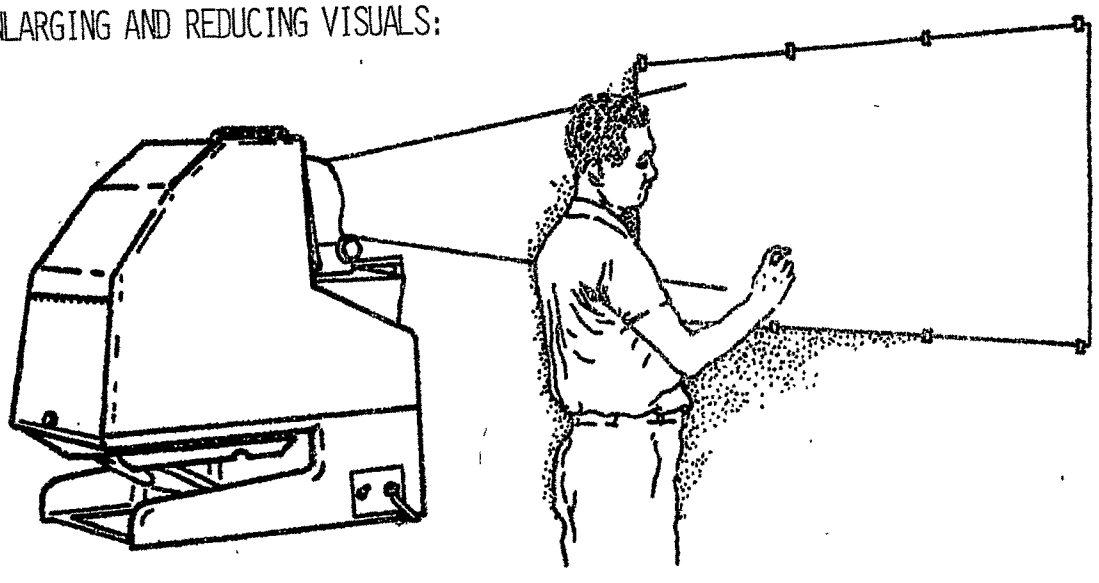
Module II — Non Projected Visual Aids

Unit 8 — Enlarging & Reducing Visuals

Instructional Objectives:

1. Select the type of projector needed for enlarging
   a) Printed pictures from books and magazines.
   b) Outline of real objects.
   c) Pictures from 35 mm slide.
   d) Pictures from a translucent original.
2. Suggest a method for reducing visuals using projector.
3. Suggest two methods for enlarging visuals without any projection equipment.
4. Explain the three uses of pantograph for reproduction of diagrams/drawings.
5. Enlarge figures using the
   a) Grid method
   b) Pantograph method
   c) Opaque projector
   d) Overhead projector
6. Reduce figures using the
   a) Pantograph method
   b) Grid method
   c) Overhead projector.
7. Explain how pounce pattern method is used for image transfer.
8. Organise and make a diagram on the chalk board using pounce pattern method.

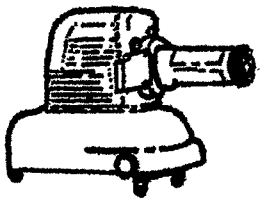
ENLARGING AND REDUCING VISUALS:

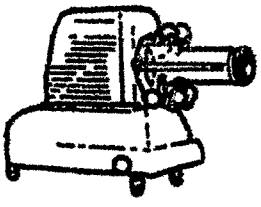


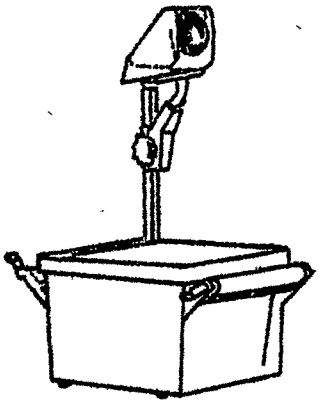
ENLARGING VISUALS BY PROJECTION

The opaque is often used as a means of enlarging drawing. We can enlarge drawings from (i) sheets torn from magazines or periodicals, (ii) drawings obtained from other sources, and (iii) real objects having certain limited third dimension. All these can serve as subject matter for tracing. Interesting drawings can be made by manipulating more than one visual taken from different sources. Perhaps, you may desire to use in the same drawing, chart, or poster, ideas from different sources, and the best thing you can do is to copy the portions you want on to the same sheet of paper, from all these sources, so that you will get what you exactly require.

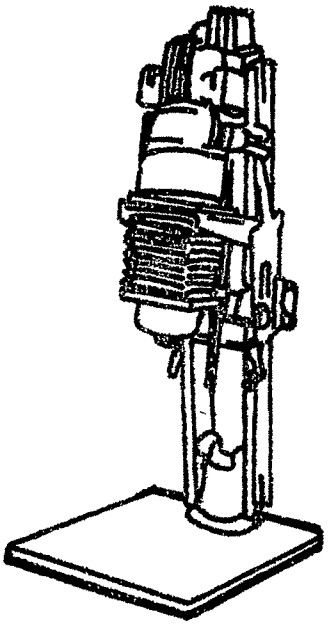
Any type of slide projectors can be used as a device for producing







enlarged drawings for such visuals as charts, posters graphs, chalkboard exhibits, bulletin board or magnetic board exhibits. You can practically project and trace on a desired surface any type of slide form. In a like manner you can use 35 mm film strips also for the same purpose. The image area of an overhead projector is 250 x 250 mm and the hand drawn transparency or prepared transparency can be



enlarged with an overhead projector. Ther photographic enlarger can also be used as a projection device for preparing large visuals from a transparent or translucent original. The material is placed in the enlarger the way one inserts a regular photographic negative. The enlarger can be adjusted

to focus the image of the desired size down on the base - easel - of the enlarger. Avoid leaving the lamp of any of the projectors or enlarger for a long time to prevent the damage of the optical system.

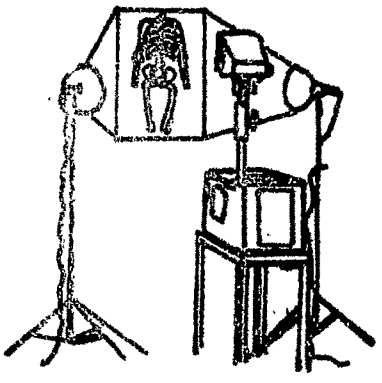
The sheet on which the drawing is to be drawn, is fixed on to a vertical board, as shown at the beginning of this unit. The drawing which is to be copied is placed on the platen. The opaque projector is moved towards or away from the projection surface, depending on the size of the image required - away for bigger size - and the picture focussed. The tracing of the picture or part of the required picture can now be done. In case superimpositions of any other picture is to be added, the other picture can be placed on the platen, and necessary additions or alterations can be made. While switching one, remember to switch the fan first, and while switching off, remember to switch off fan after a little time, to allow the system to cool. Remember to switch off room light and room is dark, for copying work.

