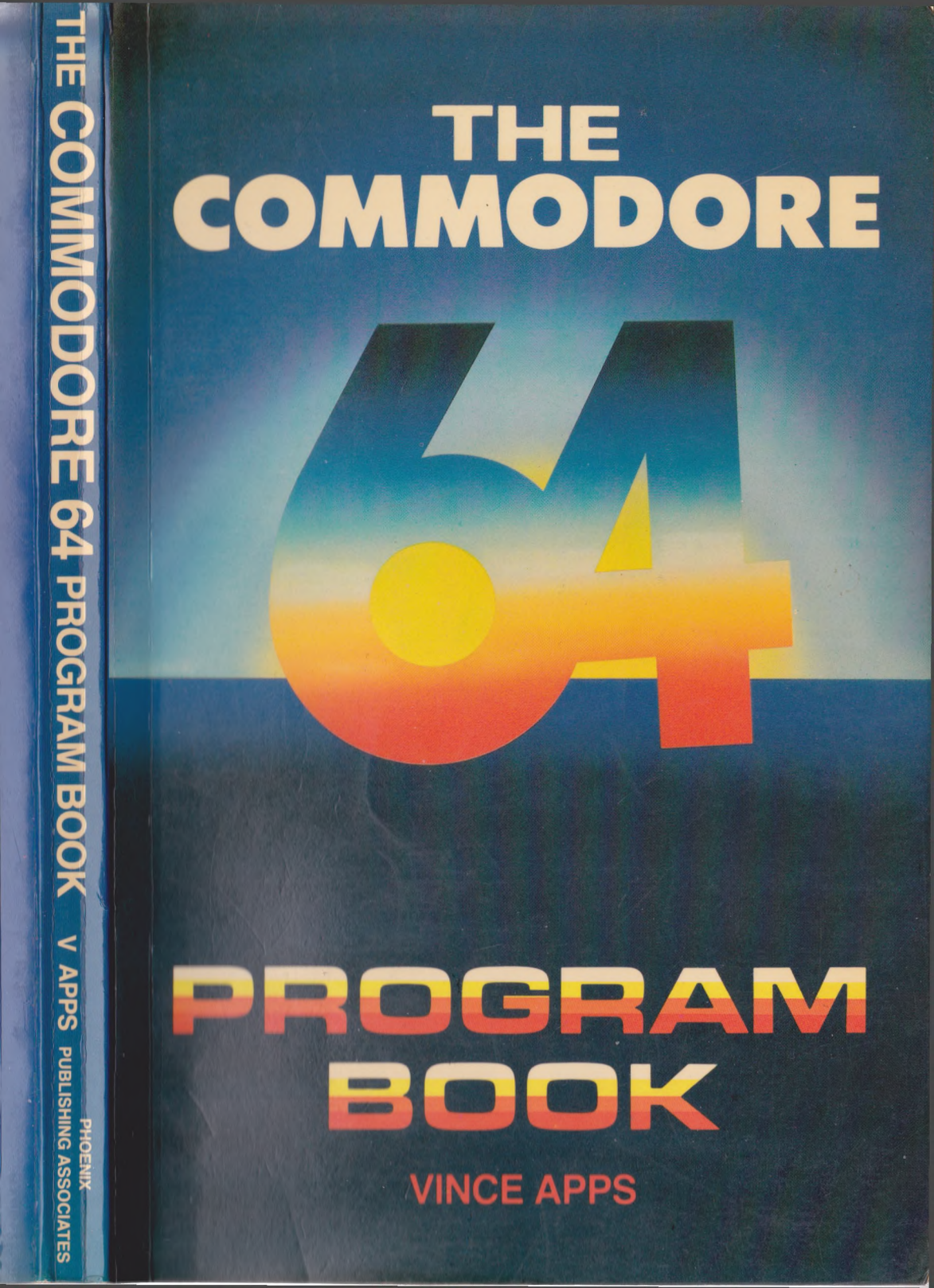
THE COMMODORE 64 PROGRAM BOOK
V APPS
PHOENIX PUBLISHING ASSOCIATES
THE COMMODORE
64
PROGRAM BOOK
VINCE APPS

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VINCE APPS

Phoenix Publishing Associates
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FOREWORD

If you are a Commodore 64 owner, or are about to become one, it is probably because you have decided that this computer offers you more on graphics, colour, sound and memory.

Because of the potential of the Commodore 64, we have written a wide selection of programs to meet your needs.

If you are a games player, you will find ample use of colour and graphics to please your eye and test your reactions. If you are someone who is interested in 'beating the computer' by working out logical steps, then the adventure games are for you.

Programmers are catered for with a highly versatile assembler/disassembler program, which will allow machine code users to convert hexadecimal to decimal. They will also be able to save and load machine code routines to, and from, tape.

To help users understand the graphic symbols, we have listed the line numbers and given instructions for their use. We have also explained sub-routines, so that users may alter the programs, if they wish, to increase the speed and complexity of many of the games.

All of the programs in this book have been listed complete with spaces to improve clarity. Normally Commodore Basic does not require spaces between key words and variables or numerical constants and their deletion will both save space in memory and may speed up the running of the program.

Examples:

POKE 1024, 6 becomes POKE1024,6
GOTO 590 becomes GOTO590
FOR J = 1 TO 10 becomes FORJ=1TO10

If you are a beginner to computing it may be a good idea to type in the programs exactly as listed, complete with spaces, until you are sure that the program has been entered correctly. Spaces can always be removed afterwards using the delete key.

The programs in this book have been very carefully debugged and the listing dumped direct from the computer before printing. This is to ensure reliable error-free listings that should work first time, every time. If a program doesn't work your first reaction will probably be to scream, but remember that virtually all mistakes are caused by simple typing errors or by not knowing how to use your machine.

Read the instruction manual supplied with the machine and approach the typing in a slow and careful manner. Remember that the more effort that you put into learning about your computer, the more you will undoubtedly get out of it.

Contents

FORBIDDEN CITY

In a deserted city on a far away planet, there is legend of a hidden treasure guarded by force fields, hallucinatory gases and alien life forms. Do you have the courage to set forth and seek the treasure?

The city lies at the edge of a vast primeval forest, near shimmering lakes, and will offer the unsuspecting visitor choices of silver spoons, blue liquids, metal discs and possible death. You will see however, that if the going gets tough, you can always stop for a Coke!!

How to play

Your input is a standard form of verb followed by noun eg. Take Spoon, Take Metal Box, Take Notebook etc. Compass directions can be abbreviated to N, S, E, W.

If you haven't typed in an adventure game before, you will find that it can be time consuming as you have to be very careful with data statements, otherwise you could run round in circles, as the logical structure of the program will collapse. We recommend therefore, that you have a cassette recorder to hand, so that you can load your listings when you have had enough work for one sitting. You can then complete your input at your next session.

We have also included a "save game" feature so that, if you cannot finish the adventure before you have to surrender the family television set, you can just type the word SAVE as your command; and LOAD to re commence.

Graphics Characters

Line	
14	Clear
20	6 cursor down
120	Clear
180	Cursor down
186	Cursor down
190	2 cursor down
210	Clear
290	Home, cursor down
360	Full line of Commodore key and I
3280	Clear
3380	Clear
3455	Clear
3470	Clear
3472	6 cursor down
3480	12 cursor down
3510	Clear
3512	6 cursor down
3514	12 cursor down
3520	Clear

The program

Lines	
30- 114	Dimension arrays and read in Data
120- 190	Print game instructions
280- 360	Print location descriptions
404- 526	Input and analyse command and goto relevant part of program
530-580	Verb press
590-680	Drink
690-850	Insert
870-1010	Read
1020-1260	Pull
1270-1370	Use

1380-1412	Drop
1450-1582	Go
1590-1732	Take
1750-1982	Examine
2000-2182	Open
2190	Verb data
2200-2202	Noun data
2214-2980	Location descriptions and exit data
2990-3212	Help
3220-3240	Delay subroutine
3280-3360	Save game
3380-3460	Load game
3470-3530	End of game routines

```
10 REM FORBIDDEN CITY
12 REM
14 PRINT "□"
20 PRINT "■■■■■■■■" TAB(11) "FORBIDDEN CIT
Y"
30 DIM M(60,4),OB(30),OJ$(30),R$(60),DR$
(4),OL(30)
40 GOTO 2190
50 REM  READ IN DATA
60 READ V$,N$,Z$,RN,NN,CP
62 N$=N$+Z$
70 FOR J=1 TO RN
80 FOR K=1 TO 4
82 READ M(J,K)
84 NEXT K,J
90 FOR J=1 TO NN
92 READ OL(J)
94 NEXT J
100 FOR J=1 TO NN
102 READ OJ$(J)
104 NEXT J
110 FOR J=1 TO 4
112 READ DR$(J)
114 NEXT J
116 REM PRINT INSTRUCTIONS
120 PRINT "□"
130 PRINT "THERE IS A LONG DESERTED ALIE
N CITY ON"
132 PRINT "A FAR AWAY PLANET IN WHICH, L
EGEND HAS"
134 PRINT "IT, A VAST TREASURE IS HIDDEN
.  MANY"
136 PRINT "HAVE ATTEMPTED TO FIND IT, BU
T NONE"
138 PRINT "HAVE RETURNED."
140 PRINT
170 PRINT "TOGETHER WE WILL ATTEMPT TO F
IND THE"
172 PRINT "TREASURE.  GIVE ME TWO WORD P
HRASES AS"
174 PRINT "INSTRUCTIONS, EG GO NORTH, EX
AMINE"
176 PRINT "TABLE, TAKE INVENTORY."
180 PRINT "■THERE ARE MANY MORE INSTRUCT
IONS YOU"
182 PRINT "MAY USE, BUT I WON'T SPOIL YO
UR FUN BY"
184 PRINT "TELLING YOU THEM ALL!"
186 PRINT "■IN CASES OF DESPERATION TYPE
 HELP AS"
```

```
188 PRINT "YOUR COMMAND."
190 PRINT "▒▒PRESS ANY KEY TO START."
200 GET G$
202 IF G$="" THEN 200
210 PRINT "▒"
260 GOTO 400
270 REM PRINT LOCATION
280 FOR J=1024 TO 1343
282 POKE J,32
284 NEXT J
290 PRINT "▒▒LOCATION: "R$(CP)
300 FOR J=1 TO NN
302 IF OL(J)=CP THEN 310
304 NEXT J
306 GOTO 320
310 PRINT "VISIBLE: ";
312 FOR J=1 TO NN
314 IF OL(J)<>CP THEN 318
316 PRINT OJ$(J)
318 NEXT J
320 PRINT "DIRECTIONS: ";
322 FOR J=1 TO 4
324 IF M(CP,J)=0 OR M(CP,J)=88 THEN 328
326 PRINT DR$(J);:DF=1
328 NEXT J
330 IF DF=0 THEN PRINT "??"
340 DF=0
350 PRINT
360 PRINT "────────────────────────────────────────
────────"
370 IF CP=46 OR CP=25 OR CP=14 OR CP=5 O
R CP=10 THEN 3250
375 IF CP=12 THEN R$(12)="IN A DANK SMEL
LY ROOM."
380 RETURN
400 FOR J=1 TO 5:PRINT:NEXT:GOSUB 270
402 FOR J=1 TO 16:PRINT:NEXT
403 IP$=""
404 INPUT "WHAT NOW";IP$:PRINT
405 IF IP$="N" THEN IP$="GO NOR"
406 IF IP$="S" THEN IP$="GO SOU"
407 IF IP$="E" THEN IP$="GO EAS"
408 IF IP$="W" THEN IP$="GO WES"
410 IF IP$="HELP" THEN 2990
420 IF IP$="SAVE" THEN 3270
430 IF IP$="LOAD" THEN 3370
432 IF LEN(IP$)<6 THEN PRINT "I DON'T UN
DERSTAND THAT.":GOTO 400
436 REM INSTRING ROUTINES
440 FOR X=1 TO LEN(IP$)
442 IF MID$(IP$,X,1)=" " THEN 450
444 NEXT X
446 IF X>LEN(IP$)-2 THEN IP$="E":GOTO 43
2
450 VB$=LEFT$(IP$,3)
460 NT$=MID$(IP$,X+1,LEN(IP$)-X)
470 NO$=MID$(IP$,X+1,3)
480 FOR VB=1 TO LEN(V$)
482 IF MID$(V$,VB,3)=VB$ THEN 488
484 NEXT VB
486 VB=0
488 VB=(VB+2)/3
490 IF VB<1 THEN PRINT "I DON'T UNDERSTA
ND THE VERB.":GOTO 400
500 FOR NO=1 TO LEN(N$)
502 IF MID$(N$,NO,3)=NO$ THEN 508
504 NEXT NO
506 NO=0
508 NO=(NO+2)/3
510 IF NO<1 OR (INT(NO)<>NO) THEN PRINT
"I DON'T UNDERSTAND THE NOUN.":GOTO 400
520 IF VB>10 THEN 526
522 ON VB GOTO 590,1740,1420,870,1020,53
0,1270,1590,1590,1380
526 ON VB-10 GOTO 1380,1740,1990,1420,10
20,690,530
530 IF NO=24 AND OB(1)=1 AND CP=44 THEN
540
534 GOTO 580
540 PRINT "THE FORCE FIELD DISAPPEARED!"
550 M(44,1)=11
560 R$(44)="A NARROW PASSAGEWAY"
```

```
570 GOTO 400
580 GOTO 1250
590 IF OB(7)=1 AND NO=21 THEN 600
592 GOTO 670
600 PRINT "SOMETHING STRANGE IS HAPPENIN
G..."
610 GOSUB 3220
620 PRINT "YOU SEEM TO BE GETTING HEAVIE
R!"
630 GOSUB 3220
640 PRINT "YOU'RE FALLING THROUGH THE FL
OOR!"
650 GOSUB 3220
660 GOTO 3470
670 PRINT "YOU CAN'T DO THAT!"
680 GOTO 400
690 IF NO=2 AND CP=13 AND OB(2)=1 THEN 7
00
692 GOTO 790
700 PRINT "THERE'S A NOISE!"
710 GOSUB 3220
720 PRINT "SOMETHING'S COMING OUT OF THE
 MACHINE!"
730 GOSUB 3220
740 PRINT "IT'S A BLACK METAL ROD!"
750 OB(2)=0
760 OL(3)=13
770 GOTO 400
780 IF NO=3 AND CP=39 AND OB(3)=1 THEN 7
90
782 GOTO 830
790 PRINT "A SECRET DOOR HAS OPENED!"
800 M(39,1)=16
810 R$(39)="A DOORWAY"
820 GOTO 400
830 IF NO=5 AND CP=2 AND OB(5)=1 THEN 13
10
840 PRINT "NOTHING HAPPENED."
850 GOTO 400
860 REM  READ
870 IF (NO=8 OR NO=19) AND (OB(8)=1 OR O
L(8)=CP) THEN 880
872 GOTO 900
880 PRINT "IT SAYS: PSZGI EMR FCPC RMM"
890 GOTO 400
900 IF (NO=10 OR NO=19) AND (OB(10)=1 OR
 OL(10)=CP) THEN 910
902 GOTO 930
910 PRINT "IT SAYS: 211154 2511419"
920 GOTO 400
930 IF NO=19 AND CP=16 THEN 940
932 GOTO 960
940 PRINT "IT SAYS: BEWARE THE HAZE. IT
CONFUSES   THE SENSES."
950 GOTO 400
960 IF (NO=11 OR NO=19) AND (OB(11)=1 OR
 OL(11)=CP) THEN 970
962 GOTO 990
970 PRINT "IT SAYS: FN SVHBD SN RTBBDDC"
980 GOTO 400
990 IF NO=15 AND CP=36 THEN 3510
1000 PRINT "YOU DON'T HAVE A "NT$
1010 GOTO 400
1020 IF NO=25 AND CP=21 THEN 1030
1022 GOTO 1110
1030 INPUT "WHICH ONE";Q
1040 IF Q=2 OR Q=3 THEN CP=16:GOTO 400
1050 IF Q=4 THEN CP=24:GOTO 400
1060 CP=46
1070 GOTO 400
1080 PRINT "A SMALL NOTEBOOK HAS APPEARE
D FROM       NOWHERE!"
1090 OL(11)=28
1100 GOTO 400
1110 IF NO=25 AND CP=47 THEN 1120
1112 GOTO 1140
1120 CP=42
1130 GOTO 400
1140 IF NO=25 THEN 1150
1142 GOTO 1250
1150 INPUT "WHICH ONE";Q
1160 IF Q=3 AND CP=42 THEN 1170
```

```
1162 GOTO 1190
1170 CP=47
1180 GOTO 400
1190 IF (Q=3 OR Q=2) AND CP=28 THEN 1080
1200 IF Q=4 AND CP=28 THEN 1210
1202 GOTO 1230
1210 CP=29
1220 GOTO 400
1230 CP=46
1240 GOTO 400
1250 PRINT "NOTHING HAPPENED."
1260 GOTO 400
1270 IF NO=2 AND CP=13 THEN 1280
1272 GOTO 1300
1280 VB=16
1290 GOTO 520
1300 IF NO=5 AND CP=2 AND OB(5)=1 THEN 1
310
1302 GOTO 1360
1310 PRINT "THE GATE IS UNLOCKED."
1320 M(2,1)=3
1330 R$(2)="OUTSIDE THE ENTRANCE TO THE
 CITY"
1340 GOTO 400
1360 PRINT "YOU CAN'T DO THAT!"
1370 GOTO 400
1380 IF NO=3 THEN 1390
1382 GOTO 1400
1390 M(40,1)=24
1400 IF OB(NO)<>1 THEN 1410
1402 OB(NO)=0
1404 OL(NO)=CP
1406 PRINT "YOU'VE DROPPED IT."
1408 GOTO 400
1410 PRINT "YOU DON'T HAVE "NT$
1412 GOTO 400
1420 REM GO
1430 REM DIRECTIONS
1450 IF CP=32 AND NO=31 THEN 1460
1452 GOTO 1490
1460 IF M(32,4)=99 THEN 1470
1462 GOTO 1510
1470 CP=16
1480 M(32,4)=35
1490 IF NO=17 AND CP=50 THEN 1500
1492 GOTO 1510
1500 NO=30
1510 IF CP=32 AND OB(6)=1 AND NO=31 THEN
 1520
1512 GOTO 1530
1520 M(35,4)=36
1530 REM NOT ALLOWED
1540 IF NO<28 OR NO>31 THEN PRINT "YOU C
AN'T GO THAT WAY.":GOTO 400
1550 IF M(CP,NO-27)=0 THEN PRINT "YOU CA
N'T GO THAT WAY.":GOTO 400
1560 IF M(CP,NO-27)=88 THEN PRINT "YOU C
AN'T GO THAT WAY, YET.":GOTO 400
1570 REM DIRECTION OK
1580 CP=M(CP,NO-27)
1582 GOTO 400
1590 IF NO<>27 THEN 1650
1600 FOR J=1 TO NN
1610 IF OB(J)<>1 THEN 1630
1620 PRINT OJ$(J)
1630 NEXT J
1640 GOTO 400
1650 IF NO>13 THEN PRINT "YOU CAN'T TAKE
 THAT!":GOTO 400
1660 FOR J=1 TO 15
1662 IF OB(J)=1 THEN CN=CN+1
1670 NEXT J
1680 IF CN>3 THEN PRINT "YOU CAN'T CARRY
 ANY MORE.":CN=0:GOTO 400
1690 CN=0
1700 IF NO<>3 THEN 1720
1710 M(40,1)=88
1720 IF OL(NO)<>CP THEN 1730
1722 OL(NO)=0
1724 OB(NO)=1
1726 PRINT "IT'S YOURS."
1728 GOTO 400
```

```
1730 PRINT "THERE'S NO "NT$" HERE!"
1732 GOTO 400
1740 REM EXAMINE
1750 IF NO=8 AND (OB(8)=1 OR OL(8)=CP) T
HEN 1760
1752 IF NO=11 AND (OB(11)=1 OR OL(11)=CP
) THEN 1760
1754 GOTO 1780
1760 PRINT "THERE'S SOME WRITING ON IT."
1770 GOTO 400
1780 IF NO=9 AND (OB(9)=1 OR OL(9)=CP) T
HEN 1790
1782 GOTO 1810
1790 PRINT "THERE ARE SEVERAL SMALL LIGH
TS ON IT."
1791 GOSUB 3220
1792 PRINT "THEY ARE STARTING TO FLICKER
 - IT MIGHT"
1794 PRINT "BE DANGEROUS!"
1800 GOTO 400
1810 IF NO=10 AND (OB(10)=1 OR OL(10)=CP
) THEN 1760
1820 IF NO=22 AND CP=26 THEN 1830
1822 GOTO 1860
1830 PRINT "THERE'S A SMALL PLASTIC CUBE
 ON IT."
1840 OL(8)=26
1850 GOTO 400
1860 IF NO=26 AND CP=13 THEN 1870
1862 GOTO 1890
1870 PRINT "THERE'S A SMALL VERTICAL SLO
T AT THE"
1872 PRINT "TOP AND A SHUTE AT THE BOTTO
M."
1880 GOTO 400
1890 IF NO=18 AND CP=39 THEN 1900
1892 GOTO 1920
1900 PRINT "THERE'S A SMALL CIRCULAR HOL
E IN IT."
1902 PRINT "ABOUT FOUR FEET FROM THE GRO
UND."
1910 GOTO 400
1920 IF NO=16 AND CP=43 THEN 1930
1922 GOTO 1970
1930 IF OB(9)=1 OR OL(9)<>0 THEN 1960
1940 PRINT "LOOK!"
1950 OL(9)=43
1960 GOTO 400
1970 REM NOT FOUND
1980 PRINT "NOTHING SPECIAL"
1982 GOTO 400
1990 REM OPEN
2000 IF CP=12 AND NO=23 THEN 2010
2002 GOTO 2070
2010 PRINT "LOOK!"
2020 IF OL(2)<>0 OR OB(2)=1 THEN 2040
2030 OL(2)=12
2040 IF OL(4)<>0 OR OB(4)=1 THEN 2060
2050 OL(4)=12
2060 GOTO 400
2070 IF CP=34 AND NO=23 THEN 2080
2072 GOTO 2120
2080 PRINT "LOOK!"
2090 IF OL(10)<>0 OR OB(10)=1 THEN 2110
2100 OL(10)=34
2110 GOTO 400
2120 IF CP=33 AND NO=20 THEN 2130
2122 GOTO 2160
2130 PRINT "THERE IS AN EXPLOSION..."
2140 GOSUB 3220
2150 GOTO 3470
2160 PRINT "YOU CAN'T DO THAT."
2162 GOTO 400
2170 REM NOT FOUND
2180 PRINT "THERE'S NOTHING THERE."
2182 GOTO 400
2184 REM VERB STRING
2190 DATA DRIEXAGO REAPULPUSUSETAKGETPUT
DROLOOOPEWALMOVINSPRE
2194 REM NOUN STRING
2200 DATA BOXDISRODSPOKEYAMUFLACUBHELTIN
NOT----------SIGSHEPODWALWRI
```

```
2202 DATA LOCLIQTABCUPBUTLEVMACINVNORSOU
EASWES
2210 DATA 51,26,2
2214 REM LOCATION DESCRIPTIONS
2220 R$(1)="IN A CORRIDOR."
2230 DATA 12,11,13,14
2240 R$(2)="OUTSIDE OF THE ENTRANCE TO T
HECITY FACING THE LOCKED GATE."
2250 DATA 88,0,0,0
2260 R$(3)="IN A GREY STONE PASSAGE."
2270 DATA 4,2,0,0
2280 R$(4)="IN A NARROW CORRIDOR."
2290 DATA 5,3,6,0
2300 R$(5)="FALLING INTO A DEEP PIT..."
2310 DATA 0,0,0,0
2320 R$(6)=R$(1)
2330 DATA 7,8,0,4
2340 R$(7)="IN A SMALL DARK ROOM."
2350 R$(8)="IN A LOW METAL TUNNEL."
2360 R$(9)=R$(1)
2370 DATA 0,6,0,0,6,0,9,0,44,0,10,8
2380 R$(10)="IN A SMALL NARROW CHAMBER.
   THE WALLS ARE MOVING TOWARDS YOU..."
2390 R$(11)="IN A PASSAGEWAY."
2400 R$(12)="IN A DANK SMELLY ROOM. A SM
ALLALIEN LIFEFORM IS WATCHING YOU."
2410 DATA 0,0,0,0,1,44,0,15,0,1,0,0
2420 R$(13)="IN A LARGE EMPTY HALL"
2430 R$(14)="IN A LASER TESTING CHAMBER.
..
                -- Z A P ! --"
2440 R$(15)=R$(1)
2450 DATA 0,10,0,1,0,0,0,0,39,0,11,0
2460 R$(16)="IN SOME SORT OF ENERGY FIEL
D, A GREEN HAZE SURROUNDS YOU."
2470 R$(17)="IN THE ENERGY FIELD."
2480 FOR J=18 TO 23
2490 R$(J)=R$(17)
2500 NEXT J
2510 DATA 17,39,17,19,17,16,18,18,17,19,
18
2512 DATA 17,18,38,16,17,38,18,21,22,17,
18
2514 DATA 19,20,40,17,20,23,25,17,22,18-
2520 R$(24)=R$(11)
2530 R$(25)="IN A FREEZER ROOM. THE DOOR
   LOCKS BEHIND YOU..."
2540 R$(26)="IN AN OLD DERELICT STORAGE
   ROOM."
2550 DATA 26,40,41,25,0,0,0,0,0,24,0,0
2560 R$(27)=R$(3)
2570 R$(28)="IN A TELEPORT ROOM."
2580 R$(29)="IN A LOW GLOOMY STONE
   PASSAGEWAY"
2590 DATA 45,0,28,41,0,0,0,27,31,27,30,3
W
2600 R$(30)="IN AN APPARENTLY EMPTY STEE
L  VAULT."
2610 R$(31)="IN AN ALIEN LABORATORY"
2620 R$(32)=R$(1)
2630 DATA 0,0,0,29,0,29,0,0,34,33,29,99
2640 R$(33)="IN A HIGH CEILINGED CHAMBER
. THE FLOOR SOUNDS HOLLOW."
2650 R$(34)="IN WHAT APPEARS TO BE A SMA
LL ALIEN RESTAURANT."
2660 R$(35)="AT THE END OF A SHORT
   CORRIDOR."
2670 DATA 32,0,0,0,0,32,0,0,0,0,32,88
2680 R$(36)="IN THE SECRET TREASURE ROOM
!"
2690 R$(37)=R$(17)
2700 R$(38)=R$(17)
2710 DATA 0,0,35,0,18,19,16,38,19,20,37,
17
2720 R$(39)="A FLAT WALL."
2730 R$(40)="AT THE FRINGE OF AN ENERGY
   FIELD."
2740 R$(41)=R$(1)
2750 DATA 88,15,0,0,88,22,18,16,42,43,27
,24
2760 R$(42)=R$(28)
2770 R$(43)="IN A VAST ECHOING ROOM."
2780 R$(44)="IN A NARROW PASSAGE.  A FOR
```

```
CE FIELD BARS YOUR WAY."
2790 DATA 0,41,0,0,41,5,0,0,88,9,0,0
2800 R$(45)="IN A GLOOMY PASSAGE FACING
A  HEAVY LOCKED DOOR."
2810 R$(46)="DEEP IN SPACE SURROUNDED BY
   THOUSANDS OF STARS..."
2820 DATA 88,27,0,0,0,0,0,0
2830 R$(47)="IN A SMALL PLASTIC DOME."
2840 R$(48)="AT THE EDGE OF A DENSE
   PRIMEVAL FOREST."
2850 R$(49)="IN THE MIDDLE OF A FOREST.
"
2860 R$(50)="AT THE EDGE OF A VAST
   SHIMMERING LAKE."
2870 DATA 0,0,48,0,0,0,49,47,49,50
2872 DATA 49,48,49,0,51,0
2880 R$(51)="INSIDE THE POD."
2890 DATA 0,0,0,50
2900 DATA 7,0,0,0,0,51,31,0,0,0,0,26,21
2902 DATA 42,0,12,34,33,13,28,43,47,50,3
6
2910 DATA 16,0
2912 REM OBJECT DESCRIPTIONS
2920 DATA A SMALL METAL BOX WITH A RED
 BUTTON.
2922 DATA A SMALL METAL DISK.,A BLACK ME
TAL ROD.
2924 DATA A SILVER SPOON.,A KEY.,AN AMUL
ET.
2926 DATA A FLASK OF LUMINOUS BLUE LIQUI
D
2928 DATA A PLASTIC CUBE.,A HELMET.,A TI
N.
2930 DATA A NOTEBOOK.,A WOODEN TABLE.,4
LEVERS (1 TO 4).
2932 DATA 4 LEVERS (1 TO 4).,A RAISED PL
ATFORM.
2934 DATA A CUPBOARD.,A SMALL CUPBOARD.,
A STEEL LOCKER.
2940 DATA A RUSTY MACHINE.,4 LEVERS (1 T
O 4).
2942 DATA A NARROW SHELF.,A SINGLE LEVER
.
2944 DATA A SPACECRAFT'S ESCAPE POD.
2950 DATA A SIGN.,SCRIBBLED WRITING ON A
 WALL.
2952 DATA A GREY METAL SPOON.
2960 DATA "N ","S ","E ","W "
2970 OB(5)=1
2980 GOTO 50
2984 REM HELP
2990 IF CP=17 OR CP=19 OR CP=18 OR CP=37
 THEN 3000
2992 IF CP=38 OR CP=20 OR CP=22 OR CP=23
 THEN 3000
2994 GOTO 3020
3000 PRINT "KEEP TRYING, THERE IS A WAY
OUT!"
3010 GOTO 400
3020 IF CP<>16 THEN 3050
3030 PRINT "TRY READ."
3040 GOTO 400
3050 IF CP<>13 THEN 3080
3060 PRINT "TIME FOR A COKE!"
3070 GOTO 400
3080 IF CP<>42 AND CP<>28 AND CP<>21 THE
N 3110
3090 PRINT "ONE OF THEM MUST DO SOMETHIN
G USEFULL!"
3100 GOTO 400
3110 IF CP<>2 THEN 3140
3120 PRINT "TRY TAKE INVENTORY."
3130 GOTO 400
3140 IF CP<>44 THEN 3170
3150 PRINT "TURN IT OFF THEN."
3160 GOTO 400
3170 IF CP<>45 THEN 3200
3180 PRINT "LET'S TRY A DIFFERENT ROUTE.
"
3190 GOTO 400
3200 REM NO SPECIAL SITUATION
3210 PRINT "DON'T FORGET TO EXAMINE THIN
GS."
```

```
3212 GOTO 400
3220 FOR J=1 TO 4500
3230 NEXT J
3240 RETURN
3250 GOSUB 3220
3260 GOTO 3470
3270 REM SAVE
3280 PRINT "□"
3300 OPEN 1,1,2,"DATA"
3302 CMD 1
3310 FOR J=1 TO NN
3320 PRINT OB(J):PRINT OL(J)
3330 NEXT J
3340 PRINT M(44,1):PRINT R$(44)
3342 PRINT M(39,1):PRINT R$(39):PRINT M(
40,1)
3344 PRINT M(32,4):PRINT M(35,4):PRINT C
P
3346 PRINT#1
3350 CLOSE 1
3360 GOTO 400
3370 REM LOAD
3380 PRINT "□"
3400 OPEN 1,1,0,"DATA"
3410 FOR J=1 TO NN
3420 INPUT#1, OB(J)
3422 INPUT#1, OL(J)
3430 NEXT J
3440 INPUT#1,M(44,1)
3441 INPUT#1,R$(44)
3442 INPUT#1,M(39,1)
3443 INPUT#1,R$(39)
3444 INPUT#1,M(40,1)
3446 INPUT#1,M(32,4)
3447 INPUT#1,M(35,4)
3448 INPUT#1,CP
3450 CLOSE 1
3455 PRINT "□"
3460 GOTO 400
3464 REM END OF GAME
3470 PRINT "□"
3472 PRINT "■■■■■■■" TAB(7) "Y O U ' R E
   D E A D !"
3480 PRINT "■■■■■■■■■■■■■■■■"
3490 INPUT "TRY AGAIN";Q$
3500 IF LEFT$(Q$,1)="Y" THEN RUN
3502 GOTO 3520
3510 PRINT "□"
3512 PRINT "■■■■■■■" TAB(6) "<<THE TREASU
RE IS YOURS!>>"
3514 PRINT "■■■■■■■■■■■■■■■■"
3516 GOTO 3530
3520 PRINT "□"
3530 END

READY.
```

SNAKE

Here is a chance to find out how much snakes like to eat frogs and spiders.

