

# ELBUG

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# PATTERN PENDING

The graphic abilities of the Electron are well known but this machine can do more than just display aliens and laser bolts. These two short programs from Charles Francis demonstrate a more tranquil use for your computer's abilities.

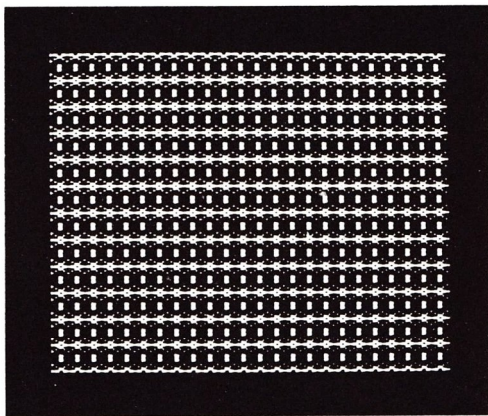
Both of these two short programs produce ever-changing colourful displays on your Electron's screen that are both fascinating and restful.

The first program is called Weave as it produces a square display with lines of colour running across and up and down with a strong resemblance to woven cloth - especially tartan, at times.

The pattern is formed by plotting lines using the Exclusive OR option of the GCOL command (GCOL3). The spacing of the lines and the plotting colour are both varied at random. The display constantly changes as lines are plotted again and again across and up the square.

At any time a particularly pleasing pattern can be frozen by pressing the space bar. Another press of the space bar will resume activities.

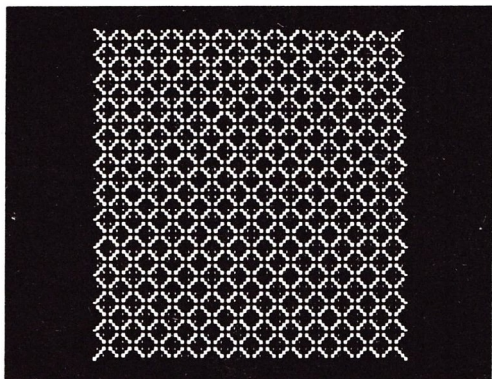
The area of the pattern is controlled by the variables, X1%, X2%, Y1%, and Y2%. These determine the left and right and upper and lower reaches of the pattern



square and are fixed in lines 120 and 130. You can alter these if you wish. However, remember that a larger square, although more dramatic takes longer for the Electron to plot onto the screen and so the speed of production of the pattern is reduced. The quick speed of change of smaller squares is their most attractive point.

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The October ELBUG magazine cassette contains a whole feast of programs for Electron owners. Many of the programs from this month's BEEBUG are there - Recursive Trees, Loan Repayments, the Data Structures examples of Linked Lists and Binary Trees, the Workshop Procedures on text compression - and the programs from this ELBUG supplement: Weave, Pattern, and Moon-Pod. All this for just £3.00 plus 50p post and packing.



The second of these two graphical snippets is similar in many respects to Weave but produces a more complex display.

Like the first program it depends on the constant re-plotting of lines using the GCOL3 command at different spacings and in different colours. This time, however, rather than plot the lines across and up the square a diagonal drawing pattern is used.

The size of the whole pattern is controlled by the variable, width%. This is set to 384 in line 120 but can easily be changed if you want. Again, the larger patterns will be slower to appear on the screen.

```

10 REM PROGRAM WEAVE
20 REM AUTHOR CHARLES FRANCIS
30 REM VERSION E0.1
40 REM ELBUG OCT 1985
50 REM PROGRAM SUBJECT TO COPYRIGHT
60 :
70 ON ERROR GOTO 1000
80 :
100 MODE 2
110 VDU 23,1,0;0;0;0;
120 Y1%=224:Y2%=800
130 X1%=256:X2%=1024
140 REPEAT
150 C%=RND(7)
160 B%=RND(4)*8
170 GCOL3,C%
180 FOR X%=X1% TO X2% STEP B%
190 MOVE X%,Y1%
200 DRAW X%,Y2%
210 NEXT X%
220 IF INKEY(0)=32 REPEAT UNTIL INKEY(
0)=32
230 C%=RND(7)
240 A%=RND(4)*4
250 GCOL3,C%
260 FOR Y%=Y1% TO Y2% STEP A%
270 MOVE X1%,Y%
280 DRAW X2%,Y%
290 NEXT Y%
300 IF INKEY(0)=32 REPEAT UNTIL INKEY(
0)=32
310 UNTIL FALSE
320 END
330 :
1000 ON ERROR OFF
1010 MODE 6
1020 IF ERR<>17 REPORT:PRINT" at line "
;ERL
1030 END

