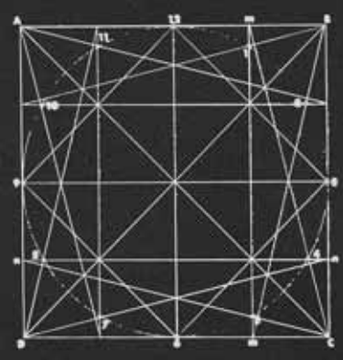

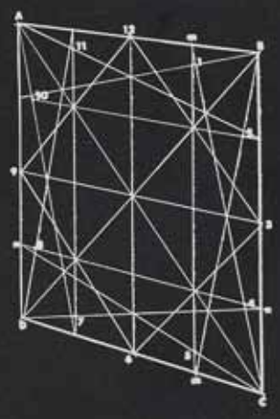

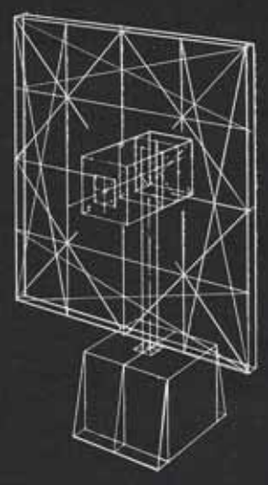

The twelve-point ellipse

Occasionally it is necessary to draw an ellipse larger than those found on ellipse guides. As an aid to drawing a smooth curve in such cases the draftsman can locate eight additional points on the ellipse by geometric construction. To see how this is done, let us start with a circle in a square:

1. Draw a square *ABCD* and draw the diagonals to locate its center. Draw a circle tangent to the sides of the square.
2. Divide the square into quadrants by connecting the midpoints of the sides.
3. Locate the center of each quadrant by drawing the diagonals.
4. Draw horizontals and verticals through the center of each quadrant (*mm* and *nn*, for example).
5. Draw line *Cm*. *Its intersection* with *nn* will lie on the circle. Similarly, the intersection of *Cn* with *mm* will lie on the circle. By repeating this construction, eight points on the circle can be located in addition to the original tangent points.

When this construction is carried out with a perspective square, it locates eight points on the ellipse inscribed in that square.