On the screen, hopping for their lives, are six frogs and an unlimited number of spiders who appear at random, as the game progresses. The spider, which grows continually, is under your control and you must keep him fed and alive. You see, also scattered around the screen are rocks and if you hit them, or double back and run into yourself, it's all over and the frogs and spiders live to fight another day.

The spiders are worth 10 points and the puddle jumping frogs are worth 100 points. When you reach 1000 points a new screen will be generated. The same will occur should you be good enough to reach 2500 points.

How to play

To move left and right use keys O and P

To move up and down use keys Q and A

The game features a "wrap round" screen so if you move off at the top you will reappear at the bottom.

Graphics symbols

Line
290 Clear
490 Home
500 Cursor up

1110 Clear
1340 Home
1350 Cursor up
1360 Home
1540 Home
1730 Clear
1750 3 cursor down
1810 4 cursor down
1880 Clear
1930 Clear
2120 Home
2130 15 cursor down
2140 Cursor down
2150 3 cursor down
2160 Cursor down
2180 Clear

The program

Lines

130- 190	Read in machine code for sound effects
210- 260	Main subroutine calling loop
270- 310	Generate new screen
330- 640	Look at keyboard and determine direction of snake
660- 850	Move next frog in sequence
870- 910	Sound subroutine
930- 990	Collision
1010-1090	Delay routine for progressive difficulty of game
1110-1520	Set initial values for game and define graphics characters
1540-1820	Display score at end of game and calculate and print high score table
1830-1940	Deal with new game request or end of program
1950-2190	Print title screen

```
100 REM SNAKE
110 REM
120 REM READ M/C
130 FOR J=49152 TO 49184
140 READ B:POKE J,B
150 NEXT J
160 DATA 169,30,141,1,212,169,33,141,4
170 DATA 212,96,169,45,141,1,212,169,83
180 DATA 141,4,212,96,169,40,141,1,212
190 DATA 169,83,141,4,212,96
200 REM MAIN ROUTINE
210 GOSUB 1110
220 GOSUB 330
230 GOSUB 660
240 GOSUB 1010
250 POKE S+4,0
260 GOTO 220
270 REM NEW SCREEN
280 GOSUB 870
290 PRINT "□"
300 GOSUB 1340
310 GOTO 220
320 REM KEYBOARD SCAN
330 K=PEEK(197)
340 IF K=62 THEN W=1
350 IF K=10 THEN W=3
360 IF K=38 THEN W=4
370 IF K=41 THEN W=2
380 IF W=1 THEN R=R-40
390 IF W=2 THEN R=R+1
400 IF W=3 THEN R=R+40
410 IF W=4 THEN R=R-1
420 IF D+R<1064 THEN R=R+960
430 IF D+R>2023 THEN R=R-960
440 P=PEEK(D+R)
450 IF P=32 THEN 610
460 IF P<>34 THEN 540
470 SC=SC+100
480 SYS 49152
490 PRINT "■"
500 PRINT "□"TAB(12)SC
510 IF SC>=1000 AND SF=0 THEN SF=1:GOTO
280
520 IF SC>=2500 AND SG=0 THEN SG=1:GOTO
280
530 GOTO 610
540 IF P<>35 THEN 580
550 SYS 49174
560 SC=SC+10
570 GOTO 490
580 IF P<>36 AND P<>33 THEN 610
590 GOSUB 930
600 GOTO 1540
610 POKE D+R,33
620 POKE C+R,2
630 SYS 49163
640 RETURN
650 REM MOVE FROGS
660 F=F+1
670 POKE S+4,0
680 IF F=7 THEN F=1
690 IF FM(F)=-1 THEN 850
700 M=INT(RND(0)*4)+1
710 IF M=1 THEN IN=-40
720 IF M=2 THEN IN=1
730 IF M=3 THEN IN=40
740 IF M=4 THEN IN=-1
750 IF PEEK(D+FM(F))<>34 THEN FM(F)=-1:G
OTO 350
760 POKE D+FM(F),32
770 FM(F)=FM(F)+IN
780 IF D+FM(F)<1064 THEN FM(F)=FM(F)+960
790 IF D+FM(F)>2023 THEN FM(F)=FM(F)-960
800 IF PEEK(D+FM(F))=32 THEN 830
810 FM(F)=FM(F)-IN
820 GOTO 780
830 POKE C+FM(F),5
840 POKE D+FM(F),34
850 RETURN
860 REM SOUND SUBROUTINES
870 FOR GS=1 TO 255
880 POKE S+1,GS:POKE S+4,33
```

```
890 POKE S+4,0
900 NEXT GS
910 RETURN
920 REM COLLISION
930 FOR SN=1 TO 80
940 POKE S+1,40:POKE S+4,33
950 POKE D+R,32
960 POKE S+4,0
970 POKE D+R,33
980 NEXT SN
990 RETURN
1000 REM DELAY ROUTINE
1010 LA=LA+1
1020 IF RND(0)<LA/30 THEN 1040
1030 GOSUB 1050
1040 FOR DE=1 TO 250-LA:NEXT
1050 SP=INT(RND(0)*950)+40
1060 IF PEEK(D+SP)<>32 THEN 1090
1070 POKE D+SP,35
1080 POKE C+SP,6
1090 RETURN
1100 REM INITIALIZE
1110 PRINT "□"
1120 POKE 55,0:POKE 56,56
1130 PRINT CHR$(142)
1140 POKE 56334,PEEK(56334)AND 254
1150 POKE 1,PEEK(1)AND 251
1160 FOR J=0 TO 511
1170 POKE J+14336,PEEK(J+53248)
1180 NEXT J
1190 POKE 1,PEEK(1)OR 4
1200 POKE 56334,PEEK(56334)OR 1
1210 POKE 53272,(PEEK(53272)AND 240)+14
1220 FOR J=14600 TO 14639
1230 READ D:POKE J,D
1240 NEXT J
1250 DATA 24,60,126,255,255,126,60,24
1260 DATA 189,153,126,60,60,36,66,36
1270 DATA 129,36,153,127,24,127,153,36
1280 DATA 56,126,255,255,255,255,255,126
1290 DATA 255,255,255,255,255,255,255,25
5
1300 D=1024:C=55296
1310 POKE 53281,0:POKE 53280,2
1320 POKE 646,1
1330 IF F3=0 THEN F3=1:GOSUB 1950
1340 PRINT "■"
1350 PRINT "□      SCORE: " SC SPC(7) "H
I SCORE: " HS
1360 PRINT "■"
1370 FOR J=1 TO 30
1380 R=INT(RND(0)*950)+40
1390 POKE D+R,36
1400 POKE C+R,4
1410 NEXT J
1420 FOR J=1 TO 6
1430 FM(J)=INT(RND(0)*950)+40
1440 POKE D+FM(J),34
1450 POKE C+FM(J),5
1460 NEXT J
1470 S=54272
1480 W=2:R=31
1490 FOR L=S TO S+23:POKE L,0:NEXT L
1500 POKE S+24,15
1510 POKE S+6,240
1520 RETURN
1530 REM END OF GAME
1540 PRINT "■"
1550 FOR J=1 TO 13:PRINT "■":NEXT J
1560 PRINT "YOUR SCORE: "SC
1570 FOR GA=1 TO 10
1580 GET G$
1590 NEXT GA
1600 INPUT "YOUR NAME";NM$
1610 IF LEN(NM$)>12 THEN PRINT "TOO LONG
.":GOTO 1600
1620 SA(10)=SC
1630 N$(10)=NM$
1640 FOR J=10 TO 2 STEP-1
1650 IF SA(J)<SA(J-1) THEN 1720
1660 TP=SA(J-1)
1670 T$=N$(J-1)
```

```
1680 SA(J-1)=SA(J)
1690 N$(J-1)=N$(J)
1700 SA(J)=TP
1710 N$(J)=T$
1720 NEXT J
1730 PRINT "■"
1740 PRINT TAB(10)"HIGH SCORE TABLE"
1750 PRINT "■■■"
1760 FOR M=1 TO 9
1770 PRINT TAB(5)M" "SA(M)"    ";
1780 PRINT N$(M)
1790 NEXT M
1800 PRINT:PRINT
1810 PRINT TAB(8)"■■■■PRESS P TO PLAY"
1820 PRINT TAB(14)"S TO STOP"
1830 GET Q$
1840 IF Q$="" THEN 1830
1850 IF Q$<>"P" THEN 1900
1860 LA=0:SC=0:HS=SA(1)
1870 SF=0:SG=0
1880 PRINT "■"
1890 GOSUB 1350:GOTO 220
1900 POKE 646,14:POKE 53281,6
1910 POKE 53280,14:POKE 53272,21
1920 POKE S+24,0
1930 PRINT "■"
1940 GOTO 2200
1950 READ B
1960 IF B=-1 THEN 2120
1970 POKE D+B,37
1980 POKE C+B,5
1990 GOTO 1950
2000 DATA 164,165,166,170,174,178,179
2010 DATA 180,184,188,191,192,193,194
2020 DATA 195,203,207,210,214,217,221
2030 DATA 224,227,231,243,250,251,254
2040 DATA 257,261,264,266,271,284,285
2050 DATA 286,290,292,294,297,298,299
2060 DATA 300,301,304,305,311,312,313
2070 DATA 314,327,330,333,334,337,341
2080 DATA 344,346,351,363,367,370,374
2090 DATA 377,381,384,387,391,404,405
2100 DATA 406,410,414,417,421,424,428
2110 DATA 431,432,433,434,435,-1
2120 PRINT "■"
2130 PRINT "■■■■■■■■■■■■■■■■■■■■"TAB(9)"O/P
FOR LEFT/RIGHT"
2140 PRINT "■"TAB(10)"Q/A  FOR  UP/DOWN"
2150 PRINT "■■■"TAB(8)"FROGS SCORE 100 P
OINTS"
2160 PRINT "■"TAB(8)"SPIDERS SCORE 10 PO
INTS"
2170 FOR DE=1 TO 18000:NEXT
2180 PRINT "■"
2190 RETURN
2200 END
```

CATERPILLAR

Horror of horrors — if you hate creepy crawlies and spiders this is not the game for you.

You are being chased around the screen by a fast advancing caterpillar and **"six"** giant red spiders. Scattered around the screen are a number of purple toadstools and yellow mushrooms. If you eat one of the mushrooms your movement will speed up for a short time but — if the caterpillar eats one of the toadstools its speed will increase for a short time.

You can gain 10 points for each segment of the caterpillar you shoot, and, because the spiders are really bad news, 100 points for each one destroyed. If you are sharp enough to hit the caterpillar between the eyes on its orange head, be warned — it will regenerate from a random position on the screen.

The game will end if the caterpillar or the spiders get you or if you collide with the segments of the caterpillar.

How to play

To move left and right use keys O & P

To move up and down use keys Q & A

To fire, press keys W & S for up and down and L & : for left and right.

Graphics symbols

Line	
646	Home, cursor up
700	Clear
920	Home
930	Cursor up
940	Home
1170	Clear
1178	3 cursor down
1180	3 cursor down
1182	1 cursor down
1184	3 cursor down
1186	Cursor down
1188	3 cursor down
1190	Cursor down
1500	Home
1520	Cursor down
1740	Clear
1760	3 cursor down
1820	4 cursor down
1880	Clear

The program

Lines	
25- 35	Call initial subroutines
40- 80	Main subroutine calling loop
100- 190	Look at keyboard and move
200- 380	Move next spider in sequence towards victim
410- 610	Move caterpillar
614- 672	Shoot in direction indicated by key pressed
700-1160	Set initial values and define graphics characters

1170-1194 Print title screen
1200-1360 Collision with caterpillar and spider
1400-1470 Read machine code routines
1500-1830 Calculate and print high score table
1840-1920 Deal with new game request or end program

```
10 REM CATERPILLAR
20 REM
25 GOSUB 1170
30 GOSUB 700
35 GOSUB 1400
37 REM   MAIN LOOP
40 GOSUB 100
45 GOSUB 614
50 GOSUB 200
55 IF SC<500 THEN GOSUB 100:GOSUB 614
65 GOSUB 410
70 IF SC<1500 THEN GOSUB 100:GOSUB 614
75 IF SC<3000 THEN GOSUB 100:GOSUB 614
80 GOTO 40
90 REM   SCAN KEYBOARD
100 K=PEEK(197)
105 IF K=38 THEN P=P-1
110 IF K=41 THEN P=P+1
115 IF K=62 THEN P=P-40
120 IF K=10 THEN P=P+40
125 IF P<1064 OR P>2023 THEN P=OP
130 IF P=OP THEN 190
135 IF PEEK(P)=33 THEN 1200
140 IF PEEK(P)=35 THEN 1300
145 IF PEEK(P)=37 THEN P=OP:GOTO 190
150 IF PEEK(P)<>36 THEN 170
152 POKE P,32
155 FOR F4=1 TO 10
160 GOSUB 100
162 GOSUB 614
165 NEXT F4
170 POKE OP,32
175 POKE P,34
180 POKE C+P-1024,3
185 OP=P
190 RETURN
195 REM   MOVE SPIDER
200 F=F+1
210 IF F=7 THEN F=1
220 IF PEEK(FM(F))=35 THEN 230
222 FM(F)=INT(RND(0)*950)+1024
223 IF PEEK(FM(F))<>32 THEN 222
224 GOTO 365
230 POKE FM(F),32
240 FM(F)=FM(F)-SGN(INT((FM(F)-1024)/40)
-INT((P-1024)/40))*40
250 FM(F)=FM(F)-SGN((FM(F)-INT((FM(F)-10
24)/40)*40)-(P-INT((P-1024)/40)*40))
270 IF PEEK(FM(F))=32 THEN 365
280 IF PEEK(FM(F))<>34 THEN 360
290 FOR F1=1 TO 60
300 POKE FM(F),32
310 SYS 49174
320 POKE FM(F),35
324 POKE FM(F)+C-1024,2
330 POKE S+4,0
340 NEXT F1
350 GOTO 1500
360 FM(F)=FM(F)+SGN(FM(F)-(P-INT(P/40)*4
)*(FM(F)-P)40))*VR
365 POKE FM(F),35
370 POKE FM(F)+C-1024,2
380 RETURN
400 REM   MOVE CATERPILLAR
410 IF PEEK(CP)=33 THEN 428
414 CP=INT(RND(0)*950)+1064
416 IF PEEK(CP)<>32 THEN 414
422 GOTO 590
```

```
423 POKE C+CP-1024,5
430 CP=CP-SGN(INT((CP-1024)/40)-INT((P-1
024)/40))*40
434 CP=CP-SGN((CP-INT((CP-1024)/40)*40)-
(P-INT((P-1024)/40)*40))
440 IF PEEK(CP)=32 THEN 590
450 IF PEEK(CP)<>34 THEN 530
460 FOR F1=1 TO 60
470 POKE CP,32
480 SYS 49152
490 POKE CP,33
494 POKE C+CP-1024,5
500 POKE S+4,0
510 NEXT F1
520 GOTO 1500
530 IF PEEK(CP)<>37 THEN 590
534 POKE CP,33
536 POKE CP+C-1024,5
540 FOR F1=1 TO 10
550 GOSUB 410
560 NEXT F1
590 POKE C+CP-1024,8
595 SYS 49163
600 POKE CP,33
610 RETURN
612 REM  SHOOT?
614 K=PEEK(197)
615 FD=0
616 IF K=9 THEN FD=-40
618 IF K=13 THEN FD=40
620 IF K=42 THEN FD=-1
622 IF K=45 THEN FD=1
624 IF FD=0 THEN 670
626 POKE S+1,100
628 POKE S+4,129
630 FP=P
632 FOR F2=1 TO 7
634 FP=FP+FD
636 IF PEEK(FP)=32 THEN 666
638 IF PEEK(FP)<>33 THEN 654
640 POKE S+1,15
642 POKE S+4,83
644 SC=SC+10
646 PRINT "■"TAB(12)SC
648 POKE FP,32
650 POKE S+4,0
652 GOTO 666
654 IF PEEK(FP)<>35 THEN 664
656 POKE S+1,10
658 POKE S+4,33
660 SC=SC+100
662 GOTO 646
664 IF PEEK(FP)=36 OR PEEK(FP)=37 THEN 6
70
666 NEXT F2
670 POKE S+4,0
672 RETURN
690 REM  INITIALIZE
700 PRINT "■"
710 POKE 55,0:POKE 56,56
720 PRINT CHR$(142)
730 POKE 56334,PEEK(56334)AND254
740 POKE 1,PEEK(1)AND251
750 FOR J=0 TO 511
760 POKE J+14336,PEEK(J+53248)
770 NEXT J
780 POKE 1,PEEK(1)OR4
790 POKE 56334,PEEK(56334)OR1
800 POKE 53272,(PEEK(53272)AND240)+14
810 FOR J=14600 TO 14639
820 READ D:POKE J,D
830 NEXT J
840 DATA 24,60,126,255,255,126,60,24
850 DATA 56,68,56,108,170,56,68,198
860 DATA 129,136,153,127,24,127,153,36
870 DATA 24,60,126,255,255,24,24,24
880 DATA 24,24,126,221,187,24,24,24
890 D=1024:C=55296
900 POKE 53281,0:POKE 53280,5
910 POKE 646,1
920 PRINT "■"
930 PRINT "■      SCORE:  "SC SPC(7)  "HI S
```

```
CORE:  "HS
940  PRINT "■"
950  S=54272
960  FOR L=S TO S+23:POKE L,0:NEXT L
970  POKE S+24,15
980  POKE S+6,240
990  FOR J=1 TO 20
1000  R=INT(RND(0)*950)+40
1010  POKE D+R,36
1020  POKE C+R,7
1030  NEXT J
1040  FOR J=1 TO 10
1050  R=INT(RND(0)*950)+40
1060  POKE D+R,37
1070  POKE C+R,4
1080  NEXT J
1090  FOR J=1 TO 6
1100  FM(J)=INT(RND(0)*950)+1064
1110  POKE FM(J),35
1120  POKE C+FM(J)-1024,2
1130  NEXT J
1140  P=2004:OP=2005
1160  RETURN
1165  REM  TITLE SCREEN
1170  PRINT "■"
1172  POKE 53281,7
1174  POKE 53280,7
1176  POKE 646,2
1178  PRINT "■■■■" TAB(12) "CATERPILLAR"
1180  PRINT "■■■■" TAB(9) "O/P  FOR  LEFT/
RIGHT"
1182  PRINT "■" TAB(10) "Q/A  FOR  UP/DOW
N"
1184  PRINT "■■■■" TAB(8) "L/:  FIRE  LEFT
/RIGHT"
1186  PRINT "■" TAB(9) "W/S  FIRE  UP/DOW
N"
1188  PRINT "■■■■" TAB(3) "BODY  SEGMENTS
 SCORE  10  POINTS"
1190  PRINT "■" TAB(6) "SPIDERS  SCORE  1
00  POINTS"
1192  FOR D=1 TO 15000:NEXT
1194  RETURN
1198  REM  END ROUTINES
1200  FOR F1=1 TO 60
1210  POKE P,32
1220  SYS 49152
1230  POKE P,33
1240  POKE S+4,0
1250  NEXT F1
1260  GOTO 1500
1300  FOR F1=1 TO 60
1310  POKE P,32
1320  SYS 49174
1330  POKE P,35
1340  POKE S+4,0
1350  NEXT F1
1360  GOTO 1500
1390  REM  READ MACHINE CODE
1400  FOR MC=49152 TO 49184
1410  READ B:POKE MC,B
1420  NEXT MC
1430  DATA 169,30,141,1,212,169,33,141,4
1440  DATA 212,96,169,45,141,1,212,169,83
1450  DATA 141,4,212,96,169,40,141,1,212
1460  DATA 169,83,141,4,212,96
1470  RETURN
1490  REM  HIGH SCORE TABLE
1500  PRINT "■"
1510  FOR J=1 TO 13
1520  PRINT "■"
1530  NEXT J
1540  PRINT "YOUR SCORE:  "SC
1550  FOR GA=1 TO 10
1560  GET G$
1570  NEXT GA
1580  NM$=""
1590  INPUT "YOUR NAME";NM$
1600  IF LEN(NM$)<15 THEN 1630
1610  PRINT "TOO LONG"
1620  GOTO 1580
1630  SA(10)=SC
```

```
1640 N$(10)=NM$
1650 FOR J=10 TO 2 STEP -1
1660 IF SA(J)<SA(J-1) THEN 1730
1670 TP=SA(J-1)
1680 T$=N$(J-1)
1690 SA(J-1)=SA(J)
1700 N$(J-1)=N$(J)
1710 SA(J)=TP
1720 N$(J)=T$
1730 NEXT J
1740 PRINT "■"
1750 PRINT TAB(10) "HIGH SCORE TABLE"
1760 PRINT "■■■■"
1770 FOR M=1 TO 9
1780 PRINT TAB(5) M " "SA(M)"   ";
1790 PRINT N$(M)
1800 NEXT M
1810 PRINT:PRINT
1820 PRINT TAB(8)"■■■■PRESS P TO PLAY"
1830 PRINT TAB(14)"S TO STOP"
1840 GET Q$
1850 IF Q$="" THEN 1840
1860 IF Q$<>"P" THEN 1900
1870 SC=0:HS=SA(1)
1880 PRINT "■"
1890 GOSUB 920
1895 GOTO 40
1900 POKE 49152,0
1910 SYS 49152
1920 END

READY.
```

MORSE CODE

In case you were thinking of going on a sailing holiday and wanted to brush up your morse code, we have included this item for you.

You will have the choice of random letters, random words, sending and receiving messages in code.

How to play

1. Random letters.
   This will send random letters at a selectable speed with an optional display of the letter.

2. Random words.
   Words from the data list in lines 940-970 are taken at random and sounded in morse code. After a short pause you will be asked to input the word. You can, of course, alter the list of words to suit any level of ability from beginner to advanced.

3. Send message.
   This section enables you to send a message of your choice. Make sure that the length of the message does not cause the input statement to exceed the maximum length of two screen lines.

4. End.
   Stops the program.

Programming hints

At maximum speed the random letter generator will

send at approximately 60 characters per minute, which is adequate for the Radio Amateur's morse test. If you are a beginner to morse code, don't try and memorize the individual dots and dashes for a letter. Listen to the overall sound as each is sent, and you will be surprised just how easily it can be learnt.

Graphics characters

Line	
290	Clear, 2 cursor down
300	cursor down
310	cursor down
320	cursor down
324	cursor down, 3 cursor down
370	clear
600	cursor down, cursor down
620	cursor down, cursor down
662	2 cursor down
990	clear

The program

Lines	
120-180	Set sound registers
190-270	Dimension arrays and read data
290-340	Print menu and input choice
350-360	Input speed
400-480	Random letters
500-646	Random words
660-780	Send message
800-894	Subroutine to sound morse code
900-930	Morse code data
940-970	Word date

```
100 REM MORSE CODE
110 REM
120 S=54272
130 FOR J=S TO S+23
140 POKE J,0
150 NEXT J
160 POKE S+24,15
170 POKE S+6,240
180 POKE S+1,66
190 DIM M$(26),W$(20)
200 REM READ IN DATA
210 FOR J=1 TO 26
220 READ M$(J)
230 NEXT J
240 REM READ IN WORDS
250 FOR J=1 TO 20
260 READ W$(J)
270 NEXT J
280 REM PRINT MENU
290 PRINT "□■■"
300 PRINT "■1. RANDOM LETTERS"
310 PRINT "■2. RANDOM WORDS"
320 PRINT "■3. SEND MESSAGE"
324 PRINT "■4. END■■■"
330 INPUT "OPTION";W
334 IF W=4 THEN 980
340 IF W<1 OR W>3 THEN 330
350 INPUT "SPEED (1 TO 100)";SP
360 IF SP>100 OR SP<1 THEN 350
370 PRINT "□"
380 ON W GOTO 400,500,660
390 REM RANDOM LETTERS
400 INPUT "DISPLAY (Y/N)";Q$
410 FOR T=1 TO 100
420 R=INT(RND(0)*26)+1
430 IF Q$="N" THEN 450
440 PRINT CHR$(R+64) "  ";
450 GOSUB 800
460 NEXT T
470 FOR DE=1 TO 3000:NEXT
480 GOTO 290
490 REM RANDOM WORDS
500 FOR G=1 TO 10
506 FOR DE=1 TO 2000:NEXT
510 RW=INT(RND(0)*20)+1
520 FOR T=1 TO LEN(W$(RW))
530 L$=MID$(W$(RW),T,1)
540 R=ASC(L$)-64
550 GOSUB 800
560 NEXT T
570 FOR DE=1 TO 1000:NEXT
580 INPUT "WHAT WAS THE WORD";A$
590 IF A$<>W$(RW) THEN 620
600 PRINT "■CORRECT!■"
610 GOTO 630
620 PRINT "■THE WORD WAS "W$(RW)"■"
630 NEXT G
640 FOR DE=1 TO 3000:NEXT
646 GOTO 290
650 REM SEND MESSAGE
660 INPUT "WHAT IS YOUR MESSAGE";A$
662 PRINT "■■"
670 FOR T=1 TO LEN(A$)
680 L$=MID$(A$,T,1)
690 PRINT L$;
700 IF L$<>" " THEN 740
710 FOR DE=1 TO 800
720 NEXT DE
730 GOTO 760
740 R=ASC(L$)-64
750 GOSUB 800
760 NEXT T
770 FOR DE=1 TO 3000:NEXT
780 GOTO 290
800 FOR J=1 TO LEN(M$(R))
810 POKE S+4,83
820 FOR DE=1 TO 22*VAL(MID$(M$(R),J,1))
830 NEXT DE
840 POKE S+4,0
850 FOR DE=1 TO 70
```

```
860 NEXT DE,J
870 REM SPEED DELAY
880 FOR DE=1 TO 1100-SP*10
890 NEXT DE
894 RETURN
900 DATA 13,3111,3131,311,1,1131,331
910 DATA 1111,11,1333,313,1311,33
920 DATA 31,333,1331,3313,131,111,3
930 DATA 113,1113,133,3113,3133,3311
940 DATA COMPUTER,RANDOM,RECORD,CONTACT,
RADIO
950 DATA ESTABLISH,ENABLE,ALPHA,ZEBRA,HO
TEL
960 DATA POND,FOXTROT,HIGHER,POSSIBLE,BR
AVO
970 DATA DIGEST,MESSAGE,REFLECT,QUEBEC,M
AYDAY
980 POKE S+24,0
990 PRINT "J"
1000 END
```

RESCUE

If you have ever fancied being a valiant knight in shining armour, you now have the chance. A fair maiden has been imprisoned in the black magician's castle and you are her only hope of release within the time limit.

