16
7040 SOUND9,16
7050 SOUND10,16
7060 SOUND12,56
7070 SOUND13,0
7080 RETURN
8000 PLAY(1,4,1,10)
8010 PLAY(2,4,3,10)
8020 GOTO 8500
8030 PLAY(1,4,1,0)
8040 PLAY(2,4,3,0)
8050 VB=VB+1:IF VB<2 GOTO 8000 ELSE VB=0: RETURN
8500 FORVV=1 TO 200:NEXT:GOTO 8030

```

ASSEMBLY LANGUAGE FOR BEGINNERS

This will be an occasional series which may be supplemented from time to time by a demonstration at the club night. I believe that the only real way to learn machine coding is by doing it and playing with small modules. In order to be able to follow the instructions, you will need a monitor program, such as G-MON (Computing Today, Feb 84) or ZEN. Do not attempt to learn the methods by just reading about it. Power up your Colour Genie, load up your monitor, and start here.

Let us make some of the jargon of Assembly Programming clear first:

\* **Machine Code** is the 0's and 1's that actually tell the computer what to do. It is usually expressed in hexadecimal numbers (base 16) or hex for short.

\* **Assembly** is the language in which the machine code is represented by a set of mnemonics, e.g. the machine code instruction 11000011 (binary) or C3 (hex) is represented by the operation instruction JP (jump).

\* A **bit** is one digit of a binary number. Thus C3 hex is an 8 bit number. (8 bits = 1 byte)

\* The **Most Significant Byte (MSB)** is the largest byte of a 16 bit number and the **Least Significant Byte (LSB)** is the smallest byte of a 16 bit number. Thus the LSB of 443A hex is 3A hex and 44 hex is the MSB.

\* **ASCII** (American Standard Code for Information Interchange) is the numerical code which is used to tell computers which letter, number or symbol to use, e.g. 41 hex represents the letter A and 32 hex represents the number 2.

\* A **register** is the place where the Z80 keeps its current working information. We have access to 9 registers at any one time. The others are best left alone at this stage. The registers act like the memories of an electronic calculator.

Ready?

Enter the following machine code using your monitor in the Modify mode:

\* Type in the following:

M 8000

G-MON should show M:8000:00:

\* Now type in the following numbers without a break:

21 00 44 06 1A 3E 41 77 23 10 FC C3 66 00

\* Press X to exit from the monitor mode

\* Enter J 98000 J to start the program but don't blink or you will miss the action.

\* If you want to see it again, clear the screen and type in CALL 8000.

If you have an 'accident' and you crash the system, don't panic. Do a RESET, then CALL BC00 to re-enter G-MON and start over again. If you never have a crash, then you will never have done any machine coding! It's part of the fun (and agony).



This is the machine code program that you have just entered:

Machine Code	Operation	Operand	Explanation
21 00 44	LD	HL,4400H	<b>Load</b> the combined HL registers with the hex number 4400.
06 1A	LD	B,1AH	<b>Load</b> the B register with 1A hex
0E 41	LD	A,41H	<b>Load</b> the A register with 41 hex
77	LD	(HL),A	<b>Load</b> the memory location pointed to by the HL register with the value contained in the A register
23	INC	HL	<b>Increment</b> the value in the HL register
10 FC	DJNZ	LOOP	<b>Decrement</b> the value in the B register by one and <b>jump</b> back if it is still <b>non zero</b> .
C3 66 00	JP	0066H	<b>Jump</b> to location 0066 in ROM which is the re-entry to BASIC.

I will not tell you what you have seen, but now try changing some of the numbers to see the effect.

- \* Change 4400, but be careful! If you go outside the range 4400-4800, the results can be unpredictable!
- \* Change 1A to change how much is printed on the screen.
- \* Change 41 to change what is printed.

If you have never done any machine coding before this, then welcome to a new field. What I would like from those folks who are interested in Assembly, is a response of some kind, even if it is only a moan. Let me know, through Nola, of things you don't understand, or don't like in the articles, and also things that you as a beginner, would like explained.

-A.G.C. (the Video Genie man)

#### Please Note -

G-MON is available on tape from the Colour Genie Users Group for \$3.50 (this includes the cost of the tape.)

ZEN is available, also on tape, for \$20.00.

The reason for the difference in cost, is that G-MON has been typed in from a magazine by one of our members, and royalties have to be paid on ZEN.

-Nola

RENUMBER and MERGE

At the last club meeting, one of the utilities requested was for a means of renumbering one line only. Two small routines which I developed will enable this. Type in this program and save it to tape. You may either merge it with one of your existing programs or start a new program from line 100 (say). To use the MERGE facility, type in RUN 40. The program will cope with either normal or expanded memory. When you have finished with the Utilities, simply DELETE 0 - 58. - Allan Clarke