Direct copying can also be done by using the overhead projector in a similar manner. In a like manner slides or film strips could be copied. The photographic enlarger can be used to copy either on a photographic paper, or on to an ordinary white paper, depending on the nature of the copy required.

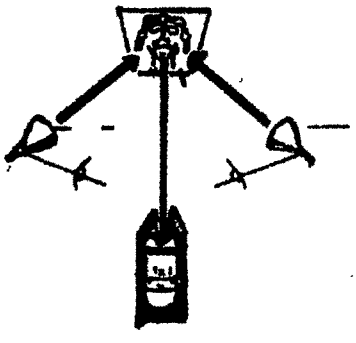
REDUCING VISUALS BY REVERSE PROJECTION.

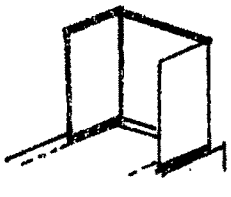
We use opaque projector normally to copy pictures, when enlargements are required. There are times, when you require to copy large enlargements

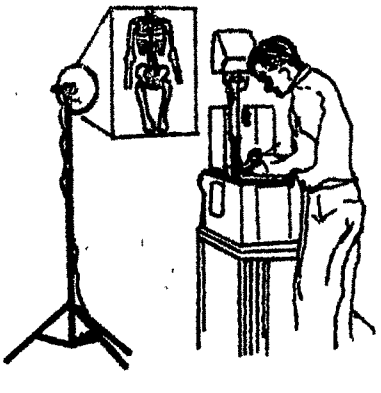
to a reduced form, say to be used on an opaque projector, or for making a slide or an overhead projection transparency. There are several ways of accomplishing this. If the image can be drawn readily, the reverse projection may be the simplest approach using an overhead projector.



In a slightly darkened room, place the overhead projector on its stand or a table with the lens, facing the visual to be produced. Illuminate the visual with a pair of light sources such as photofloods or other lamps, as shown. Tape any drawing or picture which are required to be reduced - the visual - on to a vertical board as shown. Tape any opaque or translucent drawing material on the stage of the projector. The light reflection from the visual will reflect back through the projector's lens system onto the stage of the projector. Moving the projector away from the visual, will reduce the size of the image on the projector stage; moving it closure will increase the size. The focusing device on the projector is used to sharpen the image as it is reflected onto the drawing surface. Extraneous room light may make it difficult to see the image on the stage of the projector. A simple light shield may be made out of cardboard as shown here.

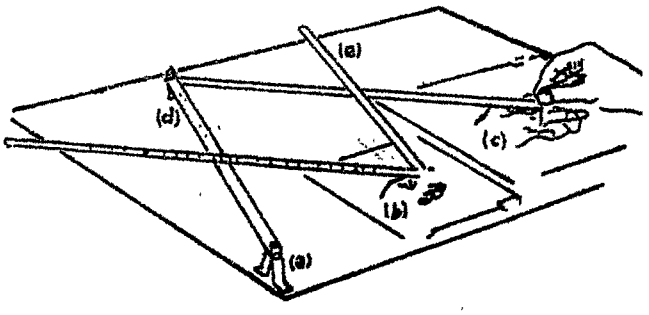




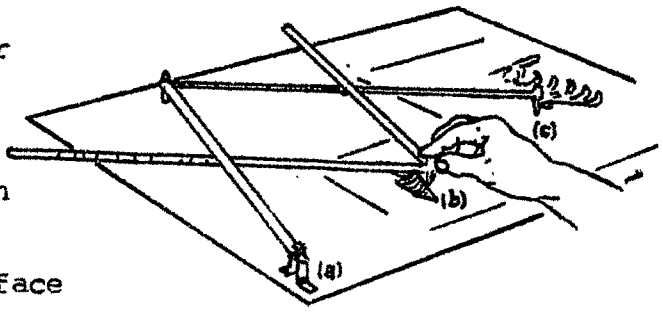


The overhead projection lamps is not to be switched on for this purpose. When everything is ready, proceed to copy along the lines of the reflected image. If you require a transparency, place a piece of opaque white paper under the transparent surface and proceed.

ENLARGING AND REDUCING VISUALS WITH A PANTOGRAPH:



If you do not want to use any projection device, there are other methods to enlarge or reduce visuals. A pantograph is a simple drawing device used to make enlarged or reduced reproductions of drawings. It is generally made of four-wood, metal, or plastic bars containing a series of holes so calibrated, and by hinging these bars together at certain predetermined points, about twenty to forty different ratios in enlargement or reduction may be realised. You must have a large and sufficiently smooth surface like a drawing board. Place the picot (a) firmly at the lower left-hand corner.



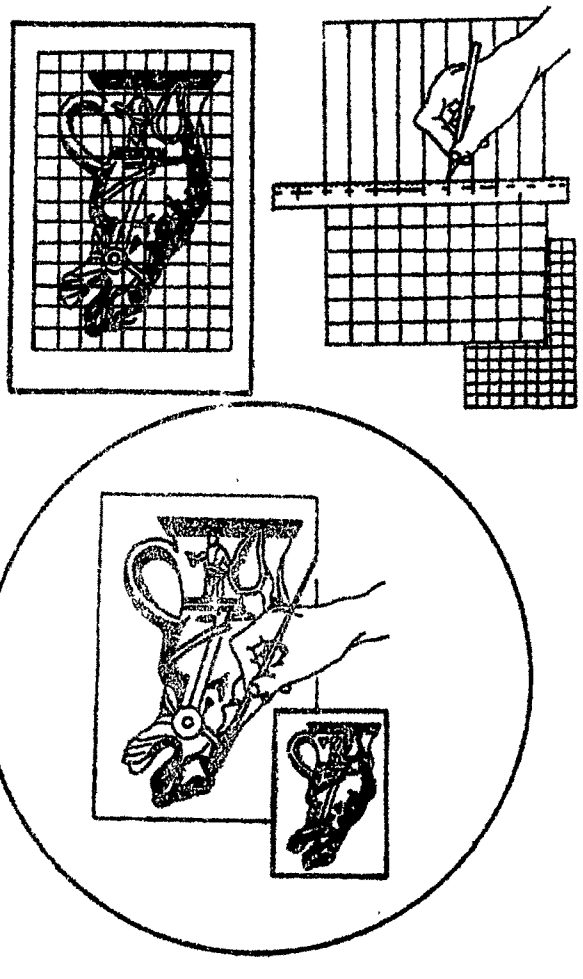
To enlarge the drawing, the tracer point is attached at (b) At position (c) is located the pencil or pen holder. You must guide the tracing pin over the original drawing with your one hand, and guide the pencil or pen with the other hand. The pencil should be free to move and use soft pencil. A good reproduction can be made, if you can guide the tracing pin smoothly avoiding jerks or exaggerated irregularities.

