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RUNS ON AN ATARI IN 8K

CHANGING HEARTS

Anyone who had a heart would not have invented this puzzle game. Simple to play yet challenging to work-out, Changing Hearts is an unusual problem which is well suited to the computer.

The object of the game is to change a pattern of dark hearts surrounding a light coloured one to a pattern of light hearts, surrounding a dark one.

As you select individual hearts, different groups of hearts will be complemented depending on your choice. Selecting a corner will change four hearts in a square including that corner. Choosing a heart at the middle of an edge will reverse all hearts along that edge. Finally, if the central heart is chosen, all hearts in a cross will be switched.

The first challenge is simply to solve this puzzle without losing any hair. A higher challenge is to solve it in the fewest moves possible. Supposedly, this number is eleven. If at any time you wish to return to the starting position, press the letter "I", (initialise). This will cost you a turn, however.

You can save yourself a lot of typing from omitting the instructions (lines 1000-1110), and deleting line 60.

Of interest to programmers will be the extensive use of strings to hold integer numbers (0-255). There are a number of good reasons for doing this. First, a single character in a string requires much less memory than a number (two bytes compared to seven). The numbers can be retrieved easily using Atari's string splitting convention (see line 900).

String comparison is also useful for comparing entire groups of numbers at once. Notice how easy it is to check for a win or loss in lines 250 and 260. The numbers are entered into strings as control graphics.

Many lines in "Changing Hearts" contain special control characters which DO NOT show

up in this listing. To enter these special characters, hold the control key down while typing the upper case letters and the commas below:

Line 30: P\$ should contain HCJCLCHEJELEHGJGLG

Line 40: G\$ contains ABDE, ABC, BCEF, ADG,, BDEFHCFI, DEGH, GHI,, EFHI,

Lines 410-440 contain graphics in their PRINT statement as follows:

Line 410: QRWRWRE

Line 420: ARSRSRD

Line 430: ARSRSRD

Line 440: ZRXXRC

In lines 1000 and 1010, there should be two control commas (heart characters) in each line PRINT statement. The first one after the open parenthesis character, and one before the closing parenthesis character, and one before the closing parenthesis. The first heart in line 1000, and the second one in line 1010, should also be typed in reverse video, as should the word "light" in lines 220 and 1010.

PROGRAM EXPLANATION

Lines 10-40: The keyboard is opened for input to get keys without requiring a RETURN. Various strings are initialised. See the instruction for special comments concerning P\$ and G\$.

Lines 50-60: Title — The hearts blink in and out because of the POKEs which change from upper-case to lower-case graphics mode and back (POKEs into 756).

Lines 170-180: Initialise game — The board is printed along with the initial heart configuration.

Line 190-270: Main loop of game — Gets player selection, checks for legal move, flashes appropriate group and complements hearts in that group, checks for winning or losing situations and repeats. CHR\$(125) clears the text area.

Lines 300-310: Advises of a losing condition.

Lines 350-380: Acknowledges a win, small demonstration, asks if repeat wanted. The POKEs into 708 are another way to change colours (colour register 0). The POKEs into 656 and 657 align the cursor in the text area (row and column). The POKE into 76 clears the last key byte.

Lines 400-450: Subroutine to print the board. The SETCOLOR 4,2,8 is necessary so the background hearts in graphics mode 2 don't show because they are the same colour as the background. The SETCOLOR 3,4,10 makes the light hearts especially light so they show up well on a black and white TV. CHR\$(124) creates the vertical lines, completing squares. The POKE into 752 blanks the cursor.

Lines 500-550: Subroutine to put hearts on the board. Flag F controls the configuration printed as described under variables.

Lines 600-620: Subroutine which flashes hearts in a group determined by the number selected, N. The subroutine then complements these hearts.

Lines 700-730: Delay subroutine used during instructions and in winning and losing routines. Delay determined by point where entered.

