

GRAPHIC ARTS: A TEXTBOOK OF BASIC THEORY, PROCEDURE AND PRACTICE

by

JOHN ALDEN KRIDER

B.A., Kansas State University, 1967

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Journalism and Mass Communications

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1976

Approved by:


Major Professor

LD
2668
.T41
1976
K75
C.2



A11209 480745

TABLE OF CONTENTS

Chapter

I. INTRODUCTION.....	1
QUALIFICATIONS OF AUTHOR.....	2
II. CURRENTLY AVAILABLE GRAPHIC ARTS TEXTBOOKS.....	3
GENERAL OBSERVATIONS.....	3
DESCRIPTIONS AND CRITIQUES OF EXISTING GRAPHIC ARTS TEXTBOOKS AND SUPPLEMENTARY SOURCE BOOKS.....	5
III. PLAN FOR A NEW GRAPHIC ARTS TEXTBOOK.....	35
CONTENTS OF PROJECT TEXTBOOK.....	36
DESCRIPTION OF CONTENTS.....	37
Appendix A. MANUSCRIPT OF PROJECT TEXTBOOK.....	

CHAPTER I

INTRODUCTION

The graphic arts industry embraces a loose collection of professions which have one common goal: producing effective printed communications. Writers, editors, designers, graphic artists, illustrators, typographers and printers all work toward this goal.

While these disciplines together accomplish the graphic arts process, they all too often are isolated in their own narrow endeavors. Much of that isolation may stem from basic education patterns. Training for printers consists of acquiring technical skills needed to manipulate their machines; writers are taught to labor over their words, honing them to sharpen the communicative value; designers are schooled in esoteric principles of visual responses; artists and illustrators shut themselves away to perfect techniques with various media.

While all these distinctly separate courses are followed by those training for the various disciplines within the graphic arts industry, far too little importance has been placed on their inherent interdependence.

Journalism and commercial art students at the college level are in an excellent position to view and train for the graphic arts process in its entirety. Universities offer the unique breadth of interdisciplinary training which can be found few other places.

Modern liberal arts colleges, far more than technical schools or art institutes, have the resources available for training graphic arts personnel in the broadest aspects of the craft.

College courses in graphic arts theory and practice have existed for many years. They generally have served a useful purpose, but in a limited way. The limitation seems to have been caused by a failure to pull the wide-ranging material together. Integrating the hard mechanics of the printing process with the subtle principles of design theory is an awesome task.

This work seeks to accomplish that task by proposing a new basic graphic arts textbook for college-level journalism and commercial art students.

Qualifications of Author

For the last decade the author of the project textbook has been engaged in the graphic arts business as an editor, designer, commercial artist, creative director, teacher and lecturer. He has been responsible for the preparation of a wide variety of publications ranging from letter-head and envelope design to production and design of books, magazines and catalogs.

CHAPTER II

DESCRIPTIONS AND CRITIQUES OF EXISTING GRAPHIC ARTS

TEXTBOOKS AND SUPPLEMENTARY SOURCE BOOKS

A number of graphic arts textbooks are on the market for college-level courses. Each has its own character and possesses its individual strengths and several have been written by widely-noted authorities in the industry.

Why prepare and publish another?

The author has read, reviewed and attempted to teach from a number of the available texts. None has been satisfactory for a variety of reasons.

General Observations

In general, the available texts seem to be too verbose or ignore altogether important areas of graphic arts theory. Many texts omit or lightly cover the principles of design. Others which do devote considerable effort to design present it as a hodge-podge of examples of well-designed pieces, with little or no organization.

None of the textbooks available meets this simple test: clear, simple descriptions of procedures involved, uncomplicated by overly-detailed descriptions of machinery. It is the author's conviction that students get confused in the "cogs and gears" approach to technical information. One text reviewed contained more than 40 pages on silk screen processes. That is more than anyone wants (or needs) to know about silk screen unless setting up a business. If that is the case, there are a number of excellent books available which cover the subject in more minute detail.

All of the available textbooks rely heavily upon photographs to enhance and illustrate the written text. It is the author's contention that photographs are usually not the best medium for conveying specific technical information. A photograph of a Linotype or Ludlow machine really tells the student nothing except what the machine looks like---its outline form and mass---it conveys no information as to the machine's capabilities or uses. Simple diagrammatic drawings have proved far more valuable to the author when explaining techniques, processes and equipment.

Much of the writing in standard available texts is convoluted and overly detailed. For example, one text contains the following explanation:

After casting, matrices are lifted to the top of the machine and pushed back over the magazine. They are supported on a triangular, grooved distributor bar, and hang from the teeth that are arranged in a characteristic triangular pattern at the top of the matrix. Grooves in the bar are keyed to the tooth combination just as a key matches notches in a lock. When the matrix is directly above its proper channel, it is released and drops down for immediate reuse.¹

This description is accompanied by an air-brushed photograph with letters pointing out the various parts of the mat distribution system.

The corresponding statement in the project manuscript is as follows:

Once the line is cast, the brass molds are automatically returned to their storage areas, ready to be used again in another line.²

A line drawing accompanies this statement, showing the casting and distribution process.

Students do not need to know how to repair the distribution system of a Linotype, they merely need to know that it is there and it works. Certainly the distribution system is a very important part of the machine, but in the broad context of typographical composition, it is a small matter. What is important about the machine is what it produces---its capabilities, and how they are translated into the editor's and designer's desires.

Description and Critiques of Specific Books

THE GRAPHICS OF COMMUNICATION:

Typography, Layout, Design

Arthur T. Turnbull and Russel N. Baird, Second Edition, Holt, Rinehart,
Winston, New York, 1968

Description

The text is divided fairly equally (in number of pages) between nuts-and-bolts mechanics and the more abstract design principles.

In the preface to the book's first edition, the authors set the guiding premise: "... (t)he successful journalist must have a practical knowledge of the mechanics of production as well as a keen awareness of the principles of design to function effectively in any of the diversified areas of communication."

The text then sets out to uphold that premise by treating some communications theory; a historical background for graphic processes; today's reproduction methods; type and typefaces; plates and presses; paper and bindery; and design elements of typography.

In the typography section, the authors bring readability studies into consideration when designing a printed piece.

From this base, the text launches into a single chapter on layout and design principles. "Creative" type usage follows, along with copy preparation, and a section on the mechanics involved in preparing art and photos for printing. The authors then turn to two chapters devoted to the specific areas of newspaper and magazine design.

A final chapter, devoted to planning other printed pieces, gives information on special paper considerations and standard unit sizes.

The two appendices in the text give a list of characters per pica of selected typefaces and a brief showing of some "commonly used" typefaces.

The text's glossary is large and includes most-used printing and graphics terms.

Critique

While this text is, by far, the best of any reviewed, it is a bit pompous and verbose. The illustrations are generally clear, but there certainly could be more of them. For example, the authors take nearly five pages to explain the point system of measuring type. The only illustrations in the section are various sized rules, decorative border material, dashes, brackets and decorative letters. Now, I believe the best way to teach the point system is to illustrate it graphically, and compare it with a familiar measurement--the inch or the centimeter. The authors take paragraphs of text to do what a simple line drawing would do with more impact. Nowhere do they actually show how big a point or pica is.

The mechanical sections are overly-adequate and suffer from over-writing and relying on photos of machinery rather than drawings and diagrams of basic concepts.

The design principles section flows pretty well, but it, too, suffers from over-writing. The authors have included the basic elements of proportion, balance, contrast, rhythm, unity and harmony. No attempt is made to inter-relate these "big six" elements--a mistake, I think. Certainly, it is easier to just illustrate each principle separately and go on to the next one, but I would like to see a series developed that builds a single layout using each principle forcefully enough to show their relationships.

The sections on newspaper makeup and magazine layout seem adequate but they appear a bit dated and not particularly pragmatic.

In short, this volume does a good job of pulling together mechanics and design, but I feel the design section wasn't given the same methodical, pragmatic attention as the other sections.

While there are as many "rules" for layout design as there are designers, I think that it could be useful to present some sort of skeletal "do's and don't's" for the beginning designer.

EXPERIENCES IN VISUAL THINKING

Robert H. McKim, Brooks/Cole Publishing Company, Monterey, California, 1972

Description

A heady volume intended for college-level design students of all types. The book is as much a workbook as a straight text, as there are numerous exercises which illustrate rather abstract and esoteric thoughts.

Living up to its title, the volume presents many situations for the reader to "experience."

McKim traces psychological and sociological research on the thought process. "What is thinking?" he asks. He then answers by saying that it's hard to say, but it is both a psychic and somatic function.

From that premise, McKim moves to tying the somatic function with vision, then, describes "visual thinking."

The author discusses levels of consciousness, imaging, and ambidextrous thinking--presenting visual puzzles and diagrams to illustrate.

In a carefully-constructed chart, McKim presents a jargon-filled list of "strategies" which are shown throughout the book. There are chapters and exercises on "purging," "recentering," "subjectifying," "synthesizing" (or generative alternatives), and "idiom changing."

In total, the text seeks to stimulate the student into new, or at least unfamiliar, patterns of visual thought.

Critique

My first reaction is to recoil so strongly at the academic jargon that permeates this book so as to deny its usefulness. With the right instructor leading the student through the maze (armed with a dictionary of psychology), the book presents some interesting and thoughtful ideas.

What the impact of the text on an incoming freshman would be, I would hesitate to say, but I have a strong feeling that if the author had applied some of his visual exercises to his writing skills, he would have fared much better.

Having that off my chest, I think there is some useful material presented. The urge to categorize every variation of the visual perception process, however, gets in the way.

The invention of terms like "graphic ideation" serves only to muddy already dirty waters.

McKim's chapter titled "Out of the Language But" is probably the most effective in the text. Here he discusses the relationship between thought and language and reproduces Vygotsky's double-circle schematic of that interaction. Instead of using Vygotsky's two circles of "thought" and "speech," however, McKim plugs in "visual thinking" and "graphic language." Where the circles overlap and Vygotsky gets what he calls "verbal thought," McKim gets something called "graphic ideation."

In this chapter McKim also introduces Ogden and Richards' model which relates thought and language not with two circles, but with a

semi-open triangle. The apex of the triangle is "thought," the left corner is "symbol," and the right corner (connected by a dotted line) is the "referent." Ogden and Richards' model introduces the concept that the language symbol stands for, but is not the same as, the referent. It works nicely.

On the whole, I think that the book is tedious, and, although it is trying to present elusive, abstract thoughts, it could have done a better job of sorting it all out.

INK ON PAPER

Edmund C. Arnold, Harper and Row, New York, 1963

Description

Ink on Paper is perhaps one of the most used textbooks in the graphic arts field. It is subtitled "A Handbook of the Graphic Arts," and includes a full set of chapters covering all necessary topics.

The book begins with a chapter outlining the development of the written language and follows it with a unit tracing the historical evolution of the Latin alphabet. Continuing the emphasis on words, Arnold then presents chapters on type forms, printers' terms, hot metal composition, copyfitting and proofreading.

Cold type composition isn't introduced until near the end of the text---the fifth from the last chapter.

After the first seven chapters dealing with words and type, Arnold presents two chapters on layout and design of printed pieces. The book then moves to units on letterpress printing, the production of letterpress plates and engravings, intaglio printing and offset lithographic printing. Among these units, Arnold includes two chapters on color theory and color printing.

A section on the craftsman as an artist (The Fine Arts) precedes the "cold" type chapter. The book concludes with chapters on paper, ink, bindery operations and planning of printing.

A glossary and index complete the textbook.

Several of Arnold's chapters stand out as rather unique in the graphic arts textbook field. The opening two units on the development of written language and the Latin alphabet as well as the section on the fine arts and the final planning section are additions to the normal table of contents.

Critique

Edmund Arnold's book is a complete one---perhaps overly complete. It has a tendency to belabor insignificant points and, by so doing, enlarge their importance out of proportion to their usefulness.

The opening chapters on the development of the written language and the development of the Latin alphabet are rich and interesting. Their place in a textbook of this sort, however, is questionable. Because of their laborious detail, they tend to hog the book down from its first sentence. I found myself urging Arnold to "get on with it."

Basic organization of the book seems adequate with the exception of the misplaced chapter on offset lithography, and the "lost" chapter on cold type production. The offset chapter is five chapters after the letterpress section and the cold type chapter is removed from the "Setting Type" unit by 12 chapters. Why cold composition was not included in the typography section is difficult to understand.

Arnold's writing is somewhat labored and overly-detailed. It suffers trying to include descriptions of every tree in the forest at the expense of describing the forest itself.

For a textbook of this size (323 pages) there are far too few illustrations. The author relies on long text narrations to attempt to accomplish what simple illustrations would do more forcefully.

Each chapter is followed by a list of suggested readings on the particular subject. The bibliographic notes are helpful, and the book's glossary is full and complete.

It is understandable why this text has become a standard teaching aid. It is probably one of the most complete compilations available. It is somewhat dated in terms of outlook. The out-of-door placement of offset production and photocomposition indicates the author's disdain for those methods.

A combination of extremely dedicated students and particularly gifted instructor would provide this text with the support necessary to make a solid contribution to the knowledge of graphic arts techniques.

A SURVEY OF THE GRAPHIC ARTS

Frank Mathews, Stipes Publishing Co., Champaign, Ill., 1969

Description

A graphic arts textbook devoted almost exclusively to the mechanics of printing and related operations.

In the book, Mathews takes a step-by-step approach to how printing occurs and all mechanical operations attendant to printing.

Starting with the four basic methods of reproduction, Mathews moves to the history of printing, which is rich and detailed.

After a detailed study of letterpress methods, Mathews classifies illustrations. In this chapter, he arranges, side-by-side, a continuous tone photograph, an ink wash and a line pen-and-ink drawing. Explanation

of the differences inherent in the mechanical reproduction of these types of art is given and then, in the next chapter, Mathews shows how each are reduced to metal for letterpress printing. Later chapters go through the steps for offset and gravure printing.

Reproduction photography is covered extensively, and with that background, Mathews is able to give offset lithography one of the soundest explanations possible.

A chapter on phototypesetting precedes a detailed section on color separation. The color section is unique to most graphic texts, as are the following chapters on printing tints, shades and tones, and duotones and flat-color halftones.

Chapters on paper manufacture, printing inks and finishing and binding operations precede a chapter on selecting and buying paper. Comparison of printing methods (what Mathews calls the "big three") is contained in a chapter which also includes explanations of dry offset and wrap-around letterpress.

Electrostatic printing is also explained.

Chapter 20 deals with economics, how to figure costs and how to place an order with a commercial printer.

As almost an afterthought, Mathews includes a final chapter titled "Layout, Type and Artwork." In this final chapter, he treats layout, design, typography (as it relates to overall design), photo cropping and scaling, artwork and camera-ready paste-ups.

Critique

In terms of mechanics, Mathews' book is one of the best. He methodically explains every technique in fairly lucid terms. He tends at times to get a bit tangled in his own web of explanation, however.

The overall organization of the text seems appropriate---except for the final afterthought chapter dealing with design and artwork. It seems to me that these techniques should be included earlier---even in a text that's almost exclusively mechanical in nature. Somehow a relationship between the cold machines and the warm nature of design of graphic elements should be drawn.

The sections on color separation and tints, shades and tones are excellent and are too infrequently included in graphics texts---or at best, merely explained away. Mathews gives these items full and adequate treatment.

Although the final section on layout and art leaves a lot to be desired, it does include the process of cropping and scaling photos---another important operation all too often left out or under-explained.

Mathews' book is true to its title: it is, indeed, a complete survey of the graphic arts. It suffers from being somewhat over-written and by seriously short-changing design and layout impact in the graphic arts.

GRAPHIC ARTS PROCEDURES

R. Randolph Karch, American Technical Society, Chicago, 1948

Description

One of the "old classics" in the graphic arts field, this is a textbook in every sense. Organized on a "How To" basis, the book starts with "How to Understand the Printing Processes," and therein briefly describes the four main printing methods. Karch returns later in the text to detailed discussions of each method, including press techniques, operation, platemaking, etc.

Moving to typography, Karch includes a large amount of historical material which is beneficial in understanding the development of letter forms.

"How to Make Layouts" includes detailed copyfitting methods and a long list of scale numbers for hundreds of type faces. "How to Make Layouts," deals almost entirely with typographic display.

The book's next "How To" chapters are necessarily dated, but they describe setting type, copy preparation and proofing, locking up a form and imposing pages. Chapters detailing how to run various presses follow, then a chapter on how paper is made.

Bindery work is described next and, finally, "How to get a Job in the Graphic Arts." Much of this material is dated, also.

Critique

For a textbook that's this dated (1948), I find myself referring to it as much as any other I own. The long sections on how the Linotype and Ludlow work, plus the laborious sections on press operation are a bit too detailed for the average student, but they are fairly well written and present the material clearly.

I think the best section of the text is the history of typography chapter, which traces early forms of Roman, Gothic and "Humanistic" styles of expression to present day (1948) typefaces. Strangely enough, not much space is given to the sans-serif styles, which were particularly popular in the couple of decades preceding publication of the book.

This text has by far the largest display of type faces and descriptions of each face than any other text I've seen.

Unfortunately, the author does not even hint at some of the basic principles of graphic design, nor does he give the impression that they might even be a part of the whole picture.

The technical sections are, of course, wholly out-of-date. The basic technique of a halftone engraving is there, but it is shrouded in antiquated etching methods.

Offset printing is treated lightly, befitting its importance in 1948. What is presented, however, is basically sound, with the exception of the lengthy description of the egg albumin and deep-etch methods of plate preparation. I don't think anybody sensitizes his own plates anymore.

All-in-all, this is a comfortable book--it is superior in organization and presentation of the material than some of the modern attempts.

THE POCKET PAL

Graphic Arts Production Handbook

International Paper Company, New York, 1974

Description

The Pocket Pal is a small paper-bound handbook published by the International Paper Company since 1934. The current edition is the eleventh revision.

The volume contains one of the most complete ranges of technical information about the processes of printing. Sections on stripping and imposition, graphic arts photography, and platemaking are full and technically detailed.

The handbook begins with a chapter on the history of printing before presenting a unit on the future of the craft. This section presents

material on facsimile transmission, micropublishing, electrostatic printing, solid-state printing and jet printing.

The handbook then moves to the more conventional methods and presents letterpress, gravure, offset, silk screen and xerography.

Type and typesetting is treated next, including material on readability and legibility, printer's measurements and proof reader's marks. The following chapter treats copy and art preparation. Graphic arts photography is discussed in detail in the next chapter before moving to complete chapters on stripping and imposition, platemaking and press techniques of the major printing forms.

Binding, paper and printing ink all occupy a separate chapter, and the handbook concludes with an expansive glossary of terms. The final four pages display types of paper made and sold by the publisher.

Critique

The Pocket Pal is an excellent reference source for all mechanical production procedures in the graphic arts. It includes a great amount of material which is highly technical (particularly in the graphic arts photography and stripping and imposition sections).

The writing is concise, and very brief. It suffers, however, from the technical vantage point and the general lack of explaining "why" things should be done the way they should.

There is, of course, no material on layout and design of printed pieces. A small section covering preparation of camera-ready layouts is included, but covers only the mechanics.

The chapter on papermaking is one of the clearest, most well-developed in the handbook, as well it should be, since the handbook is published by a paper company.

In general, no beginner in the graphic arts field should be without a Pocket Pal. Its glossary alone is worth the price of the book. Its excellence as a working handbook, however, does not make it a good classroom text. It suffers in this regard from too much technical material and a nearly complete failure to relate theories and procedures to the whole.

As a supplementary reference work, the Pocket Pal is without peer.

PRINTING AND THE ALLIED TRADES

R. Randolph Karch, Pittman Publishing Corp., New York, 1962

Description

In the 21 chapters of the main text, Karch covers nearly all of mechanical processes related to printing. Starting with the history of printing, he moves to printing processes where he includes the four major forms as well as xerography. The next chapter explains type and type faces and presents typographic measuring systems.

Karch includes a separate chapter on spacing material before presenting a detailed chapter on hand composition. The four chapters which follow are all related to hand composition: proving and correcting, distribution of type, border and rule, and layout and display composition. In all, there are seven chapters dealing with foundry type composition.

Before moving to hot type composition, Karch includes a chapter on commercial printing which shows how many standard pieces are prepared.

Illustrations of these items are included.

A chapter each on hot type composition and cold type composition follows, then four chapters on letterpress operations: lock-up and imposition, letterpress printing presses, letterpress printing plates and duplicate letterpress printing plates.

A section on ink and color precedes the single chapter on offset lithography, collotype and gravure.

The main part of the text is concluded with chapters on bindery operations, printing paper, and accident and health hazards.

Karch presents a workbook section at the back of the text. In it, he includes exercises and problems, projects and objective tests.

The final part of the book includes a glossary, index and a production summary.

Critique

Although published in 1962, this text is little better than Karch's 1948 effort. Not that the material isn't presented clearly and very basically; it is. The major problem with it is the overbearance of letterpress and foundry type composition. More than half of the text is devoted to the smallest detail of hand composition and letterpress procedures. Offset processes aren't really dealt with until the 18th chapter.

The whole text reminds me of a junior high school course in vocational printing in 1957, and, in all fairness, that was probably Karch's intention.

Aside from the unbalanced content, the text suffers in other ways. There are no sections on copyfitting, design or layout, and nothing on photo cropping or scaling.

The book is littered with photographs of machines---gratefully donated by their manufacturers. It looks like a Mergenthaler family album. These photographs add little to the student's understanding of the functions of the black blobs in the pictures. The drawings that are used are generally adequate, and are well-produced.

This text may have had its place in its day---but because of the terrific imbalance of foundry type composition and letterpress printing techniques, its time and place have passed.

GRAPHIC COMMUNICATIONS

Richard J. Broekhuizen, McKnight Publishing Company, Bloomfield, Ill., 1973

Description

This textbook is in the McKnight Career Publication series and has specific application to vocational schools.

The format of the text is divided into five major sections with the sixth and final section dealing with careers in the field.

The author, in concise, simple language and aided by quality photos and drawings, treats every conceivable facet of the broad and somewhat cumbersome graphic communications business. His first section deals specifically with communications.

Section II presents design, typography and layout under the heading of something called "Message Analysis."

The book's third section (called "Image Generation") treats composition: handset foundry type, machine-set type, and all forms of photo-composition. He even includes linoleum blocks and clip art in this section.

Section three deals with the reproductive and production process and presents a thorough discourse on paper manufacturing and printing. There's a 40-page chapter on silk-screen production included, also.

The final major section of the text deals with binding, finishing and packaging and includes every bindery operation imaginable.

The text is full and complete. It attempts to treat each segment of the graphics business on an equal plane with an eye to career stimulation.

Critique

The book is unabashedly a "career" publication and because of that, includes a great volume of material which otherwise would be burdensome. The 40-page section on silk screen, for example, is probably more than anyone wants to know about it---unless there is career interest. The section even treats printing of decals, 'T'-shirts, and electronic circuit boards.

There is a section in the book (under the "Image Generation" heading) on continuous tone photography which explains how to take a picture with a 35mm camera---it's actually a short-course in photography.

The section on design begins with the proper respect for communication of the message: "To be an effective communicating device, the message must be presented so that:

- 1) it attracts the attention of the reader;
- 2) it is easily read and understood; and,
- 3) it makes a lasting impression on the reader."

Clean, pure, simple.

Broekhuizen makes a strong case for designing around function by looking at design of elements in a typical Holiday Inn---from the "great sign" out front to registration forms and key tags, he relates function to design. He even talks about the design of the phone dial in the motel room.

A fairly standard discussion of design principles follows, and includes good illustrations of basics like balance, contrast, rhythm, proportion and unity. The pictures are unusually good.

While there is a lot of material packed into these 370 pages, it has been well-edited and well-presented.

Even though I don't like the pomposity of terms like "Image Generation" and "Message Analysis" the text is otherwise clearly and concisely written.

Its application as a vocational text is undisputed. Why can't college texts read this way?

PRODUCTION FOR THE GRAPHIC DESIGNER

James Craig, Watson Gupstill Publications, New York, 1974

Description

Living up to its title, this book is every bit a production book. It included nothing which is not directly related to the problems a designer may face in producing a printed piece. It is a handbook for beginning designers. The book, in fact, is dedicated to "every graphic designer whose printed piece did not quite live up to his expectations."

The book opens with a lengthy section on typesetting. This chapter is one of the most complete available. It includes nearly 45 pages on the intricacies of photo composition, and discusses in minute detail each section of the photocompositor. Sections on keyboard units, computer units, photo units, editing and correcting capabilities, OCR systems, CRT systems and photodisplay units are included. The chapter even includes a listing of manufacturers of phototypesetting equipment.

The chapter on printing processes includes many large photographs of various machines. It includes descriptions of three of the forms of printing: letterpress, gravure and offset lithography.

A unit on color printing, including four-color process, follows the printing chapter, and, in turn, is followed by units on ink, paper, imposition, folding, binding and the preparation of mechanicals.

The mechanicals chapter includes material on scaling art and photos as well as line conversion methods and preparation of camera-ready art.

Critique

Parts of this work are excellent. For example, the sections on paper, ink, imposition, folding and binding are presented with great clarity and brevity. Other parts of the book are useful as well, but don't measure up to these outstanding sections.

The book's major deficiency is the lack of any material on design principles.

Because of the "handbook" nature of the text, it is many times too cumbersome for the beginning graphic arts student. For example, the long discussion on kinds and types of phototypesetting equipment is too intricate to be of great value for the beginner. As a background resource work, there are few textbooks which can equal its detail in the photocomposition section. But, as a basic text, those areas are just too detailed and complicated.

Many times the author used photographs to illustrate specific processes. The photos, while of excellent quality, add very little to the knowledge imparted---and in some cases detract from it.

It strikes me that this book would make a better contribution as a supplementary text or resource book rather than a primary teaching tool.

MILTON GLASER GRAPHIC DESIGN

Milton Glaser, Woodstock Press, Woodstock, New York, 1973

Description

A collection of works selected by the author and annotated as to method, medium and design rationale.

The book's introduction excerpts a conversation between Peter Mayer and the author during September, 1972. In it, Glaser treats the classic schism between the artist and the designer. "...design in many ways is a

vernacular language," he says, "Design-related work assumes that the audience addressed has a prior understanding of the vocabulary. The essential heart of most art activity is the self-expressive potentiality that the form offers, enlarging therefore the possibilities for the invention of new modes of perception for both the artist and the audience."

In the introduction, as, indeed, throughout the book, Glaser comments on his various styles, their inception, formulation and execution.

The portfolio is a rich collection of the varying styles and individual works which have brought Glaser to the forefront in American graphic design.

Included---along with the author's rationale---are the famous "poppy" and Dylan posters, book jackets, record album covers, magazine illustrations and even a series of photos showing a store design. Two of Glaser's more notable alphabet designs are shown---"Babyfat" and "NeoFutura"---as well as several lesser-known styles.

Glaser briefly describes his efforts in designing the New York Magazine format and the over-the-weekend redesign of the format for Paris Match.

The collection reflects the wide variety of "feeling" Glaser has infused into his works---from the heavy surrealistic to the hard-edged art deco.

Critique

Glaser's book is, of course, a sensual delight to anyone laboring in the vineyards of design. The sheer variety of technique is impressively potent.

The real "meat" of the volume lies not so much in the illustrations---many of which are familiar---but in the short notes accompanying each.

Glaser, along with his partner in the Push Pin Studios, Seymore Chwast, is one of the most well-known graphic designers in the country. Herb Lubalin is probably the only other real "high priest" currently working in the country.

I was particularly pleased to see, during the introductory conversation and woven into the portfolio descriptions, a healthy respect for the process of communication.

Glaser certainly gives the impression his work is parallel to the copywriter's---that they should embrace and support each other.

Glaser is not an overly-gifted illustrator---which is, in my opinion, part of the reason for his design success. Although some of his work---particularly the surrealistic material---is too subtle for my taste, his portfolio generally supports his words: "Now we're beginning to realize that all aspects of communication, whatever the form, have extraordinary implications to the community receiving the information. And so we can't afford not to pay attention to the quality of information that is distributed. In fact, we know that a comic strip may have a more profound effect on its community than a work of Picasso."

So the task then becomes to exercise high concern for the totality of communication, whether we are using words alone or words with pictures and art. Our concern for societal impact must be rigorous.

Through this and other readings, it occurs to me more forcefully than before that words are communications parasites---they rely totally upon both the audiences' collective sociological and environmental makeup and the visual context in which they appear.

How can we continue to teach communicators to write words in a vacuum and then spill them out to the audience with little or no regard to whether they will be noticed, read, understood or acted upon?

I don't think we can.

GOOD OR BAD DESIGN?

Odd Brochmann, Van Nostrand Reinhold, New York, 1970

Description

In this thin volume, Brochmann tries to deal with what makes things beautiful and what makes them ugly. By the time he gets to the next-to-last chapter, he is able to make a stab at major characteristics of both beautiful and ugly.

Brochmann leads to the way of defining "good" and "bad" by a series of illustrated chapters which support each element in his ultimate definitions.

Starting with the 'Problems of Design,' Brochmann points out that design includes many considerations: utilitarian values, cost, fashion or style, materials, etc. He also states that some people have an innate, well-developed "sense" which guides them in determining beautiful from ugly.

In seeking the "good" or "bad" in any endeavor, however, it's the "open eye" which can be the most enriching, Brochmann believes. "The wider the perspective, the stronger our experience, and it's really experience that we are after. Preferably in everyday things," he says.

Moving to more academic descriptions of design, Brochmann treats many of the commonly-discussed components---shape, geometry and abstract values, nature's influence, order, rhythm, balance and grouping, color, light and surface texture.

He then discusses how we see things; the relationship to what we "like," and the relationship of cheap and expensive in commercial design.

The concept of "style" is traditionally treated, but Brochmann brings into that discussion the effect of tolerance and intolerance.

When all is said and drawn, Brochmann finds it possible to list the criteria for what is good-looking---and he does so by first eliminating what does not look good, that which we call "ugly."

"Ugly," then, is, in the absolute sense. "...everything that occasions physical feelings of displeasure and all that is trashy and shoddy, that tries to look as if it were better than it really is, and all that seems discordant, like a gold ring in a pig's nose, and all mess and litter, and all that is worn out or broken, everything that tells of stupidity or lack of consideration, everything that is evidently useless for its purpose."

His definition of "good-looking" then becomes the opposite of the definition of "ugly."

"Good-looking in the absolute sense is everything which has been made with care, both intellectual and technical, appropriate to the nature of the task and its place in the whole. Being good-looking presupposes order whether of technical, practical, formal or organic nature, individually or in combination. The degree of beauty can only be registered by comparing performances accomplished under similar conditions and with similar aims. The exceptional can be especially beautiful, but is not necessarily so.

"Good-looking in the relative sense is everything that helps to confirm our general ideas of what is right and proper. Even more attractive are the things that seem to foretell improvements to come."

Critique

Brochmann's work is interesting. While he doesn't tell us anything essentially new---or anything we probably couldn't have come up with ourselves with the proper direction and thought, he puts it all together in a way that flows with gentle logic.

The book is simple. Its simplicity is what gives it its impact. Perhaps it might have been just as well had Brochmann not tried to sum it up by writing what was "ugly" and "beautiful," but nevertheless, even with the circuitous definitions, the work holds water.

What especially impressed me was his view of the experiential nature of design. He seems to advance the theory (or I'm reading it into it because I want to) that life, itself, is experiential; that in order to perceive, we must know, and in order to know we must "experience."

And the beauty of the work is that he says it once with perhaps a small illustration, then doesn't belabor it to death.

The sections on order and shape are well-thought and well-written. Both sections are, of course, particularly applicable to graphic design as well as "pure" design and commercial design.

In the section on shape, Brochmann states: "The square is a hypothetical concept and no drawing can depict a square without actually being one. Our drawing of a tree is not a tree, just a drawing; however, one can safely say that it represents or has the character of a tree."

How many reams of paper and words have been directed at that concept with less success than his two sentences?

The book has a very European character about it---aside from spellings like "colour"---and somehow imparts a freshness and pragmatic simplicity which most books of its genre lack.

LAYOUT AND GRAPHIC DESIGN

Raymond A. Ballinger, Van Nostrand Reinhold, New York, 1970

Description

Written as a textbook for design students as well as a source and idea book for what Ballinger calls "junior designers," the work includes some of the basic design principles and techniques.

Each section of the text includes project assignments as well as numerous illustrations.

Ballinger begins the book where he says we must all begin---with doodling. From there he treats "forms" (geometric and otherwise), collage, humor in layouts, illustration in layouts, pictorial resources and the camera.

From that point---about midway into the text---he jumps to the basics of layout. In rapid order he disposes of symmetry and asymmetry, borders, grids and what he refers to as "unusual dimensions in layout." The "unusual dimensions" are the quasi-three dimensional pieces produced by folding paper.

He then pictures (with little or no explanation) the basic and common tools used by a graphic artist. A one-page commentary with a pick-up ad from Doyle, Dane, Bernbach tell of the uses of a Polaroid camera in commercial design work.

Basic typography is treated in a four-page section which shows the major type families.

Brief material on rough visualization, presentation techniques, and paper sizes follows.

A chapter on forms of reproduction and methods of printing line art and photographs is the final section of the book. Here, Ballinger displays

drawings to depict the differences among letterpress, gravure and planographic printing and introduces, with supporting illustrations, the half-tone technique of reproducing photographs.

Critique

I would hate to have to try to teach graphic design, graphic arts or anything else from this text. Although there are some areas of vigor, the book seems to be wholly lacking in any organization. The subject jumps from one area to another like Hollywood's celebrated absent-minded professor.

The final chapter and the chapter on the designer's tools are clearly out of place. How can you teach someone to design something that has to be printed on a press if he has no knowledge of the limitations of the printing processes? Why, halfway through the book, does Ballinger suddenly introduce the designer's tools? Wouldn't the student need some appreciation of the tools in order to proceed with the project assignments in the first 14 sections?

Although brevity is next to godliness, Ballinger's brevity hurts in many areas. While his two-page illustration of the three main type families is particularly clear (mainly from the pictures), he blandly says, "the good layout designer knows a great deal about type and its variety of uses." I agree. Then, in the next sentence, he abdicates and says "We cannot devote very much space to the subject in this book, but there are many books available on the history of type and typography, nomenclature, type usage and inspiration; some of these books deserve a place in your graphic arts library." What a cop-out!

In the section on "rough visualizations" Ballinger makes an attempt (in two paragraphs) to describe the process of specifying type. Although I

still cling to brevity, he has not given justice to the sometimes difficult explanations of points and picas, leading, body size and copyfitting---all of which he dismissed in those two paragraphs.

There are a couple of good points: the type family illustration mentioned already, and parts of the forms of reproduction chart seem strong and clear.

For the most part Ballinger seems to have relied on his selection of illustrations to carry the story, and even on this basis, I've seen better picture books. Any of the yearbooks on design, illustration and advertising do superior jobs of stimulating ideas for the working designer.

GRAPHIC DESIGN AND REPRODUCTION TECHNIQUES

Peter Croy, Hastings House, Visual Communication Books, New York, 2nd
edition revised, 1972

Description

This text is of the handbook variety for practicing graphic arts personnel. Its foreward states that the book "tries to give an answer to all questions on the technical aspects and practical problems of graphic design." While the author intended the book to be a reference work as well as a basic textbook for the field, it seems to fit more easily into the former category.

In its 284 pages, Croy has included every conceivable topic. He treats all of the standard subjects: forms of printing, forms of composition, photographs, halftone theory, paper, ink, artwork, mechanicals, and graphic design samples.

Other chapters in the volume are unique. Sections on technical drawings, lighting for photography, backgrounds for photography, camera

techniques, darkroom techniques, combination images and air brushing are treated in few other graphic arts sources.

There are no sections on typographic readability or copyfitting.

The organization of the text is as follows: letterpress printing (including presses, composition, photographic techniques, halftone theory, etc.); planographic and intaglio printing; craft printing; silk screen printing; typography; book design; illustrations; graphic design; technical drawings; materials; lighting for photography; backgrounds for photography; camera techniques; darkroom techniques; combination images; lettering and air brushing.

All descriptions are painstakingly detailed and the book's illustrations and diagrams are well prepared and presented.

Critique

The author is European and the book was printed in England. It, therefore, has a very "continental" sense about it. Although it is an excellent reference source and would be a valuable handbook for the working editor, designer or graphic artist, it is too technically detailed for use as a basic graphic arts textbook.

There is a great amount of information in the book. Its organization, while having some limitations, does seem to flow fairly well. The book includes some material that has not been seen in other similar texts.

A major drawback of the book includes the lack of a section on copyfitting. This omission, in itself, would disqualify the book for use as a basic text.

Another major disadvantage of the book is the inclusion of so much material which is far above the basic level. Perhaps the book would be

useful if a sequence of graphic arts courses was in use and this text were used for more sophisticated levels.

LAYOUT 4:

Printing, Design + Typography

Charles J. Felton, Charles J. Felton, St. Petersburg, 1970

Description

In the book's forward, Felton states the purpose of the volume is to "show how advertising and printing can be made attractive, interesting and easy to read."

The text originally appeared as monthly columns in Printing magazine, beginning in 1947. The book, therefore is aimed primarily at the commercial printer and exhorts him to use basic principles of layout and design in his work.

Organization of the book is in ten basic sections, and, because of the interrelating nature of the content, the sections overlap in both word and picture.

Every conceivable item in the long stream-of-consciousness text is illustrated with pencil thumb-nail sketches or finished printed pieces. The illustration explanations are many times more illuminating than the text.

In due course, Felton discusses the basic design principles of balance, contrast, proportion, rhythm, unity, etc. He brings these principles in fully half-way through the book---after he has written on "Versatility in Newspaper Ads," "Dynamic Magazine Ads," promotion pieces, book design, point-of-purchase and job printing design.

Felton devotes a great amount of space and verbiage to what he calls "Layout Formats." A treatment of the question of horizontal or vertical design is offered in this section.

Admitting to a great affinity for typography, Felton follows the basic design principles with a long, backward look at type design. Countless (literally) drawings illustrate every subtle nuance of type styles.

The author treats white space design with a small section: "Through proper application of white space a layout gets interesting 'breathing space' without which overcrowding and stiltiness might prevail." He then gives a few examples which portend to show the good use of white space.

Critique

Without reading the preface (A Word of Thanks), you can tell by fanning the book that its author must be at least 70 years old.

Nearly every example, illustration, and picture is straight out of the 1940's school of graphic design. The examples don't necessarily weaken the words, but it's hard to ignore them entirely.

How anyone (particularly one who has written as much on the subject as Felton has over the years) could have published a text that's so hard-to-read and understand is beyond me.

Aside from the stream-of-consciousness writing and lack of section or subheadings, this "layout" book is, in itself, one of the worst examples of malpractice. The book would hardly stand a single one of the author's tests for good design.

Once you sort out which caption applies to which example and then try to separate it from the body copy, you've lost interest in the particular subject.

Since this book was self-published (and is now in its fourth printing) the author's pleas for good design + typography in printed materials almost vanish in the hodgepodge collection of thousands of words and sketches shoe-horned into its 300 pages.

Many of the recognized formulas for good design are there somewhere, but, without a roadmap, it's difficult to see any value whatsoever in this book.

A layout and design book should, of and in itself, be a showcase of the subject. This one is the trashcan.

CHAPTER III

A PLAN FOR DESIGNING A MORE ADEQUATE GRAPHIC ARTS TEXTBOOK

Because of the aforementioned deficiencies of available graphic arts textbooks, a new book could make significant contributions to the field's teaching efforts.

This project has consisted of writing and illustrating a basic graphic arts textbook for use in college-level graphic arts courses. It is directed at both the journalist, who may need to acquire design and layout skills to augment his technical knowledge and writing ability, and the commercial artist, who may need to complement his creative talents with the realities of printing and production mechanics.

The text is not a handbook for practitioners. It is a basic teaching tool---written to begin at "ground zero" and then add theory, practice and technique in a step-by-step fashion.

Through several semesters of classroom teaching experience and years of attempting to train subordinates (many who had college-level "graphic arts" courses), the author has made effective use of brief explanations of processes, amplified with simple, everyday analogies and accompanied by simple blackboard sketches.

In the preparation of the project textbook, the same approach has been employed. Simplistic line illustrations accompany the text descriptions. The drawings themselves are a major factor in the ease of understanding each theory, principle and procedure.

The manuscript for the new graphic arts textbook is included in this thesis as Appendix A. The appended manuscript represents the major portion

of work on this thesis. It appears here as an edited draft, subject to further editing prior to publication.

Contents of Project Textbook

The chapter-by-chapter contents of the manuscript are outlined below and described in the following section.

Introduction

Chapter I:

Forms of the Printed Piece.

Chapter II:

Forms of Reproduction: Relief Printing, Planographic Printing, Intaglio Printing, Screen Process Printing, Electrostatic Printing.

Chapter III:

Typography: Letter Forms; Type Measurement; Forms of Composition, including metal type (hand-set foundry type, linecasting machines, and other casting machines); non-metal type (hand drawn, strike-on type, transfer lettering, and photo composition); Readability; Specification of Type; Copy Preparation; Copy Editing Symbols; Proofreading Symbols; and Copyfitting.

Chapter IV:

Photography: Halftone Theory, Special Photo Effects, Cropping, Scaling, Full Color Photographs, and Duotones.

Chapter V:

Art: Types of Art and Preparation of Camera-ready Artwork.

Chapter VI:

Other Components of the Printed Piece: Paper and Ink.

Chapter VII:

Design: Components; Principles, including visual characteristics and characteristics of position; Eye Pattern; Reader Flow; Design Problems; and Photo Spreads.

Chapter VIII:

Guidelines for Good Publications.