To reduce a drawing, the position of the pencil and the tracing pin are to be reversed. The pencil will be at (b), and the tracing pin will be at the point (c).

To make an exact reproduction, locate pivot point at (b) and the tracing pin at (a) with pencil at (c). To change the pantograph to different ratios, the connecting points at (d) and (e) are moved to the desired ratio points.

Thus you can make use of the pantograph to enlarge, reduce or make an exact reproduction of visuals, especially drawings.

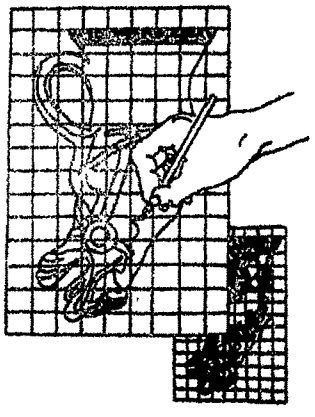
GRID DRAWING:



An easy way to reduce and enlarge drawings, symbols, letters etc., is by the grid or the square method. The original image is subdivided through a grid pattern into smaller, less complex areas. This will enable you to reproduce the small squared sections of the drawing one at a time and on its completion, have effectively reproduced a rather complex image in any desired size from a direct reproduction to one, either smaller or larger than the original.

First, lay out a square grid pattern over the image you want to reproduce. Decide the size, based on how complex is your drawing.

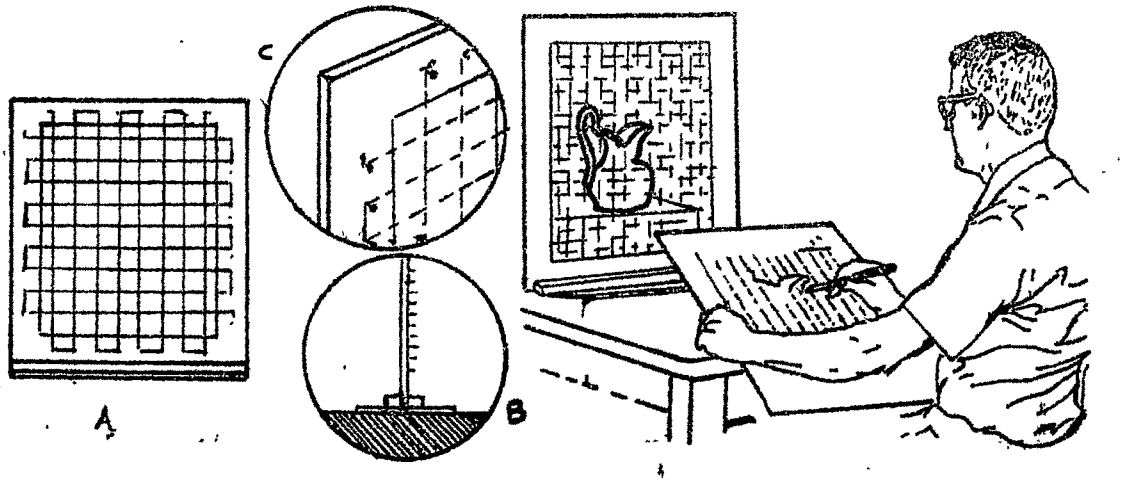
Use light pencil lines for making grid. Next, draw on the surface on which you want the drawing, another grid of the desired proportion. You may erase the grid after finishing the drawing. You may as well trace the desired drawing a second time from the one you have made on the squares. If you get transparent graph paper, you can eliminate the original grid ie. on the first picture you want to copy. You can place the squared transparent graph paper on drawing you want to copy. Trace image on to desired surface. Clean basic lines.



You may again take it on the desired medium, filling in shading and details as required. If you are not able to get transparent graph paper, and you want to avoid making grids on the original drawing, you can use transparent acetate sheets, on which you have made squares. You may make several sheets in which different grid size are made. You may use these acetate grid sheets over any drawing or picture you want to copy. This will avoid damage of the original visual.

In order to make drawings from three dimensional objects, a simple grind frame can be constructed. Small brads or tacks are inserted at a desired uniform distance around the opening of a frame. The head of each brad is allowed to produce at least 3 mm as shown at (B). It is often desirable to make smaller grids when working with complex subject matter. Therefore when making the frame (A), make sure that the intervals between the nails are rather small. Elastic string or rubber bands are

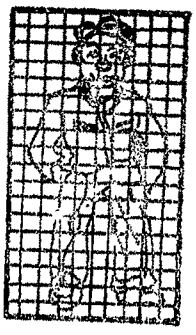
stretched between protruding nail heads to form a square grid (C). We can make different sized grids by stretching the strings in different patterns, when the intervals between the nails are small.

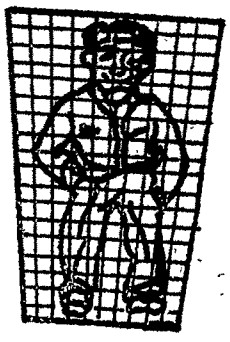


An actual photograph or object when used to reduce or enlarge through the grid method you may encounter with many problems. If your grid is not small enough some times, details are likely to be lost. You must also be careful not to omit essential lines. You must constantly analyse and understand the relative function of each line in contributing to the image formation.

You may use the grid method to draw on irregular surface. You can use the grid method to draw even perspective drawings. The drawings can be made to make them appear to lie on irregular contours as shown at A, B, C and D. The designs here are on three different surfaces.

Distortion:



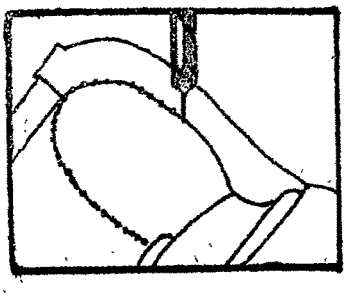


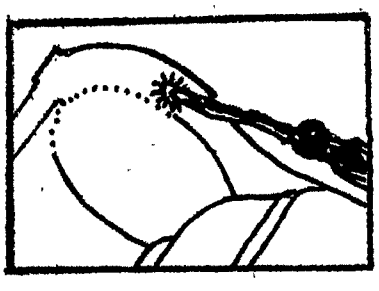
Distortion is another thing which could be easily got done through the grid method. You may make horizontal grid distortion or vertical grid distortion. Here are some examples of the grid distortions. Horizontal grid distortion gives this cartoon character (A) a rugged, husky appearance by broadening the chest (B). The character takes a thin appearance (C) when variations on the vertical grid are used. Note that the grids in areas, a, b, c, d, & e on the picture at (C) all vary in size. When you design costumes and want to teach different types of people this method will help you very much to explain many situations.

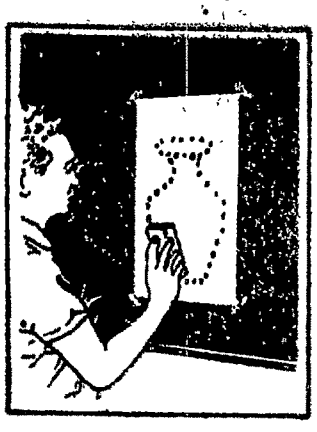
Distortion, if carefully planned can lead to very effective utilisation.