```

0 ' *** PROCEDURE RENUMBER *** A.G.Clarke
2 'N.B. Does not renumber line number references in program.
4 INPUT"First line to be renumbered";L1
6 INPUT"Last line to be renumbered";L2
8 INPUT"Enter new start of line numbers";L
10 INPUT"Line number increments";LX
12 I=PEEK(16548)+PEEK(16549)*256 ' I=LOCATION OF LINE POINTER
14 P1=PEEK(I+2);P2=PEEK(I+3)
16 LN=P1+P2*256 ' CURRENT LINE NUMBER
18 IF PEEK(I+1)=0 THEN END
20 IF LN>=L1 GOSUB 26
22 IF LN>=L2 THEN END
24 I=PEEK(I)+PEEK(I+1)*256:GOTO 14
26 HB=INT(L/256):LB=L-HB*256
28 POKE I+2,LB:POKE I+3,HB
30 L=L+LX
32 RETURN
34 '
36 '
38 ' *** PROCEDURE MERGE ***
40 P1=PEEK(16633);P2=PEEK(16634);P1=P1-2
42 IF P1<0 THEN P1=P1+256:P2=P2-1
44 P3=PEEK(16548);P4=PEEK(16549)
46 INPUT"Press <RETURN> when the second program
is ready to load.";
48 PRINT:PRINT"When you have renumbered the second
program, if necessary, with RENUM, enter
the commands 'POKE 16548,\"P3\"' and 'POKE
16549,\"P4\"'."
50 PRINT:PRINT"Remember that the starting line number
of the second program must be greater
than the last line number of the first
program."
52 POKE 16548,P1:POKE 16549,P2
54 CLOAD
56 END
58 '

```

```

3 REM MODIFIED FOR A COLOUR GENIE BY          BARRY WALKER.
5 CLS:COLOUR1
10 PRINTTAB(16)"WUMPUS"
20 PRINT "CREATIVE COMPUTING MORRISTOWN NEW JERSEY"
24 PRINT:PRINT:COLOUR7:PRINT"P. 179.MORE BASIC COMPUTER GAMES":COLOUR1:PRINT
30 INPUT"DO YOU WANT INSTRUCTIONS?(Y-N)" I$
50 IF I$="N"THEN 60 ELSE GOSUB 1000
60 REM SET UP CAVE(DODECAHEDRAL NODELIST
70 DIM S(20,3)
80 FOR J=1 TO 20
90   FOR K=1 TO 3
100    READ S(J,K)
110   NEXT K
120 NEXT J
130 DATA 2,5,8,1,3,10,2,4,12,3,5,14,1,4,6
140 DATA5,7,15,6,8,17,1,7,9,8,10,18,2,9,11
150 DATA10,12,19,3,11,13,12,14,20,4,13,15,6,14,16
160 DATA15,17,20,7,16,18,9,17,19,11,18,20,13,16,19
200 REM LOCATE L ARRAY ITEMS
210 REM 1- YOU,2-WUMPUS,3&4PITS,5&6BATS
220 DIM L(6),M(6)
230 FOR J=1 TO 6
240   L(J)=RND(20)
260   M(J)=L(J)
270 NEXT J
280 REM CHECK FOR CROSSOVERS(IEI(1)=L(2)   ETC)
290 FOR J=1 TO 6
300   FOR K=J TO 6
310     IF J=K THEN 330
320     IF L(J)=L(K) THEN 240
330   NEXT K
340 NEXT J
350 REM SET # ARROWS
360 A=5
365 L=L(1)
370 REM RUN THE GAME
375 COLOUR4:PRINT"HUNT THE WUMPUS"
380 REM HHAZARD WARNINGS AND LOCATIONS
390 GOSUB 2000
400 REM MOVE OR SHOOT
410 GOSUB 2500
420 ON O GOTO 440,480
430 REM SHOOT
440 GOSUB 3000:GOSUB 6000
450 IF F=0 THEN 390
460 GOTO 500
470 REM MOVE
480 GOSUB 4000
490 IF F=0 THEN 390
500 IF F>0 THEN 550
510 REM LOSE
520 PRINT"HA HA HA - YOU LOSE"
530 GOTO 560
540 REM WIN
550 PRINT"HEE HEE HEE HEE -THE WUMPUS WILL GET YOU ...   NEXT TIME !!!"
560 FOR J=1 TO 6
570   L(J)=M(J)
580 NEXT J
590 PRINT"SAME SET UP(Y-N)"
600 INPUT I$

```

With W U M P U S if you remove the NBGRD statement (which is part of line 8145) when the normal screen is called the screen is white, and wherever there is something on the low resolution screen there is a block the same colour as what was there. The Break key restores things to normal.

What appears to happen is that if the Background command is used on the LGR page followed by some Print statements, the Genie goes into a background mode. You get printed a block one character wide which is the colour of the character in that position on the LGR page -- the original CHUNKY GRAPHICS on a white screen.

