2 Orthographic Sketching

Orthographic Views — General Conditions

An *orthographic view* (ortho meaning at right angles) presents two of the three dimensions of height, width, and depth in one view. When these three dimensions are known, the object is unambiguous. The view can be made by different people at different locations within acceptable variation. Two or more views drawn at the same scale are usually arranged so that the two share a common dimension. That allows the views to be *read*, that is, the geometry to be understood. When views are arranged in this manner they are said to be *aligned*. See Fig. 2-1. In practice, large industrial drawings may be on separate sheets, making reading difficult.

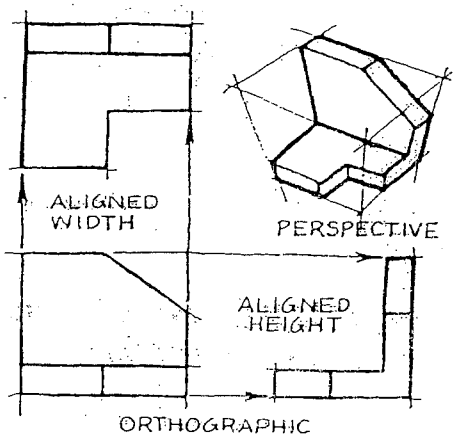


Fig. 2-1. Aligned views.

Orthographic views show no perspective. Conditions that are parallel in space are shown parallel on the drawing. The perspective in Fig. 2-1 is for comparison only and is not an aligned view.

The *front view* is usually the view that shows the characteristic shape of the object or the position in which the object is usually found. Additional views are positioned as needed above (top view), to the right or left (side views), or below (bottom view). Thin objects such as shims, gaskets, or plates require only one view and a note as to their thickness (Fig. 2-2). Cylindrical objects may require only two views. The more complicated the object, the more views are needed to fully describe object geometry.

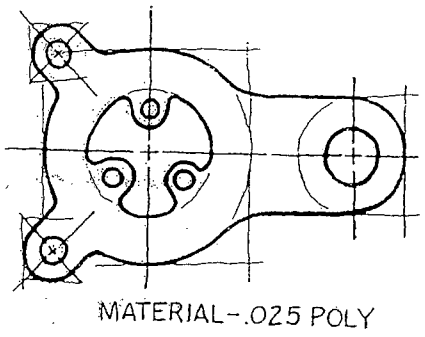


Fig. 2-2. A One-view orthographic sketch.

Sheet 2.0 on page 25 shows both pictorial and orthographic views of the same object. The *pictorial* is used for visualization. The orthographic views are used to establish the exact relationship of geometric features such as planes, holes, and the like. Viewing directions have been established in the pictorial view that corresponds to orthographic views. Study each viewing direction and its resulting orthographic view.

Note that you can visualize a part's general shape quite easily from a pictorial sketch. From the pictorial traditional orthographic views can be prepared. Follow these steps to prepare orthographic views (Fig 2-7):

1. Decide which views are necessary and sufficient.
2. Rough out the overall dimensions of the views. Keep them aligned.
3. Add the detail and work *between the views*. That is, you may have to simultaneously work on two views, adding from one to the other until they are complete.

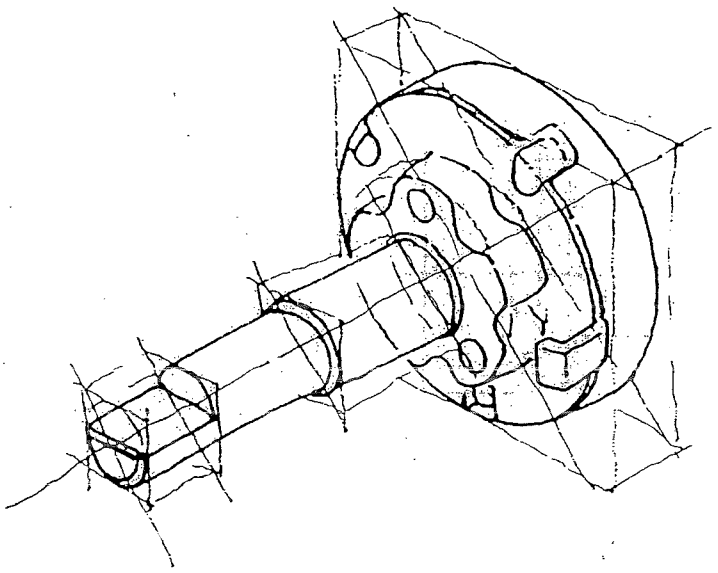
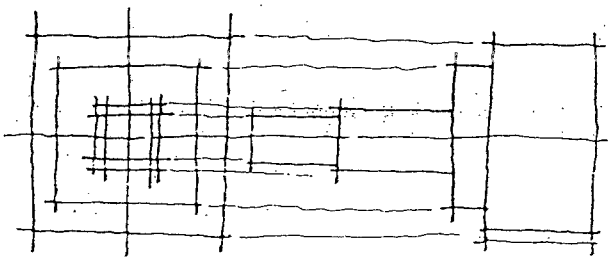