POUNCE PATTERN FOR IMAGE TRANSFER

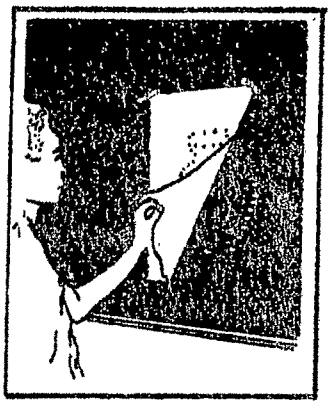
An extremely old technique of transferring an image from one surface to another is through the use of a pounce pattern. This is also known as dot dusting. This is very effective when you want to produce large images, such as for chalkboard drawings, signs, etc.







A



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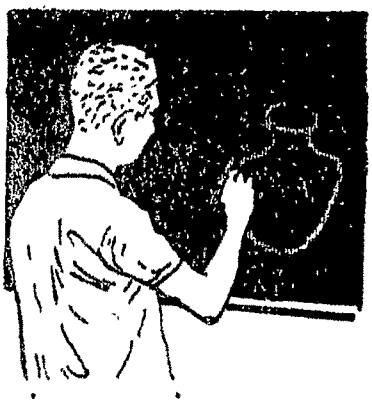


You may copy by the grid method from a small drawing, a large drawing of the required size, in case the small drawing cannot be used in front of the class room, or use a drawing if a large one is available. Make perforations along the lines of the original to be reproduced on the board, using sharp pointed tool such as a cutting needle, or pounce wheel. A sewing machine needle will serve well for this purpose. The finer the detail of the drawing, the closer together the perforations are made. When all the lines on the original have been perforated, the pattern is ready for use. This perforated drawing may be transferred to any other surface by patting over the lines with powder or chalk dust. A powder puff or duster works well for this process. (A). When transferring the image to a light surface, a dark coloured chalk dust must be used. After all lines have been carefully covered with dust, check to see that a complete dot pattern has been transferred(B). Then you may complete the visual image along the dots. It is possible for the instructor, to make the dots on the board in advance, and when the trainees have come, start drawing along the dots which will give impression, that the instructor is doing an original work.

Learner activities:

1. Enlarge given figures using

   a) Grid
   b) Pantograph
   c) Opaque projector
   d) Overhead projector

2. Reduce given charts on opaque transparent sheet using

   a) overhead projector
   b) grid
   c) Pantograph

3. Using the enlargement done with epidiascope, make a pounce patrern and draw the diagram by dot dusting on the chalk board.

4. Examine the projector equipment available in C.T.I. and say which of these could be used for enlarging/ reducing visuals.

5. In how many ways could you do enlargement of visuals <u>without</u> any projection equipment.

6. List 3 uses of pantograph for reducing/enlarging visuals.

7. List four ways of grid method of reproduction.

AUDIO VISUAL EDUCATION

Module II	Non Projected Visual Aids.
Unit 8	Enlarging & Reducing Visuals.

Pr. Ex. 26: Enlarging Visual : Non Projection Method I.

PROBLEM: Using Grid method Enlarge a visual.

A. PROCEDURE:

1. Use furnished visual and the transparent graph square sheet.
2. Make squares on the drawing sheet, using pencil.
3. Transfer the drawing square by square.

B. EQUIPMENT & MATERIALS

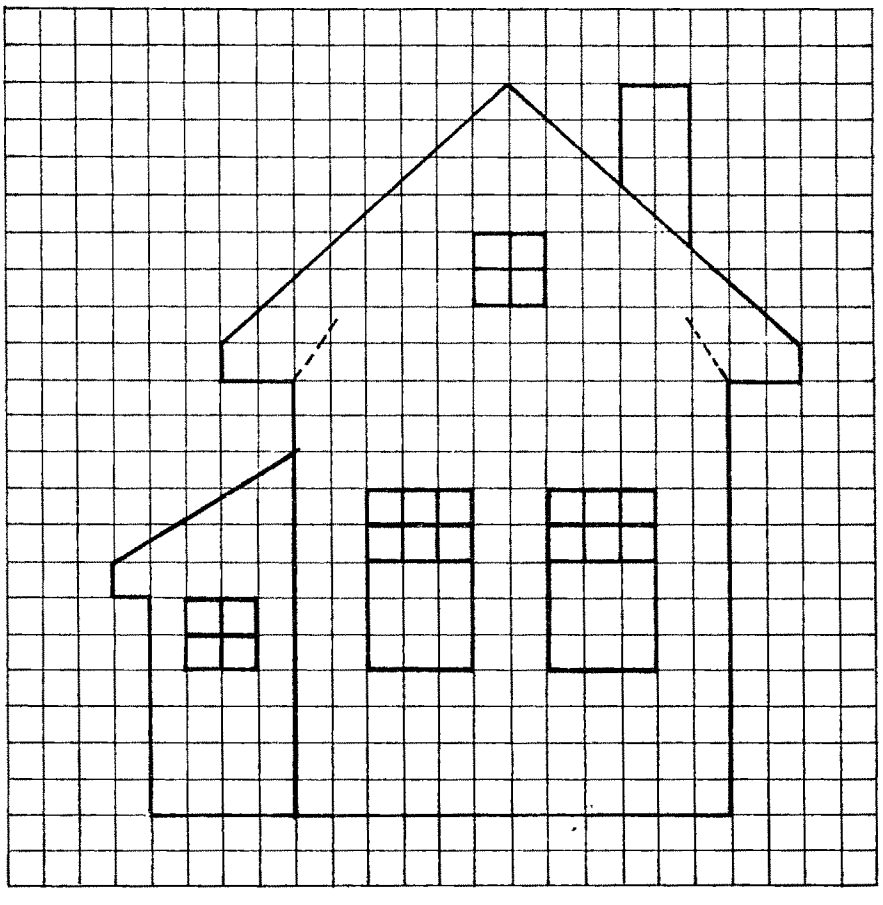
1. Drawing board.
2. Transparent graph sheet or square paper.
3. A_4 size paper and a tracing paper.
4. Pencil, rubber & instrument.

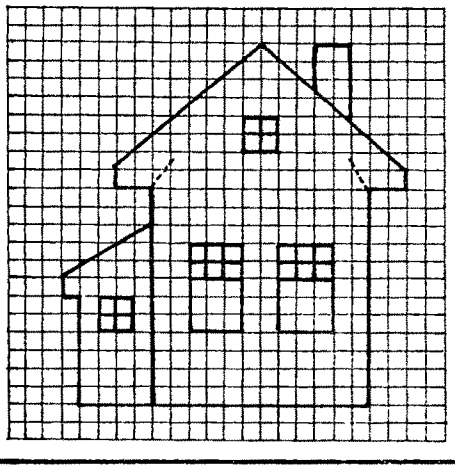
C. POINTS FOR GRADING:

1. Inclusion of all important lines and points.
2. Eveness of lines.
3. Cleanliness of the visuals made
4. General overall appearance.

D. Deadline for the Project : 23rd May.

GRID METHOD





Module II	Non Projected Visual Aids
Unit 8	Enlarging & Reducing Visuals

Pr. Ex. 27: Enlarging visual : Non Projection Method: II

PROBLEM: With a Pantagraph enlarge a visual.

A. PROCEDURE:

1. Use furnished visual for enlargement to A_3 size.
2. Use Pantagraph.
3. Use drawing board and A_3 size drawing sheet.
4. Use pencil and tracing pin at proper position to the size required.
5. Fasten the pantagraph properly.
6. Do not work too fast.

B. MATERIALS & EQUIPMENT:

1. Drawing board.
2. Pantagraph
3. Pencil, rubber etc.
4. Visual, A_3 size drawing sheet.

C. POINTS FOR GRADING:

1. Inclusion of all important lines and items.
2. Evenness of lines.
3. Cleanliness of the visual made.
4. General overall appearance.

D. Deadline for the project: May 23rd.

ENLARGING VISUAL
(PANTOGRAPH METHOD)

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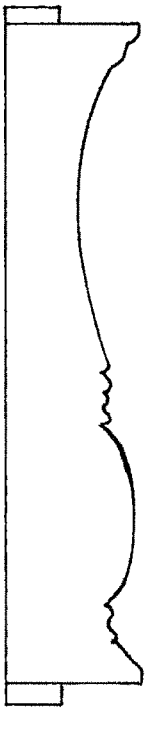

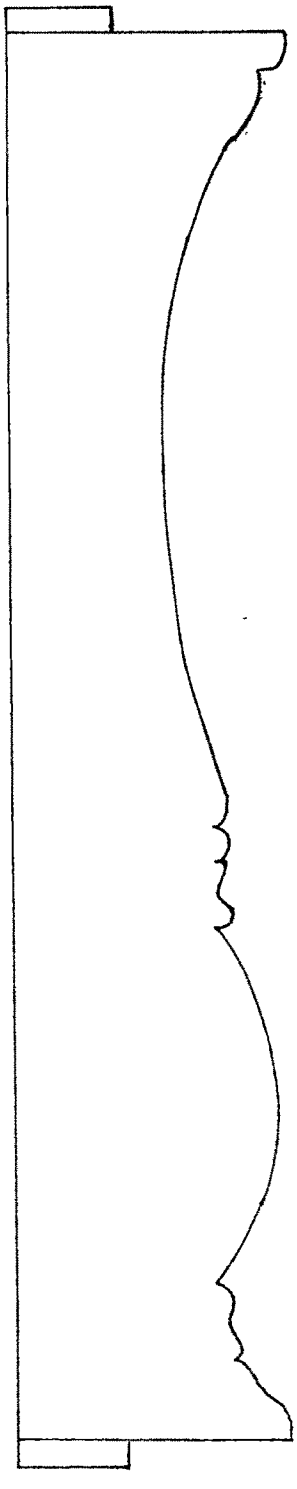

AUDIO VISUAL EDUCATION

Module II	Non Projected Visual Aids
Unit 8	Enlarging & Reducing Visuals.

Pr.Ex.28 : Enlarging Visual: Projection Method: I

PROBLEM: Using opaque projector enlarge a line drawing.

A. PROCEDURE:

1. Use line drawing made available for enlarging in a darkened room.
2. Use opaque projector, taking assistance from your Training Officer for its operation, for enlargement.
3. Pin up the heavy weight paper of A_3 size on to the soft board, fixed to the wall.
4. Make pencil sketch of the outline of the line drawing to 4 times.
5. After making the drawing, check for missing lines if any and see that no omission of essential items are made.
6. Now complete the missing lines and points with free hand if possible or use the opaque again to complete the drawing.

B. MATERIALS & EQUIPMENT:

1. Opaque projector, mounting board.
2. Heavy weight A_3 size drawing card.
3. Pencil, rubber, and other required drawing materials.

C. POINTS FOR GRADING:

1. Inclusion of all important items in the drawing.
2. Evenness of lines.
3. Cleanliness of the visuals made.
4. General overall appearance.

D. Deadline fot the Project : May 23rd.

ENLARGING VISUAL USING OPAQUE PROJECTOR

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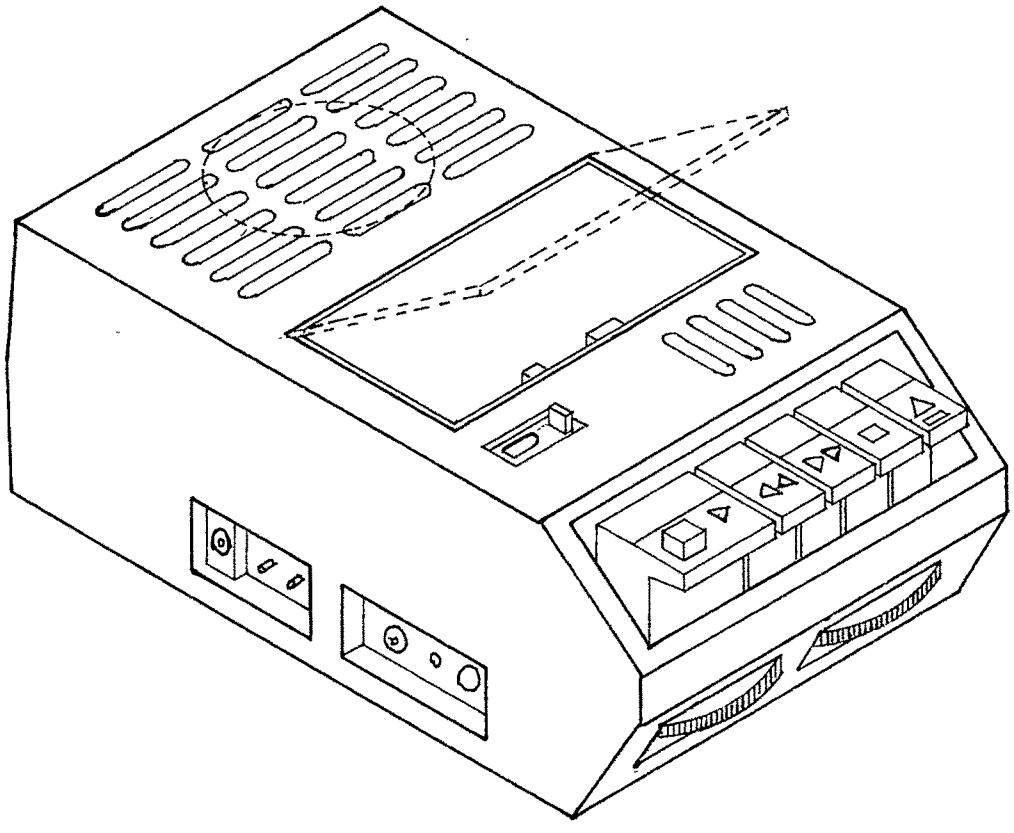
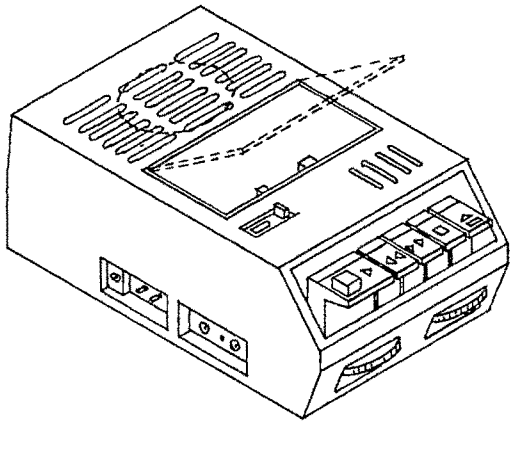




Module II	Non Projected Visual Aids.
Unit 8	Enlarging & Reducing Visuals

Pr.Ex.29: Enlarging Visual : Projection Method II.

PROBLEM: Using Overhead projector enlarge a drawing.

A. PROCEDURE:

1. Use transparent chart given.
2. Place it on the Overhead projection stage. Take the help of the Training Officer, for its operation.
3. Project the visual on the A_3 sheet fixed on the vertical board. Focus.
4. Get the proper size of image by moving toward or away from the board for smaller or larger pictures. Focus again.
5. Adjust the overhead tilting mirror knob for proper adjustment of the picture so that pictures is centered on the sheet.
6. Using pencil, draw the outline and then fill in the details.

B. MATERIALS & EQUIPMENT.

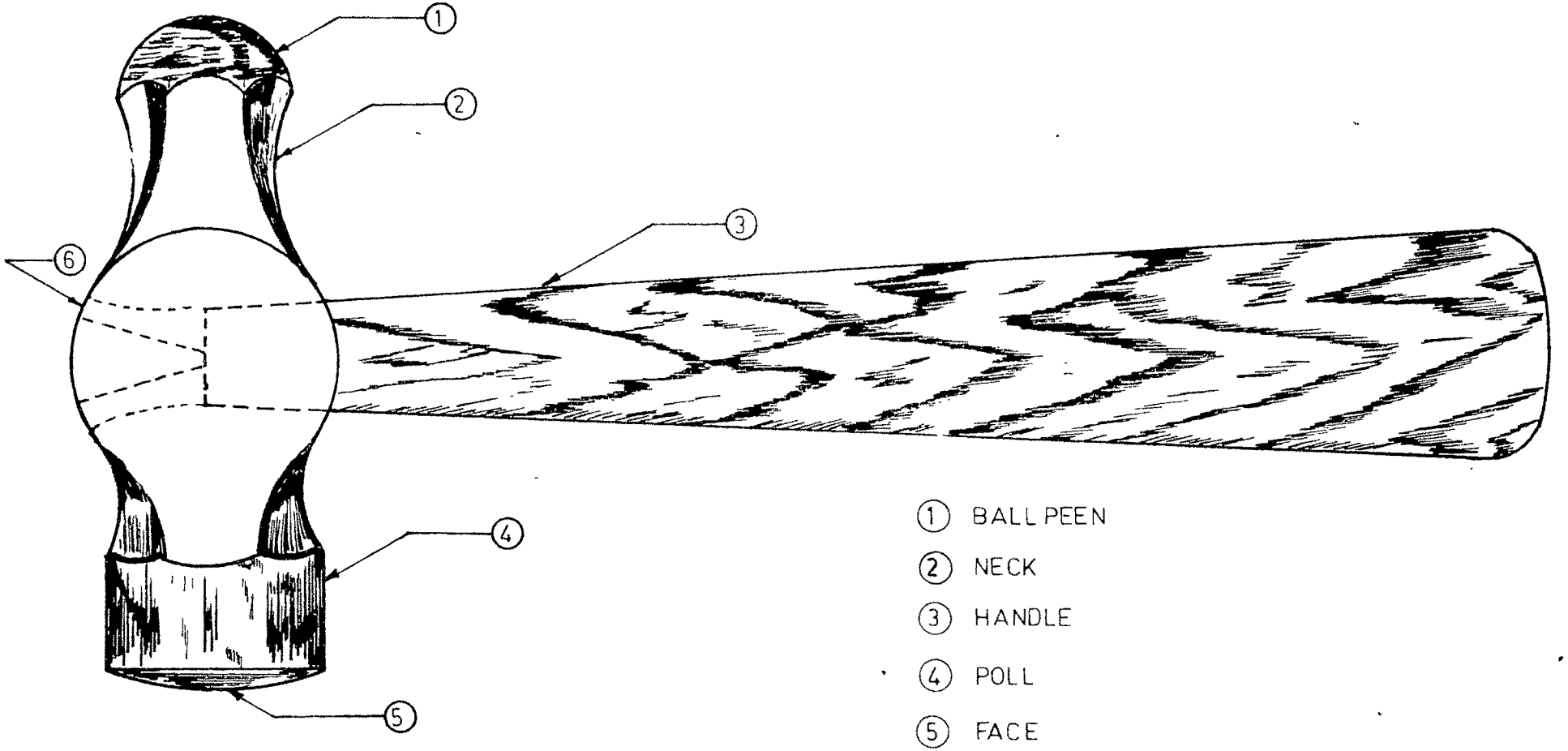
1. Overhead projector.
2. Transparent acetate with picture.
3. A_3 size drawing paper.
4. Pencil, rubber.

C. POINTS FOR GRADING:

1. Inclusion of all important lines and items.
2. Evenness of the lines.
3. Cleanliness of the picture made.
4. General overall appearance.

D. Deadline for project : May 23rd.

BALL PEEN HAMMER



1. BALL PEEN
2. NECK
3. HANDLE
4. POLL
5. FACE
6. WEDGE

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Module II — Non Projected Visual Aids
Unit 8 — Enlarging & Reducing Visuals

Pr.Ex: 30 : Reducing a visual : Non-Projected Method I

PROBLEM: Using Pantagraph reduce a visual.

A. PROCEDURE:

1. Use furnished visual, for reduction to A_4 size.
2. Use Pantagraph.
3. Use a drawing board and the A_4 size drawing sheet for reducing.
4. Use inking pen and tracing pin at proper position, to the size required.
5. Fasten the Pantagraph properly.
6. Do not work too fast.

B. MATERIALS AND EQUIPMENT:

1. Drawing board
2. Pantagraph
3. Pencil, rubber, ink, inking pen.
4. Visual and A_4 size paper.

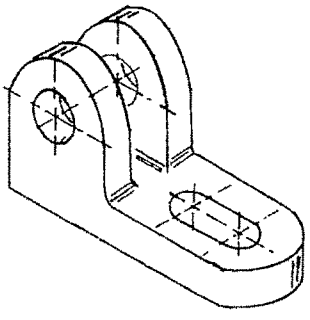
C. POINTS FOR GRADING:

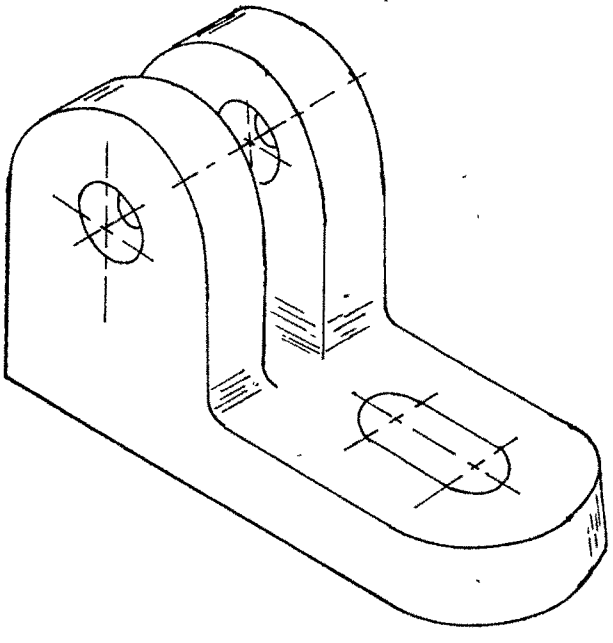
1. Inclusion of all important lines and items.
2. Evenness of lines.
3. Cleanliness of the visual made.
4. General overall appearance.

D. Deadline for the project : May 23rd.

M II/8/Pr.Ex. 30 (1).

REDUCING VISUAL USING PANTOGRAPH





AUDIO VISUAL EDUCATION

Module II	Non Projected Visual Aids
Unit 8	Enlarging & Reducing Visuals.

Pr.Ex.31 : Reducing Visual - Non Projection Method II.

PROBLEM: Using Grid method reduce a visual.

A. PROCEDURE:

1. Use furnished visual
2. Use transparent squared sheet.
3. Make squares for reduction of visual.
4. Use pencil and transfer the visual, use less erasing.
5. Trace the drawing again, on to drawing sheet with ink.

B. MATERIALS & EQUIPMENT:

1. Drawing Board.
2. Transparent square paper.
3. Paper 15 x 15 cm.
4. Drawing sheet.
5. Pencil, rubber, ink, inking pen.

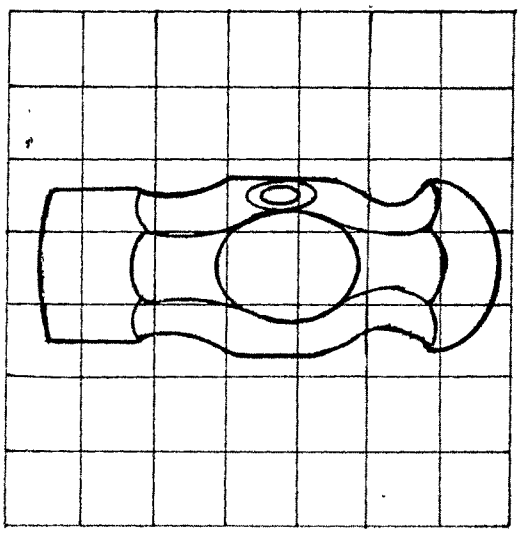
C. POINTS FOR GRADING:

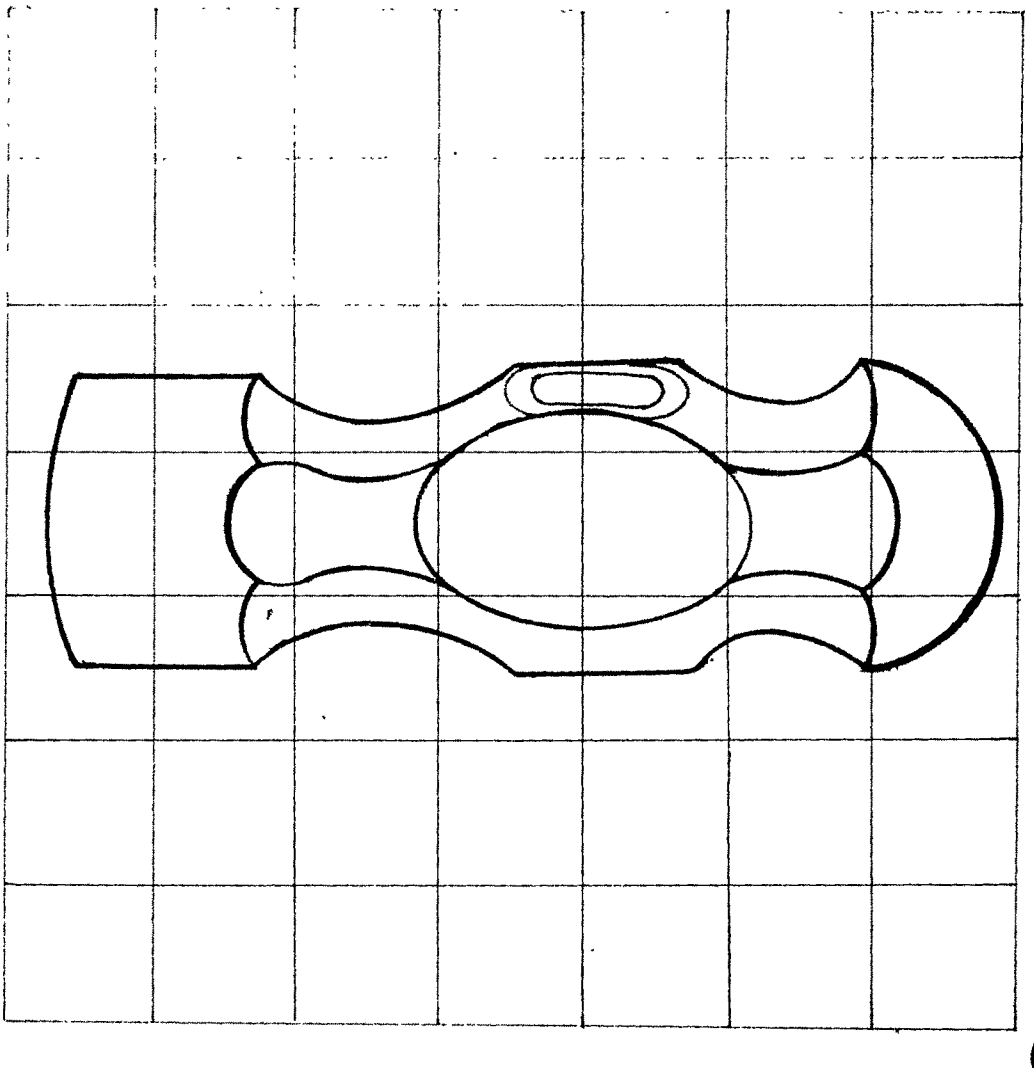
1. Inclusion of all important lines and items.
2. Evenness of lines.
3. Cleanliness of the picture made.
4. General overall appearance.

