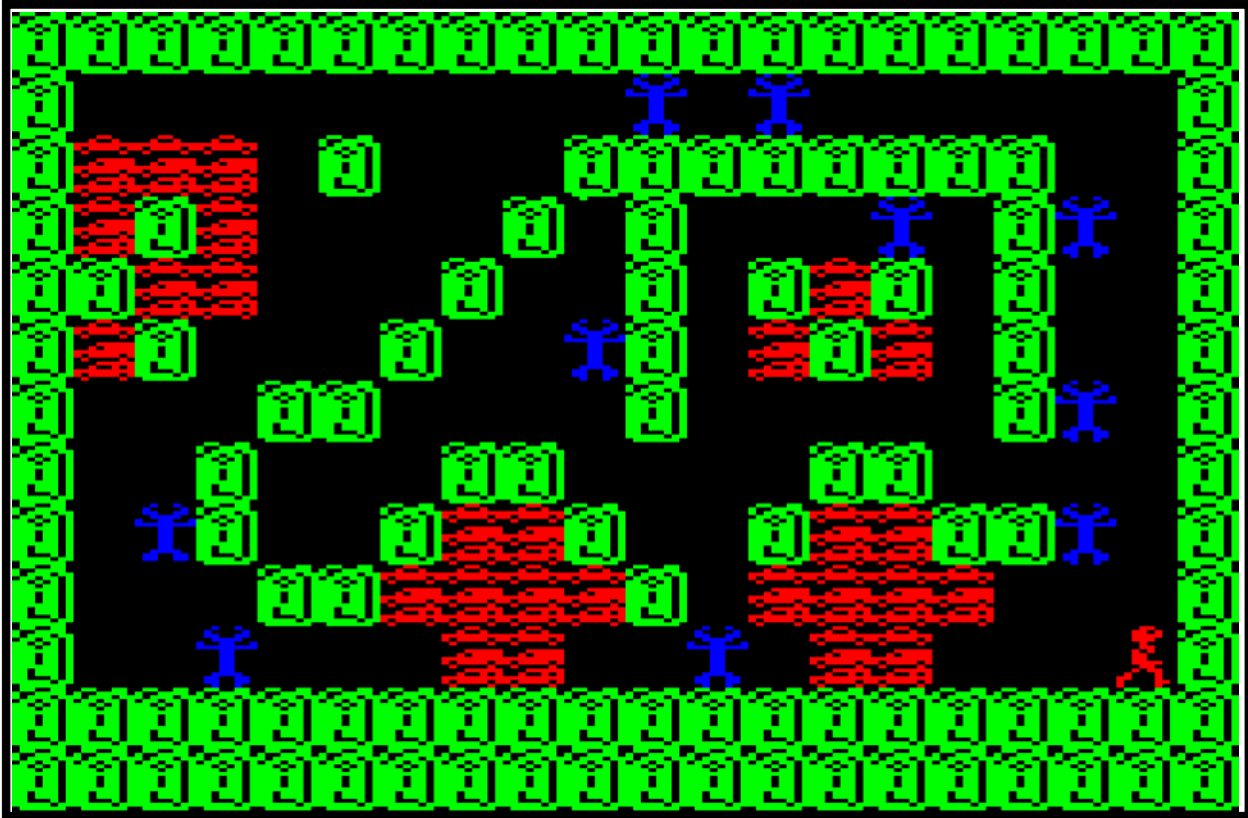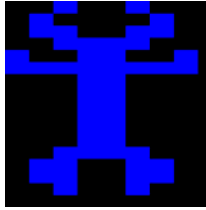# SAS Squad

ANDROIDZ

By Stephen Scott

For users of the BBC B, Master, Master Compact,
Acorn 32-bit series (under emulation),
PC (under emulation) and
Apple Macintosh (under emulation)

CONTENTS

Welcome

Androidz was the very first computer game I wrote. Programmed on the Acorn 8-bit BBC Micro, the game was published in the June 1994 issue of the now discontinued magazine *Acorn Computing*. It was republished on *Acorn User*'s cover CD-ROM of April 1995. This booklet is the first in a short series of booklets, each one a self contained project detailing the game, plus the complete listing for you to type in.

Whatever happens, I hope you enjoy reading this text, typing the listings in, and playing the game.

Compatibility

This game was developed on an unexpanded BBC Micro Model B, fitted with OS 1.2, BASIC version 2, and Acorn 1770 DFS. This is essentially the standard setup for many users. It should nonetheless work on every machine, except the Model A, which only has 16k of memory, far less than the total size of the game. I did attempt a 32-bit version of *Androidz*, but the coding began to get too sticky, and I shelved the project. So, for the present, the game can only be run under an emulator.

This version of *Androidz*, is slightly different from the original, in its choice of filenames, and the removal of the original title screen, because it cannot be published in listing form. The game will run happily on Acorn's !65Host or Warm Silence Software's !6502Em emulators .

Apart from the BBC Micro and 32-bit BBC emulators, there are also emulators available on the PC, Mac, and other machines. So it is likely that *Androidz* will also work on this software. The only way to find out is by trying it, because I do not have access to the software.

Typing in the game

There are three listings to type in. They can be typed up using a text editor such as !Zap or !Edit on the 32-bit Acorn machines. The first listing can be saved as DROID1. Listing 2 contains some data lines which are longer than the limit allowed by both Basic. The way to get round this is to type the word DATA as D. (a D and a full stop). The listing can then be saved as DROID2, while Listing 3 can be saved as DROID3. To play the game, type CHAIN"DROID1". The listings are correct; they are taken directly from a working version, so any bugs and mistakes are likely to be of your own doing!

Of course, these loading instructions may only apply to the BBC Micro and most emulators. Emulators on other machines may use different methods - if in doubt, check the emulator's instructions.

