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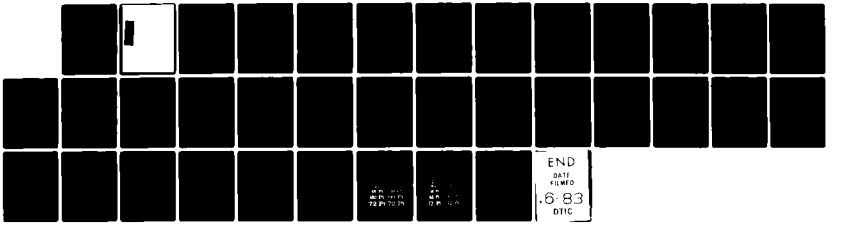

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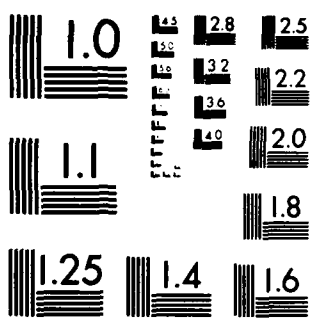

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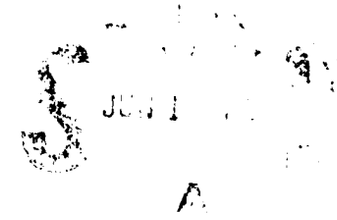
USAWC MILITARY STUDIES PROGRAM

COMMUNICATING IN A NOISY WORLD

INDIVIDUAL ESSAY

by

Patricia M. Gaynor
GM-14, Defense Logistics Agency



US Army War College
Carlisle Barracks, Pennsylvania 17013
18 April 1983

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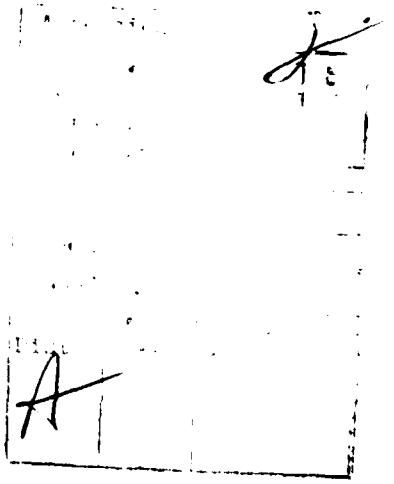

ABSTRACT

AUTHOR: Patricia M. Gaynor, GM-14, Defense Logistics Agency

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The proliferation of information in today's society is glutting communications channels and making it ever more difficult to get a message through. Although briefly reviewing advancements in communications technology, this paper concentrates on the prosaic presentation of textual and graphic material in our day-to-day commerce with people. It examines the barriers we create--sometimes with the help of new technologies--that blunt our messages and confuse and discourage the intended recipients.

INTRODUCTION

We are living in what has been called the Information Age. Advancements in technology and higher levels of education have both contributed to the generation of knowledge and increased information dissemination. The deluge of information flowing through communications channels makes it ever more difficult to get a message through. It is so tempting to concentrate our attention on the exciting things that are happening in the fields of computers and communications technology that we relegate to the realm of the unimportant those prosaic communications media that have and continue to serve us so well. The presentation of textual and graphic material is so common that we fail to recognize the barriers we create--sometimes with the help of new technologies--that blunt our messages and confuse and discourage the recipients. This paper examines these more familiar information transfer modes in the light of the total communications process and points out some of the faults we commit. Although it does not describe all possible remedies, it does attempt to shed some light on the problem areas. Perhaps it may prompt some communicators to devote more care and consideration to the design and presentation of the printed word and other graphic materials.