```

```

10 REM PROGRAM PATTERN
20 REM AUTHOR CHARLES FRANCIS
30 REM VERSION E0.1
40 REM ELBUG OCT 1985
50 REM PROGRAM SUBJECT TO COPYRIGHT
60 :
70 ON ERROR GOTO 1000
80 :
100 MODE2
110 VDU 23,1,0;0;0;0;
120 width%=384
130 VDU29,640;512;
140 REPEAT
150 C%=RND(7)
160 GCOL3,C%
170 B%=RND(6)*16
180 IF B%=80 THEN 150
190 MOVE-width%,width%
200 DRAWwidth%,-width%
210 FOR X%=-width%+B% TO width%-B% STE
P B%
220 MOVE X%,width%
230 DRAW width%,X%
240 DRAW-X%,-width%
250 DRAW-width%,-X%
260 DRAW X%,width%
270 NEXT X%
280 MOVE-width%,-width%
290 DRAWwidth%,width%
300 IF INKEY(50)=32 THEN REPEAT UNTIL
INKEY(0)=32
310 UNTIL FALSE
320 :
1000 ON ERROR OFF
1010 MODE 6
1020 IF ERR<>17 REPORT:PRINT" at line "
;ERL
1030 END

```

# Your Guide To BEEBUG

Only one of the programs appropriate to the Electron in this month's BEEBUG needs any alteration to run. However, a few general comments on Beeb program conversion may prove useful to all Electron users.

Beeb programs sometimes fail to run on the Electron because of the Beeb's mode 7 and extra sound facilities. However, conversion rarely proves very difficult.

The Beeb's mode 7 display is of the same format as mode 6 but with a full range of colours and crude graphics. Mode 7 is not available on the Electron, however the Electron defaults to mode 6 when it encounters a MODE 7 command. So BBC micro programs that include a mode 7 display will therefore run on the Electron but often with a corrupted (and monochrome) display.

The Beeb has three sound channels and control over the volume of notes. Electron Basic includes all the SOUND and ENVELOPE parameters that are used in the BBC micro even though several have no effect. This means that Beeb programs making full use of sound will still run on the Electron unaltered, though not, of course, producing the full effect.

The other major difference between the Electron and the BBC micro is speed. The Electron is much slower and particularly slow in modes 0, 1, and 2. BBC micro programs often benefit from a change of mode (admittedly, with a loss of some colours) when running them on the Electron. The changes needed will be given in this ELBUG supplement.

## RECURSIVE TREES

This program produces fascinating displays of tree-like structures, making full use of the not inconsiderable graphical talents of the Electron.

The program also provides a useful introduction to the whole subject of recursion. This is a very useful programming tool and one that the Electron is comparatively rare in including in its Basic.

## GLENTOP'S 3D GRAPHICS SYSTEM

Although animation programs produced by the 3D Graphics Development System will work on an Electron, Glentop Publishers have no plans at present to release a version for the Electron.

## DYNAMIC MEMORY DISPLAY

This useful utility will not operate on the Electron because it requires the BBC micro's mode 7 to operate.

## BOFFIN

This highly entertaining game is available for the Electron on which it performs well. The competition run by the game's publishers, Addictive Games, is also open to ELBUG members, so have a go and see if you can be the month's top scorer on Boffin and win £50.