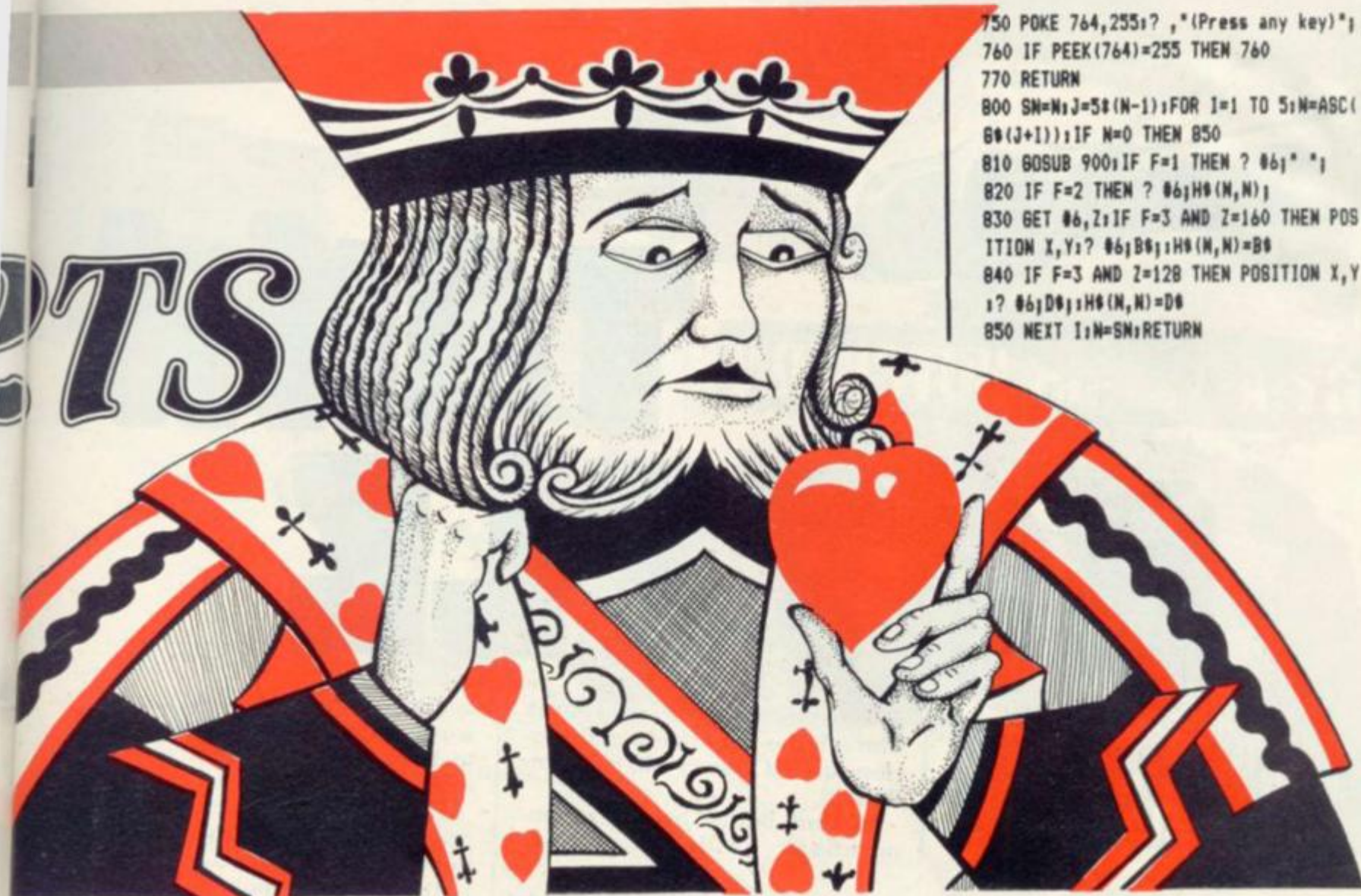
Lines 750-770: Keyboard input subroutines which prompts and waits for any key to be pressed.

Lines 800-850: A subroutine which operates on a group of positions determined by the number N. Hearts may be printed, erased or complemented depending on the flag F.

Line 900: Subroutine to retrieve screen positions from string P\$.

Line 1000-1110: Instructions

TS



```

750 POKE 764,255:?"(Press any key)";
760 IF PEEK(764)=255 THEN 760
770 RETURN
800 SN=N:J=5:(N-1):FOR I=1 TO 5:N=ASC(
  B$(J+1)):IF N=0 THEN 850
810 GOSUB 900:IF F=1 THEN ? "6";
820 IF F=2 THEN ? "6";H$(N,N);
830 GET #6,Z:IF F=3 AND Z=160 THEN POS
  ITION X,Y:?"6";B$(N,N)=B$
840 IF F=3 AND Z=128 THEN POSITION X,Y
  :?"6";D$(N,N)=D$
850 NEXT I:N=SN:RETURN

```

```

10 DIM P$(18),B$(45),B$(1),D$(1),H$(9)
  ,F$(9),L$(9),S$(9),N$(9):OPEN #1,4,0,"
  K1"

```

```

20 D$=CHR$(160):B$=CHR$(128):FOR I=1 T
  O 9:L$(I)=D$:F$(I)=B$:NEXT I:S$=L$:S$(
  5,5)=B$:F$(5,5)=D$

```

```

30 P$="":N$="1234567
  89"

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```

40 G$="

```

```

50 GRAPHICS 2:POSITION 2,5:?"6";"CHANG
  ING HEARTS":FOR I=3 TO 6:SETCOLOR 0,I,
  4:SOUND 0,RND(0)*40+10,10,8

```

```

55 GOSUB 710:POKE 756,226:SOUND 0,RND(
  0)*40+10,10,8:GOSUB 710:POKE 756,224:N
  EXT I:SOUND 0,0,0,0

```

```

60 POKE 752,1:?"":?"Need Instructions
  ?":?"( Y or N )":GET #1,K:IF K=8
  9 THEN GOSUB 1000