THE NATURE OF COMMUNICATION

It is the ability to communicate, to transfer ideas from mind to mind, that is a fundamental aspect of humanity. Some would go so far as to say, "We are human because we can communicate."[1] Communication is certainly the essence of civilization. Without communication we could not recognize and express the common interests among us; we could not band together in groups to cooperate in achieving mutual goals. The

following words encapsulate this important fact, "With communication, we can have civilization; without it, we can't. It is as simple as that."[2] Communication is a complex activity. It has many interconnected levels and facets and it becomes more abstract and complex as civilization advances. The process of communication involves "four equally important parts: The communicator, the message, the medium, and the recipient."[3] Too often we tend to attach importance to the message alone with perhaps a nod to the medium. (Shall we call or write?) The communicator and the recipient are given scant notice.

The communicator enters into the process in more ways than one. He is, first of all, the originator of the message. The manner in which he conveys the message will speak of how confident he is of his command of the subject; how convinced he is of the validity and significance of his message; how urgently he wishes to inform, or persuade, or even control, his audience; how sensitive he is to the capabilities, the prior knowledge, and perceptions of the intended recipients. Not only the actual phrasing but also non-verbal factors will be a reflection of the communicator.

The message to be conveyed consists of thoughts, feelings, ideas that we reduce to a code. The codes we use are words or visual images, but the words or images are only symbols of what is in the mind. It follows that the coding scheme used must be mutually understood by both the sender and the receiver. A classic example of an effective, though meager, coding scheme that served its intended purpose well was the Armee Deutsch, the command language used by the Imperial Austrian Army prior to 1918. It consisted of not more than two hundred action words each of which had only one meaning. It was devised to provide essential

communication in a polyglot army whose officers and men spoke a variety of languages.[4]

The medium, the vehicle or method used to convey the message, will also color the message itself and ultimately influence its affect. A memorandum to all employees written in tired prose will not create the same reaction as a tersely worded oral message presented at a hastily called meeting directly at the work site. A well-publicized television speech replete with sophisticated visuals will have an impact different from the same message printed in the daily newspaper. On the other hand, it is not wise to attempt to convey verbally complex messages via television, because television viewers are accustomed to snatching meaning from visual images.[5] A string of numbers in a computer printout may have little meaning until they are organized and labeled in some fashion.

The recipient is an important player in the process of communication. It is the recipient who "makes or breaks" the communications process. Until he accepts the message and makes its meaning "common" between himself and the sender, no communication occurs. "The communicator speaks or writes or sings--but he does not communicate. Indeed, he cannot communicate. He can only make it possible, or impossible, for a recipient--or rather, "percipient"--to perceive."[6] If the end of communication for a manager is influence, he must first solicit the cooperation of his intended audience.[7] Each recipient brings himself to the communications process, and each will respond differently to the various modes of imagery. The verbal man will respond primarily to words, the visual man to pictorial or diagrammatic forms, the kinaesthetic man to mime or gesture.[8] A skillful communicator, who

believes in his message and truly cares about getting it across, will neither demand nor expect his audience to be all his kind of man. He will try to adapt himself and his message to accommodate the full range of his audience if at all possible.

Drucker discusses communication in terms of four fundamentals:

(1) Communication is perception,
(2) Communication is expectations,
(3) Communication is involvement,
(4) Communication and information are totally different. But information presupposes functioning communications.[9]

Just as sound does not occur if there is no one to hear it, so communication does not exist if no one perceives it. The range of the recipient's perception is the limiting factor in communication, and perception is bound up more in experience than in logic. The communicator must reach the recipient's base of experience in order for the message to get through. The recipient must somehow conceive in his "mind's eye" what the meaning of the message is to him. His cultural background and emotional state will condition his understanding and reaction to the message.

As humans we approach any encounter with a certain set of expectations and we will attempt to force any impressions we receive into that frame of reference. The communicator must discern what these expectations may be in order to target his message properly. If he can recognize that his message will be contrary to or beyond the limits of his receiver's expectations, he must seek a point of departure to lead his hearers or readers to expand their range of expectation to take in the unexpected message.

The involvement required in communication places some demand upon the recipient. We communicate to inform--and that demands retention, to pursuade--and that demands thought, or to direct--and that demands action. If communication runs counter to the aspirations, values, or motivations of the recipient, the message will be resisted or ignored.

