

SECTION TWO: LINES AND CURVES

2.1 DRAWING STRAIGHT LINES

Straight lines are drawn, using the mouse, by specifying the beginning and the end point of the line you wish to draw.

- a. Mark the **+** symbol from the menu with either mouse button.

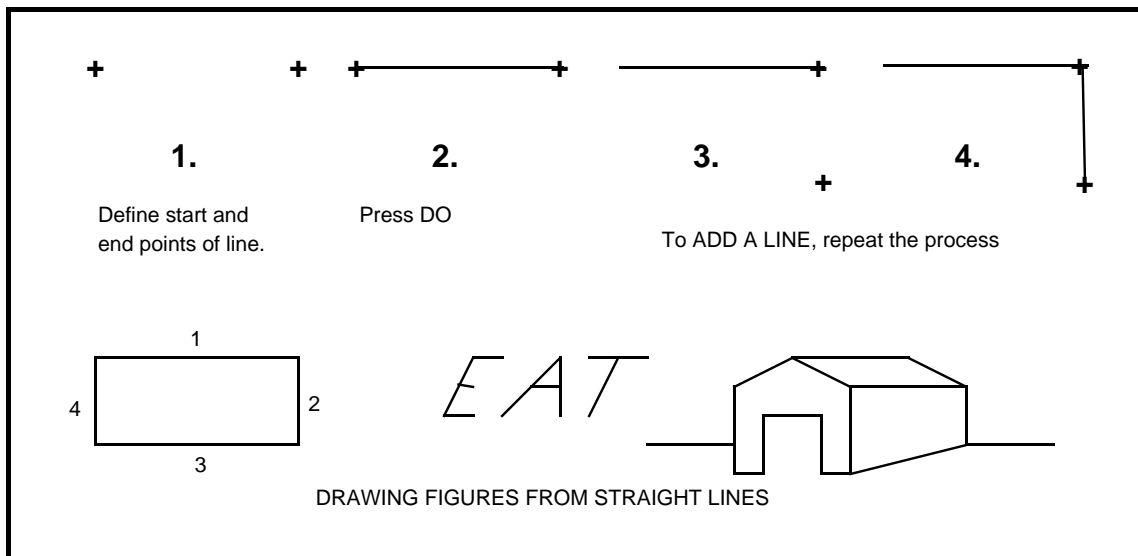
Move the cursor into the picture area and position the intersection where you want the line to begin.

Press the left mouse button (to start the line exactly where the cursor is) or the right mouse button (to start the line at the nearest grid point).

- b. Move the cursor to the point you want the line to end and press either the left or right mouse button again.

- c. Press the **DO** key.

Lines of various lengths can be drawn vertically, horizontally, or at angles. Lines may meet, intersect, or overlap.

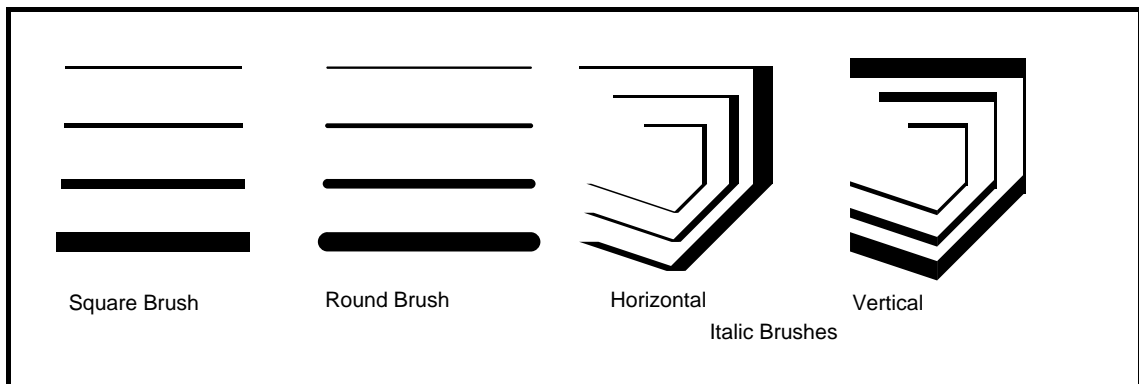


2.2 CHOOSING LINE WIDTH AND BRUSH SHAPE

The two vertical menus in the upper left corner of the screen give you a choice of both line width and brush shape. When you enter the DRAW program, you'll see a black box around the thinnest of the lines at the top and another around the square brush shape (this white on black reversal is called *complementing*). This means that the thin line with a square end is pre-selected.