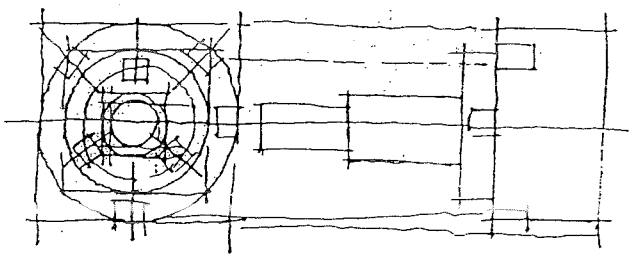
Fig. 2-6. Pictorial sketch.

CAD Example

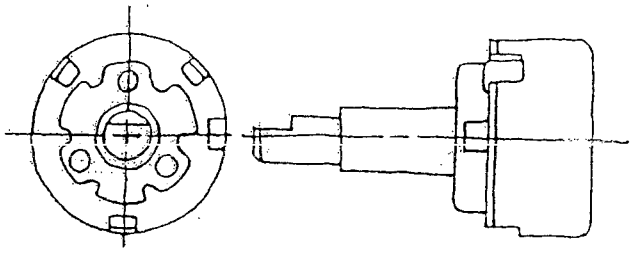
A designer will work from pictorial or orthographic sketches in order to produce a CAD drawing. The overall strategy is much the same—define the overall geometry first and then add the detail.