Chapter IX:

Bibliography.

Chapter X:

Glossary and Index.

Description of Contents

The text begins with a chapter outlining the basic forms of the printed piece. Every piece of printed material conforms to one of the configurations illustrated.

The four major printing methods historically serving the graphic arts industry (relief, planographic, intaglio and screen process) are presented in the second chapter. Also included in the chapter is a newer form of printing, electrostatic or xerography.

Each process is reduced to simple explanations coupled with simple line drawing illustrations. It is the author's contention that while a journalist or designer needs to know how his piece will be printed and the steps it takes to accomplish it (particularly those steps and processes which directly relate to his work) it is not important to know that egg albumen was once the coating used for preparing letterpress engravings. There is just too much necessary, working knowledge to digest to clutter it up with misty-eyed reports of how it "used to be."

This is not to discount the value of historical perspective. The history of printing and particularly typography, is fascinating. But the author feels these historical anecdotes actually may impede the understanding of the basic processes. Once the theory of the processes is at hand, and firmly in mind, then the student should have the opportunity to trace its historical development.

Chapter two also includes a comparison chart which visually portrays each printing process characteristic. Commercial advantages and disadvantages also are included.

Chapter three concerns typography. Grouping of letter forms and illustration of their characteristics is included. The several forms of typesetting are illustrated and explained and a basic step-by-step copy-fitting section is presented along with sample problems.

The text's fourth chapter discusses photographs--halftone theory, special effects derived from photographic images, cropping and scaling. Several illustrated sample cropping-scaling problems are included. Process color is described and illustrated.

Chapter five discusses art; its kinds, uses and applications. Much of this chapter illustrates the preparation of camera-ready artwork.

Chapter six covers the other components in a finished printed piece: ink, paper, and bindery techniques. Basic characteristics of ink and paper are described and illustrated. Bindery operations are likewise categorized, described and illustrated.

Chapter seven represents the second major section of the text. It discusses the principles of design, both in their academic definition and transferred to practical application. The principles of visual characteristics and those principles of position are identified and illustrated.

The design section discusses specific design problems: reader flow, tone, focal points, margins, special effects, etc.

The final chapter is a section on guidelines for good publications. These guidelines are subjective judgments and are presented as the author's opinion. They have been developed from numerous speeches and seminars on graphic design presented by the author.

A bibliography follows chapter eight and the text is concluded by a combined glossary and index, which will be completed for final preparation of the manuscript.

FOOTNOTES

¹Arnold, Edmund C., Ink on Paper, Harper and Row, New York, 1936. p.47

²Krider, John A., Graphic Arts: A Textbook of Basic Theory, Procedure and Practice, unpublished. Manuscript p. 35

APPENDIX A

GRAPHIC ARTS: BASIC THEORY, PROCEDURES AND PRACTICE

by

John A. Krider

(c) Copyright, John A. Krider, 1976

ACKNOWLEDGMENTS

Grateful acknowledgment is extended to Dr. Robert Bontrager, whose simple statement, "you ought to write it," encouraged me to begin; to Dr. Sandra Ernst, a friend and colleague who nagged me to finish; and to long-time friend and professional colleague, Victor Eisenhut, of Graphic Arts, Inc., Topeka, Kansas, who was gracious enough to edit the technical sections and who continually keeps me abreast of new developments in the field.

TABLE OF CONTENTS

INTRODUCTION	1
I. FORMS OF THE PRINTED PIECE	4
II. FORMS OF REPRODUCTION	9
Relief Printing (letterpress)	9
Planographic Printing (offset lithography)	17
Intaglio Printing (gravure)	21
Screen Process Printing (silk screen)	27
Xerography (electrostatic printing)	28
III. TYPOGRAPHY	31
The Anatomy of a Letter	31
Type Measurement	40
Forms of Composition	44
Metal Type	
Hand-set foundry type	45
Linecasting machines	46
Non-metal Type	
Hand drawn type	50
Strike-on type	51
Transfer lettering	52
Photocomposition	54

Readability	56
Specification of Type	60
Copy Preparation	61
Copy Editing Symbols	61
Proof Reading Marks	63
Copyfitting	64
IV. PHOTOGRAPHS	78
Other Operations with Photos	79
Cropping the Photographs	80
Photo Scaling	83
Process Color	94
Duotones	96
V. ART	98
Halftone Art	98
Line Art	98
Combination Art	99
Color Art	101
The Camera-Ready Layout	103
VI. OTHER COMPONENTS OF THE PRINTED PIECE ...	109
Paper	109
Printing Inks.....	114
Bindery Operations	115

VII.	DESIGN	119
	Basic Components of Design	120
	Principles of Visual Characteristics	122
	Principles of Position	128
	Eye Pattern	134
	Reader Flow	135
	Design Problems	135
	Special Design Effects	139
	Photo Spreads	142
VIII.	GUIDELINES FOR GOOD PUBLICATIONS	143
IX.	BIBLIOGRAPHY	147
X.	GLOSSARY AND INDEX	148

INTRODUCTION

This book is designed and written to provide a basic understanding of graphic arts theory and practice. It is aimed at both the journalism student who may need to acquire skills to produce effective publications as well as the commercial art student who needs to complement his creative talents with the realities of printing and production mechanics.

Effective printed publications are a combination of creative effort and technical expertise. A handsomely-designed printed piece which fails to communicate its intended message is worthless. A handsome building which fails to serve its inhabitants is equally worthless. An architect must design his structures with knowledge of their use, knowledge of building materials and methods, and understanding of the principles of engineering and construction.

The journalist, graphic designer and commercial artist must, likewise, have a basic understanding of the various components of a printed piece.

The purpose of a printed piece (be it a magazine, brochure, poster, newspaper, broadside or advertisement) is communication. And that purpose must be given paramount importance---all other considerations must pay homage to the central kernel of the communication.

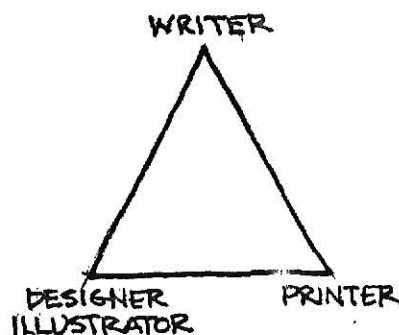
Writers and designer/illustrators are historical enemies, whereas they should work hand-in-hand to accomplish their joint mission: communication.

Brilliant copywriting, coupled with brilliant design and illustration, and enhanced by brilliant production techniques produces brilliant printed pieces. Each point of the triangle is of equal importance. Each point is dependent upon the other. If one fails in its support, the others suffer proportionately.

**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH DIAGRAMS
THAT ARE CROOKED
COMPARED TO THE
REST OF THE
INFORMATION ON
THE PAGE.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

So, since the three points are so interdependent upon each other, it's best that each of the professionals has at least a basic understanding of the other's functions.



To this end, this book is dedicated.

Many times there aren't three clearly-defined points on our triangular model. The journalist may find it necessary, for any number of reasons, to function as both the copywriter and the designer. The printer may end up designing his client's materials. The designer may become a copywriter for particular pieces.

In any event, the three separate functions still exist, regardless of the numbers of people performing them. The more understanding between the people performing these functions, the better the product. It's just that simple.

Because there are so many different steps necessary to bring an idea from inception to printed piece, a broad understanding of the process is imperative. This text attempts to treat each area of the process in a basic way, starting from the simple decisions of format, and moving through different methods of printing, selecting and producing type, handling photographs and artwork, selecting paper and ink, and organizing the various elements on the page.

But, this book doesn't pretend to belabor every mechanical and technical procedure in great detail. It seeks merely to present a basic step-by-step of each process and how each process relates to the whole. Additional readings would be necessary to research every topic. But by the simplistic content, it

is the author's intention to provide base-line working knowledge and, at the same time, the impetus for further study and personal experimentation.

jak

July, 1976

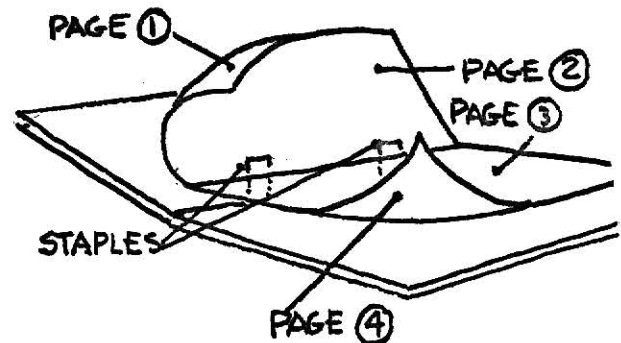
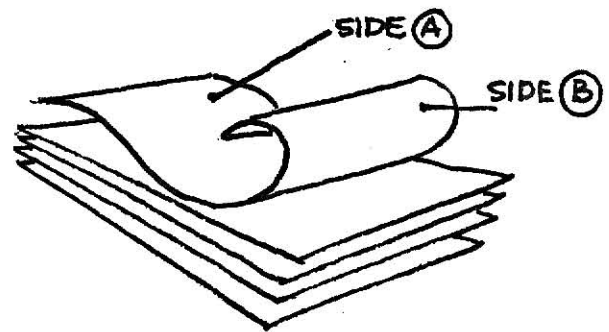
CHAPTER ONE

FORMS OF THE PRINTED PIECE

Printed communications can take several forms, all of which most people are familiar with, even though they may not have tried to categorize them as such. It is helpful, however, to outline these basic forms and clearly define them in order to be sure we're talking about the same thing as our printer, designer, or artist.

The Leaf, or Sheet

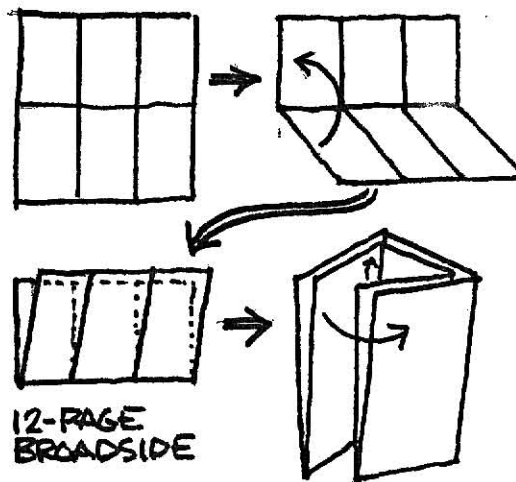
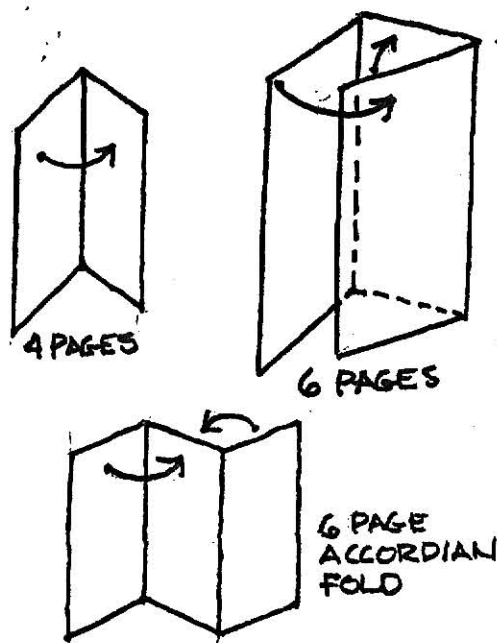
All printed pieces start with a sheet or leaf. A sheet of paper has two sides. When that sheet is bound into a book, as this one you're reading, it becomes a page---with only one side. In a small stapled book each sheet becomes four pages. A secretary puts a sheet of paper into the typewriter and types on one side. She then has two pages---one blank and one with typing on it. If she turns the sheet over and types on the back side, she then has two pages of typed material on one sheet of paper. Flat sheets, either singly or in combination with other sheets, present a form with which it is easy to maintain reader flow throughout the piece.



The Folded Leaf, Folder, or Leaflet

Simply taking our flat sheet and folding it produces a folder. A folder may have only one fold, or it may have several, complicated ones. When the sheet is large and has many folds, it is sometimes called a Broadside. A broadside is usually printed on only one side of the sheet, and usually unfolds like a road map.

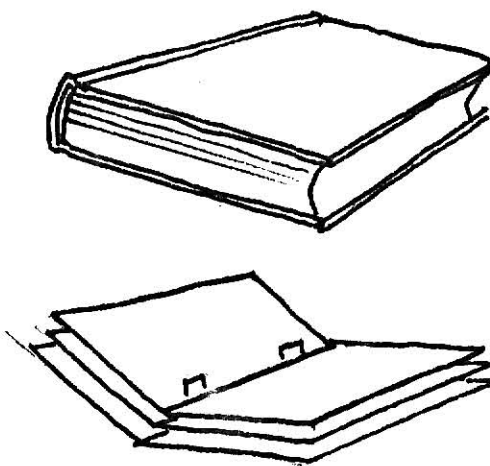
Broadsides are used for posters, advertising material and circulars. By introducing the several folds to the large sheet, the reader flow is difficult to maintain in a broadside. As the piece unfolds, the reader doesn't really know where to go next, and many times may be destined to wander around the piece in search of what to read next. The size of the sheet itself may present problems in the ease of reading a broadside.



The Book

A number of flat sheets, or leaves, fastened together is called a book. The book may have only a few pages with a separate hard-bound cover or it may be made up of many pages with a paper soft cover. It may be stapled through the center or stapled at the side. It can be stuck together with glue or sewn on a sewing machine to hold it together. But, strictly speaking, any piece which is made up of several pages bound together is a book. Magazines are

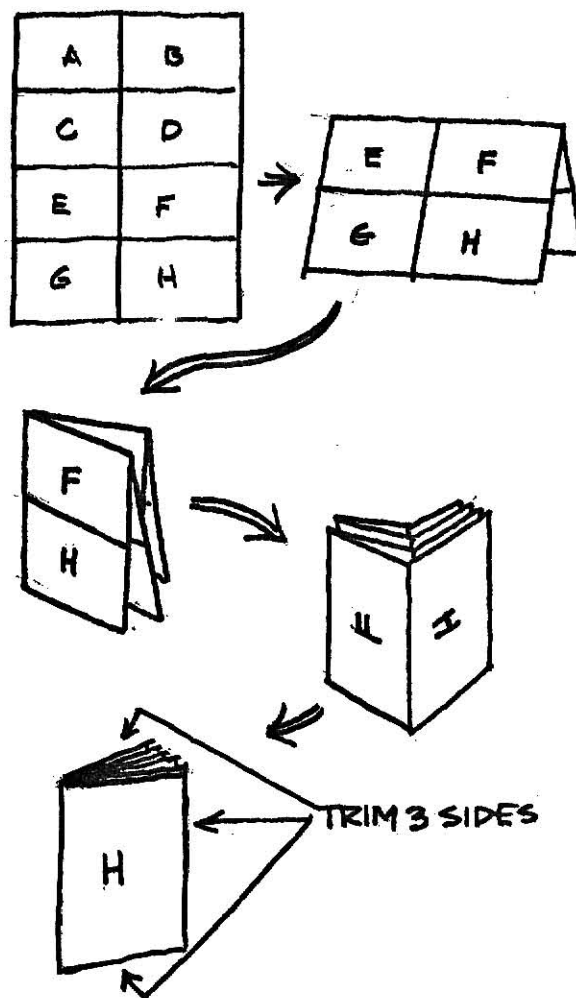
called "books" by those in the trade. When the dimensions of the book are smaller than 8 1/2 x 11 inches and there are few pages, the book is sometimes called a booklet. The book and booklet, however, have the same characteristics.



Reader flow in a book is built-in.

Each page follows another, one-by-one through the book. The reader always knows where to go next.

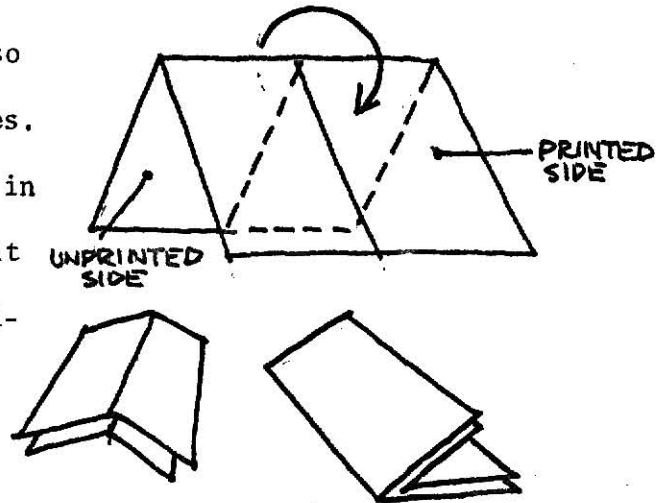
Most books are produced in sections called signatures. A signature starts as a large sheet with as many as 16, 32, or 64 pages printed on it. It is then folded down to the book's page size and bound together with the other sections. The number of pages printed in one signature (or sig) is wholly determined by the size of the printing press being used. Most small presses are capable only of printing on an 11 x 17 inch sheet, which, when folded into a book, produces four 8 1/2" x 11" pages. Strictly speaking, then, these would be four-page signatures.



The French Fold

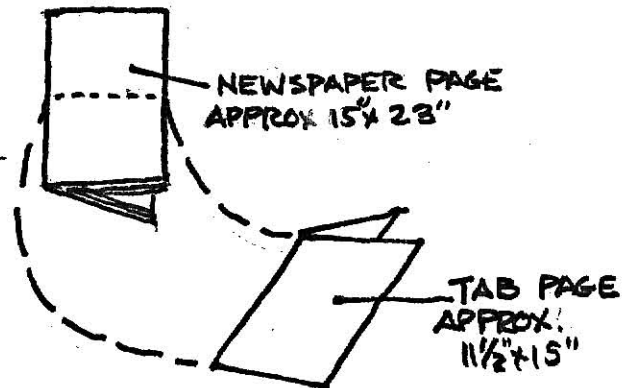
The most familiar example of a french fold is the standard greeting card. The sheet of paper is printed on one side

and the un-printed side is folded in so the printed side constitutes four pages. Although there are four printed pages in a french fold, there are actually eight pages in all. This type of fold eliminates the need to print on both sides of the sheet.



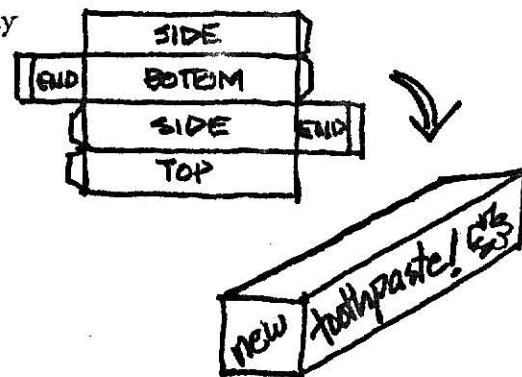
The Tabloid

The newspaper form is, essentially, an unbound book. It is a collection of sheets folded together without a binding. A tabloid is an un-bound newspaper which is half the size of the standard newspaper page. The tabloid is used with increasing frequency for advertising inserts, political advertising material and other low-budget, high volume applications.



Other Forms

Leaving aside projected or electronic images, all forms of printed materials emanate from the basic types---which all begin with a sheet. There are specialty applications, of course, which defy classification. Point-of-purchase materials, packaging, and novelty items all present their own configurations. These items, however, usually start from the basic sheet of paper and through creative printing, folding,



glueing and cutting, are fabricated into various shapes.

CHAPTER TWO

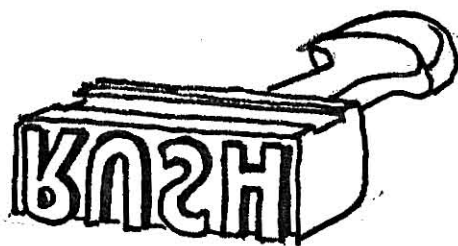
FORMS OF REPRODUCTION

The development of printing as we know it today has been a long, complicated process. The industrial and technical revolutions in this century have produced amazing innovations in the printing industry that make modern methods a far cry from the simple hand-operated press Gutenberg and others used in the seventeenth and eighteenth centuries. But, even with the introduction of computer-operated presses and other space-age technology, the four basic forms of reproduction still exist. They, along with the newer xerography or electrostatic printing method, continue as the feasible ways to produce a desired image on paper in quantity.

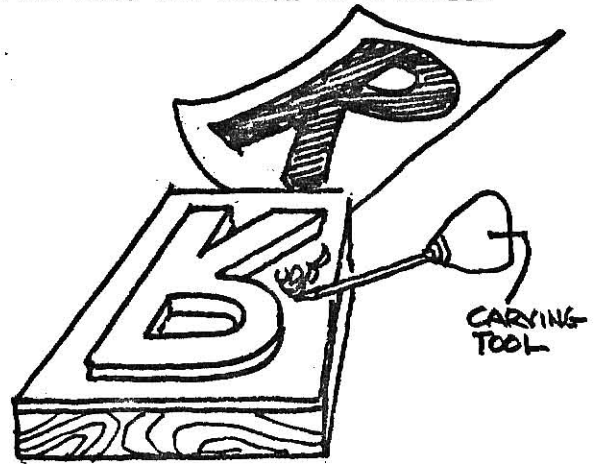
Relief Printing (Letterpress)

Relief printing is familiar to everyone. It has been the mainstay of the printing industry for decades, and only in the last generation have improvements in planographic printing (offset) forced letterpress methods into a secondary status.

The theory of letterpress printing is simple: from a raised image coated with ink, transfer the ink to a piece of paper forced upon it. The familiar rubber stamp is one of the simplest forms of relief printing. Other simple forms include a linoleum block or potato print used to produce designs on paper or fabric. Most school children learn



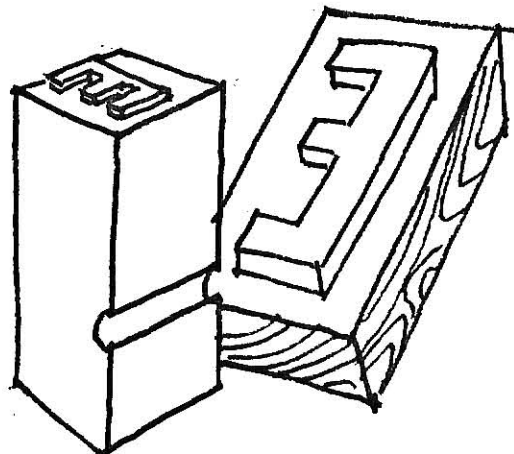
to make a simple linoleum block to print Christmas cards or other items. The design to be transferred to the paper is carved into the block in a mirror image. Ink is then rolled onto the finished design and a piece of paper is pressed on to the wet ink. When the paper is removed, the image is transferred to the paper in a positive image. This technique, complicated with mechanical operations, is basic to all relief printing.



The Letterpress

Most commercial relief printing is called letterpress printing. The name has particular significance when taken literally---the "letters" are "pressed" onto the paper and the image is transferred, just as in simple linoleum block printing.

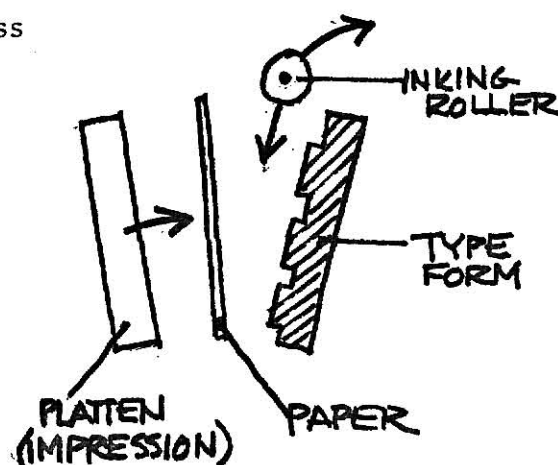
In letterpress printing, all type, artwork, and photographs must be converted to a form where the image area is raised above the surface of the plate. Type used in letterpress printing usually is made of metal and most often is produced on a Linotype or Ludlow machine. Early-day letterpress printers used wooden type and set it character-by-character by hand. Handset wood type is still used sparingly, but most is made from a metal alloy.



There are four basic functions which must be present for letterpress printing: 1) a "form" to hold the image (type, art, photos); 2) an impression mechanism to apply pressure; 3) a paper delivery system; and 4) an inking mechanism.

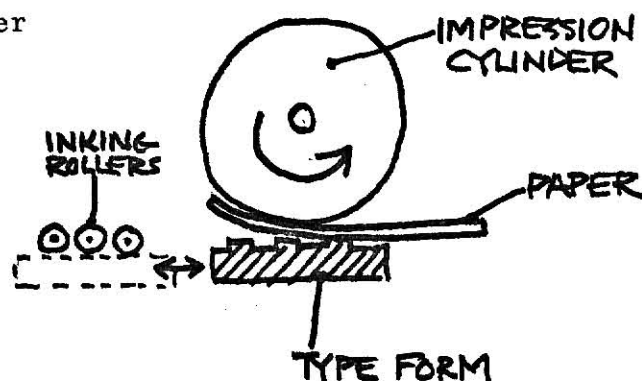
The Platten Press

The simplest commercial letterpress consists of a form to hold the type and other image material, a flat plate or "platen" to apply pressure, and inking rollers to re-ink the form after an impression has been made. This type of simple press relies upon hand insertion and removal of the paper.



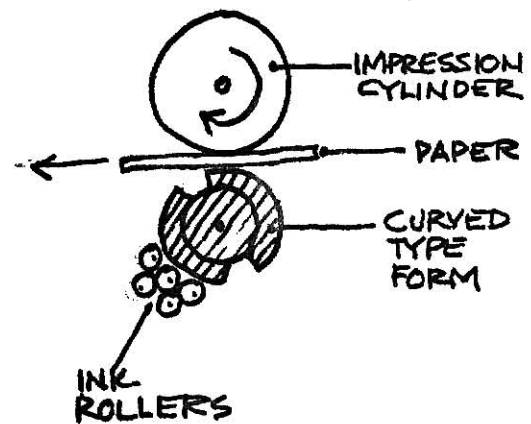
Cylinder Press

Once a popular press in the United States, the flatbed cylinder press has fast become obsolete. Here, the impression mechanism is a large cylinder fixed on a stationary axis above a movable type form. Grippers on the cylinder pull the paper around it and in its next revolution rolls over the inked type form. The form moves under a series of inking rollers as the cylinder is raised and the printed sheet delivered.



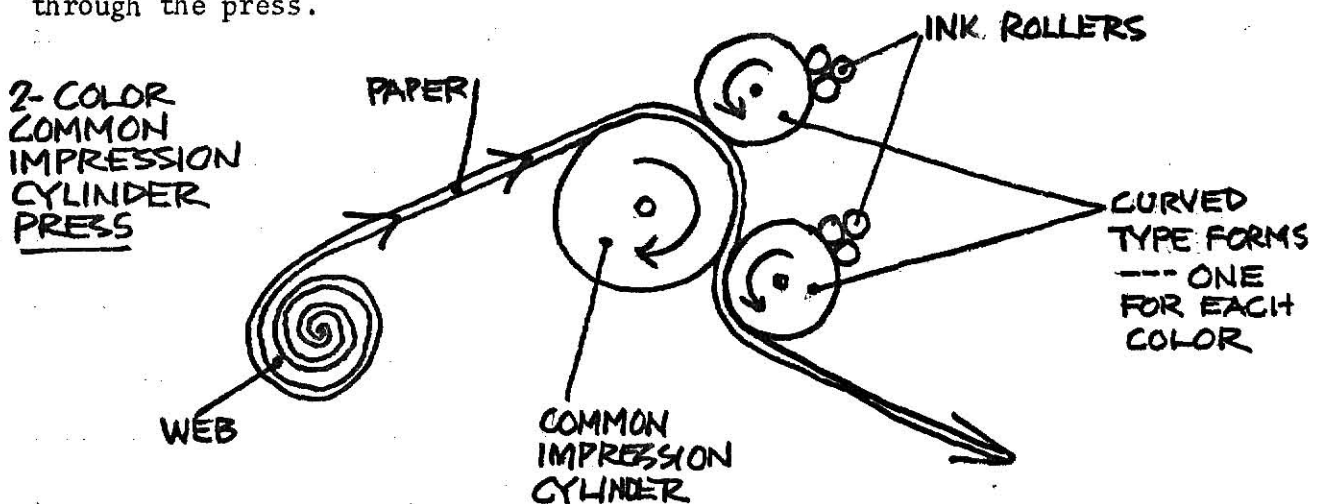
Rotary Press

By curving the image form and wrapping it around another cylinder, it soon became possible to greatly increase the speed and efficiency of presses. Here, the paper is fed between two cylinders, one the impression cylinder and the other holding the image material. The curved plates are formed in metal from a curved mat called a stereotype.



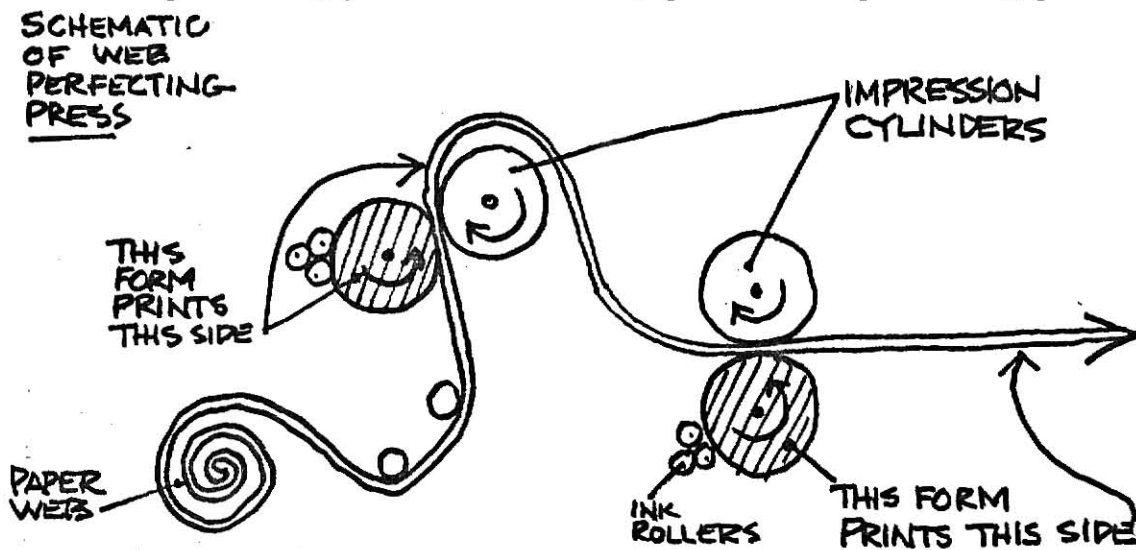
The Web-fed Rotary Press

A press that prints on a large roll of paper rather than individual sheets is called a web press. The web (or roll) passes through the impression and form cylinders and is automatically sheeted and usually folded at the end of the press. By simply adding another form and inking mechanism to the impression cylinder, it becomes possible to print two colors at the same pass through the press.



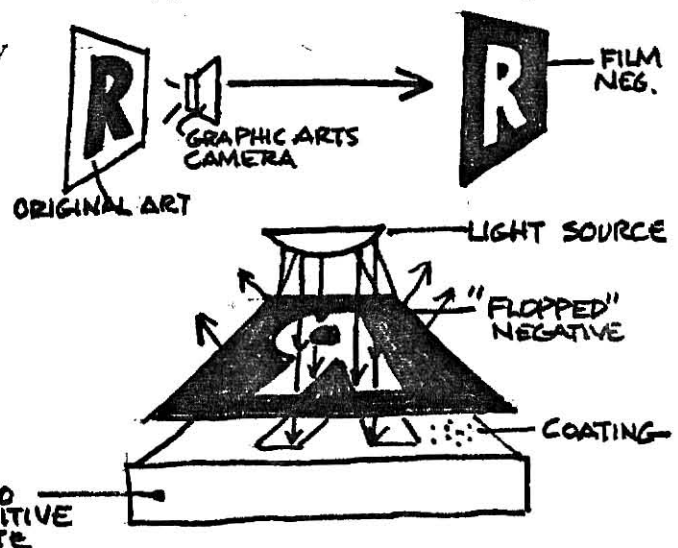
Perfecting Press

A press which can print on both sides of a sheet or web in one pass is called a perfecting press. Most rotary presses are perfecting presses.



Preparing Plates for the Letterpress

Because all material printed by letterpress must be converted to a form which has the image in relief, it is necessary that everything be cast in metal at some point. Most letterpress printers use metal Linotype characters for text matter. Other machines also produce metal type for use on a letterpress. Line artwork must be produced separately and converted to a metal plate called a line engraving or a line "cut." It is produced by photographing the drawing, laterally reversing or "flopping" the resulting negative, placing it on a sheet of sensitized metal and exposing it to light.



The photographer makes his print on photo-sensitive paper. The engraver exposes on photosensitive coated metal. The coating of the metal hardens where

the light from the exposure strikes it, thus hardening the image on the plate.

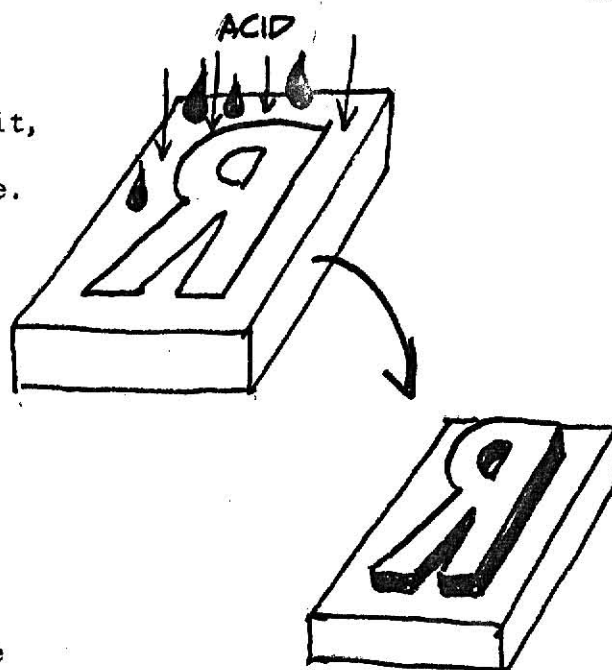
An acid etch is then applied to the exposed plate and eats away the un-hardened metal. The hardened coating in the image area protects

it from the acid which is used to lower the non-image level below that of the image. The image is thus made to stand in relief, the highest point

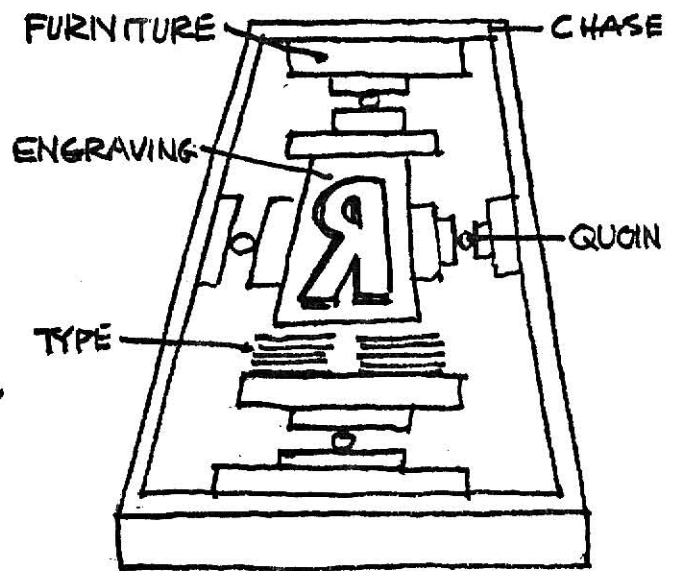
on the plate. The raised image is the printing surface. Like the linoleum block, when inked and pressed on paper the printed design will appear as drawn.

All artwork and photographs must be converted to engravings in order to be printed by letterpress. Preparing a photograph for the etching process is similar to the line etching, but a screened pattern is introduced. (It is called a "halftone," and is described in the photograph section.) Special type which may not be available on a Linotype or Ludlow machine can also be produced for letterpress printing by making a line engraving of the desired words or phrases.

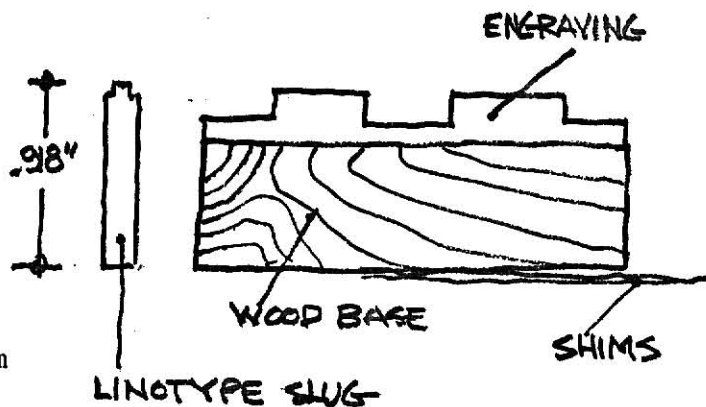
When everything has been prepared in relief, the separate elements of the piece to be printed are assembled. A large metal frame, called a chase, is used to hold the individual units in place. The printer arranges the elements (type, line engravings and halftone engravings) in the proper position within the chase. Since letterpress printing is a direct-impression method, all of the elements are mirror images. The printer assembles them into a mirror image of the final designed piece.



Once the elements are in place, the form, or chase, is locked tightly with wooden pieces. These pieces come in a variety of sizes in order to fill out the frame of the chase. They are called furniture. After all the metal elements and the furniture are in place, small expandable pieces called quoins are placed within the frame. These quoins are then expanded with a key to tightly hold all pieces in the chase. This operation is called the "lock-up" and the form is now ready for installation on a flatbed press.

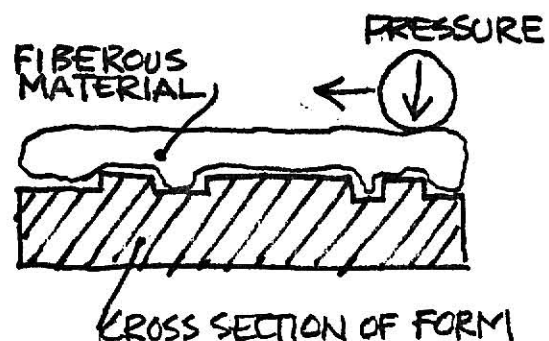


It is important to note that all elements of the printed piece must be exactly the same height in order to produce an even image on the paper. Linotype slugs, foundry type, and etchings must be a uniform .918" high in order to print. This



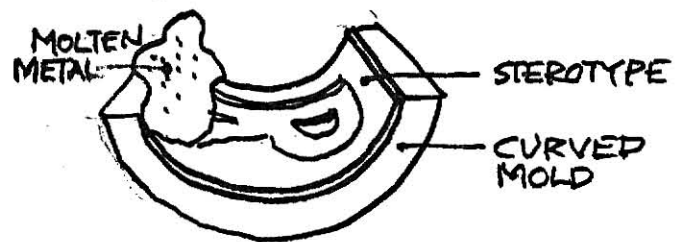
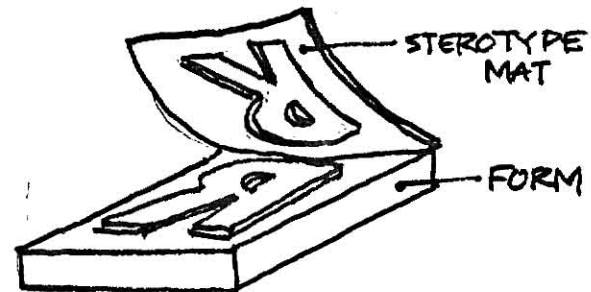
dimension is called "type high." It is sometimes necessary to "shim" with layers of tissue under an engraving in order to bring it to the required height so the image prints uniformly.

The preparation of material for a rotary press is the same as for the flatbed press---except there's one final step. It is necessary to convert the flat

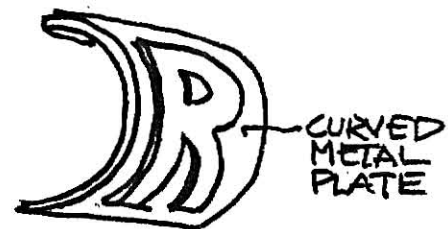


chase full of type and etchings into a curved plate to fit on the cylinder. This is accomplished by a process known as "sterotyping." Once the form is completed and proofed, it is coated with a wet cellulose fiber material---resembling paper mache.

The moist material is forced down into the metal elements of the flat form under pressure. When dry, the material is peeled off the metal units and is an exact duplicate of the form. We now have a fibrous paper "mat" which reads in a positive image, having been struck from the mirror image of the metal forms.



The flexible mat is then curved around a cylinder and molten metal poured over it. When cooled, the paper mat is removed and a mirror image, curved metal plate is ready for installation on the rotary cylinder of the press.



Characteristics of Letterpress Printing

1. All material to be printed must be prepared in relief and in mirror image.
2. Ink is deposited upon the raised surface of the plate and directly transferred to the paper.
3. Type, illustrations and photographs are prepared separately.
4. All elements of the printed piece are prepared in metal.

Advantages of Letterpress Printing

1. It is simple, mechanical method---ink on metal, metal in direct contact with paper.
2. Corrections are easy to make. One line of type is simply removed and another inserted, the form re-locked up and re-installed on the press.
3. Color coverage is fairly uniform and letterpress presents good solid ink coverage.
4. It is particularly good for long runs---type and etchings do not wear out quickly.
5. Split runs are easy. Copy, photos or art can be changed easily.

