

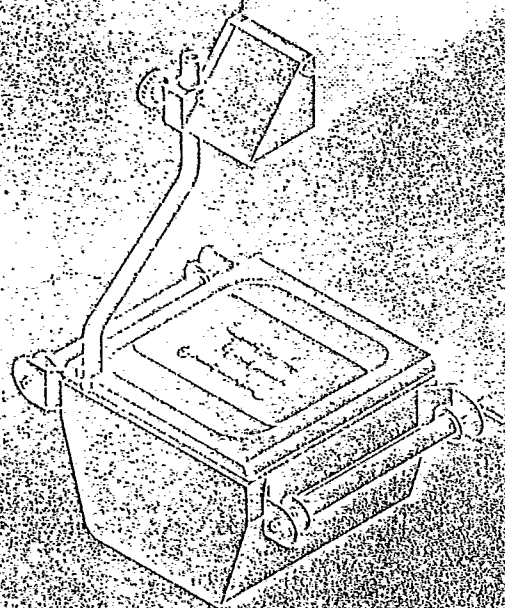


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Preparation of visual aids for lectures



British Standards Institution



Documents

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Foreword

This Published Document has been prepared under the direction of the Management Committee of the British Standards Society.

The aim of this guide is to help lecturers select suitable visual aids for their lectures and to provide most of the information that a newcomer to the subject needs when preparing slides and transparencies. In addition, it contains a check-list for lecturers and grids for use in preparing art-work.

The guide is a revision of PD 6482 : 1977 'Preparation of art-work for lecture slides', which is withdrawn. In this

revision, the scope has been enlarged to cover most of the visual aids in common use.

The recommendations in this guide are intended primarily for British Standards Society (BSS) members.

With acknowledgements to the Institution of Electrical Engineers' 'Handbook for Speakers' and the UK Atomic Energy Authority's Code of Practice 'Preparation of Artwork for Slides and Transparencies used in Lectures'.

NOTE. The title of the publication referred to in this document is given on the inside back cover.

Preparation of visual aids for lectures

1. Introduction

1.1 It is difficult to imagine any lecture which cannot be improved by the use of suitable visual aids. Visual aids have two big advantages: first, an audience will absorb information more readily through its eyes than through its ears, and secondly, visual aids in themselves provide variety and command attention. It is normal for the attention of an audience to wander; visual aids bring them back to the point. They reinforce the spoken word, they explain, they summarize and they give shape and colour to what might otherwise be a monotonous monologue.

1.2 However, visual aids require as much thought and preparation as the wording of the lecture itself; and whereas the wording can easily be changed or adapted right up to the last moment, visual aids take much time to prepare and cannot easily be changed. It is therefore important for a lecturer to ascertain the status and possible size of his audience and to decide early what visual aids to use. It is often appropriate to build the lecture round them. The two should be complementary.

1.3 Since the size of audience and the equipment available will be major factors in deciding what visual aids to use, the following information may be helpful. The average meeting room of, say, 7 m x 5 m will comfortably hold a *small audience* of 25 people, or 16 sitting at desks, and should be provided with a screen 1.5 m x 1 m for film or slides or overhead projector. A large room, e.g. the Council Room at BSI, which is 10 m x 14 m, holds a *large audience* of 120, or 50 at desks and has a screen 3 m x 3 m for film or slides, of which an overhead projector can use about 1.5 m x 1.5 m. A very large room, e.g. the Lecture Theatre at the Institution of Electrical Engineers which is approximately 18.5 m x 18.5 m at its widest part holds a *very large audience* of 600 and has a screen 4.5 m x 3 m, of which an overhead projector uses about 3 m x 3 m. A 20 in television set can be watched comfortably by about 20 people.

1.4 Having decided what visual aids to use, the next step should be to warn and consult those who will be responsible for their final preparation, i.e. drawing office, art department, photographic department, etc. This document is concerned with the drawings which the lecturer himself has to or is able to prepare, with or without the help of a drawing office, for the preparation of slides or for transparencies. The photographic conversion of such drawings into slides is not dealt with.