```

```

170 T=0

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```

180 H$=S$:GOSUB 400:F=2:GOSUB 500

```

```

190 T=T+1

```

```

200 ? CHR$(125):?"Turn # ":T:?"Pick a
  number (1-9)"

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210 GET #1,K:N=K-48:IF N=25 THEN 180

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```

215 IF N<1 OR N>9 THEN 210

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220 GOSUB 900:GET #6,H:IF H=160 THEN ?
  CHR$(125):?"":?"You may only pick lig
  ht hearts.":GOSUB 760:GOTO 210

```

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250 GOSUB 600:IF H=L$ THEN 300

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260 IF H=F$ THEN 350

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```

270 GOTO 190

```

```

300 FOR S=30 TO 190:SOUND 0,S,10,8:NEX
  T S:SOUND 0,0,0,0:?"CHR$(125):?"Sorry
  , there's no way out !!!":GOSUB 750

```

```

310 GOTO 370

```

```

350 ? CHR$(125):FOR J=0 TO 14:POKE 708
  ,4+16*J:SOUND 0,50-2*J,10,8:GOSUB 730:
  POKE 708,40:GOSUB 730

```

```

351 NEXT J:SOUND 0,0,0,0

```

```

360 POKE 656,1:POKE 657,10:?"CONGRATU
  LATIONS !!!":?"You did it in "J;" tu
  rns.":GOSUB 750

```

```

370 POKE 764,255:?"CHR$(125):?"":?"Car
  e to try again? (Y or N)":GET #1,K:IF
  K=89 THEN 170

```

```

380 ? "Thanks for the game.":END

```

```

400 GRAPHICS 2:SETCOLOR 4,2,8:SETCOLOR
  3,4,10:POKE 756,226:POKE 752,1

```

```

410 POSITION 7,2:?"6";

```

```

420 POSITION 7,4:?"6";

```

```

430 POSITION 7,6:?"6";

```

```

440 POSITION 7,8:?"6";

```

```

450 FOR X=7 TO 13 STEP 2:FOR Y=3 TO 7
  STEP 2:POSITION X,Y:?"6";CHR$(124):NE
  XT Y:NEXT X:RETURN

```

```

500 FOR N=1 TO 9:GOSUB 900:IF F=1 THEN
  ? "6";H$(N,N);

```

```

510 IF F=2 THEN ? "6";S$(N,N);

```

```

520 IF F=3 THEN ? "6";F$(N,N);

```

```

530 IF F=4 THEN ? "6";N$(N,N);

```

```

540 IF F=5 THEN ? "6";L$(N,N);

```

```

550 NEXT N:RETURN

```

```

600 FOR L=1 TO 5:F=1:GOSUB 800:SOUND 0
  ,5*N+50,10,8:F=2:GOSUB 800:SOUND 0,5*N
  +80,10,8

```

```

620 NEXT L:SOUND 0,0,0,0:F=3:GOSUB 800
  :RETURN

```

```

700 FOR K=0 TO C:NEXT K:RETURN

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710 C=150:GOTO 700

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```

720 C=1000:GOTO 700

```

```

730 C=30:GOTO 700

```

```

900 X=ASC(P$(2*N-1)):Y=ASC(P$(2*N)):PO
  SITION X,Y:RETURN

```

```

1000 H$=S$:GOSUB 400:F=2:GOSUB 500:?"
  Go from this pattern ...":?"( 's aro
  und )":GOSUB 750

```

```

1010 F=3:GOSUB 500:?"CHR$(125):?"To thi
  s pattern ( 's around )":?"by choosi
  ng light hearts.":GOSUB 750

```

```

1020 GRAPHICS 2:F=4:GOSUB 500:POKE 752
  ,1:?"These are the position numbers."
  :?"Different groups of hearts will be

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```

1030 ? "reversed depending on your cho
  ice.":GOSUB 750:F=2:GOSUB 400:GOSUB 50
  0

```

```

1040 ? "If you pick the center square,
  the":?"hearts in a cross will be rev
  erse."

```

```

1050 GOSUB 720:N=5:GOSUB 600:GOSUB 750
  :?"CHR$(125):?"If you choose the middle
  square on"

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```

1060 ? "an edge, the whole edge will b
  e":?"reversed.":GOSUB 720:N=8:GOSUB 6
  00:GOSUB 750

```

```

1070 ? CHR$(125):?"If you pick a corner
  , a square":?"including that corner w
  ill be":?"reversed"

```

```

1080 GOSUB 720:N=7:GOSUB 600:GOSUB 750
  :?"CHR$(125):?"If you end up with all d
  ark hearts":?"you lose !!!":F=5

```

```

1090 GOSUB 500:GOSUB 750:?"CHR$(125):?"
  Hit the 'I' key to get back to the":?"
  initial position."

```

```

1100 ? "Understand the instructions?":
  POKE 764,255:GET #1,K:IF K<>89 THEN 10
  00

```

```

1110 RETURN

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