## PROGRAMMING IN WORDWISE PLUS

Sadly the excellent Wordwise Plus is not available on the Electron.

## LOAN REPAYMENT

If you took out a second mortgage to buy your Electron this is just the program to tell you how much you are going to be paying back each month.

Although very short, this program provides all the answers on this most confusing subject.

The program runs in mode 7 on the BBC micro. However, it will operate quite happily in mode 6 although the teletext codes in the listing that produce colour on the Beeb version will only produce the odd character of garbage on the Electron's screen. You needn't make any alterations to the program to use it, but if you want to tidy up the Electron version a little, make these changes:

```
110 PRINTTAB(8,2)"Interest Repayments"  
360 VDU12,26:PRINTTAB(5,24)"Press Shift  
t to continue";:VDU28,0,22,39,4
```

### FIRST COURSE - Print Formatting (Part 1)

The First Course this month provides a useful insight into how to get all those numbers lined up and orderly. Formatting text on the Electron's screen is never easy but all the tools are there in Basic. This article will help you to get it right.

### EPROM PROGRAMMER PROJECT (Part 2)

The EPROM Programmer construction project started in the last issue will not work on the naked Elk as it requires a Printer Port and a User Port. However, if you have an interface that provides both of these (the Mushroom interface from Broadway Electronics, for example - see ELBUG Vol.2 No.4) then interfacing the EPROM programmer is possible.

However, such interfaces tend to use different memory addresses for the two ports than those in the Beeb. You may have to change the values assigned to IORA, IORB, DDRA, DDRB, and PCR in lines 1570 to 1590 of the program.

### DOUBLE DENSITY DISC FILING SYSTEMS

The Electron is already blessed with a double density disc system, in the form of the Plus 3 reviewed in ELBUG Vol.2 No.8. The Beeb has a whole host of different systems to contend with.

### WORKSHOP - Text Compression

As the Electron has no low memory consumption mode 7 display, the storage of text on this machine is even more difficult than on the Beeb. This article describes the principles of compressing text into small amounts of memory and extracting it again, and provides two procedures to do this.

These procedures will work unaltered on the Electron.

### WORDWISE PLUS HINTS

Like the tutorial series on programming in Wordwise Plus, these hints offer little interest for ELBUG members.

### FURTHER DISC MENU EXTENSIONS

Even if you are fortunate enough to own an Acorn Plus 3 disc unit, the extended disc catalogue will not work with

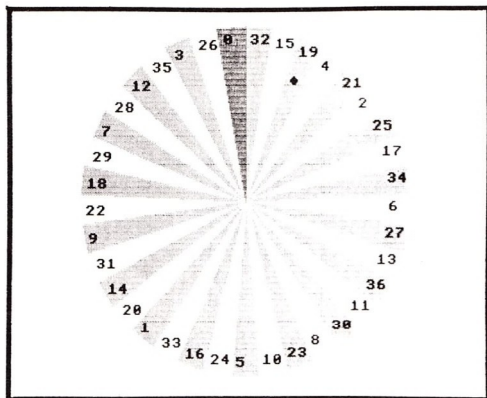
your machine because of the different way in which the Plus 3 ADFS stores files on disc.

### LOOKING AT DATA STRUCTURES (Part 2)

Arranging the data used in a program in the most efficient way is a very important part of writing a program. This article, the second of two, looks at the methods of Linked Lists and Binary Trees. Everything said is applicable to the Electron and the example programs will work without any changes.

### INTERFACING THE BEEB - Eight books reviewed

All but one of the books looked at in this review are meant specifically for the BBC micro. However, ELBUG members interested in electronics will find much to interest them in any of these works.



### ROULETTE

This colourful implementation of the casino game will work perfectly on the Electron with two changes: In lines 1630 and 1650 change UNTIL TIME=I%2 to read UNTIL TIME>I%2. It runs a little slower than it does on the BBC micro, but this just adds to the tension, waiting to see if you have won a fortune.

### HINTS

The following hints in this month's BEEBUG are applicable to the Electron.