2. Types of visual aid

2.1 General. Apart from actual examples or models of items referred to in the lecture (which may be held up, handed round or displayed near the entrance to the lecture room) there are six visual aids in common use: films, video tape, slides, transparencies, drops or wallcharts and a blackboard, which are described in 2.2 to 2.7. The rest of the publication is devoted to the preparation of the artwork for slides and transparencies, but the essential principles of legibility from the back of the room, simplicity and clarity, apply equally to all visual aids.

2.2 Films. A short cine film provides an excellent visual aid to a lecture. It is usually best shown at the beginning, to introduce the subject or bring out the problem to be discussed, or at the end, to summarize the lecture, reinforce the conclusions or finish on a lighter note. The lecturer will be fortunate if a suitable film or extract from a film exists, as its special preparation will be time consuming, costly and require expert assistance.

2.3 Video tape. The use of video tape is fast becoming a very practical alternative to a film. It is much easier to make and much less expensive. However, as it is usually shown on a television set it is normally only suitable for small audiences, unless a series of television sets is used or special equipment is provided. There are two other advantages: the room need not be in darkness, and the lecturer can easily control the picture, turning it on and off, stopping or slowing down the motion or repeating parts.

2.4 Slides. These form the normal visual aids to a lecture. They are comparatively cheap and easy to produce, although they take time to make. Early decisions and a good liaison with the photographic department are essential.

Like a film, slides usually require darkness to show best, and too much switching on and off of lights can be disturbing. They are therefore best shown in groups of several at a time, unless the whole lecture can be given in darkness except for an introduction and a conclusion. Yet too many slides can also become monotonous, and something like 30 would be the limit for most lectures. At the other end of the scale, it is seldom worth showing less than five. Provided that a large enough screen is available, good quality slides can be shown to very large audiences.

Slides can also be used to give an audio-visual presentation in which the commentary is taped and the slides automatically fade into one another at the right time. The effect is almost as good as a film. This technique requires two projectors, special equipment and up to 160 slides; so its application is limited to special occasions and to lectures which, e.g. for training purposes, are to be often repeated.

2.5 Transparencies. These are large sheets of film contained in a cardboard mount for use with an overhead projector. The projector throws an image over the lecturer's shoulder on to a screen. To prevent distortion, the screen should be normal to the axis of the beam from the projector, both horizontally and vertically, i.e. it should, if possible, be tilted forward (see figure 1).

Transparencies are very suitable for less formal occasions and smaller audiences, as, unless special arrangements are made, the projected image cannot be larger than about 1.5 m x 1.5 m. As for video tape, complete darkness is not necessary, so notes can be taken by the audience and there is no switching on and off of lights. The lecturer can very easily control the picture, uncovering different portions of it, overlapping it with other transparencies or drawing on it. Transparencies are more fragile and subject to damage than slides, but they are very much quicker to produce, especially in colour, since they do not have to be photographed. However, they require the same careful thought in their design as slides.

2.6 Drops or wallcharts. These are large diagrams or charts, drawn on linen paper, which either singly or as a series are unrolled before an audience at the proper time. Alternatively they may be made up as flip charts to be hung over a blackboard. Unless very big, when they become unwieldy in transit, they can only be used for small audiences, for which they are simple and effective. Once unrolled, and unless covered by a subsequent drop or chart, they remain for the audience to see, so they are sometimes good for listing the general outline of a lecture at the beginning or summarizing its conclusions at the end. Clearly they have to be readable from the back of the lecture room. In general, they have been superseded by transparencies.

2.7 Blackboards. A blackboard is best used, if at all, in front of a small audience. It is all too easy for an audience to lose interest in a diagram or formula being worked on by the speaker: it is better to show a sequence of slides or transparencies. However a blackboard is often convenient for illustrating a reply to a question. Otherwise, with a small audience, and if an overhead projector is not available, a blackboard can be turned to good use provided that the speaker has planned and rehearsed what he is going to put on it, and when.

2.8 Others. Similar considerations apply to whiteboards, or large sheets of paper, although coloured marker pens allow more scope for artistic skill. Other boards, for use with magnetic or felt figures, are useful for special purposes.