Introduction

This documentation is an account of how I came to develop the game. Firstly, I shall disclose the fact that I do not write games particularly often. When the inspiration comes, then I try my
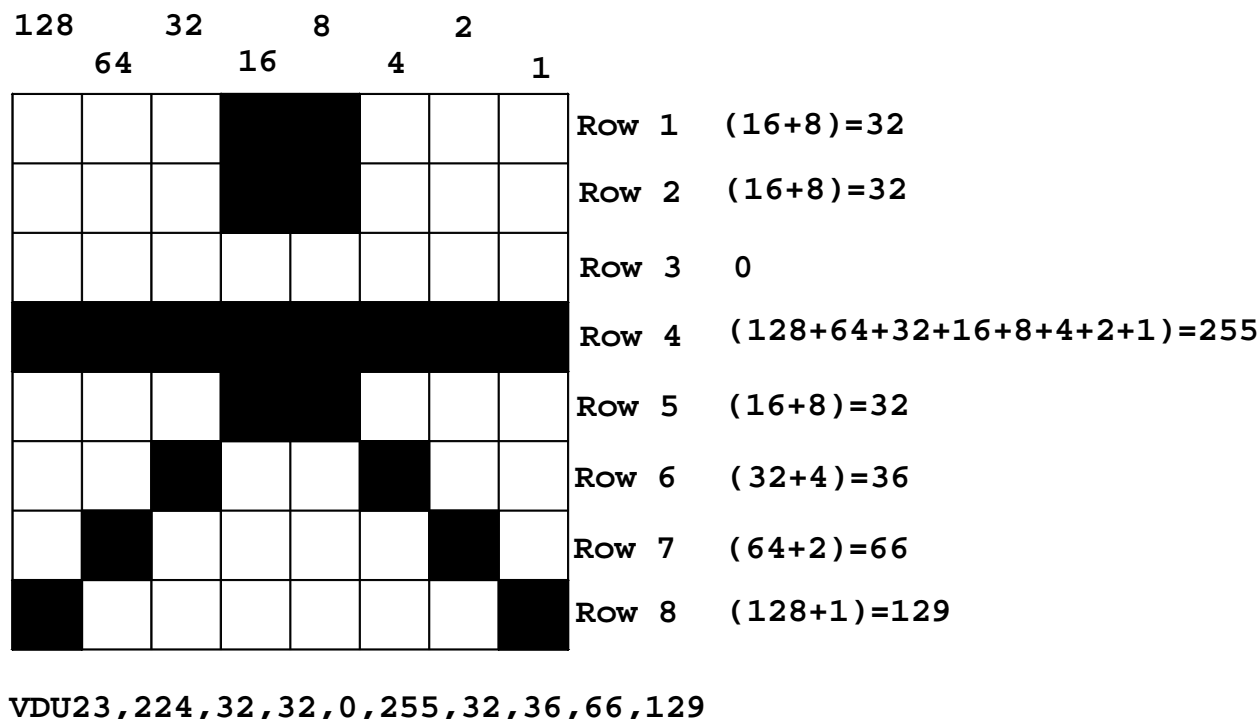
damndest to get the game finished, without being snarled up in overcomplicated programming and giving up in frustration.

The following text contains details of the original idea, who thought of it, and how, three years later, the game finally came into being, albeit in a different style from what it was originally intended to be.

The main inspiration for the game was *The Gate*, a type in game by David Hopkins, and published in the August 1989 issue of *The Micro User* magazine, the forerunner to *Acorn Computing*. It was this, coupled together with a boring summer (I had just finished A levels, and now had three months off before starting a new course), that lead to the *Androidz* project.

The coding of *Androidz* use a technique employed in *The Gate* of a memory map, called `S%()`.

128	64	32	16	8	4	2	1		
			■					Row 1	(16+8)=32
			■					Row 2	(16+8)=32
								Row 3	0
■	■	■	■	■	■	■	■	Row 4	(128+64+32+16+8+4+2+1)=255
			■					Row 5	(16+8)=32
		■			■			Row 6	(32+4)=36
	■					■		Row 7	(64+2)=66
■							■	Row 8	(128+1)=129

`VDU23,224,32,32,0,255,32,36,66,129`

This two dimensional array contains a value in each of its cells. 0 means a space, 1 and 2 means a block, and 3 onwards represent each of the robots. The robots themselves each have arrays, one containing its location on the screen, the other flagging whether it is destroyed or not. If it is destroyed, the next robot is then checked in the list. Notice how the movement of the robots gets faster, the fewer there are of them on the screen.

The graphics of *Androidz* are made using VDU definitions. Two definitions are required to make a character, they are placed on top using the string CHR$10+CHR$8.

There is only provision for around 30 of these definitions in Basic. These are VDU224 to 255. But there are 20 levels in *Androidz*, each with 3 characters (2 blocks, and 1 robot), and then there are the frames for your character, and the bullets. How do they all fit in? Its very simple, the character graphics are held in DATA statements, and these are fed into specific VDU codes i.e. VDUs 240 and 241 are the codes for the robot. The data is simply read into these on each level change.

To speed things up, a little machine code is used to print the robots on the screen. It is the machine equivalent of a VDU240,8,10,241, but it is processed faster than in Basic. The code can be found on line 10 of listing 2.

The Story [containing gratuitous references to *Jurassic Park* - it was out in '93]

It is the year 2002. Robots are now responsible for the manufacture of most household items like cars, televisions and even furniture. The robots use a neural network controlled by a main computer. Despite all this technology, humans still keep tabs on the manufacturing process, dealing with any problems which rear themselves up. For any problems beyond the help of the maintainance crew, the latest addition to the police force - the Robot Apprehension Unit (*R.A.U.*) - is called in to deal with incidents where robots go out of control due to bugs in their programming, or short circuits in the system etc.

You play the part of one of the *R.A.U.* officers - a position everyone wants to be in, due to the high salary and the variations in the kinds of incidents that are faced each day. Because of the nature of the job, you only get three weeks holiday at a set period in the year. But one officer must stay behind to deal with any calls that come in during that time. If you were lucky, you would be sent some reserve officers from another station. However, this year it is not the case, due to a national shortage of officers. You happened to draw the short straw, so you are that officer.

Ordinary officers cannot be drafted in to the *R.A.U.* because of the shortage so you are on your own for the next three weeks. It is of course Murphy's Law that the highest number of calls asking for *R.A.U.* assistance come at exactly the same time as those three weeks...

The three weeks are nearly over; the rest come back from Triassic Park tomorrow, and so you naturally think that you won't get any more calls for the rest of the day. But it is not the case. A call comes in stating that a huge power surge has knocked out the neural networks of twenty nearby factories. As a result of this, the robots have gone on the rampage, killing the maintainance crews with the laser welding instruments attached to their arms. There is no-one left to shut them down, and they would run on battery power for weeks even if the computer was shut down. The only hope is for them to be destroyed. You have been asked to do the job, and it is a very substantial job, much larger than any you have come across. The media have got hold of the situation, and will make you either a hero or a loser depending on the final outcome.

Use the Z, X, * and ? keys to move about each factory level, killing the robots with your single firing laser gun, activated by pressing Return. The robots can of course fire at you, but they are also heat sensitive and will home in your position if you linger around in one place for too long. You must use the natural cover of the factory walls and machinery to help evade the robots, although some factories have less cover than others. If you fail the task then your tally of kills is assessed by the Chief Superintendant and his report will appear on screen.

Just think - if you complete the task you will get your name in the papers and be well rewarded with three weeks at Isla Nobbler for the holiday of a lifetime ... (eek!)

Good Luck!

Game keys:

Z	move left	S/Q	Sound on/off
X	move right	Delete	Pause
*	move up	Copy/End	Unpause
/	move down		

And finally

I hope you have enjoyed reading this booklet, and better still, enjoyed playing the game. If you have any queries or bug reports concerning other machines, or anything in general, then write to me at the following address:

Stephen Scott
17 Northcroft Villas
Egham
Surrey
TW20 0DZ

Although at the time of writing I am at university, my term time address and e-mail number are likely to change too much to warrant inclusion here. The above address is more permanent, since it is my parents address!