D. Deadline for the Project : May 23 rd.

M II/ 8/Pr.Ex. 31 (i).

GRID METHOD





Module II: Non Projected Aids.
Unit 8: Enlarging & reducing visuals.

Pr. Ex. 32. Reducing visual by reverse projection method.

PROBLEM: To reduce a given visual using overhead projector.

A. PROCEDURE

1. Use chart made available-A 3 size-Darken room slightly.
2. Take assistance of your Training Officer to use the overhead projector for the reduction of the visual.
3. Use two photofloods or reflected flood lamps at 45^{o} to the visuals to light evenly the visual to be reduced.
4. Get the proper size of the focussed image on the transparent acetate sheet taped to the stage of the O.H.P.
5. Work slowly.
6. Use Camel or Luxor coloured felt pend and make all important lines and points.
7. Use the light shield for the OHP stage if required to cut lights.
8. If you are unable to get a clear picture, use a white opaque paper under the transparent acetate sheet on the O.H.P. stage.

B. MATERIALS & EQUIPMENT

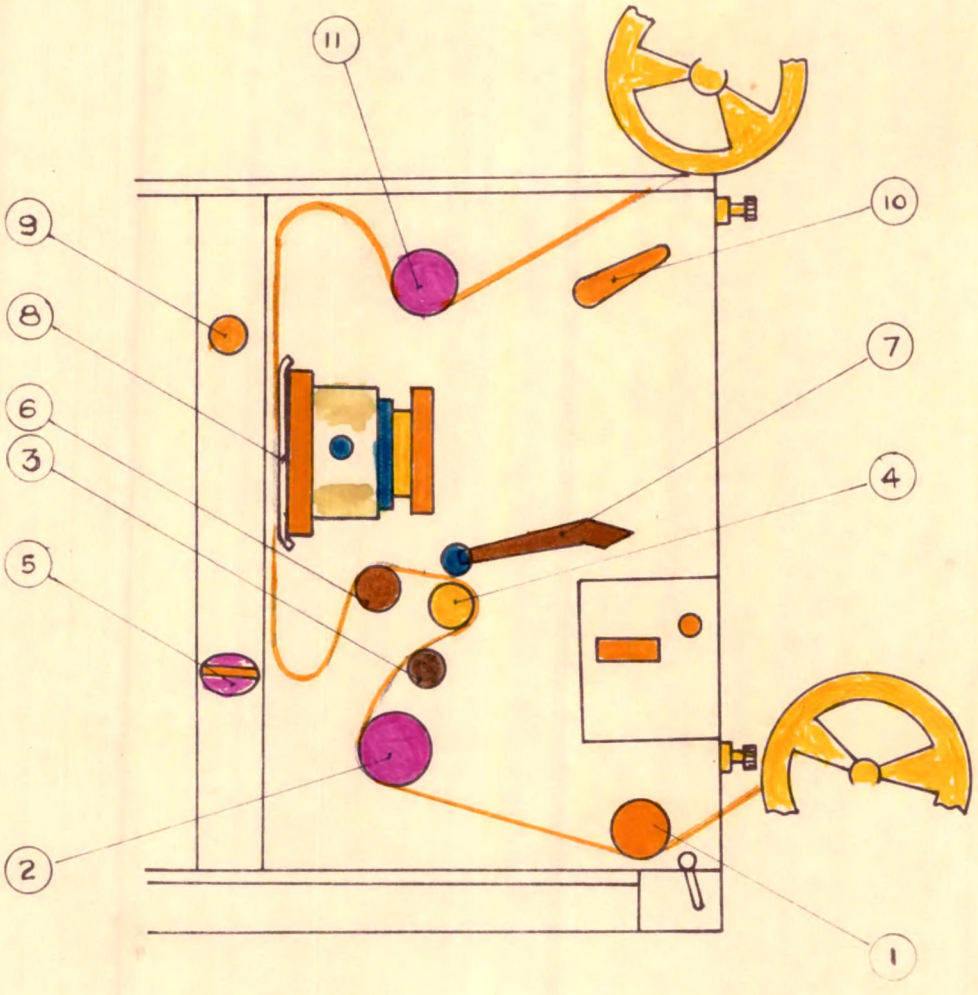
1. Overhead Projector
2. A pair of photoflood lamps with reflectors
3. Given drawing A 3 size
4. Transparent acetate 125 x 125 mm.
5. Coloured felt pens.
6. Light shades or light shield.

C. POINTS FOR GRADING

1. Inclusion of all important lines and items.
2. Evenness of lines.
3. Cleanliness of the picture made.
4. General overall appearance.

D. DEADLINE FOR SUBMISSION: 23rd May.

REVERSE PROJECTION BY O.H.P



1. SNUBBER
2. TAKE UP SPROCKET
3. TENSION ROLLER
4. SOUND DRUM
5. SOUND SILENT SWITCH
6. GUIDE ROLLER
7. PRESSURE ROLLER
8. GATE
9. FRAMER
10. PROJECT REWIND LEVER
11. SUPPLY SPROCKET

Module II : Non Projected Visual Aids.
Unit 8 : Enlarging and reducing visuals.

Pr. Exercise: 33: Pounce or dot dusting method.

Problem: To produce a visual on the chalkboard using the pounce or dot dusting method.

A.PROCEDURE

1. Use furnished illustration for pr.ex. 33.
2. Using opaque projector enlarge the given illustration onto a heavy weight paper.
3. Using sewing needle or pounce wheel perforate along drawn lines. Work on soft surface first. e.g. old magazine or scrap cardboard or old news paper bunch.
4. Test reproduction ability of your stencil on chalkboard.
5. Spray varnish over perforated areas with plastic clear spray to toughen the tiny holes.
6. Perforations should be closer together in areas of fine detail and farther apart on less complicated lines.

B. EQUIPMENT & MATERIAL

1. Heavy weight paper
2. Soft surface (old magazine, scrap cardboard or old paper)
3. Sewing needle or pounce wheel.
4. Clear varnish, chalk dust, soft cloth and/or duster etc.
5. Sprayer

C. POINTS FOR GRADING

1. Original enlargement made with opaque projector.
2. Quality of perforations
3. Spacing of perforations
4. Dusting of chalk on the chalkboard
5. Readability of the matter on the chalkboard
6. Overall appearance.

D. DEADLINE FOR SUBMISSION: May 23rd.

DOT DUST PUNCH METHOD