

Board Games

Nine by Eight

This game, based on one written by Chris Callender, is somewhat like Draughts, except that the board measures nine squares by eight, rather than eight by eight. Captures are made like pawn captures in Chess. That is, you move diagonally and land on top of an opponent's piece in order to capture it. All moves are on the white squares, diagonally in any direction. There are no multiple jumps.

You have the first move, and the winner is the first player to capture six of the opponent's pieces. You're playing from the bottom of the screen and the BBC Micro is playing down from the top.

You move by entering the number down the side relating to the square you're moving from, and then the number across the bottom of the relevant square. Then you follow the same process for the square you're moving to. Only legal moves are accepted.

```
10 REM NINE x EIGHT
20
30 MODE 1
40 PROC_init
50 REPEAT
60     PROC_new_game
70     REPEAT
80         PROC_board
90         PROC_your_go
100        PROC_board
110        PROC_my_go
120        UNTIL Myscore=6 OR Yourscore=6
130        PROC_board
140        UNTIL NOT FN_another
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150 MODE 7
160 END
170
180 DEF PROC_init
190 VDU 23,0,10,32,0;0;0;
200 VDU 23,128,-1,-1,-1,-1,-1,-1,-1,-1
210 VDU 23,129,0,0,0,1,3,7,&F,&1E
220 VDU 23,130,0,0,-1,-1,-1,-1,0,0
230 VDU 23,131,0,0,0,&80,&C0,&E0,&F0,&
78
240 VDU 23,132,&3C,&3C,&3C,&3C,&3C,&3C
,&3C,&3C
250 VDU 23,133,0,&18,&3C,&7E,&7E,&3C,&
18,0
260 VDU 23,134,&1E,&F,7,3,1,0,0,0
270 VDU 23,135,&78,&F0,&E0,&C0,&80,0,0
,0
280 DIM S$(10,11)
290 VDU 19,3,6,0,0,0
300 ENDPROC
310
320 DEF PROC_new_game
330 RESTORE
340 FOR Y%=1 TO 10
350     READ R$
360     FOR X%=1 TO 11
370         S$(Y%,X%)=MID$(R$,X%,1)
380     NEXT X%
390 NEXT Y%
400 Myscore=0:Yourscore=0
410 CLS
420 ENDPROC
430
440 DEF PROC_board
450 LOCAL X%,Y%
460 FOR Y%=0 TO 9
470     FOR X%=0 TO 10
480         PRINT TAB(X%*3,Y%*3);
490         PROC_square(S$(Y%+1,X%+1))

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```

500      NEXT X%
510      NEXT Y%
520 COLOUR 2:COLOUR 129
530 PRINT TAB(34,1);"9 x 8";
540 COLOUR 1:COLOUR 128
550 PRINT TAB(34,27);"Me ";Myscore
560 COLOUR 2
570 PRINT TAB(34,29);"You ";Yourscore
580 ENDPROC
590
600 DEF PROC_square(C$)
610 IF C$<"J" PROC_side(C$)
620 IF C$="x" COLOUR 1:PROC_piece
630 IF C$="o" COLOUR 2:PROC_piece
640 IF C$="[fs0]" COLOUR 3:PROC_block
650 ENDPROC
660
670 DEF PROC_side(N$)
680 COLOUR 2:COLOUR 129
690 IF N$=" " THEN COLOUR 128
700 PRINT "[spc3]";TAB(POS-3,VPOS+1);"
";N$;" ";TAB(POS-3,VPOS+1);"[spc3]";
710 ENDPROC
720
730 DEF PROC_block
740 IF X%=0 OR X%=10 THEN COLOUR 1:COL
OUR 130
750 PRINT"[fs0][fs0][fs0]";TAB(POS-3,V
POS+1);"[fs0][fs0][fs0]";TAB(POS-3,VPOS+
1);"[fs0][fs0][fs0]";
760 ENDPROC
770
780 DEF PROC_piece
790 COLOUR 128
800 PRINT"[fs1][fs2][fs3]";TAB(POS-3,V
POS+1);"[fs4][fs5][fs4]";TAB(POS-3,VPOS+
1);"[fs6][fs2][fs7]"
810 ENDPROC
820