Listing 1

```
 10 REM Androidz title page and setup
 20 REM By Stephen Scott
 30 REM 9th August, 1993
 40 REM (c) Acorn Computing
 50 MODE7
 60 VDU23;8202;0;0;0;
 70 CLS:FORI=1TO2
 80 PRINTTAB(14,I)CHR$141CHR$129"ANDROIDZ":NEXT
 90 PRINTTAB(13,4)"v1.0 (28/8/93)"
100 PROCappear1(11,11,"Credits ? (Y/N)",135)
110 REPEAT:A$=GET$:UNTILA$="Y"ORA$="y"ORA$="N"ORA$="n"
120 IFA$="N"ORA$="n"THENGOTO150
130 CLS
140 PROCcredits
150 CLS
160 PROCappear2(6,6,"Please select an option:",131)
170 PRINT''SPC5"1. Quick instructions"
180 PRINT''SPC5"2. Long, sprawling instructions"
190 PRINT''SPC5"3. Load the game"
200 PRINT''SPC5"4. Play something else"
210 REPEAT:A=GET:UNTILA=49ORA=50ORA=51ORA=52
220 IFA=49THENPROCsimple:GOTO260
230 IFA=50THENPROCnovel:GOTO260
240 IFA=51THENGOTO260
250 CLS:PRINT'"Pah! You have no taste for brilliant
games!":END
260 PROCenv:PAGE=&1100:CHAIN"Droid2"
270 END
280 :
290 DEFPROCappear1(x,y,m$,c)
300 FOR a=1 TO LEN(m$)
310 b%=ASCMID$(m$,a,1)
320 x1=x-5:y1=y-5:x2=x+5:y2=y+5
330 REPEAT
340 PRINTTAB(0,y)CHR$(c)
350 VDU31,x1,y1,32,31,x1,y2,32,31,x2,y1,32,31,x2,y2,32
360 x1=x1+1:x2=x2-1
370 y1=y1+1:y2=y2-1
380 VDU31,x1,y1,b%,31,x1,y2,b%,31,x2,y1,b%,31,x2,y2,b%
390 UNTIL x1=x AND x2=x AND y1=y AND y2=y
400 x=x+1
410 NEXT
420 ENDPROC
430 :
440 DEFPROCappear2(x,y,m$,c)
450 PRINTTAB(x-1,y)CHR$(c)
460 FOR a=1 TO LEN(m$)
470 b%=ASCMID$(m$,a,1)
480 y2=22
490 REPEAT:VDU31,x,y2,b%
500 VDU31,x,y2+1,32
510 y2=y2-1
520 UNTIL y2=y-1
530 VDU31,x,y,b%
540 x=x+1
550 NEXT
560 ENDPROC
570 :
580 DEFPROCappear3(x,y,m$,c)
590 PRINTTAB(x-1,y)CHR$(c)
600 FOR a=1 TO LEN(m$)
610 b%=ASCMID$(m$,a,1)
620 x2=38
630 REPEAT:VDU31,x2,y,b%,32
640 x2=x2-1
650 UNTIL x2=x-1
660 VDU31,x,y,b%
670 x=x+1
680 NEXT
690 ENDPROC
700 :
710 DEFPROCsimple
720 CLS
730 PRINT'CHR$134"Simple Instructions:"
740 PRINT'" It is the year 2002, and you are a
member of the police's Robot           Apprahension Unit
(R.A.U.) whose task   it is to destroy mad robots. You
have   been assigned to deal with an incident"
750 PRINT" at 20 factories whose robots have gone
haywire due to a power surge. You must  destroy them all
with your laser gun."
760 PRINT'" Beware! The robots can shoot back at     you!
```

€

```
You start with 5 lives."
  770 PRINT'" Keys:"
  780 PRINT'"  Z - left        S = Noise"
  790 PRINT "  X - right        Q = Quiet"
  800 PRINT "  * - up      Delete = Pause"
  810 PRINT "  ? - down      Copy = Unpause"
  820 PRINT " Ret - fire"
  830 PRINT'CHR$136"PRESS THE SPACE BAR TO LOAD THE GAME"
  840 REPEATUNTILGET=32
  850 ENDPROC
  860 :
  870 DEFPROCnovel
  880 CLS
  890 PRINT'CHR$134"Long winded instructions:"
  900 PRINTTAB(10)"Any key to scroll"
  910 VDU28,0,23,39,3
  920 PRINT'" It is the year 2002. Robots are now
responsible for the manufacture of most household items
like cars, televisions  and even furniture. The robots use
a    neural network controlled by a main"
  930 PRINT " computer. Despite all this technology,
humans still keep tabs on the           manufacturing
process, dealing with     any problems which rear
themselves up."
  940 PRINT'" For any problems beyond the help of     the
maintainance crew, the latest      addition to the police
force - the    Robot Apprehension Unit (R.A.U.) - is
called in to deal with incidents where"
  950 PRINT " robots go out of control due to bugs    in
their programming, or short circuits in the system etc."
  960 A=GET
  970 PRINT'" You play the part of one of the R.A.U.
officers - a position everyone wants    to be in, due to
the high salary and    the variations in the kinds of
incidents that are faced each day."
  980 PRINT'" Because of the nature of the job, you   only
get three weeks holiday at a set   period in the year. But
one officer    must stay behind to deal with any calls
that come in during that time. If you"
  990 PRINT " were lucky, you would be sent some
reserve officers from another station.  However, this year
```

```
it is not the case,  due to a national shortage of
officers. You happened to draw the short straw,   so you
are that officer."
 1000 A=GET
 1010 PRINT'" Ordinary officers cannot be drafted in  to
the R.A.U. because of the shortage   so you are on your
own for the next      three weeks."
 1020 PRINT'" It is of course Murphy's Law that the
highest number of calls asking for      R.A.U. assistance
come at exactly the   same time as those three weeks..."
 1030 PRINT'" The three weeks are nearly over; the    rest
come back from Triassic Park       tomorrow, and so you
naturally think    that you won't get any more calls for
the rest of the day. But it is not the  case."
 1040 A=GET
 1050 PRINT'" A call comes in saying that a huge
power surge has knocked out the neural  networks of twenty
factories nearby,    and the robots have as a result gone
on the rampage, killing the maintainance"
 1060 PRINT " crews with the laser welding
instruments attached to their arms.     There is no-one
left to shut them down, and they would run on battery
power for weeks even if the computer was shut"
 1070 PRINT " down. The only hope is for them to be
destroyed. You have been asked to do    the job, and it is
a very substantial   job, much larger than any you have
come across. The media have got hold of the"
 1080 PRINT " situation, and will make you either a   hero
or a loser depending on the final  outcome."
 1090 A=GET
 1100 PRINT''" Use the Z,X,* and ? keys to move about
each factory level, killing the robots  with your single
firing laser gun,      activated by pressing Return. The
robots can of course fire at you, but"
 1110 PRINT " they are also heat sensitive and will   home
in your position if you linger     around in one place for
too long. You   must use the natural cover of the
factory walls and machinery to help"
 1120 PRINT " evade the robots, although some
factories have less cover than others."
 1130 PRINT'" If you fail the task then your tally of
kills is assessed by the Chief          Superintendant and
his report will      appear on screen."
```

```
 1140 A=GET
 1150 PRINT'" Just think - if you complete the task   you
will get your name in the papers    and be well rewarded
with three weeks   at Isla Nobbler for the holiday of a
lifetime ... (eek!)"
 1160 PRINT'" Use S and Q to toggle the sound output  and
Delete and Copy to pause and        unpause the game."
 1170 PRINT'" Good Luck!"
 1180 PRINT''" There! Did you enjoy that read ? Not
quite the same as reading a sci-fi       novel, but it's
only a silly plot for   a simple zap and blast game!"
 1190 PRINT'CHR$136"PRESS THE SPACE BAR TO LOAD THE GAME"
 1200 REPEATUNTILGET=32
 1210 VDU26
 1220 ENDPROC
 1230 :
 1240 DEFPROCenv
 1250 REM Walk sound
 1260 ENVELOPE1,4,0,0,0,5,2,14,27,80,-100,24,126,126
 1270 REM Ricochet
 1280 ENVELOPE2,1,1,-2,1,5,18,8,126,-1,-1,-8,120,90
 1290 REM Destroy
 1300 ENVELOPE3,1,-1,0,-5,0,0,0,50,-13,0,-2,108,74
 1310 REM End
 1320 ENVELOPE4,1,0,0,0,0,0,0,126,-1,0,-2,126,80
 1330 ENVELOPE5,1,0,0,0,0,0,0,5,-1,0,-2,100,80
 1340 ENVELOPE6,1,0,0,0,0,0,0,5,-1,0,-2,85,70
 1350 REM Laser fire
 1360 ENVELOPE7,129,-4,-3,0,20,10,20,127,-1,-1,-3,120,90
 1370 REM Death
 1380 ENVELOPE8,4,-4,-1,-1,20,20,20,1,0,0,0,1,1
 1390 REM Bell
 1400 ENVELOPE9,3,0,0,0,0,0,0,121,-10,-1,-2,120,120
 1410 ENDPROC
 1420 :
 1430 DEFPROCcredits
 1440 FORI%=1TO12
 1450 READ A%,X%,Y%,A$,C%
 1460 IFA%=2PROCappear2(X%,Y%,A$,C%)
 1470 IFA%=3PROCappear3(X%,Y%,A$,C%)
 1480 NEXT
 1490 TIME=0:REPEATUNTILTIME=300
 1500 CLS
 1510 FORI%=1TO11
 1520 READ A%,X%,Y%,A$,C%
 1530 IFA%=2PROCappear2(X%,Y%,A$,C%)
 1540 IFA%=3PROCappear3(X%,Y%,A$,C%)
 1550 NEXT
 1560 TIME=0:REPEATUNTILTIME=300
 1570 CLS
 1580 PROCappear1(8,11,"(C) Acorn Computing 1993",129)
 1590 TIME=0:REPEATUNTILTIME=300
 1600 CLS
 1610 ENDPROC
 1620 :
 1630 DATA2,10,3,"Design and Programming:",134
 1640 DATA3,11,5,"Stephen Scott",135
 1650 DATA2,10,7,"Graphic artists:",134
 1660 DATA3,11,9,"Stephen Scott",135
 1670 DATA3,11,11,"Lee Wilson",135
 1680 DATA3,11,12,"Graeme Scott",135
 1690 DATA2,10,14,"Level designs:",134
 1700 DATA3,11,16,"Stephen Scott",135
 1710 DATA3,11,18,"Graeme Scott",135
 1720 DATA3,11,19,"Lee Wilson",135
 1730 DATA3,11,20,"Neil Thomas",135
 1740 DATA3,11,21,"Ian Long",135
 1750 :
 1760 DATA2,10,3,"Sound effects:",134
 1770 DATA3,11,5,"Stephen Scott",135
 1780 DATA3,2,7,"and sounds from various games by",129
 1790 DATA3,11,9,"Mike Goldberg",135
 1800 DATA3,11,10,"Jon Perry",135
 1810 DATA2,10,12,"Title page and story:",134
 1820 DATA3,11,14,"Stephen Scott",135
 1830 DATA2,10,16,"Project commenced:",134
 1840 DATA3,11,18,"14th July, 1993",135
 1850 DATA2,10,20,"Project completed:",134
 1860 DATA3,11,22,"28th August, 1993",135
```