Disadvantages of Letterpress Printing

1. Art and photographs must be made into metal etchings, which usually necessitates sending them to an engraver.
2. Storage of heavy metal plates is cumbersome and takes much space.
3. Casting metal produces a great deal of dirt which can affect the quality of printed pieces.

Planographic Printing (Offset Lithography)

Planographic printing means "printing from a flat surface." In letterpress printing, the surface of the image was raised to accept the ink, but the image of a planographic plate is smooth and relies on a photochemical process and the theory that water and grease don't mix.

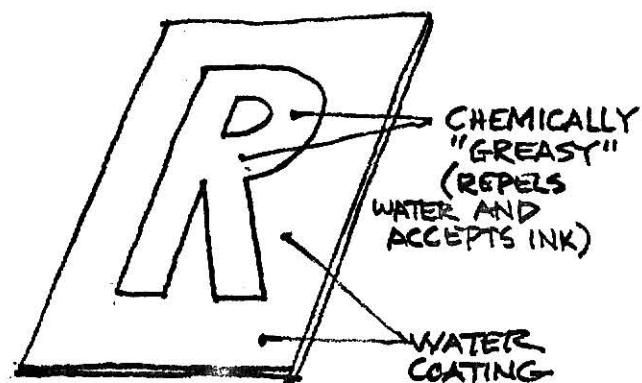
Offset printing has become a mainstay in the American printer's business, occupying a larger percentage of all printing each year.

The procedure developed out of a process called lithography, invented in 1799. Lithography means "writing on stone," and many fine artists still use lithographic stones to produce their work.

The photochemical process used to make offset printing plates makes the image areas slightly greasy.

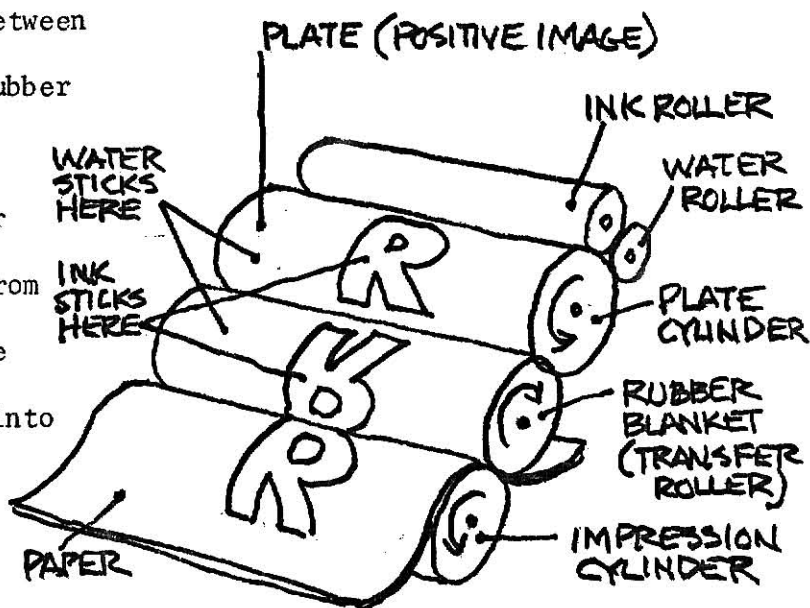
This greasy surface of the image area repels water. A thin coating of water is applied to the plate and adheres only to the non-greasy, non-

image areas. The water is mixed with an ink-repellent additive. When ink is coated on the plate, the water with its ink repellent, forces the ink to stick only in the image areas.



As the plate revolves on the press, it is continually coated with water and ink, each sticking to its own areas.

The ink image is then transferred to a rubber roller (called a blanket) and then, in turn, transferred to the paper. Because of this step between the paper and the plate (the rubber blanket) the process is called "offset" lithography. In other words, the image is "offset" from the plate to the blanket to the paper. The paper never comes into contact with the plate.



Offset Presses

Offset presses contain some of the major elements found in letterpress presses, but have two important additions. First, there has to be a rubber roller to accept the image from the plate and transfer it to the paper. The

other addition is a set of water rollers to distribute water to the plate's non-image area.

Offset presses come in many sizes and are available both in sheet-fed models and web perfecting varieties. By adding another set of inking, water, plate and blanket rollers, a second color can be applied in a single pass. Adding two more sets of the rollers produces a four-color press.

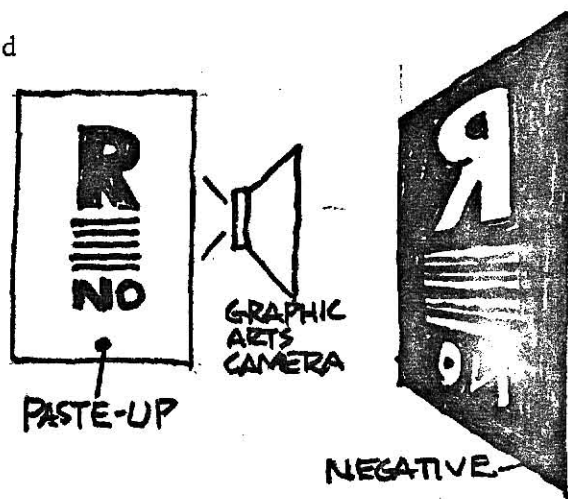
Preparing Plates for the Offset Press

It is not necessary to make metal engravings or to use metal type when preparing material for an offset plate. If metal type is used, a reproduction proof must be made from the type. All materials, with the exception of photographs, are used in a black-on-white positive image and are pasted in position on a layout board.

Photographs, because of their nature, must be handled separately.

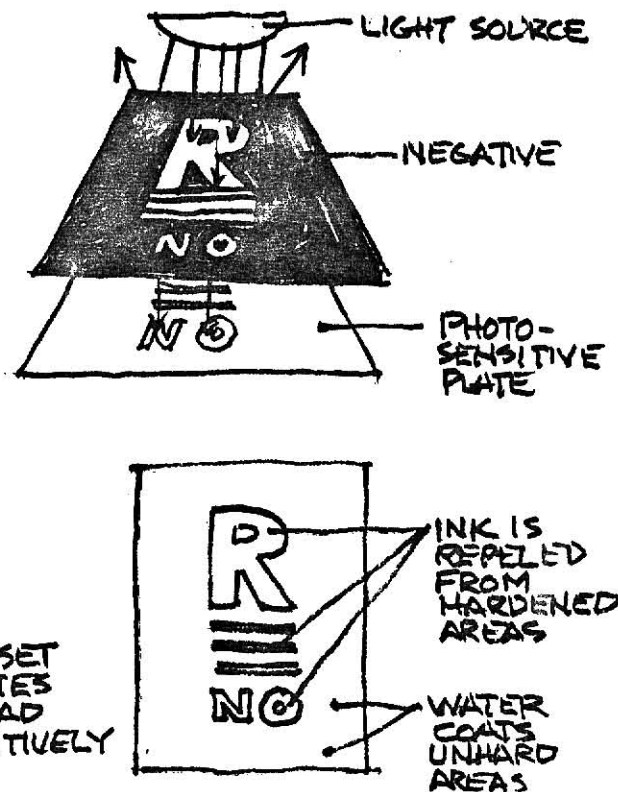
When the text material, headlines and line artwork are positioned and pasted on the layout, it is then inserted

into a graphic arts camera and photographed. The resulting negative is a mirror image of the original material. The negative is then placed on a photosensitive plate made of thin, flexible metal and an intense light projects the image onto the plate.



The light passes through the negative where it is clear (the image areas) and hardens the coating on the plate. Where the light does not strike the plate, the coating does not harden.

The plate is removed and wiped with a chemical which removes the un-hardened coating. When placed on a press, water is attracted to this area, while it is repelled from the hardened (image) areas. When ink is applied to the dampened plate on the press, it sticks only to the dry, image area. The plate reads positively, as the image is off-set onto the rubber blanket before being transferred to the paper.



Characteristics of Offset Printing

1. Ink is deposited upon the smooth surface of the plate.
2. The image is "off-set" from plate to blanket to paper---the paper does not come into contact with the plate. It is an indirect printing method.
3. Anything that can be photographed in the graphic arts camera can be reproduced easily and quickly in the shop. No etchings or engravings are necessary.

Advantages

1. Good detail is available on textured paper because of the flexible rubber blanket and the absence of a great amount of pressure.
2. Plates and negatives are thin, light, clean and can be easily stored in a small amount of space.
3. Lock-up (or "paste-up") is accomplished by pasting direct-reading paper

or film into position on the layout rather than maneuvering mirror-image metal in a form.

4. Because of the lack of metal pieces and square-edged furniture, layout of elements can be freer, without the more rigid rectilinear forms of metal and wood.
5. Because there's no need for engravings to be made, many times the preparation work can be done faster and the printed piece produced more quickly.

Disadvantages

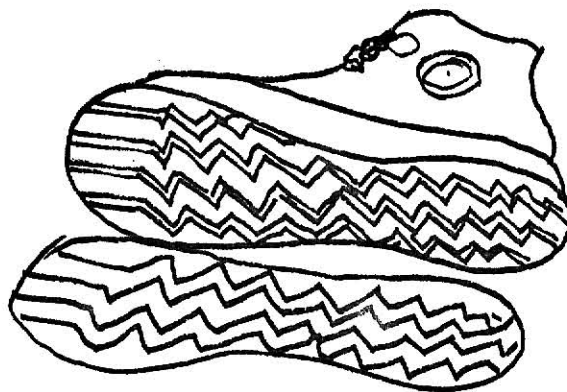
1. Equality of ink coverage may suffer because of the sensitiveness of the water-ink balance on the press.
2. Any changes require new negatives and new plates.
3. Consecutive numbering of forms, perforating and die-cutting are not possible on an offset press without special letterpress-type attachments.
4. Plates may wear out faster on long runs, although developments in fabrication of offset plates makes this a questionable disadvantage.

Intaglio Printing

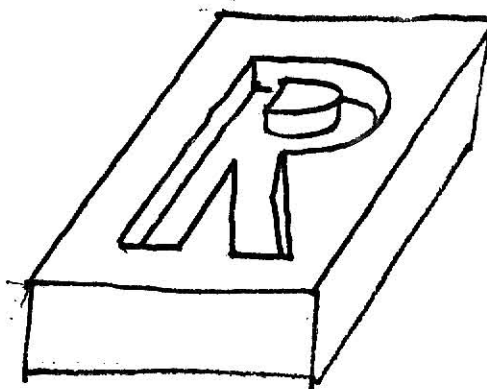
In letterpress printing the ink was deposited above the surface of the plate to transfer to the paper pressed upon it. In offset lithography, the ink was deposited upon the surface of the plate for offsetting to a blanket and then onto the paper. In Intaglio printing, the ink is deposited below the surface of the plate for transference to the paper.

Intaglio printing is printing from a depressed surface. The process involves a plate with the image incised into it. The incised portion of the plate serves as an ink reservoir. Ink is deposited and spread across the

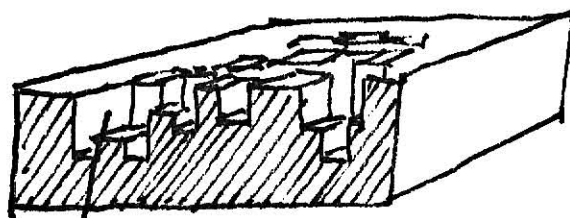
plate and then wiped from the surface with a "doctor blade," leaving ink only in the tiny recessed wells. It can be compared to the imprint of a muddy tennis shoe on a white tile floor.



In its simplest form, intaglio is used by artists to produce etchings. The design is incised in copper, the artist spreads a fluid ink over it and wipes away the excess ink. He then presses a piece of paper over the plate and the ink in the depressed areas is transferred to the paper. Intaglio printing is a direct-impression method.



In sophisticated intaglio printing (called gravure), photomechanical techniques are used to produce the incised plate. A "screen" is used in the process to produce tiny walled depressions. These depressions are all the same size, but vary in depth.



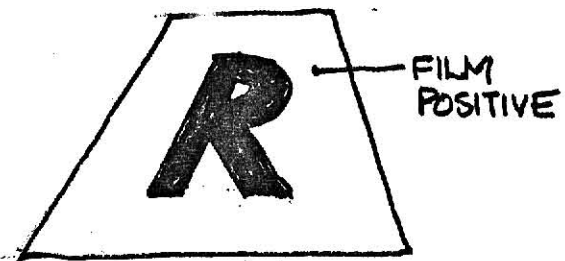
TINY WELLS FILL WITH INK.

Gravure is used in long runs of high-quality color printing. Sunday newspaper supplements, large retail catalogs, packaging, printed wall and floor coverings and other high-quality color works such as prints of famous paintings are printed by gravure.

Preparation of Gravure Plates

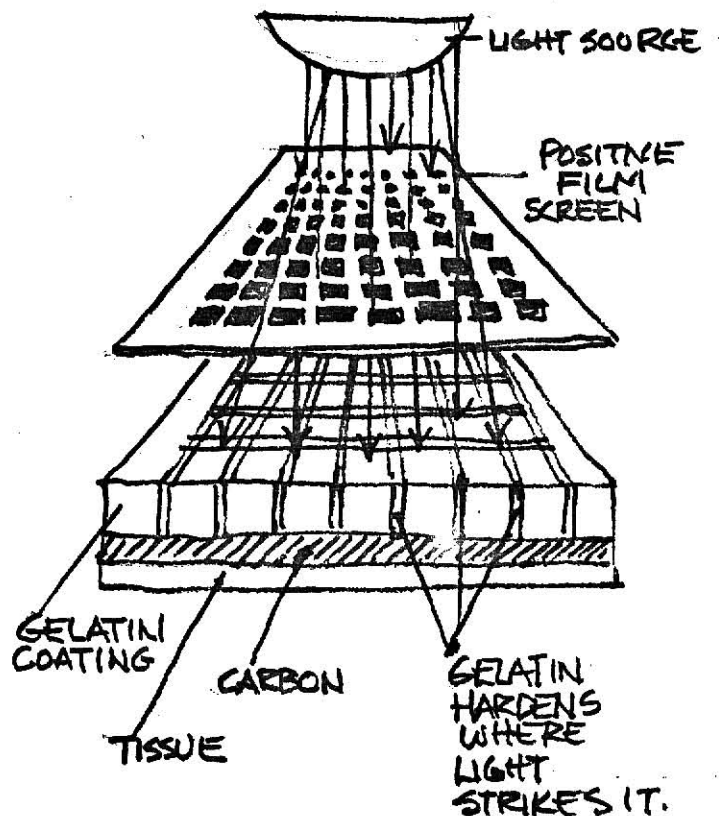
Preparation of sophisticated gravure plates is a complicated process. While it is not necessary to understand every step, it is important to be conversant with the basic procedures.

Unlike letterpress line etchings and offset plates which start with a negative of the material, the gravure plate is prepared from a film positive. The image areas appear black on a transparent film. Gravure is the only process where photographs can be handled along with line copy in the same procedure.



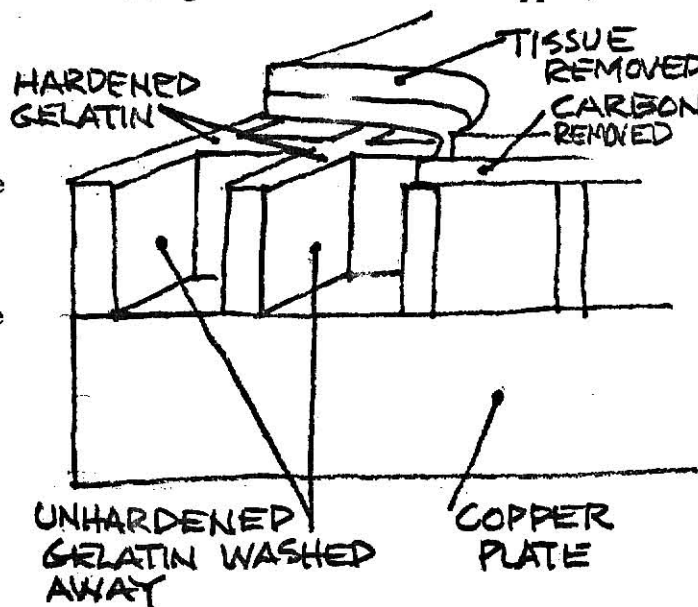
Because a gravure plate is made up of thousands of tiny wells which hold the ink, it is necessary to first produce a pattern which will form the well walls. A positive "screen" is used to make the tiny cell walls. The screen is placed over a sheet of tissue coated with gelatin. Light is exposed and where the light passes through the screen, the gelatin hardens and forms the cell walls.

If we wanted to print a solid black square, the plate preparation procedure would be as follows: The tissue is turned over onto a copper plate. The tissue is then



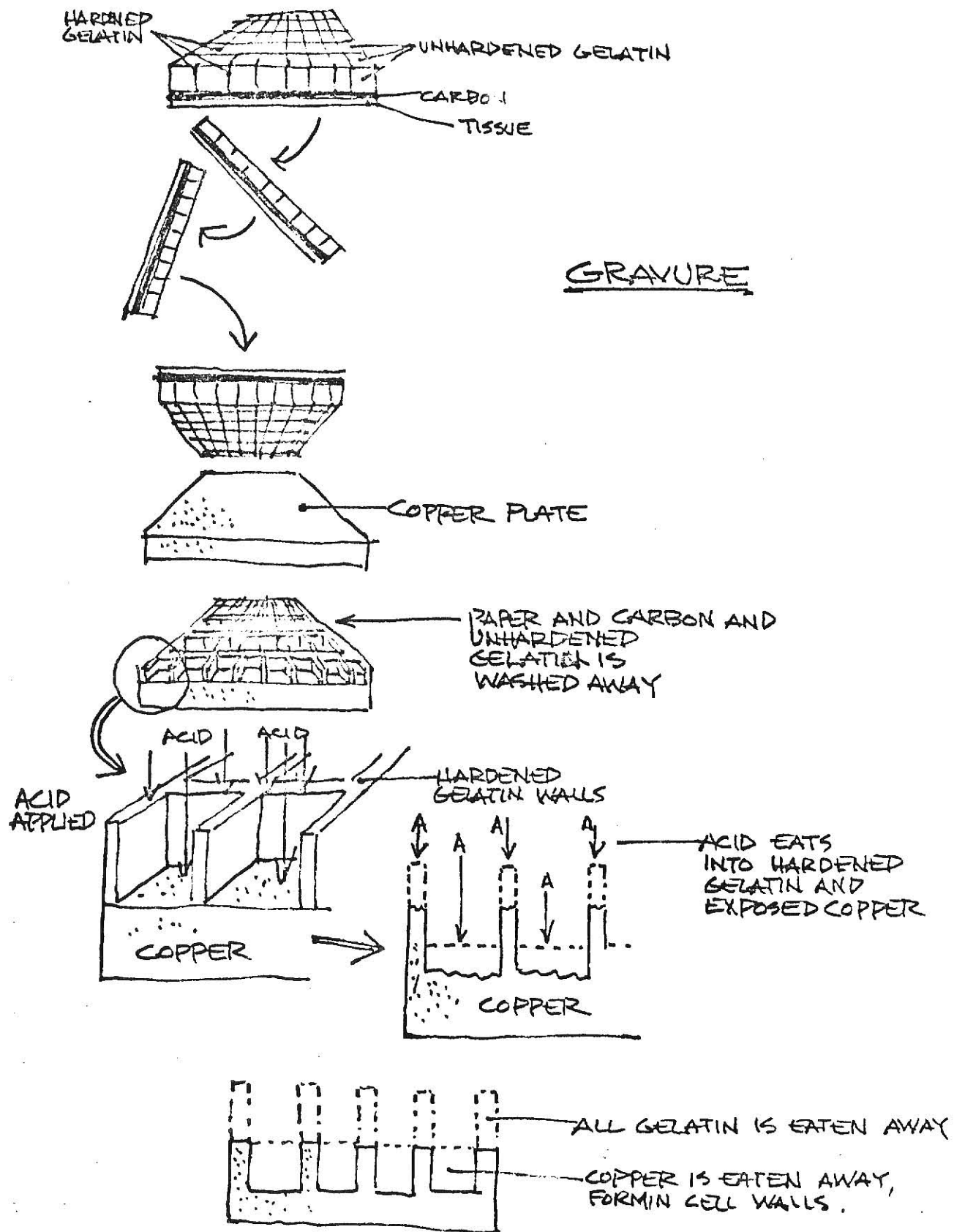
washed off the back side of the gelatin, and the un-hardened gelatin is washed away. The remaining hardened gelatin represents the clear areas, and the valleys represent the dark areas. In this example we are printing a solid black square, so all of the gelatin except the cell walls has been washed away.

An acid etching material is then poured on the plate. Before the etching material reaches the copper and starts to dissolve it, some of it has to eat through the hardened gelatin. Where the gelatin covers the copper, the acid has little time to eat through it during the etching period. Where the gelatin has been washed away, the acid immediately begins to eat away at the copper plate. Etching is done in several steps, using solutions of different strength. Ultimately, the acid eats into the copper at a sufficient depth to produce tiny reservoirs which hold the ink. Where the gelatin covered the copper, no etching has taken place.



This plate is now complete. When ink is smeared on the surface and then removed by the doctor blade, ink remains only in the reservoirs. When paper is applied to the plate, it picks up the ink from the wells and produces the black square.

The square is not solid black, however. Because of the cell walls, there are tiny criss-cross white lines through the square. The resultant solid is referred to as "screened" because of the screen effect. The screened

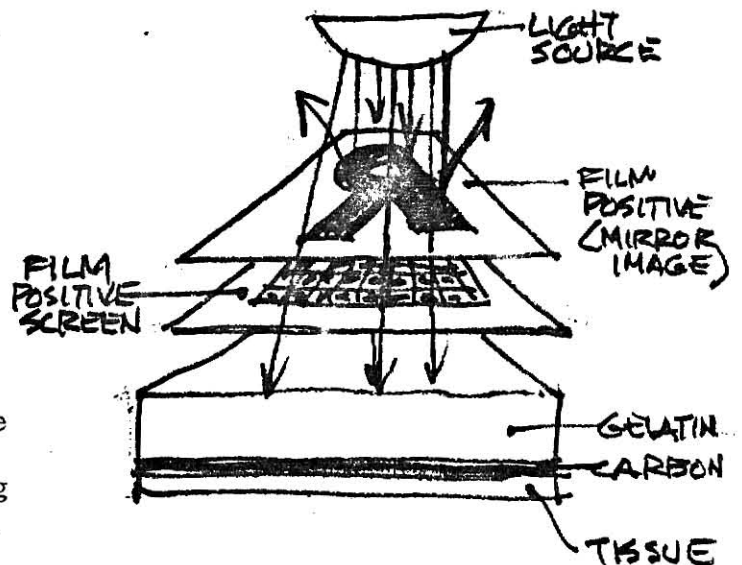
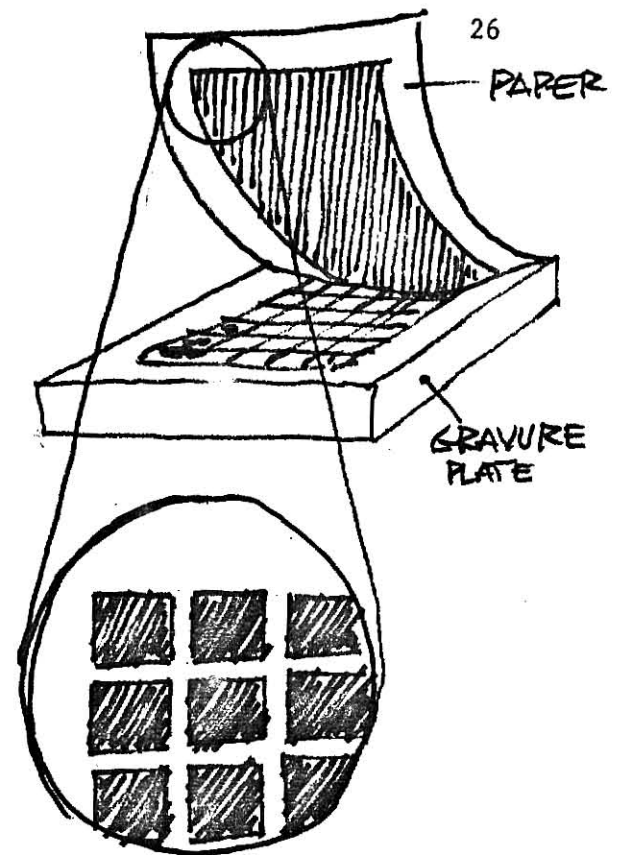


effect is similar to that used to produce photographs in other methods of printing.

When something other than a black square is desired, the etching process is complicated by another step. After the screen is placed over the gelatin and the cell walls hardened, then a film positive of the desired image is applied for a second exposure. The gelatin is then hardened everywhere except in the image area which has been protected by the black positive. Then the gelatin is placed on the copper plate and the unhardened image area is washed away. Acid is applied, eating into the plate and hardened gelatin alike. Where the plate is unprotected by hardened gelatin, the acid eats into the copper, producing an incised mirror image.

Characteristics of Gravure Printing

1. All copy, art, text, and photographs are "screened," or broken down into tiny dots because of the cell-wall structure of the plate.
2. Plate-making procedure is complicated and expensive, but plates last for

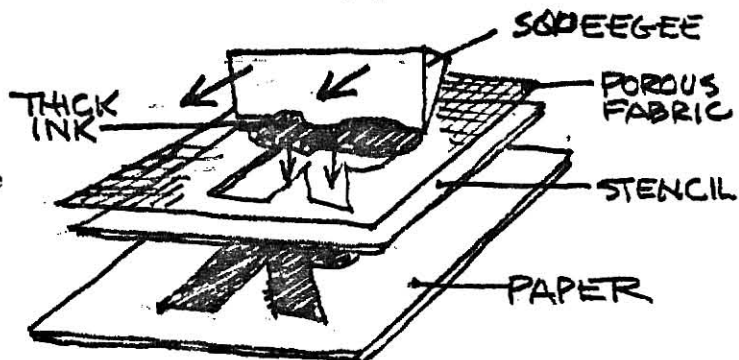


extremely long runs and produce fine quality photographs.

3. Line copy is impaired by the "screened" nature of the plate.

Screen Process Printing (Silk Screen)

Screen process printing utilizes a porous fabric, or screen, and a squeegee to force thick ink through the screen onto the paper. Silk screen can be accomplished by using the simplest equipment. The technique involves treating the screen so the ink will only pass through it in certain areas. The area which is left open, therefore, allows the ink to pass through and onto the paper, creating the image. Sophisticated photomechanical techniques are often used in commercial silkscreening.

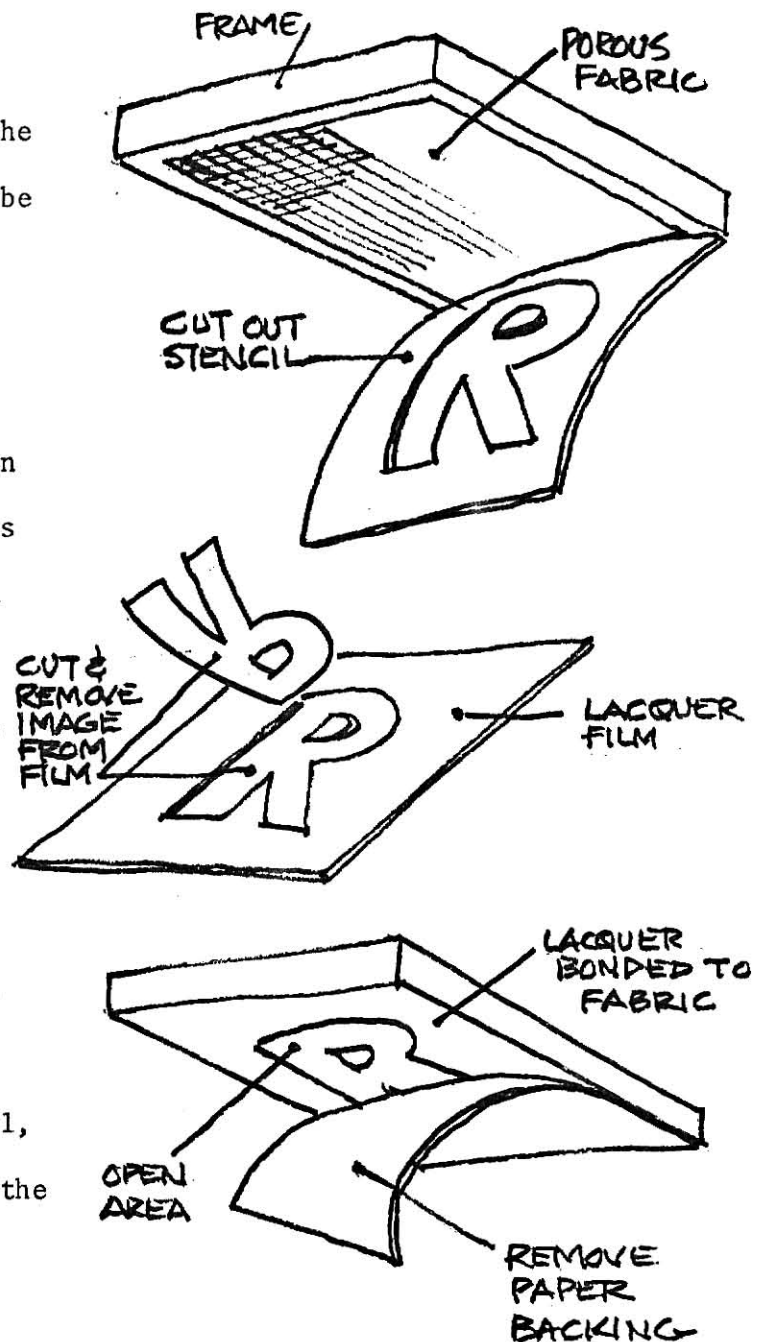


Major applications of silkscreening include posters, bumper stickers, signs, decals, wall coverings, billboards, advertising specialties, notebooks and items printed on large, thick or heavy materials which would not pass through a printing press. Detail is limited in silk screen production, but large solid areas of color usually reproduce well.

Preparation of the Silk Screen Plate

The silk screen method of printing does not use a plate as such. Rather, a porous screen transmits the ink to the paper, and a stencil is used to block out areas not wanted to be printed. A simple stencil can be prepared by using light paper such as newsprint and cutting out the desired pattern with a knife. The paper is then placed on the bottom side of the fabric and ink is spread

over it. The moisture in the ink soaks the paper and it sticks to the screen. Very few impressions can be made with a simple paper stencil. More sophisticated screens can be made by cutting the design in a special lacquer film which has been bonded to paper. The image area is cut out of the lacquer film with a knife. The sheet is then bonded with solvent to the screen and the backing paper is pulled away, leaving the lacquer film to plug the screen in all non-printing areas. Other stencils can be prepared by photographic development, which produces an excellent stencil, but is much more complicated than the hand-cutting method.

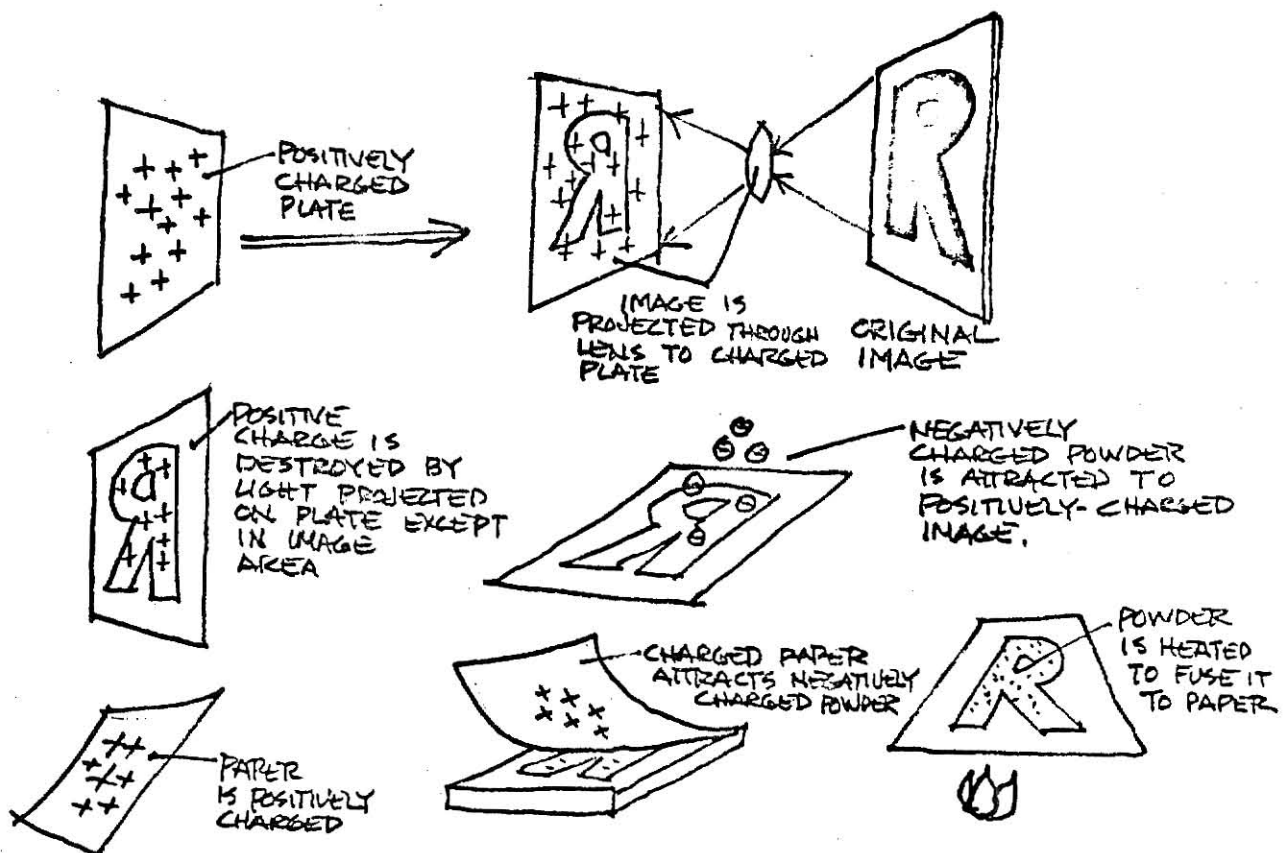


Other Forms of Printing

Xerography (electrostatic printing)

The newest proven and accepted method of printing uses no ink, no pressure and no chemicals for producing images on paper in quantity. Instead, a dry powder and the principles of photoconductivity and electrical attraction are used to create the duplicate images. In the electrostatic system an electrically charged plate is exposed under light to the image to be reproduced.

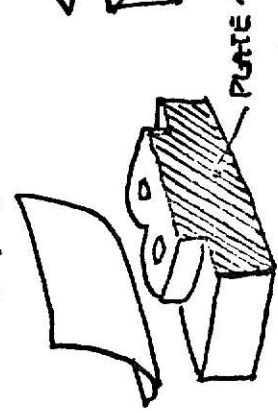
Wherever light hits the plate, the electrical charge is eliminated. Where no light strikes the plate (in the image area) the charge is maintained. Black powder then is applied to the charged areas of the plate and sticks there because of the charge. The paper is then charged with electricity, comes into contact with the plate and attracts the black powder. The powder is then heated and fuses to the paper with the resulting image affixed.



FORMS OF REPRODUCTION - CLASSIFIED AS TO THE TRANSFER OF INK.

ABOVE

- Letterpress
- Woodcut
- Linocut
- Rubber stamp
- Finger print



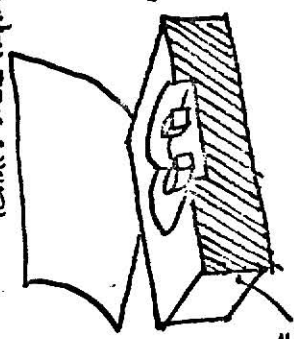
DIRECT IMPRESSION

MECHANICAL

MIRROR IMAGE PLATE

BELOW

- Intaglio
- Engraving
- Etching
- Tennis shoe imprint



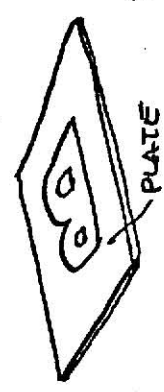
DIRECT IMPRESSION

MECHANICAL

MIRROR IMAGE PLATE

UPON

- Platographic
- Offset lithography
- Lithography



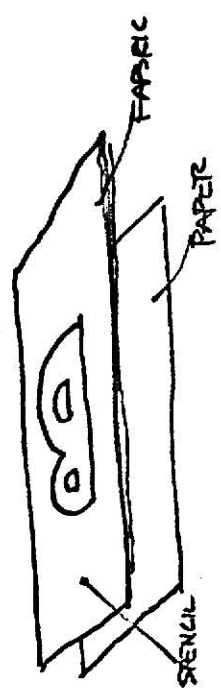
INDIRECT IMPRESSION

CHEMICAL

POSITIVE IMAGE PLATE

THROUGH

- Screen Process



DIRECT IMPRESSION

MECHANICAL

MIRROR IMAGE PLATE

CHAPTER THREE

TYPOGRAPHY

One of the several places in the graphic arts industry which art and science merge is in the area of typography. Typography, in its simplest definition, is the appearance and arrangement of letters and words. The field of typography therefore embraces not only the actual design of the various alphabets, but the placement of the words on the page and even the actual production of the type (called composition).

The development of the alphabet as we know it generally parallels the development of printing, and is equally as interesting. Many letter forms in use today can be traced back to the basic hand lettering of Italian or German scribes.

The Anatomy of a Letter

While there are hundreds upon hundreds of differing styles of type, there are certain distinctions which can be made about most of them, regardless of their individual design. Before we attempt to classify groups of type designs into categories according to their visual characteristics, it will be helpful to present basic features which are common to all or many of the type groups.

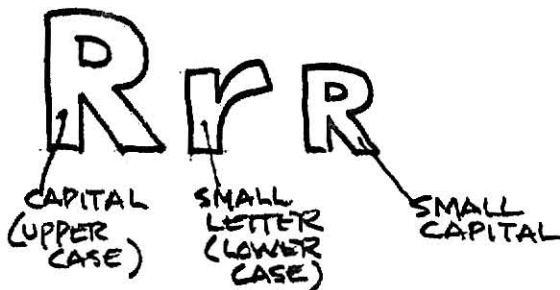
The Type Face

The individual design of an alphabet which is unique to it alone is called a type face. Each type face may have a number of variations, but the basic design is maintained throughout them all.

Upper and Lower Case

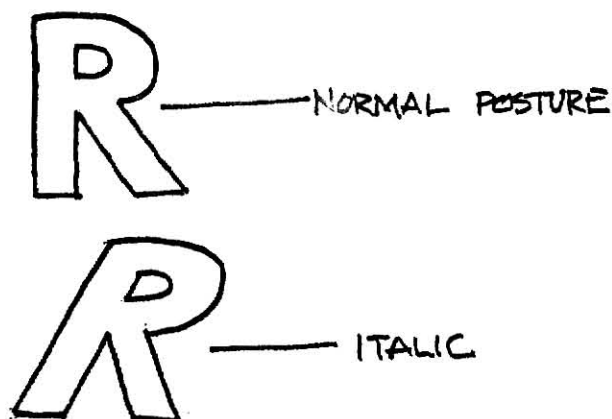
Capital letters are called "upper case," and small versions are called

"lower case." The terminology refers to the position in the type case used to hand-set metal type: capitals were located in the upper portion, small letters in the lower portion. Small caps are a cross between the two: the form of the letter is the same as the capital form, but the size is the same as the lower case.



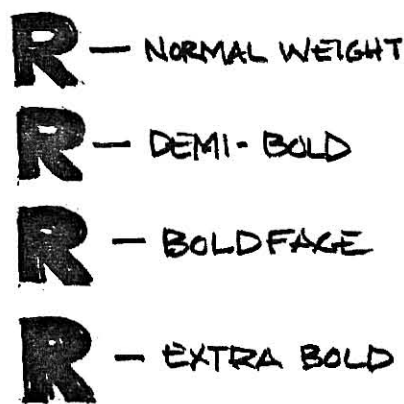
Italic

Type faces which slant to the right are called italic faces. Most commonly-used type is available in both upright style and italic slant. The italic form is reminiscent of the hand lettering produced by early-day scribes and is today used for emphasis, or differentiation, such as newspaper and book titles.



Boldface

The normal "blackness" of a letter, or its visual weight, is measured in terms of boldface. With the normal blackness designated as "medium," a heavier, darker rendering of the same letter form becomes "boldface." Some type designs are available in several weights of



"bold." Designations like "demi-bold," "extra bold," or "black" identify other heavier-than-normal faces. Boldface is used for emphasis in masses of type.

Lightface

Just as it is possible to render a letter style in a darker, heavier form, it is also possible to draw it in a narrower, lighter form. This designation is called "lightface" and it is possible to produce letters in increasingly narrow thicknesses as well. "Extra light" and "hairline" are designations given to type drawn with even thinner lines than Lightface.

R - EXTRA LIGHT
OR "HAIRLINE"

R - LIGHTFACE

R - NORMAL FACE

Condensed Faces

A particular type style can be drawn in such a way that it appears more compact, but the integrity of the original design form is maintained. Letters that are condensed occupy less linear space than the normal face. Condensed typefaces appear to be slightly "squashed" when compared to the normal face of the same style. Condensed type is used frequently in newspapers and other applications requiring a great amount of type within a limited space.

R - NORMAL FACE

R - CONDENSED FACE

Extended Faces

Just as we can "squash" a type design to produce a condensed face, it is also possible to "stretch" the

R
NORMAL

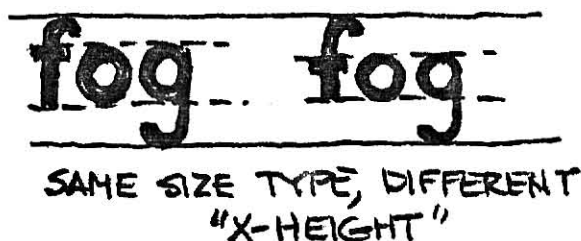
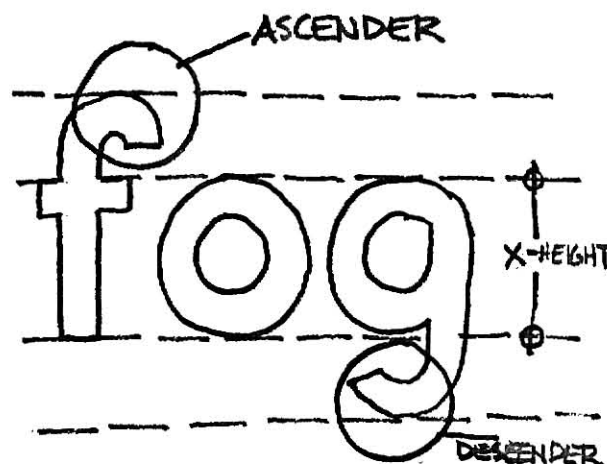
R
EXTENDED

design and prepare an "extended" face. Extended type faces are drawn out and occupy more horizontal space than the normal version. Extended faces are often used in titles, headlines for advertising material and in decorative applications of type.

Parts of the Body

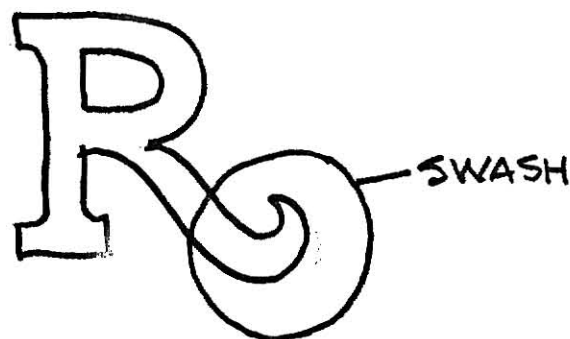
An individual letter of type can be divided into three parts. The body, or the main mass, is called the "x-height." Any portion of the letter which sticks up from the body is called an "ascender," and any portion of a letter which hangs from the body is called a "descender." These designations are important when measuring type or attempting to distinguish between two styles or designs of type.

A careful study of different styles of type will show that the proportions of the "x-height," the "ascenders" and the "descenders" vary with the design.



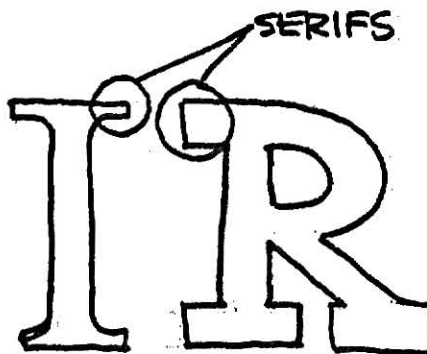
Swashes

The decorative tail which adorns some styles of type is called a "swash." These elements serve only a visual purpose, adding to the character of the design.



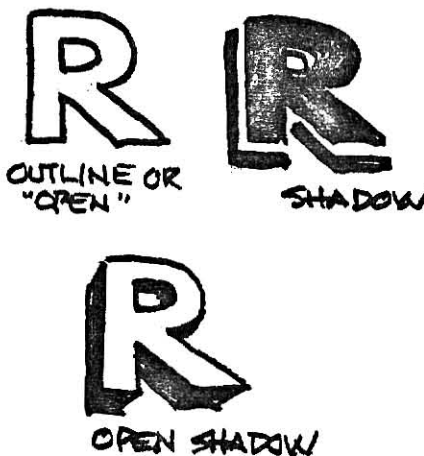
Serifs

Many typeface designs have small, almost hairline strokes at the ends of the letter forms. These strokes are called serifs. Some serifs are rendered delicately, while others are presented with bold, broad strokes. Many typographers and printers use the presence or absence of serifs in a type design to classify the style. Many type specimen books are divided between "serif" types and "sans-serif" styles. "Sans-serif" type does not have the short cross stroke at the ends of the letter strokes.



Outline type, Shadow type

Some type designs are also presented in an outline form, which is sometimes called an "open" face. Other designs can be drawn with a shadow giving the appearance of a three-dimensional letter. Letters of this type are used in larger sizes and are most generally restricted to headlines.



Basic Letter Forms

There are several ways to classify the different basic letter forms. Many times it seems that there are as many ways to classify them as there are people doing the classifying.

Generally, basic letter forms can be grouped into five main categories according to their visual appearance and design characteristics: 1) text type;

2) Roman; 3) Gothic; 4) cursive and script; and 5) novelty.

Text Type

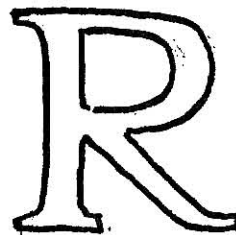
This style of lettering is most commonly called "Old English," but the name is misplaced as the style grew out of the early work of German scribes. Text type is also called "black letter." Text type is most difficult to read and is, for that reason alone, used sparingly. There usually are no lower-case letters in a text type alphabet. Formal invitations, certificates, newspaper nameplates and other decorative applications constitute the main usage of text type.



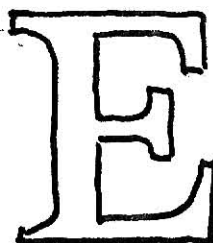
Roman Type

Roman typefaces grew out of the early work of Italian scribes and was preserved in stone on many Roman buildings. Its main design characteristic is that it almost always has serifs and the weight of the lines within a letter varies from thick to thin.

Most vertical strokes of a roman letter are thicker than the horizontal strokes. This line width variation is due to the broad-tipped quill used by early Roman calligraphers.

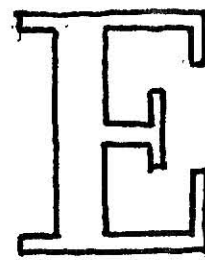


Most typographic scholars subdivide the group of Roman faces into three categories. Oldstyle Romans are characterized by subtle line

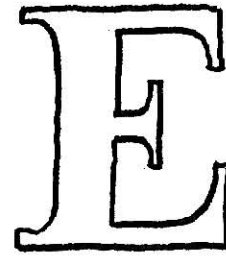


OLDSTYLE ROMAN

weight differentiation and heavier, thickened serifs, called "bracketed" serifs. Modern Roman type faces use straight, thin, "un-bracketed" serifs and have greater difference between the weight of thick and thin strokes. The third category, "Transitional" Roman exhibits characteristics of both "Oldstyle" and "Modern" Roman style.



MODERN ROMAN

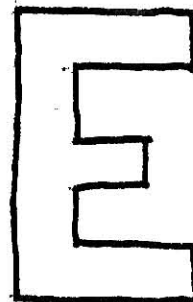


TRANSITIONAL ROMAN

Note: many printers refer to the "Roman" typeface as any style that is upright; that is, not italic. This is an unfortunate confusion of terms, whereas "Roman" is more properly used to designate a particular visual style of type design.

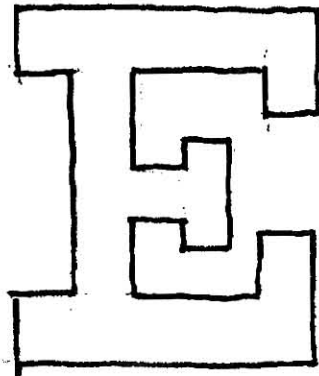
Gothic Type

The "machine age" produced a great change in the design of many everyday things in the world, including typefaces. With the emphasis on clean, smooth, uncluttered styling of the period, the Gothic or Sans-serif style of type design came into vogue. The designation of "Gothic" is, again, a misnomer, as the type style has no relationship to the Gothic style of architecture. Gothic letters generally



are drawn with the same width lines for each part. There is little or no variation in line weight. Almost all gothic type does not have serifs, and therefore, is many times referred to as "sans-serif" type.

One particular sub-section of the Gothic style has serifs, but is included in the Gothic classification because of its uniformity of line width within the letters. It is called "slab serif" type. With the exception of the heavy serifs, the design of the type is a true gothic.



Script and Cursive

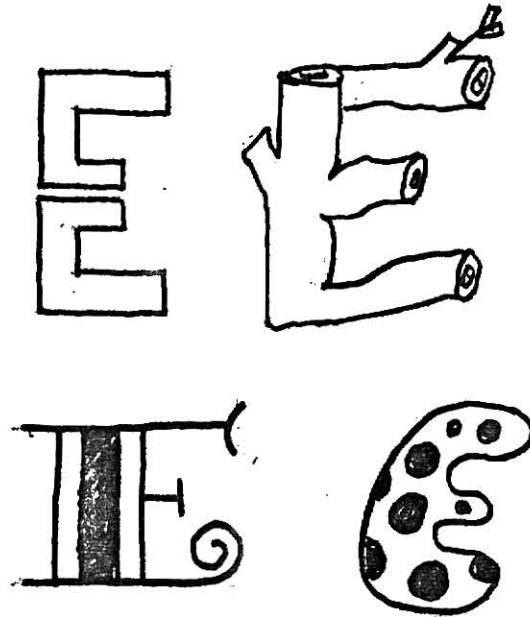
Type which is designed to capture the feeling of handwriting is called script or cursive type. The main distinction between script and cursive is that script letters appear to be joined, while cursive letters are not. Script and cursive type is used mainly for invitations and other semi-formal applications, and in a heavy bold style it is sometimes used in advertising.



Novelty type

Type which does not fit within the main visual categories is generally called novelty type. While some novelty type is simple and straightforward,

others consist of letters made up of logs, fire or balloons. Much modern type falls into the novelty category, as well. Novelty type usually is used in larger sizes and generally restricted to advertising, circulars and posters. Many times, because of its particular design, novelty type is difficult to read and should be used sparingly.



The Type Family Tree

If there isn't enough to remember about the various styles of type, there are several other designations which are important to understand and use correctly.

Type Race

A "race" of type is the broad category in which it belongs. The races have been presented here as Roman, Gothic, text, script or cursive, and novelty. The race is the broadest classification.

Type Family

A "family" of type includes a particular style of type in all its various sizes and forms. For instance, a family of type would include all sizes of medium weight type, all sizes of bold face, all sizes of light face, condensed, extended and any other stylistic variations available in the particular face or style. A family includes all sizes, weights, postures and widths.

Type Series

A "series" of type is the range of sizes available from a particular printer or typographer. A particular style may be available in a number of sizes from one printer, but only in a few select sizes from another. The complete list of sizes of each face is called the printer's "series."

Type Fonts

A type "font" is a particular alphabet---it includes only one size and variation in the type family. Every size or variation change in a particular style of type requires a different font.

Type Measurement

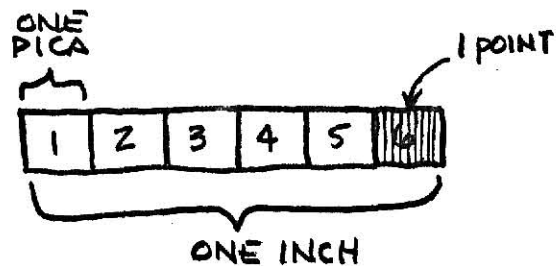
Type comes in many different sizes. From the smallest "fine print" of insurance certificates and the classified sections of newspapers to the large banner headlines of major metropolitan daily papers, type sizes are available for every need.

A special system of measurement has evolved through the years for measuring the size of type, the width of columns and the space between lines of type.

The basic unit of the measuring system is the "point." American and English "points" are equal to .0138 of an inch. Most parts of Europe use a slightly larger "point" as the basic unit, but, with the coming of the world-wide standardization of the metric system, printers may follow the trend and convert entirely to the millimeter. But printers as a whole accept those kinds of basic changes grudgingly, so it may take years before a world-wide standard is developed.

The closest fractional equivalent of .0138 inch is $1/72$, therefore one inch contains almost exactly 72 points. Since the point is a very small unit,

another larger unit is also used. It is called the pica, and is made up of 12 points. There are six picas in an inch.

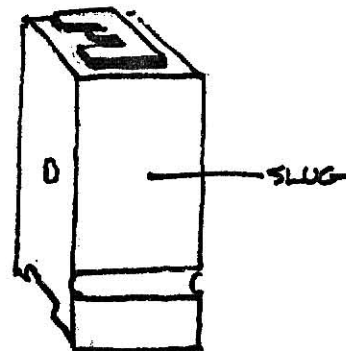


The size of type is always measured in points. Standard type sizes range from 5 1/2 point to 120 point. Several designations are given to groups of type sizes. Agate type is 5 1/2 or 6 point. Body or text type is generally produced in 8, 10, 12, and 14 point and display type includes 18, 20, 24, 30, 36, 48, 60, and 72 point. Poster type is the category of the largest sizes: 96, 120 point and larger.

Method of Measurement

Because type comes in such varying shapes and designs, a standard of measurement must be used which can be applied to all different styles.

The measurement is based on the size of a metal "slug" needed to carry the

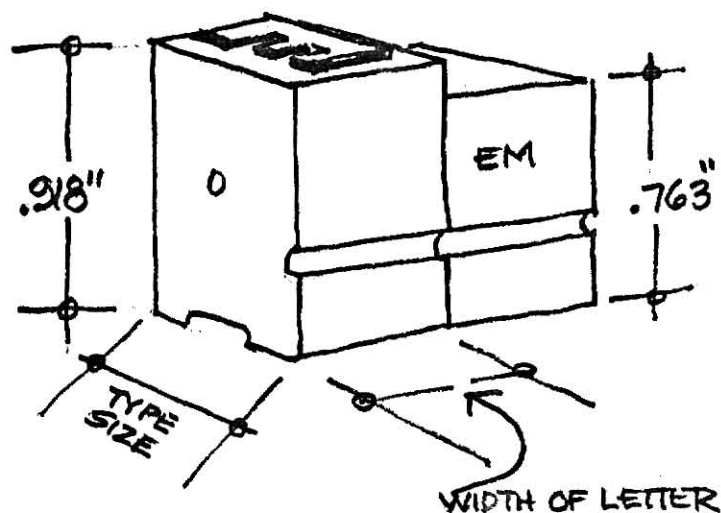


letter's image. This method was developed before the invention of photo-composition, or "cold" type, but the theory survives.

The size of a particular type specimen is not the size of the letter itself (because different designs can vary in the basic size---the "x-height" can be different) but rather, the size of the piece of metal needed to carry the image.

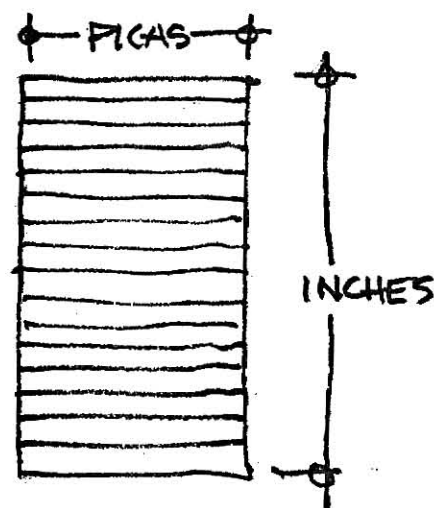
A diagram using individual foundry type characters is helpful in illustrating the various measurements of type. The thickness of the slug is

the type size. The width of each piece of type varies with the letter. A capital M is much wider than a lower-case j. Spacing material is measured in terms of a square of the type size. An "em" is a full square of the type size. An "en" is one-half the square of the type size.

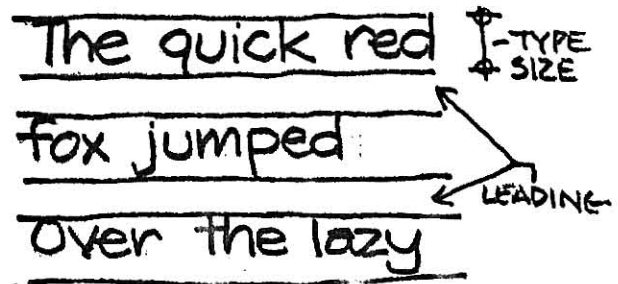


Therefore, an em of twelve point type is 12 points wide. An en of the same type is only six points wide. An em of 36 point type is 36 points wide. Ems and ens are used as paragraph indentions as well as interior spacing material. This book is set in g point type and the paragraphs are indented two ems.

Horizontal measurement of columns of type is expressed in Picas. Printers use a "line gauge," or "pica pole" to measure column widths. In this country, the length of columns is usually expressed in inches. Because columns can be long (many times up to 15" in a newspaper) the more convenient measurement is inches. A 15" column would be 90 picas long, and, because of the large number, it is easier to speak in terms of inches when measuring the length of columns.



When type is set in lines forming columns there may be spaces inserted between the lines to keep the lines from seeming pushed together. This space is called "leading," and is measured in points. Normal leading in text material is one or two points. This book has one point of leading between the lines of type.



"Cold type," produced by a variety of photo-chemical methods, is normally measured in the same way as the hot metal versions. The machines which produce the type, however, are structured on a "unit" measuring system. In most machines, a unit is equal to 1/18th of an em, or 1/18th of the size of type being set.

Thorough knowledge of type measurement is necessary in order to accurately specify type for the compositor, to accurately fit copy to layout (or vice versa), and in order to judge the readability of a mass of typeset copy.

From the foregoing discussion, it can be seen that the typographer must be concerned with the point size of the type, the leading (or space between the lines of type) and the width of the lines which form a column of type.

There is another kind of spacing which must concern a typographer and designer. Because lines of type are made up of individual characters which form individual words, the typographer should also be concerned with the internal spacing within a line of type.

Word spacing is the process of assigning proper spaces between words of a text. Letter spacing is the process of assigning space between the

letters of individual words. This spacing can greatly affect the design quality of copy and the readability of blocks of text material.

now is the time to come
to the aid of the party.

now is the time to
come to the aid of

Depending on the typesetting method (see the following section), letter spacing and word spacing are accomplished either by "eyeballing it" (hand-drawn or hand-set transfer

now is the time.
now is the time.
now is the time.

type) or automatically by the composing machine (Linotype photo compositors). Many photo compositors have the capability of adding or reducing the space between letters in a word. Hot metal casting machines have a fixed space between letters and cannot be altered.

Spacing between the words is usually uniform within a line. Typesetting machines rely upon mechanical spacing systems (Linotype) or computers (photo composition) to insert enough space between words to fill out a line to its desired width.

The intricacies of letter and word spacing for each form of composition equipment are described more fully in the next section.

Forms of Composition

There are several ways to produce letters to form words to be printed on a press. For the purposes of this discussion, we will divide the methods of composition into two very broad categories: 1) metal type and 2) non-metal type.

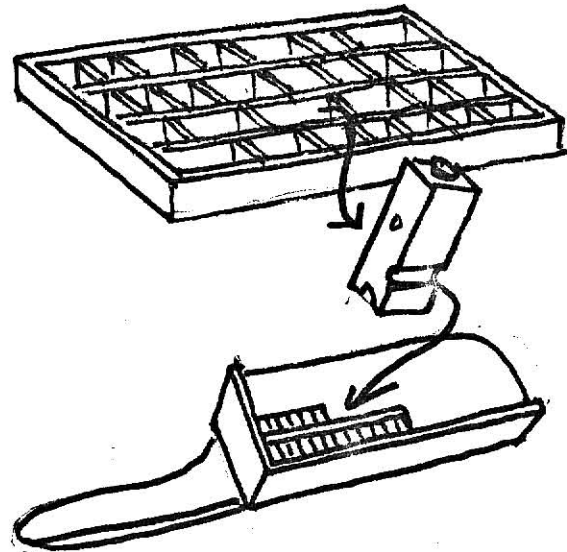
Metal Type

During the decades when the major method of printing was letterpress, all type had to be cast in metal. Even though far less letterpress printing

is done today as in the past, metal typesetting still occupies an important role. Even when copy is being prepared for offset printing, metal type can be produced and a reproduction proof made and pasted onto the layout for offset plate production.

Handset Foundry Type

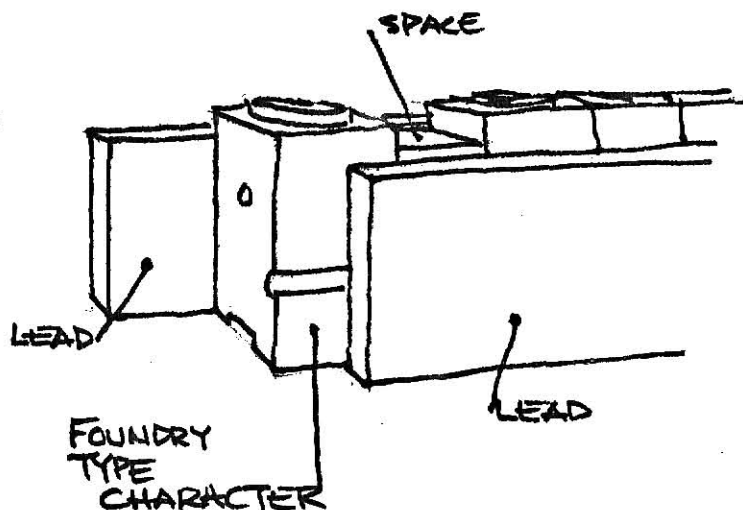
Before the invention of automatic typesetting machines, all metal type was set by hand. Each letter of each word was selected from a large case and assembled on a metal hand-held form called a composing stick. Needless to say, the process was time-consuming and since the type reads backwards, it provided the opportunity for many errors.



Not only is the hand setting of foundry type a slow process, but once the type is set in the composing stick, locked up on the press and printed, the individual letters had to be removed from the form and replaced in their own cubicles in the type case. This task is called "distributing" the type, and takes as much or more time than assembling it in the first place, because each letter has to be read in reverse and then placed in the proper cubicle.

Very little commercial composition is accomplished today with handset foundry type. Many printing shops still have an assortment of foundry type, but it is used only in rare occasions, and then only for a few words or phrases. In handsetting foundry type, all spaces between words must be inserted by hand and the leading is inserted by hand, as well. Spaces in foundry type are

shorter than the characters so they won't touch the surface of the paper when the printing takes place. The leading material, called "leads" or "things," are also manually inserted by hand between each line of set type.

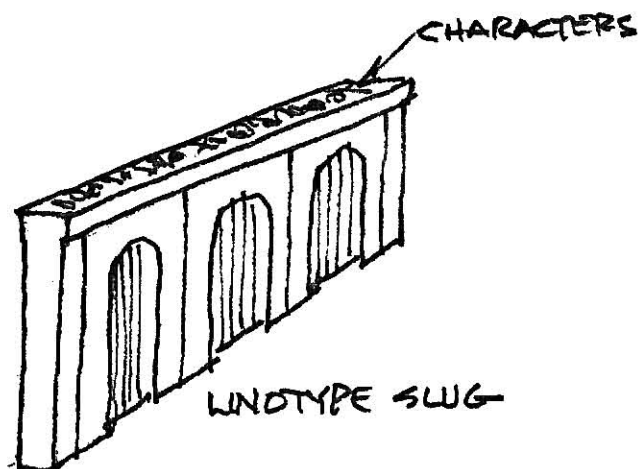


Linecasting Machines

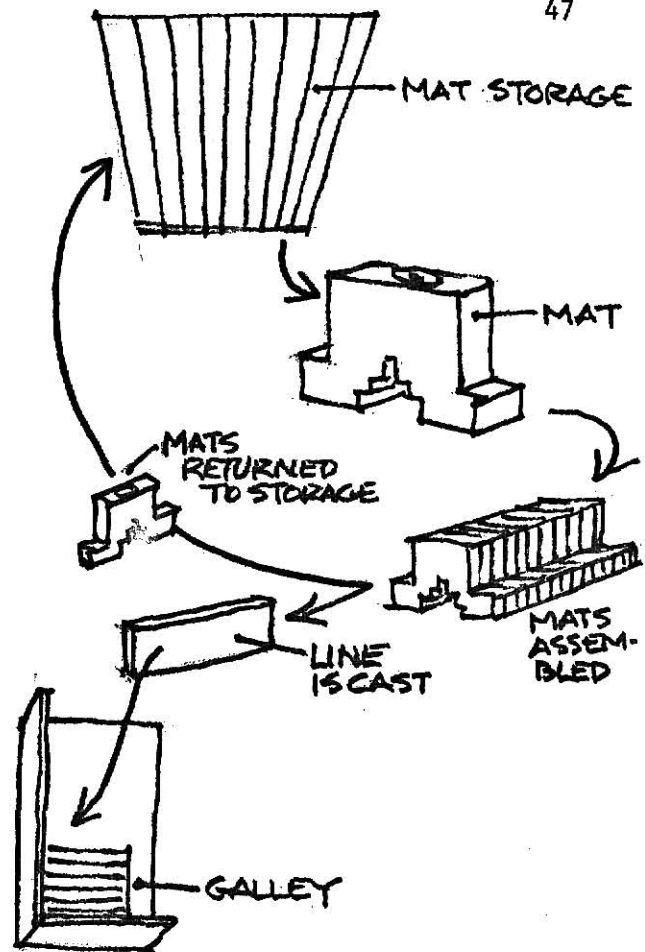
It took nearly 400 years of hand setting foundry type before a machine was perfected to accomplish the task. Otto Mergenthaller finally succeeded in developing a workable typesetting machine in the 1880's. The history of the development of the Linotype, as it was called, is as fascinating as the machine itself. Since the success of the Linotype, other manufacturers have produced similar machines, bearing other names. For the purposes of this discussion, "Linotype" will be used as a generic term referring to all line casting machines.

The Linotype is a marvelous machine bursting with cogs, wheels, pulleys and levers. When the functions of the machine are understood, it is clear why all the mechanic "gizmos" are necessary.

Basically, the Linotype produces an individually cast line of type, ready for locking into a

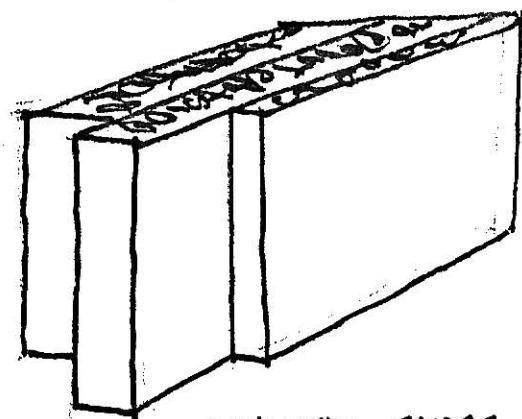


letterpress form. The machine has a keyboard similar to a typewriter. When the operator depresses a letter key, a brass mold (matrix or mat) is released from a storage area and assembled in order in the casting portion of the machine. When the line is complete, the series of mats is tightened into a line and molten lead alloy is injected into the casting area. In seconds, the lead is cool and the finished line is dropped into a metal pan called a "galley."



Once the line is cast, the brass molds are automatically returned to their storage areas, ready to be used again in another line.

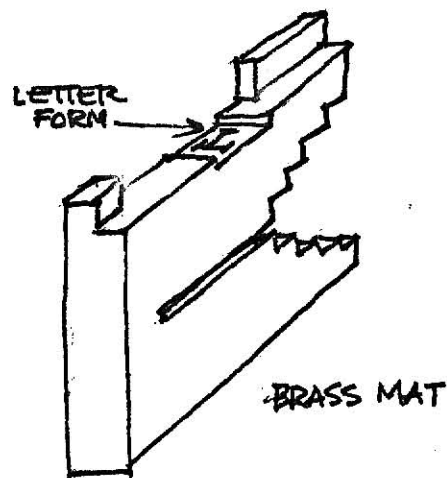
The metal strip on which the individual letters are cast is called a "slug." The machine is capable of producing a wide variety of widths and thicknesses of slugs. Since the thickness of the slug can be varied, the "leading" can be cast along with the type, thus eliminating the need to place the spacing material between the lines by hand.



LINO TYPE SLUGS .

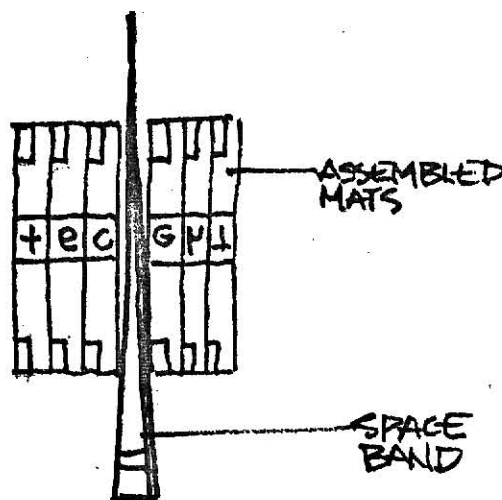
The brass matrices (or mats) used to cast the individual letters are carefully engraved with a positive image of the individual letters. When molten lead is poured onto the mats, a perfect mirror image of the letter is formed, and the resultant slug is ready for printing.

After the slugs have been printed, they are returned to the melting pot, melted down and re-cast into other lines of type. Since each line produced in the Linotype is a fresh casting, the type doesn't wear out after much use like foundry type.



Fantastic time savings were realized from the invention of the Linotype. Not only is the speed of setting the type increased many times over hand-setting, but there is no type to re-distribute. The machine automatically distributes the mats to their proper place. Used slugs are simply melted down, thus completely eliminating the chore of distribution of used type.

The word spacing function of the Linotype is performed by a number of ingenious units called "space bands." When the operator strikes the space bar on the keyboard, a space band drops into place rather than a mat. When the words are set to complete the desired length of line, the operator pulls a lever



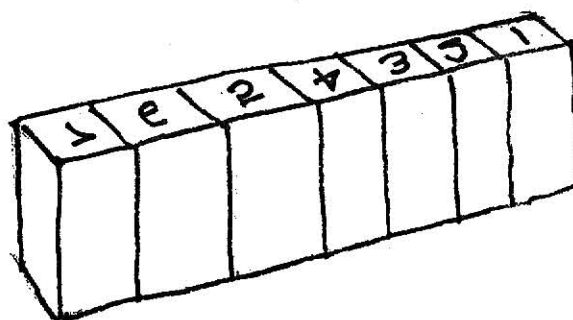
which forces the space bands to expand to fill out the line to its ends. This process of filling out the lines to the ends of the desired width is called "justification," or "justifying the line."

The space bands are expanded just before the casting process, so when the molten metal reaches the mats, they are spaced evenly and fill out the line perfectly. Because of this method of justification, spaces between words in Linotype lines are exactly the same within each line. They may vary from line to line, however, depending upon the number of characters needed to fill out the successive lines.

now is the time
to come to the

The Monotype Machine

Monotype is a cross between handset foundry type and the Linotype machine. It uses individual casting molds, or mats, to assemble lines just as the Linotype. But, instead of the machine casting the characters in a single line on one slug, the characters are cast individually and assembled into a line. The Monotype method of typesetting is helpful when setting large amounts of tabular matter which may undergo changes. When a character or figure is changed, it is not necessary to reset and recast the entire line of type, just the individual units needing correction. While not in wide use, the Monotype does serve some applications particularly well.



The Ludlow

The Ludlow, too, is a cross between hand-set foundry type and the Linotype. It also uses individual mats assembled together to cast an entire line of type in metal. But instead of the machine assembling the mats automatically, they are selected and arranged by hand and placed in the casting area. The letters are then cast on a common slug. The Ludlow is used only for larger display type, and still is in common use, although photo composition threatens its practicability. Large amounts of type are not set on a Ludlow, as the time necessary to assemble the mats and then to distribute them after casting precludes its usefulness.

Non-metal Type

The universal acceptance of the offset printing method has nearly eliminated the need for type to be produced in metal as necessary in letterpress production. Since anything that can be photographed can be printed by the offset method, all that is needed is a black-on-white image of the type pasted in position on the layout. There are several ways to produce this so-called "cold" type.

Hand-drawn Type

The simplest method of producing "cold" letters is to hand-draw them on paper or illustration board. The drawn image can then be photographed and converted to an offset printing plate. Hand-drawn letters also can be used in letterpress

NOW!

printing, using the engraving technique described earlier.

Much amateur hand-lettering is crude and unattractive, but professional calligraphers and artists often produce striking examples of individualized hand lettering. Some type faces are available in metal and in cold processes which imitate the freshness and spontaneity of hand lettering.



Strike-On Type

The most common strike-on method is using a standard typewriter. The letter image is "struck" against a ribbon of ink or carbon and the letter is transferred to the paper. The common typewriter is a rather unsophisticated typesetting machine because it is normally restricted to a set spacing system. The capital M on a typewriter is exactly the same width as a lower case j. Spacing is also rigidly controlled within the unit system. Justifying the lines on a typewriter requires at least one re-typing and often times necessitates uneven spacing or unnatural word hyphenation.



The offset printing revolution coupled with the low cost of preparing copy on the typewriter has, however, encouraged a great amount of typewriter-set copy.

Some office machine manufacturers have developed typewriters with variable spacing which allow individual letters to be more naturally formed. These machines are generally more expensive and more complicated to operate, however.

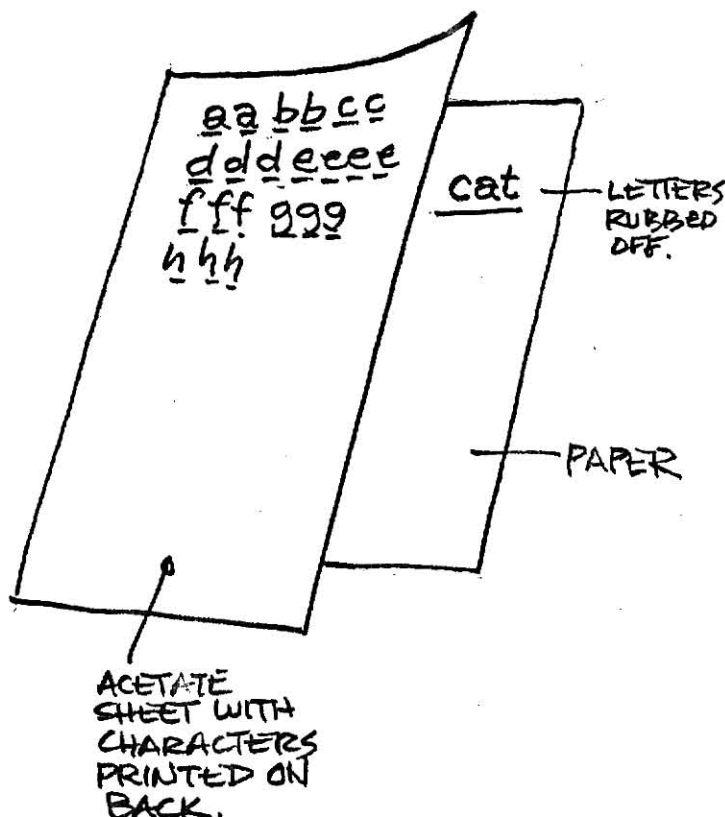
Further sophistications of the basic typewriter include the Justowriter, Varityper and IBM Selectric Composer. Each of these is essentially a strike-on system much like the common typewriter. With the Justowriter and Varityper the copy may need to be typed twice in order to justify it within the column width. Some models of these machines, however, use punched tape to record the first typing and replay the words by running the tape through the machine. This eliminates the second typing.

The IBM Selectric Composer is perhaps the most sophisticated of the strike-on systems. The basic system uses magnetic tape and a small computer to record and justify the lines of type. Codes are inserted onto the magnetic tape when the copy is typed and the computer then interprets the codes and plays out the copy in justified form. The IBM Composer uses a much more sophisticated spacing system than the ordinary typewriter.

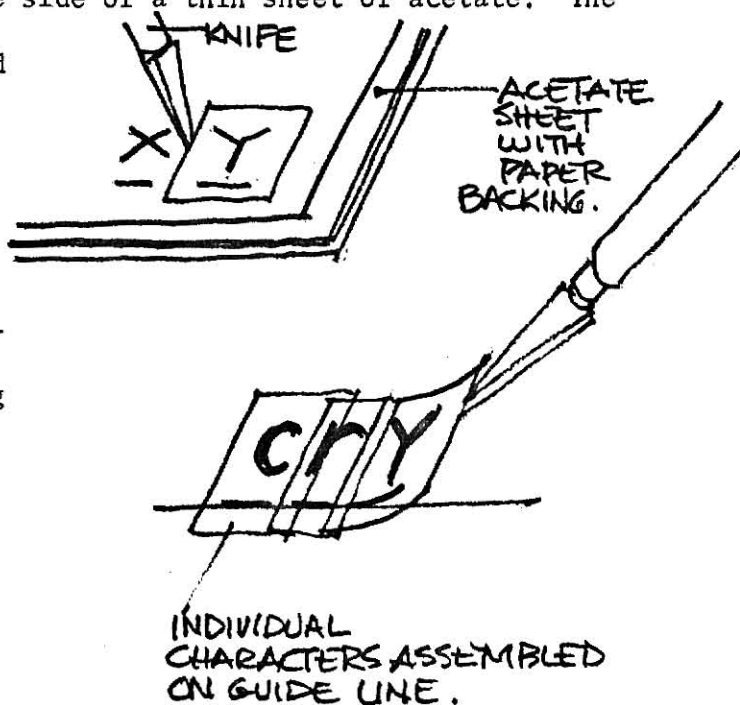
Transfer Lettering

Transfer lettering is rather a cross between hand-drawn letters and the strike-on variety. It is used primarily for larger, display type, because the process involves hand assembly. There are two types of transfer lettering. Both are sheets of letters, numerals and punctuation marks printed on thin acetate sheets. One kind, popularly referred to as "rub on lettering," requires positioning the desired letter on a sheet of paper and rubbing the top side of the acetate sheet with a hard, smooth object. The printed letter releases from the bottom side of the acetate and affixes to the paper in

position. Each successive letter is then positioned and rubbed off its backing sheet. Time, patience and great care is needed to effectively prepare "rub-on" lettering. Once the individual letter is removed or released from the backing sheet, it is there to stay---it can't be moved or repositioned. If it is inadvertently positioned incorrectly, it must be removed with a piece of masking tape or eraser and another letter reapplied.



The second type of transfer lettering is called "cut-out" lettering. It, too, is printed on the reverse side of a thin sheet of acetate. The acetate and the letters are coated with an adhesive and placed on a heavier paper backing sheet. Letters are assembled on paper by cutting around the desired character with a knife, lifting it along with the thin acetate off the backing sheet and placing it in position. These letters can be repositioned and moved around



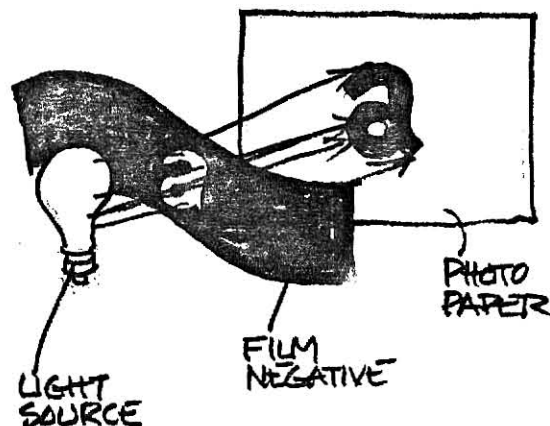
before final adhesion to the paper (called "burnishing").

Both types of transfer lettering are useful to provide a wide variety of type styles for headlines. Most printers and typographers have a limited number of type styles. Transfer lettering allows a greater variety of styles to be available.

Photo Composition

By far the most dramatic and sweeping changes in typesetting have come from the developments in photo composition. Since offset printing has eliminated the necessity for type to be prepared in metal, it soon became possible to set type using principles of chemistry, electronics and optics.

There are a number of photo composing machines on today's market. They vary individually in their basic design and the number and complexity of functions they can perform. In many systems a film negative is used to produce an image on photo-sensitive paper or film. The configuration of the negative and the kind and size of paper or film used is highly variable, but most of the machines in their simplest form operate on that basic principle.



The negative has images of all characters of the particular type face--- capitals, lower case as well as numbers and punctuation marks. When the operator strikes the desired letter on the machine's keyboard, the negative of that letter is moved into position and a light flashes. The light travels

through the clear area on the negative and strikes the photo-sensitive paper or film behind it. The paper or film is then developed much as a photographer develops a print of a picture. Where the light has struck it, the paper turns black, where it has been shielded from light, it remains white.

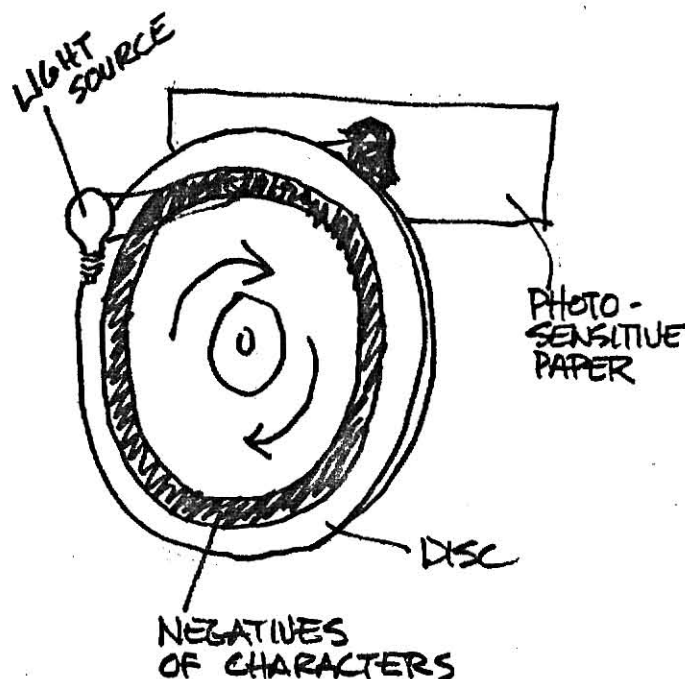


Photo composition units are controlled by a computer, which can be programmed to perform nearly any typographic function. Justification of lines is automatically performed by the computer. Letter spacing, word spacing and leading, likewise, are merely dialed into the computer which controls the position of the images on the paper or film.

Many photo units have a memory system---they can record the copy on punched tape or magnetic tape or discs and replay it from the output of the machine at any time. Other units have display terminals which show the characters on a screen as they are keyboarded. When the type is set and recorded, it can then be played through a display screen for proof reading and editing. Corrections can be made before the tape or disc is inserted in the output machine and the type set.

The advantages of photo composition are many. The enormous speed of the sophisticated machines makes it possible for one machine to produce many

times the amount of type as a Linotype. Complete flexibility in formatting and designing type areas is possible with photo composition. Optical systems in the machines also make it possible to set a wide range of sizes from one master. Although the equipment is complicated, it is easier to train operators to set type on a photo compositor than it is to train a Linotype operator. Storage, retrieval and resetting of copy is greatly enhanced by the use of magnetic tapes, discs or punched tapes. Video display terminals make it possible to edit, proof-read and correct copy in the composing room before the final type is produced. With remote video terminals it is even possible for authors to type directly on the machine, edit, proofread and produce a punched or magnetic tape or magnetic disc to be fed into the typesetter. Many newspapers have installed systems where their reporters actually set much of their own type by writing stories on a video terminal and feeding them directly into the typesetter.

It is undeniable that photo typesetting is the way of the future for nearly all typesetting. The advances made in complex equipment in the past decade, coupled with the dominance of offset printing, give it the prominent position.

Readability

Readability is the sum total of all factors which affect the extent to which a group of readers understand, read at optimum speed and find copy interesting. Because readability involves not only the physical perception of the letters and words, but the mental understanding of the perceived words, it is a concern of the writer as well as the typographer and designer.

Writers use readability formulas to determine the ease of reading their copy. These formulas are based on the difficulty of understanding and measure

a piece of copy in terms of a school grade level. A nuclear engineering textbook naturally commands a higher grade level score than a comic book.

Readability in the physical sense refers to the design and display of type which affects its perception. A great amount of research has been conducted to determine the most efficient combinations for the greatest readability in body copy. This research has given us a number of guidelines to make printed copy the most legible and easy-to-read.

Most people who are not concerned with the fine points of typography use readability and legibility synonymously. But, there is a distinct difference: readability is the ease of reading a printed page, whereas legibility refers to the speed with which each letter or word can be recognized. Readability refers to the type arrangement; legibility is concerned with type design.

Upper Case

Copy printed in all capital letters is very difficult to read. Researchers warn us to avoid setting copy in all caps at all costs.

THIS IS DIFFICULT TO READ
BECAUSE IT IS ALL CAPS.

Type Style

Researchers generally agree that Roman typefaces are more readable in large masses of copy than

Gothic faces. The individual letters of Gothic or sans-serif type tend to be more legible, but when massed together in a copy block, a type face with serifs generally becomes more readable. Therefore, it can be stated that

Roman typefaces are easy
to read.

Roman faces are more readable when used in large amounts of body copy; Gothic faces are more readable when standing alone in signs or other display applications.

Condensed type faces are more difficult to read than normal or slightly extended versions.

Condensed type faces are more difficult to read than normal faces

For text matter, a medium weight face is more easily read than either italic or bold face. Large masses of bold face are more readable than equal masses of italic, but both should be avoided.

*this is medium weight
this is boldface
this is italic*

Type Size

Researchers have concluded that the optimal sizes for text type is 9, 10, 11, or 12 point type. The best size could vary for different sizes, however, depending on the particular face's x-height.

*nine point
ten point
eleven point
twelve point*

Line Length

For the optimal text sizes, a line length (or column width) of between 18 and 24 picas is considered the most readable. Using the optimal type sizes, about 10 to 12 words can be displayed on one line.

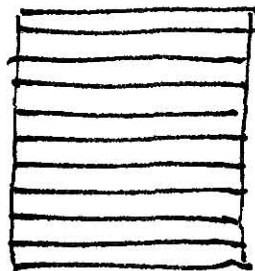
Leading

For optimal text sizes, maximum readability occurs with 1, 2, 3, or 4 points of leading, depending on the type style. Heavier faces need more space

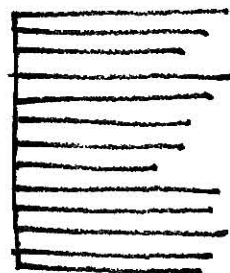
between lines to be the most readable.

Justification

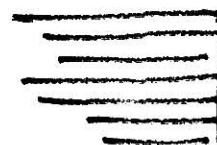
Researchers have found no real significance between justified and unjustified copy in terms of readability. The decision to leave the right side of a column ragged should be based solely upon the design characteristics of the printed piece, as it has little affect on readability. Ragged left hand margins should be avoided as they are extremely difficult to read.



JUSTIFIED



FLUSH LEFT



FLUSH RIGHT

Color and Background

Strive for the maximum brightness contrast between the paper and the printed words. Black-on-white or black-on-yellow is the most readable.

Using the foregoing research findings, it would seem that if designers and typographers wanted their work to be read easily, then all copy prepared would be Roman, 10 point with two points leading, set on a 20-pica line in medium face and printed in black ink on white paper. This, thankfully, is not the case. The guidelines from readability research are used as an optimal level---if one of the items is changed (say the material is printed in brown ink on buff paper) the readability is reduced by a small amount. But designers and typographers might agree that the visual characteristics produced by the change is worth the small readability loss.

Specification of Type

In order to have a printer or typographer set type from a typewritten manuscript, it is necessary to give exact instructions. The editor or designer usually writes these instructions on the top of the first page of the manuscript in a form of short-hand or code.

A typesetter needs to know several things before he can begin. First, of course, he needs to know the style of type selected. He then needs to know the size of type and the length of the line. He must also know the amount of leading desired in the type.

These instructions are called

"specifying" the type. Although the short-hand can vary among printers, it is usually written with the type size first, then the name of the type. A line is then drawn under this information and the size of slug is indicated below the line. (The slug size minus the type size gives the leading). The line length is then written to the side.

Special indications for boldface type, italics, centering and setting copy unjustified are also used. These are described and illustrated in the section on copy editing.

*Helvetica - 10pt.
12 18 picas wide*

OR

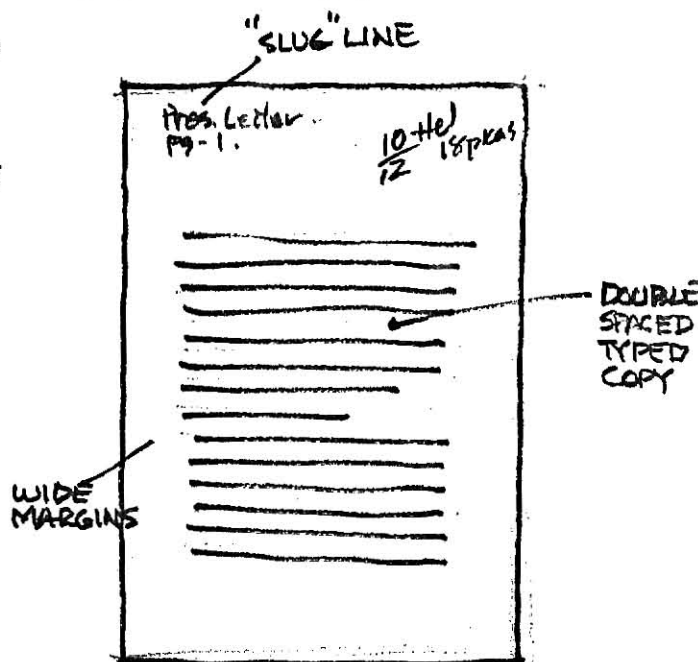
*10pt. Helvetica
on 12 - 18 picas*

OR

*10
12 Hel. 18 picas*

Copy Preparation

Before copy is sent to the printer or typographer, it should always be typewritten---preferably on 8 1/2 x 11 pages of white paper. The material should be double-spaced with ample margins. Always begin the first page of your copy about a third of the way down the page in order to leave room for specification instructions. It is also a good idea to give each separate piece of copy an identifying line, called a "slug line" to make the separate parts more easily found on the proof.



Copy Editing Symbols

A series of short-hand symbols has evolved over the years to give specific instructions to the composing operator. These marks are used on the typewritten manuscript before it is sent to the typographer or printer. A series of proof-reading marks is used to make corrections and alterations in the proof of the set type. Some proofreading symbols may differ from the copy editing symbols.

Copy Editing Symbols

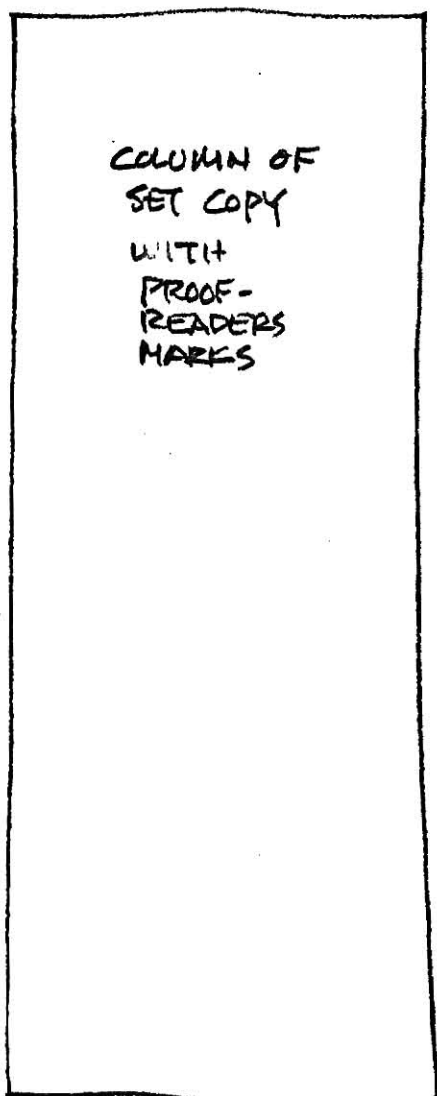
CENTER . . .] Antony's tragic love [INSERT APOSTROPHE
 PARAGRAPH [At daybreak on the 1st of august, SPELL OUT
 CAPITAL 30 b.C., Antony went forth to battle for CAPITAL
 DELETE LETTER the last mile. he had his infantry. LETTERS TRANSPOSED
 DELETE WORD also posted on the hills in front of the city LOWER CASE
 and from those hills watched his fleet INSERT LETTER
 in action...and to his horror he saw the SET IN BOLD FACE
 crews salute the enemy's crews with their
 oars, and his fleet and Caesar's sail
 away as one and when he turned around
 to see his eyes away from that incredible sight
 he saw that he was deserted by his cavalry, TRANSPOSE WORDS
 who went over to the enemy; he fought with on his infantry
 and was defeated. He then retired into the
 city crying out that he had been betrayed SET IN ITALICS
 by Cleopatra to those with whom he
 had waged war for her sake.

INSERT
 QUOTE.

Proof Reading Marks

Once the type has been set, it is returned to the editor as a proof. The proofs are generally called "galley proofs," or simply "galleys." The editor then reads the galleys and makes corrections or alterations on the proof. Alterations at this point in the process should be made sparingly, as they constitute a significant expense if made capriciously. Each mark consists of an interior symbol or mark and a marginal notation.

Proofreading marks are illustrated below.



Copyfitting

Copyfitting has been a difficult procedure for many graphic arts students to understand. While the mathematics and manipulations involved may seem complicated, the reason for doing so can be simply stated.

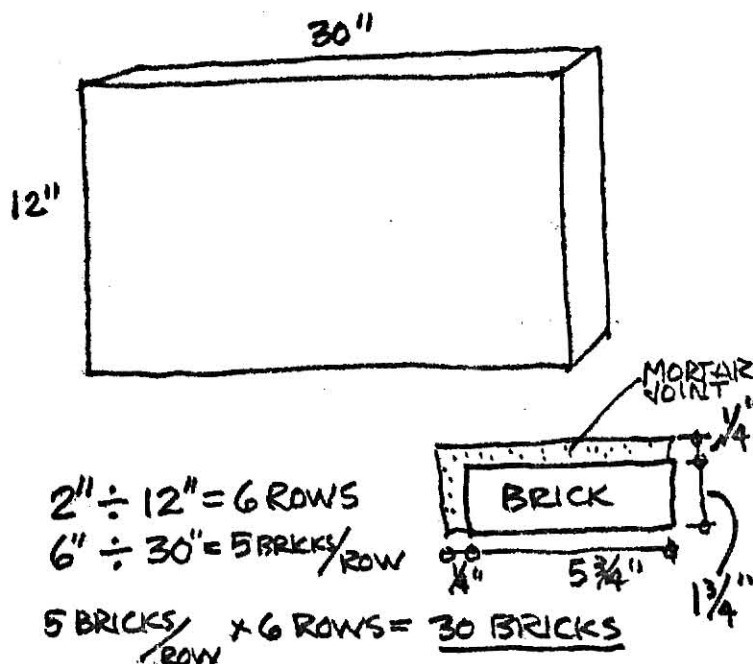
Basically all the process of copyfitting seeks to do is to match type and space. Designers and editors want to know how much space a manuscript will fill when it is set in type, or they want to know how many words will be needed to fill an available space. The entire process of copyfitting seeks to answer one of those two questions.

Seeing It Simply

In order to see the process of copyfitting in a very basic way, let's consider the following analogy:

HOW MANY BRICKS DOES IT TAKE TO
MAKE A WALL?

It's obvious that the question can't be answered without additional information. In order to figure out the answer, we must know how big a wall is needed---how high and how wide. Then, of course, we need to know how big each brick is and the thickness of the mortar joints between the bricks. With all this additional information, we



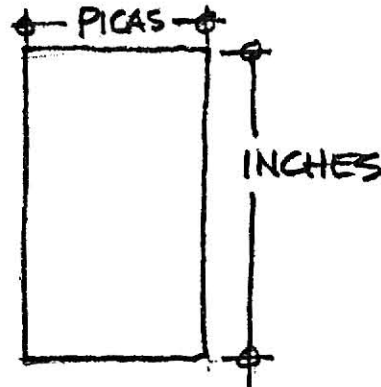
can easily figure out how many bricks are necessary for our wall.

In applying the analogy to copyfitting, our question becomes:

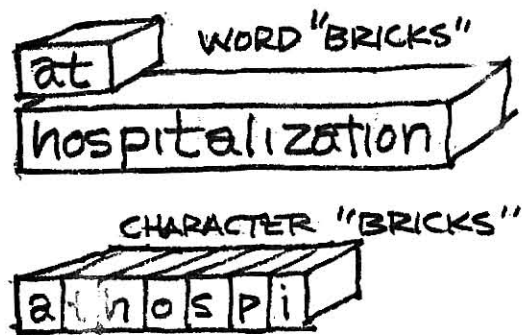
HOW MANY WORDS WILL IT TAKE TO FILL A SPACE?

First of all, we need to know the size of the space (wall). Then we need to know the size of the words (bricks) and of the leading (cement between the bricks). Once we have applied this information to the problem, it is as simple as the brick wall illustration.

The width of our "wall" is measured in picas, the height is usually measured in inches.



Now, for the size of our "bricks." We know that words vary in size because some words contain many characters, while others contain only a few or just one. So, rather than using the variable of words as our "bricks," let's use "characters." Characters also vary somewhat in size, but not nearly so much as words.



So, how big is a "character"? That depends on the size and style of type selected. Once the type has been specified, we know exactly how big our "brick" or character is.

The only remaining unknown in our calculation is the thickness of the mortar joint between the bricks. This joint is analogous to the amount of

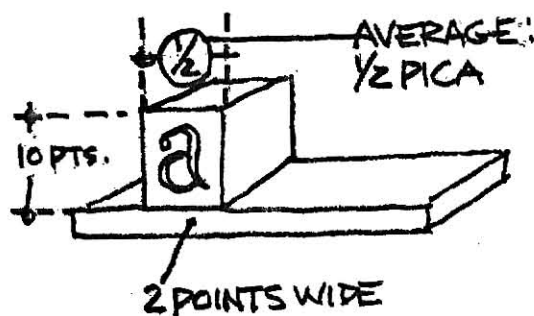
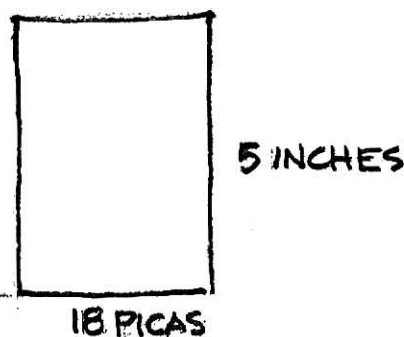
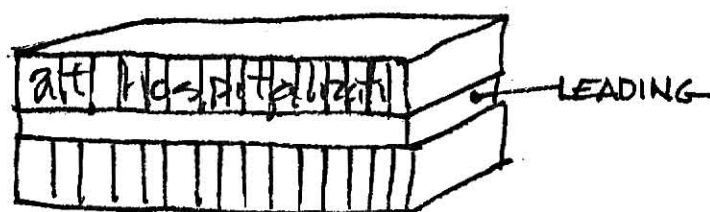
leading between lines of the typeset copy. Once this amount of leading is decided, then all of the information necessary to calculate the number of bricks in the wall is complete.

Using the foregoing pattern, let's plug numbers into the unknowns and solve a simple problem.

The size of the "wall" needed is 18 picas wide and five inches high.

Our "bricks," or characters, are 10 points high and average one half pica wide.

For the "mortar joints," let's use 2 points of leading.



Working the Problem

First, let's figure out how many bricks (or characters) will fit in one line of the "wall" (copy block). The block is 18 picas wide and the width of the characters averages $\frac{1}{2}$ pica, making two characters fit into a pica of width. Therefore, by multiplying 18×2 , we see that 36 average characters will fit on one line of our block.

Now, we need to determine how many lines will be needed to fill the block and then multiply the number of lines by the number of characters in

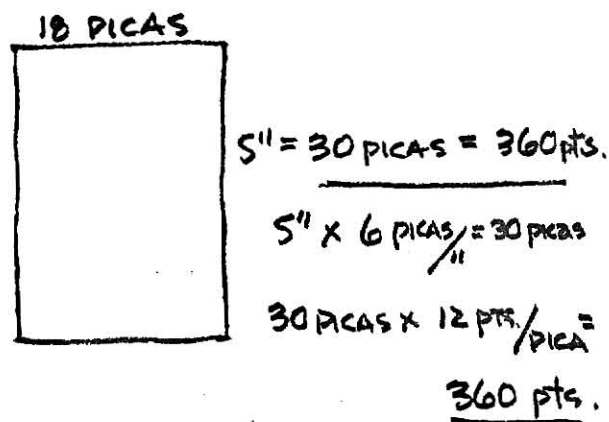
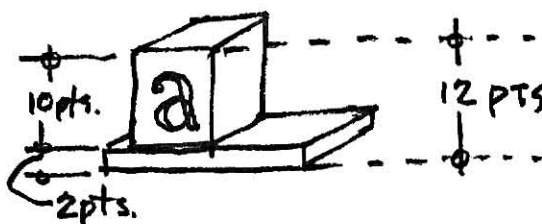
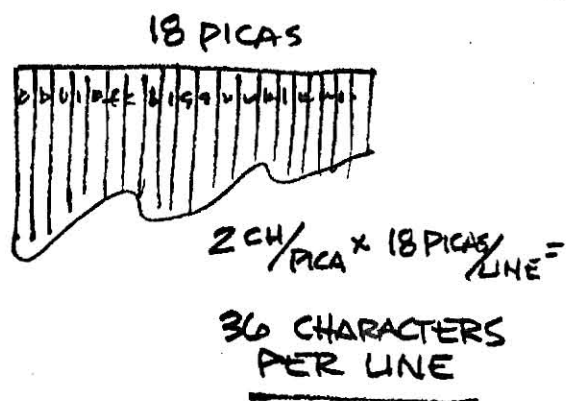
each line to determine the number of characters in the entire block.

We know our characters are 10 points high. We also know that there will be a "mortar joint" or leading of two points. Adding the type size and the leading together, we see that each line will take 12 points of vertical space.

Our block is five inches high, or 30 picas. (5 x 6 = 30). Since the height of our bricks is measured in "points," it is necessary to convert the height of our wall to points to complete the calculation. Since there are 12 points in a pica, the height of our wall is 360 points.

Now, since we know how thick each line of our wall is, we can divide and find out how many lines will fit into our wall. (360 pts. ÷ 12 pts. = 30 lines) Now we know that we need to have 30 lines made up of 36 characters to fill our copy block and complete the "wall."

All that is now necessary is to set our typewriter at a 36-character line and write copy until we reach 30 lines.



EACH LINE = 12 POINTS
TOTAL AVAILABLE = 360 POINTS.

$$\frac{360 \text{ PTS.}}{12 \frac{\text{PTS.}}{\text{LINE}}} = \underline{\underline{30 \text{ LINES}}}$$

Analysis of the Problem

In our analog-problem, it was necessary to complete a list of "unknowns" before the answer could be found. In some copyfitting applications these "unknowns" are supplied the editor or designer as a matter of style or policy. In some applications, the editor or designer must make the basic determinations to supply the "unknowns" before setting out to solve the problem.

"Unknowns" Which Must Be Determined

- 1) The style of type to be used. The width of each average character of the type is dependent upon the style of type and its design. Most commonly used type faces publish a character-size index, called the "character-per-pica" of the typeface. Of course, this character-per-pica figure varies not only with a particular face of type, but with the size of type as well. Character-per-pica counts are available in most type specimen catalogs published by printers and in specialized publications which list the character count for hundreds of typefaces and their common sizes. If this figure is not available, it can be estimated by measuring several lines of the desired type face and size, counting the characters and dividing to obtain an average character-per-pica count.

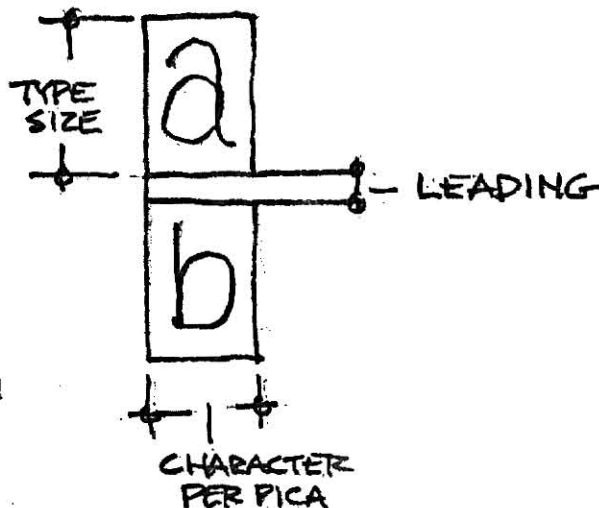


10 POINT
UNIVERSE = 2.6 CHARACTERS
PER PICA



12 POINT
OPTIMA = 1.9 CHARACTERS
PER PICA

- 2) The size of the type must be known or determined. The type size is a factor in the character-per-pica count as illustrated above. The size is also used to determine how much vertical space each line will occupy when it is set.
- 3) The amount of leading must be known or determined.
- 4) The size of the space to be filled with copy must be known or determined.



In the foregoing illustrations we have determined how many characters would be needed of a specific style and size of type with specific leading to fill a stated amount of space on the page.

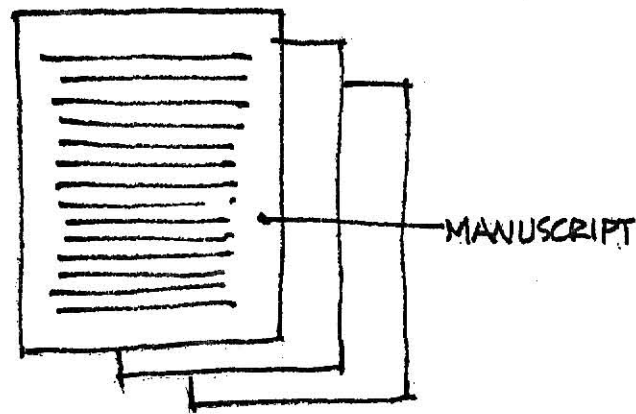
Perhaps a more common problem involving copyfitting occurs in the reverse: determining how much space will be occupied by an author's manuscript when it is set in type.

The process in this kind of a copyfitting problem is similar, but must be worked "backwards," because we have a different set of "unknowns."

Estimating a Manuscript

Stated in terms of our "brick wall" analogy, this type of problem involves having a specific number of bricks and calculating what size of wall can be built with them. An interesting twist to the problem is that we can select a wide range of sizes of bricks to accomplish the job---as long as we use the proper number.

First we need to figure how many bricks we can use to build the wall. Since our bricks are the characters in the manuscript, it is necessary to determine the total number of characters in the entire manuscript. This can be done by counting each letter; by counting several lines and determining the average number of characters per line and multiplying by the number of lines in the manuscript; or by determining the average number of characters per page of manuscript and multiplying by the total number of pages. At any rate, the figure we need is an estimate of the total number of "bricks" (characters) available to us.



AVE. CHARACTERS
PER LINE = A

NUMBER OF
LINES PER
PAGE = B

NUMBER OF
PAGES = C

$A \times B \times C =$ AVE. # OF
MANUSCRIPT
CHARACTERS

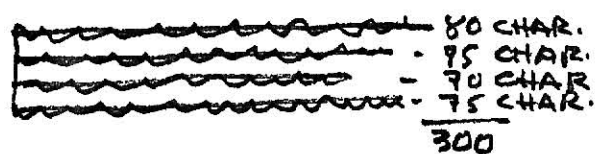
Then it is necessary to choose one of the many styles and sizes of bricks. We must make a selection of type face and size in order to have available the character count (number of characters per pica) and to know the height of the characters which will form the lines.

Next, we need to decide how thick our "mortar joints" will be---determine the amount of leading between lines.

Once these decisions are made, it is just a matter of keeping the calculations straight and making sure the units are converted to like quantities.

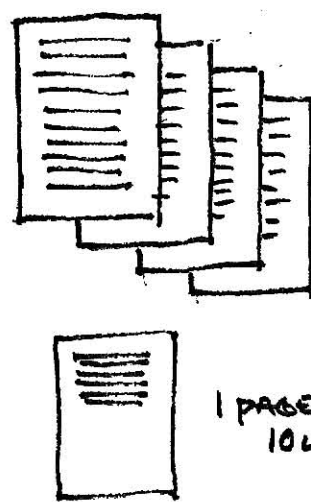
Working the Problem

We have a manuscript consisting of five pages. First, count the number of characters in three or four lines and average them. This is the average number of characters per manuscript line.



$$\frac{300}{4} = 75 \text{ CH./LINE}$$

Then count the number of lines on one full page and multiply by the number of full pages in the manuscript. Be sure to add the number of lines on any partial pages. You now have the total number of characters in the manuscript.



$$\begin{aligned} &25 \text{ LINES ON } 4 \text{ FULL PAGES} \\ &25 \text{ LINES} \times 75 \text{ CH./LINE} \\ &= \underline{1,875 \text{ CH./PAGE}} \\ &1,875 \text{ CH./PAGE} \times 4 \text{ PAGES} \\ &= \underline{7,500 \text{ CHAR.}} \end{aligned}$$

$$\begin{aligned} &1 \text{ PAGE WITH 10 LINE} \\ &10 \text{ LINES} \times 75 \text{ CH./LINE} = \\ &\underline{750 \text{ CH.}} \end{aligned}$$

Keep that figure handy and lay the manuscript aside.

Select a type face and a type style. Look up or determine the number of characters per pica for the size and style of type you've selected.

Determine the amount of leading. Decide how wide the lines (or columns) will be.

Now, with these "unknowns" determined, you can set about determining the remaining "unknown"---the length in inches of your copy after it is set in the type style and size selected, at the width selected and with the desired amount of leading.

$$\begin{array}{r} 7,500 \\ + 750 \\ \hline 8,250 \end{array} \text{ CHARACTERS IN MANUSCRIPT}$$

Plugging numbers into the known quantities, we can set up the following solution:

Manuscript: 5 pages long.

Averages 75 characters per line.

Averages 25 lines per page with only 10 lines on last page.

$$\begin{array}{r}
 75 \text{ CH/LINE} \\
 25 \text{ LINES/Pg.} \\
 \hline
 1875 \text{ CH/PAGE} \\
 4 \text{ PAGES (FULL)} \\
 \hline
 7,500 \text{ CH.} \\
 950 \text{ CH. (LAST PAGE)} \\
 \hline
 8,250 \text{ CHARACTERS}
 \end{array}$$

Total number of characters in manuscript: 8,250 characters.

Type specifications:

8 pt. Bodoni (Linotype) = 3.13 characters per pica.

2 points leading.

20 picas wide (line length).

NUMBER OF CHARACTERS PER LINE

$$3.11 \times 18 = 56.34 \text{ characters per line}$$

NUMBER OF LINES OF TYPESET COPY

Total number of manuscript characters = 8,250 char.

Characters per line of typeset copy = 56.34 char. per line.

$$8,250 \text{ char.} \div 56.34 \text{ char./line} = 146.43 \text{ lines.}$$

VERTICAL SPACE OCCUPIED BY EACH LINE

$$8 \text{ point type} + 2 \text{ points leading} = 10 \text{ points.}$$

TOTAL NUMBER OF POINTS IN TYPESET COPY

$$143 \text{ lines} \times 10 \text{ points/line} = 1,430 \text{ points of typeset copy.}$$

CONVERSION TO INCHES

$$1,430 \text{ points} \div 72 \text{ points/inch} = 19.86 \text{ inches}$$

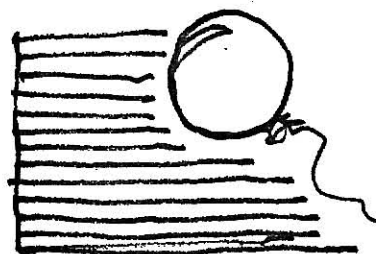
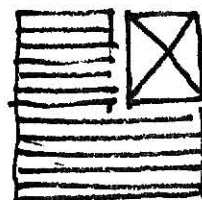
Analysis of the Problem

Our five-page manuscript will occupy nearly 20 inches when set in 8 pt. Bodoni, 20 picas wide with 2 points of leading.

Other Copyfitting Notes

When working a copyfitting problem, remember that most calculations are based on averages or estimates. Your answers should be very close if mathematics and mechanics of the problem solving don't fail you. Also remember that space must be taken into account for headlines, sub-heads and other typographical accents.

Copyfitting for irregular shapes is accomplished by essentially the same procedure, but each line is copyfitted independently, so far more accuracy is obtained. It is a slow, time-consuming process, but when done carefully, it can produce excellent results.



The method described here is called the "character count" method of copyfitting. It is recognized as the most accurate of several other methods. Other methods include a word-count system and a square-inch system.

The character count method is applicable to all situations, whereas other systems are limited in their applications.

Copyfitting Formula

Some students who have a mathematical mind, prefer to work copyfitting problems from a formula, simply plugging in known quantities and solving for

Fitting Display Type

Display type, because of its larger size and the relatively small number of characters in headlines, can be fitted with extreme accuracy. The character count method described for body or text copy is based on the average width of letters, the average characters-per-pica. With the larger type sizes used for headlines, the variation of the width of different letters is more critical. Therefore, a unit-count system has been devised and is used on most newspapers and magazines to fit the headlines within the allotted space.

The unit-count method is similar to the character count method, but rather than each letter, regardless of its width, counting as one character, letters are assigned units according to their widths.

Letters have been grouped into four categories for the assignment of a unit value. "Normal" width letters are one unit. Narrower letters occupy only 1/2 unit, and wider letters are either 1 1/2 or 2 units. Spaces count one unit and punctuation counts 1/2 unit.

The letters normally retain the same number of "units" regardless of the type size or face selected. (Some alphabets vary enough, however, to include "r" and "j" as 1/2 unit letters). What is necessary then, is to know how many units will fit in a

ONE UNIT

abcdeghjknop
qrsuvxyz
234567890
SPACES

1/2 UNIT

f, l, i, t, 1, I, ? ! " . ; :

1 1/2 UNITS

m, w, ABCDEFGHJ
KLNOPQRSTUVWXYZ

2 UNITS

M, W.

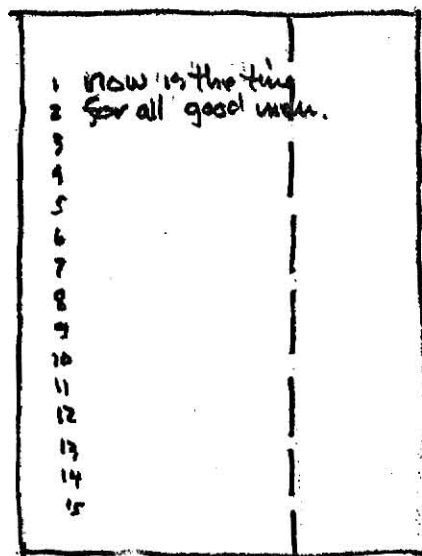
given column width for each style and size of type.

Newspapers have a headline schedule which gives the maximum unit count for each style, and size of type available in each width used in the paper make-up. The headline writer simply selects the style, size and length of headline needed and notes the maximum unit count. He then writes the headline and "counts it out," adding up the units. If his words occupy more units than the maximum, he rewrites the head. If it is too short, he again rewrites until the unit count falls within permissible limits.

Copyfitting Shortcuts

Many regular publications use various ways to avoid the mathematics of copyfitting for every article. Most magazines and newspapers use a standard type style, size, leading and column width. Once these are standardized, it is possible to use pre-printed copy sheets with the boundaries of the columns drawn on them. Then the writers can type their articles directly on these copy sheets and type line-for-line with how the copy will be set.

If, for example, it is standard that a magazine uses 10 point spartan type on a 12-point slug in 14-pica columns, the copy sheets are printed with a vertical line drawn 42 characters from the left margin. When the writer reaches the line while typing his story, he returns the carriage and types the next line



as close to the 42 character width as possible.

When the story is finished, it is only necessary to count the lines (some copy sheets have numbered lines) and multiply by 12 points to find the length of the set story in points. Dividing the figure by 72 produces the length in inches.

CHAPTER FOUR

PHOTOGRAPHS

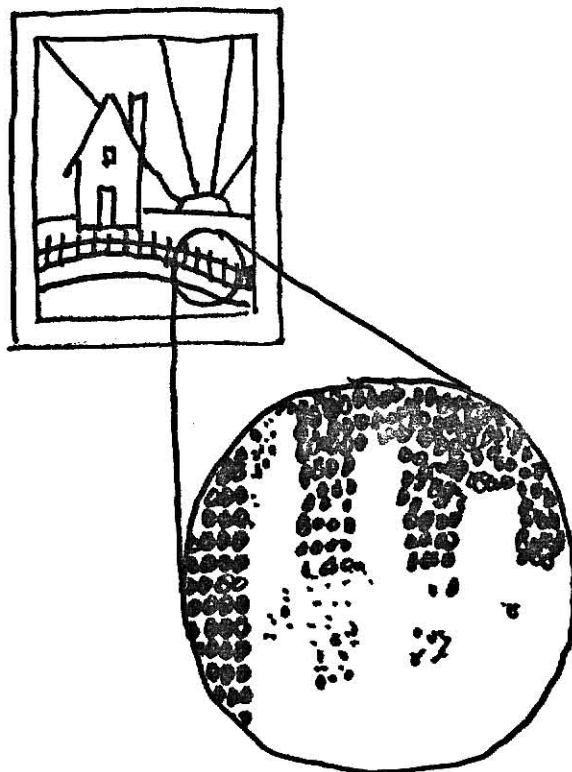
In earlier sections of this text it was noted that photographs presented special problems to reproduce and were handled separately from "line" copy in both offset and letterpress printing.

The glossy black-and-white photo you receive from the camera shop after your film has been developed is called a "continuous tone" photo. "Continuous tone" means that the value (darkness) of the images may range from pure black to stark white and can include an infinite number of gray tones in between. Because of the nature of the printing process, printers normally have no gray inks to work with, let alone the large number of shades in a photo. In simple situations they only have black ink and white paper. The problem, then, becomes how to reproduce the intermediate tones of gray with only black ink.

The solution to the problem is to employ an optical illusion. The technique is to break up the photo into tiny dots and vary the size of the dots according to the darkness of the image.

The process is called producing a "halftone," and is used not only for photographs but for continuous tone artwork (like an ink wash) as well.

By making the image out of thousands of tiny black dots,



the eye does the work of making the various shades of "gray." Where the dots are large and close together, the eye sees that area as black or very deep gray. Where the dots are tiny and widely-separated, we see light gray and even white. Between these extremes, the size and distance separating the dots produces the illusion of varying shades of gray.

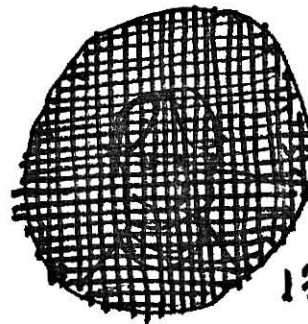
In order to produce a halftone, the operator of the graphic arts camera places a "screen" in the camera and photographs the picture through the screen. The screen comes in varying numbers of lines of dots per square inch. The more lines of dots per inch, the finer the screen and the less conspicuous the dots are in the finished halftone.

Most newspapers use between 85-100 line screen. These are considered coarse screens, and need to be so because the surface of the paper used for newspapers is rough and individual dots would appear smeared and distorted when printed.



85-LINE

Fine printing on slick paper usually employs a 133 or 150-line screen, as the dots are more faithfully reproduced on the smooth paper.



133-LINE

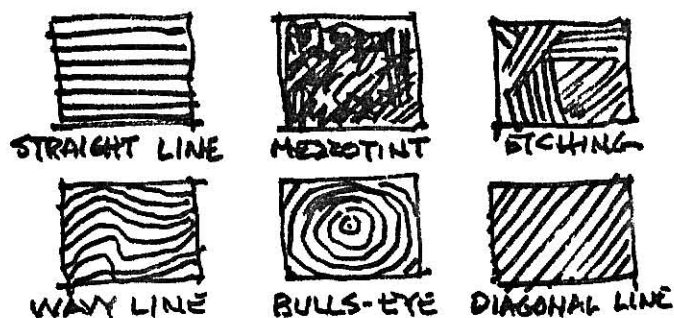
Other Operations with Photos

By using specialty screens instead of the regular half-tone screen, a wide variety of patterns can be introduced to a photograph. These special effects may be available only at larger commercial printers, and should be used sparingly as accents. Sometimes when a particular photograph is of poor

quality, one of these effects can be employed to reduce the impact of the photo's weaknesses.

Line Conversions of Photographs

If, when placing a photograph in a graphic arts camera, we use no screen at all, the picture is recorded in stark blacks and whites with the gray tones dropping out. This process is called a "line conversion" of a photograph and is used to produce an image which looks more like artwork than a photograph.



LINE CONVERSION

Cropping the Photograph

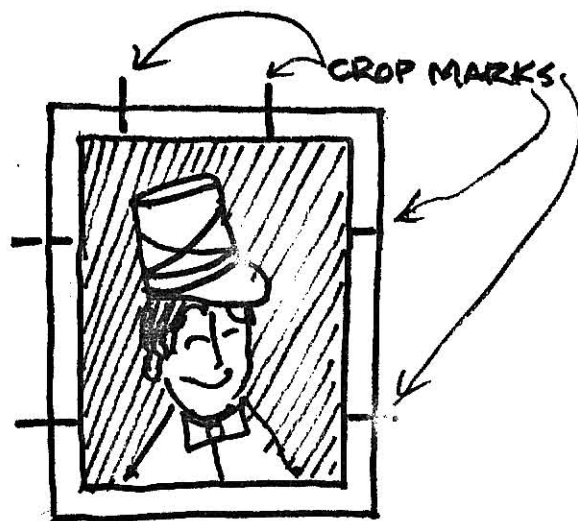
Frequently when an editor or designer receives a picture from the photographer, there is a wider view of the subject than is necessary to convey its meaning. The editor or designer then "crops" the photograph, removing the extraneous material from it.

Sensitive cropping can greatly enhance the impact of printed photographs. Poor cropping, or none at



all, can weaken the photo, tending to "water down" the impact of the desired subject.

The physical act of cropping is accomplished simply by placing "crop marks" on the edges of the photo. A photograph should never be cut with scissors or a knife.

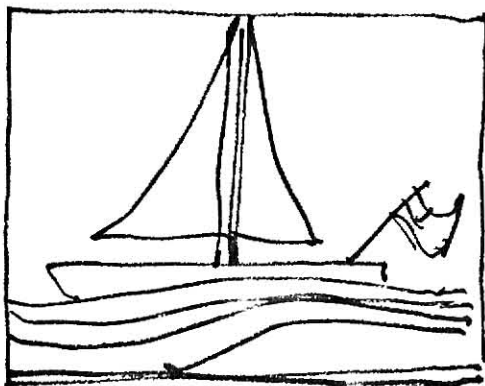


Photographs always should be cropped for content. the impact of the photo should be considered first and then enhanced by removing distracting background material.