Communication differs from information as perception differs from logic. Information is impersonal and formal. Its meaning is derived from its context including the human components of the communications process. Since information is always encoded, there must be prior communication to agree upon and establish a scheme of coding that will be understood by both sender and receiver. Information, however, may not be at all what we are attempting to communicate. Often enough the "message" of our communication may be shared experiences, hence, in this instance the primacy of perception as opposed to logic.[10]

In the final analysis, the recipient is the key to effective communication. Any act of communication is void if the recipient is not capable and prepared to accept it.

TECHNOLOGY AND THE INFORMATION EXPLOSION

Webster's New World Dictionary of the American Language defines a computer as "a device used for computing; spec., an electronic machine which, by means of stored instructions and information, performs rapid, often complex calculations or compiles, correlates, and selects data."[11] There was a move afoot several years back, although a futile and short-lived one, to find or coin a different, more expressive name to identify these remarkable machines. Many computer programs include little calculation per se but, instead, are taken up with manipulating,

comparing, sorting, and simply moving data. A more generic definition of computer might be, "any device for storing and processing information."[12] This definition could include the human brain and take us back two million years to the first landmark in a study of information interchange. Man's dominance over animals can be attributed to the development of human language and man's ability to communicate. The invention of writing about 10,000 years ago marked another breakthrough in information technology. This achievement made it possible to reduce information and experience to a tangible form no longer bound by time and space. The brain was no longer the only repository for information.[13] The written word helped to extend the limits of a community. The confines of a community were generally understood to be the area that could be traveled in one day to convey information. As recently as one hundred years ago this area took in only a radius of ten to twenty-five miles. Today it takes but a few seconds to transmit information throughout the world. Even people can be transported in hours over distances that formerly took days or months. Advancements in technology have made vast changes in the way we live. Changes in our economic systems alone have created what Drucker calls "a global shopping center."[14]

It was not a quantum leap from the discovery of writing to instantaneous communication. The commercial application of the telegraph did not occur until the 1840s, but even with that the oceans remained a barrier. For example, the people in London did not learn of Lincoln's assassination until 12 days after the event. The ocean barrier was overcome early in this century by the telephone with its cable links between Europe and America. The first commercial telephone had been

developed in 1877. Mass communication by way of radio became possible by the 1920s. Its significance as a political medium was inaugurated by President Franklin D. Roosevelt in the 1930s. Motion pictures in the 1920s and 1930s injected image and movement into mass communications. By the middle of the century television had moved from its experimental stages of 1927 to become commonplace in the home.

Meanwhile business and government were facing larger and larger volumes of information that were becoming increasingly difficult to store and manipulate. Punch card systems were a first step toward bringing these information-handling problems under control. Even these systems could not keep pace with the growing demand for speedy calculation and rapid, efficient information retrieval.

It was the needs of the U.S. military that originally gave impetus to the development of the electronic computer. The first machines, in the 1940s and early 1950s, were rudimentary compared to today's computers, and they required a great deal of space.[15] If you travel to the UNIVAC plant in Blue Bell, Pennsylvania, you could open a door and step inside a UNIVAC I. Today you can slip a computer into your pocket or perch one on the end of your thumb. There were sages in the early years who sincerely believed that a half dozen computers would meet all the needs we would ever have for them. Only large data processing operations such as the Census Bureau were thought to have sufficient requirements to fully employ the capabilities of computers. In the time since, however, computers have become pervasive. They are an indispensible element in sophisticated weapons systems. Without computers there would be no space program, no trips to the moon. Business and industry, banking and retail

sales, even book and newspaper publishing have incorporated computer systems into their operations.

Man has been generating and transmitting knowledge at an ever-increasing rate for 10,000 years. That rate jumped sharply upward with the invention of writing. The development of printing presses with movable type accelerated the rate even more.