Listing 2

```
   10 DIMpr%100:FORP=0TO2STEP2:P%=pr%:[OPTP:LDA#17:JSR&FFEE
:LDA&70:JSR&FFEE:LDA#240:JSR&FFEE:LDA#10:JSR&FFEE:LDA#8:JSR
&FFEE:LDA#241:JSR&FFEE:RTS:]NEXT:P%=&80:[OPT2:LDA#135:JSR&F
FF4:STX&71:RTS:]
   20 ONERRORMODE7:REPORT:PRINT" at line ";ERL:END
   30 PROCinit:MODE5:VDU23;8202;0;0;0;
   40 FORlevel=1TO20
   50 RD%=0:F%=0:F$="":RF$="":stiff=0:FD%=1:FX%=0:FY%=0:rob
ots=10:MN%=robots:fire=0:rfire=0:rob%=1:PROCle:PROCglev:PRO
Crobots
   60 TIME=0:REPEATUNTILTIME=100:X%=RND(17)+1:Y%=RND(11)*2
   70 IFS%(X%,Y%)<>0 THEN60
   80 FORI%=1TO6:D%=0:M%=0:PROCP(2):SOUND1,-10,120,2:TIME=0
:REPEATUNTILTIME=17:PROCP(0):TIME=0:REPEATUNTILTIME=17:NEXT
:D%=0:M%=0:PROCP(2):S%(X%,Y%)=0:S%(X%,Y%+1)=0:PROCsc:PROCli
   90 REPEAT:PROCsc:PROCli
  100 IFINKEY-74:PROCsbul
  110 IFfire:PROCmovbul
  120 T%=T%+1:IFT%=100:T%=0:PROCP(0):D%=0:PROCP(2)
  130 IFINKEY-73ANDS%(X%,Y%-2)<>1:D%=1:PROCP(0):PROCF:Y%=Y%
-2:PROCP(2)
  140 IFINKEY-105ANDS%(X%,Y%+2)<>1:D%=3:PROCP(0):PROCF:Y%=Y
%+2:PROCP(2)
  150 IFINKEY-67ANDS%(X%+1,Y%)<>1:D%=2:PROCP(0):PROCF:X%=X%
+1:PROCP(2)
  160 IFINKEY-98ANDS%(X%-1,Y%)<>1:D%=4:PROCP(0):PROCF:X%=X%
-1:PROCP(2)
  170 IFINKEY-90REPEATUNTILINKEY-106
  180 IFINKEY-17THEN*FX210,1
  190 IFINKEY-82THEN*FX210,0
  200 PROCmrobs
  210 IFRND(10)=3:PROCsrobul
  220 IFrfire:PROCmrobul
  230 IFS%(X%,Y%)>1:stiff=-1
  240 IFrfire:IFRFX%=X%ANDRFY%=Y%:stiff=-1
  250 UNTILstiff ORMN%=0:IFstiff:PROCdead
  260 *FX15
  270 IFLI%<1PROCgover:level=20:GOTO300
  280 IFstiff:stiff=0:PROCplace:PROCsc:PROCli:GOTO90
  290 IFMN%=0:PROCdone:TIME=0:REPEATUNTILTIME=100
  300 NEXT
```

```
  310 IFLI%<1LI%=5:MODE7:Z%=sc%:CHAIN"Droid3":END
  320 PROCwin:MODE7:Z%=sc%:CHAIN"Droid3":END
  330 DEFPROCinit:DIMS%(19,24),M$(4,1),RX%(10),RY%(10),R%(1
0):sc%=0:LI%=5:stiff=0:VDU23,224,60,90,126,102,24,60,126,18
9,23,225,189,153,36,36,66,67,64,192,23,226,189,153,36,36,66
,194,2,3,23,227,60,126,126,126,24,60,126,189
  340 VDU23,228,24,44,60,28,8,24,20,20,23,229,28,28,24,8,8,
8,8,24,23,230,24,44,60,28,8,24,20,12,23,231,12,28,24,52,34,
35,97,33,23,232,24,52,60,56,16,24,40,40,23,233,48,56,24,16,
16,16,16,24,23,234,24,52,60,56,16,24,40,48
  350 VDU23,235,48,60,24,44,68,196,134,132,23,236,189,153,3
6,36,66,66,66,195,23,237,0,0,24,24,24,24,0,0,23,238,0,0,0,6
0,60,0,0,0
  360 B$=CHR$254+CHR$10+CHR$8+CHR$255:M$(0,0)=CHR$224+CHR$1
0+CHR$8+CHR$236:M$(0,1)=CHR$224+CHR$10+CHR$8+CHR$236:M$(1,0
)=CHR$227+CHR$10+CHR$8+CHR$225:M$(1,1)=CHR$227+CHR$10+CHR$8
+CHR$226
  370 M$(2,0)=CHR$232+CHR$10+CHR$8+CHR$233:M$(2,1)=CHR$234+
CHR$10+CHR$8+CHR$235:M$(3,0)=CHR$224+CHR$10+CHR$8+CHR$225:M
$(3,1)=CHR$224+CHR$10+CHR$8+CHR$226
  380 M$(4,0)=CHR$228+CHR$10+CHR$8+CHR$229:M$(4,1)=CHR$230+
CHR$10+CHR$8+CHR$231:ENDPROC
  390 DEFPROCP(c%):VDU17,c%,31,X%,Y%:PRINTM$(D%,F%):ENDPROC
  400 DEFPROCF:IFF%=0F%=1:ELSEF%=0
  410 T%=0:ENDPROC
  420 DEFPROCsbul:IFfire:ENDPROC
  430 fire=-1:SOUND3,7,170,1:FX%=X%:FY%=Y%:IFD%=0GOTO450
  440 FD%=D%
  450 IFFD%=1ORFD%=3:F$=CHR$237:ELSEF$=CHR$238
  460 IFFD%=1:FY%=FY%-2
  470 IFFD%=2:FX%=FX%+1
  480 IFFD%=3:FY%=FY%+2
  490 IFFD%=4:FX%=FX%-1
  500 IFS%(FX%,FY%)=1fire=0:SOUND0,2,22,1:ENDPROC
  510 IFS%(FX%,FY%)>1PROCkill:ENDPROC
  520 VDU17,1,31,FX%FY%:PRINTF$:ENDPROC
  530 DEFPROCmovbul:VDU17,1,31,FX%FY%,32
  540 IFFD%=1:FY%=FY%-2
  550 IFFD%=2:FX%=FX%+1
  560 IFFD%=3:FY%=FY%+2
  570 IFFD%=4:FX%=FX%-1
  580 IFS%(FX%,FY%)=1fire=0:SOUND0,2,22,1:ENDPROC
  590 IFS%(FX%,FY%)>1PROCkill:ENDPROC
```

```
  600 VDU17,1,31,FX%FY%:PRINTF$:ENDPROC
  610 DEFPROCrobots:FORz%=1TOrobots:RX%(z%)=0:RY%(z%)=0:R%(
z%)=0
  620 randx=RND(17)+1:randy=RND(11)*2
  630 IFS%(randx,randy)<>0 THEN620
  640 RX%(z%)=randx:RY%(z%)=randy:R%(z%)=1:?&70=3:VDU31,RX%
(z%),RY%(z%):CALLpr%:S%(RX%(z%),RY%(z%))=z%+1:S%(RX%(z%),RY
%(z%)+1)=z%+1:SOUND1,1,38,5:TIME=0:REPEATUNTILTIME=25:NEXT:
ENDPROC
  650 DEFPROCplace
  660 IFS%(X%,Y%)>1THENVDU17,3,31,X%Y%,240,31,X%,Y%+1,241 E
LSEVDU31,X%Y%,32,31,X%Y%+1,32
```
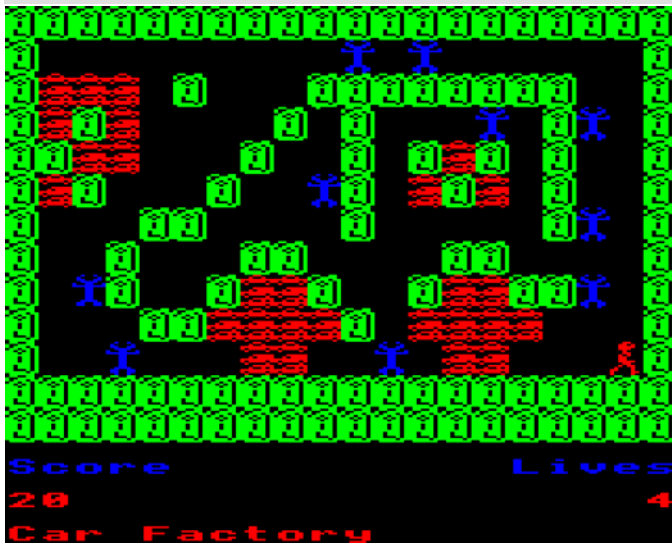


```
  670 randx=RND(12)+4:randy=6:randy=randy+RND(5)*2
  680 FORC=-2TO2:FORD=-4TO4STEP2:IFS%(randx+C,randy+D)<>0 T
HENNEXT,:GOTO670:ELSENEXT,
  690 IFS%(randx,randy)<>0THENREPEAT:randx=RND(17)+1:randy=
RND(11)*2:UNTILS%(randx,randy)=0
  700 X%=randx:Y%=randy:FORI%=1TO6:D%=0:M%=0:PROCP(2):SOUND
1,-10,120,2:TIME=0:REPEATUNTILTIME=17:PROCP(0):TIME=0:REPEA
TUNTILTIME=17:NEXT:D%=0:M%=0:PROCP(2):S%(X%,Y%)=0:S%(X%,Y%+
1)=0:ENDPROC
  710 DEFPROCmrobs:rob%=rob%+1
  720 IFrob%=robots+1 rob%=1
  730 IFR%(rob%)<>1ENDPROC
  740 S%(RX%(rob%),RY%(rob%))=0:S%(RX%(rob%),RY%(rob%)+1)=0
  750 IFX%>RX%(rob%)ANDS%(RX%(rob%)+1,RY%(rob%))=0PROCoff:R
X%(rob%)=RX%(rob%)+1:PROCon:RD%=2
  760 IFX%<RX%(rob%)ANDS%(RX%(rob%)-1,RY%(rob%))=0PROCoff:R
X%(rob%)=RX%(rob%)-1:PROCon:RD%=4
  770 IFY%>RY%(rob%)ANDS%(RX%(rob%),RY%(rob%)+1)=0ANDS%(RX%
```

```
(rob%),RY%(rob%)+2)=0PROCoff:RY%(rob%)=RY%(rob%)+2:PROCon:R
D%=3
  780 IFY%<RY%(rob%)ANDS%(RX%(rob%),RY%(rob%)-1)=0ANDS%(RX%
(rob%),RY%(rob%)-2)=0PROCoff:RY%(rob%)=RY%(rob%)-2:PROCon:R
D%=1
  790 S%(RX%(rob%),RY%(rob%))=rob%+1:S%(RX%(rob%),RY%(rob%)
+1)=rob%+1:ENDPROC
  800 DEFPROCon:?&70=3:VDU31,RX%(rob%),RY%(rob%):CALLpr%:EN
DPROC
  810 DEFPROCoff:?&70=0:VDU31,RX%(rob%),RY%(rob%):CALLpr%:E
NDPROC
  820 DEFPROCkill:R%((S%(FX%,FY%))-1)=0:MN%=MN%-1:SOUND0,3,
54,1:sc%=sc%+1:PROCsc:S%(FX%,FY%)=0:S%(FX%,FY%+1)=0:fire=0:
VDU31,FX%FY%,32,31,FX%FY%+1,32:ENDPROC
  830 DEFPROCsrobul:IFR%(rob%)<>1ENDPROC
  840 IFrfire:ENDPROC
  850 rfire=-1:SOUND3,7,220,1:RFX%=RX%(rob%):RFY%=RY%(rob%)
:IFRD%=0GOTO870
  860 RFD%=RD%
  870 IFRFD%=1ORRFD%=3:RF$=CHR$237:ELSERF$=CHR$238
  880 IFRFD%=1:RFY%=RFY%-2
  890 IFRFD%=2:RFX%=RFX%+1
  900 IFRFD%=3:RFY%=RFY%+2
  910 IFRFD%=4:RFX%=RFX%-1
  920 IFS%(RFX%,RFY%)=1rfire=0:SOUND0,2,22,1:ENDPROC
  930 IFS%(RFX%,RFY%)>1rfire=0:?&70=3:VDU31,RFX%RFY%:CALLpr
%:SOUND0,2,22,1:ENDPROC
  940 VDU17,3,31,RFX%RFY%:PRINTRF$:ENDPROC
  950 DEFPROCmrobul:VDU17,3,31,RFX%RFY%,32
  960 IFRFD%=1:RFY%=RFY%-2
  970 IFRFD%=2:RFX%=RFX%+1
  980 IFRFD%=3:RFY%=RFY%+2
  990 IFRFD%=4:RFX%=RFX%-1
 1000 IFS%(RFX%,RFY%)=1rfire=0:SOUND0,2,22,1:ENDPROC
 1010 IFS%(RFX%,RFY%)>1ORS%(RFX%,RFY%+1)>1rfire=0:SOUND0,2,
22,1:ENDPROC
 1020 VDU17,3,31,RFX%RFY%:PRINTRF$:ENDPROC
 1030 DEFPROCdead:SOUND1,8,150,45:SOUND0,-15,7,45:i=X%*64:j
=1020-(Y%*32):VDU5:GCOL0,1:FORT=1TO30:MOVEi,j:VDU23,239,RND
(255),RND(255),RND(255),RND(255),RND(255),RND(255),RND(255)
,RND(255):VDU239,10,8,239:GCOL0,0:NEXT:VDU4:LI%=LI%-1:PROCl
```

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```
i:VDU17,3:ENDPROC
 1040 DEFPROCsc:VDU17,3,31,0,27:PRINT"Score":COLOUR2:PRINTT
AB(0,29);sc%:ENDPROC
 1050 DEFPROCli:VDU17,3,31,15,27:PRINT"Lives";:COLOUR2:PRIN
TTAB(19,29);LI%;:ENDPROC
 1060 DEFPROCle:PROCch:B$=CHR$242+CHR$10+CHR$8+CHR$243:VDU2
8,0,24,20,0,12,26,17,1:FORA=0TO19:S%(A,0)=1:S%(A,1)=1:S%(A,
24)=1:PRINTTAB(A,0);B$;TAB(A,24);B$;:NEXT:FORB=2TO22STEP2:S
%(0,B)=1:S%(19,B)=1:PRINTTAB(0,B);B$;TAB(19,B);B$;:NEXT:END
PROC
 1070 DEFPROCgover:PROCsc:PROCli:TIME=0:REPEATUNTILTIME=100
:CLS:PRINTTAB(5,15)"GAME  OVER":PROCtune(2):ENDPROC
 1080 DEFPROCwin:PROCsc:PROCli:TIME=0:REPEATUNTILTIME=200:V
DU26,12,17,3,31,2,15:PRINT"CONGRATULATIONS!":PRINTTAB(4,18)
"You did it!!":PROCtune1:TIME=0:REPEATUNTILTIME=200:ENDPROC
 1090 DEFPROCch:RESTORE(1390+level*10):FORCH%=1TO6:READch%,
a%,b%,c%,d%,e%,f%,g%,h%:VDU23,ch%a%b%c%d%e%f%g%h%:NEXT:ENDP
ROC
 1100 DEFPROCglev:RESTORE(1190+level*10):READti$,a,b,c:VDU1
9,1,a;0;19,2,b;0;19,3,c;0;:PROCsc:PROCli:PRINTTAB(0,31);ti$
;:BY%=2:FORR%=1TO11:READC$:FORA%=1TO18:BL%=VALMID$(C$,A%,1)
 1110 IFBL%=0B$=" "+CHR$10+CHR$8+" ":T%=0
 1120 IFBL%=1B$=CHR$17+CHR$1+CHR$242+CHR$10+CHR$8+CHR$243:T
%=1
 1130 IFBL%=2B$=CHR$17+CHR$2+CHR$244+CHR$10+CHR$8+CHR$245+C
HR$11:T%=1
 1140 PRINTTAB(A%,BY%)B$:S%(A%,BY%)=T%:S%(A%,BY%+1)=T%:NEXT
:BY%=BY%+2:NEXT:ENDPROC
 1150 DEFPROCtune1:SOUND2,0,0,3:SOUND3,0,0,6:pi%=0:FORI%=0T
O16:FORD%=3TO5STEP1:pi%=(pi%+D%*1)AND31:SOUND1,4,pi%*4,2:SO
UND2,5,pi%*4,2:SOUND3,6,pi%*4,2:NEXT:NEXT:ENDPROC
 1160 DEFPROCtune(a):IFa=1THENRESTORE1600:E%=33:ELSE RESTOR
E1620:E%=20
 1170 FORB%=0TOE%:READA%,P%,D%:TIME=0:IFA%>0REPEAT:SOUND&00
11,A%,P%,1:SOUND&0012,A%,P%+1,1:UNTILTIME>=D%ELSEREPEATUNTI
LTIME>=D%
 1180 NEXT:ENDPROC
 1190 DEFPROCdone:VDU24,0;192;1279;1023;:GCOL0,129:CLG:GCOL
0,128:CLG:VDU26:COLOUR2:PRINTTAB(5,15)"WELL DONE!":PROCtune
(1):VDU24,0;192;1279;1023;:GCOL0,128:CLG:VDU26:ENDPROC
 1200 DATAComputer Factory,6,4,7,000000000000000000,0112211
```

```
20021122110,020000000000000020,0202121212121121020,01010000-
0000001010,010000000000000010,010100000000001010,0202121121-
212121020,020000000000000020,0112211120021122110,0000000000-
00000000
 1210 DATAWater Works,6,4,7,000000000000000000,010002020001
000110,001000200010100010,000100000100010000,00001000100200
1000,000001000222200000,000200100002000000,0202000100000020
00,002000001000022200,000200000100222220,000000000000000000
 1220 DATACar Factory,2,1,4,000000000000000000,222010001111
111100,212000010100000100,122000100101210100,21000100010212
0100,000110000100000100,001000110000110000,0010012210012211
00,000112222102222000,000000220000220000,1111111111111111111
 1230 DATAPlane Factory,7,4,2,001000000000001100,0111100000
00000000,001100000220000110,000000022220001110,002111111111
111110,011111111111111220,011112222222111122,00000022222220
0000,001100002222220000,011101000022220010,0111111000000000
00
 1240 DATAIce Cream Ltd.,5,3,7,100001000001000010,000000000
000000000,001000010000010000,101010101010101010,10001000010
0000001,220220220220220220,010000000000000100,0100000010000
00100,010000000000000100,011111111111110100,000000000000000
000
 1250 DATAT.V. Factory,6,4,1,122222222222222221,10000000000
0000001,101111100000000001,100010000000000001,1000100000000
00001,100010001110011101,100010001110010101,101111101111010
101,100000000000000001,100000000000000001,122222222222222222
1
 1260 DATAToy Factory,1,2,4,000000000000000000,022022020020
220220,010020000000020010,010111012210111010,01000102112010
0010,010011022220110010,011100021120001110,0000022211122000
00,000002222121100000,000002112121100000,000002221112200000
 1270 DATABuilders Merchant,3,5,1,000000000000000000,000000
001100000000,011111002010000000,012121002011000000,01111100
2001100000,012121002000110000,011111002000111000,0121210111
00011100,011111011100022200,011211000000212120,011211000000
221220
 1280 DATASweet factory,5,3,7,000000000000000000,0001000222
00001000,001000222200000100,010000222200000010,001000222001
110000,000001000001001000,000010000001001000,000100010011001
000,001000100100000101,010000002100000000,000000000000000000
00
 1290 DATAClothes Factory,1,6,4,000000000000000000,02000000
0000000020,200000100010000002,000001212121000000,0000112121
```

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21100000,0002112121121120000,0000212121211200000,0000001212121
000000,2000012121211000002,02000121212110000020,00000000000000
0000

 1300 DATAShoe Factory,4,2,7,000000000000000000,00000000000
1111010,000000000002000010,000000000020200010,0000011121200
00010,000220000202000010,001000000000000100,001000000002222
220,022000000221111110,0002222222001111110,00000000000000000
0

 1310 DATACeramics Factory,7,1,5,000000000000000000,0000011
11111000000,000000000001000000,000001222221002211,000002222
222022100,000002222222002200,000001111111000000,00000011111
0000000,000000011100000000,000000011100000000,2222221111122
22222

 1320 DATAFruit Warehouse,3,1,7,110000001100000000,00000000
0000000000,000121000000002000,000000002000000000,0000000020
00000000,012000000000001001,000000020200000000,000000002222
000000,111000001020000000,000020000000002001,00001100001000
0000

 1330 DATADrinks Factory,1,7,5,000001100001000200,000000000
010002000,002200000100020000,022220020000020001,01221000200
0000010,011110000200000100,011110000020001000,0111100010020
00000,001100010000200010,000000010000020001,000000100000100
000

 1340 DATALight Bulbs Inc.,7,7,1,000000000000000000,0000020
20202000000,000002022220002000,000200222222020020,020022222
222200200,002002222222202000,000222222222220020,01111111111
1111110,000000111000000000,011110000000111100,0000000111100
00000

 1350 DATAFurniture Factory,5,6,7,000001111111100000,000000
000000000000,020000000000000020,010000020020000010,02000111
1111100020,010000100001000010,022120100001021220,0200201000
01020020,020020100001020020,020020100001020020,000000000000
000000

 1360 DATACutlery Factory,7,1,4,000000000000000000,00000022
22111111110,101010222211111100,101010000001110000,1111100000
00000000,001000110000000000,001001111002222220,022211111112
222220,022201111002222220,022200110000000000,00000000000000
0000

 1370 DATASports Factory,7,3,1,000000000000000000,022222001
111100000,010101001111111111,010101001111100000,01010100022
0000000,010101002222000220,010101000220000000,0000000000000
00002,000000000000000020,022200222002022200,000000000000000
000

 1380 DATAChemical Plant,4,5,1,000000200000200020,220000020
002000020,000101000000000000,220101020200022200,00010102220
0021200,220101020200022202,000101000002000000,2201010000200
00010,001000100002001100,011111110000001000,000000000000001
010

 1390 DATAElectricity Board,3,7,6,000000000000000000,000010
000000001000,000001000200010000,100200102020100001,11002000
2020000011,100020020002002001,000020200002020000,0000020000
02020000,000000001100200000,022200001100002220,000000222222
000000

 1400 DATA240,60,90,102,126,24,0,24,129,241,90,60,102,90,23
1,153,126,129,242,0,0,126,66,66,66,66,66,243,126,0,36,86,16
9,255,0,0,244,235,188,153,36,255,36,129,36,245,153,68,185,8
0,57,36,43,209

 1410 DATA240,66,165,165,195,24,24,0,165,241,189,255,60,36,
36,36,126,126,242,204,51,0,204,51,0,204,51,243,204,51,0,204
,51,0,204,51,244,4,8,24,24,56,92,93,255,245,223,125,92,56,2
4,24,4,0

 1420 DATA240,36,66,102,60,153,255,24,24,241,24,24,24,24,60
,102,102,36,242,102,158,187,109,213,237,253,237,243,237,237
,253,221,221,197,251,126,244,24,36,255,189,66,0,31,47,245,2
55,189,66,31,37,255,189,66

 1430 DATA240,102,165,24,36,60,24,52,106,241,126,189,189,18
9,60,126,213,126,242,255,171,213,171,213,171,213,171,243,21
3,171,213,171,213,171,213,255,244,255,153,189,255,191,255,2
53,255,245,255,253,255,191,255,189,153,255

 1440 DATA240,24,60,126,255,189,153,255,165,241,129,129,126
,36,36,165,165,231,242,24,60,126,126,0,255,126,60,243,60,60
,60,60,24,24,24,0,244,0,60,102,122,122,126,126,126,245,126,
126,126,126,24,24,24,24

 1450 DATA240,129,66,66,126,219,255,231,195,241,255,60,126,
60,60,24,219,195,242,0,36,24,255,133,135,133,135,243,135,25
5,36,36,126,0,0,0,244,24,52,44,86,126,24,24,24,245,24,24,24
,12,2,4,3,0

 1460 DATA240,126,129,165,129,126,0,24,118,241,173,181,173,
24,36,126,129,255,242,24,44,86,171,213,106,52,24,243,0,56,1
68,91,60,60,98,66,244,0,119,37,127,127,213,42,0,245,103,146
,242,242,247,103,103,0

 1470 DATA240,24,60,126,165,126,126,255,189,241,189,189,153
,129,195,165,0,0,242,238,238,238,0,187,187,187,0,243,238,23
8,238,0,187,187,187,0,244,0,24,60,118,122,255,0,12,245,6,9,

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8,80,224,240,96,0
 1480 DATA240,0,66,165,24,126,219,255,231,241,219,126,126,6
0,60,24,102,255,242,24,110,90,183,237,90,52,24,243,24,24,24
,24,24,24,24,24,244,85,211,74,126,106,86,66,126,245,66,86,6
6,126,66,110,195,170
 1490 DATA240,231,165,165,231,231,0,36,24,241,24,60,126,255
,129,60,36,24,242,36,126,219,116,106,86,0,90,243,126,126,10
2,102,102,102,102,0,244,252,126,70,70,70,6,126,255,245,0,12
0,52,50,120,2,253,2
 1500 DATA240,231,36,60,126,219,189,255,189,241,219,126,60,
0,60,0,60,0,242,15,127,255,243,0,170,85,7,243,31,63,247,227
,0,170,85,0,244,102,153,153,255,255,255,102,0,245,112,16,48
,70,57,1,78,48
 1510 DATA240,60,66,126,90,126,24,66,60,241,102,219,189,255
,195,126,36,24,242,0,0,127,125,71,108,108,124,243,0,0,24,25
3,190,126,60,24,244,126,126,126,0,126,60,24,60,245,0,60,255
,189,60,60,60,24
 1520 DATA240,36,126,90,126,102,66,255,189,241,126,122,122,
122,122,122,255,66,242,32,56,28,14,10,26,20,48,243,32,0,102
,213,171,86,44,24,244,36,126,243,251,126,60,0,6,245,12,40,8
4,107,85,42,20,8
 1530 DATA240,24,60,60,90,106,86,106,86,241,106,60,52,52,52
,60,126,255,242,24,24,24,36,36,66,129,129,243,129,129,255,1
71,213,255,129,255,244,60,64,255,205,139,221,251,255,245,0,
126,82,74,74,66,36,60
 1540 DATA240,0,165,90,90,90,90,60,255,241,153,219,255,126,
165,153,66,60,242,0,0,60,66,90,133,129,66,243,36,36,60,60,6
0,24,0,0,244,255,252,236,255,255,187,255,255,245,0,60,126,1
26,126,126,24,15
 1550 DATA240,0,24,24,60,60,90,90,255,241,219,66,66,36,36,2
```