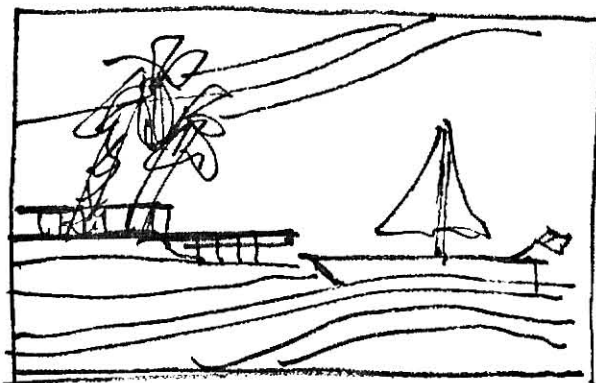
Most designers and editors prefer photos which are cropped "tightly." Tightly-cropped pictures "zero in" on the subject matter and fill the entire photo area with it. The act of tightly cropping photos can be compared to using a zoom lens on a camera and "zooming in" on the central subject.



Practice and a keen sense of visual expression is necessary to become proficient at photo cropping. Good cropping can always improve the visual statement in a poor or mediocre photo. Likewise, poor cropping can ruin the effect of a superlative photo.



WELL CROPPED



POORLY CROPPED

The Drop-Out

One method of eliminating conflicting and distracting background images in a photo is to make a "drop out" of the central subject. The drop-out halftone can be accomplished by using an air brush to actually paint out the background on the photo, or by making a drop-out "window" before the picture is sent to the printer.



The "window" is usually made from red or amber blocking film on a thin acetate sheet. The film material photographs black in the graphic arts camera. When the artist cuts out the desired image in the film, he removes the film from the portion of the picture not wanted. The acetate overlay is then a solid area with exactly the same outline as the desired image. When the overlay is photographed, it produces a negative which is clear in the image area and black in the non-image areas.

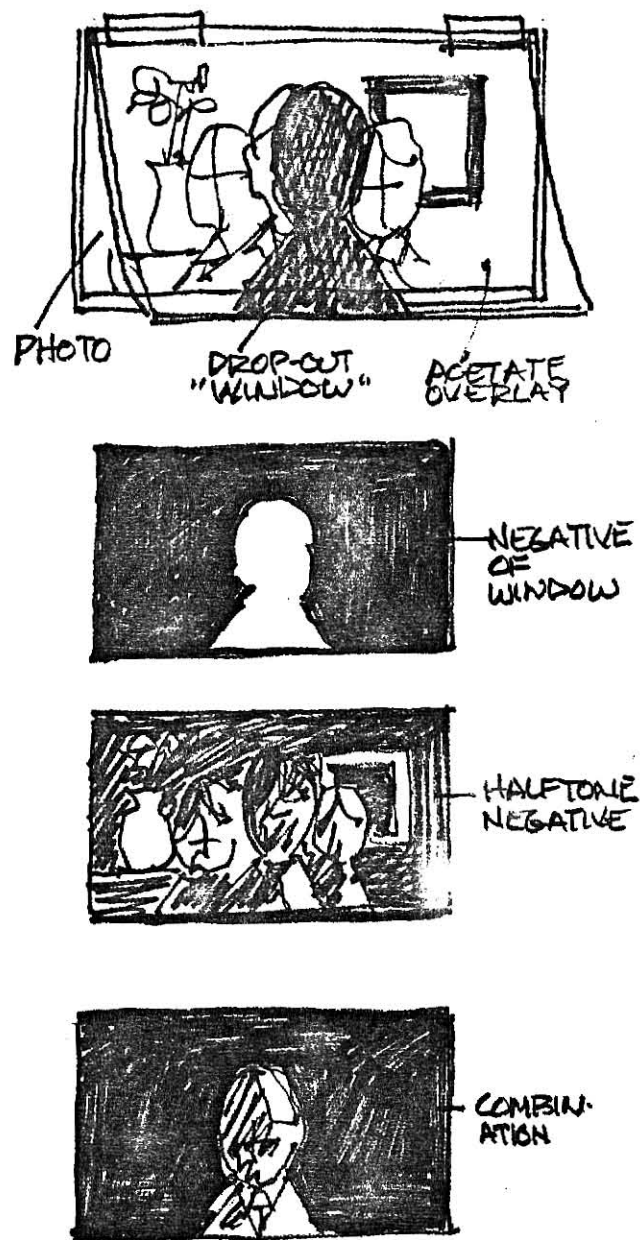
This drop-out negative is then joined with a halftone negative of the entire picture. The black area of the drop-out negative effectively blocks out all of the halftone not wanted in the finished picture. When the combination negative is exposed to a plate, light sensitizes the plate only in the halftone area desired.

The drop-out method of producing an outline photo is usually characterized by a rather sharp edge around the subject. Outline photos which have been produced using the airbrush method may have softer outline edges.

By using the airbrush to make the edges of a photograph very fuzzy and soft, a vignette photo can be produced. Very popular in the 1930's and 1940's, this technique is passe today.

Photo Scaling

Not all photos are the same size. Some may come to the editor or designer as 8 x 10 inch prints. Others may be 5 x 7's or 4 x 5's. Photographers may crop their pictures before



submitting them, thus introducing a wide variety of sizes and shapes of original photos. If an editor has five 8 x 10 pictures to place on one 8 1/2 x 11 inch page, obviously the photos must be reduced in order to fit. In other cases, pictures must be enlarged to fit a page layout.

The process of figuring the reduction or enlargement is called photo "scaling." As in copyfitting, mathematics plays a predominant role in the "scaling" process.

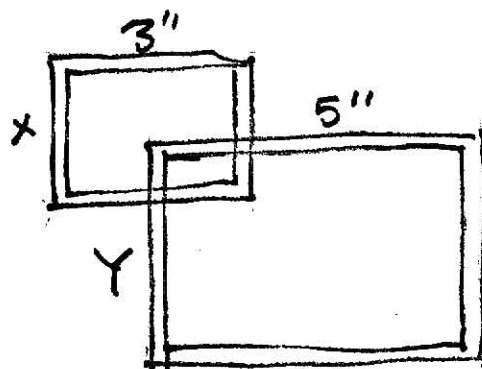
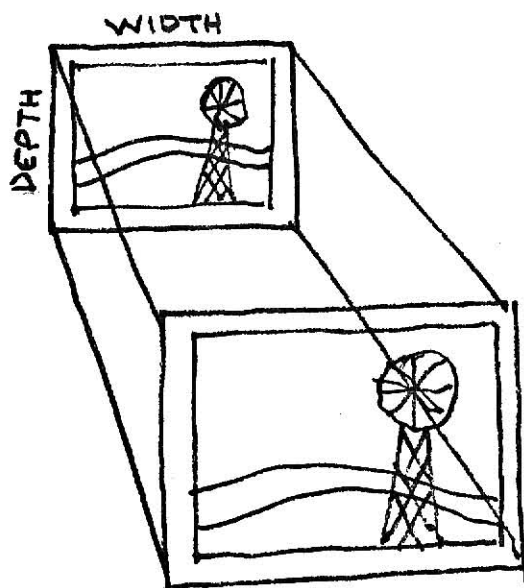
A rectangular photo has two dimensions: its width and its depth. These two dimensions establish the picture's proportions. If the photo is enlarged, the proportion between its width and depth must be maintained.

In basic terms, the proportion is merely a relationship between the two dimensions.

If a 3-inch wide picture is enlarged ("blown up") to be five inches wide, then the relationship between its original and enlarged depth is three-to-five.

Algebraically, the concept is expressed as a simple ratio: 3 is to 5 as X is to Y, or $\frac{3}{5} = \frac{X}{Y}$.

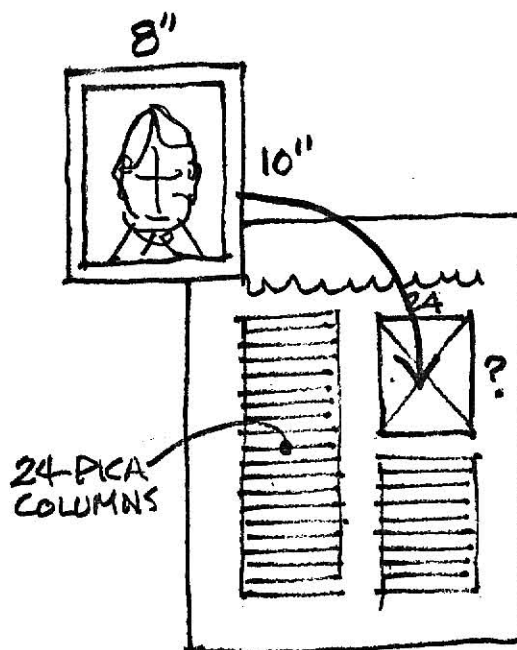
It is extremely important to understand the principle of the ratio



when attempting to enlarge or reduce photographs.

Working a Problem

Consider, for example, that we have a photo which measures 8 x 10 inches. Our page layout calls for the picture to be the width of one column, which is 24 picas (or 4 inches). Once the original picture is reduced, how deep will it be?



Solution

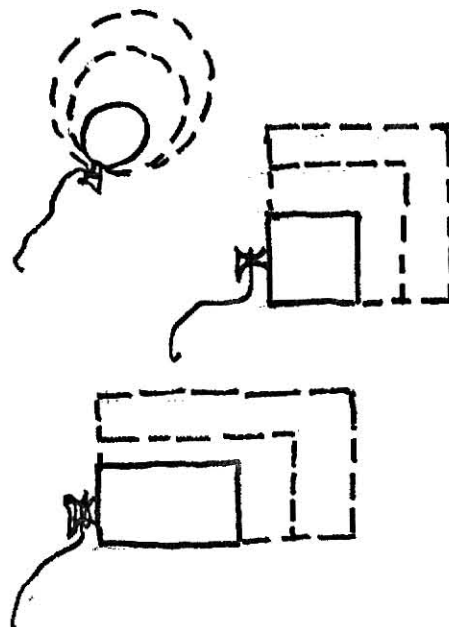
Setting up an algebraic equation to solve for the unknown (the depth of the reproduction) we have: $\frac{8}{10} \times \frac{4}{X} = 8X = 40 = X = 5$. Therefore, the printed picture will be five inches deep.

This was a simple reduction by one-half, or a reproduction size of 50% of the original. Few actual scaling problems are this simple, but each can be solved as simply.

Many students have difficulty grasping the proportional concept when applied to enlarging or reducing photos. Sometimes it is helpful to use the following analogy: suppose you are blowing up a balloon. As you blow more air into the balloon, its outline gets larger and larger. With each puff of air, the balloon's outline increases evenly.

Now suppose the balloon is square-shaped, rather than round. As you blow more air into it, the sides increase evenly. Just as in the round model.

But, if we make the balloon rectangular, rather than square, we see that the amount of increase per side is no longer quantitatively equal. The sides increase in size according to their original proportion.

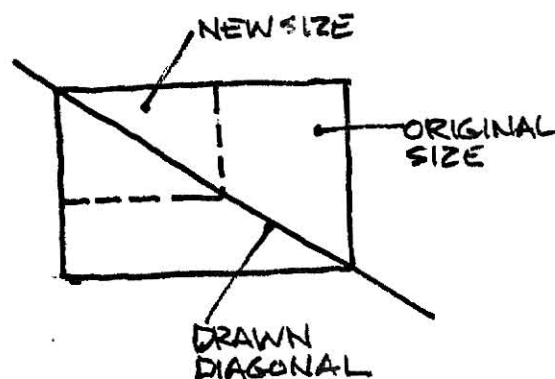
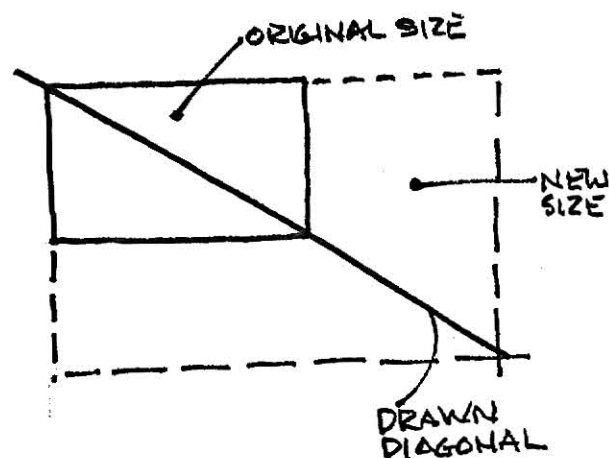


Working It Geometrically

We have demonstrated how an algebraic formula can be constructed to find a missing unknown when scaling a photo. The process can also be accomplished by geometric means.

By simply drawing the dimensions of the original photo on a plain sheet of paper, the "rule of the diagonal" can be employed.

Measure off the known dimension of the reproduction size in its proper place. Then, simply draw a diagonal connecting the corners of the original dimensions. Measure off where the diagonal meets the dimension of the reproduction size and then measure the other dimension from that point.

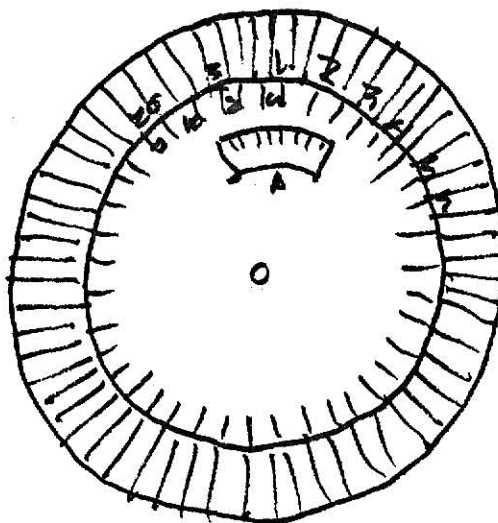


While there is no mathematics involved in using the geometric method, it is particularly important that the drawing be done accurately; that the lines are drawn straight and at right angles.

The Proportion Wheel

Since both the algebraic and the geometric methods of photo scaling require considerable time and effort, a short-cut method of figuring the enlargement and reduction proportions has been devised and is in wide use.

The proportion wheel is a simple circular slide rule. By setting up the proportion on the wheel, it is fast and simple to "read-out" the unknown dimension.

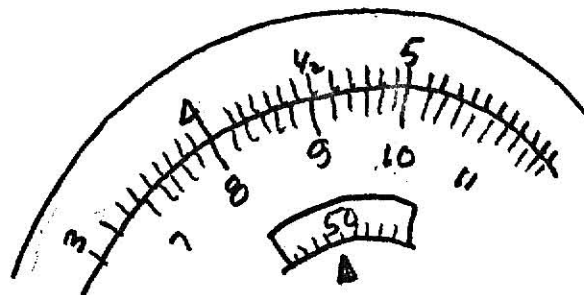


Working a Problem

Setting up the earlier problem on the proportion wheel is a simple procedure. The size of the original is noted (8 x 10), along with the known dimension of the reproduction (24 picas, or 4"). First, find the original size on the inside scale and match it to the corresponding reproduction dimension on the outside scale. (Here we know the original width is 8" and the reproduction width is 4", therefore, we must match 8 on the inside scale with "4" on the outer scale). Then, without moving the wheel, find the other original dimension on the inside scale and simply read across to the outside scale to find the unknown reproduction size (5").

Caution: Original dimensions must always be noted on the INSIDE scale. Reproduction dimensions are always given on the OUTSIDE scale.

Besides the advantage of time and effort, the proportion wheel makes another important contribution: it automatically figures the per cent of reduction or enlargement. This percentage is shown in a small window in the center of the wheel. It is always expressed in terms of the original size. In our illustration, the window shows that our reproduction size (or new size) is 50 per cent of the original. This percentage is important to the printer or graphic arts camera operator. He must know the percentage of reduction or enlargement before he can "shoot" the halftone. If the editor, designer or artist supplies this figure, the camera-man's work can be accomplished much faster.



$$\frac{8}{4} = \frac{5}{?}$$

$$\frac{8}{4} = \frac{5}{10}$$

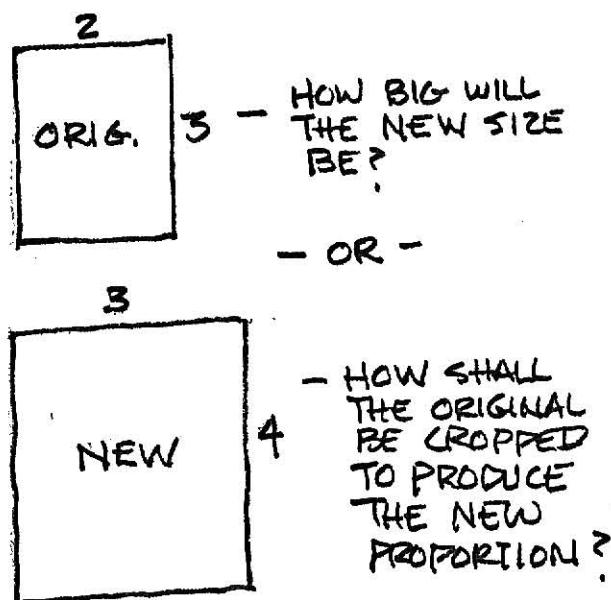
Working with Photo Scaling

It should be obvious by now that photo scaling can be a confusing operation. There are a few basic ground rules which, when

committed to memory and exercised in practice, can help to avoid a tangled mess of numbers and percentages.

FIRST In order to set up a ratio, two dimensions of the photo must be established. The two dimensions can be those of the original or those of the new, finished reproduction size, but in order to get anywhere, you must have two dimensions of one of the sizes. There are times when the procedure is worked "backwards," that is, you have the finished size indicated on the layout, and need to make the original fit it. In those cases the two "known" sizes which establish the proportion are the dimensions of the reproduction.

SECOND One of the dimensions of the "unknown" size must be arbitrarily set. In the earlier problems, the width of the column on the page layout was our "arbitrary" dimension. It was necessary to establish this dimension in order to have three known dimensions



to solve the fourth "unknown." The "arbitrary" dimension can be one of the original photo or one of the reproduction size, depending on which way the problem is worked. You cannot scale a photograph without having three dimensions and solving for the fourth---whether you solve by algebraic equation, geometric drawing or the proportion wheel.

Integrating Cropping and Scaling

Since three dimensions are necessary to arrive at the proper reduction or enlargement percentage, it may be obvious that cropping plays an important part in the scaling process. Those "arbitrary" dimensions noted earlier may be established by cropping the photograph.

SAMPLE CASE NUMBER ONE

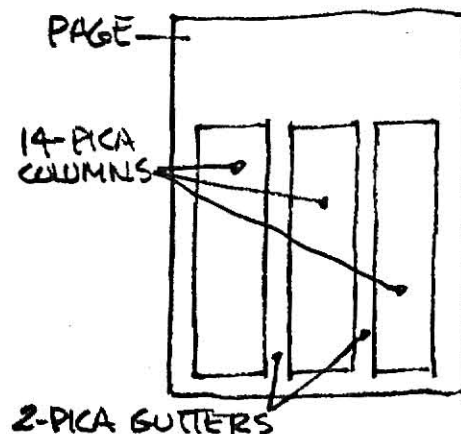
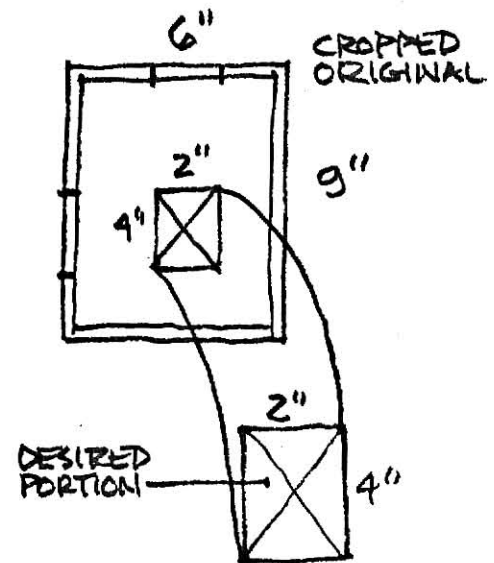
Suppose we have a photograph which measures 6 by 9 inches. While the picture is a good one, we don't want to use all of it. Instead, we want to use only a portion of the center of the print.

The area we wish to use is only 2 by 4 inches.

The picture will be displayed in a magazine which uses 14-pica columns. We want to print the picture two columns wide.

What we need to know is:

1) how deep will the reproduction size photo be when printed in the

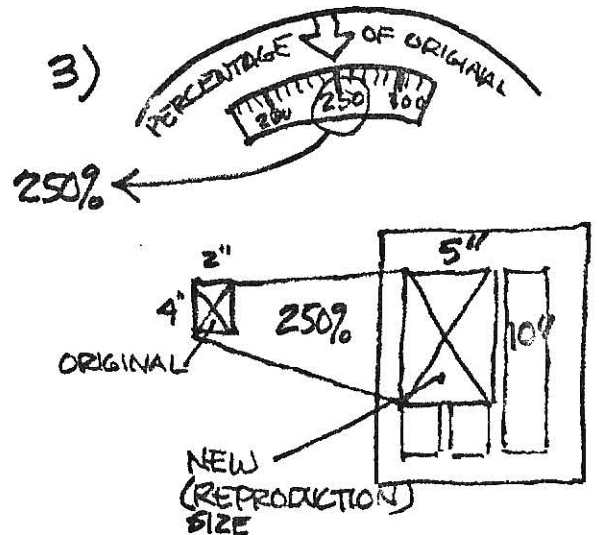
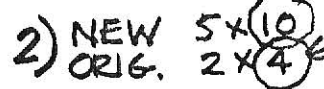
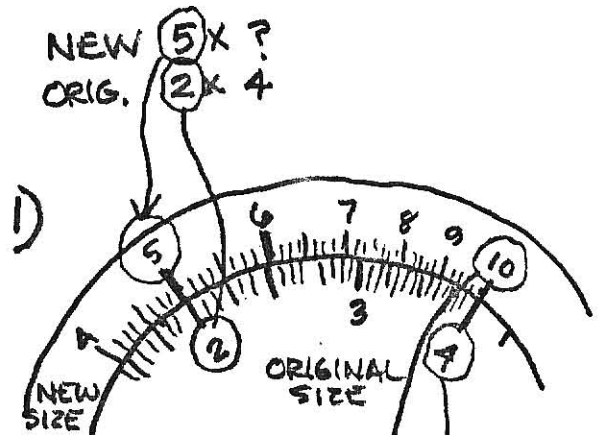
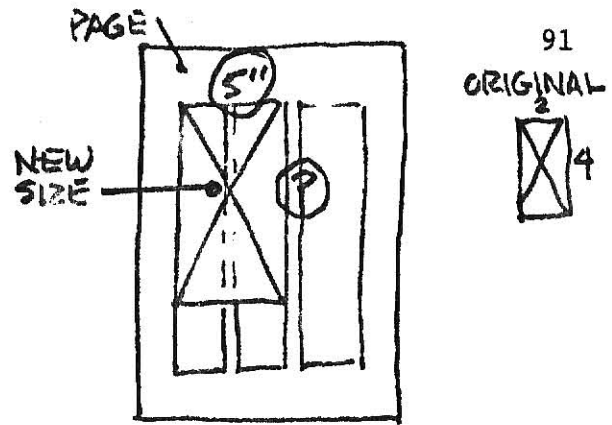


magazine? and, 2) what is the percentage of reduction or enlargement:

STEP ONE: Two columns in the magazine equal 28 picas. Between the columns is a two-pica "gutter," making the desired width of our reproduction 30 picas, or 5 inches.

STEP TWO: Set up the ratio: "2 is to 5 as 4 is to X" on the proportion wheel. Find the "2" on the inside scale and place it opposite the "5" on the outside scale. Then, find the "4" on the outside scale and read across to find the unknown on the inside scale. It is 10. Therefore, the finished reproduction size will be 10 inches deep. The whole picture will be 5 inches by 10 inches.

STEP THREE: Look in the window and read the percentage of reduction or enlargement. In this case it is 250% of the original which indicates an enlargement. The same size would be 100%, a reduction would be less than 100%.



SAMPLE CASE NUMBER TWO

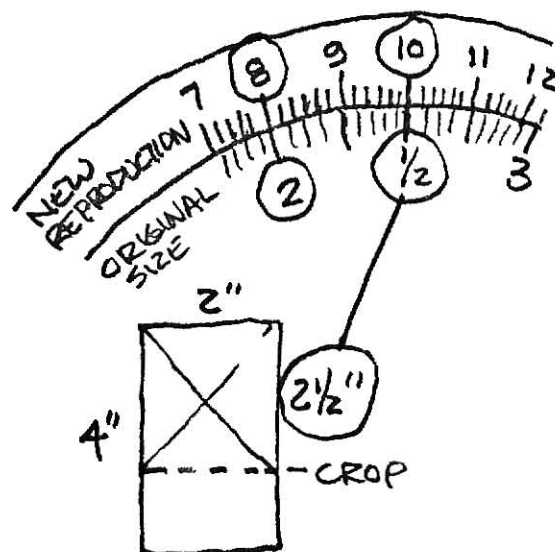
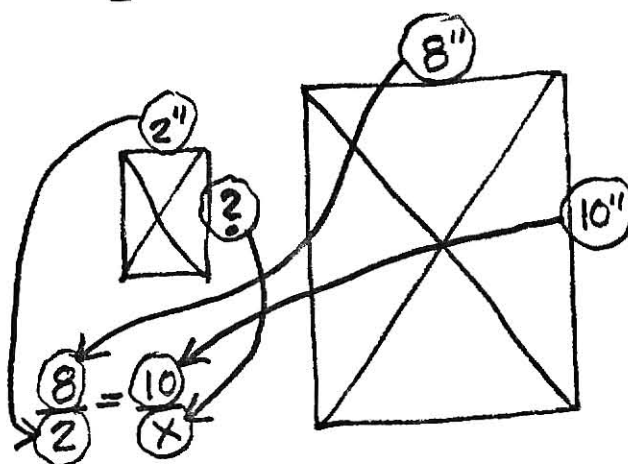
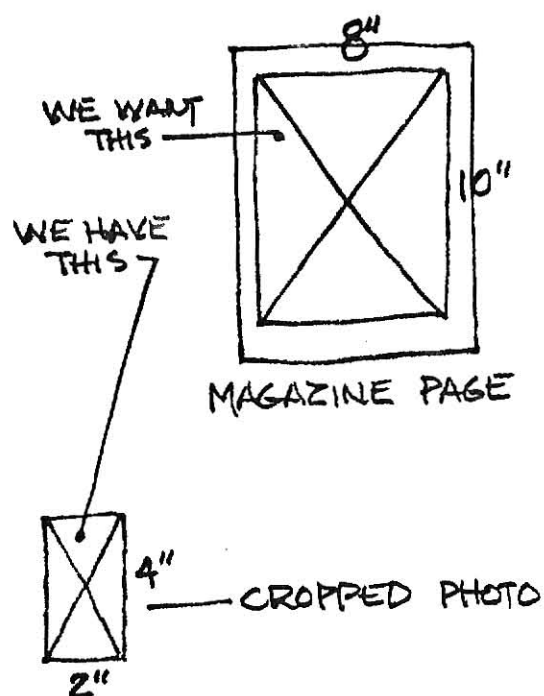
Suppose we wish to use the same picture in the magazine, but this time we want it to be a full page.

In this example, we start with the dimensions of the reproduction size (the full page) and make sure the original photo is cropped to the same proportion.

STEP ONE: The area we want to fill with the photo is 48 picas wide, or 8 inches. (Three 14-pica-wide columns plus two 3-pica gutters). The depth of the page is 10 inches.

STEP TWO: We have two dimensions of one of the sizes (the reproduction size), now we must have one dimension of the other size (the original) in order to solve for the fourth. Since we have already cropped the photo for its content (to 2 x 4"), we need to assign one of those dimensions and then see if the other is proportionately accurate.

Let's arbitrarily select the 2" width. If we blow up the 2" width

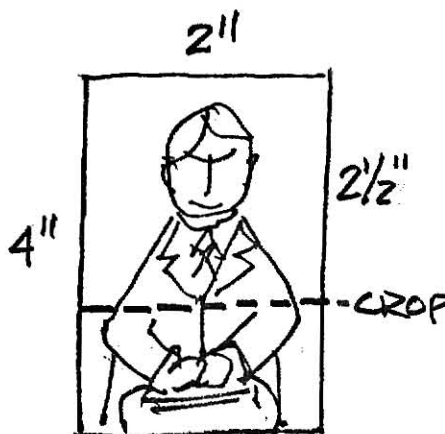


of the original to 8" wide, how much of the original do we need to get our finished 10" dimension?

STEP THREE: Find the "2" on the original (inside) scale of the wheel. Align it with the "8" on the reproduction scale (outside). Now find the "10" on the outside scale and read across to the original scale. The corresponding number is "2 1/2".

Therefore, the original must be cropped to a 2 x 2 1/2" size in order for it to be blown up proportionately to fill the entire page of the magazine.

STEP FOUR: If the 2 x 2 1/2 inch dimensions of the original are acceptable when considering the content of the photo, the process is completed by noting the percentage of original size in the wheel's window. If the content of the photo will not allow the cropping at 2 1/2" deep, then a new width must be arbitrarily selected and the problem worked again until the cropped original is proportional to the page size.



In the foregoing problems, a fraction occurred only once, and it was one-half. Many times, the fractions may not be that easy. It is usually easier to work in picas when scaling photos because fractions are usually limited to one-halves because of the smaller unit. Although proportion wheels are calibrated in inches, pay no mind. The whole operation is nothing more

than a ratio and the quantitative units do not affect the outcome. A ratio can be worked in apples or peanuts if it's easier.

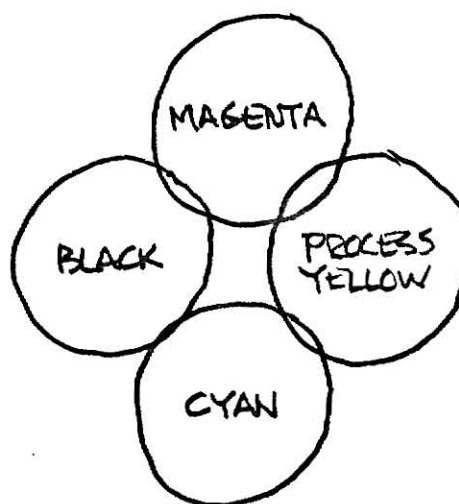
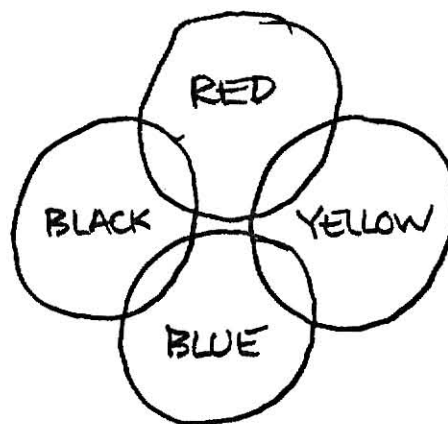
Process Color

All of the discussion about halftones to this point has concerned black-and-white photographs. Indeed, a black-and-white photo can be printed in any one color---say red---if that's the color of ink the pressman puts on the press. But, nevertheless, it's still a one-color halftone.

When a full-color photo is printed, the process gets a bit more complicated. Printing a full-color photograph is called printing "process" color.

In order to get the full range of colors which might appear in a photo, three specially-balanced colors of ink, plus black, are used. By counting black as a color, four colors are combined to make up the wide range of different hues in a color photo. Because of the use of four colors, the method is often called "four color process."

The colors of ink used are essentially the primary colors---red, yellow, blue, and, of course, black. But just any "red," "yellow" or "blue"

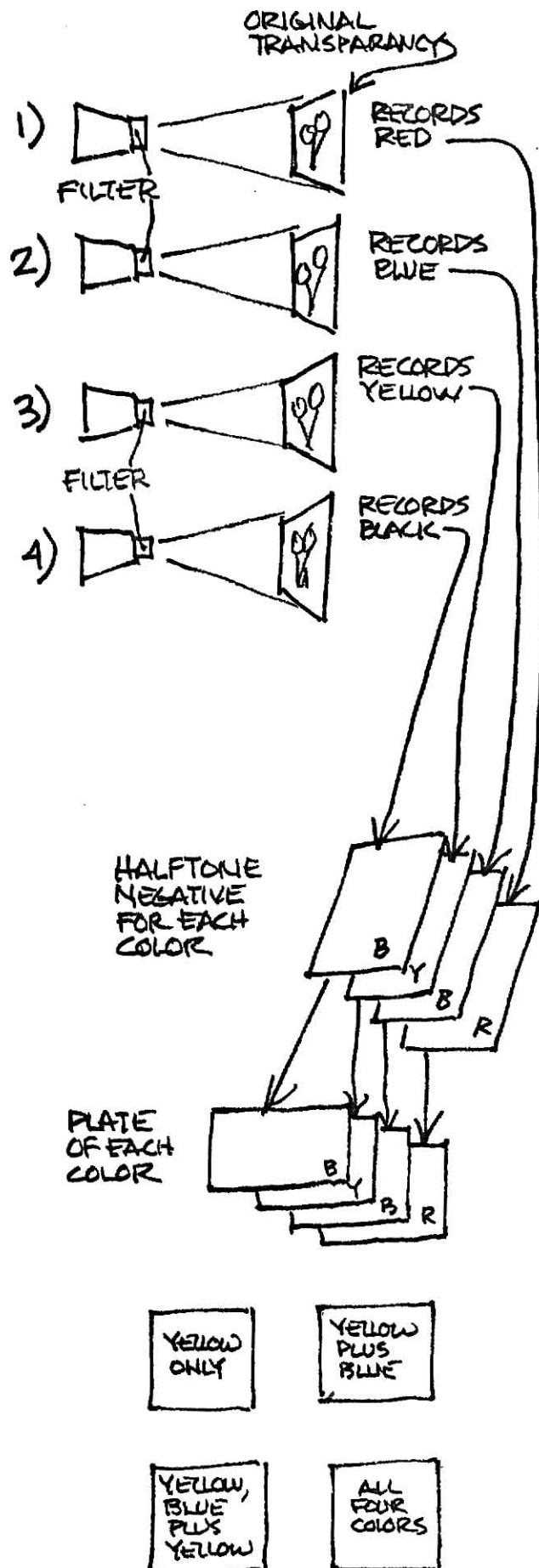


won't work. The ink has to be specifically-controlled shades of those three. The "red" is called magenta, the "blue" is "cyan" or "process blue," and the yellow is "process yellow." Together with black, these inks are capable of combining to reproduce any shade of any color.

Simply put, the preparation of process color plates is as follows:

The original color photo (either a print or a transparency) is placed in a process camera. Through the use of special filters, the photo is shot four times. The first time a filter is used which screens out all the color except the red. The varying amounts of red are recorded on film, using the half-tone screen method. Next, a filter is installed to screen out all colors in the original except the blue, and those shades are recorded on film. The yellow in the original is recorded next and then the black.

The negative for each color contains the half-tone dot pattern,



so the varying values of each color are faithfully recorded.

A plate (offset, letterpress engraving, or gravure) is made for each of the four colors.

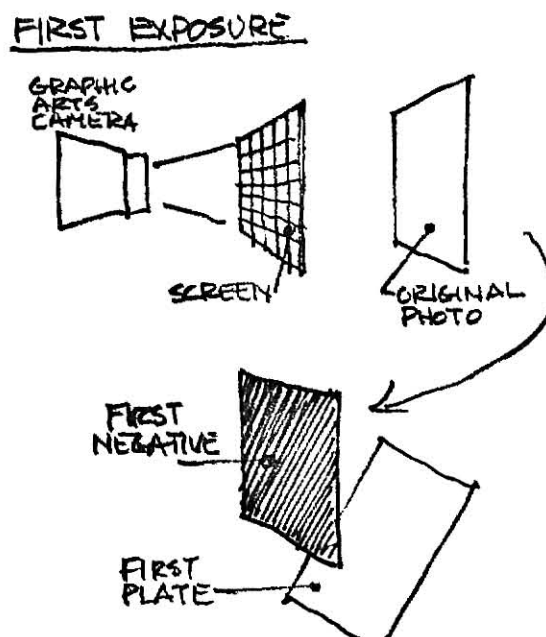
The plates are then installed one-by-one on the printing press and each color in turn is printed. When the four colors of ink are placed on top of one another, the transparent inks combine and produce the color of the original photograph.

The procedure of producing the four negatives is called "separating" the color. The negatives themselves are called "separations."

Four-color process is many times more desirable than printing a photo in black-and-white, but it is considerably more expensive as well. The separations themselves are expensive to make. Then, of course, it takes four runs through the press to print process color. The time, and some expense, can be reduced by making two runs on a two-color press, or making only one run on a four-color press, but these presses are usually larger varieties and cost more to run. Another added expense in four-color work is the necessity for four plates.

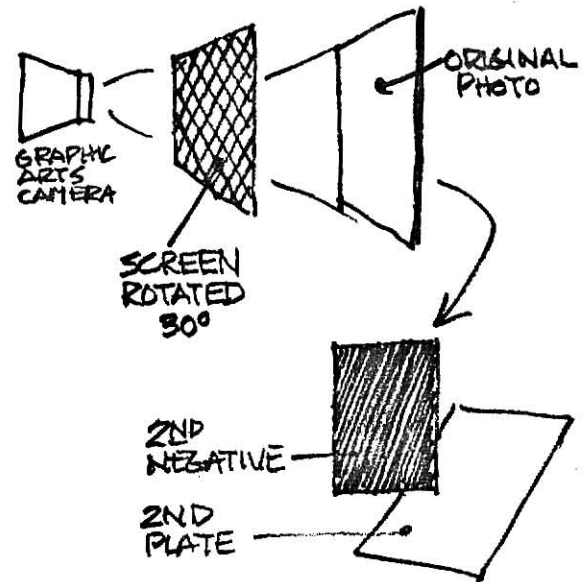
Duotones

Somewhere in between the black-and-white photo and the four color process picture, lies a two-color variety called a "duotone." The duotone basically starts with a black-and-white halftone. After the halftone is shot, it is shot again, this time rotating the screen 30° in the camera and making a slightly different exposure.



The negatives from each shooting are then plated. One plate is usually run in black ink, and the other in some color. The black run tends to tone the color down to just a vague suggestion. The result is a photo which has a rich tone---slightly tinted, but seemingly "deeper" in character.

SECOND EXPOSURE



CHAPTER FIVE

ART

In graphic terms, "art" is anything on a printed page that is not type. Many printers refer to photographs as "art" as well as actual drawings and paintings produced by commercial artists. For this presentation, we will distinguish between art and photographs.

From the printer's standpoint, there are only two forms of art:

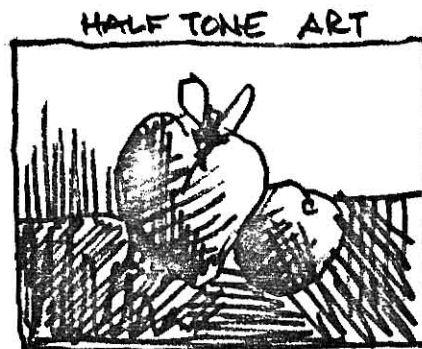
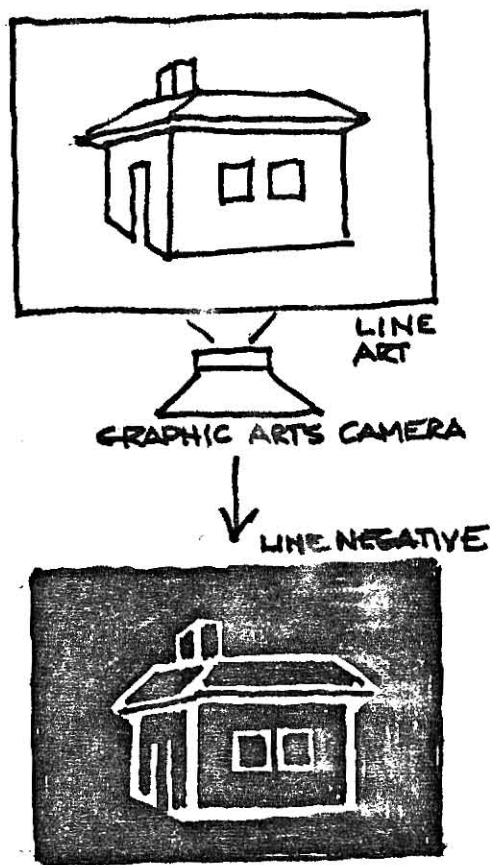
1) "line" art and, 2) "halftone" art.

Line Art

Any drawing which can be reproduced in simple blacks and whites without a halftone screen is referred to as line art. Pen-and-ink sketches, drawings and renderings which are made up of solid lines can be copied directly in the graphic arts camera. The negative produced in the camera is then used to make a letterpress line engraving or an offset plate as described earlier.

Halftone Art

Any piece of art which uses "tones" of gray similar to a black-and-white photograph is halftone art. Ink washes, for example, present a wide tonal variety

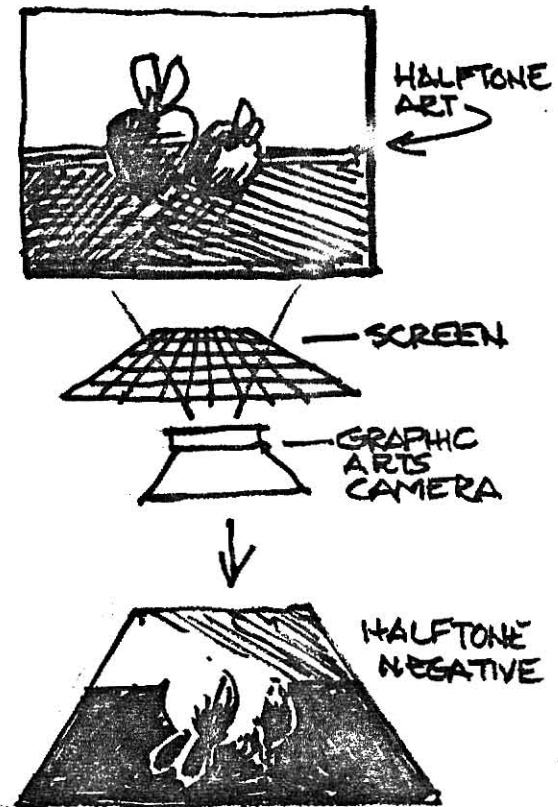


and, therefore, must be reproduced as halftone art. Pencil drawings are frequently shot as halftones to maintain the subtly of shading inherent in pencil lines. Charcoal, pastel chalk, water color paint, oil paint, air brush, and collages are other examples of artistic media usually reproduced in halftone.

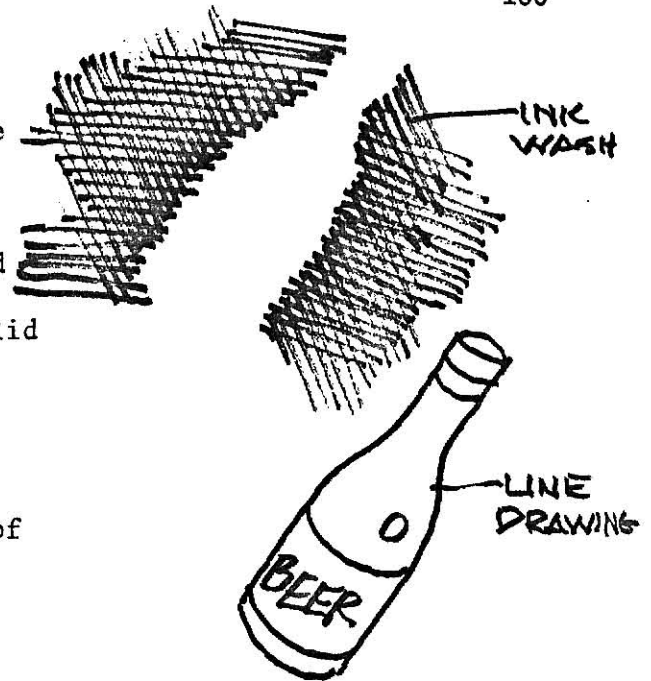
The halftone procedure for art is exactly the same as for producing a halftone of a photo. A "screen" is inserted in the camera to break up the image into thousands of tiny dots. The size and distribution of the dots within the halftone determines the value of tone that the eye perceives.

Combination Art

Some art is produced as a combination of "line" and "halftone" processes. The form and content of the finished art determines whether it will become a combination shot. When the artist, for example, wishes to use a "wash" background with a solid, line drawing of the desired object in the foreground, a combination



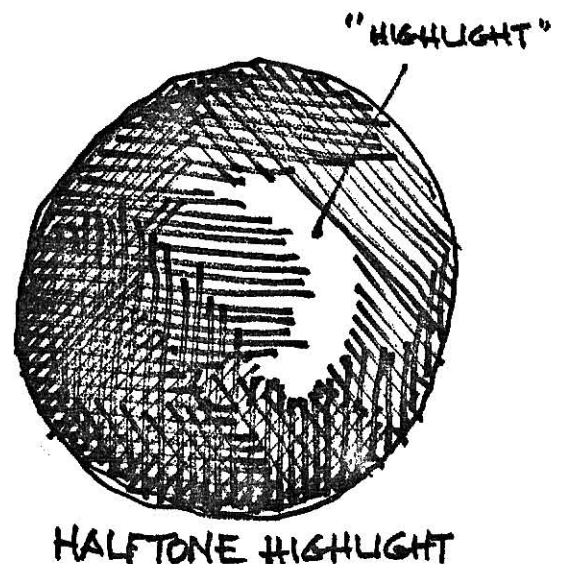
set of negatives is made. If the example were to be recorded completely as "line" art, the background would lose its varied texture and appear only as streaks of solid black. If the whole piece were to be recorded as "halftone" art, the object would be broken up with the dot pattern of the halftone screen and would not be as black and sharp as if it were solid, or "line."



In this example, the bottle drawing is prepared separately from the wash background. The two pieces are shot separately (the wash shot halftone, the bottle shot line) and the negatives are then combined to make the finished printing plate.

Halftone Highlight

It is possible to shoot a halftone and then mechanically remove the dot structure in certain portions. The finished product is usually called a highlight halftone, and although it can be used with both art and photographs, the technique is most often used with halftone art.



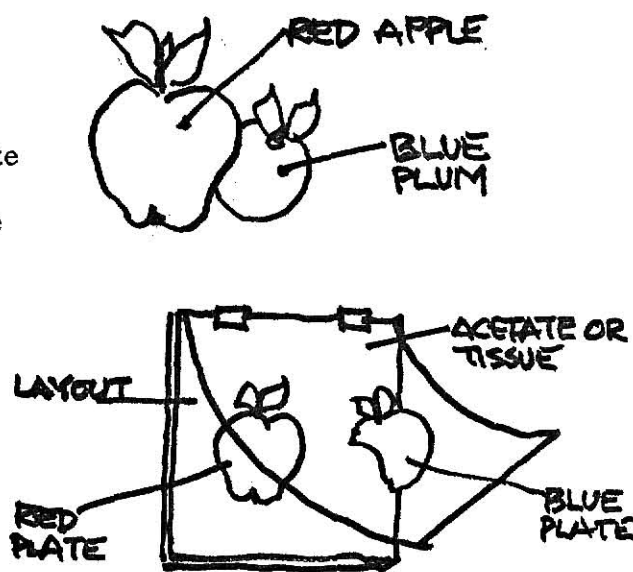
Some artists wish to achieve a "clean," brighter white in highlight areas of an illustration. This can be done by physically opaquing out the dots on the halftone negative or by actually grinding them off a letterpress halftone engraving.

Color Art

Full color art is treated the same as full color photographs. Many times a color painting will be photographed with color transparency film first in order to have a color transparency for the separation camera. It is possible to separate color positives (prints, paintings, etc.), but the results may not be as good.

Multi-color Art

Many times art is prepared to be reproduced in two or three colors. In these cases, the artist must separate the colors as he prepares the art. The image for each color is then shot separately and a plate for each color is made. When color is used in this way, it is generally called "spot color."

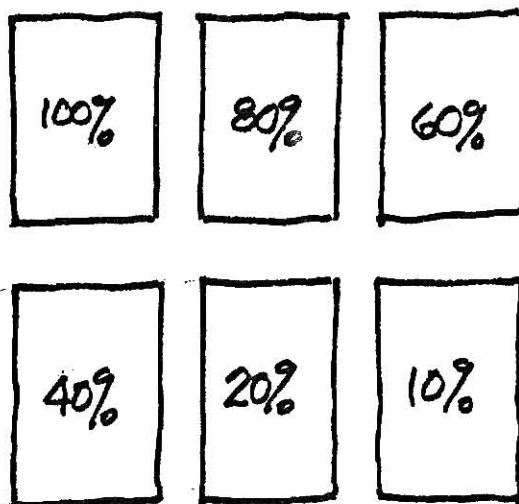


By using two or three colors, the skilled graphic artist can combine different tints of each to produce several colors in the printed piece.

"Screening" Color

We have referred to combining "tints" of specific colors to produce different shades in a printed piece. "Screening" of a color is similar to

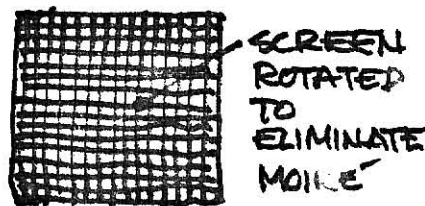
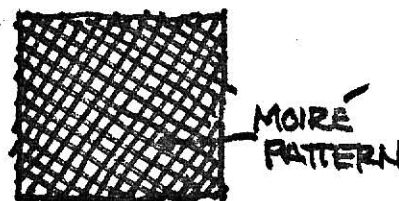
the process used to prepare a halftone. By breaking up a solid color block into dots, lighter tints can be obtained. These tints are called, appropriately, "screens" of the color.



The value (darkness) of the tint is controlled by the size of dots in the screen pattern and is expressed in terms of a percentage of the solid color. A 10 per cent screen is very light; its dots are small and far apart, allowing the whiteness of the paper to "dilute" the color intensity. A 90 per cent screen is very nearly as dark as the solid color without a screen pattern.

Moire

When combining two or more screens, care must be taken to avoid producing an interplay of dots which causes a "moire." The moire pattern can be distracting and can ruin carefully-prepared artwork. The pattern can be eliminated or greatly reduced in most cases by rotating the screens 30° in the camera before shooting. This rotation reduces the dot interplay of the two screen patterns. The technique to reduce moire patterns is used when combining the four dot pattern negatives of a four-color process picture.



Art Sources

While many publications staffs employ full-time designers and commercial artists to produce artwork, some firms prefer to buy specific pieces of illustrative art from free-lance artists for a per-job fee.

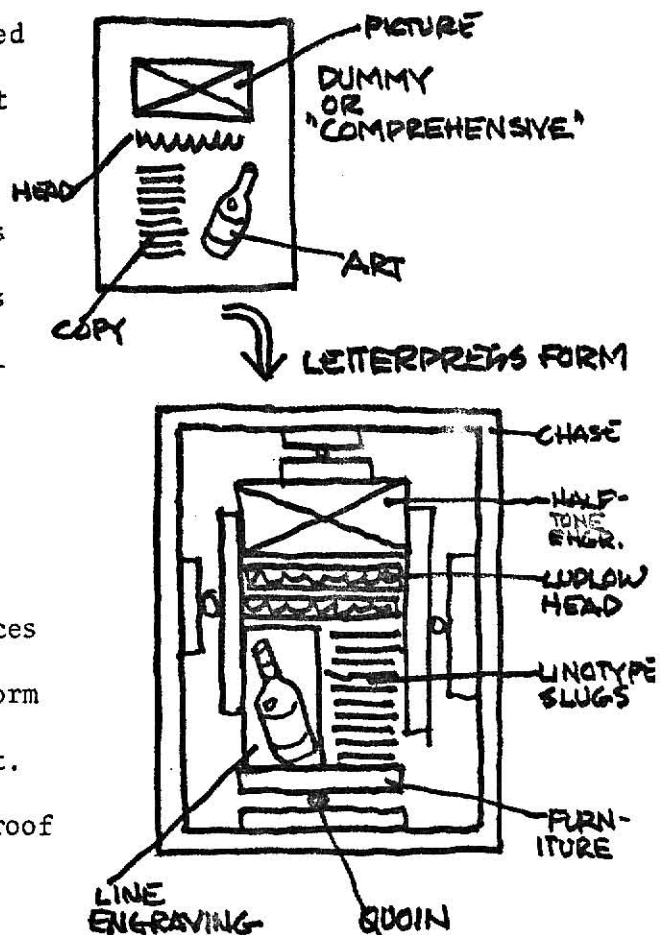
Art services are also available which provide the subscriber with stock illustrations for a nominal fee. Other sources of art include published un-copyrighted clip books, library archives and newspaper mat services.

The Camera-ready Layout

Preparing artwork and designing a layout for a printed piece is slightly different for the two major printing forms.

Letterpress Layout

Because everything on the finished page will be reduced to metal, it is not necessary for the artist or designer to make a finished layout for a letterpress job. A comprehensive layout which shows where each element will appear is sufficient. The printer will then take the separate elements and produce them in metal as type, line engravings or half-tone engravings. Once he has these pieces in hand, he simply places them in the form as indicated by the comprehensive layout. He then locks up the form and pulls a proof for the editor or designer.



Many times the copy is indicated on the comprehensives by simply pasting in a galley proof of the type after it has been corrected.

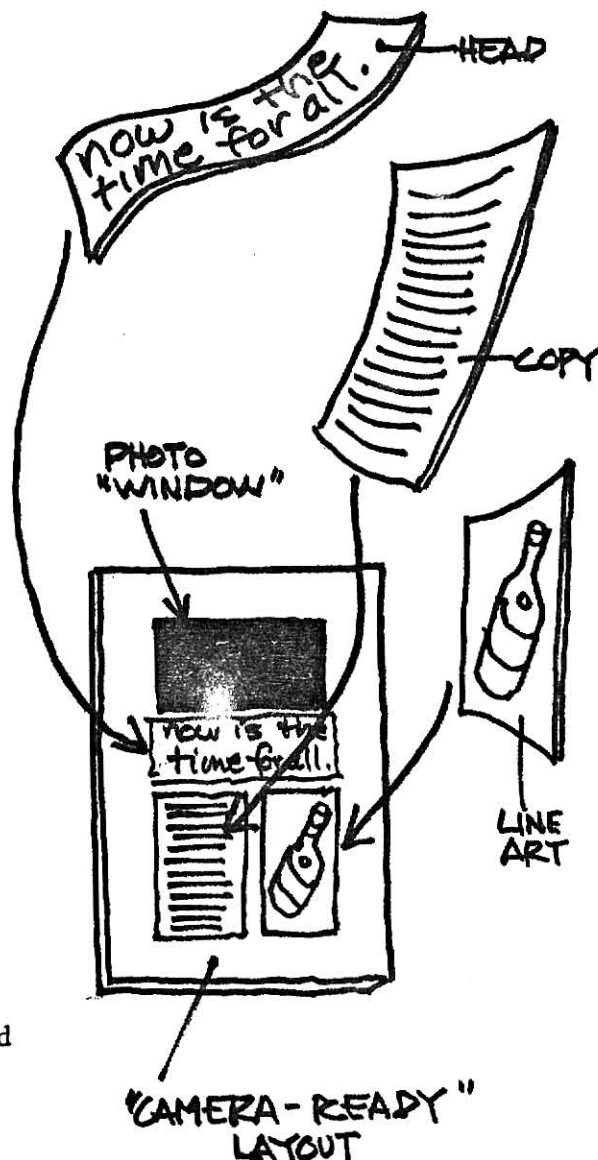
All that is necessary for the printer to lay out a letterpress job is the comprehensive, or a "roadmap" to tell him what goes where.

Offset Layouts

Since there is no metal involved in the production of offset negatives and plates, the designer or artist can retain complete control over the job by producing a "camera-ready" layout. This layout is the final positioning of all elements on the printed page.

Reproduction proofs of all copy are pasted in precise position, all headlines and actual-size line artwork are, likewise pasted into position. Since halftones are handled separately, they are usually indicated by a black or red "window" in the layout. This "window" will photograph clear on the negative and allow the halftone negative to be "stripped in" the area.

Some artists use velox prints of halftones for the final paste-up. These are prints of an already-screened photo and contain the dot pattern. Once the picture contains the halftone dot pattern it can be photographed along with the



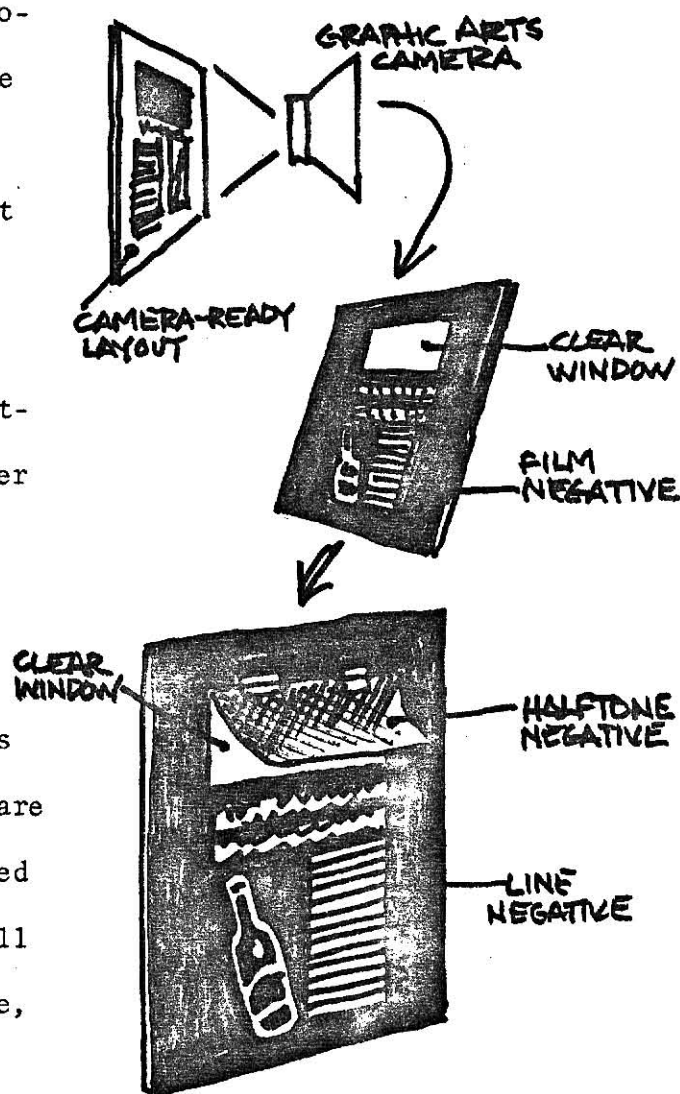
other "line" copy in the graphic arts camera.

Many times artwork is prepared larger than the size it will appear on the printed page. By reducing the art, minor imperfections are reduced and the art appears sharper. Also, sometimes it is more convenient for the artist to work at a larger scale. If art is prepared at a larger size, then it must be proportional to the finished size. The same principles of ratio and proportion must be applied as are used in the scaling of photographs.

For a simple job with no photographs, the layout artist can prepare the piece "camera-ready" with the printer needing only to photograph it in his graphic arts camera and then expose a plate.

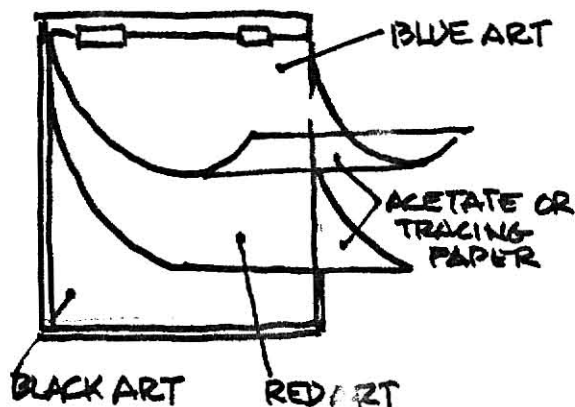
If photos are involved, or artwork needs to be reduced, then another step is involved---that of shooting the halftone or shooting a reduced version of the over-sized art.

Usually the separate shootings for the photographs and reduced art are left in negative form and simply taped to the master line negative. Once all elements are in place on the negative, it is ready for plating.

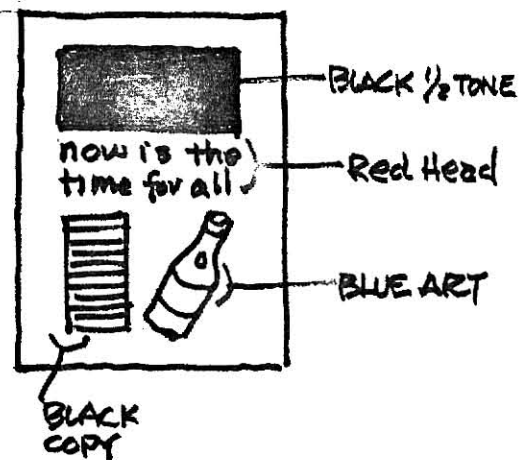


Second- or third-color layouts are prepared in essentially the same way, but usually are affixed to clear acetate or tracing tissue. The acetate

or tissue allows the layout artist to see the basic color layout beneath and make sure the additional color layouts are properly affixed and aligned. The overlays are then photographed as before and a plate is exposed from each.



In two-color work it sometimes isn't necessary to physically separate the colors if they don't overlap or touch each other. If this is the case, the artist simply notes which element prints in which color and the printer simply splits up the negative and exposes two plates---one for each color.



"Finished" Art

The layout or paste-up artist and the commercial artist are generally concerned with what is called "finished" art.

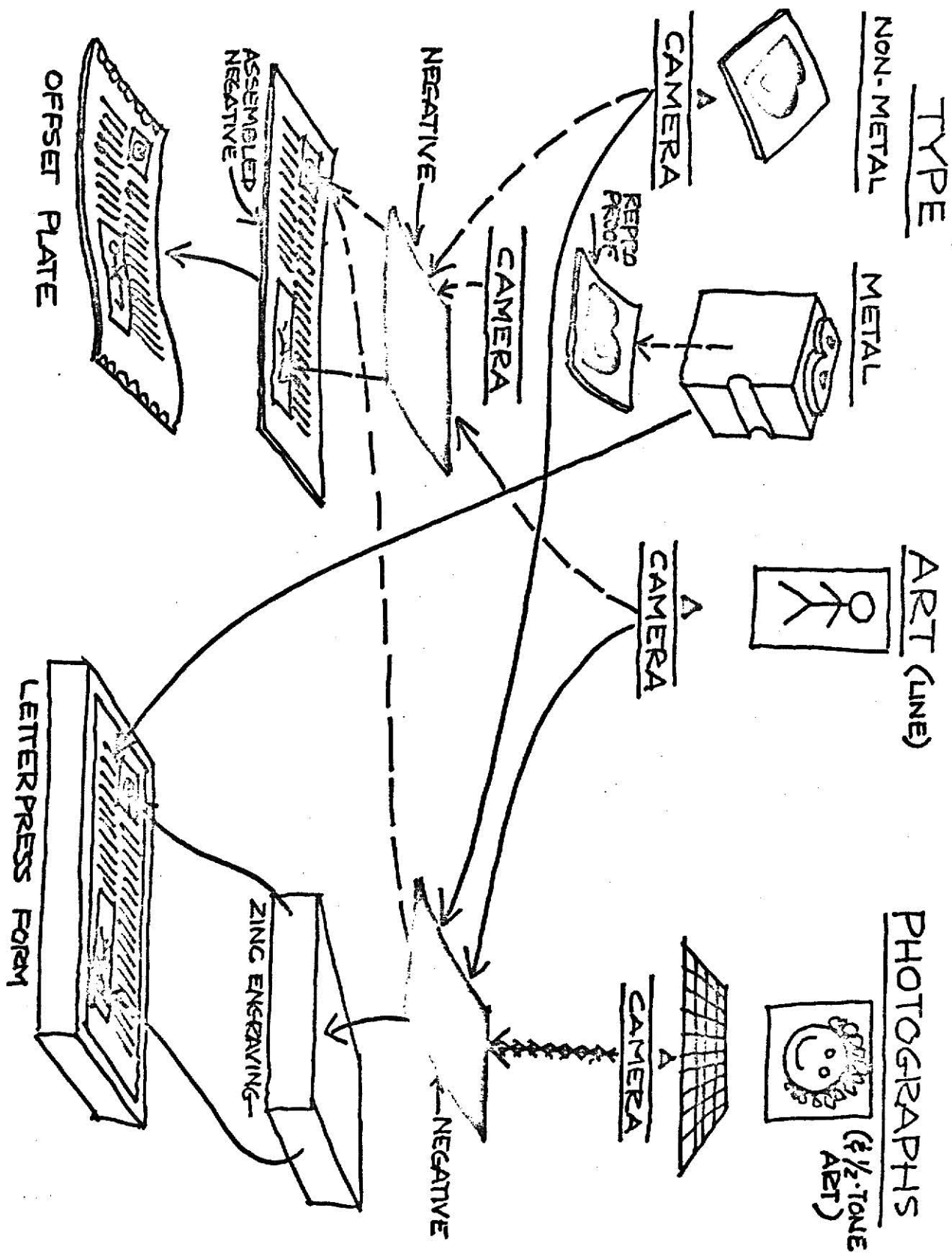
"Finished" art means that it's ready for the camera---or "camera-ready" art. The commercial artist learns quickly that his effort is not an end in itself, as with the fine artist.

When the fine artist paints a picture for hanging on the wall, it has to be perfect in every detail. His painting is the final product of his efforts.

The commercial artist produces not a final product, but only a step in the final product. The final product is, of course, the printed piece. The

artist's work is only a step in completing that printed piece. Because of the nature of commercial art, certain short cuts can be taken. For example, most artists use a non-reproducing blue pencil when sketching in their designs or pictures. The blue pencil needn't be erased before photographing, because the film used in graphic arts cameras isn't sensitive to blue. Many times when an artist makes a mistake or isn't satisfied with a portion of a drawing, he simply pastes a piece of white paper over the unwanted area and redraws it. The graphic arts camera doesn't "see" the paper patch job, and the artist is relieved of the necessity of starting over from scratch.

Because of some of these "short cuts," a "finished" piece of commercial art may look far from finished to the untrained eye. Experience and thorough knowledge of the graphic arts process allow artists to produce beautiful illustrations from what may appear to be sloppy, patch-uped work. Of course, all artwork should be created as carefully and cleanly as possible, but time limitations and work loads many times demand utilizing "short cuts."



CHAPTER SIX

OTHER COMPONENTS OF THE PRINTED PIECE

Paper

The printing paper industry is a jungle of trade names, finishes, sizes, weights and colors. Every company manufactures wide varieties of papers for use in every conceivable situation. To the untrained observer, "paper is paper," but to printers, editors and designers, the proper paper for a job is as important a decision as any of the many others in the design process.

There are some standards in the paper industry which can help keep categories straight. Printers refer to paper as "stock."

The easiest way to classify paper, perhaps, is by type. There are five broad categories, including the ever-present "miscellaneous" category:

- 1) newsprint
- 2) bond papers (writing or business papers)
- 3) book papers (text papers)
- 4) cover papers
- 5) miscellaneous (specialty papers, ledger, index, cardboard, etc.)

Each kind of paper has an individual basic size. These basic sizes are important, because they are the basis on which the paper's weight is figured.

Newsprint

The lowest grade of printing papers, newsprint, is very coarse, has many imperfections and lacks permanence. Basic size of newsprint is 24 x 36 inches.

Bond Papers

The major use of bond papers is for writing paper. Most letterheads and envelopes are made from bond paper. The rag content of bond paper may vary from none to 100 per cent rag content. Matching envelopes are available in most bond papers. Basic size is 17 x 22 inches.

Book Papers (Text papers)

Book papers probably makes up the largest category of printing papers. It is used not only for books, but for most every type of printed material. Two major kinds of book papers are uncoated and coated. Coated book papers are what many persons refer to as "slick" papers, the ones with a glossy surface. Uncoated book papers have a regular flat, porous finish. The widest range of colors, weights and finishes is generally found in the book papers category. Book papers which have been specially formulated to run well with the dampening effect of offset presses are called "offset" papers. The basic size of book papers is 25 x 38 inches.

Cover Papers

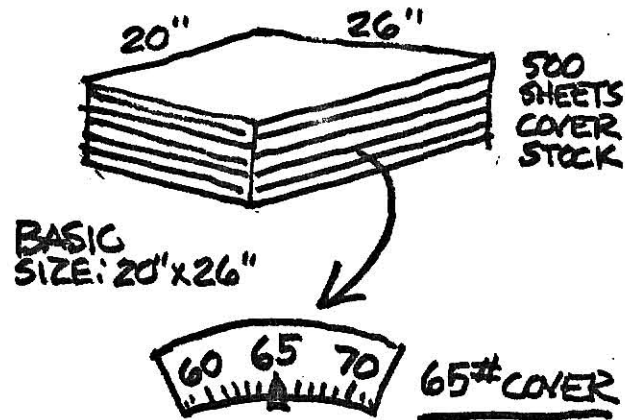
Cover papers are just what the name implies: used primarily for covers of books, pamphlets, and brochures. They are thicker than offset papers, but otherwise have many of the same attributes: available in wide ranges of colors and finishes, available either coated or uncoated, and available in several weights. The basic sheet size is 20 x 26 inches.

Miscellaneous Papers

There is a wide variety of specialty papers---ledger, index, card stock, cardboard, gummed, pressure sensitive, safety check paper, fluorescent, etc. These papers vary in standard sizes according to their group.

Paper Weight

The basic sheet size is used to determine a paper's "weight." The weight listed in a paper company's catalog is the weight of 500 sheets of the basic size. Five hundred sheets of 20 x 26 cover stock may weigh 65 pounds. That particular paper is therefore referred to as "65-pound" cover. A printer may order sheets of different sizes than the basic size, but the paper is still referred to as 65-pound.

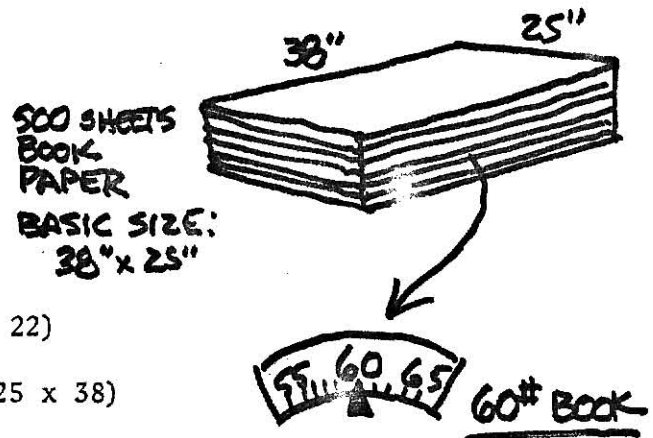


Basic weights for common printing papers are given in the following table. Since they are based on different sheet sizes, they cannot be directly related.

Bond papers: 16, 20, 24, 28 pound (17 x 22)

Book papers: 50, 60, 70, 80, 100 pound (25 x 38)

Cover papers: 60, 65, 80, 100 pound (20 x 26)



In the case of thick cover papers and cardboard, a "point" system is used to measure the thickness of each sheet. These "points" are not related to the "points" used in typography. Points when measuring cardboard or cover stock are 1/100ths of an inch.

Bulk

Bulk of paper is its thickness. It is usually determined by the simple "feel" of the sheet in the hand. Because of differing manufacturing processes, two papers which weigh the same can differ somewhat in their bulk.

Opacity

Opacity refers to a paper's ability to not "show through" printing from one side to the other. Opacity is a function of the weight and bulk of a paper, but certain types are manufactured to be particularly "opaque."

Finish

Papers can be coated with a glossy surface or coated with a satin finish. They can be uncoated, such as bond papers. There is a wide variety of embossed finishes available. Some cover papers are embossed to look like wood grain or other patterns. Cover and book papers may have smooth (vellum or antique) finishes, stippled finishes or other specialty designs. Many paper companies use different names for specific types of finishes.

Color

Probably the most apparent attribute of a sheet of paper is its color. Time was when a designer or printer could have a Henry Ford selection---any color as long as it was white. Paper companies now manufacture and stock an alarming range of colors in all fine printing papers.

Selection of Paper

There are two main categories of criteria for selecting the proper paper for each job. The first and most basic is the type of printing process to be used. Letterpress printing requires a paper that is smooth enough to ensure

a uniform ink transfer, wet strong enough to accept pressure without tearing. Offset paper must be able to accept the water of the offset process without changing shape and must have good enough surface strength to resist "picking" of small bits of the paper by the relatively sticky inks used. Rough papers and those with highly-textured surfaces print well on offset presses because of the 'give' of the rubber blanket which transfers the image. Gravure printing requires smooth paper to come in close contact with the plate, and paper with high absorption rate to "suck" the ink from the recessed cells.

Other paper-selection criteria can loosely be grouped under the heading of "design" decisions.

Size. The size of the planned printed piece should be compatible with the sheet or roll sizes of a particular paper.

Weight. The use of the printed piece usually dictates the weight of paper used. Material which is destined to be mailed is most often printed on lighter-weight paper to save postage costs. Pieces which are designed for reference or a great deal of handling, more appropriately are printed on heavier papers.

Opacity. Materials designed to be printed on both sides of the sheet should be printed on papers with a high opacity. "Show through" of printed material from one side of the sheet to the other can be distracting at best, ruinous at worst.

Finish. The wide range of finishes available lends itself to different moods and different tonal feelings. An antique catalog may be appropriately printed on rough, uneven paper. A brochure for a luxury automobile might lend itself to glossy, hard, coated paper. Uncoated papers are best for large amounts of text material, as coated, "glossy" papers tend to tire the eyes.

Coated papers, however, produce more spectacular halftones and are particularly effective with four-color process.

Color. The selection of paper color is important---it is the background upon which all words, art and photographs appear. A picture printed on white may appear very much different than the same photo printed on blue paper. When deciding on the paper color for a job, the color of ink to be printed on the paper is also a prime factor. The most easily readable combinations exist where there is maximum contrast between the ink color and the paper color.

Cost. Budget considerations are many times the first ones made. The wide variety of papers comes in an equally-wide range of prices. Usually a balance of quality and cost can be struck if the editor or designer has the perseverance to seek out all alternatives.

Printing Inks

The variety of colors of printing inks is nearly limitless. Printers usually stock a specific number of colors in a particular line of inks and always have these available. A wider range of inks is available on order, however, and, although they cost more, many times a special-order ink is necessary.

Most printers use the Pantone Matching System (PMS) as a standard for determining an exact ink color. The PMS colors are numbered and can be duplicated from coast to coast. Inks used to print four-color photographs (process inks) are specifically balanced to produce the total range of colors when overlapped in a process photo. As discussed earlier, process inks consist of process red (or magenta), process blue (or cyan), process yellow and black.

Most regular printing inks are transparent---that is, they will allow

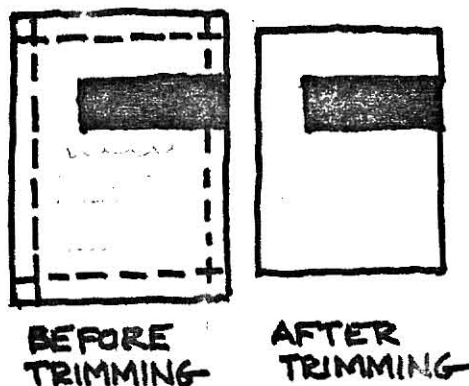
the color of the paper to affect their hue. When overlapped, transparent inks combine and take on the hue of the two colors. Special opaque inks (sometimes called poster inks) are also available. They produce heavy, flat tones which do not transmit the color of paper or combine to produce other colors.

Bindery Operations

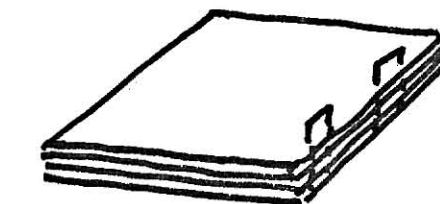
The final step in the production cycle for most printed pieces is the printer's bindery. All finishing operations are performed in the bindery. Common operations available in most bindery sections of print shops are as follows:

Folding. Paper may be machine-folded in a variety of ways, depending on equipment available. Standard folds are the simple one fold leaflet, the two-fold, french fold and accordian fold. Many other configurations can be designed if available machinery has the capabilities. The last alternative is hand-folding which is both time-consuming and expensive.

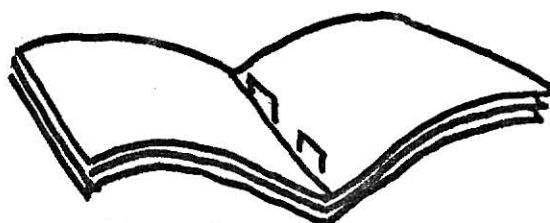
Trimming. Many times materials are printed on over-sized stock and trimmed down to the proper size. Books are trimmed after binding to produce smooth edges. Any material which extends to the edge of a page must be printed oversize and trimmed after printing. Extending an image to the edge of a page is called "bleeding" the image. Photographs, solid ink coverage and art work is sometimes "bled off the page."



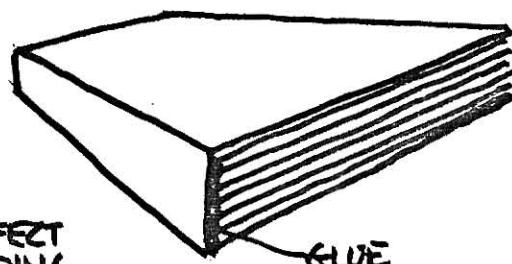
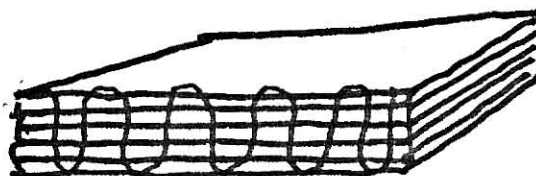
Stitching. The large stapler used to bind magazines, small booklets and brochures is called a stitcher. There are two main kinds of stitching. The side stitch is merely a collection of single sheets which are stapled along the edge---either the left side or the top. The saddle stitch is used to fasten magazines and other booklet forms together. Saddle-stitched books are printed in four-page signatures and opened at the center spread. The book is then placed on a "saddle," where wire stitches are forced through the center. After stitching, the book is then trimmed on three sides.



SIDE STITCH

SADDLE
STITCH

Binding. There are two major types of binding in common use. Either method may accommodate a hard or soft cover. Perfect binding is a process which trims and glues the backbone of a number of assembled signatures under pressure. A sewn book utilizes a machine much like a larger version of a home sewing machine to actually sew individual signatures together with thread. The sewn book is then bound with a hard or soft cover.

PERFECT
BINDING

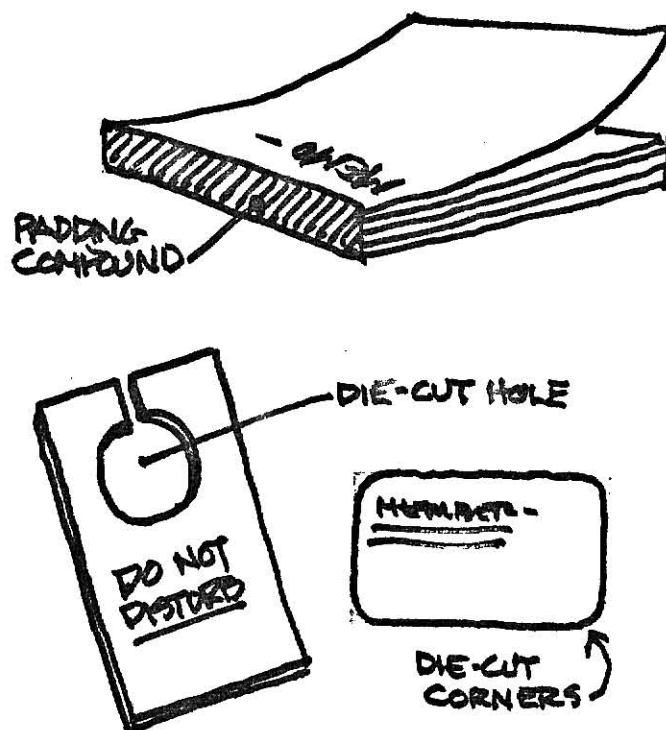
SEWN BOOK

Other Bindery Operations

Padding. Padding is glueing a set of papers or cards together with a rubbery substance which allows sheets to be torn off without disturbing the

balance of the pad. The most familiar example of padding is the standard office memo pad.

Die Cutting. A letterpress operation which physically removes a portion of the paper. In its simplest form, die cutting punches out a hole in the paper. Dies can be specially made in nearly any configuration. Die cutting also produces round-cornered cards and file folder tabs.



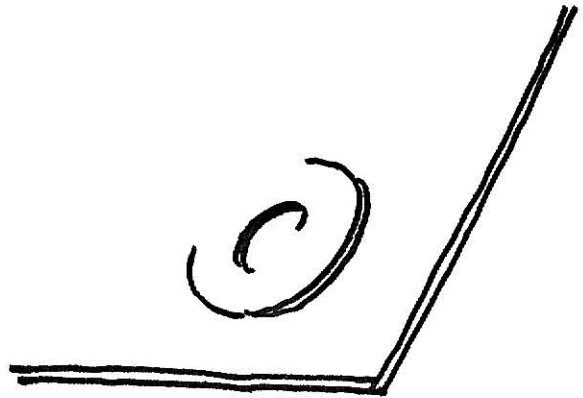
Scoring. Some heavy cover papers need to be scored before folding in order to produce a clean fold. Heavy papers or hard-coated papers tend to "crack" if folded without scoring first. Most scoring is done on a folder which produces an indentation along the fold line. When the paper is folded, it does so without cracking or wrinkling.

Perforation. Tear-off cards, receipts and other material which need to be easily detached from the main piece is usually machine perforated. The operation sometimes uses a letterpress which, with the proper perforation die, punches a series of slits along the perforation line.

Embossing. Raised surfaces which appear to be "pushed out" of the paper are embossed. The process uses specially-prepared dies which are produced in two parts, a female and a male. The paper is placed between the two parts of the die and they are brought together with a great amount of

pressure and sometimes heat. The paper is "stretched" by the shape of the die and retains the raised image. The embossed image may be either "blind" or it may have a printed surface.

Stamping. Covers of corporate annual reports and other prestige literature are often foil stamped. The operation is basically similar to the embossing procedure, but here a strip of metallic foil is inserted between the image and the paper and the pressure applied isn't usually enough to distend the fibers of the paper. The foil is transferred to the paper much the same as ink is transferred in letterpress, with the exception that heat is applied in the process.



CHAPTER SEVEN

DESIGN

Graphic design is the process of arranging the various elements (type, photos and art) on the page.