Step1 Layout Overall Dimensions

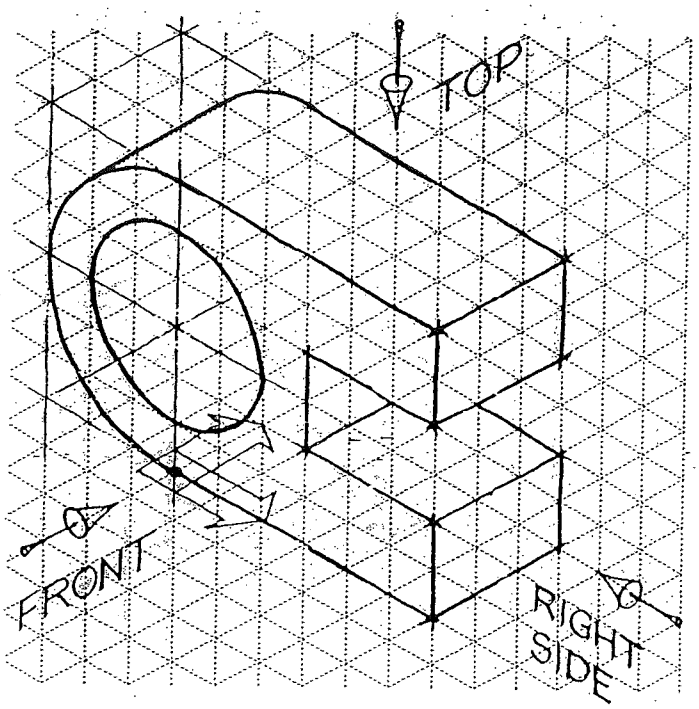


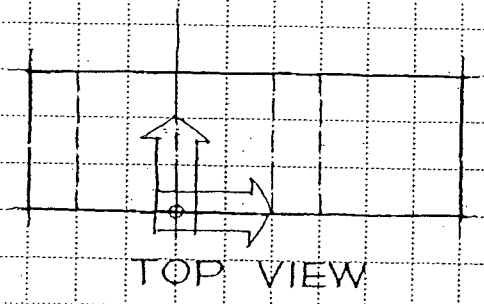
Step 2 Rough Out Details

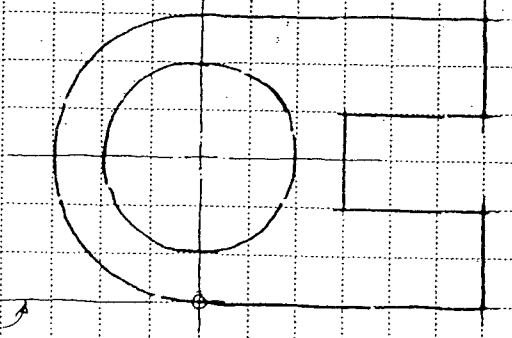


Step 3 Add Detail

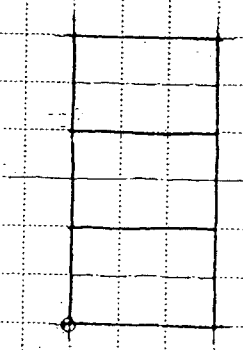
Fig. 2-7. Steps in completing orthographic views.