How to play

The magician's castle will be found at the top right of the screen. From your starting position in the bottom left you must move up to the castle to complete your task.

Not unnaturally, the evil magician is a little peeved at your intrusion into his affairs and is hurling large moss covered green boulders at you. These magical boulders will kill you if you bump into one, or are unlucky enough to be underneath one when it falls.

To further compound your problems, the magician has sent his two dastardly boulder-crunching henchmen after you. Luckily these two are both stupid and violent, and can sometimes clear a path for you, as long as you keep a respectful distance.

Move using keys O and P for left and right, and Q and A for up and down. To ease your burden, the time limit can be increased via line 1782, and/or the number of boulders at the start of the game via line 1610.

Graphics characters

Line	
670	Home
680	10 cursor down
1110	Home
1120	10 cursor down
1140	Home
1210	Clear
1250	5 cursor down
1260	8 cursor down
1270	Cursor down
1590	Clear
1900	Home
1940	Clear

The program

Lines	
120- 130	Initial subroutines
140- 180	Main subroutine calling loop
200- 300	Knights new position
310- 470	Hit rock
480- 570	Caught by henchman
580- 690	Reached castle
700- 740	Move knight
800- 900	Move henchmen in turn
920- 950	Throw boulder
1000	Decrement time left
1020-1130	Out of time
1140-1160	Print time left
1210-1300	Title screen
1400-1580	Define characters and set initial values
1590-1690	Set up screen at start of gamee
1720-1760	Set sound registers
1900-1990	End of game

```
100 REM RESCUE
110 REM
120 GOSUB 1210
130 GOSUB 1400
135 REM MAIN LOOP
140 GOSUB 200
150 GOSUB 800
160 GOSUB 920
162 GOSUB 200
170 GOSUB 1000
180 GOTO 140
190 REM LOOK AT KEYBOARD
200 K=PEEK(197)
210 IF K=38 OR K=41 OR K=62 OR K=10 THEN
 250
220 FOR DE=1 TO 15
230 NEXT DE
240 GOTO 740
250 IF K=38 THEN P=P-1
260 IF K=41 THEN P=P+1
270 IF K=62 THEN P=P-40
280 IF K=10 THEN P=P+40
290 IF P<1064 OR P>2023 THEN P=OP
292 IF (P-D)/40=INT((P-D)/40) THEN P=OP
300 IF P=OP THEN 740
305 REM ROCK
310 IF PEEK(P)<>34 THEN 480
312 POKE OP,32
320 POKE S+1,12
330 POKE S+4,129
340 FOR DE=1 TO 50
350 NEXT DE
360 POKE S+4,0
370 FOR J=50 TO 10 STEP-1
380 POKE P,33
390 POKE S+1,J
400 POKE S+4,33
410 FOR DE=1 TO 10
420 NEXT DE
430 POKE P,34
440 POKE S+4,0
450 FOR DE=1 TO 10
460 NEXT DE,J
470 GOTO 1900
480 IF PEEK(P)<>37 THEN 580
482 POKE OP,32
490 FOR J=1 TO 60
500 POKE S+1,60
510 POKE S+4,83
520 POKE P,33
530 POKE S+4,0
540 FOR DE=1 TO 10
550 NEXT DE
560 POKE P,37
570 NEXT J
572 GOTO 1900
575 REM CASTLE
580 IF PEEK(P)<>35 AND PEEK(P)<>36 THEN
700
582 POKE OP,32
590 FOR J=1 TO 4
600 READ N,DU
610 POKE S+1,N
620 POKE S+4,33
630 FOR DE=1 TO DU*8
640 NEXT DE
650 POKE S+4,0
660 NEXT J
670 PRINT "■"
680 PRINT "■■■■■■■■■■■■" TAB(12) " YOU MAD
E IT "
690 GOTO 1900
700 POKE S+1,35
702 POKE S+4,33
706 POKE OP,32
710 POKE P,33
720 POKE C+P-D,4
730 OP=P
732 POKE S+4,0
740 RETURN
```

```
800 F=F+1
810 IF F=3 THEN F=1
820 POKE M(F),32
830 M(F)=M(F)-SGN(INT((M(F)-D)/40)-INT((
P-D)/40))*40
840 M(F)=M(F)-SGN((M(F)-INT((M(F)-D)/40)
*40)-(P-INT((P-D)/40)*40))
850 IF PEEK(M(F))=32 OR PEEK(M(F))=34 TH
EN 880
860 IF PEEK(M(F))>=35 AND PEEK(M(F))<=37
 THEN 900
870 IF PEEK(M(F))=33 THEN 490
880 POKE S+1,55
882 POKE S+4,83
886 POKE M(F),37
890 POKE C+M(F)-D,2
892 POKE S+4,0
900 RETURN
910 REM THROW ROCK
920 RK=INT(RND(0)*959)+40
922 IF PEEK(RK+D)=33 THEN 320
928 IF PEEK(RK+D)=35 OR PEEK(RK+D)=36 TH
EN 950
930 POKE D+RK,34
940 POKE C+RK,5
950 RETURN
990 REM DECREMENT TIME LEFT
1000 TL=TL-1
1010 IF TL>=0 THEN 1140
1020 FOR J=50 TO 15 STEP-1
1030 POKE S+1,J
1040 POKE S+4,83
1050 FOR DE=1 TO 50
1060 NEXT DE
1070 POKE S+4,0
1080 FOR DE=1 TO 10
1090 NEXT DE
1100 NEXT J
1110 PRINT "■"
1120 PRINT "■■■■■■■■■■■■" TAB(11) " OUT OF
 TIME "
1130 GOTO 1900
1140 PRINT "■";
1150 PRINT TAB(22) STR$(TL)+" "
1160 RETURN
1200 REM TITLE SCREEN
1210 PRINT "□"
1220 POKE 53281,2
1230 POKE 53280,2
1240 POKE 646,7
1250 PRINT "■■■■■■" TAB(15) "RESCUE"
1260 PRINT "■■■■■■■■■■" TAB(10) "O/P FOR L
EFT/RIGHT"
1270 PRINT "■" TAB(11) "Q/A FOR UP/DOWN"
1280 FOR DE=1 TO 3000
1290 NEXT DE
1300 RETURN
1390 REM INITIALIZE
1400 POKE 55,0
1410 POKE 56,56
1420 PRINT CHR$(142)
1430 POKE 56334,PEEK(56334)AND 254
1440 POKE 1,PEEK(1)AND 251
1450 FOR J=0 TO 511
1460 POKE J+14336,PEEK(J+53248)
1470 NEXT J
1480 POKE 1,PEEK(1)OR 4
1490 POKE 56334,PEEK(56334)OR 1
1500 POKE 53272,(PEEK(53272)AND 240)+14
1510 FOR J=14600 TO 14639
1520 READ D:POKE J,D
1530 NEXT J
1540 D=1024
1550 C=55296
1560 POKE 53281,0
1570 POKE 53280,15
1580 POKE 646,1
1590 PRINT "□";
1600 PRINT TAB(12) "TIME LEFT: 99"
1610 FOR J=1 TO 300
```

```
1612 RK=INT(RND(0)*959)+40
1620 POKE RK+D,34
1622 POKE C+RK,5
1630 NEXT J
1640 POKE 1101,35
1650 POKE 55373,7
1660 POKE 1102,36
1670 POKE 55374,7
1680 POKE 1945,33
1690 POKE 56217,4
1700 S=54272
1710 P=1945:OP=1945
1720 FOR J=S TO S+23
1730 POKE J,0
1740 NEXT J
1750 POKE S+24,15
1760 POKE S+6,240
1770 M(1)=1135
1780 M(2)=1262
1782 TL=99
1790 RETURN
1795 REM CHARACTER DATA
1800 DATA 24,24,60,90,153,36,36,108
1810 DATA 60,126,127,255,255,126,126,60
1820 DATA 170,255,255,182,255,255,182,25
4
1830 DATA 170,254,254,218,254,254,106,12
6
1840 DATA 24,60,126,255,255,195,231,231
1845 REM SOUND DATA
1850 DATA 33,50,45,50,36,50,50,90
1890 REM END OF GAME
1900 PRINT "■"
1910 FOR J=1 TO 23:PRINT:NEXT
1912 FOR J=1 TO 10
1914 GET GA$
1916 NEXT J
1920 INPUT "PLAY AGAIN";Q$
1930 IF LEFT$(Q$,1)<>"Y" THEN 1970
1940 PRINT "□"
1950 GOSUB 1590
1952 RESTORE
1954 FOR J=1 TO 40
1956 READ GA
1958 NEXT J
1960 GOTO 140
1970 POKE 49152,0
1980 SYS 49152
1990 END
```

LINE RENUMBER

This short but effective program will resequence all lines in your Basic programs. Some care is needed in its use, since we have to fool the computer into having two programs resident in memory at one time. Follow carefully the procedure set out below and you shouldn't have any problems.

How to play

1. Type in and save the line renumber program onto a tape and verify it.

2. Turn off the power supply to the computer and turn back on.

3. Load the line renumber program.

4. Type : POKE 44,15 and press return.

5. Load your Basic program to be renumbered.

6. Type : POKE 44,8 and press return

7. Type : RUN and press return. Input the new start line and increment when prompted. Wait until the computer responds with READY.

8. Type : POKE 44,15 and press return.

9. SAVE your now renumbered program onto tape and verify it in the normal way. Turn the computer power supply off and on. LOAD your program back into the computer.

Any gosub, goto statements will still of course have the old numbers and must be changed by hand.

```
100 REM LINE RENUMBER
110 REM
120 X=3841
130 INPUT "NEW START LINE";LN
140 INPUT "INCREMENT";IN
150 NM=PEEK(X)+256*PEEK(X+1)
160 IF NM=0 THEN 220
170 POKE X+2,LN-((INT(LN/256))*256)
180 POKE X+3,INT(LN/256)
190 LN=LN+IN
200 X=NM
210 GOTO 150
220 END
```

BOMBER

As the pilot of a plane you are faced with a desperate fuel shortage. You are circling down towards a city which has been cleared of its population, for your landing.

Now you have one last chance. Can you bomb away the buildings and clear an emergency runway before it's too late?

How to play

Release your bombs by pressing the space bar. Buildings will be destroyed more quickly if hit at their base, so accuracy is more important than speed.

If you manage to land your plane successfully, you will be faced with a second city with even higher buildings.

Programming hints

The game can be made easier if desired by reducing the height of the buildings you need to destroy. The easiest way to do this is to reduce the value of SK in lines 130 and 2170 for the first city, and in lines 2360 and 2240 for the second city.

Graphics characters

Line	
510	Home
770	Home
1520	Clear

1670 Home
1780 Home
1800 Cursor down
2020 Clear
2050 3 cursor down
2110 4 cursor down
2160 Clear
2350 Clear
2390 Clear
2430 5 cursor down
2440 8 cursor down

The program

Lines

120- 140	Initial subroutines
160- 190	Main subroutine calling loop
210- 300	Increment horizontal position & check for new level
310- 380	Horizontal position & new level on reverse pass
420	Collision detection
460	Look at keyboard to detect if space bar pressed
470- 550	Starting position of bomb
560- 600	Sound effects
620- 670	Move bomb and plane
680	Bomb off screen
690- 870	Bomb hits building
890- 920	New bomb position
940-1200	Define initial characters and set initial values
1210-1440	Read in sprite data
1450-1470	Set screen and ink colours
1470-1510	Set sound registers
1520-1690	Print city for start of game
1710-1820	Plane crashes into building
1830-1850	Clear keyboard buffer

1860-2120 Calculate and print high score table
2130-2220 New game values
2240-2340 Sound effects for successful landing
2350-2370 Print second city
2390-2460 Title screen

```
100 REM BOMBER
110 REM
120 GOSUB 2390
130 SK=5
140 GOSUB 940
150 REM MAIN LOOP
160 GOSUB 210
170 GOSUB 450
180 POKE S+4,0
190 GOTO 160
200 REM MOVE PLANE
210 PX=PX+IN
220 IF PX>0 OR IN>0 THEN 310
230 IF PEEK(V+16)=0 THEN 270
240 POKE V+16,0
250 PX=255
260 GOTO 390
270 POKE 2040,193
280 PY=PY+4
290 IN=1
300 GOTO 390
310 IF PX<255 OR PEEK(V+16)=1 OR IN<1 TH
EN 350
320 POKE V+16,1
330 PX=0
340 GOTO 390
350 IF PX<100 OR PEEK(V+16)=0 OR IN<1 TH
EN 390
360 PY=PY+21
370 IN=-1
380 POKE 2040,192
390 IF PX>45 AND PEEK(V+16)=1 AND PY>228
 THEN 2240
400 POKE V,PX
410 POKE V+1,PY
420 IF PEEK(V+31) AND 1=1 AND PY>50 THEN
 1710
430 RETURN
440 REM DROP BOMB
450 IF BD=1 THEN 620
460 IF PEEK(197)<>60 THEN 910
470 IF PX<24 OR (PX>65 AND PEEK(V+16)=1)
 THEN 910
480 IF BL<1 THEN 910
490 BD=1
500 BL=BL-1
510 PRINT "■" TAB(29) STR$(BL)+"  "
520 GOSUB 210
530 BI=IN
540 BX=INT((PX+256*PEEK(V+16))/8)-2-1*(I
N<1)
550 BY=INT(PY/8-4)
560 POKE S+6,240
570 POKE S+1,28
580 POKE S+4,83
590 GOSUB 210
600 POKE S+4,0
610 GOTO 630
620 POKE D+BY*40+BX,32
630 GOSUB 210:GOSUB 210
640 BX=BX+BI
650 GOSUB 210:GOSUB 210
660 BY=BY+1
670 GOSUB 210:GOSUB 210
680 IF BY>24 OR BX<0 OR BX>39 THEN BD=0:
GOTO 910
```

```
690 IF PEEK(D+BY*40+BX)<34 OR PEEK(D+BY*
40+BX)>37 THEN 880
700 POKE S+1,94
710 POKE S+5,6
720 POKE S+6,17
730 POKE S+4,129
740 BD=0
750 SC=SC+10
760 GOSUB 210
770 PRINT "■" TAB(13) SC;
780 GOSUB 210
790 POKE D+BX+BY*40,42
800 POKE C+BX+BY*40,1
810 POKE 53281,2
820 GOSUB 210:GOSUB 210
830 POKE 53281,0
840 POKE D+BX+BY*40,32
850 BY=BY-1
860 IF PEEK(D+BY*40+BX)<34 OR PEEK(D+BY*
40+BX)>37 THEN 910
870 GOTO 700
880 IF BY>24 OR BX<0 OR BX>39 THEN BD=0:
GOTO 910
890 POKE D+BY*40+BX,38
900 POKE C+BY*40+BX,4
910 GOSUB 210
920 RETURN
930 REM INITIALIZE
940 PRINT CHR$(142)
950 POKE 56334,PEEK(56334) AND 254
960 POKE 1,PEEK(1) AND 251
970 FOR J=0 TO 511
980 POKE J+14336,PEEK(J+53248)
990 NEXT J
1000 POKE 1,PEEK(1) OR 4
1010 POKE 56334,PEEK(56334) OR 1
1020 POKE 53272,(PEEK(53272) AND 240)+14
1030 FOR J=14608 TO 14647
1040 READ B:POKE J,B
1050 NEXT J
1060 REM CHARACTER DATA
1070 DATA 255,153,153,255,153,153,255,25
5
1080 DATA 254,170,254,170,254,170,254,17
0
1090 DATA 0,24,60,126,255,153,153,255
1100 DATA 0,124,254,170,254,170,254,170
1110 DATA 0,0,60,24,60,60,24,0
1120 POKE 2040,192
1130 BL=80
1140 IN=-1
1150 PX=65:PY=50
1160 V=53248:S=54272
1170 D=1024:C=55296
1180 POKE V+39,6
1190 POKE V+16,1
1200 POKE 53282,0
1210 FOR J=12288 TO 12350
1220 READ B:POKE J,B
1230 NEXT J
1240 REM SPRITE DATA
1250 DATA 0,0,0,0,0,0,0,0,0,0
1260 DATA 0,0,0,0,0,0,0,0,28,0
1270 DATA 0,60,0,0,60,12,0,124,28
1280 DATA 31,255,252,63,255,252,127,255,
252
1290 DATA 0,124,0,0,60,0,0,60,0
1300 DATA 0,28,0,0,0,0,0,0,0
1310 DATA 0,0,0,0,0,0,0,0,0,0
1320 FOR J=12352 TO 12414
1330 READ B:POKE J,B
1340 NEXT J
1350 DATA 0,0,0,0,0,0,0,0,0,0
1360 DATA 0,0,0,0,0,0,0,56,0
1370 DATA 0,60,0,48,60,0,56,62,0
1380 DATA 63,255,248,63,255,252,63,255,2
54
1390 DATA 0,62,0,0,60,0,0,60,0
1400 DATA 0,56,0,0,0,0,0,0,0
```

```
1410 DATA 0,0,0,0,0,0,0,0,0,0
1420 POKE V+1,50
1430 POKE V+16,1
1440 POKE V,65
1450 POKE 53280,0
1460 POKE 53281,0
1470 POKE 646,1
1480 FOR J=S TO S+23
1490 POKE J,0
1500 NEXT J
1510 POKE S+24,15
1520 PRINT "□"
1530 FOR K=963 TO 996
1540 RB=INT(RND(0)*SK)
1550 RT=INT(RND(0)*2)+1
1560 RC=INT(RND(0)*6)+2
1570 FOR J=1 TO RB
1580 IF RT=1 THEN POKE D+K-J*40,34
1590 IF RT=2 THEN POKE D+K-J*40,35
1600 POKE C+K-J*40,RC
1610 NEXT J
1620 IF RT=1 THEN POKE D+K-RB*40-40,36
1630 IF RT=2 THEN POKE D+K-RB*40-40,37
1640 POKE C+K-RB*40-40,RC
1650 NEXT K
1660 POKE V+21,1
1670 PRINT "■";
1680 PRINT TAB(6) "SCORE: " SPC(9) "BOMB
S: "BL
1690 RETURN
1700 REM END ROUTINE
1710 POKE S+6,240
1720 POKE S+24,15
1730 FOR J=100 TO 10 STEP-1
1740 POKE S+1,J
1750 POKE S+4,33
1760 NEXT J
1770 POKE S+4,0
1780 PRINT "■"
1790 FOR J=1 TO 13
1800 PRINT "■"
1810 NEXT J
1820 PRINT "YOUR SCORE: "SC
1830 FOR GA=1 TO 10
1840 GET G$
1850 NEXT GA
1860 NM$=""
1870 INPUT "YOUR NAME";NM$
1880 IF LEN(NM$)<15 THEN 1910
1890 PRINT "TOO LONG!"
1900 GOTO 1870
1910 SA(10)=SC
1920 N$(10)=NM$
1930 FOR J=10 TO 2 STEP-1
1940 IF SA(J)<SA(J-1) THEN 2010
1950 TP=SA(J-1)
1960 T$=N$(J-1)
1970 SA(J-1)=SA(J)
1980 N$(J-1)=N$(J)
1990 SA(J)=TP
2000 N$(J)=T$
2010 NEXT J
2020 PRINT "□"
2030 POKE V+21,0
2040 PRINT TAB(10) "HIGH SCORE TABLE"
2050 PRINT "■■■"
2060 FOR M=1 TO 9
2070 PRINT TAB(5) M " " SA(M) "   ";
2080 PRINT N$(M)
2090 NEXT M
2100 PRINT:PRINT
2110 PRINT TAB(8) "■■■■PRESS P TO PLAY"
2120 PRINT TAB(14) "S TO STOP"
2130 GET Q$
2140 IF Q$="" THEN 2130
2150 IF Q$<>"P" THEN 2470
2160 PRINT "□"
2170 SC=0:SK=5:BD=0
2180 BL=80:IN=-1
2190 PX=65:PY=50
```

```
2200 POKE 2040,192
2210 GOSUB 1420
2220 GOTO 160
2230 REM SUCCESSFUL LANDING
2240 IF SK=10 THEN 2350
2250 POKE S+24,15:POKE S+6,240
2260 FOR J=1 TO 4
2270 READ N,B
2280 POKE S+1,N
2290 POKE S+4,33
2300 FOR DE=1 TO B*6
2310 NEXT DE
2320 NEXT J
2330 POKE S+4,0
2340 DATA 23,50,35,50,26,50,40,90
2350 PRINT "□"
2360 SK=10
2370 GOTO 2180
2380 REM TITLE SCREEN
2390 PRINT "□"
2400 POKE 53281,2
2410 POKE 53280,2
2420 POKE 646,7
2430 PRINT "■■■■■■" TAB(16) "BOMBER"
2440 PRINT "■■■■■■■■■■" TAB(2) "PRESS THE
SPACE BAR TO RELEASE BOMBS"
2450 PRINT "■■DESTROY ALL BUILDINGS TO L
AND YOUR PLANE"
2460 RETURN
2470 POKE 49152,0
2480 SYS 49152
2490 END
```

BREAKOUT

This game should be a pushover for those amongst you who have spent too many hours in arcades playing with the machines.

Across the top of the screen are five rows of coloured bricks, and the objective is to demolish this mutli-coloured prison by bouncing a ball off the bricks.

Clear the wall and a new screenful will be generated.

How to play

Use keys O and P to control your bats, but remember that you will have to predict the trajectory of the ball as it returns to you.

Programming hints

The game can be made easier, or maybe you might think more difficult, by increasing the number of balls in play.

To do this, increase the value of BL in line 1170 to the number of balls you require.

Graphics characters

Line	
550	Home
870	Home
910	Clear
970	Home

1210 Clear
1220 Clear
1640 Clear
1680 3 cursor down
1690 6 cursor down
1710 3 cursor down
1760 Home
1780 Cursor down
1980 Clear
2000 3 cursor down
2060 4 cursor down
2120 Clear

The program

Lines
130- 140 Initial subroutines
160- 180 Main subroutine calling loop
210- 320 Look at keyboard and move bat
340- 360 Blank old ball position and move ball
380- 490 Bounce on screen edge or top
510- 670 Missed ball
690- 700 Look for clear ball position
710- 780 Bounce ball
800- 890 Ball hits brick
900- 920 Generate new screen
930- 950 Next ball position
970-1200 Define characters and set initial values
1210-1510 Set up screen
1520-1620 Initial values
1640-1740 Display title screen
1760-2070 Calculate and print high score table
2080-2170 New game or end

```
100 REM BREAKOUT
110 REM
120 REM INITIAL ROUTINES
130 GOSUB 1640
140 GOSUB 970
150 REM MAIN LOOP
160 GOSUB 210
170 GOSUB 340
180 GOSUB 210
190 GOTO 160
200 REM LOOK AT KEYBOARD
210 P=PEEK(197)
220 IF P=38 OR P=41 THEN 250
230 FOR DE=1 TO 25:NEXT DE
240 GOTO 320
250 IF P=38 THEN IN=-1
260 IF P=41 THEN IN=1
270 BP=BP+IN
280 IF BP<1944 THEN BP=BP+1
290 IF BP>1983 THEN BP=BP-1
300 POKE BP-IN,32
310 POKE BP,35
320 RETURN
330 REM MOVE BALL
340 POKE C+R*40+D,32
350 R=R+Y
360 C=C+X
370 REM SCREEN EDGE?
380 IF R>0 THEN 440
390 POKE S+1,55
400 POKE S+4,83
410 Y=-Y
420 R=R+Y
430 REM SCREEN EDGE?
440 IF C>=0 AND C<=39 THEN 510
450 POKE S+1,55
460 POKE S+4,83
470 X=-X
480 C=C+X
490 GOTO 930
500 REM MISSED BALL
510 IF R<24 THEN 690
520 POKE S+1,20
530 POKE S+4,33
540 BL=BL-1
550 PRINT "■";
560 PRINT TAB(12) BL;
570 POKE S+4,0
580 FOR DE=1 TO 2000:NEXT DE
590 IF BL=0 THEN 1760
600 POKE C+R*40+D,32
610 C=19
620 R=INT(RND(0)*5)+15
630 XR=INT(RND(0)*2)
640 X=-1
650 IF XR=0 THEN X=-X
660 Y=-1
670 GOTO 930
680 REM LOOK AT BALL POSITION
690 LA=PEEK(C+R*40+D)
700 IF LA=32 THEN 930
710 IF LA<>35 THEN 800
720 Y=-Y:X=-X
730 POKE S+1,35
740 POKE S+4,83
750 IF PEEK(197)=38 OR PEEK(197)=41 THEN
  X=-X
760 C=C+X
770 R=R+Y
780 GOTO 940
790 REM BRICK HIT?
800 IF LA<>33 THEN 930
810 IF PEEK(C+X+40*(R+Y)+D)=32 THEN Y=-Y
820 Y=-Y
830 POKE S+1,70
840 POKE S+4,33
850 POKE CL+C+40*R,8
860 SC=SC+10
870 PRINT "■";
880 PRINT TAB(31) SC
```

```
890 POKE S+4,0
900 IF SC/1600<>INT(SC/1600) THEN 930
910 PRINT "□"
920 GOSUB 1210
930 POKE C+40*R+D,34
940 POKE S+4,0
950 RETURN
960 REM INITIALIZE
970 PRINT "■"
980 POKE 55,0
990 POKE 56,56
1000 PRINT CHR$(142)
1010 POKE 56334,PEEK(56334)AND 254
1020 POKE 1,PEEK(1) AND 251
1030 FOR J=0 TO 511
1040 POKE J+14336,PEEK(J+53248)
1050 NEXT J
1060 POKE 1,PEEK(1) OR 4
1070 POKE 56334,PEEK(56334) OR 1
1080 POKE 53272,(PEEK(53272) AND 240)+14
1090 FOR J=14600 TO 14623
1100 READ D:POKE J,D
1110 NEXT J
1120 REM CHARACTER DATA
1130 DATA 0,126,126,126,126,126,126,0
1140 DATA 0,0,24,60,60,24,0,0
1150 DATA 0,0,255,255,255,255,0,0
1160 CL=55296:D=1024
1170 BL=5
1180 POKE 53281,0
1190 POKE 53280,11
1200 POKE 646,1
1210 PRINT "□"
1220 PRINT "□      BALLS: "BL SPC(8) "SCO
RE: " SC
1230 FOR J=55336 TO 55455
1240 POKE J,8
1250 NEXT J
1260 FOR J=920 TO 959
1270 POKE J+CL,6
1280 NEXT J
1290 POKE 938+D,35
1300 FOR J=160 TO 199
1310 POKE J+CL,2
1320 POKE J+D,33
1330 NEXT J
1340 FOR J=200 TO 239
1350 POKE J+CL,7
1360 POKE J+D,33
1370 NEXT J
1380 FOR J=240 TO 279
1390 POKE J+CL,5
1400 POKE J+D,33
1410 NEXT J
1420 FOR J=280 TO 319
1430 POKE J+CL,4
1440 POKE J+D,33
1450 NEXT J
1460 FOR J=55616 TO 56215
1470 POKE J,8
1480 NEXT J
1490 FOR J=56256 TO 56295
1500 POKE J,8
1510 NEXT J
1520 Y=-1:X=-1
1530 R=15
1540 BP=938+D
1550 C=19
1560 S=54272
1570 FOR L=S TO S+23
1580 POKE L,0
1590 NEXT L
1600 POKE S+24,15
1610 POKE S+6,240
1620 RETURN
1630 REM TITLE SCREEN
1640 PRINT "□"
1650 POKE 53281,7
1660 POKE 53280,7
```

```
1670 POKE 646,2
1680 PRINT "■■■■" TAB(14) "BREAKOUT"
1690 PRINT "■■■■■■■■   USE KEYS O & P TO M
OVE YOUR BAT"
1700 PRINT "    LEFT AND RIGHT."
1710 PRINT "■■■■    EACH BRICK REMOVED FRO
M THE WALL"
1720 PRINT "    SCORES 10 POINTS."
1730 FOR DE=1 TO 1000:NEXT DE
1740 RETURN
1750 REM END OF GAME
1760 PRINT "■"
1770 FOR J=1 TO 13
1780 PRINT "■"
1790 NEXT J
1800 PRINT "YOUR SCORE: "SC
1810 FOR GA=1 TO 10
1820 GET G$
1830 NEXT GA
1840 NM$=""
1850 INPUT "YOUR NAME";NM$
1860 IF LEN(NM$)>12 THEN PRINT "TOO LONG
.":GOTO 1850
1870 SA(10)=SC
1880 N$(10)=NM$
1890 FOR J=10 TO 2 STEP-1
1900 IF SA(J)<SA(J-1) THEN 1970
1910 TP=SA(J-1)
1920 T$=N$(J-1)
1930 SA(J-1)=SA(J)
1940 N$(J-1)=N$(J)
1950 SA(J)=TP
1960 N$(J)=T$
1970 NEXT J
1980 PRINT "□"
1990 PRINT TAB(10) "HIGH SCORE TABLE"
2000 PRINT "■■■■"
2010 FOR M=1 TO 9
2020 PRINT TAB(5) M " " SA(M) " ";
2030 PRINT N$(M)
2040 NEXT M
2050 PRINT:PRINT
2060 PRINT TAB(8) "■■■■PRESS P TO PLAY"
2070 PRINT TAB(14) "S TO STOP"
2080 GET Q$
2090 IF Q$="" THEN 2080
2100 IF Q$<>"P" THEN 2150
2110 SC=0
2120 PRINT "□"
2130 GOSUB 1170
2140 GOTO 160
2150 POKE 49152,0
2160 SYS 49152
2170 END
```

METEOR RUN

A friendly alien space cruiser has been pulverised by a meteor shower and it's crew have abandoned ship.