LOCAL POINTS OF INTEREST  
TROUBLE WITH \*FX3  
QUICK RANDOM

# TWO NEW ELECTRON PRODUCTS

Alan Webster takes a look at two new add-ons for the Electron and Plus-1 combination from a new name in the business.

Product : Sideways ROM Cartridge  
Adaptor  
Supplier : Advanced Computer Products  
6, Ava House,  
High Street,  
Chobham, Surrey.  
0276-76545  
Price : £10.35

Product : Sideways RAM Cartridge  
Supplier : Advanced Computer Products  
6, Ava House,  
High Street,  
Chobham, Surrey.  
0276-76545  
Price : £39.10

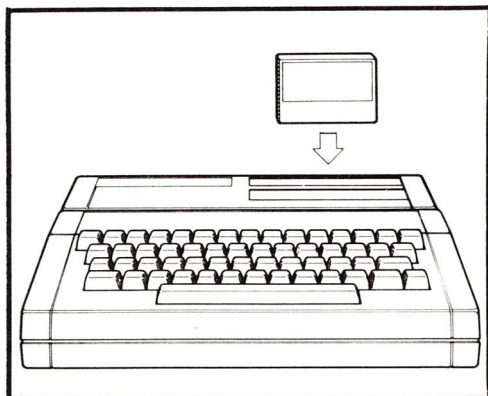
Advanced Computer Products is launching a whole new range of add-ons for the Electron. These include sideways RAM cartridges, sideways ROM adaptors and an advanced DFS based on the one in use in the BBC B+ to allow the Electron to read BBC formatted discs on the Plus-3.

Here we look at the first two of these items, the sideways ROM adaptor and the sideways RAM cartridge.

## ROM ADAPTOR

The ACP ROM adaptor enables you to use 'standard' ROM and EPROM chips, such as those sold as sideways ROMs for the BBC micro, in the Electron's Plus-1. The ROM adaptor is packaged in a neat cartridge case similar to those already used for products such as View and Viewsheets. This can plug into either of the Plus-1 cartridge sockets and is treated as a sideways ROM by the Electron.

Into this you can plug in any ROM you need. For example, you could have Toolkit and Elkman in two cartridge adaptors and plug them both into the Plus-1 at the same time, using utility programs from each whenever needed. When you need to use another ROM, you simply unplug one of the cartridges and replace it. If you don't already own an Electron ROM board (such as



those made by Slogger and Broadway Electronics. See ELBUG Vol.1 No.10 and Vol.2 No.4), this is a cheap way of installing sideways ROMs on your system.

The package comes as a cartridge case, which can be unscrewed to reveal a small printed circuit board with a turned-pin socket for the ROM or EPROM. A turned-pin socket consists of circular legs instead of the usual flat legs of normal sockets. This means that the whole board, complete with ROM, can fit inside the slim cartridge and, in theory, it makes it easier to insert ROMs. Unfortunately, in reality, it is a little difficult to insert ROMs into the socket. One member of the ELBUG staff who has been using ROMs for quite a few years had a little difficulty in plugging the ROM into the socket, and another member of staff who had never even touched a ROM before just gave up trying to insert the ROM.

However, once you have managed to insert the ROM into the socket, the socket then plugs into the Plus-1. There is no soldering required, just the use of a screwdriver to fix and unfix the two screws on the case.

The difficulty of plugging and unplugging ROMs into the ROM adaptor means that this system is not really suitable for constantly interchanging ROMs from

your collection. You really need as many ROM adaptors as you have ROMs. Although, as prices for computer peripherals go, the ACP ROM adaptor is cheap, you don't have to buy very many before you could have bought a ROM board instead - about four in fact.

However, the ACP ROM board does guarantee that you will have no problems of incompatibility, either physical or electronic, between your ROM facilities and the Plus-1.