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4,126,129,242,24,60,126,189,90,66,126,126,243,0,0,255,126,6
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,157,137,137,137,255
 1560 DATA240,0,60,90,153,60,126,90,126,241,66,255,189,129,
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,16,16,16,244,24,24,24,56,56,56,56,56,245,0,24,24,24,24,24,
24,24
 1570 DATA240,0,102,231,36,36,24,60,90,241,189,255,255,0,12
6,0,60,24,242,251,171,171,169,169,169,169,1,243,65,230,228,
224,224,70,70,64,244,24,44,86,106,213,106,86,36,245,24,24,2
4,24,24,24,27,3
 1580 DATA240,0,255,189,255,118,44,52,239,241,181,173,52,24
,0,60,36,66,242,0,36,36,36,36,36,36,36,243,36,36,66,66,129,
129,195,126,244,16,16,40,24,0,56,56,56,245,56,56,56,40,40,5
6,124,254
 1590 DATA240,129,153,126,219,255,102,90,102,241,60,60,24,1
26,153,153,129,126,242,24,24,24,255,44,52,255,36,243,60,74,
126,82,74,255,129,129,244,60,24,0,8,16,12,2,28,245,32,24,4,
8,16,0,24,60
 1600 DATA9,137,8,0,0,7,9,117,11,0,0,5,9,105,10,0,0,4,9,89,
10,0,0,4,9,129,10,0,0,5,9,109,8,0,0,7,9,97,7,0,0,6,9,81,10,
0,0,6,9,125,8,0,0,6,9,105,7,0,0,6
 1610 DATA9,93,7,0,0,5,9,77,8,0,0,7,9,117,8,0,0,7,9,97,7,0,
0,6,9,85,9,0,0,5,9,69,10,0,0,6,9,77,11,0,0,76,9,117,13,0,0-
,17
 1620 DATA9,61,13,0,0,36,9,61,10,0,0,26,9,61,10,0,0,11,9,61
,11,0,0,43,9,73,11,0,0,29,9,69,10,0,0,12,9,69,11,0,0,29,9,6
1,11,0,0,11,9,61,11,0,0,27,9,57,11,0,0,11,9,61,11,0,0,99,9,
61,15,0,0,19
```

 10 REM Androidz #3

Listing 3