Only you, and your brave crew, can save the unfortunate survivors of this calamity.

The trouble is that the meteors are still coming in waves, and your own ship has no forecefield to protect it from the danger. Oh, by the way, your laser guns have overheated, and you have no way to destroy the meteors, you can only avoid them.

How to play

Use the O and P keys to move left and right.

Every helpless alien you pick up gains you extra points.

Graphic characters

Line
230 Shift Q
580 Clear
600 Cursor down
730 Cursor down
750 Cursor down, cursor down
790 Clear
820 Clear

The program

Lines

130-160	Main subroutine calling loop
180-270	Scroll screen and print meteors and alien
290-460	Look at keyboard and move ship testing for alien or meteors.
490-510	Set screen and ink colours
520-560	Set sound registers
570-660	Initial values
670-750	End of game
760-810	Check for new game request
820-860	End of program

```
100 REM METEOR RUN
110 REM
120 GOSUB 480
130 GOSUB 290
140 GOSUB 180
150 SC=SC+5
160 GOTO 130
170 REM SCROLL
180 TV=R*40+C+1024
190 POKE TV,32:POKE TV+1,32
200 W=INT(RND(0)*40)
210 WA=WA+W
220 IF WA>39 THEN 250
230 PRINT SPC(W) "●";
240 GOTO 200
250 WA=0
260 IF RND(0)>.9 THEN PRINT SPC(INT(RND(
0)*40)) CHR$(30) CHR$(126) CHR$(158);
270 RETURN
280 REM MOVE SHIP
290 IF PEEK(197)=38 AND C>0 THEN C=C-1
300 IF PEEK(197)=41 AND C<38 THEN C=C+1
310 TV=R*40+C+1024
320 IF PEEK(TV)=81 OR PEEK(TV+1)=81 THEN
 670
330 IF PEEK(TV)=94 OR PEEK(TV+1)=94 THEN
 350
340 GOTO 400
350 POKE S+1,40
360 POKE S+4,33
370 SC=SC+100
380 FOR DE=1 TO 20:NEXT
390 POKE S+4,0
400 IF INT(SC/100)<>SC/100 THEN 440
410 R=R+1
420 IF R>22 THEN R=22
430 TV=R*40+C+1024
440 POKE TV,127:POKE TV+54272,2
450 POKE TV+1,255:POKE TV+54273,2
460 RETURN
470 REM INITIALIZE
480 S=54272
490 POKE 53280,0
500 POKE 53281,0
510 POKE 646,7
520 FOR J=S TO S+23
530 POKE J,0
540 NEXT J
550 POKE S+24,15
560 POKE S+6,240
```

```
570 R=3:C=20
580 PRINT "□"
590 FOR J=1 TO 12
600 PRINT "■"
610 NEXT J
620 FOR J=55296 TO 56295
630 POKE J,7
640 NEXT J
650 SC=0
660 RETURN
670 POKE S+4,83
680 FOR J=160 TO 20 STEP-1
690 POKE S+1,J
700 FOR DE=1 TO 10:NEXT DE
710 NEXT J
720 POKE S+4,0:PRINT
730 PRINT "■YOUR SCORE: "SC
740 IF HS<SC THEN HS=SC
750 PRINT "■HIGH SCORE: "HS"■"
760 FOR J=1 TO 10:GET GA$:NEXT J
770 INPUT "PLAY AGAIN";Q$
780 IF LEFT$(Q$,1)="N" THEN 820
790 PRINT "□"
800 GOSUB 570
810 GOTO 130
820 PRINT "□"
830 POKE 646,14
840 POKE 53280,14
850 POKE 53281,6
860 END
```

ANAGRAM

Your 64 will generate a series of anagrams for you to solve, acting on the data which you feed into your computer.

How to play

It is very simple of course.

All you have to do is to identify the word and type in your, hopefully, correct answer.

Type QUIT to give up on a particular anagram and STOP to end the entire program.

Programming hints

The words for selection are contained in the DATA statements to be found in lines 510 to 610. These can easily be changed to suit various levels of knowledge and experience. You could use this program to form the base for a science quiz, if you wished.

Make sure that only one word can be formed as the correct answer or you will have some heavy arguments among users.

It is simple to change the DATA, just delete and add words as you wish. Do remember, however, that if you change to total number of words, you will need to change the value for WD$ in the DIM statement in line 130.

Graphics characters

Line
120 Clear
340 Cursor down
400 Cursor down
420 Cursor down
490 Cursor down
630 2 cursor down

The program

Lines

120	Clear screen
130	Dimension storage arrays
140-190	Read data into array
220-230	Select random word
250-290	Jumble word
300-330	Print word
350-370	Input guess and test for correct answer
400-410	Wrong answer
420-480	Correct answer
510-610	Word data
630-640	End of program

```
100 REM ANAGRAM
110 REM
120 PRINT "□"
130 DIM WD$(100),M$(12)
140 J=1
150 REM READ IN DATA
160 READ WD$(J)
170 IF WD$(J)="END" THEN 200
180 J=J+1
190 GOTO 160
200 J=J-1
210 REM SELECT WORD
220 R=INT(RND(0)*J)+1
230 A$=WD$(R)
240 TR=TR+1
250 FOR I=1 TO LEN(A$)
260 R=INT(RND(0)*12)+1
270 IF M$(R)<>"" THEN 260
280 M$(R)=MID$(A$,I,1)
290 NEXT I
300 FOR I=1 TO 12
310 IF M$(I)="" THEN 330
320 PRINT M$(I);
```

```
330 NEXT I
340 PRINT "■"
350 INPUT "YOUR GUESS";G$
360 PRINT
370 IF G$=A$ THEN 420
380 IF G$="QUIT" THEN 490
390 IF G$="STOP" THEN 630
400 PRINT "TRY AGAIN!■"
410 GOTO 350
420 PRINT "CORRECT!■"
430 NC=NC+1
440 A$=""
450 FOR I=1 TO 12
460 M$(I)=""
470 NEXT I
480 GOTO 220
490 PRINT A$ "■"
500 GOTO 440
510 DATA POND,WOOD,MOUSE,TIGER,ANTELOPE,
CASSETTE,SERENDIPITY,COMPUTER
520 DATA PROGRAMME,APPLE,WORD,TRAIN,HOUS
E,APEX,DERELICT,DIGIT,BUTTERFLY
530 DATA IDEA,INDEPENDENT,ANAGRAM,MINOTA
UR,DUNGEON,MINIATURE,ENVIRONMENT
540 DATA MOTH,PARTY,OCEAN,ORBIT,OXYGEN,P
ASSPORT,PENNY,PENINSULA,RABBIT
550 DATA PEAR,TOAD,POUND,GUESS,BINARY,PU
PIL,BASIC,ANALOGUE,VIDEO,BUG,RECORD
560 DATA MAZE,SOFTWARE,MODULAR,CONTROL,C
ABLE,ISSUE,LEAF,HELICOPTER
570 DATA TELEVISION,TELEPHONE,DICE,CHESS
,PROGRESS,SHARK,BOOK,ROBOT,PLAY,FILM
580 DATA EVENT,GOOSE,FRESH,JUNIOR,CRICKE
T,PICTURE,HEAP,HAVOC,EXPERT
590 DATA LANGUAGE,TRAVEL,VILLAGE,GENERAT
ION,MUSIC,CALCULATOR,ATLAS,PAPER
600 DATA CARD,CHIMNEY,TICKET,CODE,BIRD,F
ISH,COLOUR,LAKE,TYRE,CAKE,ITCH
610 DATA ROAD,SAIL,SAFE,PRICE,MIST,BREAD
,PIE,INSECT,BOOT
620 DATA END
630 PRINT "YOU GUESSED"NC"CORRECTLY OUT
OF"TR-1:PRINT "TRIES.■■"
640 END
```

PHARAOH'S CURSE

This is the kind of adventure game that even your older friends and family may like to play, as it involves logic, memory and the powers of deduction — you don't have to be a crackshot arcade games player.

On this adventure you will be seeking for treasure, of course, but you will have to decide whether or not to collect stone urns, iron rods, boxes, earthenware pots and daggers on your way to the centre of the pyramid.

You will have to decide whether or not to go East, West, North, South and whether or not to open doors, enter ante rooms and tackle mazes. Beware that floors may crumble, walls may collapse, mists may envelope you as the tombs are protected against robbers such as you.

How to play

The input is standard verb followed by noun eg. Go South, Examine Table, Take Key etc. Compass directions can be abbreviated to N, S, E, W.

Typing in adventure games can take quite a time, so we recommend that you have a cassette storage available, so you can load onto tape and complete the list loading in two sittings if necessary. Be very careful when typing in data statements, as a single error might not be picked up by the program, but could prove to make a nonsense of your logical structure.

The adventure features a "save game" facility so that there is no need to stay up all night playing. Just type the

word SAVE as your command; and LOAD to reload your unfinished game.

Graphics characters

Line	
14	Clear
20	6 cursor down
120	Clear
260	Clear
290	Home, cursor down
360	Full line of Commodore key and I
2630	Clear
2720	Clear
2792	Clear
2810	Clear
2812	6 cursor down
2820	12 cursor down
2850	Clear
2854	6 cursor down
2856	12 cursor down

The Program

Lines	
30- 114	Dimension arrays and read in data
120- 240	Print instructions
274- 360	Print location descriptions
370	Special locations
430- 590	Input and analyse command then go to relevant part of the program
600- 660	Verb strike
670- 690	Read
700- 770	Move
780- 812	Drop
820- 942	Walk, go

950-1082 Take
1090-1582 Examine
1590-1852 Open
1860-1922 Dig
1930 Verb data
1940-1942 Noun data
1960-2540 Location descriptions and exit data
2560-2622 Help
2640-2710 Save game
2720-2800 Load game
2810-2860 End of game routines
2870-2890 Delay subroutine

```
10 REM PHARAOH'S CURSE
12 REM
14 PRINT "□"
20 PRINT "■■■■■■■■" TAB(11) "PHARAOH'S CUR
SE"
30 DIM M(44,4),OB(40),OJ$(40),R$(44),DR$
(4),OL(40)
40 GOTO 1930
50 REM READ IN DATA
60 READ V$,N$,Z$,RN,NN,CP
62 N$=N$+Z$
70 FOR J=1 TO RN
80 FOR K=1 TO 4
82 READ M(J,K)
84 NEXT K,J
90 FOR J=1 TO NN
92 READ OL(J)
94 NEXT J
100 FOR J=1 TO NN
102 READ OJ$(J)
104 NEXT J
110 FOR J=1 TO 4
112 READ DR$(J)
114 NEXT J
120 PRINT "□"
130 PRINT "THERE IS A LONG FORGOTTEN VAL
LEY IN"
132 PRINT "EGYPT WHERE, RUMOUR HAS IT, A
 VAST"
134 PRINT "SECRET TREASURE IS HIDDEN."
136 PRINT
140 PRINT "MANY HAVE ATTEMPTED TO FIND T
HIS"
142 PRINT "PHARAOH'S HOARD BUT NONE HAVE
 RETURNED."
144 PRINT
150 PRINT "IF YOU ARE WILLING, WE WILL A
TTEMPT"
152 PRINT "TO FIND THE TREASURE TOGETHER
."
154 PRINT
180 PRINT "GIVE ME TWO WORD COMMANDS AS"
182 PRINT "INSTRUCTIONS, EG GO NORTH, EX
AMINE DOOR.";
184 PRINT "TAKE INVENTORY.":PRINT
190 PRINT "THERE ARE MANY MORE COMMANDS
YOU CAN "
192 PRINT "USE, BUT I WILL LEAVE YOU TO
DISCOVER"
194 PRINT "THEM FOR YOURSELF."
200 PRINT
202 PRINT "IN CASES OF DESPERATION, TYPE
 HELP AS   YOUR COMMAND."
```

```
220 PRINT
240 PRINT "PRESS ANY KEY TO START..."
250 GET NU$
252 IF NU$="" THEN 250
260 PRINT "J"
270 GOTO 430
274 REM PRINT LOCATION
280 FOR J=1024 TO 1343
282 POKE J,32
284 NEXT J
290 PRINT "LOCATION: "R$(CP)
300 FOR J=1 TO NN
302 IF OL(J)=CP THEN 310
304 NEXT J
306 GOTO 320
310 PRINT "VISIBLE: ";
312 FOR J=1 TO NN
314 IF OL(J)<>CP THEN 318
316 PRINT OJ$(J)
318 NEXT J
320 PRINT "DIRECTIONS: ";
322 FOR J=1 TO 4
324 IF M(CP,J)=0 OR M(CP,J)=88 THEN 328
326 PRINT DR$(J);:DF=1
328 NEXT J
330 IF DF=0 THEN PRINT "??"
340 DF=0
350 PRINT
360 PRINT "________________________________________
_____"
370 IF CP=13 OR CP=35 OR CP=36 OR CP=25
OR CP=42 THEN 380
372 GOTO 410
380 GOSUB 2870
390 GOSUB 2870
400 GOTO 2810
410 RETURN
430 FOR J=1 TO 5:PRINT:NEXT:GOSUB 280
432 FOR J=1 TO 16:PRINT:NEXT
434 IP$=""
436 INPUT "WHAT NOW";IP$
438 PRINT
440 IF IP$="HELP" THEN 2560
450 IF IP$="N" THEN IP$="GO NORTH"
460 IF IP$="S" THEN IP$="GO SOUTH"
470 IF IP$="E" THEN IP$="GO EAST"
480 IF IP$="W" THEN IP$="GO WEST"
490 IF IP$="SAVE" THEN 2630
500 IF IP$="LOAD" THEN 2720
502 IF LEN(IP$)<6 THEN PRINT "I DON'T UN
DERSTAND THAT.":GOTO 430
510 FOR X=1 TO LEN(IP$)
512 IF MID$(IP$,X,1)=" " THEN 520
514 NEXT X
516 IF X>LEN(IP$)-2 THEN IP$=" ":GOTO 50
2
520 VB$=LEFT$(IP$,3)
530 NT$=MID$(IP$,X+1,LEN(IP$)-X)
540 NO$=MID$(IP$,X+1,3)
550 FOR VB=1 TO LEN(V$)
552 IF MID$(V$,VB,3)=VB$ THEN 558
554 NEXT VB
556 VB=0
558 VB=(VB+2)/3
560 IF VB<1 THEN PRINT "I DON'T UNDERSTA
ND THE VERB.":GOTO 430
570 FOR NO=1 TO LEN(N$)
572 IF MID$(N$,NO,3)=NO$ THEN 578
574 NEXT NO
576 NO=0
578 NO=(NO+2)/3
580 IF NO<1 THEN PRINT "I DON'T UNDERSTA
ND THE NOUN.":GOTO 430
590 ON VB GOTO 820,700,1090,1590,1860,95
0,950,790,790,670,700,600
600 REM STRIKE
610 IF NO=24 AND OB(5)=1 AND CP=20 THEN
620
612 GOTO 650
620 PRINT "A SECRET DOORWAY HAS OPENED!"
630 M(20,4)=30
640 GOTO 430
```

```
650 PRINT "NOTHING HAPPENED."
660 GOTO 430
670 REM READ
680 PRINT "TRY EXAMINE."
690 GOTO 430
700 REM MOVE
710 IF NO=26 AND CP=4 THEN 720
712 GOTO 750
720 PRINT "A SECRET PASSAGEWAY!"
730 M(4,4)=39
740 GOTO 430
750 REM NO SPECIAL SITUATION
760 PRINT "NOTHING HAPPENED."
770 GOTO 430
780 REM DROP
790 IF OB(NO)<>1 THEN 810
800 OB(NO)=0
802 OL(NO)=CP
804 PRINT "YOU'VE DROPPED IT."
806 GOTO 430
810 PRINT "YOU DON'T HAVE "NT$
812 GOTO 430
820 REM WALK
830 IF NO=20 AND CP=30 AND OB(1)=1 THEN
840
832 GOTO 860
840 CP=11
850 GOTO 430
860 REM DIRECTIONS
870 IF NO<28 OR NO>31 THEN 880
872 GOTO 900
880 PRINT "YOU CAN'T GO THAT WAY."
890 GOTO 430
900 IF M(CP,NO-27)=0 THEN 880
910 IF M(CP,NO-27)=88 THEN 920
912 GOTO 940
920 PRINT "YOU CAN'T GO THAT WAY, YET!"
930 GOTO 430
940 CP=M(CP,NO-27)
942 GOTO 430
950 REM TAKE
960 IF NO<>32 THEN 1020
970 FOR J=1 TO NN
980 IF OB(J)<>1 THEN 1000
990 PRINT OJ$(J)
1000 NEXT J
1010 GOTO 430
1020 IF NO>13 THEN PRINT "YOU CAN'T TAKE
 THAT!":GOTO 430
1030 FOR J=1 TO 15
1032 IF OB(J)=1 THEN CN=CN+1
1040 NEXT J
1050 IF CN<4 THEN 1060
1052 PRINT "YOU CAN'T CARRY ANY MORE!"
1054 CN=0
1056 GOTO 430
1060 CN=0
1070 IF OL(NO)<>CP THEN 1080
1072 OL(NO)=0
1074 OB(NO)=1
1076 PRINT "IT'S YOURS."
1078 GOTO 430
1080 PRINT "THERE'S NO "NT$" HERE!"
1082 GOTO 430
1090 REM EXAMINE
1100 IF NO=1 AND (OB(1)=1 OR OL(1)=CP) T
HEN 1110
1102 GOTO 1190
1110 PRINT "IT'S COVERED IN HIEROGLYPHIC
S!"
1112 PRINT
1120 GOSUB 2870
1130 PRINT "WAIT...":PRINT
1140 GOSUB 2870
1150 PRINT "THERE'S A SLIP OF PAPER INSI
DE..."
1152 PRINT
1160 GOSUB 2870
1170 PRINT "IT SAYS: HE WHO CARRIES THIS
 SHALL GO"
1172 PRINT "UNTO HIS OWN REFLECTION."
1174 PRINT
1176 PRINT "TRANSLATION BY ADVENTURE TRA
```

```
NSLATIONS    INC.";
1178 PRINT " COPYRIGHT 2040 B.C."
1180 GOTO 430
1190 IF NO=3 AND (OB(3)=1 OR OL(3)=CP) T
HEN 1200
1192 GOTO 1260
1200 PRINT "HMMM..."
1202 PRINT
1210 GOSUB 2870
1220 PRINT "IT'S DIFFICULT TO READ..."
1222 PRINT
1230 GOSUB 2870
1240 PRINT "I THINK IT SAYS: STRIKE A MA
N WITH A ROD"
1242 PRINT "OF IRON TO **SMUDGE** RESTIN
G PLACE..."
1244 PRINT
1246 GOSUB 2870
1248 PRINT "THATS ALL I CAN MAKE OUT."
1250 GOTO 430
1260 IF NO=26 AND CP=4 THEN 1270
1262 GOTO 1290
1270 PRINT "IT DOESN'T LOOK THAT HEAVY!"
1280 GOTO 430
1290 IF NO=7 AND (OB(7)=1 OR OL(7)=CP) T
HEN 1300
1292 GOTO 1320
1300 PRINT "THERE'S A HOLE IN IT!"
1310 GOTO 430
1320 IF NO=9 AND (OB(9)=1 OR OL(9)=CP) T
HEN 1330
1322 GOTO 1360
1330 PRINT "THERE'S AN OLD PARCHMENT IN
THERE."
1340 OL(3)=CP
1350 GOTO 430
1360 IF NO=16 AND CP=5 THEN 1370
1362 GOTO 1390
1370 PRINT "THERE'S A KEYHOLE."
1380 GOTO 430
1390 IF NO=20 AND CP=30 THEN 1400
1392 GOTO 1420
1400 PRINT "THERE'S AN UGLY LOOKING CREA
TURE IN      THERE!"
1410 GOTO 430
1420 IF NO=10 AND (OB(10)=1 OR OL(10)=CP
) THEN 1430
1422 GOTO 1500
1430 PRINT "THERE'S A POISONOUS SPIDER I
NSIDE."
1432 PRINT
1440 GOSUB 2870
1450 PRINT "OOPS!"
1452 PRINT
1460 GOSUB 2970
1470 PRINT "TOO LATE!"
1480 GOSUB 2870
1490 GOTO 2810
1500 IF NO=25 AND CP=10 THEN 2850
1510 IF NO=26 AND CP=15 THEN 1520
1512 GOTO 1540
1520 PRINT "YOU WON'T MOVE THIS ONE!"
1530 GOTO 430
1540 IF NO=11 AND (OB(11)=1 OR OL(11)=CP
) THEN 1550
1542 GOTO 1570
1550 PRINT "THERE'S AN EMBALMED COCKROAC
H IN THERE."
1560 GOTO 430
1570 REM NO SPECIAL SITUATION
1580 PRINT "NOTHING SPECIAL."
1582 GOTO 430
1590 REM OPEN
1600 IF NO=17 AND CP=5 THEN 1610
1602 GOTO 1640
1610 PRINT "LOOK!"
1620 OL(23)=5
1630 GOTO 430
1640 IF NO=17 AND CP=7 THEN 1650
1642 GOTO 1690
1650 PRINT "LOOK!"
1660 IF OL(1)<>0 OR OB(1)=1 THEN 430
```

```
1670 OL(1)=7
1680 GOTO 430
1690 IF NO=17 AND CP=9 THEN 1700
1692 GOTO 1760
1700 PRINT "LOOK!"
1710 IF OL(2)<>0 OR OB(2)=1 THEN 1730
1720 OL(2)=9
1730 IF OL(6)<>0 OR OB(6)=1 THEN 430
1740 OL(6)=9
1750 GOTO 430
1760 IF NO=6 AND (OB(6)=1 OR OL(6)=CP) T
HEN 1770
1762 GOTO 1810
1770 PRINT "WATCH OUT!"
1772 PRINT:GOSUB 2870
1774 PRINT "THERE'S A POISONOUS SNAKE IN
 THERE!"
1776 PRINT
1780 GOSUB 2870
1782 PRINT "QUICK! WHAT'S THE CURE FOR A
 SNAKEBITE?"
1784 PRINT
1790 GOSUB 2870
1792 PRINT "TOO LATE..."
1794 GOSUB 2870
1800 GOTO 2810
1810 IF NO=16 AND CP=5 AND OB(2)=1 THEN
1820
1812 GOTO 1850
1820 PRINT "IT'S OPEN."
1830 M(5,3)=16
1840 GOTO 430
1850 PRINT "YOU CAN'T DO THAT."
1852 GOTO 430
1860 REM DIG
1870 IF CP<>23 THEN 1910
1880 PRINT "YOU'VE UNCOVERED A SECRET EN
TRANCE!"
1882 PRINT
1884 GOSUB 2870
1886 PRINT "IT LOOKS SCARY... I DON'T TH
INK YOU      SHOULD GO DOWN THERE!"
1890 M(23,1)=24
1900 GOTO 430
1910 REM NO SPECIAL SITUATIONS
1920 PRINT "THERE'S NOTHING THERE."
1922 GOTO 430
1930 DATA GO MOVEXAOPEDIGTAKGETDROLEAREA
PULSTR
1940 DATA CLOKEYPARNULRODBOXBUCDAGURNPOT
BOTNUL
1942 DATA NULSANPYRDOOCASCHACAVMIRNULNUL
MUMSTASIGROCNULNORSOUEASWESINV
1950 DATA 44,27,3
1960 R$(1)="AT THE END OF THE VALLEY OF
   TOMBS. SHEER CLIFFS RISE AROUND YOU."
1970 R$(2)="IN THE VALLEY OF TOMBS."
1980 R$(3)=R$(2)
1990 R$(4)="IN A GLOOMY GREY STONE CAVE.
   WATER TRICKLES DOWN ONE WALL."
2000 R$(5)="IN A SMALL BURIAL CHAMBER. T
HEFLOOR IS HARD PACKED EARTH."
2010 DATA 2,0,0,0,3,1,9,0,6,2,5,4,0,0,3,
88,0,0,88,3
2020 R$(6)=R$(2)
2030 R$(7)="IN A LOW STONE BURIAL CHAMBE
R."
2040 R$(8)=R$(2)
2050 R$(9)="IN A LARGE DARK BURIAL CHAMB
ERWITH A FLOOR OF STONE SLABS."
2060 R$(10)="AT THE END OF YOUR JOURNEY.
"
2070 DATA 8,3,7,0,0,0,0,6,0,6,0,0,0,0,0,
2,12,0,0,0
2080 R$(11)="ON THE OTHER SIDE OF THE
    MIRROR."
2090 R$(12)="IN THE ANNEXE TO THE BURIAL
    CHAMBER."
2100 R$(13)="FALLING INTO A DEEP SLIMY P
IT DESIGNED TO TRAP TOMB ROBBERS..."
2110 R$(14)="AT THE JUNCTION OF TWO
    PASSAGES."
```

```
2120 R$(15)="IN A SMALL ANTE-ROOM. BE
    CAREFULL, THE FLOOR IS SLIPPERY."
2130 DATA 37,31,30,0,0,10,14,0,0,0,0,0,1
3,38,15,12,0,0,0,14
2140 R$(16)="TO THE WEST OF THE PYRAMID
OF PTAH."
2150 R$(17)="TO THE WEST OF THE PYRAMID
OF AMON."
2160 R$(18)="TO THE SOUTH OF THE PYRAMID
 OFAMON."
2170 R$(19)="TO THE NORTH OF THE PYRAMID
 OFAMON."
2180 R$(20)="TO THE EAST OF THE PYRAMID
OF AMON."
2190 DATA 21,23,0,5,19,18,0,0,0,0,20,17,
23,0,20,17,19,18,0,88
2200 R$(21)="TO THE NORTH OF THE PYRAMID
 OFPTAH."
2210 R$(22)="TO THE EAST OF THE PYRAMID
OF PTAH."
2220 R$(23)="TO THE SOUTH OF THE PYRAMID
 OFPTAH."
2230 R$(24)="IN AN OVAL ENTRY CHAMBER."
2240 R$(25)="FALLING INTO A DEEP AND
    OCCUPIED SNAKE PIT..."
2250 DATA 0,0,22,16,21,23,0,0,88,19,22,1
6,27,23,26,25,0,0,0,0
2260 R$(26)="IN A WOOD LINED MORTUARY
    CHAMBER."
2270 R$(27)="IN A COLD DARK BURIAL CHAMB
ER."
2280 R$(28)="IN SOME KIND OF ENCHANTED R
OOMTHINGS ARE NOT WHAT THEY SEEM..."
2290 R$(29)="IN A SMALL ANTE-ROOM. A COL
D  SLAB FLOOR BENEATH YOUR FEET."
2300 R$(30)="IN A LARGE SQUARE ENTRY
    CHAMBER."
2310 DATA 0,0,0,24,0,24,28,29,28,28,28,2
7,0,0,27,0,0,0,20,88
2320 R$(31)=R$(14)
2330 R$(32)="IN AN ANTE-ROOM. THE WOODEN
    WALLS CRUMBLE TO YOUR TOUCH."
2340 R$(33)="IN A LOW CEILINGED STORE RO
OM."
2350 R$(34)="IN THE CHAMBER OF ANUBIS. T
HE AIR IS COLD."
2360 R$(35)=R$(13)
2370 DATA 11,34,0,32,0,33,31,0,32,0,0,0,
31,36,35,0,0,0,0,0
2380 R$(36)=R$(13)
2390 R$(37)="IN THE CHAMBER OF UPUAUT.
    THERE IS A FAINT MIST IN THE AIR."
2400 R$(38)="AT A TURN IN THE PASSAGEWAY
."
2410 R$(39)="IN A MAZE LIKE COMPLEX OF
    CAVES."
2420 R$(40)=R$(39)
2430 DATA 0,0,0,0,0,11,0,38,14,0,37,0,0,
40,4,0,39,41,0,0
2440 R$(41)=R$(39)
2450 R$(42)="FALLING DOWN A CLIFF INTO T
HE VALLEY OF TOMBS..."
2460 R$(43)=R$(39)
2470 R$(44)=R$(39)
2480 DATA 40,0,42,43,0,0,0,0,44,0,41,0,0
,43,0,0
2490 DATA 0,0,0,0,27,0,33,26,44,29,33,0,
0,23,0,5,5,0
2492 DATA 0,30,7,9,0,20,10,15,4
2500 DATA A CLOAK,A LARGE IRON KEY,A FAD
ED PARCHMENT,NUL
2502 DATA AN IRON ROD,A BOX,A LEATHER BU
CKET
2510 DATA A DAGGER,A STONE URN,AN EARTHE
NWARE POT
2512 DATA A BOTTLE OF EMBALMING FLUID,NU
L,NUL,SAND
2514 DATA A PYRAMID,A LARGE WOODEN DOOR,
A STONE CASKET
2520 DATA A BURIAL CHAMBER,A CAVE,A FULL
 LENGTH MIRROR,A STONE CASKET
2522 DATA A STONE CASKET,A MUMMY,A STATU
```

```
E,A SIGN,A LARGE ROCK,A LARGE ROCK
2530 DATA "NORTH ","SOUTH ","EAST ","WES
T"
2540 GOTO 50
2550 REM HELP
2560 IF CP<>4 THEN 2570
2562 PRINT "ADVENTURES CAN BE A VERY MOV
ING EXPERIENCE!"
2564 GOTO 430
2570 IF CP<>5 AND CP<>7 AND CP<>9 THEN 2
580
2572 PRINT "OPEN SESAME!"
2574 GOTO 430
2580 IF CP<>23 THEN 2590
2582 PRINT "THE SAND LOOKS SOFT."
2584 GOTO 430
2590 IF CP<>20 THEN 2600
2592 PRINT "WHAT DID THE PARCHMENT SAY?"
2594 GOTO 430
2600 IF CP<>30 THEN 2610
2602 PRINT "HAVE YOU GOT THE CLOAK YET?"
2604 GOTO 430
2610 IF CP<>16 AND CP<>21 AND CP<>22 AND
 CP<>19 AND CP<>17 AND CP<>18 THEN 2620
2612 PRINT "PERHAPS THE ENTRANCE IS ON A
NOTHER SIDE?"
2614 GOTO 430
2620 PRINT "DON'T FORGET TO EXAMINE THIN
GS."
2622 GOTO 430
2630 PRINT "■"
2640 OPEN 1,1,2,"DATA"
2650 CMD 1
2660 FOR J=1 TO NN
2662 PRINT OB(J)
2664 PRINT OL(J)
2666 NEXT J
2670 PRINT M(20,4)
2672 PRINT M(4,4)
2674 PRINT M(5,3)
2676 PRINT M(23,1)
2680 PRINT CP
2690 PRINT#1
2700 CLOSE 1
2710 GOTO 430
2720 PRINT "■"
2730 OPEN 1,1,0,"DATA"
2740 FOR J=1 TO NN
2742 INPUT#1,OB(J)
2744 INPUT#1,OL(J)
2746 NEXT J
2750 INPUT#1,M(20,4)
2760 INPUT#1,M(4,4)
2770 INPUT#1,M(5,3)
2780 INPUT#1,M(23,1)
2782 INPUT#1,CP
2790 CLOSE 1
2792 PRINT "■"
2800 GOTO 430
2810 PRINT "■"
2812 PRINT "■■■■■■■■" TAB(7) "Y O U ' R E
   D E A D !"
2820 PRINT "■■■■■■■■■■■■■■■■■■"
2830 INPUT "TRY AGAIN";Q$
2840 IF LEFT$(Q$,1)="Y" THEN RUN
2842 GOTO 2900
2850 PRINT "■"
2854 PRINT "■■■■■■■■" TAB(6) "<<THE TREASU
RE IS YOURS!>>"
2856 PRINT "■■■■■■■■■■■■■■■■■■"
2860 GOTO 2900
2870 FOR J=1 TO 2500
2880 NEXT J
2890 RETURN
2900 END

READY.
```

BINARY TO DECIMAL CONVERTER

This program will convert a sequence of binary digits (0's and 1's) into a decimal number.