3. Slides

3.1 Any picture chart or diagram can be shown on a slide, but the most common are: photographs, maps, graphs, tables, organizational charts, flow charts, pie charts, bar charts, column charts and pictorial charts. All should be specially selected or designed for slide showing (see figure 2).

3.2 Slide showing during a lecture is quite different from illustrating a report or paper, when the reader can devote as much time as he likes to studying any illustration. During a lecture the time for study is very limited, so the slide has to make its point quickly and obviously. Most slides fall into the trap of showing too much at once: a diagram cluttered with detail will quickly and deservedly lose the attention of the audience. Clarity and simplicity should be the watch words (see figures 3 and 4).

3.3 A lecturer has to decide what point he wishes to make and his slide has to be designed to make it as clearly and simply as possible. Ideally it should be possible to absorb the desired message in a few seconds, unless the lecturer wishes to take his audience slowly through the slide with a pointer, e.g. in a table or organizational or flow chart. Even so, it is preferable to use succeeding slides to build up the story stage by stage, keeping everyone together, and by this means the final slide in the series can be quite comprehensive (see figure 5).

3.4 Today the universally accepted form of slide is the 50 mm x 50 mm slide made from 35 mm film. This has a 24 mm x 36 mm picture, which can be shown either 'landscape' or 'portrait'. It is preferable to show all slides 'landscape', even if this means masking the sides to show, say, a photograph of a tall building. This is because most screens are wider than they are tall, so 'landscape' slides can usually be shown bigger than 'portrait' slides; and a mixed collection of slides would all have to be shown at the smaller size.

3.5 Charts and diagrams should therefore be made 'landscape' and half as wide again as they are tall. When drawing a diagram to be later photographed and made into a slide, it is convenient to do this on an A4 size sheet of film, tracing paper or typing paper inside an imaginary rectangle 240 mm x 160 mm. No part of the drawing should however be nearer than 10 mm to the outside edge.

To ensure this and to help in maintaining horizontal and vertical axes, it is recommended that a 10 mm grid be temporarily attached with paper clips or small pieces of adhesive tape behind the A4 sheet to act as a trace. Figure 6 provides a suitable grid. The picture should all be inside the grey border. On completion of the drawing, it should be re-centred inside the grey border and the key lines (two at each corner) marked in, to aid the photographer.

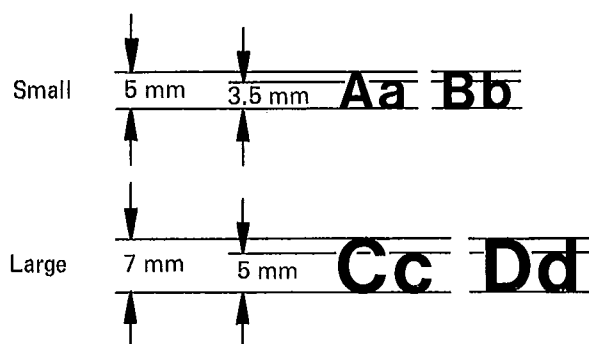
3.6 In the interest of clarity and simplicity there are a few rules which should normally be observed. There should be no underlining of words, vertical lines in a table are seldom necessary, about five columns of five lines should be the maximum size of table, a slide should rarely include more than five lines in a graph, or 30 words. If more are needed, then the slide should be built up in stages. All unnecessary material should be ruthlessly eliminated (but beware of leaving out a north point and scale from any map or plan).

3.7 Two thicknesses of lines should suffice for most drawings, and they are most easily drawn with fibre tipped pens. For a drawing on A4 paper as recommended above, the thickness should be approximately:

Thin	0.5 mm	
Thick	1 mm	

Dotted or broken lines may also be used.

3.8 Similarly, two sizes of lettering are preferable, the small size being that which will be legible from the back of a room fitted with the correct size of screen, and the large size being noticeably larger. Letters approximately the following sizes, which are in accordance with ISO 3098/1, are recommended.



Lettering should be the usual upper and lower case, since block capitals become difficult to read in any quantity; they should be reserved for short titles only, in the large size of lettering. Exceptionally, italics may also be used, in the small size. Thus, for the normal slide, the main heading should be in large upper case lettering, minor headings in large upper case and lower case lettering, and all the rest in small upper and lower case lettering.