```
  20 REM by Stephen Scott
  30 REM August 1993
  40 REM (c) Acorn Compting
  50 :
  60 sc%=Z%
  70 PROCverdict
  80 PAGE=&1100:CHAIN"Droid2"
  90 END
 100 :
 110 DEFPROCverdict:FORI=0TO1:PRINTTAB(0,I)CHR$141"Inciden
t Report";:NEXT:PRINTTAB(24)CHR$140CHR$135"24th May, 2002";
:PRINTCHR$145STRING$(39,CHR$172):PRINT" You scored";CHR$136
;sc%:PRINT'" FURTHER COMMENTS";CHR$145STRING$(22,CHR$172);
 120 IFsc%<=10m$=" Abysmal performance! You're out of the
police force!"
 130 IFsc%>=11ANDsc%<=20m$=" For a member of the elite R.A
.U. you    didn't do a very good job. An absolute  shambles
. You have been put down in     rank to a constable."
 140 IFsc%>=21ANDsc%<=40m$=" Not a bad performance for a
newcomer to the R.A.U. But you had the potential to finish
the job. I hope you do better    next time!"
 150 IFsc%>=41ANDsc%<=70m$=" You've managed the average nu
mber of    kills of an experienced officer, and    we hope
you improve to a true marksman  on your next assignment."
 160 IFsc%>=71ANDsc%<=110m$=" Well! For a beginner you
did a very     good performance, particularly on those
last few levels. You are getting better all the time."
 170 IFsc%>=111ANDsc%<=160m$=" A magnificent job. You
very nearly did  all the factories. You are a true
member of the R.A.U."
 180 IFsc%>160m$=" I was astounded by the job you did
today. You are now the envy of the      entire force, and
your name is on the   news. I received a letter from the
Queen today. You're up for a bravery     award!"
 190 PRINT:FORa=1TOLEN(m$):PRINT;MID$(m$,a,1);:TIME=0:REPE
ATUNTILTIME=5:NEXT:PRINTTAB(0,19)CHR$145STRING$(39,CHR$172)
;TAB(14,20)"Chief Superintendant Scott";:PRINTCHR$145STRING
$(39,CHR$172)
 200 PRINTTAB(0,22)CHR$136"Press the spacebar to play agai
n...";:REPEATUNTILGET=32:ENDPROC
```