To choose a heavier line width, place the cursor over the desired width and press any mouse button. The complement will change to indicate the line width that is now selected.

The second column lets you choose among four brush shapes: round, square, vertical italic, and horizontal italic. The procedure is the same for choosing a brush shape. You can select any combination of line width and brush shape. Below are examples of some of the combinations:



2.3 CHANGING LINE WIDTH AND BRUSH SHAPE IN AN EXISTING DRAWING

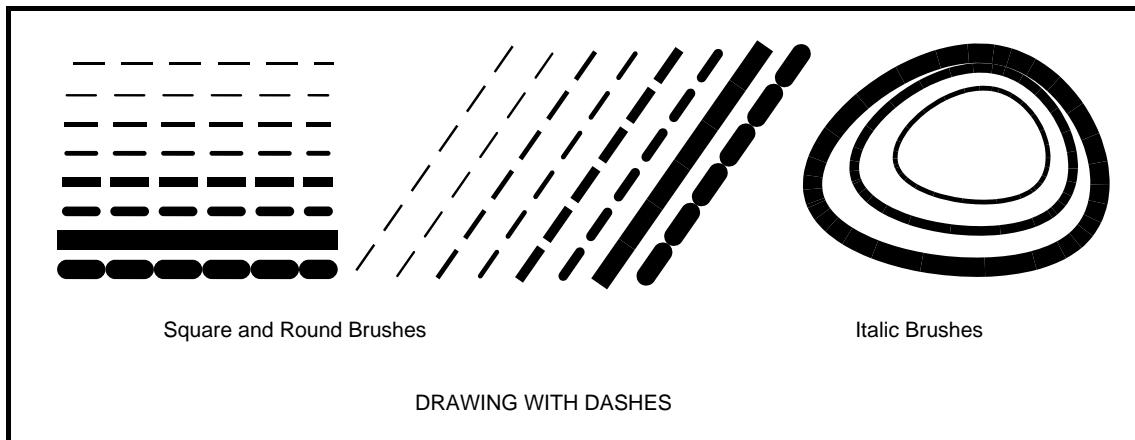
You may wish to create a drawing using the pre-selected (default) lines and brushes, then go back and make changes after you see what the drawing looks like. Simple.

- a. Make the changes you want in the menu (see preceding section).
- b. Position the cursor over the little paintbrush in the menu and press either mouse button. The cursor will take on the shape of the paintbrush.
- c. Move the paintbrush into the picture area and position it over the line you wish to change. Press a mouse button and the line will change.

2.4 DRAWING DASHED, OR BROKEN LINES

Dashed lines may be created from existing solid lines or curves.

- a. With the mouse, mark the small **scissors** in the menu.
- b. Position the cursor (now in the form of the scissors) over the line to be broken and press any mouse button.



To return a broken line to its former solid condition, mark the line with the scissors again.

The size of both the solid lines and open spaces of the dashes may be changed at the Executive Level. (See section X.3 "Changing Default Values")

2.5 DRAWING FREEHAND

It's possible to draw simple figures freehand with the mouse. First, choose the brush width and shape as explained above. Notice the square directly below these two menus. The figure in the middle of the square shows the brush selections. To draw freehand:

- a. Mark the square (it takes a few seconds for the cursor to change shape), and move the cursor into the picture area.
- b. Hold down the left mouse button as you "draw" the figure.

When you release the mouse button, your figure will disappear momentarily as the program plots the *knots* along the curve and redraws the figure, smoothing out the curves and bumps. As you will see with some trial and error, the redrawing will eliminate most fine detail, so the freehand capability is best suited for larger, less detailed drawings.

You'll see too that freehand drawing uses up the available memory rapidly. If you plan to do a lot of drawing, particularly with the heavier lines, you may want to set aside more memory for *splines* at the EXECUTIVE (See section X.3, "Changing Default Values").