```

605 CLS
610 IF I<>"Y" THEN 230
620 GOTO 360
800 COLOUR(RND(15)):PRINT@880,"PRESS P FOR PREVIOUS PAGE"
810 COLOUR(RND(15)):PRINT@920,"PRESS N FOR NEXT PAGE";
820 I$=INKEY$:IF I$="" THEN 800
830 COLOUR N2:CLS
840 IF I$="P" THEN ON I2-1 GOTO 1010,1070,1140,1230,1350,1350
850 ON I2GOTO 1070,1140,1230,1350,1410
1000 REM INSTRUCTIONS
1010 PRINT"WELCOME TO*::COLOURS:PRINT" HUNT THE WUMPUS *::COLOURI
1020 PRINT" THE WUMPUS LIVES IN A CAVE OF 20 ROOMS."
1030 PRINT"EACH ROOM HAS 3 TUNNELS LEADING TO OTHER ROOMS."
1040 PRINT"(LOOK AT A DODECAHEDRON TO SEE HOW THIS WORKS)":PRINT:PRINT
1050 PRINT"I WILL SHOW YOU WHAT A DODECAHEDRON IS."
1055 PRINT"PRESS ANY KEY"
1057 FG$=INKEY$:IF FG$="" GOTO 1057
1058 PRINT"PRESS ANY KEY TO GET BACK TO INSTRUCTION*::FOR SN=1 TO 600:NEXT:SN=1: GOSUB 8000
1059 LGR
1060 N2=1:I2=1:GOTO 800
1070 COLOUR7:PRINT" HAZARDS:"
1080 PRINT"BOTTOMLESS PITS - TWO ROOMS HAVE BOTTOMLESS PITS IN THEM."
1090 PRINT" IF YOU GO THERE, YOU FALL INTO THE PIT(AND YOU LOSE !)"
1100 PRINT"SUPERBATS - TWO OTHER ROOMS HAVE SUPER BATS."
1110 PRINT"IF YOU GO THERE ,A BAT GRABS YOU AND"
1120 PRINT"TAKES YOU TO SOME OTHER ROOM AT RANDOM (WHICH MIGHT BE TROUBLESOME)"
1130 N2=7:I2=2:GOTO800
1140 PRINT " WUMPUS : "
1150 PRINT"THE WUMPUS IS NOT BOTHERED BY THE HAZARDS"
1160 PRINT"(HE HAS SUCKER FEET AND IS TOO BIG FOR A BAT TO LIFT).USUALLY HE IS ASLEEP."
1170 PRINT"TWO THINGS WAKE HIM UP: YOUR ENTERING HIS ROOM OR YOU SHOOTING AN ARROW."
1180 PRINT" IF THE WUMPUS WAKES UP, HE MOVES (P=.75) ONE ROOM"
1190 PRINT"OR STAYS STILL"
1200 PRINT"(P=.25). "
1210 PRINT"AFTER THAT, IF HE IS WHERE YOU ARE, HE EATS YOU UP(AND YOU LOSE !)"
1220 I2=3:GOTO 800
1230 PRINT" YOU:"
1240 PRINT"EACH TURN YOU MAY MOVE OR SHOOT A CROOKED ARROW"
1250 PRINT" MOVING: YOU CAN GO TO ONE ROOM(THRU ONE TUNNEL)"
1260 PRINT" ARROWS: YOU HAVE 5 ARROWS. YOU LOSE WHEN YOU RUN OUT."
1270 PRINT"EACH ARROW CAN GO FROM ONE TO FIVE ROOMS. YOU AIM BY : "
1275 PRINT "TELLING"
1280 PRINT" THE COMPUTER THE ROOMS YOU WANT THE ARROW TO GO TO."
1290 PRINT" IF THE ARROW CAN'T GO THAT WAY (IE NO TUNNEL) IT"
1300 PRINT "MOVES"
1310 PRINT " AT RANDOM TO THE NEXT ROOM."
1320 PRINT" IF THE ARROW HITS THE WUMPUS, YOU WIN."
1330 PRINT" IF THE ARROW HITS YOU, YOU LOSE."
1340 I2=4:GOTO 800
1350 PRINT"WARNINGS:"
1360 PRINT" WHEN YOU ARE ONE ROOM AWAY FROM THE WUMPUS OR A HAZARD, THE COMPUTER SAYS : "
1370 PRINT" WUMPUS- ' I SMELL A WUMPUS'"
1380 PRINT" BATS - ' BATS NEARBY'"
1390 PRINT" PIT - ' I FEEL A DRAFT'"
1400 I2=5:GOTO 800
1410 RETURN
2000 REM PRINT LOCATION AND HAZARD WARNINGS
2010 PRINT
2020 FOR J=2 TO 6
2030 FOR K=1 TO 3
2040 IF S(L(1),K)<L(J) THEN 2110
2050 ON J-1 GOTO 2060,2090,2090,2100,2100
2060 PRINT"I SMELL A WUMPUS!":GOSUB7000
2070 GOTO 2110
2080 PRINT"I FEEL A DRAFT!":GOSUB7000
2090 GOTO 2110
2100 PRINT"BATS NEARBY!":GOSUB7000
2110 NEXT K
2120 NEXT J
2130 PRINT"YOU ARE IN ROOM *::L(1)
2140 PRINT"TUNNELS LEAD TO *::S(L,1):S(L,2):S(L,3)
2150 PRINT
2160 RETURN
2500 REM CHOOSE OPTION
2510 PRINT"SHOOT OR MOVE(S-M)"
2520 INPUT I$
2530 IF I$<>"S" THEN 2560
2540 O=1
2550 RETURN
2560 IF I$<>"M" THEN 2510
2570 O=2
2580 RETURN
3000 REM ARROW ROUTINE
3010 F=0
3020 REM PATH OF ARROW
3030 L=L(1)
3040 PRINT"NO OF ROOMS(1-5)"
3050 INPUT J9
3060 IF J9 <1 OR J9 >5 THEN 3040
3070 FOR K=1 TO J9
3080 PRINT"ROOM NUMBER * "
3090 INPUT P(K)
3095 IF K<=2 THEN 3115
3100 IF P(K)<P(K-2) THEN 3115
3105 PRINT"ARROWS ARE NOT THAT CROOKED-TRY ANOTHER ROOM"
3110 GOTO 3080
3115 NEXT K
3120 REM SHOOT ARROW
3140 FOR K=1 TO J9
3150 FOR K1=1 TO 3
3160 IF S(L,K1)=P(K) THEN 3295
3170 NEXT K1
3180 REM NO TUNNEL FOR ARROW
3190 L=S(L,RND(3))
3200 GOTO 3300
3210 NEXT K
3220 PRINT"MISSSED"
3225 L=L(1)
3230 REM MOVE WUMPUS
3240 GOSUB 3370
3250 REM AMMO CHECK
3255 A=A-1
3260 IF A>0 THEN 3280
3270 F=-1
3280 RETURN
3290 REM SEE IF ARROW IS AT L(1) OR L(2)
3295 L=P(K)
3300 IF L<>L(2) THEN 3340
3310 PRINT"AAA! YOU GOT THE WUMPUS!"
3320 F=1
3330 RETURN

```