> Prior to 1500 . . . Europe was producing books at a rate of 1000 titles per year . . . By 1950, four and a half centuries later, the rate had accelerated so sharply that Europe was producing 120,000 titles a year . . . And by the mid-sixties, the output of books on a world scale . . . approached the prodigious figure of 1000 titles per day."[16]

Science alone is contributing 250 million pages a year to our store of newly published information.[17] Technology, including the computer, is a prime source of this phenomonal proliferation of knowledge. The same technology provides powerful tools that give man the capability of coping with huge volumes of information.

THE PLACE OF CONVENTIONAL GRAPHIC COMMUNICATIONS

The advancements in communications and information processing technology during the past three decades are impressive. Children in school today cannot conceive of a world without radio or television. Many schools, including those at the elementary level, have installed computers both to enhance the instructional process in general and to provide the students with a degree of computer literacy. It would be a mistake, however, to become so enamored of the new and so eager to dash into the future that we discount the significance of communications media

that now seem so commonplace to us. The printed word has been with us for five hundred years, and, despite the doomsday prophets, there is abundant evidence that it will remain a highly important communications medium for a long time to come. Some examples of premature, and likely unfounded, predictions were cited, though not supported, in a book published in 1969:

> Newspapers will be a relic of the past in the world of 1984.
>
> Letters will be left to the eccentrics who will enjoy them for themselves.
>
> Libraries for books will have ceased to exist in the more advanced countries and most of the world's knowledge will be in machine-readable form. A few books will be preserved at museums.
>
> Paper work will cease to exist in twenty years.[18]

Some of these predictions are already about to be overtaken by time. Toffler claimed in his Future Shock that, at the time of that book's publication (1970), adults in the United States spent an average of fifty-two minutes a day reading newspapers. In addition to newspapers, those same people also devoted time to other kinds of reading such as books and magazines, advertising and instructions. We are, says Toffler, "surrounded by print," and absorbing "between 10,000 and 20,000 edited words per day." That number is only a small portion of the edited words that each person is exposed to every day.[19]

None of the new communications media have yet proved truly superior to word printed on paper for its basic function of displaying information. It is flexible because it allows great variety in style and format. There are approximately 2000 type faces available today. From the elegant, medieval-like flowing script to the square, clean modern

styles, type styles themselves are an element of the true message, not just a means to display the words. A formal proclamation has a different message to convey than step-by-step instructions for assembling a child's toy. With a printed page, the reader sets his own pace and picks his own time and place. The printed page is a simple and convenient system for recording information. "It is small, light, cuttable, clippable, pastable, movable, disposable, and inexpensive."[20] It has a permanence about it that is not threatened by a power outage.

The printed page has its limitations, of course. The newer technologies of electronics and micrographics exceed its capabilities in the areas of storage density, data manipulation, and speed of transmission. The printed word, however, does not depend on machinery or special training to make it accessible to any literate person. Given the option, when a user is ordering a document from a collection that is stored in microform, he will more often request a paper copy even if it costs a little more. "Clearly, neither microfiche nor computer screen displays meet all the demands for convenience, light weight, low cost, and credibility that paper-based documents provide.[21]

Graphic communication is not limited to print on paper. It includes graphs, charts, and illustrations, often accompanied by some amount of text. It also encompasses the visual material displayed on a screen or flip-chart to accompany an oral presentation. In audio-visual presentation, the visuals should be an adjunct to the spoken words. They are intended to enhance the commentary, reinforcing or highlighting the important elements of the speech. Use of visuals has become so commonplace in office briefings and large-group meetings that people have begun to expect them. "When relying on the spoken word alone to

communicate, an estimated 90 percent of a message is misinterpreted or forgotten entirely. We retain only 10 percent of what we hear. Adding appropriate visual aids to the spoken word boosts retention to approximately 50 percent."[22] The use of visuals permits the audience to employ a second sense, that of sight, to assist them in absorbing the speaker's message. Skilled communicators will recognize "the fact that individuals are differently attuned to different media. There are visualizers, verbalizers and spatializers, each with their biased modes of assimilation. Hence there can be no ideal way of imparting complex information to all comers. The purveyor of information should bear these differences in mind, trying as far as possible to leave no kind of receiver out of account."[23] The speaker should not thrust the whole burden of the communications process on visual aids. They must always be subordinate to the speaker and are a tool he can use to control the presentation.