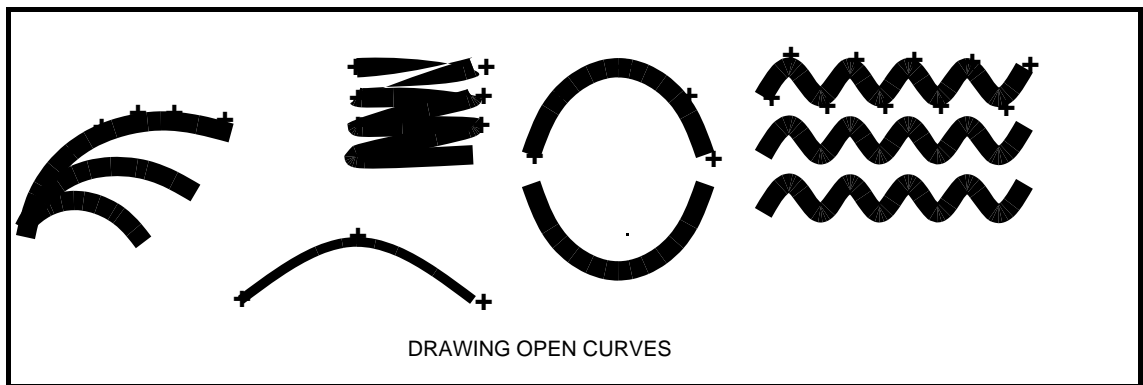
2.6 DRAWING CURVED LINES

2.6.1 Open curves

Curved lines can be drawn by specifying the *knots* (knots are simply markers along the intended curve) at the desired points:

- Mark the **+** and move the cursor into the picture area.
- Specify at least three knots with any mouse button.
- Press **DO**

The closer together the knots, the finer and smaller the resulting curve. The more knots that are defined, the smoother the curve.

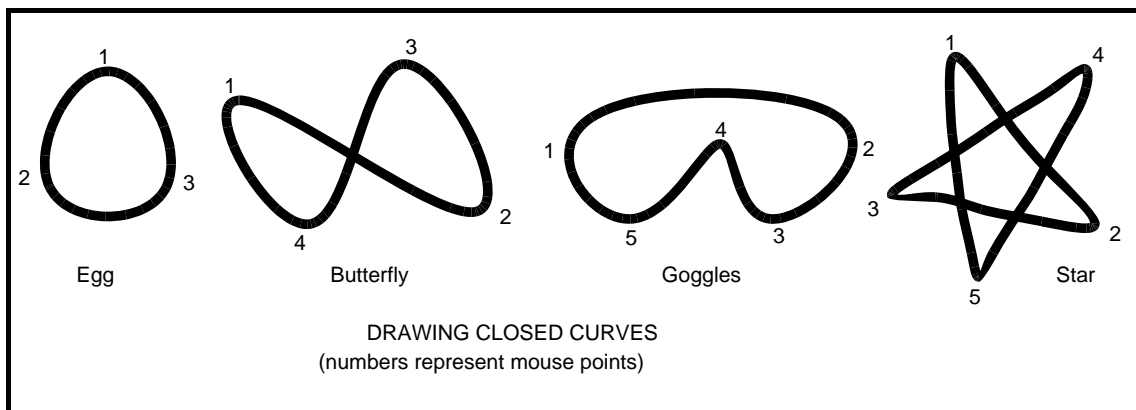


2.6.2 Closed curves

Closed curves can be drawn using the circular menu symbol.

- Mark the **circular symbol** and move the cursor into the picture area:
- Specify at least **three** knots with any mouse button.
- Press the **DO** key.

Below are some samples of closed curves. The numbers indicate the order in which the knots were specified:



2.7 DRAWING CIRCLES AND ARCS

To draw perfect circles and arcs:

Retrieve the program* called *CIRCLE.DRAW*

*(see section 6.1, "Retrieving Files")

CIRCLE.DRAW is a template comprised of a pre-drawn circle with its center and two arcs of different sizes (half and quarter circles). By selecting, copying or moving, and scaling, you can create arcs and circles of any size and place them anywhere in your document. You should be familiar with section 5, "EDITS AND SPECIAL EFFECTS", in order to produce the kinds of sample circles and arcs shown below:

