THE PRINTED WORD

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Introduction

Irrespective of the value of the communication, all printed matter can be divided into two definite areas. The first requires little or no reader participation and is judged purely upon the needs of the reader - choice of newspaper, author, subject interest etc. The second in which the reader or user of the printed material has demands made upon him in the form of making a decision based upon the information, giving asked-for information or performing a function and acting on given instructions. In the second area legibility, comprehension and presentation are the main concern.

We are all subjected in one way or another to printed material that requires action on our part, from completing a tax return, taking an examination or attempting to construct a model from a kit of parts, and have found that the speed at which the job is completed, or the success or failure from acting upon written instructions, is dependent on the way that the chosen words or instructions were presented, either with or without illustrative aids.

There are applications where the visual display of words that demand positive action on the part of the reader fall outside the area of printed matter. Motorway signing systems, warning and informative notices etc. are such examples and have, in addition to the factors of legibility, comprehension and presentation the new factors of Time and Distance in achieving communication effectiveness.

These new factors, which are not critical in normal word presentation, dictate that presentation of the legible and comprehensive parts is critical in an application where there may be no allowance made for misunderstanding on the part of the reader.

Design Objectives

A resume of the chief attributes of printed material that is intended as the sole means of communication, not supported

by spoken commentary or illustrative prompting and instruction, would read as follows:

1. Its ability to give information accurately and concisely
2. Its ability to possibly seek information
3. Its ability to collect that information, and
4. Its ability to allow easy retrieval of the sought and collected information.

In other words, communication can sometimes be a two-way process.

The success of communication by the printed word could be placed upon three factors:

1. The use of common-sense when constructing the words of communication
2. The ability of the writer or communicator to view a specialist subject through the eyes of a non-specialist, illiterate or semi-illiterate reader, and
3. The ability of the writer or designer to present the written information in such a manner as to enhance and predict its effectiveness.

Together with these factors must be put the understanding of production techniques when applied to the financial resources available.

The choice of type-size, for example, can be determined by several factors including:

1. The amount of text to be set
2. The amount of space available on the page for the text
3. The normal lighting conditions in which the material is meant to be read. For instance, if it is to be read in natural lighting then a smaller type-size is used than if read as, say, an instruction or maintenance manual under a tractor or down a mine in poor lighting conditions
4. The distance at which the material is meant to be read. If it were a poster or explanatory wall diagram, then a larger type-size would be used than if it were a piece of hand-held material intended for use at normal eye level and distance
5. The age or educational status of the reader. Children, semi-illiterate or old people may find difficulty in reading so the easier it can be made the better, and one would use a larger type-size than that employed for the educated reader in full command of his or her sensory powers.

All production techniques can be chosen by determining the factors of use, together with the finance allotted for production and the availability of the technique.

It has been mentioned that common-sense is a prime factor in the construction of the written word. An extension of this common-sense could be in the form of defining one's own ability in the various areas of design and production, and a rational look at all the factors governing the presentation of information can be seen as being part of this. A check list of these factors enables you to structure both the design and production more effectively, and might read as follows:

Type of publication:	Book Booklet / Leaflet Poster Other
Type of information:	Statistical text Statistical diagram Explanatory text Explanatory diagram General information
Type of text:	Informative Technical (either statistical or explanatory) General
Type of illustration:	Objective Symbolic Abstract
Type of reader:	Illiterate (reader in this case means user) Semi-literate Literate General
Location of reader:	Rural Urban General
Age of reader:	5-15 15-60 60+ General
Supporting material:	Is other information to be used in conjunction with the publication (printed or verbal)?
Distribution:	How is the publication to be distributed? By mail By hand to the reader Collected by the reader Other
Retrieval:	Does the publication seek information from the reader, and how is this gathered information retrieved?
Resources:	What resources, creative, production or financial are available?

Each one of the above, or any other factor contained in a check list requires a selective decision which, when made, will provide the basis on which design and production can be implemented, either with or without professional assistance.

Production of the printed word

The first requirement in the production of the printed word is the means by which the individual characters or letters in the word are assembled ready for printing.

The techniques for letter-assembly or type-setting can be basically broken down into four areas:

Hand composition, which indicates the manual placing in position of these individual letters. The modern technique hardly varies in principle from the invention of moveable type in about 1440. Each letter is an individually cast piece of a lead alloy which bears the characteristics of the letter in reverse, so that when printed it appears correct and the right way round.

Mechanical composition in which the letters are assembled either in complete lines of type (Linotype) or as individual letters made up as lines (Monotype). Like hand composition, mechanical letter-assembly is based upon hot metal.

Photo-composition This method is used increasingly as an alternative to hot metal and is primarily a photographic technique. The individual letters are placed in position on a negative matrix and either by manual selection or by using a keyboard, are positioned between a light-source and photographic paper which is then exposed to give the images. A unique aspect of photo-composition is that it is not limited to the fixed sizes that are used in hot metal, and although using the same size ranges as that method, can complement these with intermediate sizes to suit certain applications. The ability to distort letters and spacing is also unique to this method.

Capable of very fast setting speeds, photo-composition can be used for a variety of applications.

Cold Setting Any method other than the above, especially those which depend upon the use of manual or electric typewriters or the IBM composing system are classified under this heading. The advantage of this method is in the fact that type-setting can be supplied by the ordinary office typewriter and typist without resorting to specialist and costly skills and equipment. The operating of the IBM units requires some training, and the resulting type-setting can be compared with that obtained by the more traditional methods. In the majority of applications where speed and economy are the main limitation, this method is ideal, provided that limitations regarding type-size, style and their use is worked to and the skill of the typist is not overestimated.

Tabular matter set by conventional typewriter

'KODAK' COLOUR FILM AND SIZES AVAILABLE		METER SETTINGS AND LIGHTING BALANCE
'Kodachrome' II for Daylight	135,828	Daylight ASA 25
'Kodachrome' II, Type A	135	Photoflood ASA 40
'Kodachrome-X'	126,135	Daylight ASA 64
'Ektachrome-X' (Process E-4)	126,135,127,120/620	Daylight ASA 64

The same copy set by an IBM composing unit

'KODAK' Colour Film and Sizes Available		Meter Settings and Lighting Balance
'Kodachrome' II for Daylight	135,828	Daylight ASA 25
'Kodachrome' II Type A	135	Photoflood ASA 40
'Kodachrome-X'	126,135	Daylight ASA 64
'Ektachrome-X' (Process E-4)	126,135,127,120/620	Daylight ASA 64

Hot metal typesetting showing headings and sub-headings

National Youth Orchestra of Great Britain

Rimsky-Korsakov

The Russian Easter Festival
Overture Op 36

Rimsky-Korsakov remained, for much of his life, unsatisfied by the dogma of the Russian Orthodox Church, and found himself more attracted by ancient Slav paganism and by mysticism. But in 1888 he attended Easter morning service in St Petersburg, and was so impressed by its colourful nature that he decided to write an Overture for orchestra

Elements of the printed word

About a quarter of the world's population has learned to make itself understood with the symbols, or letters, of the Latin alphabet. Some can decipher it easily, others find it more difficult. Letters are the individual parts of the alphabet, and the basic shapes of these letters cannot change and their function is fixed. Variations of these basic shapes have been made however, and are used as aids to comprehension and should be considered as just as much a part of the communication factor as the words that make up the message. These variations are available in the shape, size, weight, width and slope of the standard letter, each has its use and each can be misused.

Spaces that appear between each letter is automatically provided in all systems of composition, but in photo-setting, these can be varied to suit the text.

Type-faces are distinguished in two forms: those with end lines (serifs) and those without (sans serif) and there is a large selection of type-style in both forms. Usually books, leaflets and any printed material that is intended for continuous reading at normal eye level and distance are set in the serified form which is known as 'Roman'. This form is easier to read, especially in the large areas of text that are found in books, as the serifs act as leaders onto the next letter and word, and the eye tires less easily. Sans serif is more suitable for use in technical and tabular matter.

Both forms are available in all three systems of composition, although if an ordinary typewriter is used, the letter form will vary slightly from that used to type these notes.

Capital letters are known as 'caps' and small letters as 'lower case'.

Measurement The unit of measurement used in printing is the 'point' abbreviated to 'pt'. There are two point systems in use, the English/American (used in Great Britain and the United States and areas under British or American influence) and the Didot (abbreviated as 'D') which is used in all other areas.

The point (pt) itself is approximately 1/72", and type-sizes are arranged in single point increments from 6 to 12pt for bookwork and text setting, by two points from 12 to 18pt, by six points from 18 to 48pt and by 12 points from 48 to 72pt for display setting. As already mentioned, photo-composition, whilst basically using the same increments, can produce sizes outside this scale for special requirements.

Weights and widths Apart from size, letters of any one type-style also differ in the graduations of weight and width. Weight indicates the various thicknesses of strokes in relation to the height and spaces within the letter-form and is usually graded as light, medium, bold and extra bold. There is no standardization of this weight factor, and a bold in one type-style varies from that of another.

Widths are the vertical outer dimensions of the letters. They are in definite proportion to the weight of the letter. Many type-styles are available in only one width, but others offer several, including: extra condensed, condensed, expanded and extra expanded.

Slope In addition to upright letters, or those which are at right-angles to the base line, sloped, or italic, type is also available. Letters in italic slope in one direction only. All type-styles contain an italic version and like variations of weight and width can be used, in conjunction with standard, upright letters, to gain emphasis in text as well as being used where differentiation of certain areas is required.

The word Words are combinations of single letter, and are placed on the page in the order of speech, using spaces to separate individual words, one from another.

A line which contains words and spaces must have optical coherence, i.e. the words must be clearly recognizable and not run into one another. Care must be taken in that the space between words is not too great so as to disrupt the flow of reading. A normal space between words is of a fixed size and regularly repeated.

When word spacing for larger type-sizes (headings of display setting) the spaces may have to be modified as irregularities in letters at the end and beginning of words become apparent and require optical spacing.

The line and column Lines consist of words arranged one after the other, and are placed one on top of the other in a column, with either the natural, built-in space (set solid) or extra space (leading) inserted between the lines in order that a greater degree of legibility is achieved.

The width of a column is usually determined by the number of letters that have to be accommodated, and usual practice is that a column width that contains between 40-60 letters is satisfactory for most needs, and ensures a line that is not too tiring to read and allows the eye to find its way back to the start of the next line.

Lines in columns can be arranged in four ways:

(1) Justified or set full out with lines flush at both the left and right hand side of the column. Word breaks at the end of lines are hyphenated.

(2) Unjustified - ranged left with the lines flush at the left hand side of the column only. These notes are set in this manner which is the usual style for office typewriters.

(3) Unjustified - ranged right with the lines flush at the right hand side of the column. Rarely used except in certain tabular work because of difficulty in reading.

(4) Centred The symmetrical arrangement of the lines on each side of a vertical axis. This type of column is not suitable for text and should only be used in display work.

Examples of type sizes and weights

Justified setting

Ten members of the staff of the Division of Forest Research have undergone a three-day course in public speaking.

It was requested by members of the staff who felt they could benefit from some tuition in the art of communicating with the public, talking to industry and special visitors, and speaking at seminars and lectures and to

Unjustified setting ranged left

By contrast the remainder of the book is far more successful. Backed by tables and appendices, this gives briefly explicit descriptions of nearly 700 species of trees and shrubs, with excellent colour photographs of many of these. Inevitably the coverage is selective, and one could quibble at some of the choices (e.g., no *Eucalyptus microcorys;* only *F. macrophylla* among the *Ficus*). However, in all, this part fully justifies the book's existence.

Printing

Methods of producing the printed image suitable for everyday needs can be defined in three distinct areas:

1. Letterpress The traditional method of printing from a raised (relief) surface from hot metal type-setting. Illustrations can be in the form of line blocks for work containing solid or pure line areas or half-tone for the reproduction of photographs or illustrations containing variations in tone.

2. Offset lithography Based on the principle of grease and water not mixing, a flat metal or paper plate holds the inked (grease) printing area and the non-printing area, which is kept wet, on the same surface.

   The printed image is transferred onto the paper via a rubber offset roller. Preparation for lithography is done in the form of 'artwork' which is the pasting-up of both type-setting and illustration in position ready for photographic transferring onto the place. Type-setting can be either hot metal, photo or cold composition. This method is increasingly used in the production of all manner of printed material from books and leaflets to newspapers.

3. Silk screen A very quick and cheap method of printing posters, display material and other publications not containing small size illustrations or type-setting. Fine nylon mesh is stretched over a frame and the non-printing areas masked off either by hand or photographically. Ink is squeezed through the open, printing areas onto the paper.

Calculations

The area required for type-setting original typescript can be calculated. Type-face manufacturers provide charts with which it is possible to make these calculations based upon the type-style, type-face used together with the number of letters in the original manuscript and the width of column to be used.

This procedure is known as 'casting-off' when counting the number of letters in the manuscript and 'copy fitting' when estimating the amount of space required to 'fit the copy'.

It is suggested that unless you have a working knowledge of these calculations it is left to the typographer or printer to work out the exact area which your copy will require, for not only will it be difficult to learn the system in the short time available at present, but there are other working terms such as 'ems' and 'ens' that could cause confusion.