Graphics are simplified representations of the intended message. The viewer's previous knowledge will influence what information he takes from the graphic, and his attention will be drawn to the aspect of the graphic which is familiar and easiest to understand. He will scan the visual in a pattern reflecting his own expectations and will interpret the graphic accordingly. The designer of the graphic must, therefore, attract the viewer's attention to the important elements by highlighting them through skillful use of form, position, or color.[24]

There are a variety of techniques and equipment that can be used to display visual aids. They range from a simple chalk board, to transparent slides projected on a screen, to motion pictures. Likewise, there are a number of ways of preparing the visuals to be used, from a

verbal outline handwritten on a transparent sheet to artistic, multicolored slides prepared by a professional graphic arts shop. Whatever the method of preparation and presentation, the visuals must be consistent with the message and designed with both the audience and the meeting environment in mind.

IMPEDIMENTS TO MESSAGE TRANSMISSION

For the all the absolute essentiality of communication in our social, economic, and cultural lives how often we fail to make it work! "Failures in . . . communication . . . are due mainly to the limited capacity of the receiver or to the injection of unwanted noise."[25] Noise in this sense is not limited to unintelligible sound or faulty electrical signals. Noise is

> Any undesired disturbance in a communication system such as random electrical currents. Noise is observed as hissing in a radio receiver and as white flecks (snow) on a television screen. In human communication any source of message distortion from unwanted sound to distracting emotions by the receiver may be thought of analogically as noise.[26]

It would not be improper to include in this definition the many and various quality failures we unwittingly or carelessly incorporate into the media we use to convey our messages.

We have at our command in this age a vast array of equipment, techniques, and automated systems to assist us in coping with the immense volume of information that is being generated. These capabilities are invaluable in meeting our increasing needs to collect, retain, compact, extend, extract, and otherwise manipulate our growing store of information and to disseminate it far and wide. In the final analysis,

much of the output of this prodigious technology must be perceived by a person in order for it to become useful to society. True, some of these systems speak to us in audible sounds and certainly we still speak to each other. In large measure, though, the perception of information depends on the mundane exercise of reading it. Illustrations, numerical arrays, graphs, and diagrams must also be seen to be perceived. Print on paper is not the only medium that we read; we also read words, numbers, and other graphics on cathode ray tubes, projection screens, and painted signs.

Most people who encounter computer systems today are familiar with the term "user friendly". It is, or ought to be, the goal of every designer--to make his system convenient, comprehensible, and unintimidating even to the most casual of users. It is a term and a concept that should be extended to other communications media as well.

"Friendliness" in the medium of print on paper (including computer printouts) can be expressed in many ways. One of the most important ways is to ensure that the print is legible, i.e., able to be read. "Design, weight, style, size and length of line are the primary factors in readability of type."[27] If he can't read the print or must struggle to do so, there is a high risk that the receiver will be hampered or prevented from decoding the message correctly and miss its meaning altogether.

There are many factors involved in the writing and designing of printed materials so that they can be understood and retained by their intended audience. There is a difference between designing a document and just printing it. Proper design includes clear and orderly arrangement of the information, ample white space for margins and

separators, and avoidance of clutter such as too many different visual elements or multiple type faces. Using a single, simple device for adding emphasis is more effective than combining boldface type, color, and underscoring. Combining all three devices would be counterproductive. While large blocks of type printed entirely in capital letters may give the illusion of emphasis, it is actually harder to read and more intimidating for the reader.[28]