```

```

830 DEF PROC_your_go
840 COLOUR 2
850 VDU 28,33,26,39,3,12,26
860 PRINT TAB(33,6);"Your go"
870 PRINT TAB(34,8);"FROM?"
880 REPEAT
890     COLOUR 1
900     PRINT TAB(35,10);
910     from$=FN_move
920     X%=ASC(from$)-63:Y%=VAL(RIGHT$(f
rom$,1))+1
930     IF S$(Y%,X%)="o" THEN 980
940     VDU 7
950     PRINT TAB(33,10);"ILLEGAL";
960     PROC_delay(200)
970     PRINT TAB(33,10);"[spc7]";
980     UNTIL S$(Y%,X%)="o"
990 COLOUR 2
1000 PRINT TAB(35,12);"TO?"
1010 REPEAT
1020     COLOUR 1
1030     PRINT TAB(35,14);
1040     to$=FN_move
1050     X1%=ASC(to$)-63:Y1%=VAL(RIGHT$(t
o$,1))+1
1060     IF S$(Y1%,X1%)<>"o" AND ABS(X%-X
1%)=1 AND ABS(Y%-Y1%)=1 THEN 1110
1070     VDU 7
1080     PRINT TAB(33,14);"ILLEGAL";
1090     PROC_delay(200)
1100     PRINT TAB(33,14);"[spc7]";
1110     UNTIL S$(Y1%,X1%)<>"o" AND ABS(X
%-X1%)=1 AND ABS(Y%-Y1%)=1
1120 IF S$(Y1%,X1%)="x" THEN Yourscore=
Yourscore+1
1130 S$(Y%,X%)=" ":S$(Y1%,X1%)="o"
1140 SOUND 2,-10,101,5:SOUND 2,-10,84,5
1150 ENDPROC
1160

```

```

1170 DEF PROC_my_go
1180 VDU 28,33,26,39,3,12,26
1190 COLOUR 2
1200 PRINT TAB(34,6);"MY GO"
1210 IF Yourscore=6 THEN ENDPROC
1220 A$="o":PROC_think
1230 IF FL%<>1 THEN A$=" ":PROC_think
1240 S$(E%,F%)=" "
1250 IF S$(E%+G%,F%+H%)="o" THEN Myscor
e=Myscore+1
1260 S$(E%+G%,F%+H%)="x"
1270 SOUND 2,-10,84,5:SOUND 2,-10,101,5
1280 ENDPROC
1290
1300 DEF PROC_think
1310 PRINT TAB(34,8);"Think"
1320 E%=RND(4)+1:F%=RND(2)+1:G%=0:H%=0
1330 FL%=0
1340 IF S$(E%,F%)<>"x" THEN 1400
1350 IF S$(E%+1,F%+1)=A$ THEN G%=1:H%=1
1360 IF S$(E%+1,F%-1)=A$ THEN G%=1:H%=-
1
1370 IF S$(E%-1,F%+1)=A$ THEN G%=-1:H%=
1
1380 IF S$(E%-1,F%-1)=A$ THEN G%=-1:H%=-
1
1390 IF G%<>0 AND H%<>0 THEN FL%=1:GOTO
1430
1400 E%=E%+1:IF E%>9 THEN E%=2:F%=F%+1
1410 IF F%>10 THEN 1430
1420 GOTO 1330
1430 PRINT TAB(34,8);"[spc5]"
1440 ENDPROC
1450
1460 DEF FN_another
1470 VDU 28,33,26,39,3,12
1480 COLOUR 3
1490 IF Myscore=6 THEN PRINT"I WON" ELS
E PRINT"YOU WON"

```

```

1500 COLOUR 1
1510 PRINT'"Again?";
1520 REPEAT K$=FNkey
1530     UNTIL K$="Y" OR K$="N"
1540 VDU 26,12
1550 =(K$="Y")
1560
1570 DEF PROC_delay(centi)
1580 TIME=0
1590 REPEAT UNTIL TIME>=centi
1600 ENDPROC
1610 END
1620
1630 DEF FN_move
1640 LOCAL key$,key$,move$
1650 REPEAT key$=FNkey
1660     IF key$<"A" OR key$>"I" THEN VDU
7
1670     UNTIL key$>="A" AND key$<="I"
1680 PRINT key$;:move$=key$
1690 REPEAT key$=FNkey
1700     IF (key$<"1" OR key$>"8") AND ke
y$<>CHR$(127) THEN VDU7
1710     UNTIL (key$>="1" AND key$<="8")
OR key$=CHR$(127)
1720 IF key$=CHR$(127) VDU127:GOTO 1660
1730 PRINT key$;:move$=LEFT$(move$,1)+k
ey$
1740 REPEAT key%=GET
1750     IF key%<>13 AND key%<>127 THEN V
DU 7
1760     UNTIL key%=13 OR key%=127
1770 IF key%=127 THEN VDU127:GOTO 1690
1780 =move$
1790
1800 DEF FNkey
1810 *FX 15 1
1820 LOCAL Key%
1830 Key%=GET

```



```

1840 IF Key%>96 AND Key%<127 THEN Key%=
Key%-32
1850 =CHR$(Key%)
1860
1870 DATA "[fs0]ABCDEFGH I[fs0]"
1880 DATA "1x[fs0]x[fs0]x[fs0]x[fs0]x1"

1890 DATA "2[fs0]x[fs0]x[fs0]x[fs0]x[fs
0]2"
1900 DATA "3x[fs0]x[fs0] [fs0]x[fs0]x3"

1910 DATA "4[fs0] [fs0]x[fs0] [fs0] [fs
0]4"
1920 DATA "5 [fs0] [fs0] [fs0] [fs0] 5"

1930 DATA "6[fs0]o[fs0]o[fs0]o[fs0]o[fs
0]6"
1940 DATA "7o[fs0]o[fs0]o[fs0]o[fs0]o7"

1950 DATA "8[fs0]o[fs0]o[fs0]o[fs0]o[fs
0]8"
1960 DATA "[fs0]ABCDEFGH I[fs0]"