It must be noted immediately that design is a very subjective process--- there is no "right" way or "wrong" way to design a printed piece. The elements can be arranged in many ways, but some arrangements may be more effective than others. The goal, of course, is the clarity of communication. To be effective, the communication must be presented in an attractive, cohesive way.

Every printed piece is designed. Simply placing type and a headline in the center of a page is an act of designing. Since graphic design in its simplest sense is the act of arranging graphic elements on a page, many people are engaged in the process whether they know it or not. Printers, editors, copy boys, even secretaries are designers when they arrange the elements on a printed page.

Most publishers of magazines, books, or other forms of printed literature employ professional graphic designers and artists who have been trained in the craft.

Design is free. Every printed piece is "designed" by someone. Using basic design principles, non-professionals can design effective printed pieces. Good design is not a mysterious process which can only be accomplished by highly-paid professional designers. By learning the basic components and principles of design theory and then practice in applying those principles, the student can acquire the basic skills necessary to effectively design most

normal printing jobs. Highly-sophisticated printed pieces don't require more sophisticated design techniques, they merely require more sophisticated interpretation of the basic techniques.

The following discussion of design components and principles is basic in all design forms---they are applied to the design of buildings, furniture, automobiles as well as graphic design. In the context of this presentation, however, we will relate the components and principles directly to graphic communications.

Basic Components of Design

There are three basic components of design. They are: 1) the line; 2) the plane; and 3) the mass.

The Line. Lines, of course, come in various forms. There are four visual characteristics which establish a line's form. A line has shape, that is, it is straight, curved, undulating or jagged. A line has length, which is a relative quantity. A "short" line

can become "long" when compared to a shorter

one still. Lines have direction, which is a function of their "force" and "speed."

Force and speed depend on the length and width of the line. Short lines are both weak and slow. Long lines are both strong and fast. Increasing the width of a line tends to give it more force, but at the same time, slows it down. Increasing the length of a line tends to give it greater speed, but reduce its force. Lines have

SHAPE:

STRAIGHT 

CURVED 

UNDULATING 


JAGGED 

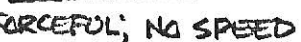
LENGTH:

SHORT 

LONG 

DIRECTION:

FAST; NO FORCE 

FORCEFUL; NO SPEED 

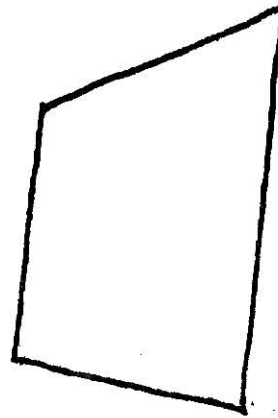
SURFACE:





surface characteristics. A line can have color and texture. It can vary in value (darkness and lightness) and it can vary in hue. Texture can vary from smooth and solid to rough and stippled.

The Plane. Planes introduce the second dimension to the basic line. A plane can be thought of as a line or lines which outline or give the illusion of outlining a specific space. Planes, therefore, have heights and widths. The visual characteristics which establish the form of a plane are similar to those of lines. Planes have shape: they can be straight-line geometric forms, curved line geometric forms, or non-geometric, or "free" form. The size of a plane refers to its relative visual "weight." A plane can be tiny in relation to another or it can appear to be huge. As do lines, planes have direction. The configuration of the plane's shape helps to establish its visual direction. Circles and squares are very static---that is, their visual direction is equalized within the form. Other forms establish a clear directional thrust. Planes have characteristics related to their surfaces. Surface characteristics



SHAPE:

STRAIGHT LINE GEOMETRIC



CURVED LINE GEOMETRIC



STRAIGHT LINE NON-GEO



CURVED LINE NON-GEO. (FREE FORM)

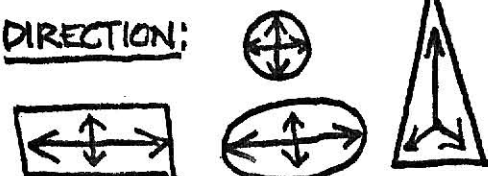


SIZE:



TINY HUGE

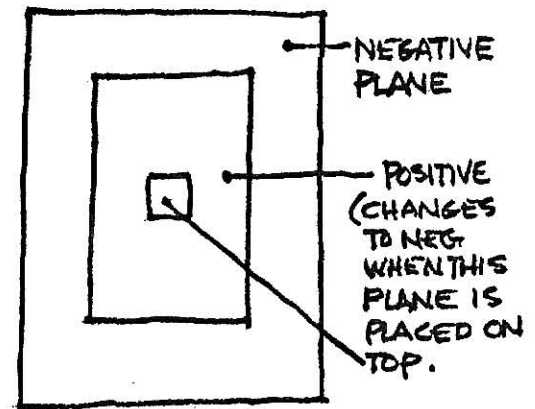
DIRECTION:



can vary as in lines. Planes also can be SURFACE!

"negative" or "positive" planes. A "positive" plane can become a "negative" one by placing another plane on top of it.

The Mass. Mass adds the third dimension to a plane, and, therefore, does not relate to two-dimensional applications such as graphic design.



Principles of Visual Characteristics

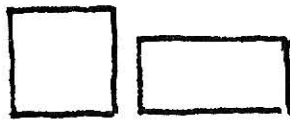
There are five design principles which relate to visual characteristics. Many of them may be familiar concepts. Others may be new considerations. Not all of the visual principles necessarily appear in every design. Some are part of the designer's working vocabulary. Others are more esoteric in nature.

Harmony. Harmony is exhibited by a pleasing or congruent arrangement of parts of a design to give conformity and consistency. Harmony can be expressed as the agreeable relationship between the parts of a design, based on similarity of the visual characteristics of the parts. When designing with planes, harmony is achieved by making one or more of the visual characteristics of the planes similar. This can be accomplished by using similar shapes, sizes, directions, textures, colors or any combination. If a design of planes has more dissimilar characteristics than similar ones, the elements probably will not be harmonious. Harmony in a design can range from complete monotony (everything in harmony) to chaos (nothing in harmony).

Dominance. Dominance is where one part of a design is visually more obvious than other parts. Dominance can be accomplished by shape, size,

direction or color.

HARMONY



SHAPE



SIZE



SHAPE &
DIRECTION



SIZE AND
DIRECTION



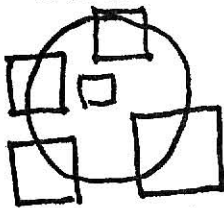
SHAPE & SIZE



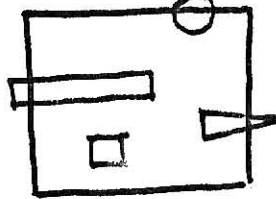
SHAPE, SIZE
& DIRECTION

DOMINANCE

SHAPE: SQUARE IS DOMINANT

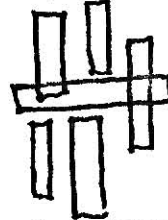


QUANTITY



SIZE

DIRECTION: VERTICAL IS DOMINANT

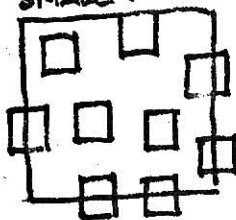


QUANTITY



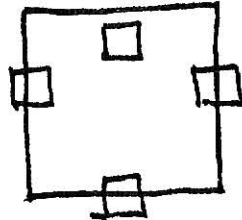
SIZE

SIZE: DOMINANT
SMALL SQUARES



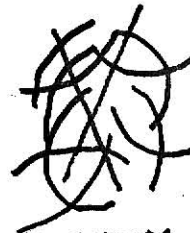
QUANTITY

LARGE SQUARE

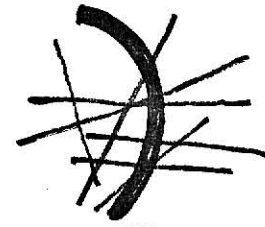


SIZE

SHAPE: CURVE IS DOMINANT



QUANTITY



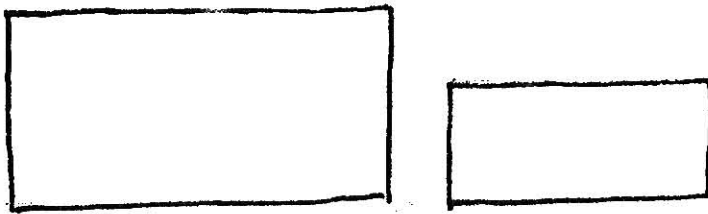
SIZE

(PRINTED SAMPLES SHOWING HARMONY)

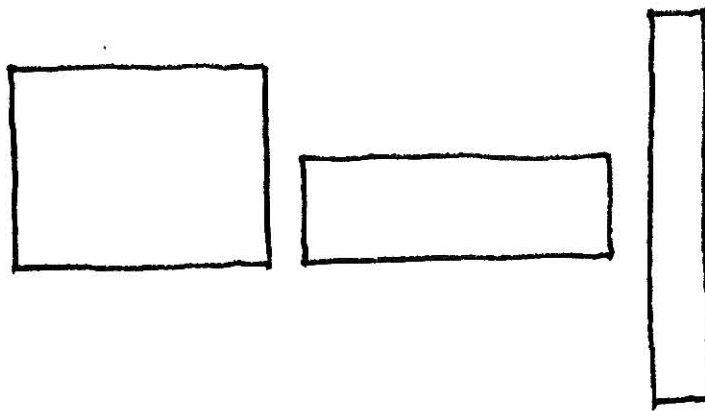
(PRINTED SAMPLES OF DOMINANCE)

Proportion. Proportion in a design is the relation of one part to another, or to the whole. Proportion relationships are most often based on the number, shape and size of the elements. Proportional relationships can also exist in degrees of surface texture and color. Proportion is always present in any design. In more successful designs, proportional considerations are carefully planned to avoid a haphazard, discordant appearance.

IN PROPORTION:



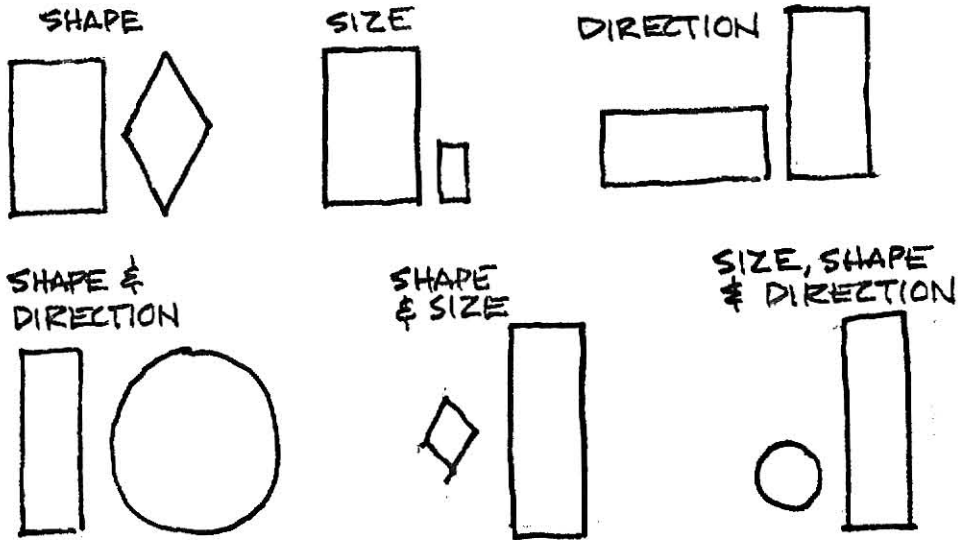
OUT OF PROPORTION:



(PRINTED PROPORTION SAMPLES)

Polarity. Polarity is the relationship of opposites between the parts of a design. Essentially, polarity is the opposite of harmony. If two planes are in polarity, they are necessarily unharmonious. Polarity is introduced by making one or more of the visual characteristics in opposition to others.

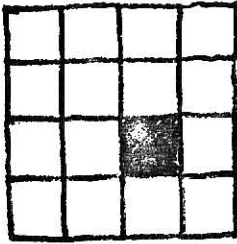
POLARITY OF:



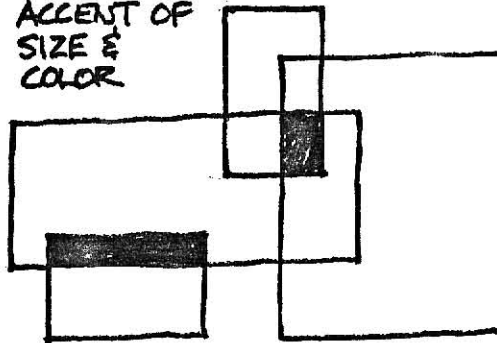
(PRINTED SAMPLES SHOWING POLARITY)

Accent. An accent element is in polarity to its surroundings. It is a small detail in contrast; it is the complement of dominance. For an accent element to be effective it usually is in polarity to the dominant elements in a majority of its visual characteristics (color, size, shape, direction, etc.).

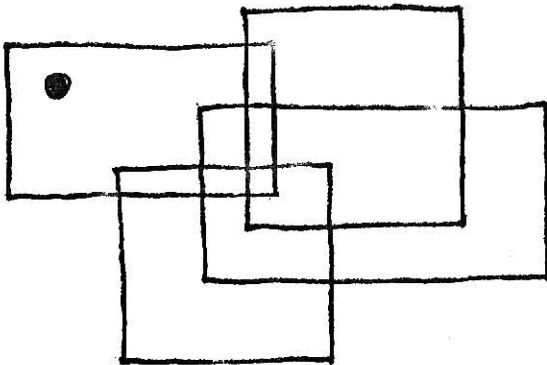
COLOR ACCENT



ACCENT OF
SIZE &
COLOR



ACCENT OF COLOR & SHAPE & SIZE



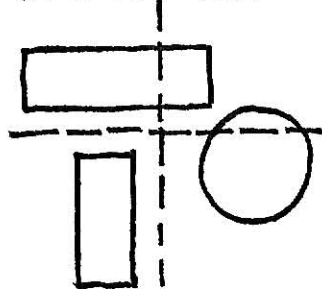
(PRINTED SAMPLES SHOWING ACCENTS)

Principles of Position

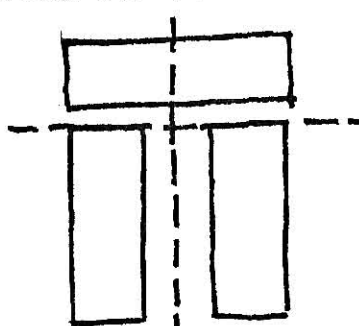
In the foregoing discussion, we were concerned with the relationship of different elements in a design based on how they looked. The following principles are concerned with the placement or position of the elements in a design and the resulting relationships.

Balance. Balance is visual equilibrium of various elements in a design. Considerations must be made as to the visual "weight" of elements resulting from their color, shape, size and texture. The state of visual balance in a design occurs around some point in space. This point is called the axis of the design. Formal balance is symmetrical about an axis, and is generally regarded as rigid and static. Informal balance is asymmetrical and more flexible and dynamic than formal balance. Elements in an informally-balanced design are usually not the same size and visual weight and are at different distance from the axis, which is usually not in the center. Formal balance can be achieved with purely geometric means, but informal balance takes a sensitive eye and a keen sense of visual weight.

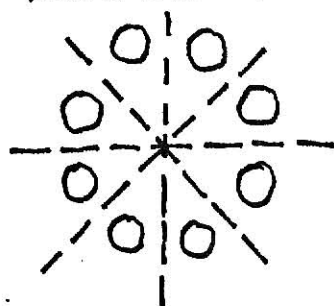
INFORMAL BALANCE



FORMAL BALANCE

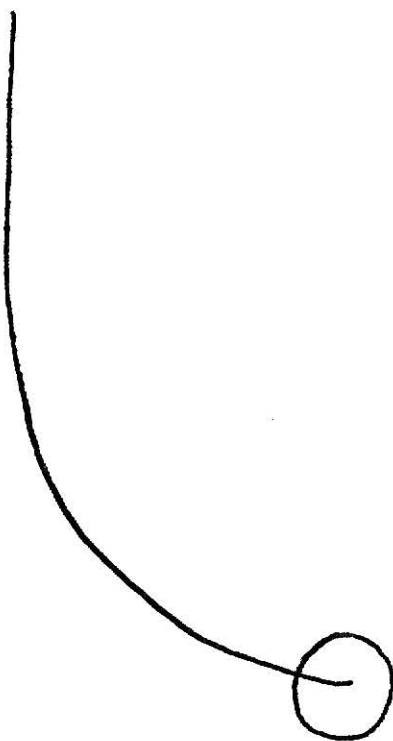


RADIAL BALANCE



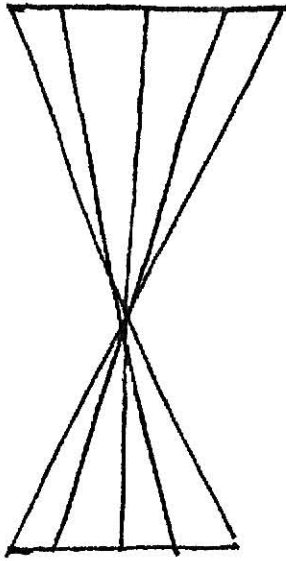
(PRINTED SAMPLES OF BALANCE)

Movement. Movement is the apparent motion of an object through the space of a design. The movement in a design is usually made up of a combination of shapes which exhibit similar directions. Design movement in graphic design is extremely important, in that the reader should be led through the design in such a way that the intended communication will be perceived in the proper order, with clear succession of elements on the page.



(PRINTED SAMPLES SHOWING MOVEMENT)

Tension. Tension is the visual appearance of "tautness" in a design due to the arrangement of its elements. Tension can be a very subtle quality which does not exist in all designs. Tension is a function of the directional movements in a design, and occurs most often when two strong directional forces are in opposition.



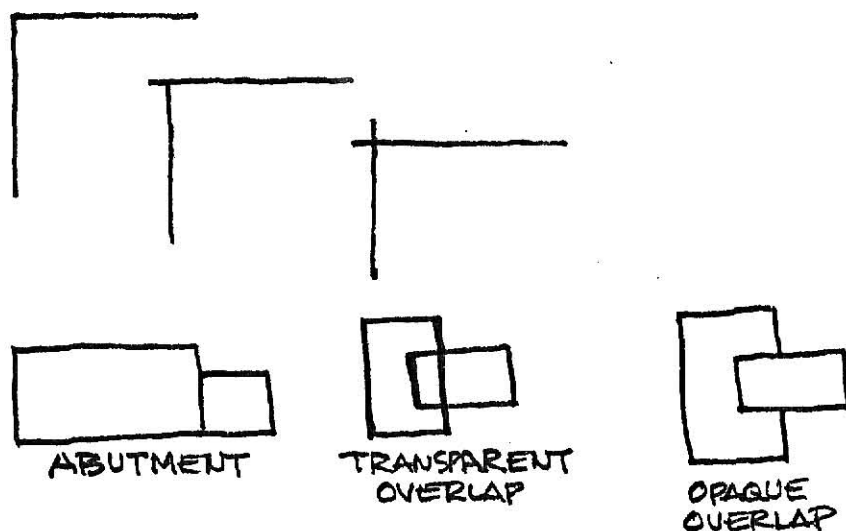
(PRINTED EXAMPLES OF TENSION)

Rhythm. Rhythm occurs when design elements are placed so they create measured movement. It is most often created using a consistent element and repeating it in a regular pattern. Rhythm is a type of design movement---a movement which is interrupted at regular intervals and continues using a regular sequence of repeated elements.



(PRINTED EXAMPLES OF RHYTHM)

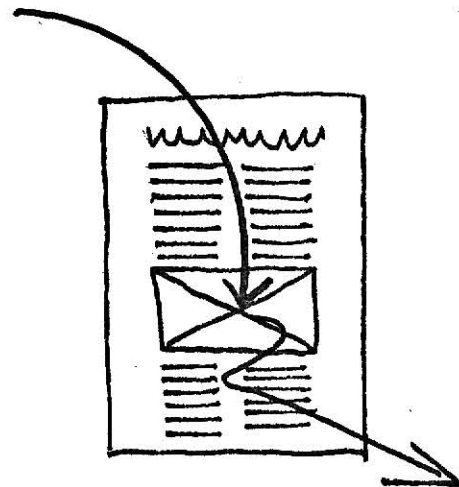
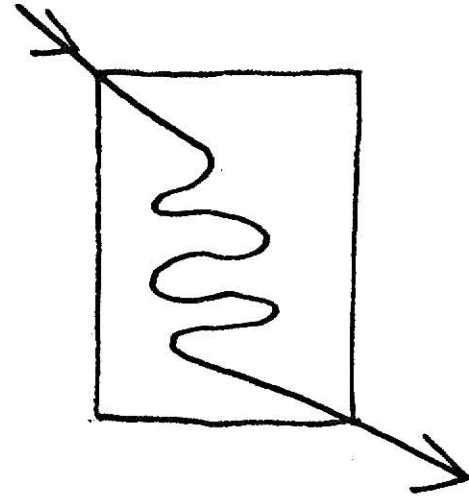
Articulation. Articulation is the joining together of design elements. There are only three ways two lines can be joined: overlapping at the joint with both lines extending beyond; both lines stopping precisely at the point of joining; and just one line stopping at the joining point and the other passing through it. Planes can be joined by butting them together, overlapping them, or overlapping them so they create a third plane. The concern over how two elements are joined may seem overly detailed, but in graphic design, the principle of articulation can be particularly important.



(PRINTED SAMPLES SHOWING ARTICULATION)

Eye Pattern

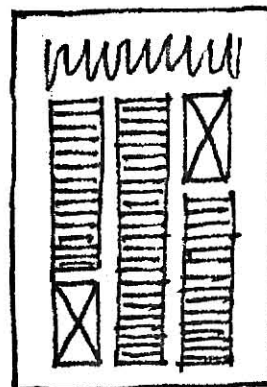
Substantial research has been done on the pattern which normal readers glance at a printed page. In general, the research supports the theory that without distraction, a person's eye enters a page at its upper left-hand corner and then makes a series of back-and-forth movements and leaves the page at the lower right-hand corner. This normal eye pattern can be interrupted, however, by the placement of visually dominant elements. Dominant elements like photographs serve as "magnets" to the eye, drawing it to the heavy visual weight. For that reason, it is usually best to place dominant photos above headlines and text copy. In this way, the eye is drawn first to the heavy weight of the photo, then to text matter. If the picture were placed below the copy, the eye would "jump" the copy and be drawn to the weight of the picture.



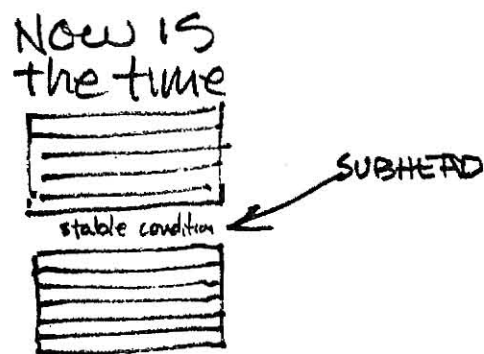
Researchers find that the eye is reluctant to "backtrack" the normal pattern. If the reader "jumps" over the copy to fix on a picture, it may not backtrack to read the copy. If the reader skips the copy, part of the communication is lost.

Reader Flow

When designing the layout of a printed piece, it is important to examine the reader flow of the copy. Care must be taken to assure that the copy doesn't jump around in a confusing manner. When photographs or artwork are included they should be placed at the top or bottom of copy columns so the reader won't have to jump over them when reading. Each time a reader is forced to "jump" or to make a decision where to read next, he is more likely to give up and quit the effort.



Subheads are helpful to guide readers through a mass of copy. In small folders, reader flow can be more difficult to handle than in larger books. The problem, of course, is the several panels which fold out in various ways. The direction of the folds and the way a reader unfolds them must be carefully studied before placing the copy on the panels.

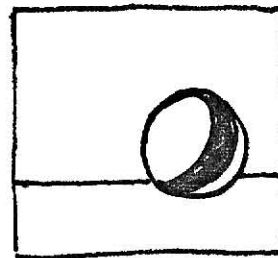


Design Problems

Graphic design is a problem-solving task. With copy, headlines, photos, artwork, photo captions and other graphic elements, the designer must create a pleasing but functional whole. In graphic design, the whole is always greater than the sum of the parts. There are several general areas of concern that a designer

must deal with during the process.

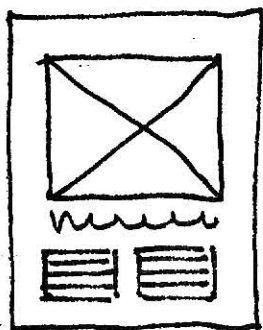
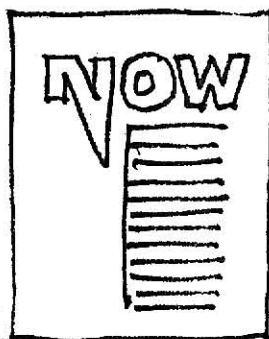
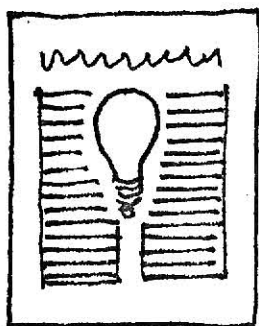
Less is More. The concept of "less is more" usually can be applied to graphic design. The elimination of unnecessary elements in a design generally strengthens the remaining elements. Just as in photo cropping, where we tried to eliminate the distracting background material to sharpen the central image, the same process can be applied to the overall design of a page. One pebble on the beach may be a rare and beautiful find, but when surrounded by other pebbles, sea shells, driftwood, etc., it can easily be overlooked; it has lost the visual impact which makes it stand out.



Tone. The concept of the "tone" of a printed piece can be likened to "style" or visual "feeling." Tone is determined by the subject matter and the audience the piece is prepared for. The "tone," or overall feeling, of a political poster would be quite different than a poster promoting a circus or school carnival. A report on extracurricular school activities might possibly be designed with a different tone if it is directed to the school board than if it is written and distributed to the school's students. The matter of "tone," is highly subjective, to be sure. But it usually is easier to design a piece if the tonal feeling is established first. Key words which can reflect "tone" are "formal," "dignified," "breezy," "mod," "jazzy," "subtle," "austere," etc. Deciding the tone of a printed piece is simply reducing the

visual impression to one or two words. With this guideline firmly in mind, the designer can more easily direct his thoughts and efforts.

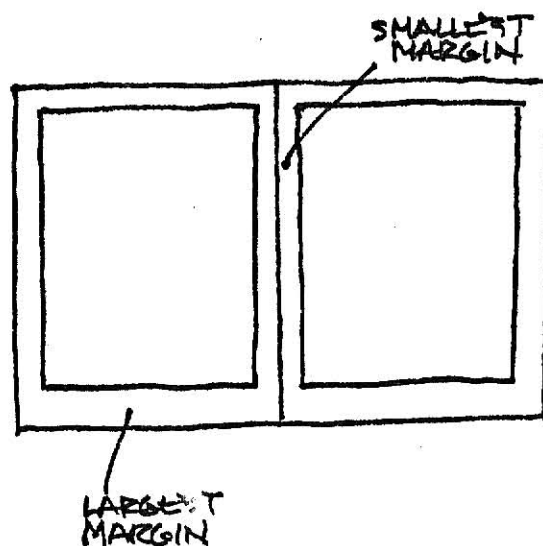
Focal Point. Every design should have a focal point, or point around which the composition is balanced. In graphic design, the layout's focal point can be a headline, a dominant photo, or artwork. The design principle of dominance usually establishes the focal point. Once the focal point is established, the designer works to balance the other elements around that point or the axis created by the dominant object.



(PRINTED SAMPLES OF STRONG FOCAL POINTS)

Consistency. Design consistency gives a printed piece unity---a feeling that it is all part of the same communication. Consistency is particularly important in magazine and brochure design. Where a piece is made up of several different articles or sections, it is possible to vary the design of the separate sections within a consistent format. Several things which contribute to consistency are common body type face, common margins, common photo caption style, and common column widths. To gain variety, one of these items might be changed from section to section (the column width, for example); But altering more than one of the items in a publication tends to reduce consistency and produce a "jumbled" hodge-podge.

Margins. A piece of paper (page in a book, panel in a folder) becomes the canvas for the designer who "paints" his design upon it. Margins of the page become the frame around his work. Generous margins must be established and violated only in special situations. The common style in magazine and book design is to place the widest margin at the bottom of the page, and then reduce the size of the margins as you go around the outside to the gutter. Gutter margins should be much smaller than outside margins, because when a magazine or book is opened, the inside gutter margins combine to produce an interior margin which is twice as wide as each individual page margin.



Designing for Usage. "Form follows Function" is another axiom which should be applied to graphic

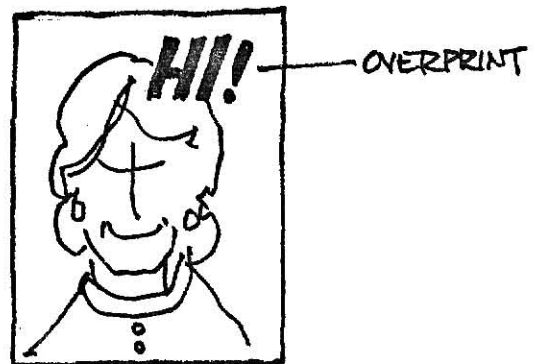
design. The most obvious function which affects design is the nature of the communication itself. Then there's the audience to which the communication is directed. The actual configuration of the printed piece is the last consideration. The graphic designer should ask himself three basic questions before he begins to undertake a design. "What am I saying?" "To whom?" "Through what medium?" Once these questions are answered, the designer can undertake building an effective communication.

There are other usage factors which can affect the design of printed pieces. The quantity, or number of copies to be printed, the method of distribution (mail? Hand-out? etc.) and, of course, the budget available all have influence on the size, shape and design of the final piece. If a printed piece is to be mailed, will it be a self-mailer, or will it need an envelope? If envelopes are used, the size limitations imposed by the post office, as well as the standard sizes available from envelope manufacturers, has an enormous impact on the basic design decisions.

Special design Effects

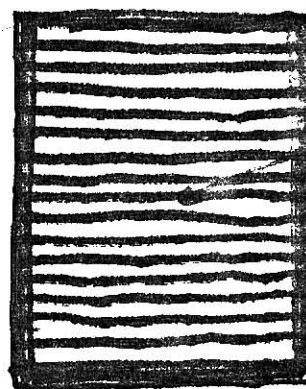
Some specific design techniques should be considered as special effects and used sparingly to avoid their becoming commonplace.

Overprinting. Sometimes called "surprinting," overprinting is simply printing one image on top of another. Art or photos can be printed on color blocks to give them special prominence. Headlines can be printed over photos, color blocks or artwork.



Reversing. When a headline or other image is printed in such a way

that its negative image forms its outline, it is referred to as being "reversed." A reversed headline is the negative form of the words: white letters surrounded by solid black. Headlines and copy are elements which are most often reversed in to black or solid color. Care must be taken in reversing small type, as it becomes very difficult to read. Color is an important consideration in reversing, too. Some colors are not dark enough to strongly outline the desired image.



REVERSED
BODY
TYPE

Bleed. As noted briefly in the section describing cutting and trimming operations, "bleeding" an image means extending it to the edge of the page. Any piece which is to contain bleeds must be printed on an over-sized sheet and trimmed down to the proper size. Elements which are bled are extended beyond the trim lines on the layout and on the press sheet. When trimmed, the portion beyond the trim line is cut away, leaving the image "running off the page." Bleeding photos off a page can measurably

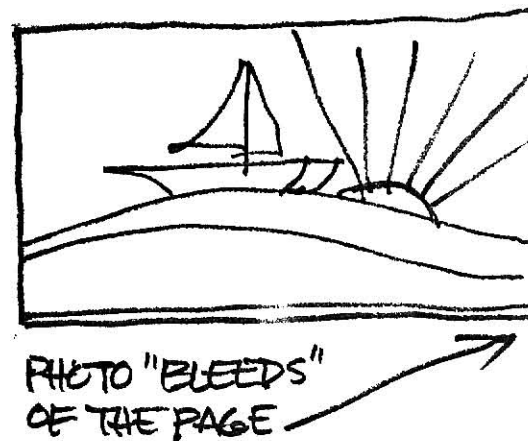
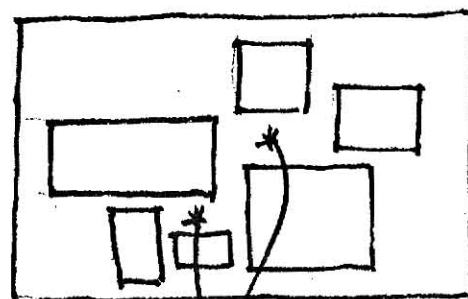
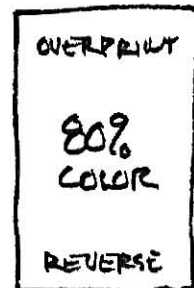
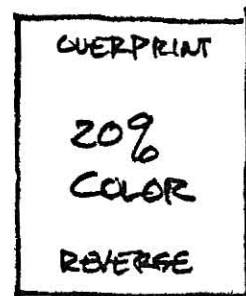


PHOTO "BLEEDS"
OF THE PAGE

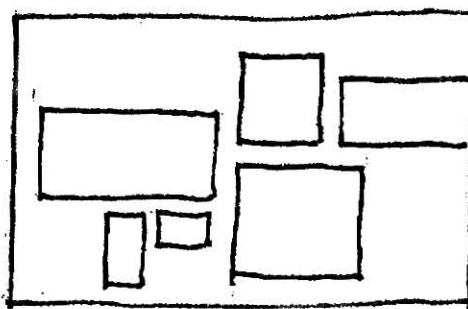
extend the impact and direction of the layout.

Tint blocks. When designing a piece in two or more colors, interest can be obtained by using "tint blocks." These are simply screened tones of color and usually are overprinted with type or art. This technique was very popular in the 40's and 50's, but extreme overuse during that time has lessened its desirability today. Care must be taken that the color and percentage of the screened tint is not so dark as to make the overprinted image illegible.

White Space. When designing a page layout the designer has to be concerned with not only the images he's arranging on the page, but with negative areas around those elements. Those areas are referred to as "white space," and must be designed as carefully as the positive images. "Trapped" white space should be avoided as it tends to produce visual "holes" in a layout. Trapped white space destroys the visual unity of a page design. Care must be taken to arrange photos and



"TRAPPED" WHITE SPACE



DESIGNED WHITE SPACE

artwork so the white space is pulled together and flows to the outside of a layout.

Photo Spreads. Many kinds of printed pieces contain photo spreads. Magazines, newspapers, brochures, annual reports and advertising circulars invariably contain spreads of photographs to illustrate their points. Designing good photo spreads isn't difficult, but there are certain guidelines which make it easier and produce quality results.

- 1) Choose your best picture (or the one which makes the strongest communicative statement), crop it tightly and play it big. Make it the dominant element on the spread.

- 2) Select a small number of supporting photos which serve to amplify the central, dominant image. Don't be afraid to eliminate as many possible photos as you can. The fewer needed to tell the story, the better. Select photos which can stand alone or can be explained simply. Remember, the reader is probably not as familiar with the subject as the editor or designer.

- 3) Select photos which can be cropped and scaled to different shapes and sizes. The most successful photo spreads include both highly horizontal and highly vertical photos.

- 4) Group the supporting photos around the dominant one, establishing a common internal margin. Remember to design room for captions or cutlines under each photo.

- 5) Search for an appropriate accent for the spread. A trademark, headline, circle-shaped photo, touch of color, appropriate symbols, standing heads, line conversions, special photo effects, etc., serve the purpose well.

- 6) Avoid at all costs "trapped" white space. "Bunch" the photos together and let the white space flow to the outside to "frame" the spread.

CHAPTER EIGHT

GUIDELINES FOR DESIGNING GOOD PUBLICATIONS

1) EDIT, EDIT, EDIT. Just as a writer seeks to hone and sharpen his communication by carefully editing his copy, the designer should, likewise, edit his materials. The elimination of unnecessary photos, headlines, subheads, artwork, etc. tends to strengthen the communication value of the piece, narrowing its focus and sharpening its mental image in the reader's mind.

2) Group, Group, Group. Successfully designed printed materials usually have been "pulled together" by grouping the various visual elements. Grouping the graphic elements provides a unified, planned appearance and generally serves to aid the reader in understanding the intended communication.

3) Have a reason for doing everything. Design decisions must not be made capriciously. The successful designer is able to justify each of his decisions, whether it's the placement of a headline or the treatment of a photo. If graphic design is approached as a task of problem-solving, then each of its steps must be supportable as a means to the final solution of the design problem.

4) Save the "Gimmicks" for when you really need them. Special effects, referred to here as "gimmicks," are a helpful tool in the bag of a designer. But, when the special effects are dragged out for every solution; are used with wild abandon, they then lose their special effect value. If every photo is presented as an outline drop-out, then the accent value of the technique is lost. Special effects should stand out from the ordinary; be true accents.

5) Throw white space to the outside. Trapped white space produces visual "holes" in a design and gives it the appearance of un-planned randomness

that confuses the eye and the reader. In the process of grouping visual elements, make sure excess white space is thrown to the outside of the page. If this technique is adhered to, trapped white space never can occur.

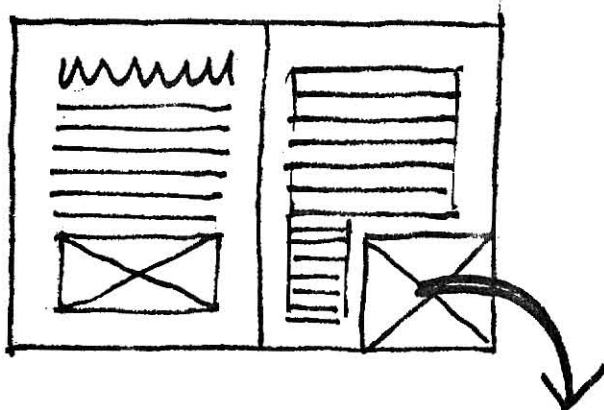
6) Always position headlines above copy. Headlines are used to "lure" the reader into the text of the story. They serve to pique the reader's curiosity and draw him directly into the body type. Because of their functional nature, headlines should always appear directly above the copy which they relate to.

7) Attempt to position photographs above headlines and copy. Because the visual weight of a photograph serves as a "magnet" to the eye. If the dominant photo of a page is placed below the headline, the eye may be drawn immediately to it and "skip" the copy. Since research has proven that it's difficult to force the eye to re-trace its normal path, the reader may go on and never go back to read the copy. If this does occur, then part of the planned communication is lost.

8) The flashier the typeface, the harder it is to read. Care must be taken when using highly-ornamental and distinctive typefaces, as many of them are extremely difficult to read. If the readability of the type is sacrificed for a design consideration, the piece loses much of its communicative value.

NOW
now

9) Never bleed a picture into a corner. Bleeding a photograph into a corner visually forces the picture to "fall off the page." While the special effect of bleeding photos can be used with advantage when used sparingly, no case can be made for forcing a picture off the corner of a page.



10) White space is free: use it. The paper on which a piece is printed is its canvas; it is the background that "frames" the designer's efforts. Generous amounts of white space should be incorporated into designs to give them "breathing room." Pages with little white space appear cramped and out of proportion to the page.

11) Crop photographs tightly. To sharpen the communicative message, it is usually advisable to crop photographs as tightly as possible around the central object. Extraneous and unnecessary background images are distracting and tend to "water down" the impact of the desired image. Crop photos savagely.

12) Establish a center of interest and support it. Every layout should have a central point of visual interest; all other elements should serve to support that center of interest.

13) Establish margins and stick to them.

14) People in the Western World read from left to right. Words should always be presented to read from left-to-right. Never arrange type to read from top-to-bottom or staggered.

15) Never get funny with photos. If a photo is worth printing, it is worth printing in a straight-forward manner. Odd shapes and unusual surface treatments can weaken the impact of a good photo.

16) When in doubt, leave it out. An old adage used by newspaper reporters and editors, the admonition applies well to graphic design. If there is any doubt about including any element in a design, the piece probably will be better without it.

BIBLIOGRAPHY

GLOSSARY AND INDEX

GRAPHIC ARTS: A TEXTBOOK
OF BASIC THEORY, PROCEDURE AND PRACTICE

by

JOHN ALDEN KRIDER

B. A., Kansas State University, 1967

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Journalism and Mass Communications

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1976

GRAPHIC ARTS: A TEXTBOOK OF BASIC THEORY, PROCEDURE AND PRACTICE

A report on the rationale, justification and need for a new textbook for college-level graphic arts courses. The report also includes the author's qualifications for writing and designing the textbook.

Because the graphic arts industry embraces a wide variety of professions--writers, editors, designers, graphic artists, illustrators, typographers and printers--it is necessary to bring each endeavor together, in consonance, in order to produce the common goal of all: effective printed communication. The report traces this interdependence and notes that the university environment is uniquely qualified to bring the disciplines together.

The report makes the case for a new simplified text for use in both journalism courses and commercial art courses, in effect teaching both groups of students the same procedures from the same point of view.

The form of the text is to illustrate theory, principle and procedure with brief, terse text amplified with simple analogies and accompanied by basic diagrammatic sketches. It is reasoned that the usual illustration sources in existing textbooks--photographs--are inadequate because pictures don't show how things work, rather, merely what they look like.

The report outlines the textbook and includes its table of contents. Material in the text is presented in the following order: forms of the printed piece, forms of reproduction, typography, photographs, art, ink, paper, bindery operations, design principles, and guidelines for good publications.

The report also includes descriptions and critiques of currently available textbooks in the field of graphic arts and graphic design.

Appendix A is a draft manuscript of the new textbook.