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GUIDELINES FOR THE PLANNING AND PREPARATION OF ILLUSTRATED TECHNICAL TALKS

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16. Abstract

Guidelines are presented for the preparation of illustrated talks which are audience oriented and which are aimed at the efficient transfer of technical information. Early decisions concerning the required number of slides are helpful in initial planning for a good quality talk. Detailed considerations are; the establishment of limited objectives, selection of appropriate slide material, development of a text which is well coordinated with the slides, and accurate timing.

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GUIDELINES FOR THE PLANNING AND PREPARATION
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INTRODUCTION

Illustrated technical talks, in which slides or charts are used to complement the text, are potentially very efficient for the transfer of information from a speaker to an audience. It is always rewarding to listen to well-organized talks that provide a favorable listening and learning atmosphere. They are audience oriented and result from advanced planning which takes into account the needs and capabilities of the individuals in the audience. In most cases, the audience will be made up of people who have varying levels of understanding of the subject. The challenge is to tailor the presentation in such a manner that the nonexpert as well as the expert in the audience retains some useful information.

Useful guidelines are available for persons giving illustrated technical talks, particularly with regard to slide quality (ref. 1) and the manner of presentation (refs. 1, 2, and 3). Since most deficiencies in such talks are traceable to inadequate preparation, there is thus a need for additional guidelines in the planning and preparation phases.

The purpose of this paper is to extend the material of the references by describing some simple concepts, which when properly applied can save preparation time and effort, improve clarity, and increase the general effectiveness of an illustrated technical talk. This paper is based on

wide experience gained directly in the preparation of talks, the supervision of others in talk preparations and in attendance at technical meetings. Information contained herein most directly relates to talks prepared for technical society meetings but is useful for any type of oral presentation where visual aids are used. Definition of the objectives of the talk, preparation of the slide and text material, and determination of the presentation time are included as special topics for discussion.

OVERALL GUIDELINES

Emphasis in this paper is on the planning and organization of the slide material and text prior to presentation because of its importance in producing a good talk. The actual manner of presentation is beyond the scope of this paper except insofar as the preparation details may influence it. Each person will have his own approach to the presentation, and will add his own mannerisms, personal touches, and humor as appropriate. Almost anyone can give a very effective illustrated talk provided that he really wants to communicate and follows a few simple guidelines.

Probably the most important as well as the most difficult lesson for a speaker to learn is that he can accomplish only limited objectives in any technical talk. To clarify this important point, he may be able to introduce a new piece of work or some new facet of a previously studied subject in such a way that a person in the audience knows whether it is profitable for him to pursue further study of the subject or not. The speaker may be able to summarize some existing information for or make a few lasting points to the average listener. Above all he has a unique

opportunity to establish his credibility with the audience as an expert resource person. If he tries to give the hard sell to a lot of detailed information he will probably end up communicating with only a few people who are experts like himself. The latter approach can be useful in small group discussions but is not recommended in presentations to general audiences.

Speaking Rate

Most speakers are overly optimistic concerning the amount of material that can be presented in a given period of time. Where visual aids are concerned the speaking rate should be slower than for other types of public speeches. Based on hundreds of observations by the author, a speaking rate of 100 words per minute is judged to be a good working average. Some persons can comfortably talk faster and still be understood, but the above is a workable compromise, bearing in mind the interests of both the listener and the speaker.

Advanced Planning

The listener is almost completely at the mercy of the speaker and in order to follow the presentation effectively, needs several specific items of information. He needs to know early in the talk what the subject is, the scope of the presentation, and what approach will be used in presenting the material. Then after the descriptive and discussion material is presented, he needs to be reminded of the main conclusions.

One suggested criterion for preparation of an illustrated talk is that the audience deserves to receive from it at least as much as they

devote in time and effort to listen to it. Let us take as an example a 15-minute talk to the Acoustical Society of America that is given in a session with an attendance of 100 persons. Based on prorating the estimated expenses of travel, per diem, and salary for a 3-day meeting, the audience will collectively have invested about $1,000 to listen to this paper. The average speaker should be willing to make a similar investment, or the equivalent of about 1 to 3 man weeks of planning, preparation and rehearsal.

Timing of Presentation

Most guides to preparing and giving technical talks miss the point completely about planning for the time allotted. Hardly any talk is scheduled without a time being assigned. A person generally fills up the time allotted — it is only a question of whether he does it wisely or not. Planning for the talk must recognize the available time and provide for wise usage, without running overtime.