```

Mandala

Based on Draughts, this game pits you (the round, mandala-like pieces) against the BBC Micro' spieces (which look a little like Chess knights). You move diagonally, as in Draughts, and you capture by jumping over the opponent' spiece into an empty square beyond. There are no multiple jumps. Each piece can move in any direction (that is, forwards or backwards on the diagonal).

You start off in the corner of the board, rather than along the sides as in ordinary Draughts. You defeat your trusty BBC Micro if you manage to capture seven of its pieces before it manages to capture seven of yours. The computer will concede the game if it decides you have such a lead that it could never catch up.

You' lfind the game runs very quickly, and the computer' s response time increases a little as the game progresses. You move by entering a four-digit number, made up from the number across the top then down the side of the piece you' re moving, then the number across the top then down the side of the square you' re moving to.

Note that this program uses speech, if fitted, speaking the moves. Due to the length of the program, you must set page to &E00. You do this by entering, as a direct command, PAGE=&E00 before you enter or load the program.

```
10 REM MANDALA
20 ON ERROR GOTO 2580
30 MODE 1
40 PROC_initialise
50 REPEAT
60     PROC_newgame
70     PROC_drawboard
```

```

80     ON ERROR GOTO 2570
90     REPEAT
100         PROC_humanmove:PROC_wait
110         PROC_computermove:PROC_wait
120         UNTIL human=7 OR computer=7
130     UNTIL NOT FN_anothergame
140 MODE 7
150 END
160 DEF PROC_humanmove
170 COLOUR 1:COLOUR 131
180 PRINT TAB(33,8);"Your";TAB(33,9);"
Move"
190 PROCspeak(290):PROCspeak(272):PROC
speak(128)
200 COLOUR 1:COLOUR 131:PRINT TAB(33,1
2);"From":COLOUR 128:PROCspeak(200)
210 VDU 31,34,13,32,32,8,8
220 from$=FN_move
230 xfrom=ASC(LEFT$(from$,1))-64
240 yfrom=VAL(RIGHT$(from$,1))
250 IF A%(10*xfrom+yfrom)<>mandala THE
N PROC_retry:GOTO 200
260 COLOUR 131:PRINT TAB(33,15);" To "
:COLOUR 128:PROCspeak(ASC"2")
270 VDU 31,34,16,32,32,8,8
280 to$=FN_move
290 xto=ASC(LEFT$(to$,1))-64
300 yto=VAL(RIGHT$(to$,1))
310 IF (xto MOD2<>yto MOD2)THEN PROC_r
etry:GOTO 200
320 IF (yto-yfrom)<0 THEN PROC_retry:G
OTO 200
330 IF A%(10*xto+yto)<>blank PROC_retr
y:GOTO 200
340 IF ABS(xfrom-xto)<>1 THEN 410
350 A%(10*xfrom+yfrom)=blank:A%(10*xto
+yto)=mandala
360 COLOUR 1
370 PROC_mandala(xto,yto)

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```

380 COLOUR 0
390 PROC_square(xfrom,yfrom)
400 ENDPROC
410 IF A%((10*xto+yto+10*xfrom+yfrom)/
2)<>knight THEN PROC_retry:GOTO 200
420 human=human+1
430 PROCspeak(275):PROCspeak(228):PROC
speak(204):PROCspeak(65):PROCspeak(257):
PROCspeak(232):PROCspeak(48+human)
440 A%((10*xto+yto+10*xfrom+yfrom)/2)=
blank
450 COLOUR 1
460 PROC_mandala(xto,yto)
470 COLOUR 0
480 PROC_square(xfrom,yfrom)
490 A%(10*xfrom+yfrom)=blank:A%(10*xto
+yto)=mandala
500 PROC_square(xfrom+(xto-xfrom)-SGN(
xto-xfrom),yfrom+(yto-yfrom)-SGN(yto-yfr
om))
510 COLOUR 1
520 PRINT TAB(32,3);"YOU : ";human
530 ENDPROC
540 DEF PROC_computermove
550 COLOUR 2:COLOUR 131
560 PRINT TAB(33,8);" My ";TAB(33,9);"
Move":PROCspeak(ASC"I"):PROCspeak(272):P
ROCspeak(228)
570 FOR Z%=88 TO 1 STEP -1
580     IF A%(Z%)<>knight THEN 640
590     Y%=-11:FLAG=0
600     IF Z%+Y%>88 OR Z%+Y%<11 OR Z%+2*
Y%>88 OR Z%+2*Y%<11 THEN 620
610     IF A%(Z%+Y%)=mandala AND A%(Z%+2
*Y%)=blank THEN FLAG=Z%:Z%=1:GOTO 640
620     Y%=-9*(Y%=-11)+9*(Y%=-9)+10*(Y%=
11)+(Y%=100)
630     IF Y%<>0 THEN 600
640     NEXT Z%