Programmers will be quick to appreciate its use in defining graphics characters. Each of the characters of your Commodore 64 consists of eight rows of eight binary digits. It is thus easy to type each character straight into this program to obtain the poke codes for each new definition.

Graphics characters

Line	
130	Clear
140	Cursor down, cursor down
150	Cursor down
160	Cursor down
320	Clear

The program

Lines	
130-160	Print instructions for program
180	Input string of binary digits
190	S to stop program
200-270	Convert binary to decimal
290-310	Print decimal and go back to start of loop
320-330	End of program

```
100 REM BINARY TO DECIMAL CONVERTER
110 REM
120 REM INSTRUCTIONS
130 PRINT "□"
140 PRINT "■INPUT YOUR BINARY NUMBER AS
A STRING OF 1'S AND 0'S■"
150 PRINT "EG 100110■"
160 PRINT "INPUT S TO STOP■"
170 REM MAIN LOOP
180 INPUT "BINARY";B$:IF B$="" THEN 180
190 IF B$="S" THEN 320
200 N=1
210 DC=0
220 FOR J=1 TO LEN(B$)
230 A$=MID$(B$,LEN(B$)-J+1,1)
240 IF A$="0" THEN 260
250 DC=DC+N
260 N=N*2
270 NEXT J
280 REM PRINT DECIMAL
290 PRINT "DECIMAL = " DC
300 PRINT
310 GOTO 180
320 PRINT "□"
330 END
```

PILOT

Pilot is a flight simulation game for one player. You have a choice of two landing strips to take off from and land at, with a separate graphics display of the landing strip and a smaller scale terrain map. The two landing strips will be seen at the West and East of the terrain map. The landing strip display will automatically come into view as you near the landing strip, as long as you are below 2,000 ft. Likewise the terrain map will be displayed as you leave the landing strip area. Your position will be shown on both displays by a flashing aeroplane. Your direction is taken from the HDG reading. On the bottom half of the screenin an instrument display which is your main aid to flying.

The instruments

HDG Your heading (the direction in which you are travelling) in degrees. North is 0°, East is 90°, South is 180° and West is 270°.

RDR The rudder position, negative to the left, positive to the right.

GAS The amount of fuel remaining.

SPD Your forward airspeed.

PWR Engine power setting.

ALT Your altitude.

ROC or ROD
Rate of climb or rate of descent. A red light will also show if you are descending.

FLP The position of the wing flaps. 0 is fully closed, 30 is fully open.

GEAR UP or GEAR DOWN
The position of the landing gear.

The square to the right of the instrument display is an artificial horizon. When the red line is low down, your nose is pointing upwards and when the line is high your nose is pointing towards the ground. Bank is similarly shown, when the red line is from bottom left to top right, you are banked to the right.

How to play

E S D X The aeroplanes joystick is represented by these four keys. To pitch the nose down, press key E, to pitch up press X. Likewise use S and D to bank the aeroplane; this causes a sideways airflow which turns the plane in the same direction as the bank. In all cases hold the key down until the computer responds.

O P The engine power is reduced by key O and increased by P.

W R The rudder is controlled by keys R for right and W for left. The rudder controls operate the landing gear for turning on the runway and also assist with turning when in the air.

A F Keys A and F operate the wing flaps. F to open, A to close. When the flaps are fully closed (0), the stalling speed, at which you lose control, is about 80 knots; when fully open (30), the plane will not stall until around 60 knots. Do not extend the flaps at higher speeds, since this will cause drag and could result in damage to the wings.

G The landing gear is operated by pressing key G. Leave the gear in the up position except when taking-off and landing. At high speeds, having the landing gear down will cause drag and may result in damage to the aeroplane.

Remember in all cases to hold the key down until the computer responds.

Terrain key

Green areas are below 100 ft.

Red areas are below 1,000 ft.

Black areas are below 4,000 ft.

Watch your altitude when travelling over these areas, otherwise you will crash.

Options

There are three options at the start of the game, Take-off, Landing or In-flight. Select In-flight on your first attempts. Once you can handle the plane in the air the landing option can be used to practice the final approach, this is the most difficult part of flying and you will no doubt crash many times before you are successful!

There is an option to provide for the effects of wind in the game. Start with calm air; trying to navigate and land in gale-force winds requires real skill.

Landing

Both landing strips are best approached from the East on a heading of 270°. Your height must be below 2,000 ft. As you approach the runway area, the landing strip will automatically come onto the top part of the screen, replacing the terrain map. Reduce your airspeed for the final approach and reduce power quickly after touch-down to stop before the end of the landing strip. The flaps can be fully open for the final part of the landing to reduce the stalling speed.

The aerodynamics of flight are extremely complicated and changing one control will affect other factors, for example banking will affect lift on the wings causing the plane to drop.

Avoid extremes of speed, both high and low, otherwise you may lose control. Likewise the joystick controls (E S D X) should not be used in extreme settings until, that is, you are confident enough to attempt loops and rolls.

Above all don't expect flying to be easy. Much practice is required, particularly for the final approach and landing. If you can take off and travel to the second landing strip and back again you may consider yourself successful. You will be refuelled each time you land.

Control Summary

E Nose down
X Nose up
S Bank (and turn) left
D Bank (and turn) right
O Reduce power
P Increase power
R Rudder right

W Rudder left
F Open flaps
A Close flaps
G Landing gear

Graphics characters

Line
120 Clear
160 Cursor down, 2 cursor down
170 Cursor down
180 Cursor down
190 4 cursor down
250 Clear
520 Home
530 Cursor down
540 Cursor right

The program

Lines

160-240	Print and select options
260-270	Initial routines
280-310	Main loop
330-560	Routines for instrument displays
580-620	Update fuel remaining
630-690	Update speed
700-810	Update altitude and check for landing or crash
820-940	Update climb or descent values
960-1100	Loss of control
1140-1190	Taxi too fast so crash
1220-1250	Look at keyboard
1260-1500	Move joystick
1510-1540	Increase or decrease power setting
1550-1570	Flap setting

1580-1600	Rudder setting
1610-1640	Landing gear up/down
1670-1720	Calculate and display heading
1740-1750	Wind effects
1760-1770	Position
1780-2180	Move plane and print new display if necessary
2200-2280	Blank screen
2300-2430	Print instrument panel
2440-2490	Print landing strip
2500-2530	Clear display area
2550-2750	Print terrain map
2770-3000	Define graphics characters and set initial values
3060-3170	Crash
3180-3220	Gear up on landing
3250-3280	Banked on landing
3300-3500	Successful landing
3520-3680	Set initial values for different options
3700-3750	End of program

```
100 REM PILOT
110 REM
120 PRINT "□"
130 POKE 53281,1:POKE 646,11
140 TB=49153
150 REM PRINT MENU
160 PRINT "■" TAB(12) "PILOT■■"
170 PRINT " 1. TAKE OFF■"
180 PRINT " 2. LANDING■"
190 PRINT " 3. IN FLIGHT■■■■"
200 INPUT "WHICH OPTION";Q
210 IF Q<1 OR Q>3 THEN 200
220 PRINT:PRINT
230 INPUT "WIND EFFECTS";A$
240 IF LEFT$(A$,1)="Y" THEN WN=1
250 PRINT "□"
260 POKE 53280,0
270 ON Q GOSUB 3480,3520,3560
280 GOSUB 1220
290 GOSUB 580
295 GOSUB 1220
300 GOSUB 1670
310 GOTO 280
320 REM PRINT AT ROUTINES
330 P$=RIGHT$(P$,LEN(P$)-1)
340 IF LEN(P$)>1THEN370
350 P$="  "+P$
360 GOTO 520
370 IF LEN(P$)>2 THEN 400
380 P$="   "+P$
390 GOTO 520
400 IF LEN(P$)>3 THEN 430
410 P$="  "+P$
420 GOTO 520
430 IF LEN(P$)>4 THEN 520
```

```
440 P$=" "+P$
450 GOTO 520
460 P$=RIGHT$(P$,LEN(P$)-1)
470 IF LEN(P$)>1 THEN 500
480 P$=" "+P$
490 GOTO 520
500 IF LEN(P$)>2 THEN 520
510 P$=" "+P$
520 PRINT "■"
530 FOR J=1 TO R-1:PRINT "■";:NEXT J
540 FOR J=1 TO C:PRINT "■";:NEXT J
550 PRINT P$;
560 RETURN
570 REM UPDATE INSTRUMENT PANEL
580 FU=FU-PW*0.008
590 IF FU>0 THEN610
600 FU=0:PW=0
610 P$=STR$(INT(FU))
620 R=15:C=4:GOSUB460
630 TA=PW*1.14-B2*44.978-VE*((FL>0)*(VE>
100))*FL/150
640 VE=(TA-0.1*VE*((GR=0)*(VE>100))+VE/2
*(VE<10)+VE*4)/5
650 IF VE<20 THEN 670
660 VE=VE+RND(0)*4-2
670 IF VE<0 THEN VE=0
680 P$=STR$(INT(VE))
690 R=18:C=4:GOSUB 460
700 AL=AL+RO/10
710 IFAL<0 THEN AL=0
720 P$=STR$(INT(AL))
730 R=16:C=17:GOSUB 330
740 IF (AL<1)*(TS<>41)*(TS<>42) THEN 306
0
750 IF (AL<1)*(GR=1) THEN 3180
760 IF (AL<1)*(ABS(B3-B1)>3) THEN 3180
770 IF (AL<1)*(RO<-320) THEN 3060
780 IF (AL<1)*(VE<1)*((TS=41)+(TS=42))*(
RO<0)*(RO>-320) THEN 3180
790 IF (AL<100)*(PS=39)*(WM=2) THEN 3060
800 IF (AL<1000)*(PS=40)*(WM=2) THEN 306
0
810 IF (AL<4000)*(PS=38)*(WM=2) THEN 306
0
820 TA=((B2*62.4-ABS(B3-B1)*22.28)*31.33
)
830 RO=(TA-(220*VE/150)*(AL>5)*SGN(RO)-V
E*B2*2.6*(B2<-1)+RO*2)/3
840 GOSUB 860
850 GOTO 960
860 IF AL>5 THEN RO=RO+RND(0)*8-4
870 IF RO>=0 THEN 920
880 P$=STR$(ABS(INT(RO)))
890 POKE 1763,4
900 POKE 1764,40:POKE 56036,2
910 GOTO 940
920 POKE 1763,3:POKE 1764,32
930 P$=STR$(INT(RO))
940 R=19:C=17:GOSUB 330
950 RETURN
960 IF(VE>(80-FL*0.66))+(AL<5) THEN 1110
970 RO=RO-ABS(RO*RND(0)/2)-RND(0)*320*(8
0-VE)
980 GOSUB 860
990 FOR J=1 TO 5
1000 POKE S+1,70:POKE S+4,83
1010 FOR DE=1 TO 100:NEXT
1020 POKE S+4,0
1030 FOR DE=1 TO 50:NEXT
1040 NEXT J
1050 IF RND(0)>0.5 THEN 1070
1060 K=14:GOTO 1290
1070 IF RND(0)>0.5 THEN 1090
1080 K=13:GOTO 1290
1090 IFRND(0)>0.5 THEN K=88:GOTO 1290
1100 K=18:GOTO 1290
1110 IF(AL<20000)+(RO<0) THEN 1130
1120 RO=RO*15000/AL
1130 IF VE>360 THEN RO=RO-2.148*VE:GOTO
990
```

```
1140 IF(VE<140)+(AL>0) THEN 1200
1150 GOSUB 3010
1160 P$="TAXI":R=15:C=9:GOSUB 520
1170 P$="TOO":R=17:C=9:GOSUB 520
1180 P$="FAST":R=19:C=9:GOSUB 520
1190 GOTO 3060
1200 RETURN
1210 REM LOOK AT KEYBOARD
1220 K=PEEK(197):IF K=64 THEN 1650
1230 POKE S+1,55:POKE S+4,33
1240 FOR DE=1 TO 100:NEXT
1250 POKE S+4,0
1260 IF K<>14 AND K<>23 AND K<>13 AND K<
>18 THEN 1510
1270 IF (AL<5)*(VE<(80-FL*0.66)) THEN 15
10
1280 IF K<>23 AND AL<4 THEN 1510
1290 IF B1>6 OR B1<-5 THEN 1310
1300 POKE(17+B1)*40+1048,32:POKE(17+B1)*
40+1049,32
1310 IF B2>6 OR B2<-5 THEN 1330
1320 POKE(17+B2)*40+1050,32:POKE(17+B2)*
40+1051,32
1330 IF B3>6 OR B3<-5 THEN 1350
1340 POKE(17+B3)*40+1052,32:POKE(17+B3)*
40+1053,32
1350 IF K=14 THEN B1=B1-1:B2=B2-1:B3=B3-
1
1360 IF K=23 THEN B1=B1+1:B2=B2+1:B3=B3+
1
1370 IF K=13 THEN B1=B1-1:B3=B3+1
1380 IF K=18 THEN B1=B1+1:B3=B3-1
1390 IF B2>9 THEN B1=B1-14:B2=B2-14:B3=B
3-14
1400 IF ABS(B3-B1)>13 THEN TA=B1:B1=B3:B
3=TA
1410 IF ABS(B3-B1)>7 THEN B1=B1-1:B2=B2-
1:B3=B3-1
1420 IF B1>6 OR B1<-5 THEN 1450
1430 POKE(17+B1)*40+1048,40:POKE(17+B1)*
40+55320,2
1440 POKE(17+B1)*40+1049,40:POKE(17+B1)*
40+55321,2
1450 IF B2>6 OR B2<-5 THEN 1480
1460 POKE(17+B2)*40+1050,40:POKE(17+B2)*
40+55322,2
1470 POKE(17+B2)*40+1051,40:POKE(17+B2)*
40+55323,2
1480 IF B3>6 OR B3<-5 THEN 1510
1490 POKE(17+B3)*40+1052,40:POKE(17+B3)*
40+55324,2
1500 POKE(17+B3)*40+1053,40:POKE(17+B3)*
40+55325,2
1510 IF K=38 AND PW>9 THEN PW=PW-10
1520 IF FU<=0 THEN 1540
1530 IF K=41 AND PW<211 THEN PW=PW+10
1540 P$=STR$(PW):R=21:C=4:GOSUB 460
1550 IF K=10 AND FL>4 THEN FL=FL-5
1560 IF K=21 AND FL<26 THEN FL=FL+5
1570 P$=STR$(FL):R=22:C=17:GOSUB 460
1580 IF K=17 AND RD<2 THEN RD=RD+1
1590 IF K=9 AND RD>-2 THEN RD=RD-1
1600 P$=" "+STR$(RD)+" ":R=12:C=17:GOSUB
520
1610 IF K<>26 OR AL<4 THEN 1650
1620 IF GR=1 THEN GR=0:P$="DOWN":GOTO 16
40
1630 IF GR=0 THEN GR=1:P$="UP  "
1640 R=23:C=10:GOSUB 520
1650 RETURN
1660 REM NEW POSITION
1670 HD=HD-(B3-B1)*3-RD*2*(VE>2)
1680 M2=M2-1
1690 IF AL<1 AND VE>1 THEN HD=HD+RD*15
1700 IF HD>=360 THEN HD=HD-360
1710 IF HD<0 THEN HD=360+HD
1720 P$=STR$(HD):R=12:C=9:GOSUB 460
1730 IF WN=0 THEN 1760
1740 IR=COS(WD/57.296)*WS/200
1750 IC=SIN(WD/57.296)*WS/200
```

```
1760 PR=PR-(VE/200)*COS(HD/57.296)+IR
1770 PC=PC+(VE/200)*SIN(HD/57.296)-IC
1780 IF WM=1 THEN 1890
1790 IF PC<40 OR PC>310 OR PR<15 OR PR>1
00 THEN PR=OI:PC=OC
1800 POKE(INT(OI/10+.5))*40+INT(OC/10+.5
)+1024,PS
1810 IF M2=15 THEN Z=5
1820 IF M2=2 AND WM=1 THEN Z=1
1830 POKE TB,Z
1840 PS=PEEK((INT(PR/10+.5))*40+INT(PC/1
0+.5)+1024)
1850 POKE(INT(PR/10+.5))*40+INT(PC/10+.5
)+1024,INT((HD+45+360*(HD>315))/90)+34
1860 TB=(INT(PR/10+.5))*40+INT(PC/10+.5)
+55296
1870 Z=PEEK(TB):POKE TB,4
1880 OI=PR:OC=PC:GOTO 2000
1890 POKE(INT(TR+.5))*40+INT(TC+.5)+1024
,TS
1900 IF M2=15 THEN Z=5
1910 IF M2=2 AND WM=1 THEN Z=1
1920 POKE TB,Z
1930 TC=TC+(VE/120)*SIN(HD/57.3)+IC*(AL<
1)*VE/80+IC*(AL>0)
1940 TR=TR-(VE/120)*COS(HD/57.3)-IR*(AL<
1)*VE/80-IR*(AL>0)
1950 IFTR>100RTR<20RTC>300RTC<4THEN2140
1960 TS=PEEK((INT(TR+.5))*40+INT(TC+.5)+
1024)
1970 POKE(INT(TR+.5))*40+INT(TC+.5)+1024
,INT((HD+45+360*(HD>315))/90)+34
1980 TB=(INT(TR+.5))*40+INT(TC+.5)+55296
1990 Z=PEEK(TB):POKE TB,4
2000 IF WM=2 AND AL<2000 AND PC<295 AND
PC>267 AND PR<55 AND PR>41 THEN 2020
2010 GOTO 2070
2020 IF WM=1 THEN 2160
2030 IF M2>0 THEN 2160
2040 GOSUB 2500:GOSUB 2440:WM=1:M2=3
2050 TR=PR-35:TR=TR/2:TC=PC-264
2060 TS=PEEK((INT(TR+.5))*40+INT(TC+.5)+
1024):GOTO 2160
2070 IF WM=2 AND AL<2000 AND PC<85 AND P
C>58 AND PR<75 AND PR>61 THEN 2090
2080 GOTO 2160
2090 IF WM=1 OR M2>0 THEN 2160
2100 GOSUB 2500:GOSUB 2440:WM=1:M2=3
2110 TR=PR-55:TR=TR/2:TC=PC-55
2120 TS=PEEK((INT(TR+.5))*40+INT(TC+.5)+
1024):GOTO 2160
2130 IF M2>0 THEN 2160
2140 IF WM=2 THEN 2160
2150 GOSUB 2500:GOSUB 2550:WM=2:M2=16:PS
=39
2160 IF M2<>0 OR WM<>2 THEN 2180
2170 POKE 7*40+1031,42:POKE 5*40+1052,42
2180 RETURN
2190 REM BLANK SCREEN
2200 FOR J=0 TO 24
2210 FOR K=0 TO 39:POKE J*40+K+1024,38:P
OKE J*40+K+55296,0
2220 NEXT K,J
2230 FOR J=12 TO 23
2240 FOR K=0 TO 7:POKE J*40+23+1024+K,32
2250 NEXT K,J
2260 FOR J=14 TO 20:FOR K=0 TO 7
2270 POKE J*40+1032+K,32
2280 NEXT K,J
2290 REM PRINT INSTRUMENTS
2300 P$="HDG":R=12:C=5:GOSUB 520
2310 P$="GAS":R=14:C=4:GOSUB 520
2320 P$="SPD":R=17:C=4:GOSUB 520
2330 P$="PWR":R=20:C=4:GOSUB 520
2340 P$="GEAR DOWN":R=23:C=5:GOSUB 520
2350 P$="RDR":R=12:C=13:GOSUB 520
2360 P$="ALT  ":R=15:C=17:GOSUB 520
2370 P$="ROC  ":R=18:C=17:GOSUB 520
2380 P$="FLP":R=21:C=17:GOSUB 520
2390 IF WN=0 THEN 2430
```

```
2400 P$="WIND":R=15:C=9:GOSUB 520
2410 P$=STR$(WS)+" KN":R=17:C=8:GOSUB 52
0
2420 P$=STR$(WD)+" DEG":R=19:C=8:GOSUB 5
20
2430 RETURN
2440 FOR K=0 TO 10:POKE 1191+K,39:POKE 5
5463+K,5:NEXT
2450 FOR K=0 TO 10:POKE 1231+K,41:POKE 5
5503+K,7:NEXT
2460 FOR K=0 TO 10:POKE 1271+K,42:POKE 5
5543+K,7:NEXT
2470 FOR K=0 TO 10:POKE 1311+K,41:POKE 5
5583+K,7:NEXT
2480 FOR K=0 TO 10:POKE 1351+K,39:POKE 5
5623+K,5:NEXT
2490 RETURN
2500 FOR J=2 TO 10:FOR K=2 TO 28
2510 POKEJ*40+1028+K,32:POKE J*40+55298+
K,1
2520 NEXT K,J
2530 RETURN
2540 REM PRINT MAP
2550 RESTORE
2560 FOR J=2 TO 10:FOR K=4 TO 31
2570 READ CH,RP
2580 FOR L=0 TO RP:POKE J*40+K+L+1024,CH
2590 IFCH=38THENTA=0
2600 IFCH=39THENTA=5
2610 IFCH=40THENTA=2
2620 IFCH=42THENTA=7
2630 POKEJ*40+K+L+55296,TA
2640 NEXTL
2650 K=K+RP-1:NEXTK,J
2660 DATA 38,2,40,5,39,2,40,2,39,3,40,1,
38,3,40,2,39,8
2670 DATA 38,1,40,2,39,10,40,1,38,6,40,2
,39,5,40,1
2680 DATA 40,2,39,10,40,7,38,2,40,2,39,2
,40,2,38,1,39,19
2690 DATA 40,1,38,1,39,3,42,1,39,1,40,2
2700 DATA 39,8,40,2,39,8,38,1,40,1,39,7,
40,1,39,3,42,1
2710 DATA 39,2,40,8,38,5,40,3,39,6
2720 DATA 39,5,40,4,39,2,40,5,38,3,40,2,
39,7,39,4,40,4,39,7
2730 DATA 40,1,38,1,40,3,39,8,39,2,40,6,
39,6,40,4,39,4,40,6,40,2
2740 DATA 38,2,40,1,39,5,40,2,39,8,40,4,
38,4
2750 RETURN
2760 REM INITIALIZE
2770 POKE 55,0:POKE 56,56:PRINT CHR$(142
)
2780 POKE 56334,PEEK(56334) AND 254
2790 POKE 1,PEEK(1) AND 251
2800 FOR J=0 TO 511:POKE J+14336,PEEK(J+
53248):NEXT
2810 POKE 1,PEEK(1) OR 4
2820 POKE 56334,PEEK(56334) OR 1
2830 POKE53272,(PEEK(53272)AND240)+14
2840 FOR J=1 TO 148:READ GA:NEXT
2850 FOR J=14608 TO 14639:READ B:POKE J,
B:NEXT
2860 DATA 24,24,255,255,24,24,60,24,12,1
2,76,255,255,76,12,12
2870 DATA 24,60,24,24,255,255,24,24,48,4
8,50,255,255,50,48,48
2880 FOR J=14640 TO 14671:POKE J,255:NEX
T
2890 FOR J=14672 TO 14695:READ B:POKE J,
B:NEXT
2900 DATA 255,255,255,17,255,255,255,255
,255,255,255,255
2910 DATA 255,255,255,255,24,24,24,255,2
55,24,24,24
2920 FU=500:OI=PR:OC=PC
2930 IF WN=1 THEN WS=INT(RND(0)*30)+4:WD
=INT(RND(0)*360)
2940 S=54272
```

```
2950 FOR J=S TO S+23
2960 POKE J,0
2970 NEXT J
2980 POKE S+24,15
2990 POKE S+6,240
3000 RETURN
3010 FOR J=14 TO 20:FOR K=8 TO 15
3020 POKEJ*40+K+1024,32
3030 NEXT K,J
3040 RETURN
3050 REM CRASH
3060 POKE S+1,65:POKE S+4,129
3070 FOR DE=1 TO 50:NEXT
3080 FOR J=1 TO 20
3090 POKE 53281,2:FOR DE=1 TO 50:NEXT
3100 POKE 53281,1
3110 NEXT J
3120 POKE S+4,0
3130 GOSUB 3010
3140 P$="YOU":R=16:C=10:GOSUB 520
3150 P$="CRASHED!":R=18:C=8:GOSUB 520
3160 FOR DE=1 TO 10000:NEXT
3170 GOTO 3700
3180 IF GR=0 THEN 3230
3190 GOSUB 3010
3200 P$="GEAR":R=16:C=9:GOSUB 520
3210 P$="UP":R=18:C=10:GOSUB 520
3220 GOTO 3060
3230 IF ABS(B3-B1)<4 THEN 3300
3240 GOSUB 3010
3250 P$="TOO":R=15:C=9:GOSUB 520
3260 P$="MUCH":R=17:C=9:GOSUB 520
3270 P$="BANK":R=19:C=9:GOSUB 520
3280 GOTO 3060
3290 REM LANDING
3300 POKE S+1,40:POKE S+4,33
3310 FOR DE=1 TO 200:NEXT
3320 POKE S+1,65
3330 FOR DE=1 TO 600:NEXT
3340 POKE S+4,0
3350 GOSUB 3010
3360 P$="YOU HAVE":R=16:C=8:GOSUB 520
3370 P$="LANDED":R=18:C=9:GOSUB 520
3380 FU=500:RO=0:FOR DE=1 TO 16000:NEXT
3390 GOSUB 3010
3400 P$="YOU ARE":R=15:C=8:GOSUB 520
3410 P$="CLEAR":R=16:C=9:GOSUB 520
3420 P$="FOR":R=17:C=10:GOSUB 520
3430 P$="TAKE-":R=18:C=9:GOSUB 520
3440 P$="OFF":R=19:C=10:GOSUB 520
3450 FOR DE=1 TO 5000:NEXT
3460 GOSUB 3010
3470 GOTO 1200
3480 HD=90:PR=70:PC=71:TS=42:GR=0:WM=1:T
R=6:TC=8
3490 GOSUB 2770:GOSUB 2200:GOSUB 2500:GO
SUB 2440
3500 RETURN
3510 REM INITIAL VALUES
3520 HD=270:PR=70:PC=79:TS=32:GR=0
3530 WM=1:TR=6:TC=30:AL=400:VE=110:PW=10
0
3540 GOSUB 2770:GOSUB 2200:GOSUB 2500:GO
SUB 2440
3550 GOTO 1540
3560 HD=INT(RND(0)*360)
3570 PR=RND(0)*60+20
3580 PC=RND(0)*200+50
3590 WM=2
3600 AL=INT(RND(0)*3000)+4000
3610 VE=INT(RND(0)*50)+100
3620 PW=130
3630 GOSUB 2770
3640 GOSUB 2200
3650 GOSUB 1620
3660 GOSUB 2550
3670 PS=PEEK((INT(PR/10+.5))*40+INT(PC/1
0+.5)+1024)
3680 GOTO 1540
3690 REM END
```

```
3700 POKE 49152,0
3710 FOR J=1 TO 10
3720 GET GA$
3730 NEXT J
3740 SYS 49152
3750 END
```

INVADER

Here they come, in an unending stream from deep space, the alien invaders that you always knew were out there — waiting.

