

# High resolution graphics

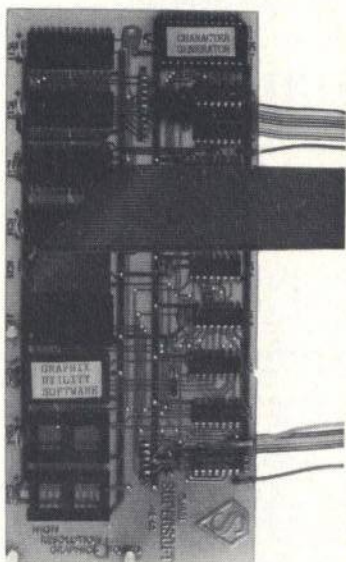
The HR-40 and HR-80 series graphics boards enable a standard PET or CBM computer to display high resolution pictures. Memory size is irrelevant as no PET memory is used. Sixty-four thousand points arranged in a 320 by 200 matrix can each be turned on or off to create smooth curves, realistic pictures, or accurate diagrams — there are countless possible applications.

The board itself measures about 8½ inches by 3¼, yet on board there is 8k of static Ram occupying addresses from \$9000 to \$AFFF (36864 to 45055). As this area of memory is often required for Rom expansion, sockets UD3 and UD4 (or UD11 and UD12) are duplicated on the board, and may be selected with one simple poke command. In fact, retaining existing PET features and options was a major design criterion.

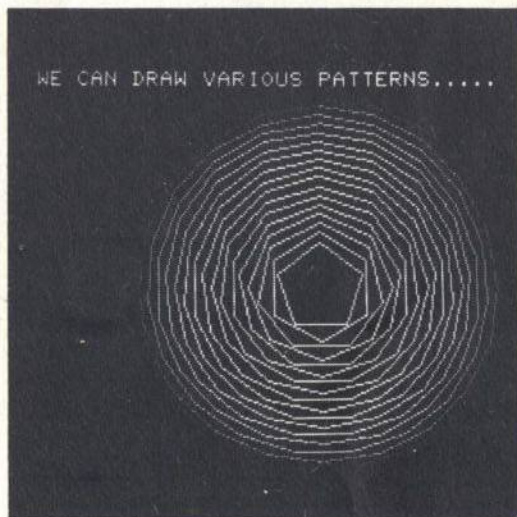
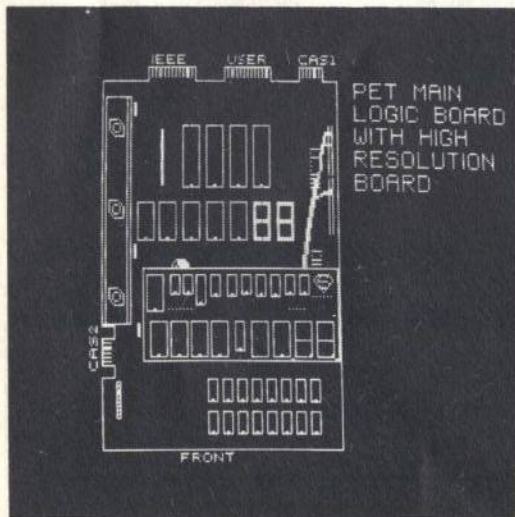
There are four software selectable screen display options. The high resolution screen is entirely independent from the normal screen (with the one exception that areas of inverse video on the standard screen generate corresponding areas on the high resolution screen). Either of the two screens may be displayed, or both, or neither — in which case the screen appears completely blank. The contents of the two screens may be read or modified whether or not they are being displayed.

Fitting is simple, and requires no soldering or track cutting. The character generator and a socketed Basic Rom are removed. The board is mounted in the character generator socket and a jumper cable plugs into the vacated Rom socket. Half a dozen simple connections are made to the memory expansion port and certain of the chips on the PET's main board.

The HR-40 and HR-80 boards cost £149 each including GRAPHIX software in EPROM. The HR-40B board for FAT-40 models is available at the same price.



The assembled board includes a 4k EPROM containing GRAPHIX software. The EPROM occupies addresses from \$E000 to \$EFFF — the first 2k contains the normal Basic routines, and the upper half the high resolution utilities (though \$E800 to \$E8FF are not used). Also on board is a 2k EPROM which is used in place of the normal character generator.





GRAPHIX performs essential tasks simply and efficiently — plotting points, drawing lines, displaying text and so on. X, Y co-ordinates are used to specify points — the bottom left-hand corner of the screen is the origin. The X-axis ranges from 0 to 319, the Y-axis from 9 to 199.

One SYS command is used to access all of the GRAPHIX functions. Thus GRAPHIX is compatible with software that adds commands to Basic (e.g. Toolkit, Dos Support).

- SET POINT      SYS HR,SP,X,Y plots a point at position X,Y.
- RESET POINT   SYS HR, RP, X,Y resets the dot (i.e. plots a black dot) at X,Y.
- FLIP POINT     SYS HR,FP,X,Y flips (inverts) the dot at X,Y.
- EXAMINE       SYS HR, E, X, Y examines location X,Y. If a black dot is found then the status word is set to 0; if a white dot is found then ST=1.
- SET LINE       SYS HR,SL, X1,Y1, X2,Y2 draws a continuous white line between X1,Y1 and X2,Y2. If only one point is specified then a line is drawn from the last point plotted to the given point.
- RESET LINE     SYS HR, RL, X1,Y1, X2,Y2 draws a continuous black line.
- FLIP LINE      SYS HR, FL, X1,Y1, X2,Y2 flips each of the points on a continuous line joining X1,Y1 and X2,Y2.
- DOT LINE       SYS HR, DL, X1,Y1, X2,Y2 alternately sets and resets

points on a continuous straight line between X1,Y1 and X2,Y2.

- MAP FILL       SYS HR,MF,X,Y will fill all or part of a black area bounded by a continuous white line. The shape of the area and positioning of the point X,Y determine the extent of the part filled (see documentation for detailed explanation).
- MAP ERASE      SYS HR,ME,X,Y will erase all or part of a solid white area (see MAP FILL).
- CLEAR          SYS HR,C clears the high resolution screen.
- INVERT         SYS HR,I inverts the screen contents (every point on the screen is 'flipped').
- TEXT           SYS HR,TNH,"This is text", X,Y displays the text string horizontally starting from X,Y. The characters are taken from a table in Rom or Ram addressed by a user-defined vector. Text may be displayed in reverse field or overlaid, and there is also a 'flip' mode which enables text to be displayed and erased without affecting the existing screen contents.

The parameters X,Y, X1,Y1, X2 and Y2 may be any constant, numeric variable or numeric expression within the range of the axes.

Additional software packages are available — a separate catalogue of high resolution software will be sent on request.