```

```

650 IF FLAG=0 THEN 870
660 Z%=FLAG
670 A%(Z%)=blank
680 A%(Z%+Y%)=blank
690 A%(Z%+2*Y%)=knight
700 computer=computer+1
710 COLOUR 128:PRINT TAB(32,4);"ME      :
";computer
720 xfrom=INT(Z%/10):yfrom=Z%-10*xfrom
730 xdel=INT((Z%+Y%)/10):ydel=Z%+Y%-10
*xdel
740 PROCspeak(200):PROCspeak(64+xfrom)
:PROCspeak(48+yfrom)
750 PRINT TAB(34,13);CHR$(64+xfrom);yf
rom
760 COLOUR 2
770 xto=INT((Z%+2*Y%)/10):yto=Z%+2*Y%-
10*xto
780 PROCspeak(ASC"2"):PROCspeak(64+xto
):PROCspeak(48+yto)
790 PRINT TAB(34,16);CHR$(64+xto);yto
800 PROC_knight(xto,yto)
810 COLOUR 0
820 PROC_square(xfrom,yfrom)
830 PROC_square(xdel,ydel)
840 COLOUR 2
850 PROCspeak(ASC"I"):PROCspeak(228):P
ROCspeak(204):PROCspeak(65):PROCspeak(25
7):PROCspeak(232):PROCspeak(48+computer)
860 ENDPROC
870 Q%=1
880 FOR Z%=Q% TO 200
890   K%=RND(77)+12
900   IF A%(K%)<>knight THEN 960
910   Y%=-11:FLAG=0
920   IF K%+Y%<11 OR K%+Y%>88 THEN 960
930   IF A%(K%+Y%)=blank THEN FLAG=Z%:
Z%=200:GOTO 960
940   Y%=-9*(Y%=-11)+9*(Y%=-9)+10*(Y%=

```

```

11)+(Y%=100)
  950   IF Y%<>0 THEN 920
  960   NEXT Z%
  970 IF FLAG=0 THEN 1190
  980 Z%=FLAG
  990 IF K%+2*Y%>88 OR K%+2*Y%<11 THEN 1
040
  1000 IF A%(K%+2*Y%)=mandala THEN 870
  1010 IF K%-2*Y%<11 OR K%-2*Y%>88 THEN 1
040
  1020 IF A%(K%-2*Y%)=mandala THEN 870
  1030 IF A%(K%+Y%)<>blank OR A%(K%)<>kni
ght THEN 880
  1040 xto=INT((K%+Y%)/10):yto=K%+Y%-10*x
to
  1050 xfrom=INT(K%/10):yfrom=K%-10*xfrom
  1060 IF xto<1 OR xto>8 THEN 870
  1070 IF yto<1 PR yto>8 THEN 870
  1080 IF (xto MOD 2)<>(yto MOD 2) THEN 8
70
  1090 A%(K%+Y%)=knight:A%(K%)=blank
  1100 COLOUR 2:COLOUR 128
  1110 PROCspeak(200):PROCspeak(64+xfrom)
:PROCspeak(48+yfrom)
  1120 PRINT TAB(34,13);CHR$(64+xfrom);yf
rom
  1130 PROCspeak(ASC"2"):PROCspeak(64+xto
):PROCspeak(48+yto)
  1140 PRINT TAB(34,16);CHR$(64+xto);yto
  1150 PROC_knight(xto,yto)
  1160 COLOUR 0
  1170 PROC_square(xfrom,yfrom)
  1180 ENDPROC
  1190 FOR G%=1 TO 200
  1200   K%=RND(77)+11
  1210   FLAG=FALSE
  1220   IF A%(K%)=knight THEN G%=200:FLA
G=TRUE
  1230   NEXT G%