In addition, there are not a great many ROMs on the market at the moment that are suitable for the Electron. Many of the commercial ROMs for the Beeb will not work on the Electron because they make extensive use of that computer's mode 7 display. So, if you wish to use just a couple of sideways ROMs on your Electron (and are prepared to work at plugging them into the cartridge sockets), then the ACP ROM adaptor is a very useful, if slightly expensive, buy.

#### SIDEWAYS RAM CARTRIDGE

The ACP sideways RAM cartridge is ideal for those ELBUG members who want to alleviate the shortage of Electron ROM software by writing their own.

RAM (Random Access Memory) is the term given to a form of memory that can be both written to and read. The Electron has 32 Kilobytes of RAM for general use, such as programs and machine operating. Just as the Electron can support, at once, several utility programs or languages in ROM, so there is nothing to stop you from using extra RAM in the same way.

The main difference between sideways RAM and the commercial ROMs (such as Toolkit) is that when the Electron is switched off, all of the data that was contained within the sideways RAM will be lost, but data contained in a ROM will still be present. However, the RAM has the advantage that the program present in the sideways 'area' of the Electron can be easily changed just by loading a new piece of software - for example, one that you have written yourself - into the sideways RAM. It is this facility that ACP's sideways RAM cartridge provides.

The Advanced Sideways RAM cartridge is the same in size and appearance as any

Plus-1 cartridge or the sideways ROM adaptor. It provides 16K of RAM - the maximum that the Electron can support in one sideways block - but this can be used as two 8K blocks. The choice is made with a switch on the side of the cartridge case.

You can have up to four 8K pieces of sideways software running in the machine at any time (if you have two cartridges) and each sideways RAM cartridge can be write protected, to prevent accidental erasure while the machine is on.

The RAM cartridge is supplied with software on cassette to let it load machine code into the RAM (useful for developing sideways ROMs of your own), a tape to disc copier and a program to let the RAM act as a printer buffer. A printer buffer is an area of memory that will 'swallow up' all the data sent by the computer to the printer at the high speed of the computer and let it out at the slow speed of the printer whilst the computer carries on with another task. The printer buffer software allows you to use one or both of the 8K RAM chips in the cartridge as a printer buffer, giving either a 6.5K or 14.5K buffer.

Details on how to 'lock' and 'unlock' the sideways RAM are given in the very comprehensive info program, providing all of the instructions on how to use the cartridge and software. The instructions give example programs in machine code that lock and unlock the sideways RAM, they give details on how to transfer the cassette programs supplied onto disc and how to use the programs supplied for the printer buffer and for loading machine code into the RAM. It also gives details on how to save sideways ROMs onto disc or cassette for loading back into RAM.

Both these products are extremely useful and worthwhile investments. Although you must have a Plus-1 to use the two ACP cartridges, these have come down in price recently and can be obtained for around half of their original cost. The sideways RAM adaptor is rather overpriced at nearly £40, but is more useful in my mind than the ROM adaptor. It is nice to see a new name in Electron add-ons, and encouraging to look at the range of products that are planned. Well done to Advanced Computer Products Limited.

# MOON~POD

Eric Pope has been burning the midnight oil and now describes the fruits of his labours - a short, but lively, arcade game for the Electron.

Moon-Pod is a short, colourful, one-player game especially written for the Electron. Because of the basic lack of speed in mode 2, the game runs in mode 5 and uses a machine code routine to plot the characters on the screen.

The idea of the game is to prolong the capture of your vital fuel pod by killing the marauding aliens. Points are scored for each alien killed. An alien starts from the top of the screen and will randomly advance down to the moons surface, where it will attempt to seize your fuel pod and carry it back to the top of the screen. Once this has been done, the game ends.