3.9 All lettering should be bold, on the wide side and not cramped together. The minimum spacing between base lines should be twice the lower case letter height, i.e. 7 mm and 10 mm respectively. Vertical or slanting lettering should be avoided.

3.10 Lettering should not be attempted free hand. Even stencilling is unlikely to produce first class results owing to the very large magnification. By far the easiest method is to use dry transfer lettering, which can be obtained at most large stationers or drawing office suppliers. Dry transfer letters are available in very many type faces; the best is probably Helvetica Medium in sizes:

Small: 20 pt (5.9 mm)

Large: 24 pt (6.5 mm)

or, alternatively, Univers 65 in sizes:

Small: 20 pt (5 mm)

Large: 24 pt (6.2 mm)

3.11 As a practical test, all these letters and lines should be readable and clearly visible on the drawing from a distance of 1.5 m, and this will produce a slide which will be readable when held as close as convenient in a good light and in due course a satisfactory image on the screen. On, for example, a 2.4 m x 2 m screen the drawing will be magnified 100 times, or 10 times each way.

3.12 Colour can often be used to enhance slides, but it will complicate their manufacture, so it is important to discuss the implications with the photographic department. When colour is considered desirable, it will usually be best to produce the original drawing in black and white with clear instructions regarding colour, leaving the photographic department to arrange the finished artwork. Only if colour is confined to a few simple lines, e.g. on a graph, should the lecturer or his assistant draughtsman attempt to produce the finished artwork with the help of coloured fibre tipped pens.

3.13 Finally, slides should be spotted with a light coloured spot in the bottom left hand corner (with the picture correct for direct viewing) and numbered consecutively in the top right hand corner. If a slide is to be shown more than once, duplicates should be provided at each number where it is to be shown. A complete list should be prepared for the projectionist, including any gaps when no slide is to be shown, and a copy of the list attached to the lecturer's notes.

4. Transparencies

4.1 Overhead equipment is not standardized world-wide, but most transparencies consist of cardboard mounts about 317 mm x 317 mm with film apertures 250 mm x 250 mm (UK) or 200 mm x 250 mm (USA). Since it is desirable to leave a 25 mm margin at the edges, drawings 200 mm x 200 mm are the best size and can be shown on all projectors. The drawings are done directly on the transparency, with no intervening photographic process. This makes them much easier and quicker to produce.

4.2 As with the artwork for slides, it will be found helpful to attach a 10 mm grid temporarily to the back of the transparency while making the drawing. Figure 7 provides such a grid; it should be positioned centrally, and all the drawing contained inside the grey border.

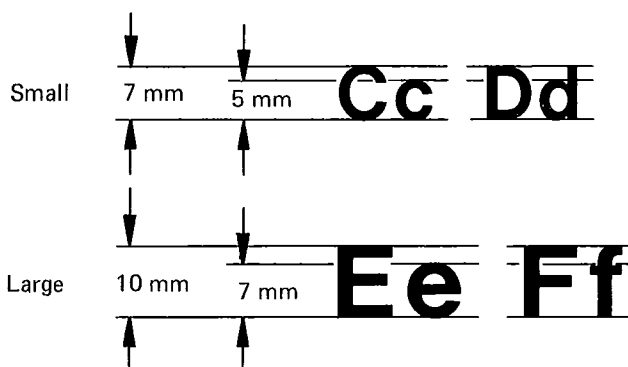
4.3 Drawing should be done with a fibre tipped pen, in black or coloured ink, either permanent or washable, the latter being used for making removable additions to a transparency during a lecture.

4.4 As with slides, two thicknesses of line will usually be sufficient:

Thin 0.75 mm 

Thick 1.5 mm 

4.5 Suitable lettering, in ISO sizes, is



4.6 Since the occasion is likely to be less formal than where slides are being shown, and the magnification is less, stencilled lettering is quite acceptable for transparencies. Even free hand lettering is often satisfactory. However, for best results dry transfer letters are again recommended in the following types and sizes:

Helvetica Medium

Small: 28 pt (7.9 mm)

Large: 36 pt (10 mm)

Univers 65

Small: 24 pt (6.2 mm)

Large: 36 pt (9.4 mm)