```

```

1240 IF FLAG THEN 1260
1250 PRINT TAB(31,21);"I CONCEDE":human
=7:COLOUR 128:PRINT TAB(32,3);"YOU : 7":
ENDPROC
1260 IF A%(K%-11)=blank THEN Y%=-11:GOT
O 1040
1270 IF A%(K%-9)=blank THEN Y%=-blank:G
OTO 1040
1280 GOTO 1250
1290 DEF PROC_newgame
1300 mandala=104:knight=99:square=143:b
lank=32
1310 B$="MSMSMSBS"+"SMSMSBSB"+"MSMSBSBS
"+"SMSBSBSK"+"MSBSBSKS"+"SBSBSKSK"+"BSBS
KSKS"+"SBSKSKSK"
1320 FOR Z%=0 TO 100:A%(Z%)=9:NEXT
1330 FOR row%=1 TO 8
1340     FOR column%=1 TO 8
1350         C$=MID$(B$, (row%-1)*8+column%,
1)
1360         IF C$="S" THEN A%(10*column%+r
ow%)=square
1370         IF C$="M" THEN A%(10*column%+r
ow%)=mandala
1380         IF C$="B" THEN A%(10*column%+r
ow%)=blank
1390         IF C$="K" THEN A%(10*column%+r
ow%)=knight
1400     NEXT column%
1410 NEXT row%
1420 computer=0:human=0
1430 ENDPROC
1440 DEF PROC_drawboard
1450 COLOUR 128:CLS
1460 COLOUR 2:COLOUR 131
1470 PRINT TAB(32,0);"MANDALA"
1480 COLOUR 1:COLOUR 128
1490 PRINT TAB(32,3);"YOU : 0"
1500 COLOUR 2

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```

1510 PRINT TAB(32,4);"ME      : 0"
1520 COLOUR 0:COLOUR 131
1530 PRINT TAB(0,0);STRING$(30," ");TAB
(0,1);"[spc4]A  B  C  D  E  F  G  H[spc4
]";TAB(0,2);"[spc3]";STRING$(24,"_");"[s
pc3]";TAB(0,27);"[spc3]";STRING$(24,"[fc
0]");"[spc3]";TAB(0,28);"[spc4]A  B  C
D  E  F  G  H[spc4]";TAB(0,29);STRING$(3
0," ")
1540 FOR row%=1 TO 8
1550     PRINT TAB(0,3*row%);"    [fc1]";TA
B(27,3*row%);"[fc2]    "
1560     PRINT TAB(0,1+3*row%);"  ";row%;"
[fc1]";TAB(27,1+3*row%);"[fc2]";row%;"  "
1570     PRINT TAB(0,2+3*row%);"    [fc1]";
TAB(27,2+3*row%);"[fc2]    "
1580     NEXT row%
1590 COLOUR 128
1600 FOR row%=8 TO 1 STEP -1
1610     FOR column%=1 TO 8
1620         IF A%(10*row%+column%)=mandala
THEN COLOUR 1:PROC_mandala(column%,row%
)
1630         IF A%(10*row%+column%)=knight
THEN COLOUR 2:PROC_knight(column%,row%)
1640         IF A%(10*row%+column%)=square
THEN COLOUR 3:PROC_square(column%,row%)
1650         NEXT column%
1660     NEXT row%
1670 PRINT TAB(10,25);
1680 ENDPROC
1690 DEF PROC_mandala(column%,row%)
1700 VDU 31,3*column%,3*row%,129,130,13
1,10,8,8,8,132,133,132,10,8,8,8,134,130,
135
1710 ENDPROC
1720 DEF PROC_knight(column%,row%)
1730 VDU 31,3*column%,3*row%,32,136,137
,10,8,8,8,138,139,140,10,8,8,8,32,141,14

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1740 ENDPROC
1750 DEF PROC_square(column%,row%)
1760 VDU 31,3*column%,3*row%,128,128,12
8,10,8,8,8,128,128,128,10,8,8,8,128,128,
128
1770 ENDPROC
1780 DEF PROC_initialise
1790 DIM A%(100)
1800 VDU 23,0,10,32,0;0;0;
1810 VDU 23,128,&FF,&FF,&FF,&FF,&FF,&FF
,&FF,&FF
1820 VDU 23,129,&00,&00,&00,&01,&03,&07
,&0F,&1E
1830 VDU 23,130,&00,&00,&FF,&FF,&FF,&FF
,&00,&00
1840 VDU 23,131,&00,&00,&00,&80,&C0,&E0
,&F0,&78