TOP VIEW

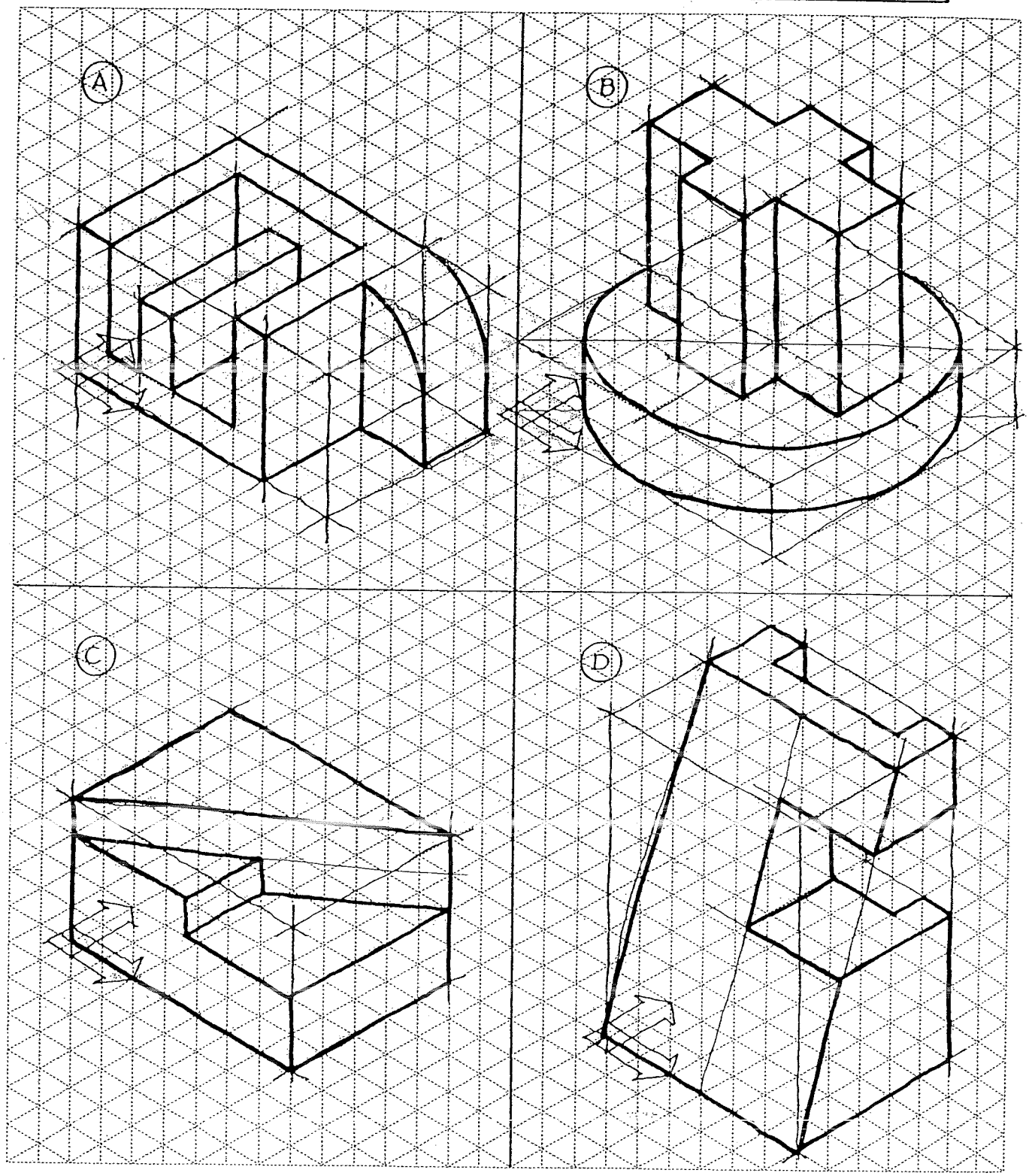


FRONT VIEW


RIGHT SIDE VIEW

Drawn By: –		FREEHAND SKETCHING	
	Scale –	TITLE	SAMPLE
Date –	Sheet of	Drawing Number	A 2.0

COMPLETE THREE-VIEW ORTHOGRAPHIC SKETCHES OF THE FOLLOWING OBJECTS. USE ORTHO GRID PAPER.



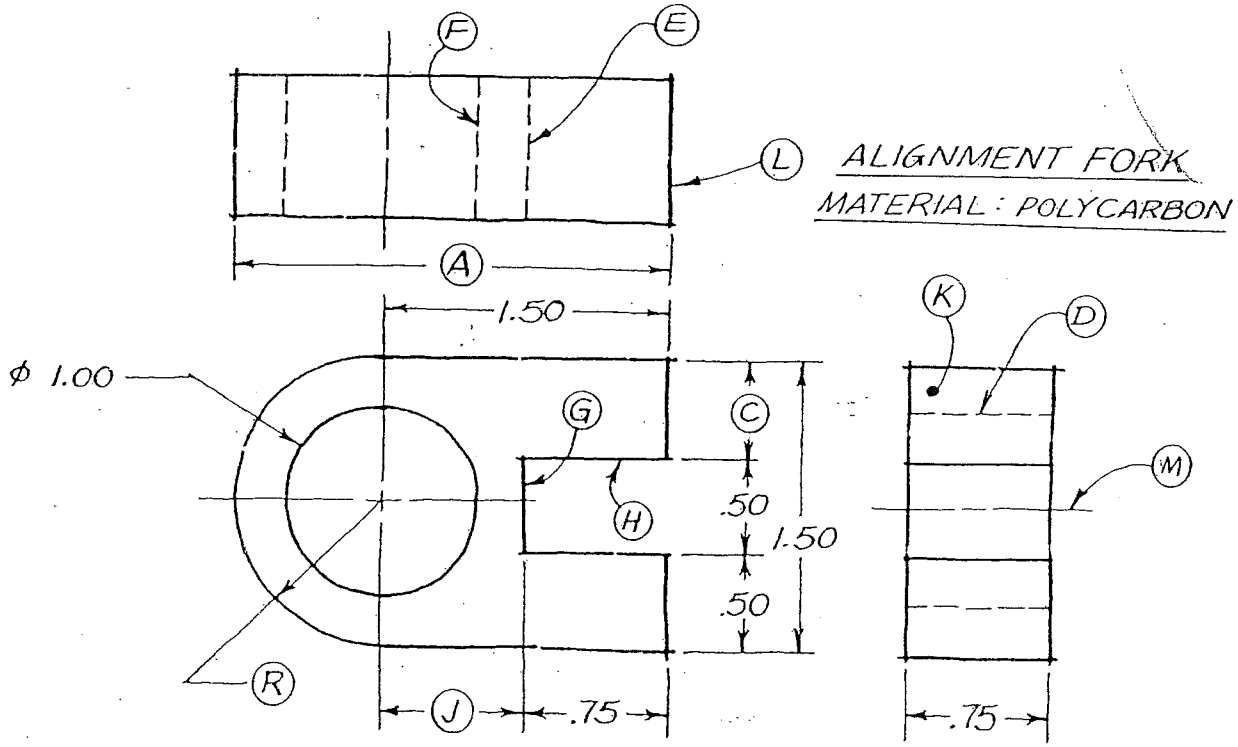
Drawn By:		FREEHAND SKETCHING	
	Scale	TITLE PICTORIAL OBJECTS	
Date	Sheet of	Drawing Number A	2.4

QUESTIONS:

1. What is the name of the object?
2. What line represents surface (G) in the top view?
3. What is dimension (J)?
4. What is the total width of the part as shown by dimension (A)?
5. What is the radius of rounded end (R)?
6. From what type of material is the part made?
7. What is the size of dimension (C)?
8. Which line in the top view is used to represent surface (K) in the right side view?
9. What type of line is (D)?
10. What type of line is (M)?