Instructions on how to play the game are given in the program, and the keys used in the game are 'Z' and 'X' for left and right, '\*' and '?' for up and down and the space bar to fire.

```

10 REM PROGRAM Moon-pod
20 REM VERSION E0.1
30 REM AUTHOR Eric Pope
40 REM ELBUG OCTOBER 1985
50 REM PROGRAM SUBJECT TO COPYRIGHT
60 :
100 ON ERROR GOTO 2140
110 DIM J%(30),K%(30)
120 REPEAT
130 RESTORE
140 MODE 2
150 PROCinst
160 MODE6
170 SC%=0
180 PROCassemble
190 MODE5
200 PROCsetup
210 REPEAT
220 PROCmen(2)
230 PROCalien(2)
240 UNTIL C%=0 OR P%=0
250 IF P%=0 SC%=SC%+1:GOTO190
260 PROCendgame
270 UNTIL0
280 :
290 DATA 0,0,4,6,7,82,7,0,0,0,0,0,12,2
00,14,0

```

```

300 DATA 0,0,0,0,3,53,7,0,0,0,2,6,14,1
64,14,0
310 DATA 0,16,49,115,97,33,33,65,0,128
,200,236,104,72,72,36
320 DATA 16,50,50,50,18,16,16,51,128,1
96,196,196,132,128,128,204
330 DATA 0,0,0,0,0,7,7,0,0,0,0,0,14,
14,0
340 :
1000 DEFPROCship
1010 IFFR=0 FORA=1TO30:NEXT
1020 IF FR=1 PROCfire(2)
1030 IF INKEY-99 AND FR=0 PROCfire(1)
1040 OX=X%:OB=B%
1050 IFINKEY-105 AND X%<7EB1 X%=X%+&14
0:GOTO1070
1060 IFINKEY-73 AND X%>593F X%=X%-&140
1070 IFINKEY-98 AND X%>5807 X%=X%-8:B%
=&5010:GOTO1090
1080 IFINKEY-67 AND X%<7FF0 X%=X%+8:B%
=&5000
1090 !&70=OB:!&72=OX:CALLsprite
1100 !&70=B%:!&72=X%:CALLsprite
1110 IFABS(X%-P%)<17 PROCexplode(X%,B%)
:C%=0:P%=1
1120 ENDPROC
1130 :
1140 DEFPROCmen(M%)
1150 PROCship
1160 IFC%=0 OR P%=0 ENDPROC
1170 !&70=&5030:IFC%=1 THEN!&72=P%+L%+&
140:GOTO1190
1180 !&72=C%
1190 CALL sprite
1200 IFM%=1 ENDPROC
1210 IFC%<1 !&72=P%+&140:GOTO1240
1220 C%=C%+((RND(3)-2)*8):IFC%>7FF0 C%
=&7FF0 ELSE IF C%<7EC0 C%=&7EC0
1230 !&72=C%
1240 CALLsprite
1250 ENDPROC
1260 :
1270 DEFPROCalien(M%)
1280 PROCship
1290 IFP%<2 OR C%=0 ENDPROC
1300 !&70=&5020
1310 !&72=P%
1320 CALLsprite:IFM%=1 ENDPROC
1330 P%=P%+L%:PROCPick
1340 !&70=&5020:!&72=P%
1350 CALLsprite