1850 VDU 23,132,&3C,&3C,&3C,&3C,&3C,&3C
,&3C,&3C
1860 VDU 23,133,&00,&18,&3C,&7E,&7E,&3C
,&18,&00
1870 VDU 23,134,&1E,&0F,&07,&03,&01,&00
,&00,&00
1880 VDU 23,135,&78,&F0,&E0,&C0,&80,&00
,&00,&00
1890 VDU 23,136,&00,&00,&01,&07,&0F,&13
,&33,&7F
1900 VDU 23,137,&00,&80,&80,&80,&C0,&C0
,&C0,&E0
1910 VDU 23,138,&00,&01,&03,&07,&0F,&09
,&03,&00
1920 VDU 23,139,&FF,&FF,&FF,&F7,&C7,&87
,&07,&07
1930 VDU 23,140,&E0,&E0,&E0,&E0,&E0,&E0
,&F0,&F0
1940 VDU 23,141,&0F,&1E,&1E,&3E,&7D,&FF
,&00,&00
1950 VDU 23,142,&F0,&F0,&F0,&F0,&F0,&F8
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```

, &00, &00
1960 VDU 23, 143, &01, &01, &01, &01, &01, &01
, &01, &FE
1970 VDU 23, 144, &FF, &00, &00, &00, &00, &00
, &00, &00
1980 VDU 23, 145, &01, &01, &01, &01, &01, &01
, &01, &01
1990 VDU 23, 146, &80, &80, &80, &80, &80, &80
, &80, &80
2000 VDU 19, 3, 4, 0, 0, 0
2010 speech=FN_SYNTH
2020 ENDPROC
2030 DEF FN_SYNTH:REM if OS 0.10 put =F
LASE here.
2040 A%=235:X%=&00:Y%=&FF:!&70=USR&FFF4
2050 IF ?&71=&FF THEN =TRUE ELSE =FALSE
2060 DEF PROCspeak(word)
2070 IF NOT speech THEN ENDPROC
2080 SOUND -1, word, 0, 0
2090 REPEAT UNTIL ADVAL(-9)>60
2100 ENDPROC
2110 DEF FN_move
2120 LOCAL key$, key%, move$
2130 *FX 15 1
2140 REPEAT key$=GET$
2150     IF key$<"A" OR key$>"H" THEN VDU
7
2160     UNTIL key$>="A" AND key$<="H"
2170 REMUNTIL key$>="A" AND key$<="H"
2180 PRINT key$;:PROCspeak(ASC(key$))
2190 move$=key$
2200 REPEAT key$=GET$
2210     IF (key$<="1" OR key$>="8") AND
key$<>CHR$(127) VDU7
2220     UNTIL (key$>="1" AND key$<="8")
OR key$=CHR$(127)
2230 IF key$=CHR$(127) THEN VDU 127:GOT
O 2150
2240 PRINT key$;:PROCspeak(ASC(key$))

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2250 move$=LEFT$(move$,1)+key$
2260 REPEAT key%=GET
2270     IF key%<>13 AND key%<>127 THEN V
DU7
2280     UNTIL key%=13 OR key%=127
2290 IF key%=127 THEN VDU 127:GOTO 2200
2300 =move$
2310 DEF PROC_retry
2320 PRINT TAB(32,20);"ILLEGAL":PROCspe
ak(193)
2330 PRINT TAB(34,21);"MOVE":PROCspeak(
128)
2340 PROCspeak(241):PROCspeak(272):PROC
speak(162)
2350 PROC_wait
2360 PRINT TAB(32,20);"[spc7]"
2370 PRINT TAB(34,21);"[spc4]"
2380 ENDPROC
2390 DEF PROC_wait
2400 FOR W%=1 TO 5000:NEXT
2410 ENDPROC
2420 DEF FN_anothergame
2430 ON ERROR GOTO 2580
2440 COLOUR 1
2450 PRINT TAB(31,22);
2460 IF computer=7 AND human=7 THEN PRI
NT"A DRAW":PROCspeak(ASC"U"):PROCspeak(1
65):PROCspeak(ASC"I"):PROCspeak(173):PRO
Cspeak(ASC"1")
2470 IF computer=7 AND human<>7 THEN PR
INT"I WIN":PROCspeak(ASC"I"):PROCspeak(A
SC"I")
2480 IF computer<>7 AND human=7 THEN PR
INT"YOU WIN":PROCspeak("ASC"U"):PROCspea
k("ASC"1")
2490 PROCspeak(128):PROCspeak(267):PROC
speak(257):PROCspeak(209):PROCspeak(266)
:PROCspeak(275):PROCspeak(204):PROCspeak
(human+48):PROCspeak(165):PROCspeak(205)