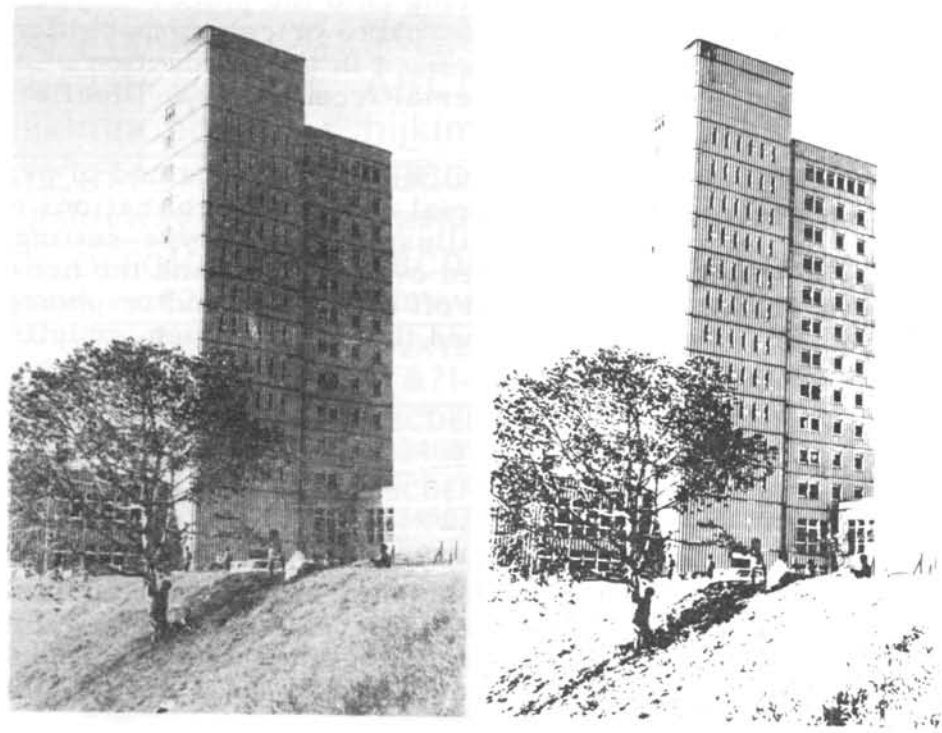
Illustrations

The choice of illustration and its reproduction are sometimes paramount in the effectiveness of communication in being able to explain or demonstrate one particular part of the information that would otherwise take time in writing and possibly understanding.

Reproduction of illustrations is in two forms - Line and Halftone.

Line illustrations are, as the name implies, made up of solid areas or lines without tonal areas. The preparation for these illustrations is in the form of black and white originals, and any tone that may be required is introduced at this stage as a pre-printed area of dots or other linear devices that gives the appearance of a tone of the solid colour.

Line illustration developed from a continuous-tone original



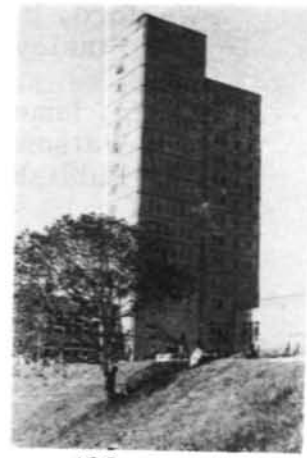
Half tones are prepared from continuous-tone photographic originals, and in order that they can be printed, must be rephotographed through a screen that breaks up the whole of the tonal areas into a series of dots that progressively increase from very small for the light areas to large for the dark tones.

The size of these screens is based upon the number of dots to the inch.

Course screen half-tone illustration

65 screen

85 screen



100 screen

It is important that the correct screen is used on paper for which it is suitable, and will avoid the loss of definition which might be critical in the illustration.

If finance allows only the cheapest method of production with the cheapest type of paper, it might be worth considering a simplification of the illustrative material in the form of line instead of halftone provided that the detail required to be shown is not lost.

Communicating with the printer

So far we have only dealt with outgoing communication or that which has an effect upon the reader in the giving of instructions, information etc. There is also communication that has to be made with the printer or whoever is producing the material.

As with outgoing communication, the information given to the printer must be clear, concise and to the point. In the situation where you are dealing direct with the printer and not relying on his design services he will need to know the following:

1. Size of publication (in either trimmed or folded Imperial sizes or the International 'A' sizes), and the approximate number of pages.
2. Number of colours to be used.
3. Type of paper (if a choice is allowed).
4. Amount of text.
5. Number of illustrations and whether line or halftone.
6. Binding or finishing requirements.
7. Quantity needed.

and the original manuscript must show clearly any alterations to text, words or passages to be set in bold, italic or any other variation of type-style.

Further reading list

Rudolf, Hostettler (1949) The printer's terms.
Hermann Strehler, St Gallen (Switzerland).

Warford, H S (1971) Design for print production.
Stanley Focal Press, London.

Craig, James (1974) Production for the graphic designer.
Watson-Guptill Publications, New York, Pitman
Publishing, London