```

3340 IF L<>L(1) THEN 3210
3350 PRINT"OUCH!ARROW GOT YOU!"
3360 GOTO 3270
3370 REM- MOVE WUMPUS ROUTINE
3380 K=RND(4)
3390 IF K=4 THEN 3410
3400 L(2)=S(L(2),K)
3410 IF L(2) <>L THEN 3440
3420 PRINT "TSK TSK TSK -WUMPUS GOT YOU!"
3430 F=-1
3440 RETURN
4000 REM- MOVE ROUTINE
4010 F=0
4020 PRINT "WHERE TO":
4030 INPUT L
4040 IF L<1 OR L>20 THEN 4020
4050 FOR K=1 TO 3
4060 REM- CHECK IF LEGAL MOVE
4070 IF S(L(1),K)=L THEN 4130
4080 NEXT K
4090 IF L=L(1) THEN 4130
4100 PRINT "NOT POSSIBLE-":
4110 GOTO 4020
4120 REM-CHECK FOR HAZARDS
4130 L(1)=L
4140 REM- WUMPUS
4150 IF L <>L(2) THEN 4220
4160 PRINT "...OOPS! BUMPED A WUMPUS!"
4165 GOSUB 7600
4170 REM- MOVE WUMPUS
4180 GOSUB 3380
4190 IF F=0 THEN 4220
4200 RETURN
4210 REM- PIT
4220 IF L <>L(3) AND L <> L(4) THEN 4270
4225 GOSUB 7200
4230 PRINT "YYYYIIIIIEEEE....FELL IN PIT"
4240 F=-1
4250 RETURN
4260 REM- BATS
4270 IF L <> L(5) AND L <> L(6)THEN 4310
4275 GOSUB 7400
4280 PRINT "ZAP...SUPER BAT SNATCH! ELSEWHEREVILLE FOR YOU
4290 L=RND(20)
4300 GOTO 4130
4310 RETURN
5000 END
6000 REM SHOOTING SOUND
6010 SOUND 6,15
6020 SOUND 7,7
6030 SOUND 8,16
6040 SOUND 9,16
6050 SOUND10,16
6060 SOUND12,16
6070 SOUND13,0
6080 RETURN
7000 REM WARNING SOUND
7010 SOUND 7,254
7020 SOUND 8,15
7030 FOR SN=1 TO50
7040 SOUND 0,150

```

```

7050 FOR SJ=1 TO20 :NEXT:SI=0
7060 SOUND 0,155
7070 FOR SJ=1 TO 20:NEXT
7080 NEXT
7090 SOUND 8,0:SI=0:SN=0
7100 RETURN
7200 REM FALLING
7210 FOR SN=1 TO 255
7220 SOUND 7,254
7230 SOUND 8,15
7240 SOUND 0,SN
7250 NEXT
7260 SOUND 8,0:SN=0
7270 FOR SJ=1 TO 100:NEXT:SI=0
7280 SOUND 6,0
7290 SOUND 7,7
7300 SOUND 8,16
7310 SOUND 9,16
7320 SOUND 10,16
7330 SOUND 12,56
7340 SOUND 13,0
7350 RETURN
7400 REM BLASTOFF
7410 SOUND 7,248
7420 SOUND 8,15:SOUND 9,15:SOUND10,15
7430 FOR SN=1 TO 255
7440 SOUND 0,SN
7450 SOUND 2,256-SN
7460 FOR SJ=1 TO 20
7470 SOUND4,SJ:NEXT
7480 NEXT
7490 SOUND 7,255
7500 SI=0:SN=0
7510 RETURN
7600 PLAY(3,1,12,15)
7610 FOR SN=1 TO 50:NEXT
7620 SN=0:SOUND7,255
7630 RETURN
7999 REM DRAW DODECAHEDRON
8000 FOR BGRD:FCOLOUR4
8010 PLOT20,5TO90,5TO115,55TO60,95TO
5,60TO20,5
8020 PLOT30,15TO80,15TO100,55TO60,80TO
25,60TO30,15
8030 PLOT57,25TO75,40TO70,55TO50,55TO
40,40TO57,25
8040 PLOT57,25TO57,15
8050 PLOT20,5TO30,15
8060 PLOT90,5TO80,15
8070 PLOT40,40TO28,33
8080 PLOT75,40TO87,33
8090 PLOT5,60TO25,60
8100 PLOT50,55TO40,70
8110 PLOT60,80TO60,95
8120 PLOT70,55TO83,67
8130 PLOT 100,55TO115,55
8140 FG#=INKEY#:IF FG#=""THEN 8140
8145 LGR:NBCRD
8150 FG#="" :RETURN

```