The U.S. military services have conducted several studies to determine how best to prepare technical manuals and instructions for use by service members. A team experimented with university undergraduates to explore how people read and use directions presented in text and illustrations. They concluded that the presence of illustrations did significantly improve performance. It appeared that the ambiguities in both text and illustrations could be readily resolved because of the redundancy that the presence of both forms provided. Their results also led them to believe, however, that "specific types of information are presented more effectively in texts or in illustrations."[29] Curran, another investigator, measured comprehensibility of manuals with respect to the reading levels of the intended recipients.[30] He considered in his study the many factors involved in readability and comprehensibility of technical manuals, such as: use of familiar words, short sentences, smooth style, and simple sentence structure. He discussed the distinction between the terms "readability" and "comprehensibility" and cited this definition of "readability": "used to indicate legibility of either handwriting or typography, ease of reading due to either the interest-value or the pleasantness of writing, and ease of understanding or comprehension due to the style of writing."[31] Although Curran did

not explore the area of media with respect to the usability of the instructional material, neither did he discount its importance. In preparing technical manuals for use by military personnel there are certainly a number of questions that must be addressed by the designer. Is the print large enough? Is the book small enough? If it is a "handbook," can it be held in one hand? If it will be used frequently day after day, is the binding durable enough? Will the type of binding permit the book to lie flat while a technician's hands are busy with the equipment? To the degree that the manual fails these and other similar tests the resulting inconvenience, irritation, or distraction to the user could be counted as "noise" in the communications process.

Far too often it seems that people working in the information field are related somehow to the proverbial shoemaker's children. Some of the professional associations in the information and data processing fields are occasionally the sources of "horrible examples" of how not to communicate. They appear to employ our wonderful new technologies to produce publications or parts thereof that are virtually unreadable.

A local chapter of one of the international associations in the computer field publishes a monthly bulletin that is printed almost entirely in six-point type. The sixteen-page booklet appears to be printed using the xerographic process, and, thanks to the reducing capabilities of modern copiers, several of the pages are reduced to smaller than six-point size. (See Appendix 1 for selected samples of type sizes.)

In a recent quarterly research journal there is an article which discusses human communication in the future. The article runs to ten pages of offensive print. It is printed in eight-point type that is

strangely and poorly spaced. The letters within words sometimes run up against each other and other times are so widely separated that the space could be mistaken for a word break. The lower case "i" is barely distinguishable from a lower case "l", and the lower case "w" is so lacking in sharpness that the blackness of each one stands out on the page. The article, indeed the entire journal, is printed with what appears to be an extra line of space between each line of print. That device may be a means of compensating for the small print, but it provides instead another distraction for the reader.

A national information society has recently published the proceedings of its annual meeting complete with author and subject indexes. These indexes are models of poor printing and could surely be labeled "noisy communications." They are computer-generated KWIC (Key Word-In-Context) and KWOK (Key-Word-Out-Of-Context) indexes, which are difficult to read when printed full size and hardly worth the trouble to try when printed approximately half the size of six-point type. There is no line spacing between entries, which results in two solid columns of miniature print punctuated by partial lines of dots (or are they dashes?) to fill out incomplete lines. Scattered throughout the entries are special characters such as asterisks and plus signs to indicate the place of words and characters that were omitted for some reason or other. There is, of course, a key to these peculiar features provided at the front of the indexes. The print is all upper case letters and the quality of the original print, together with the degree of reduction, render unreadable such letters as A, N, M, and R.

A sense of delicacy and the copyright laws prohibit exact reproduction of these examples in this paper. Figures 1 and 2 in

Appendix 2 are an attempt to simulate the latter two examples insofar as that is possible for a competent graphic arts shop.

"Friendliness" is also often lacking in the graphics that we use as visual aids with oral presentations. Sometimes a speaker forgets that, "A picture worth a thousand words must first be a good picture."[32]

The language of graphic figures is form just as the language of text is words. The form for a graphic presentation must be selected with the same care as the accompanying words should be. Visual communication can be impaired by using too much form, or not enough, or even the wrong kind.[33] Excessive and irrelevant detail in a visual can clutter the display and bury the key ideas that the visual is intended to convey.