No single factor causes so much consternation among audience, fellow presenters, and session chairmen as presentation time. It is unfair to the audience and to the subsequent speakers to run over the allotted time. For formal conferences where papers are rehearsed, it is possible to estimate the delivery time quite accurately, but in the case of open meetings and informal conferences it is not possible to have group rehearsals and the individual authors must be responsible for rehearsing their talks and for adhering to assigned time constraints. A reliable method for timing a presentation involves the preparation of

a written text of the material to be presented. Such a writeup provides the opportunity to check for errors and needless repetition, is a guide for the oral rehearsal and can also be the basis for a referenceable document.

Evaluation of the slide material alone can be the basis for accurate timing. This approach is highly recommended and can be effectively used even by inexperienced speakers. A prerequisite for its success, of course, is the availability of properly selected slides for the talk.

SLIDE CONSIDERATIONS

In a well planned paper it should be possible to get the main information from scanning the slide material. For instance, the slides should indicate the subject matter and its scope, what was done and the methods used, the results obtained, and the main conclusions. The slides thus constitute an outline of the paper, and there is, as indicated later, an optimum number of slides for a given length of presentation.

Number of Slides

The number of words of text for each slide can vary somewhat with equally good results from about 100 to 200. If a slide requires only about 100 words, it is probably simple in concept such as a photograph or sketch of a piece of equipment, or a word slide listing of ideas or factors. The contact print reproductions of standard 3 1/4- by 4-inch lantern slides in figure 1 are illustrative of relatively simple slides. They are examples of those which can be introduced, described, and discussed in about 1 minute or with about 100 words of text. On the other hand,

those of figure 2 are relatively complex and require about twice as much text. A slide which requires more than 200 words to describe is probably too complex and the material on it should be broken up into two or more slides. A talk, in order to be interesting and effective, should be well paced and, hence, 150 words per slide is judged to be near the optimum. As an example, a 15-minute talk would have 10 slides more or less. If the slides were extremely simple in concept or if their content required very little discussion, it is conceivable that as many as 15 slides might be effectively used. On the other hand, for slides which have several curves and require more discussion, less than 10 would be a better number.

Slide Quality

Much has been written about improving the quality of slides (see ref. 1) and the following are important summary points:

Slides should be clear and relatively simple, with a practical limit of three curves per slide. If it seems desirable to include a large number of curves to illustrate a trend, for example, the discussion should be aimed at identifying the trend rather than a description of each individual curve.

The number of equations should be limited to those for which the terms can be properly defined. The emphasis should be on the type of equation and the identification of significant variables involved rather than detailed information which only the expert listener can assimilate.

Writing should be readable in the back of the room. Black writing on white background is preferred but book pages and typewriter size print

are not generally acceptable. The use of color is effective for photographs
and sketches but is frowned on for data slides unless they are coded by
symbols as well as by color. Double coding tends to eliminate problems
due to color blindness and loss of detail in copying.

The above points may be difficult for some authors to adhere to
but the conclusion is that the preparation of good slides does require
considerable thought and effort. It should be noted that all the example
slides of figures 1 and 2 are of acceptable quality.

TEXT CONSIDERATIONS

An important payoff for having a text is that it provides a reliable
measure for timing the presentation. A double-space typed page with
standard margins has about 250 words or 2.5 minutes of speech. Thus, a
six page double-spaced manuscript is a good average size for a 15-minute
talk.

From the listeners point of view the text should generally not be
memorized or read as a prepared statement although either can sometimes
be done acceptably. The ideal approach to a presentation is for the
speaker to properly introduce the slides and to closely coordinate his
remarks with the material of the slides as an outline. One or two main
points per slide is about the maximum that should be attempted.

Such elements as motivation, orientation, discussion, and conclusion
all play useful roles in the texts of illustrated technical talks.
For instance, a speaker cannot assume that every listener in a large
audience knows what the paper is about, why the work is important,
and why the paper has been prepared. Even if the audience is generally

knowledgeable, it should be reminded of the purpose and scope of the paper.

Proper introduction and description of the slide material is obviously important as a basis for the effective use of the slides. A discussion of what was done and the associated results are best accomplished in close coordination with the slide material and should be fully compatible with it.

The main findings should be summarized in a conclusions or concluding remarks section. The average listener is probably not capable of retaining a long list of detailed statements, hence, it is important to select one or two main conclusions to highlight.

COMPOSITION AND FORMAT

A logical way to proceed to put a talk together is to select the slides first. Make sure that they are clear and accurate; illustrate the subject matter, support the main conclusions; and establish a logical sequence for the presentation of the paper. The text then is simply an explanation and discussion of what is on the slides. A summary of the slide and text guidelines for various length talks is given in the following table.