There are two types of nasties for you to blast away in your role as defender of the Empire.

How to play

Move your O and P keys and fire with the SPACE bar.

The small green invaders are worth ten points, and the much nastier red variety are worth twenty points.

There is a snag, however, as your score mounts the invaders will fire back with increased rapidity and one mistake will lead to the destruction of one of your three bases.

Be careful to move and aim with care as your laser gun will sometimes take a couple of seconds to recharge due to over heating.

Graphics characters

Line	
120	Clear
480	Clear
620	Home
970	Home
1060	Home
1390	Home

1790 Home
2070 Home, 10 cursor down
2090 Cursor down
2250 Clear
2270 3 cursor down
2330 4 cursor down
2390 Clear
2410 Clear
2420 4 cursor down, 3 cursor down
2430 2 cursor down
2440 2 cursor down

The program

Lines

120-150	Clear screen and set colours
160-180	Set sound registers
200-420	Define graphics characters
440-470	Initial values
480-670	Print initial screen
680	Look at keyboard
690-700	Laser Recharge
740-790	Move base
800-1100	Fire laser and check for hit
1110-1150	New alien
1160-1390	Fire alien laser
1470-1540	New alien
1550-1790	Fire alien laser
1820-1940	Print alien
1950-2010	Main subroutine calling loop
2020-2100	Game over
2120-2340	Calculate and display high score table
2350-2400	Check for new game
2410-2460	Title screen
2470-2490	Delay subroutine
2500-2520	End of program

```
100 REM INVADER
110 REM
120 PRINT "□"
130 POKE 646,1
140 POKE 53281,0
150 POKE 53280,0
160 S=54272
170 FOR J=S TO S+23:POKE J,0:NEXT
180 POKE S+6,240:POKE S+24,15
190 GOSUB 2410
200 POKE 55,0:POKE 56,56
210 PRINT CHR$(142)
220 POKE 56334,PEEK(56334) AND 254
230 POKE 1,PEEK(1) AND 251
240 FOR J=0 TO 511
250 POKE J+14336,PEEK(J+53248)
260 NEXT J
270 POKE 1,PEEK(1) OR 4
280 POKE 56334,PEEK(56334) OR 1
290 POKE 53272,(PEEK(53272) AND 240)+14
300 FOR J=14600 TO 14671
310 READ B
320 POKE J,B
330 NEXT J
340 DATA 36,1,128,1,128,1,128,42
350 DATA 195,255,219,255,195,189,24,102
360 DATA 24,24,255,255,255,255,255,255
370 DATA 0,8,8,8,8,8,8,0
380 DATA 8,8,8,8,8,8,8,8
390 DATA 255,255,255,255,255,255,255,255
400 DATA 36,1,128,1,128,1,128,42
410 DATA 60,126,189,189,255,60,66,129
420 DATA 60,126,189,189,255,60,24,24
430 DIM S(12),N$(12)
440 CL=8:OC=8
450 BS=3
460 AC=38:AR=10
470 C2=3:R2=10
480 PRINT "□"
490 FOR J=1984 TO 2023
500 POKE J,38:POKE 54272+J,5
510 NEXT J
520 FOR J=1944 TO 1947
530 POKE J,38:POKE 54272+J,5
540 NEXT J
550 FOR J=1980 TO 1983
560 POKE J,38:POKE 54272+J,5
570 NEXT J
580 POKE 1904,38:POKE 56176,5
590 POKE 1905,38:POKE 56177,5
600 POKE 1942,38:POKE 56214,5
610 POKE 1943,38:POKE 56215,5
620 PRINT "■" TAB(6) "BASES: 3" TAB(22)
"SCORE: 0"
630 FOR J=56220 TO 56251
640 POKE J,4
650 NEXT J
660 POKE 1944+CL,35
670 GOTO 1950
680 K=PEEK(197)
690 LS=LS+1
700 IF LS>8 THEN LS=8
710 IF K<>64 THEN 740
720 FOR DE=1 TO 25:NEXT
730 GOTO 1100
740 IF K=41 AND CL<35 THEN CL=CL+1
750 IF K=38 AND CL>4 THEN CL=CL-1
760 IF OC=CL THEN 800
770 POKE 1944+OC,32
780 POKE 1944+CL,35
790 OC=CL
800 IF K<>60 THEN 1100
810 IF LS<8 THEN 1100
820 LS=LS-8
830 POKE S+1,60:POKE S+4,129
840 FOR J=1904 TO 1104 STEP -40
850 POKE J+CL,37
```

```
860 POKE J+CL+54272,7
870 NEXT J
880 FOR J=1904 TO 1104 STEP -40
890 POKE J+CL,32
900 NEXT J
910 POKE S+4,0
920 IF CL<>AC THEN 1010
930 POKE AR*40+AC+1024,39
940 POKE AR*40+AC+55296,2
950 POKE S+1,40:POKE S+4,33
960 SC=SC+10
970 PRINT "■" TAB(28) SC
980 POKE AR*40+AC+1024,32
990 POKE S+4,0
1000 AC=39
1010 IF CL<>C2 THEN 1100
1020 POKE R2*40+C2+1024,33
1030 POKE R2*40+C2+55296,2
1040 POKE S+1,30:POKE S+4,0
1050 SC=SC+20
1060 PRINT "■" TAB(28) SC
1070 POKE R2*40+C2+1024,32
1080 POKE S+4,0
1090 C2=3
1100 RETURN
1110 IF C2>3 THEN 1160
1120 POKE R2*40+C2+1024,32
1130 AA=0
1140 C2=31+INT(RND(0)*2)
1150 RETURN
1160 IF RND(0)>0.2+SC/150 THEN 1400
1170 IF C2<4 OR C2>36 THEN 1400
1180 POKE S+1,60:POKE S+4,129
1190 FOR J=(R2+1)*40+C2+1024 TO (R2+1)*4
0+C2+1024+(21-R2)*40 STEP 40
1200 POKE J,36
1210 POKE J+54272,7
1220 NEXT J
1230 FOR J=(R2+1)*40+C2+1024 TO (R2+1)*4
0+C2+1024+(21-R2)*40 STEP 40
1240 POKE J,32
1250 NEXT J
1260 POKE S+4,0
1270 IF C2<>CL THEN 1400
1280 POKE S+1,30:POKE S+4,83
1290 POKE 53281,2
1300 GOSUB 2470
1310 POKE S+4,0
1320 POKE 53281,0
1330 BS=BS-1
1340 IF BS=0 THEN 2020
1350 POKE 1944+CL,32
1360 CL=8
1370 OC=8
1380 POKE 1944+CL,35
1390 PRINT "■" TAB(12) BS
1400 C2=C2-2
1410 POKE S+1,40:POKE S+4,33
1420 POKE R2*40+C2+1026,32
1430 POKE R2*40+C2+1024,34
1440 POKE R2*40+C2+55296,2
1450 POKE S+4,0
1460 RETURN
1470 IF AC<>39 THEN 1580
1480 IF RND(0)>.3 THEN 1550
1490 POKE AR*40+AC+1024,32
1500 AA=1
1510 R2=INT(RND(0)*18)+2
1520 C2=31+INT(RND(0)*2)
1530 LS=1
1540 RETURN
1550 POKE AR*40+AC+1024,32
1560 AR=INT(RND(0)*10)+2
1570 LS=1:AC=1
1580 IF RND(0)>0.01+SC/250 THEN 1800
1590 IF AC<4 OR AC>36 THEN 1800
1600 POKE S+1,60:POKE S+4,129
1610 FOR J=(AR+1)*40+AC+1024 TO 1944 STE
P 40
```

```
1620 POKE J,37:POKE J+54272,7
1630 NEXT J
1640 POKE S+4,0
1650 FOR J=(AR+1)*40+AC+1024 TO 1944 STE
P 40
1660 POKE J,32
1670 NEXT J
1680 IF AC<>CL THEN 1800
1690 POKE S+1,50:POKE S+4,129
1700 POKE 53281,2
1710 GOSUB 2470
1720 POKE S+4,0
1730 POKE 53281,0
1740 BS=BS-1
1750 IF BS=0 THEN 2020
1760 POKE 1944+CL,32
1770 CL=8:OC=8
1780 POKE 1944+CL,35
1790 PRINT "■" TAB(12) BS
1800 AC=AC+1
1810 IF LF/2=INT(LF/2) THEN 1880
1820 POKE S+1,45:POKE S+4,83
1830 POKE AR*40+AC+1023,32
1840 POKE AR*40+AC+1024,41
1850 POKE AR*40+AC+55298,5
1860 POKE S+4,0
1870 GOTO 1930
1880 POKE S+1,35:POKE S+4,83
1890 POKE AR*40+AC+1023,32
1900 POKE AR*40+AC+1024,40
1910 POKE AR*40+AC+55296,5
1920 POKE S+4,0
1930 LF=LF+1
1940 RETURN
1950 GOSUB 680
1960 IF AA<>1 THEN 1990
1970 GOSUB 1110
1980 GOTO 2000
1990 GOSUB 1470
2000 GOSUB 680
2010 GOTO 1950
2020 POKE S+4,83
2030 FOR J=200 TO 10 STEP-1
2040 POKE S+1,J
2050 NEXT J
2060 POKE S+4,0
2070 PRINT "■■■■■■■■■■■■■■" TAB(10) " G A M
E    O V E R "
2080 FOR J=1 TO 10: GET GA$: NEXT
2090 FOR J=1 TO 9:PRINT "■": NEXT
2100 PRINT "YOUR SCORE: "SC
2110 NM$=""
2120 INPUT "YOUR NAME";NM$
2130 IF LEN(NM$)>14 THEN PRINT "TOO LONG
 ":GOTO 2120
2140 SA(10)=SC
2150 N$(10)=NM$
2160 FOR J=10 TO 2 STEP -1
2170 IF SA(J)<SA(J-1) THEN 2240
2180 TP=SA(J-1)
2190 T$=N$(J-1)
2200 SA(J-1)=SA(J)
2210 N$(J-1)=N$(J)
2220 SA(J)=TP
2230 N$(J)=T$
2240 NEXT J
2250 PRINT "□"
2260 PRINT TAB(10) "HIGH SCORE TABLE"
2270 PRINT "■■■■"
2280 FOR M=1 TO 9
2290 PRINT TAB(5) M " " SA(M) " ";
2300 PRINT N$(M)
2310 NEXT M
2320 PRINT:PRINT
2330 PRINT TAB(8) "■■■■PRESS P TO PLAY"
2340 PRINT TAB(14) "S TO STOP"
2350 GET Q$
2360 IF Q$="" THEN 2350
2370 IF Q$="S" THEN 2500
2380 SC=0
```

```
2390 PRINT "■"
2400 GOTO 440
2410 PRINT "■"
2420 PRINT "■■■■■" TAB(14) "INVADER■■■■"
2430 PRINT "■■MOVE YOUR LASER BASE WITH
THE O AND P    KEYS."
2440 PRINT "■■FIRE WITH THE SPACE-BAR."
2450 FOR DE=1 TO 1000:NEXT
2460 RETURN
2470 FOR DE=1 TO 250
2480 NEXT DE
2490 RETURN
2500 POKE 49152,0
2510 SYS 49152
2520 END
```

MACHINE CODE AID

This versatile program features a number of useful routines for the machine code programmer, including an assembler and a disassembler.

Inputs are entirely in decimal, so there is no tortuous hexadecimal to worry about. The routine between line 600 and 700 will convert hex to decimal. This could be used if you have 16 figures (or perhaps previous machine code experience) to adapt the program to hex input.

The program is menu driven with the following choices:

1. Assemble

This uses a three, four or five character mnemonic to identify the code and to distinguish between the different addressing modes for the 6510 microprocessor. The first three characters of the mnemonic are standard. A description of these can be found in the Commodore 64 reference guide or many machine code handbooks. The method of addressing is determined by a suffix of one or two letters.

e.g. LDA absolute is LDA
LDA immediate is LDAIM
LDA absolute, X is LDAX
LDA absolute, Y is LDAY
LDA indirect, X is LDAIX
LDA indirect, Y is LDAIY
LDA zero page is LDAZ
LDA zero page, X is LDAZX

Other mnemonics are similar, e.g. STAIX, SBCIM, CMPY, ANDIM, LDXY.

Each mnemonic representing a code with an operand will then be followed by a single decimal number to give the full code, e.g. LDAIM 6, STA 49646, JSR 49152

The program allows the use of 26 different labels using A through to Z. These are used in a similar manner to the line numbers in Basic for reference by jump and branch statements. An assembler command will only need a label if it is to be referred to by a jump or branch.

The list of commands should be finished with END. This will tell the program to assemble then return to the menu.

The following example, which moves the screen display one character to the left, should illustrate the use of the assembler:

```
49152 LDAIM 0
49154 STAZ 251
49156 LDAIM 4
49158 STAZ 252
49160 A LDYIM 1
49162 B LDAIY 251
49164 DEY
49165 STAIY 251
49167 INY
49168 INY
49169 CPYIM 40
49171 BNE B
49173 DEY
49174 LDAIM 32
49176 STAIY 251
49178 LDAZ 251
49180 CLC
49181 ADCIM 40
49183 STAZ 251
49185 LDAZ 252
49187 ADCIM 0
49189 STAZ 252
49191 CMPIM 7
49193 BNE A
49195 LDAZ 251
49197 CMPIM 192
49199 BNE A
49201 RTS
49202 END
```

2. Disassemble

This can be used to list your own machine code programs after entry or to decipher existing routines in ROM. Input the start and end locations when prompted. Make sure that the start location is a valid code and not an operand, remember garbage in = garbage out.

All branch and jump instructions will have relative and absolute addresses indicated by a decimal number. For branch instructions any number up to 127 will be a number of bytes forward, whilst a number between 128 and 256 will indicate a backward jump calculated from 256 – operand.

3. Run m/c

Type in the start address of your machine code program and press return. Values left in the accumulator, X and Y registers will be shown on return (RTS) to Basic.

4. Block move

This can be used both to copy a part of or an entire program to a different location, or to open up a gap to provide space for those instructions you forgot to include first time around. Remember that branch instructions will be affected if you do this.

5. List Bytes

Used to list the decimal contents of a series of addresses. A machine code program can thus be written in assembler and listed, the individual bytes being poked

during a Basic program using a routine of the form:

```
100  FOR N = 49182 TO 49207
110  READ D: POKE N,D
120  NEXT N
130  DATA 169,0,133,251 .....
```

6/7 Save Bytes/Load Bytes

This routine will allow your laboriously typed in programs to be saved onto tape for future use. Note that they will be completely relocatable, all you need do is enter the start location when loading.

8. End

Ends the program.

Graphics characters

Line	
120	Clear
209	2 cursor down
770	2 cursor down
945	cursor down
985	cursor down
1000	cursor down
1200	cursor down
1600	cursor down
1615	cursor down
1820	cursor down
1850	cursor down
2000	cursor down

The program

Lines

115	Dimension arrays to be used in program
125- 160	Read in assembly mnemonic data
180- 230	Print menu and read keyboard
240- 598	Assembler
600- 700	Hexadecimal to decimal converter
750- 780	Print register contents
800- 920	Decimal to Hexadecimal
930- 990	List Bytes
1000-1030	Run m/c
1200-1310	Block move
1320-1550	Branch routine
1600-1840	Disassemble
1850-1940	Save bytes
2000-2100	Load bytes
3000-3260	Assembly mnemonic data

```
100 REM MACHINE CODE AID
110 REM
115 DIM A$(160),JM(26,10),BN(26,10)
120 PRINT "□"
125 J=1
130 READ A$(J)
140 IF A$(J)="END" THEN J=J-1:GOTO 170
150 J=J+1
160 GOTO 130
170 E$="NOT RECOGNISED"
180 PRINT "■1. ASSEMBLE"
190 PRINT "2. DISASSEMBLE"
200 PRINT "3. RUN M/C"
202 PRINT "4. BLOCK MOVE"
204 PRINT "5. LIST BYTES"
205 PRINT "6. SAVE BYTES"
206 PRINT "7. LOAD BYTES"
208 PRINT "8. STOP"
209 PRINT "■■"
210 GET Q$:IF Q$="" THEN 210
220 IF Q$>"8" OR Q$<"1" THEN 210
230 ON VAL(Q$) GOTO 240,1600,1000,1200,9
30,1850,2000,3300
235 REM ASSEMBLE
240 PRINT "ASSEMBLE■"
245 INPUT "START LOCATION";AD
250 PRINT AD;
260 INPUT Q$
270 IF Q$="END" THEN 1320
272 IF MID$(Q$,2,1)<>" " THEN 294
274 LF=ASC(LEFT$(Q$,1))-64
276 Q$=RIGHT$(Q$,LEN(Q$)-2)
280 IF BN(LF,1)<>0 THEN PRINT "DUPLICATE
 LABEL":GOTO 260
282 BN(LF,1)=AD
288 JM(LF,1)=AD
294 IF LEN(Q$)=3 THEN C$=Q$:GOTO 298
296 GOSUB 500
298 FOR P=1 TO J
```

```
300 IF C$=LEFT$(A$(P),LEN(A$(P))-3) THEN
 340
310 NEXT P
320 PRINT E$
330 GOTO 250
340 CD$=MID$(A$(P),LEN(A$(P))-2,2)
342 GOSUB 600
350 POKE AD,CD
360 AD=AD+1
370 IF RIGHT$(A$(P),1)="1" THEN 250
380 IF RIGHT$(A$(P),1)="3" THEN 430
390 IF OP>255 THEN PRINT E$:AD=AD-1:GOTO
 250
400 POKE AD,OP
410 AD=AD+1
420 GOTO 250
430 IF OP>65535 THEN PRINT E$:GOTO 250
440 POKE AD,OP-(INT(OP/256))*256)
450 AD=AD+1
460 POKE AD,INT(OP/256)
470 AD=AD+1
480 GOTO 250
500 FOR N=1 TO LEN(Q$)
510 IF MID$(Q$,N,1)=" " THEN 550
520 NEXT N
530 PRINT E$
540 GOTO 250
550 C$=LEFT$(Q$,N-1)
560 IF RIGHT$(Q$,1)<="9" AND RIGHT$(Q$,1
)>="0" THEN 596
562 LF=ASC(RIGHT$(Q$,1))-64
564 IF LEFT$(Q$,1)<>"B" THEN 578
566 FOR TS=2 TO 10
568 IF BN(LF,TS)=0 THEN BN(LF,TS)=AD+1:G
OTO 598
570 NEXT TS
572 PRINT "OUT OF LABEL SPACE":GOTO 260
578 IF LEFT$(Q$,1)<>"J" THEN PRINT E$:GO
TO 260
580 FOR TS=2 TO 10
582 IF JM(LF,TS)=0 THEN JM(LF,TS)=AD+1:G
OTO 598
584 NEXT TS
586 GOTO 572
596 OP=VAL(MID$(Q$,N+1,LEN(Q$)-N))
598 RETURN
600 N=1:CD=0
610 FOR S=1 TO LEN(CD$)
620 T$=MID$(CD$,LEN(CD$)-S+1,1)
630 IF ASC(T$)>58 THEN 660
640 HT=VAL(T$)
650 GOTO 670
660 HT=ASC(T$)-55
670 CD=CD+N*HT
680 N=N*16
690 NEXT S
700 RETURN
750 PRINT "■■ACCUM   X REG   Y REG "
760 PRINT PEEK(780)"     "PEEK(781)"
"PEEK(782)
770 PRINT"■■"
780 RETURN
800 NJ=INT(N/16)
810 NK=N-(INT(N/16))*16
820 IF NJ<10 THEN 850
830 N$=CHR$(55+NJ)
840 GOTO 860
850 N$=RIGHT$(STR$(NJ),1)
860 IF NK<10 THEN 890
870 T$=CHR$(55+NK)
880 GOTO 900
890 T$=STR$(NK)
900 N$=N$+RIGHT$(T$,1)
920 RETURN
930 PRINT "LIST BYTES■"
935 INPUT "START LOCATION";AD
940 INPUT "END ADDRESS";NB
945 PRINT "■"
950 FOR BL=AD TO NB
960 PRINT BLPEEK(BL)
970 FOR D=1 TO 1000:NEXT
980 NEXT BL
```

```
985 PRINT "■PRESS ANY KEY FOR MENU"
986 NU=PEEK(197)
987 IF NU=64 THEN 986
990 GOTO 180
1000 PRINT "RUN M/C■"
1005 INPUT "START ADDRESS";AD
1010 SYS AD
1020 GOSUB 750
1030 GOTO 180
1200 PRINT "BLOCK MOVE■"
1205 INPUT "START LOCATION";SR
1210 INPUT "END LOCATION";EN
1220 INPUT "HOW FAR (+/-)";NB
1230 IF NB<0 THEN 1280
1240 FOR M=EN TO SR STEP-1
1250 POKE M+NB,PEEK(M)
1260 NEXT M
1270 GOTO 180
1280 FOR M=SR TO EN
1290 POKE M+NB,PEEK(M)
1300 NEXT M
1310 GOTO 180
1320 FOR TS=1 TO 26
1330 IF JM(TS,1)=0 THEN 1390
1340 FOR T3=2 TO 10
1350 IF JM(TS,T3)=0 THEN 1390
1360 POKE JM(TS,T3),JM(TS,1)-(INT(JM(TS
,1)/256))*256)
1370 POKE JM(TS,T3)+1,INT(JM(TS,1)/256)
1380 NEXT T3
1390 NEXT TS
1400 FOR TS=1 TO 26
1410 IF BN(TS,1)=0 THEN 1510
1420 FOR T3=2 TO 10
1430 IF BN(TS,T3)=0 THEN 1510
1440 TV=BN(TS,1)-BN(TS,T3)
1450 IF TV>127 OR TV<-128 THEN PRINT "IN
VALID BRANCH ADDRESS "BN(TS,T3)
1460 IF TV<0 THEN 1490
1470 POKE BN(TS,T3),TV-1
1480 GOTO 1500
1490 POKE BN(TS,T3),256+TV-1
1500 NEXT T3
1510 NEXT TS
1520 FOR TS=1 TO 26:FOR T3=1 TO 10
1530 BN(TS,T3)=0:JM(TS,T3)=0
1540 NEXT T3,TS
1550 GOTO 180
1600 PRINT "DISASSEMBLE■"
1605 INPUT "START LOCATION";AD
1610 INPUT "END ADDRESS";NB
1615 PRINT "■"
1620 FOR P=AD TO NB
1630 N=PEEK(P)
1640 GOSUB 800
1650 FOR S=1 TO J
1660 IF MID$(A$(S),LEN(A$(S))-2,2)=N$ TH
EN 1700
1670 NEXT S
1680 PRINT E$
1690 GOTO 1800
1700 PRINT P;LEFT$(A$(S),LEN(A$(S))-3)"
";
1710 IF RIGHT$(A$(S),1)="1" THEN PRINT:G
OTO 1800
1720 P=P+1
1730 IF RIGHT$(A$(S),1)="3" THEN 1770
1740 PRINT PEEK(P)
1760 GOTO 1800
1770 PRINT PEEK(P)+256*PEEK(P+1)
1780 P=P+1
1800 NEXT P
1820 PRINT "■PRESS ANY KEY FOR MENU"
1822 NU=PEEK(197)
1824 IF NU=64 THEN 1822
1840 GOTO 180
1850 PRINT "SAVE BYTES■"
1860 INPUT "START ADDRESS";AD
1870 INPUT "END ADDRESS";NB
1880 POKE 251,AD-(INT(AD/256))*256)
1890 POKE 252,INT(AD/256)
1900 POKE 780,251
```

```
1910 POKE 781,NB-(<INT(NB/256)>*256)
1920 POKE 782,INT(NB/256)
1930 SYS 65496
1940 GOTO 180
2000 PRINT "LOAD BYTES■"
2010 INPUT "LOAD ADDRESS";AD
2020 POKE 780,1:POKE 781,1
2030 POKE 782,0
2040 SYS 65466
2050 POKE 780,0
2060 SYS 65469
2065 POKE 780,0
2070 POKE 781,AD-(<INT(AD/256)>*256)
2080 POKE 782,INT(AD/256)
2090 SYS 65493
2100 GOTO 180
3000 DATA ADCIM692,ADC6D3,ADCX7D3,ADCY79
3,ADCIX612,ADCIY712
3010 DATA ANDIM292,AND2D3,ANDX3D3,ANDY39
3,ANDIX212,ANDIY312
3020 DATA ASLA0A1,ASL0E3,ASLX1E3,BCC902,
BCSB02,BEQF02
3030 DATA BIT2C3,BMI302,BNED02,BPL102,BR
K001,BVC502,BVS702
3040 DATA CLC181,CLDD81,CLI581,CLVB81,CM
PIMC92,CMPCD3
3050 DATA CMPXDD3,CMPYD93,CMPIXC12,CMPIY
D12,CPXIME02
3060 DATA CPXEC3,CPYIMC02,CPYCC3,DECCE3,
DECXDE3,DEXCA1,DEY881
3070 DATA EORIM492,EOR4D3,EORX5D3,EORY59
3,EORIX412,EORIY512
3080 DATA INCEE3,INCXFE3,INXE81,INYC81,J
MP4C3,JMPI6C3,JSR203
3090 DATA LDAIMA92,LDAAD3,LDAXBD3,LDAYB9
3,LDAIXA12,LDAIYB12
3100 DATA LDXIMA22,LDXAE3,LDXYBE3,LDYIMA
02,LDYAC3,LDYXBC3
3110 DATA LSRA4A1,LSR4E3,LSRX5E3,NOPEA1,
ORAIM092,ORA0D3,ORAX1D3
3120 DATA ORAY193,ORAIX012,ORAIY112,PHA4
81,PHP081,PLA681,PLP281
3130 DATA ROLA2A1,ROL2E3,ROLX3E3,RORA6A1
,ROR6E3,RORX7E3,RTI401
3140 DATA RTS601,SBCIME92,SBCED3,SBCXFD3
,SBCYF93,SBCIXE12,SBCIYF12
3150 DATA SEC381,SEDF81,SEI781,STA8D3,ST
AX9D3,STAY993,STAIX812,STAIY912
3160 DATA STX8E3,STY8C3,TAXAA1,TAYA81,TS
XBA1,TXA8A1,TXS9A1,TYA981
3200 DATA ADCZ652,ADCZX752,ANDZ252,ANDZX
352,ASLZ062,ASLZX162
3210 DATA BITZ242,CMPZC52,CMPZXD52,CPXZE
42,CPYZC42,DECZC62
3220 DATA DECZXD62,EORZ452,EORZX552,INCZ
E62,INCZXF62,LDAZA52
3230 DATA LDAZXB52,LDXZA62,LDXZYB62,LDYZ
A42,LDYZXB42,LSRZ462
3240 DATA LSRZX562,ORAZ052,ORAZX152,ROLZ
262,ROLZX362,RORZ662
3250 DATA RORZX762,SBCZE52,SBCZXF52,STAZ
852,STAZX952,STXZ862
3260 DATA STXZY962,STYZ842,STYZX942,END
3300 END

READY.
```

CHEQUE BOOK

If you were thinking of buying a disk drive or printer to add to your Commodore system, this program will let you know if your bank acount can stand the shock.

Be careful about running this program in front of your wife, parents or friends as, if your account goes into the red, the word OVERDRAWN will flash off and on!

How to play

To use, enter your opening balance, followed by a list of cheques out and payments in. Each list should be completed with a zero so you may have to do a little rounding up and down.

The computer will prompt you for each list.

When completed, the computer will calculate your debits and credits and give you your current situation.

This program can easily be adapted to be used for household accounts, standing orders or even a small business ledger.

Programming hints

The procedure in lines 380-420 is of interest. This is the item which produces the word and action of OVERDRAWN, so you can delete this section if it bothers you.