A paramount consideration in designing and using visual aids is ensuring that they can be seen by everyone in the room. Far too often visual aids are barely visible, and hence scarcely little aid, to an appreciable segment of the audience. This fault can be caused by a number of factors. The image, including textual material, may simply be too small for the size of the room. There may be inadequate contrast between image and background, or the focus may not be sharp enough. When members of the audience have to strain to see a visual, their attention is diverted from the speaker and the message will be partially lost.

Color wisely used can increase the affect of a graphic. Any color used in a graphic must have a purpose; it must have a function other than decoration. True, color can attract the viewer's eye and lead him to look at the area thus highlighted, but, if it does not aid him in understanding the graphic and the message, it may prove a distraction.[34]

Maps can present special problems when we use them as visual aids. Maps printed in books often use pastel colors to differentiate political entities. Such distinction will be lost on a large screen. Strong, contrasting colors are more effective. The type of map displayed must be appropriate for its purpose. If the purpose is to give the audience an appreciation of the relative locations of several cities in a country, a map that is busy with topograhpical features or road nets will obscure the message and confuse the viewer.

Text on charts, graphs, or illustrations should read horizontally, and labels should be concise and their relationship to reference points clearly indicated.

If a communicator uses visual aids that are inappropriate, hard to see, or difficult to comprehend, he may destroy his message for the recipient. If he fails to consider the capabilities, sensitivities, or even comfort of his audience, he may generate anxiety, irritation, or hostility. The message he conveys may be far different from what he intended. Instead of the intended message, the audience may perceive that the speaker does not know his subject well, or, worse, that he does not much care whether this audience learns at all what he does know. "Every audience is somewhat like a jury. It passes judgment based on its comprehension of the facts presented--seasoned with a measure of human emotion."[35]

SOME PRACTICAL CONCLUSIONS

There is keen competition for attention in this noisy world. The great volumes of information coming at us from every direction, and sometimes proffered with a mixture of motives, cause all of us to be

selective in the communications we admit to our perception. We are almost forced to be less tolerant of faulty transmision, like switching off a radio station that has too much static. Much of the advertisement that comes to us through the mail is left unread unless it is presented in a concise and appealing manner. In reading directives and instructions pertaining to our work, we will often go directly to the sections that apply specifically to us and skip the rest. We can hardly expect the potential recipients of our communications to treat us more kindly. They too have limits on their time and energy and attention spans, and will be reluctant to spend too much of them to decode garbled or poorly presented messages.

It is true that the recipient is the final determinant of whether the communications process succeeds. It does, however, behoove the communicator to use every device and technique at his command to enable the recipient to accept and understand the message. The first consideration of the communicator should be to avoid creating barriers that will impede transmission.

In the case of the printed word, this means presenting the material in an eye-pleasing format with legible print well-balanced with white space. The type sizes that provide optimum legibility are ten-point and eleven-point.[36] These are the type sizes produced by standard typewriters. The style of writing should be smooth and well suited to both the subject and the audience.

Printed outputs from a computer deserve the same care as any other printed material. They should be designed so that they are easy to read and visually attractive. Headings should be concise, explanatory, and properly placed. Columns of figures should be aligned and spaced so that

they are readily understandable.[37] Computer-printed reports should be stripped of any numbers and verbiage that are irrelevant to the user and serve only to clutter the page.

If it is necessary to produce extra copies of documents or enclosures on an office copier, it is important to ensure that the copies are as clear and sharp as the originals. It contributes nothing to the communications process to demand that the recipient attempt to read faint or blurred copy to discern the message.

In audio-visual presentations we must also be concerned with whether our audience can perceive the message that the total presentation, including the graphics, is intended to convey. If we use visuals, we must design and display them so they can be seen and understood by the entire audience, including the people in the last row. Eastman Kodak[38] proposes the following working table for determining the required size of an image on a screen in relation to the size of the room:

Viewing Distance	Minimum Symbol Size
128 feet	4 inches
64 feet	2 inches
32 feet	1 inch
16 feet	½ inch
8 feet	¼ inch

Using this table it would follow that in Bliss Hall, the main auditorium of the U.S. Army War College, the image on the screen should be approximately three inches high to be seen in the last row. An image that is only two inches high would not be clearly legible beyond Row M, which is about half way into the body of the auditorium.