```

```

:PROCSpeak(204):PROCSpeak(computer+48)
2500 PRINT TAB(31,24);"Another"
2510 PRINT TAB(31,25);"try Y/N";
2520 PROCSpeak(184):PROCSpeak(ASC"U"):P
ROCSpeak(281):PROCSpeak(166):PROCSpeak(2
72)
2530 *FX 15 1
2540 REPEAT K$=GET$
2550 UNTIL K$="Y" OR K$="N"
2560 IF K$="Y" THEN PROCSpeak(289):=TRU
E ELSE PROCSpeak(226):=FALSE
2570 IF ERR=17 THEN PRINT TAB(34,20);"Y
ou";TAB(32,21);"CONCEDE":computer=7:COLO
UR 128:PRINT TAB(32,4);"ME : 7":IF FN_a
nothergame THEN RUN
2580 MODE 7
2590 ON ERROR OFF
2600 IF ERR<>17 THEN REPORT:PRINT" at l
ine ";ERL ELSE PRINT'"[fs1]BYE[fs7]"

```

Four Up

In this game, as its name implies, the aim is to get four of your pieces in a line in any direction before the computer manages to do this with its pieces.

Once you've decided which column you wish to move into, the piece drops to the lowest available position in that column.

The computer plays this game fairly well, and surprisingly quickly, when you see how many loops it has to go through.

In this version of Four Up, the BBC Micro always allows the human to have the first move, and bases its initial move on the move made by the human. You may wish to modify the program so that there is provision for the player to decide, at the start of each game, who should move first. You'll be offered a new game at the end of each round.

```
10 REM Four UP
20
30 MODE 7
40 ON ERROR GOTO 1600
50 PROC_initialise
60 REPEAT
70   PROC_board
80   PROC_win
90   PROC_human
100  PROC_board
110  PROC_win
120  PROC_computer
130  UNTIL FALSE
140 END
150
160 DEF PROC_initialise
170 VDU 23,0,10,32,0;0;0;
180 *FX 4 1
```

```

190 DIM A%(109),M%(30),P%(6)
200 E%=ASC". "
210 H%=ASC"H":C%=ASC"C"
220 FOR B%=1 TO 109
230     A%(B%)=E%
240     D%=B%-10*INT(B%/10)
250     IF D%=0 OR D%>7 OR B%<11 OR B%>7
7 THEN A%(B%)=-9
260     NEXT B%
270 quit=FALSE
280 ENDPROC
290
300 DEF PROC_win
310 IF quit THEN 450
320 X%=H%
330 B%=10
340 B%=B%+1
350 IF A%(B%)<>X% THEN 400
360 IF A%(B%+1)=X% AND A%(B%+2)=X% AND
A%(B%+3)=X% THEN 440
370 IF B%>30 THEN IF A%(B%-10)=X% AND
A%(B%-20)=X% AND A%(B%-30)=X% THEN 440
380 IF B%>33 THEN IF A%(B%-11)=X% AND
A%(B%-22)=X% AND A%(B%-33)=X% THEN 440
390 IF B%>27 THEN IF A%(B%-9)=X% AND A
%(B%-18)=X% AND A%(B%-27)=X% THEN 440
400 IF B%<77 THEN 340
410 IF X%=H% THEN X%=C%:GOTO 330
420 ENDPROC
430 REM win found
440 IF X%=H% THEN PRINT"[fs8][fs3]You:
ve beaten me" ELSE PRINT"[fs8][fs2]I've
defeated you"
450 PRINT TAB(0,22);"[fs1][fs8]Another
game ?";
460 REPEAT K$=GET$
470     UNTIL K$="Y" OR K$="N"
480 IF K$="Y" THEN RUN
490 CLS

```

```

500 *FX 4
510 END
520
530 DEF PROC_board
540 VDU 28,0,23,39,14,12,26
550 PRINT TAB(8,1);CHR$(141);"[fs1]Fou
r Up"
560 PRINT TAB(8,2);CHR$(141);"[fs1]Fou
r Up"
570 FOR K%=10 TO 70 STEP 10
580     PRINT TAB(5);
590     FOR J%=1 TO 7
600         IF A%(K%+J%)=H% THEN PRINT"[fs
3]";
610         IF A%(K%+J%)=C% THEN PRINT"[fs
2]";
620         IF A%(K%+J%)<>C% AND A%(K%+J%)
<>H% THEN PRINT"[fs6]";
630         VDU A%(K%+J%)
640     NEXT J%
650     PRINT
660     NEXT K%
670 PRINT TAB(5);"[fs1]1 2 3 4 5 6 7"
680 PRINT SPC(30)
690 ENDPROC
700
710 DEF PROC_human
720 PRINT"[fs3]Your move..."
730 REPEAT
740     PRINT TAB(0,17);"[fs3]Which colu
mn do you wish to move into"
750     PRINT"[fs3]To move: [fs6][ left"
760     PRINT"[fs6][spc10]] right"
770     PRINT"[fs6][spc5]RETURN drop"
780     J%=4
790     REPEAT
800         PRINT TAB(3+2*J%,12);"[fs3]^";
810         *FX 15 1
820         K%=GET

```

```

830      PRINT TAB(0,22);SPC(39);
840      PRINT TAB(3+2*J%,12);"  ";
850      IF K%=136 THEN J%=J%-1
860      IF K%=137 THEN J%=J%+1
870      IF J%=0 THEN J%=7
880      IF J%=8 THEN J%=1
890      UNTIL K%=13
900      Z%=J%
910      REPEAT
920          Z%=Z%+10
930      UNTIL A%(Z%+10)<>E%
940      IF A%(Z%)<>E% PRINT TAB(3,22);"[
fs1][fs8]You can't move there"
950      UNTIL A%(Z%)=E%
960      A%(Z%)=H%
970      ENDPROC
980
990      DEF PROC_computer
1000     PRINT'"[fs2]Stand by for my move..
. "
1010     B%=10
1020     B%=B%+1
1030     IF A%(B%)=-9 THEN 1060
1040     IF A%(B%)=C% THEN X%=C%:GOTO 1110
1050     IF A%(B%)=H% THEN X%=H%:GOTO 1110
1060     IF B%<77 THEN 1020
1070     GOTO 1370
1080
1090     REM Four in a row Danger/Chance?
1100     REM across
1110     IF A%(B%+1)=X% AND A%(B%+2)=X% AND
A%(B%+3)=E% AND A%(B%+13)<>E% THEN move
=B%+3:GOTO 1550
1120     IF A%(B%-1)=X% AND A%(B%-2)=X% AND
A%(B%-3)=E% AND A%(B%+7)<>E% THEN move=
B%-3:GOTO 1550
1130     IF A%(B%+1)=X% AND A%(B%+2)=X% AND
A%(B%-1)=E% AND A%(B%+9)<>E% THEN move=
B%-1:GOTO 1550