```

```

1360 ENDPROC
1370 :
1380 DEFPROCassemble
1390 FOR PASS=0 TO 2 STEP 2
1400 P%=&4000:[OPT PASS
1410 .sprite:LDY#15:.sploop
1420 LDA(&70),Y:EOR(&72),Y
1430 STA(&72),Y:DEY
1440 CPY#255:BNE sploop
1450 RTS
1460 ]:NEXT
1470 FORdata=&5000TO&504F
1480 READ ?data:NEXT
1490 ENDPROC
1500 :
1510 DEFPROCpick
1520 IFP%>&7FEF P%=P%-&280
1530 IFP%<&5800 P%=P%-L%:L%=-L%:GOTO158
0
1540 IFC%<=1 ENDPROC
1550 E%=P%-&140
1560 IF ABS(E%-C%)<17 OR ABS(P%-C%)<17
!&70=&5030:!&72=C%:CALLsprite:C%=1:L%=-L%
%
1570 ENDPROC
1580 IFC%=1 C%=0
1590 ENDPROC
1600 :
1610 DEFPROCendgame
1620 VDU24,400;600;800;850;5:GCOL3,131:
CLG:GCOL3,2
1630 MOVE410,800
1640 PRINT" GAME "" OVER "
1650 FORI=1TO2000:NEXT:*FX21
1660 IFGET:ENDPROC
1670 :
1680 DEFPROCfire(U%)
1690 IFU%=2 THEN1730
1700 FR=1:IFB%=&5000 FY%=8 ELSE FY%=-8
1710 FR%=X%+(FY%*2):F1=X%+(FY%*2)
1720 !&70=&5040:!&72=FR%:CALLsprite
1730 OF%=FR%:FR%=FR%+FY%:IFABS(FR%-F1)>
&80 FR=0:!&70=&5040:!&72=OF%:CALLsprite:
ENDPROC
1740 IFFR%<&5800 OR FR%>&7FFF FR=0:!&70
=&5040:!&72=OF%:CALLsprite:ENDPROC
1750 !&70=&5040:!&72=FR%:CALLsprite
1760 !&70=&5040:!&72=OF%:CALLsprite
1770 IFABS(P%-FR%)<17 THEN 1800
1780 IFABS(C%-FR%)<9 PROCexplode(C%,&50
30):C%=0:ENDPROC
1790 ENDPROC
1800 VDU7
1810 !&70=&5020:!&72=P%:CALLsprite
1820 !&70=&5040:!&72=FR%:CALLsprite:FR=
0
1830 P%=0
1840 ENDPROC
1850 :
1860 DEFPROCinst

```

```

1870 COLOUR1:COLOUR131:VDU28,1,4,18,1:C
LS
1880 PRINTTAB(5,3)"Moon-pod"
1890 VDU26:COLOUR2:COLOUR128
1900 PRINTTAB(4,6)"by Eric Pope"
1910 COLOUR6:PRINT"" Destroy the alien
s""before they capture""your vital f
uel pod."" A point is awarded""for sh
ooting each""alien.""
1920 COLOUR1:PRINT"The following keys"
"are used: ""Z - Left, X - Right""*
- Up , ? - Down""Space - Fire."
1930 COLOUR7:PRINT"" Spacebar to start"
;:*FX21
1940 IFGET
1950 ENDPROC
1960 :
1970 DEFPROCexplode(N%,Q%)
1980 !&70=Q%:!&72=N%:CALLsprite
1990 SOUND0,-15,6,5
2000 FORA%=1TO15
2010 J%(A%)=N%
2020 K%(A%)=(&140*(RND(3)-2))+(RND(5)-3
)*8
2030 NEXT:T%=&303
2040 SOUND0,-7,5,20
2050 FORO%=1TO10
2060 FORA%=1TO15
2070 IFJ%(A%)>&5800 !J%(A%)=0
2080 J%(A%)=J%(A%)+K%(A%)
2090 IFJ%(A%)>&5800 !J%(A%)=T%
2100 IFT%=&303 T%=&3030 ELSE IF T%=&303
0 T%=&3333 ELSE IF T%=&3333 T%=&303
2110 NEXT,
2120 ENDPROC
2130 :
2140 ON ERROR OFF
2150 MODE 6
2160 IFERR=17 END
2170 REPORT:PRINT" at line ";ERL
2180 END
2190 :
2200 DEFPROCsetup
2210 B%=&5000:FR=0
2220 VDU19,2,2,0,0,0,19,3,3,0,0,0
2230 VDU23,1,0;0;0;0;
2240 FORY=80TO1280STEP80
2250 DRAWY,RND(40)
2260 NEXT
2270 P%=(RND(&100)*&10)+&5800
2280 L%=&140+((RND(5)-3)*8):IFL%=&140 T
HEN 2280
2290 C%=&7EC0+(RND(&17)*&10)
2300 X%=&7000
2310 !&70=B%:!&72=X%:CALLsprite
2320 PRINTTAB(0,0)"Score = ";SC%
2330 PROCmen(1)
2340 PROCalien(1)
2350 ENDPROC

```