ANSWERS:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____



ALIGNMENT FORK
MATERIAL : POLYCARBON

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	Scale	TITLE READING DRAWINGS	
Date	Sheet of	Drawing Number A	2.7

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SCALE:
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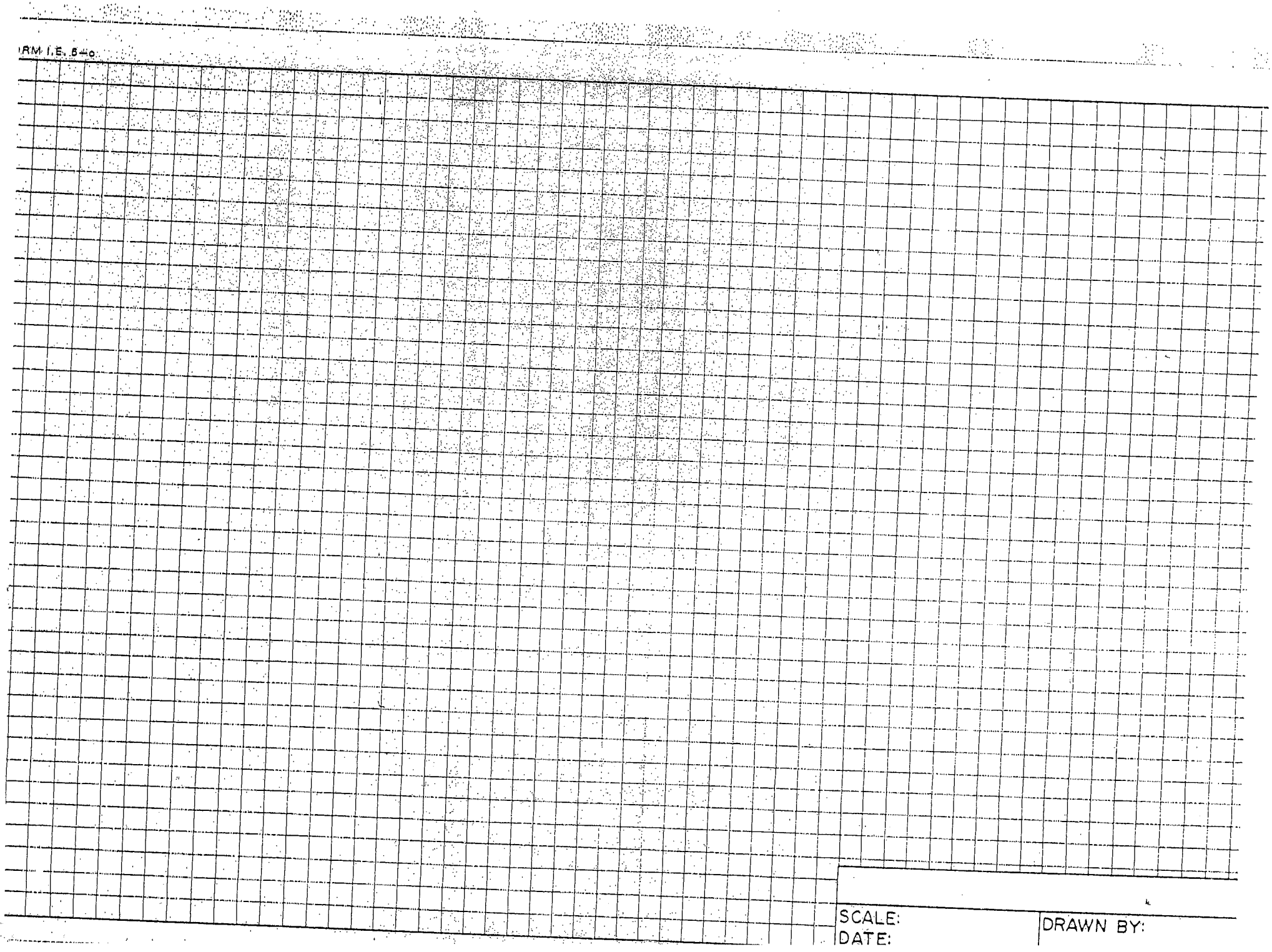
FORM I.E. 6-0



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