Some styles of print are more legible than others. "Generally san serif styles . . . tend to be most compatible to the character of visual

form since their structure is formalized rather than elaborated."[39] Standard typewriters and computer printers generally do not produce print sizes that will be legible when projected on a screen. The material displayed on the screen should be simplified and exaggerated for best effect. Captions, labels, or titles should be laid out horizontally since text displayed vertically or at an angle is not readily readable. Each illustration should depict one central idea and be expressed in familiar symbolism. When presenting narrative material, the number of words on each visual should be kept to a minimum. A speaker should not speak from an outline projected on a screen, much less speak to it. The visual should present a high contrast between image and background. Black on dark colors such as red or blue will not provide sufficient contrast.[40] The ambient lighting in the room is another important factor in audio-visual presentations.

In many business and government organizations of any size, there are printing and graphic arts specialists available to assist communicators. It is wise to consult the experts and listen to their advice. To do his job well and to communicate effectively, a speaker should also find out as much as he can about the environment in which he will be speaking. This would include the make-up of the audience as well as the physical facilities such as room size and audio-visual equipment available.

The communicator, in a sense, serves the intended recipient in any communications process. He must <u>always</u> keep the intended recipient in mind when preparing and transmitting his message, or the message may never enter the recipient's mind at all.

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33. Ibid., p. 24.

34. Waite, p. 37.

35. Anna C. Rodgers, Graphic Charts Handbook, p. iv.

36. Reidinger, p. 20.

37. George Ledin, Jr. and Victor Ledin, The Programmer's Book of Rules, pp. 60-61.

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40. Defense Supply Agency, DSA Handbook 5025.4, 1972, pp. 7-8.

GLOSSARY OF PRINTING TERMS

Arm - Short horizontal strokes, as in E, F, L, T, or inclined upward as in Y, K.

Point - A unit of measurement equaling .01383 inch, the basis of the Anglo-American point system.

Serif - The beginning or terminal stroke drawn at right angle or obliquely across the arm, stem, or tail of a letter.

Stem - All vertical strokes of a letter, and full length strokes as in V, W, and Y.

Tail - Short downward strokes, as in K and R. The term is used for the Q, even when it is a curved, horizontal stroke.

Weight - A letter's relative amount of blackness.

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APPENDIX 1
Examples of Type Sizes

Serif

BOLD	MEDIUM
6 pt	6 pt
7 pt	7 pt
8 pt	8 pt
9 pt	9 pt
10 pt	10 pt
11 pt	11 pt
12 pt	12 pt
14 pt	14 pt
18 pt	18 pt
24 pt	24 pt
30 pt	30 pt
36 pt	36 pt
48 Pt	48 Pt
60 Pt	60 Pt
72 Pt	72 Pt

APPENDIX 1
Examples of Type Sizes

San-Serif

BOLD	MEDIUM
6 pt	6 pt
7 pt	7 pt
8 pt	8 pt
9 pt	9 pt
10 pt	10 pt
11 pt	11 pt
12 pt	12 pt
14 pt	14 pt
18 pt	18 pt
24 pt	24 pt
30 pt	30 pt
36 pt	36 pt
48 Pt	48 Pt
60 Pt	60 Pt
72 Pt	72 Pt

APPENDIX 2

FIGURE 1

This is an example of how unconventional spacing and less than optimum visibility type size can make text difficult to read. What you are reading is only a simulation, but it approximates the type and spacing that were used in an article on human communication in the future. The style and spacing are so unlike what we are used to reading that it is jarring to the eye and distracting enough to distort the reader's perception.

If our message is important enough to publish, it deserves to be designed and printed in a manner that will be appealing and readily comprehensible to the intended reader.

Figure 1 was typed in 8 pt type.

FIGURE 2

Author Index

Subject Index

Figure 2 was typed in 6 pt type.