```



```

1140 IF A%(B%-1)=X% AND A%(B%+2)=X% AND
A%(B%+1)=E% AND A%(B%+11)<>E% THEN move
=B%+1:GOTO 1550
1150 IF A%(B%+1)=X% AND A%(B%-1)=X% AND
A%(B%+2)=E% AND A%(B%+12)<>E% THEN move
=B%+2:GOTO 1550
1160 IF A%(B%+1)=X% AND A%(B%-1)=X% AND
A%(B%-2)=E% AND A%(B%+8)<>E% THEN move=
B%-2:GOTO 1550
1170 IF A%(B%-1)=X% AND A%(B%-2)=X% AND
A%(B%+1)=E% AND A%(B%+11)<>E% THEN move
=B%+1:GOTO 1550
1180 REM down
1190 IF B%>20 THEN IF A%(B%-10)=X% AND
A%(B%-20)=X% AND A%(B%+10)=E% AND A%(B%+
20)<>E% THEN move=B%+10:GOTO 1550
1200 REM diagonals
1210 IF A%(B%+11)=X% AND A%(B%+22)=X% A
ND A%(B%-11)=E% AND A%(B%-1)<>E% THEN mo
ve=B%-11:GOTO 1550
1220 IF A%(B%+9)=X% AND A%(B%+18)=X% AN
D A%(B%-9)=E% AND A%(B%+1)<>E% THEN move
=B%-9:GOTO 1550
1230
1240 REM make block three?
1250 REM across
1260 IF A%(B%+1)=X% AND A%(B%+2)=E% AND
A%(B%+12)<>E% THEN move=B%+2:GOTO 1550
1270 IF A%(B%+1)=X% AND A%(B%-2)=E% AND
A%(B%+9)<>E% THEN move=B%-1:GOTO 1550
1280 IF A%(B%-1)=X% AND A%(B%-2)=E% AND
A%(B%+8)<>E% THEN move=B%-2:GOTO 1550
1290 REM vertical
1300 IF A%(B%+10)=X% AND A%(B%-10)=E% A
ND A%(B%)<>E% THEN move=B%-10:GOTO 1550
1310 REM diagonal
1320 IF A%(B%+9)=X% AND A%(B%-9)=E% AND
A%(B%+1)<>E% THEN move=B%-9:GOTO 1550
1330 IF B%>11 THEN IF A%(B%+11)=X% AND

```

```

A%(B%-11)=E% AND A%(B%-1)<>E% THEN move=
B%-11:GOTO 1550
1340 GOTO 1060
1350
1360 REM single moves
1370 FOR N%=1 TO 3
1380     M%(N%)=0
1390     NEXT N%
1400 count=0
1410 FOR B%=11 TO 77
1420     IF A%(B%)<>C% AND A%(B%)<>H% THE
N 1480
1430     IF A%(B%+1)=E% AND A%(B%+11)<>E%
THEN count=count+1:M%(count)=B%+1
1440     IF A%(B%-1)=E% AND A%(B%+9)<>E%
THEN count=count+1:M%(count)=B%-1
1450     IF A%(B%-10)=E% AND A%(B%)<>E% T
HEN count=count+1:M%(count)=B%-10
1460     IF A%(B%-11)=E% AND A%(B%-1)<>E%
THEN count=count+1:M%(count)=B%-11
1470     IF A%(B%-9)=E% AND A%(B%+1)<>E%
THEN count=count+1:M%(count)=B%-9
1480     NEXT B%
1490 IF count<>0 THEN 1540
1500 PRINT'"'[fs8][fs4]I think we shoul
d call this a draw"
1510 PRINT'''
1520 quit=TRUE
1530 PROC_win
1540 move=M%(RND(count))
1550 A%(move)=C%
1560 PRINT TAB(3+2*(move MOD 10),12);"[
fs2]^";
1570 ENDPROC
1580
1590 REM Handle Errors
1600 IF ERR=17 THEN 450
1610 MODE 7
1620 *FX 4

```

1630 REPORT:PRINT" at line ";ERL