Graphics characters

Line
120 Clear
400 9 cursor left
410 9 cursor left

The program

Lines
140 Input number of different accounts
160 Perform main loop AC times
200-270 Input balance and list of cheques
280-340 Input payments
360 Print new balance
380-420 Flash overdrawn if applicable
470 Print total of all accounts

```
100 REM CHEQUE BOOK
110 REM
120 PRINT "□"
130 PRINT
140 INPUT "HOW MANY ACCOUNTS";AC
150 PRINT
160 FOR L=1 TO AC
170 PRINT
180 PRINT "ACCOUNT NO. "L
190 PRINT
200 INPUT "LAST KNOWN BALANCE";BL
210 PRINT
220 PRINT "CHEQUES SINCE"
230 PRINT
240 INPUT CH
250 IF CH=0 THEN 280
260 BL=BL-CH
270 GOTO 240
280 PRINT
290 PRINT "PAYMENTS IN"
300 PRINT
310 INPUT PY
320 IF PY=0 THEN 350
330 BL=BL+PY
340 GOTO 310
350 PRINT
360 PRINT "YOUR CURRENT BALANCE IS "BL;
370 IF BL>=0 THEN 430
380 FOR J=1 TO 10
390 PRINT "OVERDRAWN";
392 FOR DE=1 TO 1000:NEXT
400 PRINT "■■■■■■■■■■          ";
410 PRINT "■■■■■■■■■■";
412 FOR DE=1 TO 300:NEXT
420 NEXT J
430 PRINT:PRINT
440 TB=TB+BL
450 BL=0
460 NEXT L
470 PRINT "TOTAL BALANCES = "TB
480 PRINT
490 END
```

METRIC CONVERTER

Are you still having arguments in your house about metres and feet or litres and gallons? Here is a simple to use conversion program so that everyone in the family can be right.

The program is composed of distinct modules wilth selection by a menu both for ease of use and to enable further conversion routines to be added as required.

How to play

To use, press the number key corresponding to the required conversion then input the metric weights or measures. To return to the menu enter a zero.

Graphics symbols

Line
120 Clear, 2 cursor down
160 2 cursor down
250 2 cursor down
320 Cursor down
350 2 cursor down
420 Cursor down
450 2 cursor down
550 Clear

The program

Lines
118 Defines function to print to one decimal place

120-160 Print menu
170-220 Get choice and go to routine
250-340 Kilo to pounds conversion
350-440 Metres to feet
450-540 Litres to gallons

```
100 REM METRIC CONVERTER
110 REM
118 DEF FNA(X)=INT(X*10)/10
120 PRINT "□□□□"
130 PRINT "1. KILOGRAMS TO POUNDS & OUNC
ES"
140 PRINT "2. METRES TO FEET & INCHES"
150 PRINT "3. LITRES TO GALLONS & PINTS"
160 PRINT "4. STOP□□"
170 FOR J=1 TO 10
180 GET GA$
184 NEXT J
190 GET K$
200 IF K$<"1" OR K$>"4" THEN 190
210 K=VAL(K$)
220 ON K GOTO 250,350,450,550
240 REM KILO TO LB
250 PRINT "INPUT KILOGRAMS□□"
260 INPUT KG
270 IF KG=0 THEN 120
280 OZ=KG*2.2046*16
290 IF INT(OZ)<16 THEN 320
300 PD=INT(OZ/16)
310 OZ=OZ-PD*16
320 PRINT PD "LBS" FNA(OZ) "OZS□"
330 PD=0:OZ=0:KG=0
340 GOTO 260
345 REM METRES TO FT
350 PRINT "INPUT METRES□□"
360 INPUT MT
370 IF MT=0 THEN 120
380 IN=MT*39.37
390 IF INT(IN)<12 THEN 420
400 FT=INT(IN/12)
410 IN=IN-FT*12
420 PRINT FT "FT" FNA(IN) "IN□"
430 FT=0:IN=0:MT=0
440 GOTO 360
445 REM LITRES TO GALLONS
450 PRINT "INPUT LITRES□□"
460 INPUT LT
470 IF LT=0 THEN 120
480 PN=LT*1.75985
490 IF INT(PN)<8 THEN 520
500 GL=INT(PN/8)
510 PN=PN-GL*8
520 PRINT GL "GAL" FNA(PN) "PINTS"
530 PN=0:GL=0:LT=0
540 GOTO 460
550 PRINT "□"
560 END
```

MAZE CHASE

Maze chase has you being chased around a maze by four evil looking blue ghosts intent on your downfall. In the true tradition of things, the ghosts can happily move through the maze walls but you cannot.

How to play

You can move around the maze using keys O and P for left and right and keys Q and A for up and down. Points are gained just by staying alive. You will need to keep your wits about you as well as moving with lightning reactions as this game needs some skill to play. Any score above 1,000 can be classed as respectable.

Programming hints

For those that like to tinker with programs, the maze is defined in lines 870 to 1070. Lines 870 to 940 draw the two vertical sides at the left and right of the screen. Lines 950 to 1070 control all horizontal barriers. This second section uses the data in lines 1050 — 1070 to print alternatively a number of solid blocks onto the screen followed by a number of spaces. For example, the first 38 locations of screen memory are solid blocks, the next 85 are spaces, the next 11 solid blocks.

By using this method the whole structure of the maze can be changed via only three lines of data to make the game easier, or more difficult.

Graphics characters

Line

850 Clear
1130 Home
1280 Home
1380 Cursor down
1580 Clear
1600 3 cursor down
1660 4 cursor down

The program

Lines

140	Look at keyboard
150-170	No key pressed
180-350	Move
370	Random ghost number
380-590	Move ghost
610-760	Define graphics characters
770-790	Set screen colours
800-840	Set sound registers
850-1070	Print initial screen
1090-1220	Initial values and positions
1240-1300	Main subroutine calling loop
1320-1360	Caught by ghost
1370-1670	Calculate and print high score table
1680-1760	New game
1770-1790	End of program

```
100 REM MAZE CHASE
110 REM
120 GOTO 610
130 REM MOVE
140 K=PEEK(197)
150 IF K<>64 THEN 180
160 FOR DE=1 TO 25:NEXT
170 GOTO 340
180 RN=RO:CN=CO
190 IF K=38 THEN CN=CN-1
200 IF K=41 THEN CN=CN+1
210 IF K=10 THEN RN=RN+1
220 IF K=62 THEN RN=RN-1
```

```
230 IF CN>38 OR CN<1 OR RN>25 OR RN<1 TH
EN 340
240 X=PEEK(RN*40+CN+1024)
250 IF X=34 THEN 340
260 IF X=36 THEN 1320
270 IF CN=CO AND RN=RO THEN 340
280 POKE S+1,55
290 POKE S+4,83
300 POKE RO*40+CO+1024,32
310 POKE RN*40+CN+1024,35
320 POKE RN*40+CN+55296,2
330 RO=RN:CO=CN
340 POKE S+4,0
350 RETURN
360 REM MOVE GHOSTS
370 R=INT(RND(0)*4)+1
380 IF NS(R,1)=RN THEN 480
390 POKE NS(R,1)*40+NS(R,2)+1024,ST(R)
400 POKE NS(R,1)*40+NS(R,2)+55296,5
410 NS(R,1)=NS(R,1)+SGN(RN-NS(R,1))
420 ST(R)=PEEK(NS(R,1)*40+NS(R,2)+1024)
430 IF ST(R)<>36 THEN 450
440 ST(R)=32
450 POKE NS(R,1)*40+NS(R,2)+1024,36
460 POKE NS(R,1)*40+NS(R,2)+55296,6
470 POKE S+1,25:POKE S+4,33
480 IF NS(R,2)=CN THEN 570
490 POKE NS(R,1)*40+NS(R,2)+1024,ST(R)
500 POKE NS(R,1)*40+NS(R,2)+55296,5
510 NS(R,2)=NS(R,2)+SGN(CN-NS(R,2))
520 ST(R)=PEEK(NS(R,1)*40+NS(R,2)+1024)
530 IF ST(R)<>36 THEN 550
540 ST(R)=32
550 POKE NS(R,1)*40+NS(R,2)+1024,36
560 POKE NS(R,1)*40+NS(R,2)+55296,6
570 IF RN=NS(R,1) AND CN=NS(R,2) THEN 13
20
580 POKE S+4,0
590 RETURN
600 REM INITIALIZE
610 POKE 55,0:POKE 56,56
620 PRINT CHR$(142)
630 POKE 56334,PEEK(56334) AND 254
640 POKE 1,PEEK(1) AND 251
650 FOR J=0 TO 511
660 POKE J+14336,PEEK(J+53248)
670 NEXT J
680 POKE 1,PEEK(1) OR 4
690 POKE 56334,PEEK(56334) OR 1
700 POKE 53272,(PEEK(53272) AND 240)+14
710 FOR J=14608 TO 14631
720 READ B:POKE J,B
730 NEXT J
740 DATA 255,255,255,255,255,255,255,255
750 DATA 56,68,56,108,170,56,68,198
760 DATA 56,124,186,255,255,198,56,56
770 POKE 53280,0
780 POKE 53281,0
790 POKE 646,1
800 S=54272
810 FOR J=S TO S+23
820 POKE J,0
830 NEXT J
840 POKE S+24,15:POKE S+6,240
850 PRINT "□"
860 REM DRAW MAZE
870 FOR J=0 TO 960 STEP 40
880 POKE J+1024,34
890 POKE J+55296,5
900 NEXT J
910 FOR J=39 TO 1000 STEP 40
920 POKE J+1024,34
930 POKE J+55296,5
940 NEXT J
950 FOR J=0 TO 960
960 READ B
970 FOR K=0 TO B
980 POKE J+K+1024,34
990 POKE J+K+55296,5
1000 NEXT K
1010 J=J+B-1
```

```
1020 READ B
1030 J=J+B
1040 NEXT J
1050 DATA 38,85,11,2,12,2,9,82,6,2,21,2,
5,86
1060 DATA 14,2,20,82,24,2,10,86,11,2,14,
2,7
1070 DATA 82,24,2,10,86,7,2,8,2,17,81,40
,0
1080 REM INITIAL VALUES
1090 NS(1,1)=2:NS(1,2)=5
1100 NS(2,1)=2:NS(2,2)=30
1110 NS(3,1)=23:NS(3,2)=5
1120 NS(4,1)=23:NS(4,2)=30
1130 PRINT "■" TAB(14) "SCORE: "
1140 FOR J=1 TO 4
1150 ST(J)=32
1160 POKE NS(J,1)*40+NS(J,2)+1024,36
1170 POKE NS(J,1)*40+NS(J,2)+55296,6
1180 NEXT J
1190 RN=10:RO=10
1200 CN=18:CO=18
1210 POKE RN*40+CN+1024,35
1220 POKE RN*40+CN+55296,2
1230 REM MAIN LOOP
1240 GOSUB 370
1250 GOSUB 140
1260 GOSUB 370
1270 SC=SC+10
1280 PRINT "■" TAB(20) SC
1290 GOSUB 140
1300 GOTO 1240
1310 REM CAUGHT
1320 POKE S+4,83
1330 FOR J=200 TO 10 STEP -1
1340 POKE S+1,J
1350 NEXT J
1360 POKE S+4,0
1370 FOR J=1 TO 13
1380 PRINT "■"
1390 NEXT J
1400 PRINT "YOUR SCORE: "SC
1410 FOR J=1 TO 10
1420 GET GA$
1430 NEXT J
1440 NM$=""
1450 INPUT "YOUR NAME";NM$
1460 IF LEN(NM$)>15 THEN PRINT "TOO LONG
!":GOTO 1450
1470 SA(10)=SC
1480 N$(10)=NM$
1490 FOR J=10 TO 2 STEP -1
1500 IF SA(J)<SA(J-1) THEN 1570
1510 TP=SA(J-1)
1520 T$=N$(J-1)
1530 SA(J-1)=SA(J)
1540 N$(J-1)=N$(J)
1550 SA(J)=TP
1560 N$(J)=T$
1570 NEXT J
1580 PRINT "■"
1590 PRINT TAB(10) "HIGH SCORE TABLE"
1600 PRINT "■■■"
1610 FOR M=1 TO 9
1620 PRINT TAB(5) M" "SA(M) "   ";
1630 PRINT N$(M)
1640 NEXT M
1650 PRINT:PRINT
1660 PRINT TAB(8) "■■■■PRESS P TO PLAY"
1670 PRINT TAB(14) "S TO STOP"
1680 GET Q$
1690 IF Q$="" THEN 1680
1700 IF Q$<>"P" THEN 1770
1710 SC=0
1720 RESTORE
1730 FOR J=1 TO 24
1740 READ GA
1750 NEXT J
1760 GOTO 850
1770 POKE 49152,0
1780 SYS 49152
1790 END
```

PENGUIN

It's no fun being a penguin nowadays. Six eggs to protect from marauding birds and only a laser cannon for company. See how you fare as a penguin.

How to play

Move using keys O and P for left and right. Fire your laser by pressing the space bar. You have only one shot at each bird, so aim well otherwise you will lose an egg.

The game ends when all six eggs are lost.

Graphics characters

Line

120	Clear
160	6 cursor down
170	6 cursor down
180	Cursor down
770	Clear
780	Home
1350	Home
1370	Cursor down
1580	Clear
1600	3 cursor down
1660	4 cursor down
1870	Home

The program

Lines

120-150	Clear screen and set colours
160-190	Title screen
210-500	Look at keyboard and move penguin or fire laser
520-710	Define graphics characters
720-760	Initial values and screen colours
770-780	Print headings
790-840	Set sound registers
850-890	Initial values
900-950	Lay eggs
970-1260	Move bird towards selected egg
1280-1340	All eggs eaten
1350-1390	Print final score
1400-1420	Empty keyboard buffer
1430-1670	Calculate and display high score table
1680-1710	New game
1720-1840	New bird positions
1860-1890	Update score and eggs left
1900-1920	End of program

```
100 REM PENGUIN
110 REM
120 PRINT "□"
130 POKE 53280,7
140 POKE 53281,7
150 POKE 646,2
160 PRINT "■■■■■■■■" TAB(15) "PENGUIN"
170 PRINT "■■■■■■■■" TAB(3) "KEYS O AND P
TO MOVE LEFT AND RIGHT"
180 PRINT "■" TAB(3) "SPACE-BAR TO FIRE
LASER"
190 GOTO 520
200 REM MOVE SUBROUTINE
210 KY=PEEK(197)
220 IF KY=64 THEN 240
230 POKE 1944+PC,32
240 IF KY=38 AND PC>3 THEN PC=PC-1
250 IF KY=41 AND PC<38 THEN PC=PC+1
260 POKE 1944+PC,34
270 POKE 56216+PC,0
280 IF KY<>60 THEN 500
290 IF FF=1 THEN 500
300 POKE S+1,60:POKE S+4,129
310 FOR K=22 TO BR STEP -1
320 POKE K*40+PC+1024,38
330 POKE K*40+PC+55296,2
340 NEXT K
350 POKE S+4,0
360 FOR K=22 TO BR STEP -1
```

```
370 POKE K*40+PC+1024,32
380 NEXT K
390 FF=1
400 IF PC<>BC OR BR>=23 THEN 500
410 POKE S+1,50:POKE S+4,83
420 GOSUB 210
430 POKE S+4,0
440 SC=SC+100
450 POKE 53281,14
460 M(WE)=0
470 GOSUB 1860
480 GOSUB 210
490 GOSUB 1720
500 RETURN
510 REM INITIALIZE
520 POKE 55,0
530 POKE 56,56
540 PRINT CHR$(142)
550 POKE 56334,PEEK(56334) AND 254
560 POKE 1,PEEK(1) AND 251
570 FOR J=0 TO 511
580 POKE J+14336,PEEK(J+53248)
590 NEXT J
600 POKE 1,PEEK(1) OR 4
610 POKE 56334,PEEK(56334) OR 1
620 POKE 53272,(PEEK(53272) AND 240)+14
630 FOR J=14608 TO 14647
640 READ B
650 POKE J,B
660 NEXT J
670 DATA 28,56,60,102,102,102,102,60
680 DATA 0,0,24,60,60,60,60,24
690 DATA 128,130,206,252,56,120,110,71
700 DATA 1,65,115,63,28,30,118,226
710 DATA 8,8,8,8,8,8,8,8
720 D=1024
730 C=55296
740 POKE 53280,14
750 POKE 53281,14
760 POKE 646,9
770 PRINT "□"
780 PRINT "■" TAB(5) "EGGS LEFT:" SPC(8)
 "SCORE:"
790 S=54272
800 FOR J=S TO S+23
810 POKE J,0
820 NEXT J
830 POKE S+24,15
840 POKE S+6,240
850 FOR J=1 TO 6
860 M(J)=0
870 NEXT J
880 SC=0
890 PC=15
900 FOR J=1 TO 6
910 EC(J)=J*5
920 POKE 1984+J*5,35
930 POKE 56256+J*5,6
940 NEXT J
950 EL=6
960 GOSUB 1860
970 FOR J=1 TO 6
980 GOSUB 1720
990 GOSUB 210
1000 POKE BR*40+BC+D,S3
1010 POKE BR*40+BC+C,C3
1020 GOSUB 210
1030 IF BC<=EC(WE) THEN 1070
1040 BC=BC-1
1050 WB=36
1060 GOSUB 210
1070 IF BC>=EC(WE) THEN 1110
1080 BC=BC+1
1090 WB=37
1100 GOSUB 210
1110 IF BR>23 THEN 1130
1120 BR=BR+1
1130 S3=PEEK(BR*40+BC+D)
1140 C3=PEEK(BR*40+BC+C)
1150 POKE BR*40+BC+D,WB
```

```
1160 POKE BR*40+BC+C,0
1170 GOSUB 210
1180 IF BC<>EC(WE) OR BR<>24 THEN 1250
1190 POKE S+1,25:POKE S+4,83
1200 POKE BR*40+BC+D,32
1210 EL=EL-1
1220 GOSUB 1860
1230 POKE S+4,0
1240 GOTO 1260
1250 GOTO 1000
1260 NEXT J
1270 REM END OF GAME
1280 FOR J=200 TO 10 STEP -10
1290 POKE S+1,J:POKE S+4,33
1300 FOR DE=1 TO 150:NEXT
1310 POKE S+4,0
1320 FOR DE=1 TO 20:NEXT
1330 NEXT J
1340 POKE S+4,0
1350 PRINT "■"
1360 FOR J=1 TO 13
1370 PRINT "■"
1380 NEXT J
1390 PRINT "YOUR SCORE: "SC
1400 FOR J=1 TO 10
1410 GET GA$
1420 NEXT J
1430 NM$=""
1440 INPUT "YOUR NAME";NM$
1450 IF LEN(NM$)<15 THEN 1470
1460 PRINT "TOO LONG!":GOTO 1440
1470 SA(10)=SC
1480 N$(10)=NM$
1490 FOR J=10 TO 2 STEP -1
1500 IF SA(J)<SA(J-1) THEN 1570
1510 TP=SA(J-1)
1520 T$=N$(J-1)
1530 SA(J-1)=SA(J)
1540 N$(J-1)=N$(J)
1550 SA(J)=TP
1560 N$(J)=T$
1570 NEXT J
1580 PRINT "□"
1590 PRINT TAB(10) "HIGH SCORE TABLE"
1600 PRINT "■■■■"
1610 FOR M=1 TO 9
1620 PRINT TAB(5) M " " SA(M) "   ";
1630 PRINT N$(M)
1640 NEXT M
1650 PRINT:PRINT
1660 PRINT TAB(8) "■■■■PRESS P TO PLAY"
1670 PRINT TAB(14) "S TO STOP"
1680 GET Q$
1690 IF Q$="" THEN 1680
1700 IF Q$<>"S" THEN 760
1710 GOTO 1900
1720 BC=INT(RND(0)*28)+3
1730 BR=INT(RND(0)*17)+2
1740 FF=0
1750 S3=32
1760 WE=INT(RND(0)*6)+1
1770 GOSUB 210
1780 IF M(WE)=1 THEN 1760
1790 M(WE)=1
1800 IF BC<16 THEN 1830
1810 WB=36
1820 GOTO 1840
1830 WB=37
1840 RETURN
1850 REM PRINT SCORE
1860 GOSUB 210
1870 PRINT "■" TAB(15) EL TAB(29) SC
1880 GOSUB 210
1890 RETURN
1900 POKE 49152,0
1910 SYS 49152
1920 END
```

ALIEN STORM

It's your turn to save the world as you are pitted against a never-ending stream of bomb-dropping aliens descending from the top of the screen.

How to play

Move your laser base using the O and P keys for left and right. Fire with the space bar. If you are hit by a bomb or an alien lands on your base, you will lose one of your three lives. When all lives are lost the game ends. There is a choice of 3 skill levels which govern the re-cycle speed of your laser — be warned, level 3 is **very** difficult!

Programming hints

By keeping things simple, the program consists of three subroutines called in sequence. The action has ben made fairly fast without recourse to machine code. You will be surprised at what your computer can do using only Basic.

Graphics characters

Line	
120	Clear
580	Home
760	Clear
990	Home
1210	Home
1290	Cursor down
1360	Clear

The program

Lines

120- 150	Input skill level
170- 240	Move alien down screen
260- 360	Move bombs
380	Turn off sound
390	Look at keyboard
410- 610	Fire laser
630- 670	Move base
690- 720	Main subroutine calling loop
760- 920	Define characters
930-1100	Initial values and screen
1110-1270	Base hit
1280-1330	End of game
1340-1390	New game

```
100 REM ALIEN STORM
110 REM
120 PRINT "□"
130 INPUT "SKILL LEVEL (1 TO 3)";SK
140 IF SK<1 OR SK>3 THEN 130
150 GOTO 680
160 REM MOVE ALIEN
170 POKE S+4,0
180 POKE D+AP,32
190 AP=AP+40
200 IF AP>959 THEN AP=INT(RND(0)*40)+40
210 IF AP=BP THEN 1110
220 POKE D+AP,35
230 POKE C+AP,5
240 RETURN
250 REM MOVE BOMB
260 IF M<>0 THEN 300
270 M=1
280 MP=AP
290 GOTO 360
300 POKE D+MP,32
310 MP=MP+80
320 IF MP=BP OR MP=BP+40 THEN 1110
330 IF MP>919 THEN M=0:GOTO 360
340 POKE D+MP,37
350 POKE C+MP,4
360 RETURN
370 REM MOVE BASE
380 POKE S+4,0
390 K=PEEK(197)
400 IF K=64 THEN 670
410 IF K<>60 THEN 620
420 IF SF>0 THEN 620
430 POKE D+BP-40,42
440 SF=SK
450 POKE C+BP-40,1
460 POKE S+1,40
470 POKE S+4,83
480 POKE D+BP-40,32
490 FOR J=BP-40 TO 40 STEP-40
500 IF PEEK(D+J)=32 THEN 600
510 IF PEEK(D+J)=37 THEN M=0:GOTO 540
520 AP=INT(RND(0)*40)+40
```

```
530 SC=SC+10
540 POKE D+J,42
550 POKE S+1,55
560 POKE S+4,33
570 POKE D+J,32
580 PRINT "■" TAB(18) SC;
590 GOTO 670
600 NEXT J
610 GOTO 670
620 POKE D+BP,32
630 IF K=38 AND BP>920 THEN BP=BP-1
640 IF K=41 AND BP<959 THEN BP=BP+1
650 POKE D+BP,36
660 POKE C+BP,2
670 RETURN
680 GOSUB 760
690 GOSUB 380
700 GOSUB 170
710 GOSUB 380
720 GOSUB 260
730 SF=SF-1
740 GOTO 690
750 REM INITIALIZE
760 PRINT "□"
770 POKE 55,0:POKE 56,56
780 PRINT CHR$(142)
790 POKE 56334,PEEK(56334)AND 254
800 POKE 1,PEEK(1)AND 251
810 FOR J=0 TO 511
820 POKE J+14336,PEEK(J+53248)
830 NEXT J
840 POKE 1,PEEK(1)OR 4
850 POKE 56334,PEEK(56334)OR 1
860 POKE 53272,(PEEK(53272)AND 240)+14
870 FOR J=14616 TO 14639
880 READ B:POKE J,B
890 NEXT J
900 DATA 126,255,153,255,255,255,195,231
910 DATA 0,24,60,126,255,255,255,0
920 DATA 0,0,24,24,24,24,0,0
930 D=1024
940 C=55296
950 POKE 53280,0
960 POKE 53281,0
970 POKE 646,1
980 LV=3
990 PRINT "■ LIVES:"LV"   SCORE:"SC"    HI
 SCORE:"HS
1000 S=54272
1010 FOR J=S TO S+23
1020 POKE J,0
1030 NEXT J
1040 POKE S+24,15
1050 POKE S+6,240
1060 BP=930
1070 AP=60
1080 POKE D+BP,36
1090 POKE C+BP,2
1100 RETURN
1110 POKE S+4,83
1120 FOR J=160 TO 10 STEP-1
1130 POKE S+1,J
1140 NEXT J
1150 POKE S+4,0
1160 LV=LV-1
1170 IF LV=0 THEN 1280
1180 POKE AP+D,32
1190 POKE BP+D,32
1200 POKE MP+D,32
1210 PRINT "■" TAB(7) LV
1220 AP=INT(RND(0)*40)+40
1230 BP=930
1240 POKE D+BP,36
1250 POKE C+BP,2
1260 M=0
1270 GOTO 690
1280 FOR J=1 TO 12
1290 PRINT "■"
1300 NEXT J
1310 PRINT "YOUR SCORE: "SC
```

```
1320 IF SC>HS THEN HS=SC
1330 FOR J=1 TO 10:GET GA$:NEXT J
1340 INPUT "PLAY AGAIN";Q$
1350 IF LEFT$(Q$,1)="N" THEN 1400
1360 PRINT "J"
1370 SC=0
1380 GOSUB 980
1390 GOTO 690
1400 POKE 49152,0
1410 SYS 49152
1420 END
```

MONEYBAGS

It's pennies from heaven, or at least dollar signs from the top of the screen in this simple but addictive game for one player.

How to play

You are in control of a catcher which is located at the bottom of the screen, and can be moved left and right with the M and N keys. Catch as many of the dollars as you can but miss 20 and the game ends. As your score increases so will the number of dollars on the screen at one time, so nimble fingers will be needed for a high score.

Graphics characters

Line	
410	Home
430	Cursor down
580	Home
804	Clear
810	Home

The program

Lines	
130-150	Main subroutine calling loop
180-270	Move catcher
300-310	Increment dollar number
320-334	New dollar position
340-350	Move dollar

360-390 Missed
400-476 20 dollars missed
480-520 Check for new game and set initial values
530-606 Caught dollar
700-830 Initial values and screen

```
100 REM MONEYBAGS
110 REM
120 GOSUB 700
130 GOSUB 180
140 GOSUB 300
150 GOTO 130
170 REM MOVE CATCHER
180 K=PEEK(197)
190 IF K=64 THEN 270
200 POKE P+D,32:POKE P+1+D,32
210 IF K=39 AND P>920 THEN P=P-1
220 IF K=36 AND P<958 THEN P=P+1
230 POKE D+P,76
240 POKE D+P+1,122
250 POKE C+P,2
260 POKE C+P+1,2
270 RETURN
290 REM MOVE NEXT DOLLAR
300 F=F+1
310 IF F=10 THEN F=1
320 IF M(F)>0 THEN 340
322 IF F-1>SC/30 THEN 630
330 M(F)=INT(RND(0)*40)
334 GOTO 350
340 IF RND(0)>.9 THEN 630
344 POKE M(F)+D,32
350 M(F)=M(F)+40
360 IF M(F)<960 THEN 540
370 POKE S+1,25
380 POKE S+4,33
390 NM=NM+1
400 IF NM<20 THEN 600
410 PRINT "■"
420 FOR J=1 TO 13
430 PRINT "■"
440 NEXT J
450 PRINT "YOUR SCORE: "SC"■"
460 POKE S+4,0
470 IF SC>HS THEN HS=SC
472 FOR GA=1 TO 10
474 GET G$
476 NEXT GA
480 INPUT "PLAY AGAIN";Q$
490 IF LEFT$(Q$,1)="N" THEN 850
500 SC=0:NM=0
502 FOR J=1 TO 9
504 M(J)=0
506 NEXT J
510 GOSUB 804
520 GOTO 130
530 POKE S+4,0
540 IF PEEK(M(F)+D)<>76 AND PEEK(M(F)+D)
<>122 THEN 610
550 POKE S+1,60
560 POKE S+4,83
570 SC=SC+10
580 PRINT "■" TAB(12) SC
590 GOSUB 180
600 POKE S+4,0
604 M(F)=0
606 GOTO 630
610 POKE M(F)+D,164
620 POKE M(F)+C,5
624 GOSUB 180
630 RETURN
690 REM INITIAL VALUES
```

```
700 D=1024
710 C=55296
720 POKE 53280,0
730 POKE 53281,0
740 POKE 646,8
750 S=54272
760 FOR L=S TO S+23
770 POKE L,0
780 NEXT L
790 POKE S+24,15
800 POKE S+6,240
804 PRINT "□"
810 PRINT "■" TAB(5) "SCORE: "SC SPC(6)
"HI SCORE: "HS
820 P=920
822 POKE P+D,76:POKE P+1+D,122
824 POKE C+P,2:POKE C+P+1,2
830 RETURN
850 POKE 49152,0
860 SYS 49152
870 END
```

LUNAR LANDER

Now's your chance to start your astronauts training, as you endeavour to guide your landing module through a lunar cavern onto the prepared landing pad.

How to play

Control the module's rate of descent by pressing the space-bar to fire your retro-rockets, and the O and P keys to move left and right, but watch your fuel consumption. Hold each key down until the computer responds.