Length of Talk Minutes	Number of Slides		Number of Text Pages	
	Preferred	Range	Preferred	Range
10	7	5-10	4	--
15	10	8-15	6	--
20	14	10-20	8	7-9
25	17	13-25	10	9-11
30	20	15-30	12	11-13
60	40	30-60	24	22-26

The preferred number of slides in each case is judged to be near the optimum for a fast moving technical talk to a general audience. The lesser number of slides might be required for a talk to an audience already knowledgeable in the subject and, thus, capable of absorbing more detail. On the other hand, as many as one slide per minute would rarely be used unless they were simple word charts or photographs in support of an orientation or general review talk. In actual situations, the speaker will probably have a mixture of simple and relatively more complex slides and, thus, some judgment in the matter of planning is called for.

The number of text pages is directly related to the speaking rate and is fixed within narrow limits for a given length of talk. It is thus vitally important that the text be closely correlated with the slide material for maximum efficiency. A given length of text alone will contain much less technical information and may actually be more confusing to the listener than if it is well coordinated with and related to the slides.

Two points mentioned earlier are worthy of special emphasis. In any talk it is helpful to the person in the audience to be able to anticipate the scope and sequence of the paper, hence, an introduction or "road map" slide of the type shown in figure 1(a) can be very helpful. Likewise it is useful for the person in the audience to be reminded what the main conclusions are. Thus, it is helpful to end up with a summary or concluding remarks slide. The road map and conclusions slides are, of course, included in the above tabulations.

CONCLUDING REMARKS

Guidelines have been presented for the preparation of illustrated talks which are audience oriented and which are aimed at the efficient transfer of technical information. Early decisions concerning the required number of slides are helpful in initial planning for a good quality talk. Detailed considerations are; the establishment of limited objectives, selection of appropriate slide material, development of a text which is well coordinated with the slides, and accurate timing.

REFERENCES

1. Groening, J. A.: How to Address the Acoustical Society of America. JASA, vol. 51, no. 1 (part 1) 1972.

2. Katzoff, S.: Clarity in Technical Writing. NASA SP-7010, 1964.

3. Bragg, Lawrence: The Art of Talking About Science. Science, vol. 154, Dec. 1966.

EFFECTS OF SONIC BOOMS

- OTHER AIRCRAFT
- PEOPLE
- COMMUNITIES
- GROUND BUILDINGS
- GROUND MOTIONS

(a) Words

AIRPLANE OPERATING REGIMES

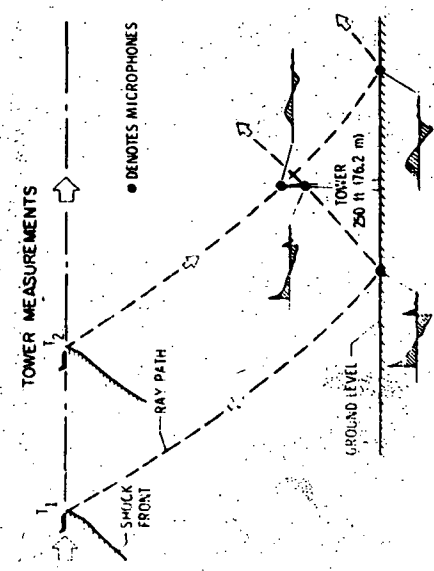HYPERSONIC

SUPERSONIC

LOW SUPERSONIC
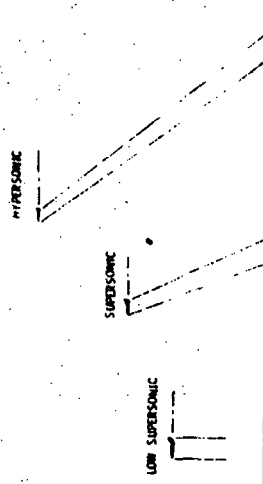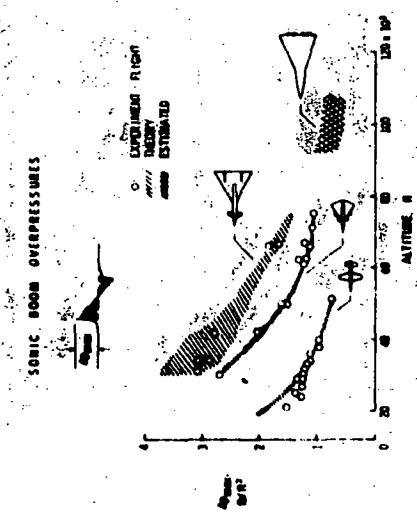
(b) Sketches

IN-FLIGHT SONIC BOOM MEASURING PROBE

(c) Photographs

Figure 1.- Examples of relatively simple slides that require about
1 minute of discussion.

(a) Conceptual Diagrams

(b) Sketches

(c) Data Presentation

(d) Equations

Figure 2.- Examples of relatively complex slides that require about 2 minutes of discussion.

12