Your horizontal velocity, fuel remaining and vertical velocity will be displayed at the top of the screen. Your vertical velocity must be down to 2, or less, on landing otherwise you will crash. Likewise, if your module touches any part of the cavern outside of the two marker flags on each side of the landing pad, you will SELF DESTRUCT.

Programming hints

A skill level at the start of your attempt should make the game suitable for all abilities, but can be made even easier by increasing the amount of fuel at the start, via line 1640. For real experts, a limit can be added to ensure that the horizontal velocity is zero on landing in line 700. Just add "AND HI=0" between VI<3 and THEN when typing in the program.

Graphics characters

Line
230 Home
240 Home
250 Home
1200Clear
1230 Clear
1620 Home
1790 Cursor down
2050 Clear
2090 6 cursor down
2100 7 cursor down
2110 Cursor down

The program

Lines

130- 140	Initial subroutine calls
160- 200	Main subroutine calling loop
220- 260	Print velocity and fuel information
290	Look at keyboard
300- 320	No key pressed so delay
350- 410	Move left
440- 500	Move right
530- 590	Slow descent
610- 680	Move module
700	Check for correct landing
720	Check for sprite to character collision
750- 920	Define characters
900-1040	Define sprites
1050-1190	Initial values
1200-1230	Input skill level
1240-1630	Set up screen
1640-1690	Initial values and enable sprite
1710-1800	Collision with cavern wall
1810-1930	Check for new game

1950-2030 Successful landing
2050-2120 Print title screen

```
100 REM  LUNAR LANDER
110 REM
120 REM INITIAL ROUTINES
130 GOSUB 2050
140 GOSUB 750
150 REM MAIN LOOP
160 GOSUB 280
170 GOSUB 610
180 GOSUB 220
190 GOSUB 2140
200 GOTO 160
210 REM  UPDATE
220 IF FU<0 THEN FU=0
230 PRINT "■" TAB(12) STR$(HI) " "
240 PRINT "■" TAB(22) STR$(FU) " "
250 PRINT "■" TAB(36) STR$(VI) " "
260 RETURN
270 REM LOOK AT KEYBOARD
280 IF FU<=0 THEN 310
290 K=PEEK(197)
300 IF K<>64 THEN 330
310 FOR DE=1 TO 30:NEXT
320 GOTO 590
330 IF K<>38 THEN 420
340 REM LEFT
350 POKE S+1,60
360 POKE S+4,129
370 HI=HI-1
380 FOR DE=1 TO 20:NEXT
390 POKE S+4,0
400 FU=FU-1
410 GOTO 590
420 IF K<>41 THEN 510
430 REM RIGHT
440 POKE S+1,50
450 POKE S+4,129
460 HI=HI+1
470 FOR DE=1 TO 20:NEXT
480 POKE S+4,0
490 FU=FU-1
500 GOTO 590
510 IF K<>60 THEN 590
520 REM UP
530 POKE S+1,40
540 POKE S+4,129
550 VI=VI-2
560 FOR DE=1 TO 30:NEXT
570 POKE S+4,0
580 FU=FU-2
590 RETURN
600 REM  MOVE SHIP
610 VI=VI+1
620 X=X+HI
630 IF X>255 THEN X=255
640 IF X<0 THEN X=0
650 Y=Y+VI
660 IF Y<50 THEN Y=50
670 POKE V,X
680 POKE V+1,Y
690 REM LANDING
700 IF Y>220 AND X>152 AND X<178 AND VI<
3 THEN 1950
710 REM CRASH
720 IF PEEK(V+31) AND 1=1 AND Y>60 THEN
1720
730 RETURN
740 REM INITIALIZE
750 PRINT CHR$(142)
760 POKE 56334,PEEK(56334) AND 254
770 POKE 1,PEEK(1) AND 251
780 FOR J=0 TO 511
790 POKE J+14336,PEEK(J+53248)
800 NEXT J
810 POKE 1,PEEK(1) OR 4
820 POKE 56334,PEEK(56334) OR 1
```

```
830 POKE 53272,(PEEK(53272) AND 240)+14
840 FOR J=14608 TO 14623
850 READ B:POKE J,B
860 NEXT J
870 REM CHARACTER DATA
880 DATA 255,255,255,255,255,255,255,255
890 DATA 255,255,255,255,255,192,192,192
900 FOR J=12288 TO 12350
910 READ B:POKE J,B
920 NEXT J
930 REM SPRITE DATA
940 DATA 0,0,0,0,0,0,0
950 DATA 7,255,224,7,255,224
960 DATA 31,255,248,31,255,248
970 DATA 127,255,254,127,255,254
980 DATA 102,102,102,102,102,102
990 DATA 127,255,254,127,255,254
1000 DATA 127,255,254,127,255,254
1010 DATA 63,255,252,49,0,140
1020 DATA 49,0,140,98,0,70
1030 DATA 103,0,230,96,0,6
1040 DATA 240,0,15
1050 POKE 2040,192
1060 V=53248
1070 S=54272
1080 D=1024:C=55296
1090 POKE V+39,6
1100 POKE V+16,0
1110 POKE 52282,0
1120 POKE 53280,0
1130 POKE 53281,0
1140 POKE 646,1
1150 FOR J=S TO S+23
1160 POKE J,0
1170 NEXT J
1180 POKE S+24,15
1190 POKE S+6,240
1200 PRINT "□"
1210 INPUT "SKILL LEVEL (1 TO 10)";SK
1220 IF SK<1 OR SK>10 THEN 1210
1230 PRINT "□"
1240 TA=40
1250 READ BA
1260 FOR J=TA TO TA+BA
1270 POKE D+J,34
1280 POKE C+J,5
1290 NEXT J
1300 READ BB
1310 FOR J=TA+BA TO TA+BA+BB
1320 POKE D+J,32
1330 NEXT J
1340 READ BC
1350 FOR J=TA+BA+BB TO TA+BA+BB+BC
1360 POKE D+J,34
1370 POKE C+J,5
1380 NEXT J
1390 TA=TA+40
1400 IF TA<>960 THEN 1250
1410 REM SCREEN DATA
1420 DATA 1,38,1,2,34,4
1430 DATA 3,31,6,7,20,13
1440 DATA 12,15,13,17,6,17
1450 DATA 17,6,17,16,7,17
1460 DATA 16,7,17,15,9,16
1470 DATA 16,9,15,15,12,13
1480 DATA 14,15,11,12,16,12
1490 DATA 6,18,16,6,12,22
1500 DATA 6,13,21,7,14,19
1510 DATA 10,14,16,10,15,15
1520 DATA 11,13,16,14,9,17
1530 DATA 15,8,17
1540 FOR J=960 TO 1000
1550 POKE D+J,34
1560 POKE C+J,5
1570 NEXT J
1580 POKE D+935,35
1590 POKE C+935,8
1600 POKE D+942,35
1610 POKE C+942,8
1620 PRINT "■";
1630 PRINT " HORIZONTAL:" SPC(5) "FUEL:"
 SPC(5) "VERTICAL:"
```

```
1640 FU=95-SK*5
1650 Y=50
1660 X=INT(RND(0)*160)+80
1670 POKE V,X
1680 POKE V+1,Y
1690 POKE V+21,1
1700 RETURN
1710 REM  CRASHED
1720 POKE S+4,33
1730 FOR J=250 TO 10 STEP -1
1740 POKE S+1,J
1750 FOR DE=1 TO 20:NEXT
1760 NEXT J
1770 POKE S+4,0
1780 FOR J=1 TO 12
1790 PRINT "■"
1800 NEXT J
1810 FOR J=1 TO 10
1820 GET GA$
1830 NEXT J
1840 INPUT "TRY AGAIN ";Q$
1850 IF LEFT$(Q$,1)="N" THEN 2170
1860 RESTORE
1870 POKE V+21,0
1880 FOR J=1 TO 79
1890 READ GA
1900 NEXT J
1910 GOSUB 1200
1920 HI=0:VI=0
1930 GOTO 160
1940 REM  SUCCESSFUL LANDING
1950 FOR J=1 TO 4
1960 READ N,B
1970 POKE S+1,N
1980 POKE S+4,33
1990 FOR DE=1 TO B*16:NEXT
2000 NEXT J
2010 POKE S+4,0
2020 DATA 23,50,35,50,26,50,40,90
2030 GOTO 1780
2040 REM  TITLE PAGE
2050 PRINT "■"
2060 POKE 53280,2
2070 POKE 53281,2
2080 POKE 646,7
2090 PRINT "■■■■■■■■" TAB(13) "LUNAR LANDE
R"
2100 PRINT "■■■■■■■■■■" TAB(4) "KEYS O AND
P FOR LEFT AND RIGHT"
2110 PRINT "■" TAB(7) "SPACE BAR TO SLOW
 DESCENT"
2120 RETURN
2130 REM DELAY
2140 FOR DE=1 TO 1200-SK*100
2150 NEXT DE
2160 RETURN
2170 POKE 49152,0
2180 SYS 49152
2190 END
```

3-D MAZE

You are trapped at the southern end of a tortuous maze and must try to reach the exit, which you know lies somewhere to the north. You will see a perspective view of the inside of the maze, as you wander around it, with either open or blocked doors in front of you and to your left and right.

How to play

To face in a particular compass direction press keys N, S, E or W. to move forward press key F. Note that you will only move by pressing key F. Although the compass keys will change your viewpoint you will remain stationary.

A skill level between 5 and 90 at the beginning of the game governs the overall size of the maze, be warned the higher skill levels are only for those with a keen sense of direction and an excellent memory!

Graphics characters

Line	
130	Clear
236	Clear
280	2 cursor down
300	Cursor down
970	Clear
1160	Home
1162	Cursor down
1180	Home
1182	Cursor down

1200 Home
1202 Cursor down
1220 Clear
1222 Cursor down
1560 Home
1562 Cursor down
1566 3 cursor down

The program

Lines

142-220 Define graphics characters
224-232 Set sound registers
238-250 Screen colours
260-300 Input skill level
350-410 Display end wall
430-540 Side wall
560-670 Side wall
690-710 Side wall door
730-750 Side wall door
760-960 Initial maze values
980-1130 Print view for each direction
1150-1224 Print direction information
1246-1550 Look at keyboard and decipher
1560-1570 Exit found
1590-1810 Set up maze
1812-1816 Delay subroutine
1820-1824 Clear keyboard buffer
1828-1830 New game
1840-1860 End of program

```
100 REM 3-D MAZE
110 REM
120 DIM M(90,12)
130 PRINT "□"
142 POKE 55,0
144 POKE 56,56
146 PRINT CHR$(142)
148 POKE 56334,PEEK(56334) AND 254
150 POKE 1,PEEK(1) AND 251
```

```
152 FOR J=0 TO 511
154 POKE J+14336,PEEK(J+53248)
156 NEXT J
158 POKE 1,PEEK(1) OR 4
160 POKE 56334,PEEK(56334) OR 1
162 POKE 53272,(PEEK(53272) AND 240)+14
164 FOR J=14608 TO 14647
166 READ B
168 POKE J,B
170 NEXT J
180 DATA 255,255,255,255,255,255,255,255
190 DATA 1,3,7,15,31,63,127,255
200 DATA 254,252,248,240,224,192,128,0
210 DATA 128,192,224,240,248,252,254,255
220 DATA 127,63,31,15,7,3,1,0
222 DS=1024:CS=55296
224 S=54272
226 FOR J=S TO S+23
228 POKE J,0
230 NEXT J
232 POKE S+24,15:POKE S+6,240
234 XV=10:YV=16
236 PRINT "□"
238 POKE 53280,15
240 POKE 53281,15
250 POKE 646,9
260 INPUT "SKILL LEVEL (5 TO 90)";LN
270 IF LN>4 AND LN<91 THEN 300
280 PRINT "5 TO 90 PLEASE■■"
290 GOTO 260
300 PRINT "■BACK IN A MINUTE...."
330 GOTO 760
340 REM END WALL
350 X=XV
360 Y=YV
370 FOR I=1 TO 5
372 FOR K=0 TO 5
374 POKE (K+X)*40+Y+DS,34
376 POKE (X+K)*40+Y+CS,8
378 NEXT K
380 Y=Y+1
390 NEXT I
410 RETURN
420 REM SIDE WALL
430 X=XV
440 Y=YV+5
450 N=6
460 FOR I=1 TO 9
470 FOR K=0 TO N-1
480 POKE (X+K)*40+Y+DS,34
490 POKE (X+K)*40+Y+CS,5
500 NEXT K
502 POKE (X-1)*40+Y+DS,35
504 POKE (X-1)*40+Y+CS,5
506 POKE (X+N)*40+Y+DS,38
508 POKE (X+N)*40+Y+CS,5
510 N=N+2
520 X=X-1:Y=Y+1
530 NEXT I
540 RETURN
550 REM SIDE WALL
560 X=XV
570 Y=YV
580 N=6
590 FOR I=1 TO 9
600 FOR K=0 TO N-1
610 POKE (X+K)*40+Y+DS,34
620 POKE (X+K)*40+Y+CS,5
630 NEXT K
640 POKE (X+N)*40+Y+DS,36
642 POKE (X+N)*40+Y+CS,5
644 POKE (X-1)*40+Y+DS,37
646 POKE (X-1)*40+Y+CS,5
648 X=X-1:Y=Y-1
650 N=N+2
660 NEXT I
670 RETURN
680 REM SIDE WALL DOOR
690 GOSUB 420
700 FOR J=0 TO 1
```

```
702 FOR K=0 TO 19
704 POKE (XV-6+K)*40+YV+8+J+DS,32
706 NEXT K,J
710 RETURN
720 REM SIDE WALL DOOR
730 GOSUB 550
740 FOR J=0 TO 1
742 FOR K=0 TO 19
744 POKE (XV-7+K)*40+YV-5+J+DS,32
746 NEXT K,J
750 RETURN
760 GOSUB 1590
770 FOR I=1 TO LN
780 FOR J=1 TO 12
790 R=INT(RND(0)*1.9+1)
800 IF M(I,J)<>0 THEN 820
810 M(I,J)=R
820 NEXT J,I
840 FOR I=1 TO 12
850 M(LN,I)=1
860 M(LN-1,I)=2
870 M(1,I)=4
880 IF M(2,I)=3 THEN 900
890 M(2,I)=1
900 NEXT I
910 FOR I=1 TO LN
920 M(I,1)=1
930 M(I,12)=1
940 NEXT I
950 R=LN-1
960 C=2
970 PRINT "□"
980 ON D+1 GOTO 990,1070,1030,1110
990 ON M(R-1,C) GOSUB 340,410,410,410
1000 ON M(R,C-1) GOSUB 550,720,720,720
1010 ON M(R,C+1) GOSUB 420,680,680,680
1020 GOTO 1140
1030 ON M(R+1,C) GOSUB 340,410,410,410
1040 ON M(R,C+1) GOSUB 550,720,720,720
1050 ON M(R,C-1) GOSUB 420,680,680,680
1060 GOTO 1140
1070 ON M(R,C+1) GOSUB 340,410,410,410
1080 ON M(R-1,C) GOSUB 550,720,720,720
1090 ON M(R+1,C) GOSUB 420,680,680,680
1100 GOTO 1140
1110 ON M(R,C-1) GOSUB 340,410,410,410
1120 ON M(R+1,C) GOSUB 550,720,720,720
1130 ON M(R-1,C) GOSUB 420,680,680,680
1140 REM PRINT DIRECTION
1150 IF D<>0 THEN 1170
1160 PRINT "■"
1162 FOR J=1 TO 11:PRINT "■":NEXT
1164 PRINT TAB(13) "FACING NORTH"
1170 IF D<>2 THEN 1190
1180 PRINT "■"
1182 FOR J=1 TO 11:PRINT "■":NEXT
1184 PRINT TAB(13) "FACING SOUTH"
1190 IF D<>1 THEN 1210
1200 PRINT "■"
1202 FOR J=1 TO 11:PRINT "■":NEXT
1204 PRINT TAB(13) "FACING EAST "
1210 IF D<>3 THEN 1240
1220 PRINT "■"
1222 FOR J=1 TO 11:PRINT "■":NEXT
1224 PRINT TAB(13) "FACING WEST "
1230 REM WHICH WAY?
1240 POKE S+1,50:POKE S+4,33
1242 GOSUB 1812
1244 POKE S+4,0
1246 K=PEEK(197)
1250 IF K=64 THEN 1246
1252 POKE S+1,60:POKE S+4,33
1254 GOSUB 1812
1256 POKE S+4,0
1260 IF K=21 THEN 1320
1270 IF K=39 THEN 1470
1280 IF K=13 THEN 1490
1290 IF K=14 THEN 1510
1300 IF K=9 THEN 1530
```

```
1310 GOTO 1240
1320 MV=MV+1
1330 ON D+1 GOTO 1340,1410,1380,1440
1340 IF M(R-1,C)=1 THEN 1550
1350 R=R-1
1360 IF M(R,C)=4 THEN 1560
1370 GOTO 970
1380 IF M(R+1,C)=1 THEN 1550
1390 R=R+1
1400 GOTO 970
1410 IF M(R,C+1)=1 THEN 1550
1420 C=C+1
1430 GOTO 970
1440 IF M(R,C-1)=1 THEN 1550
1450 C=C-1
1460 GOTO 970
1470 D=0
1480 GOTO 970
1490 D=2
1500 GOTO 970
1510 D=1
1520 GOTO 970
1530 D=3
1540 GOTO 970
1550 GOTO 1140
1560 PRINT "■"
1562 FOR J=1 TO 13:PRINT "■":NEXT
1564 PRINT "CONGRATULATIONS! YOU ESCAPED
 IN ONLY"
1566 PRINT MV "MOVES■■■"
1570 GOTO 1820
1580 REM PLOT MAZE
1590 R4=1
1600 R1=INT(RND(0)*7+3)
1610 R2=INT(RND(0)*4+2)
1620 FOR I=R4 TO R4+R2
1630 IF I=LN-1 THEN 1810
1640 M(I,R1)=3
1650 NEXT I
1660 R4=R4+R2
1670 M(R4+1,R1)=1
1680 R3=INT(RND(0)*2+1)
1690 IF R3<>2 THEN 1710
1700 R3=-1
1710 R5=INT(RND(0)*3+2)
1720 FOR I=1 TO R5
1730 IF (R1+R3*I)<11 THEN 1750
1740 R1=R1-1
1750 IF (R1+R3*I)>1 THEN 1770
1760 R1=R1+1
1770 M(R4,R1+R3*I)=3
1780 NEXT I
1790 R1=R1+R5*R3
1800 GOTO 1610
1810 RETURN
1812 FOR DE=1 TO 80
1814 NEXT DE
1816 RETURN
1820 FOR J=1 TO 10
1822 GET GA$
1824 NEXT J
1828 INPUT "TRY AGAIN";Q$
1830 IF LEFT$(Q$,1)="Y" THEN RUN
1840 POKE 49152,0
1850 SYS 49152
1860 END
```

FIREMAN

The firebugs have been at work again. This time it's a tall apartment building burning from the top down. Your task is to try and catch the unhappy residents as they leap from the windows of the burning building.

How to play

Move the firemen and blanket using keys O and P to run left and right and Q and W to walk left and right respectively. As the fire moves downwards you will have less time in which to prevent the luckless inhabitants from coming to a sticky end.

Catch as many as you can in the blanket, but miss 10 and I'm afraid that's the end of your career with the fire service.

Graphics characters

Line

530 Home
750 Home
1170 Clear
1410 Home
1560 Cursor down
1570 Cursor down
1580 Cursor down
1660 Cursor down
1670 Cursor down

The program

Lines

150	Look at keyboard
160-170	No key pressed
180-230	Update firemens position
250-340	Print firemen in new position
380-410	Man jumps
430-440	Call new layer of building routine
480-570	Missed man
580-640	Move man down towards ground
700-770	Caught man
790-900	New layer of building
920-1130	Define graphics characters
1140-1160	Set sound registers
1180-1200	Set screen colours
1210	Initial values
1230-1410	Print initial screen
1430-1450	Main subroutine calling loop
1470-1590	All men jumped
1610-1680	10 lives lost
1690-1710	Delay subroutine
1720-1740	Empty print buffer
1750-1780	New game
1790-1810	End of program

```
100 REM FIREMAN
110 REM
120 GOTO 920
130 REM MOVE SUBROUTINE
140 REM LOOK AT KEYBOARD
150 K=PEEK(197)
160 IF K<>64 THEN 180
170 FOR DE=1 TO 175:NEXT
180 OC=FC
190 IF K=62 AND FC>6 THEN FC=FC-1
200 IF K=9 AND FC<33 THEN FC=FC+1
210 IF K=38 AND FC>8 THEN FC=FC-3
220 IF K=41 AND FC<32 THEN FC=FC+3
230 IF OC=FC THEN 340
240 REM PRINT FIREMAN
250 FOR J=1948 TO 1980
260 POKE J,32
270 NEXT J
280 POKE 1943+FC,37
290 POKE 56215+FC,6
300 POKE 1944+FC,39
310 POKE 56216+FC,7
320 POKE 1945+FC,38
```

```
330 POKE 56217+FC,6
340 RETURN
350 REM FALLING MAN
360 IF JP=1 THEN 450
370 REM NEW MAN
380 CL=INT(RND(0)*18)+9
390 RW=TW
400 S3=35:CT=8
410 JP=1
420 NC=NC+1
430 IF NC/5<>INT(NC/5) THEN 450
440 GOSUB 790
450 RW=RW+1
460 IF RW<>24 THEN 580
470 REM MISSED
480 LS=LS+1
490 POKE S+1,10:POKE S+4,33
500 POKE 1984+CL,41
510 POKE 56256+CL,2
520 JP=0
530 PRINT "■" TAB(29) LS
540 GOSUB 1690
550 POKE S+4,0
560 IF LS=10 THEN 1650
570 GOTO 760
580 POKE (RW-1)*40+CL+1024,S3
590 POKE (RW-1)*40+CL+55296,CT
600 S3=PEEK(RW*40+CL+1024)
610 CT=PEEK(RW*40+CL+55296)
620 POKE S+1,240/RW:POKE S+4,83
630 POKE RW*40+CL+1024,40
640 POKE RW*40+CL+55296,5
650 IF RW<>23 THEN 760
660 POKE RW*40+CL+1024,S3
670 POKE RW*40+CL+55296,CT
680 IF FC<>CL THEN 760
690 REM SAVED
700 SV=SV+1
710 POKE S+1,52:POKE S+4,83
720 POKE 1944+FC,39
730 POKE 56216+FC,7
740 JP=0
750 PRINT "■" TAB(11) SV
760 POKE S+4,0
770 RETURN
780 REM NEW LAYER
790 TW=TW+2
800 RW=RW+2
810 IF TW>22 THEN 1470
820 FOR J=7 TO 31
830 POKE S+1,60:POKE S+4,129
840 POKE (TW-3)*40+J+1024,32
850 POKE (TW-2)*40+J+1024,32
860 POKE (TW-1)*40+J+1024,36
870 POKE (TW-1)*40+J+55296,2
880 POKE S+4,0
890 NEXT J
900 RETURN
910 REM INITIALIZE
920 POKE 55,0:POKE 56,56
930 PRINTCHR$(142)
940 POKE 56334,PEEK(56334) AND 254
950 POKE 1,PEEK(1) AND 251
960 FOR J=0 TO 511
970 POKE J+14336,PEEK(J+53248)
980 NEXT J
990 POKE 1,PEEK(1) OR 4
1000 POKE 56334,PEEK(56334) OR 1
1010 POKE 53272,(PEEK(53272) AND 240) +1
4
1020 FOR J=14608 TO 14671
1030 READ B
1040 POKE J,B
1050 NEXT J
1060 DATA 255,255,255,255,255,255,255,25
5
1070 DATA 255,129,129,129,129,129,129,25
5
1080 DATA 0,0,145,170,223,235,255,255
1090 DATA 48,120,48,124,179,49,72,204
```

```
1100 DATA 12,30,12,62,205,140,18,51
1110 DATA 0,0,0,0,0,0,129,255
1120 DATA 56,56,145,126,56,56,40,68
1130 DATA 0,0,0,1,56,254,120,48
1140 S=54272
1150 FOR L=S TO S+23:POKE L,0:NEXT
1160 POKE S+24,15:POKE S+6,240
1170 PRINT "□"
1180 POKE 53280,0
1190 POKE 53281,0
1200 POKE 646,1
1210 FC=6:OC=6:TW=7
1220 REM DRAW BUILDING
1230 FOR K=6 TO 22
1240 POKE K*40+1031,34
1250 POKE K*40+55303,8
1260 NEXT K
1270 FOR K=6 TO 22
1280 POKE K*40+1055,34
1290 POKE K*40+55327,8
1300 NEXT K
1310 FOR J=6 TO 22 STEP 2
1320 FOR K=8 TO 31
1330 POKE J*40+K+1024,34
1340 POKE J*40+K+55296,8
1350 NEXT K,J
1360 FOR J=7 TO 21 STEP 2
1370 FOR K=8 TO 30
1380 POKE J*40+K+1024,35
1390 POKE J*40+K+55296,8
1400 NEXT K,J
1410 PRINT "■" TAB(5) "SAVED:  " SPC(12)
"LOST:  "
1420 GOSUB 280
1430 GOSUB 150
1440 GOSUB 360
1450 GOTO 1430
1460 REM SUCCESS
1470 POKE S+1,33:POKE S+4,83
1480 GOSUB 1690
1490 POKE S+1,45
1500 GOSUB 1690
1510 POKE S+1,36
1520 GOSUB 1690
1530 POKE S+1,50
1540 GOSUB 1690:GOSUB 1690
1550 POKE S+4,0
1560 FOR J=1 TO 13:PRINT "■":NEXT
1570 PRINT "CONGRATULATIONS!■"
1580 PRINT STR$(SV) " LIVES SAVED.■"
1590 GOTO 1720
1600 REM FAILURE
1610 FOR J=100 TO 15 STEP -5
1620 POKE S+1,J:POKE S+4,83
1630 FOR DE=1 TO 50: NEXT
1640 NEXT J
1650 POKE S+4,0
1660 FOR J=1 TO 13:PRINT "■":NEXT
1670 PRINT "10 LIVES LOST - DEMOTION TO
BRASS      POLISHER!■"
1680 GOTO 1720
1690 FOR DE=1 TO 250
1700 NEXT DE
1710 RETURN
1720 FOR J=1 TO 10
1730 GET GA$
1740 NEXT J
1750 INPUT "TRY AGAIN";Q$
1760 IF Q$="N" THEN 1790
1770 SV=0:LS=0:NC=0
1780 GOTO 1170
1790 POKE 49152,0
1800 SYS 49152
1810 END
```

CAPITALS

Everyone knows that Kingston is near Richmond on the Thames don't they? But do they all know that Kingston is also the capital of Jamaica.

This program can be used as a party game or as a educational aid for the younger members of the family, whose geography is a little weak.

How to play

The computer will ask you for the capital city of a country and, if you answer correctly, will move on to the next question. An incorrect answer will mean that you have up to three more tries to get the answer right. It must also be spelt correctly.

Programming hints

The list of countries and capitals can be extended by adding extra data statements after line 540 and by increasing the values in lines 140, 150 and 190 to match the total number of countries. This program can easily form the basis for almost any 'question and answer' game — just type in the question as a data statement followed by the correct answer.

The question and answer should always be separated by a comma, but ensure that commas do not occur in the middle of the question/answer or you will get some strange results.

Graphic symbols

Line
130 Clear

The program

Lines
140-170 Dimension arrays and read data
190-210 Random question and prevent repetition
230-240 Input answer
250 Correct answer
260-300 Wrong answer
310-330 Print answer after 4 tries

```
110 REM CAPITALS
120 REM
130 PRINT "□"
140 DIM C$(20),P$(20)
150 FOR J=1 TO 20
160 READ C$(J),P$(J)
170 NEXT J
180 CN=0
190 RN=INT(RND(1)*20)+1
200 IF RN=R THEN 190
210 R=RN
220 PRINT
230 PRINT "WHAT IS THE CAPITAL OF ";C$(R
):PRINT
232 AN$=""
240 INPUT AN$:PRINT
250 IF AN$=P$(R) THEN PRINT "CORRECT!":G
OTO 180
260 CN=CN+1
270 IF CN=4 THEN 310
280 PRINT "TRY AGAIN!"
290 PRINT
300 GOTO 240
310 PRINT
320 PRINT "THE CAPITAL OF ";C$(R);" IS "
;P$(R);"."
330 PRINT
340 GOTO 180
350 DATA AFGHANISTAN,KABUL
360 DATA ARGENTINA,BUENOS AIRES
370 DATA BELGIUM,BRUSSELS
380 DATA BRAZIL, RIO DE JANEIRO
390 DATA CANADA,OTTOWA
400 DATA CUBA,HAVANA
410 DATA DENMARK,COPENHAGEN
420 DATA EGYPT,CAIRO
430 DATA ENGLAND,LONDON
440 DATA FRANCE,PARIS
450 DATA GREECE,ATHENS
460 DATA ITALY,ROME
```

```
470 DATA JAMAICA,KINGSTON
480 DATA NIGERIA,LAGOS
490 DATA NORWAY,OSLO
500 DATA PORTUGAL,LISBON
510 DATA RUSSIA,MOSCOW
520 DATA SCOTLAND,EDINBURGH
530 DATA SPAIN,MADRID
540 DATA U.S.A.,WASHINGTON
```

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