



**NONRESIDENT  
TRAINING  
COURSE**



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# **Illustrator Draftsman**

## **Volume 4—Presentations Graphics**

**NAVEDTRA 14334**

## **Sailor's Creed**

"I am a United States Sailor.

I will support and defend the  
Constitution of the United States of  
America and I will obey the orders  
of those appointed over me.

I represent the fighting spirit of the  
Navy and those who have gone  
before me to defend freedom and  
democracy around the world.

I proudly serve my country's Navy  
combat team with honor, courage  
and commitment.

I am committed to excellence and  
the fair treatment of all."

# PREFACE

By enrolling in this self-study course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this self-study course is only one part of the total Navy training program. Practical experience, schools, selected reading, and your desire to succeed are also necessary to successfully round out a fully meaningful training program.

**COURSE OVERVIEW:** In completing this nonresident training course, you will demonstrate a knowledge of the subject matter by correctly answering questions on the following subjects: prepress copy preparation, television graphics, displays and exhibits, and audiovisual presentations.

**THE COURSE:** This self-study course is organized into subject matter areas, each containing learning objectives to help you determine what you should learn along with text and illustrations to help you understand the information. The subject matter reflects day-to-day requirements and experiences of personnel in the rating or skill area. It also reflects guidance provided by Enlisted Community Managers (ECMs) and other senior personnel, technical references, instructions, etc., and either the occupational or naval standards, which are listed in the *Manual of Navy Enlisted Manpower Personnel Classifications and Occupational Standards*, NAVPERS 18068, found on line at

[https://buperscd.technology.navy.mil/bup\\_updt/upd\\_CD/BUPERS/enlistedManOpen.htm](https://buperscd.technology.navy.mil/bup_updt/upd_CD/BUPERS/enlistedManOpen.htm).

**THE QUESTIONS:** The questions that appear in this course are designed to help you understand the material in the text.

**VALUE:** In completing this course, you will improve your military and professional knowledge. Importantly, it can also help you study for the Navy-wide advancement in rate examination. If you are studying and discover a reference in the text to another publication for further information, look it up.

*1997 Edition Prepared by  
DMCS(SW) Sandra M. Bryan*

*Reviewed for accuracy by DMC(SW/AW) Leslie A. Crooke  
February 2003*

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## ILLUSTRATOR DRAFTSMAN (DM) TRAINING SERIES

The following volumes in the DM Training Series are available:

**DM, Vol. 1,  
NAVEDTRA  
14332**      *Equipment.* This is an overview of general shop administration, available equipment, required operator adjustments, and equipment maintenance. Knowing the capabilities and limitations of the equipment before creating artwork is essential.

**DM, Vol. 2,  
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**DM, Vol. 3,  
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**DM, Vol. 4,  
NAVEDTRA  
14334**      *Presentations Graphics.* Pre-press copy preparation, television graphics, displays, exhibits, and audiovisual presentations are end products and will influence the how and why DMs do business.

**NOTE**      For additional information on Professional Development you may go to the following web site: <https://www.cnet.navy.mil>.

For information and enrollment in NRTC's and to view the Catalog of Nonresident Training Courses, NAVEDTRA 12061, go to the following web site: <https://www.advancement.cnet.navy.mil>.

# INSTRUCTIONS FOR TAKING THE COURSE

## ASSIGNMENTS

The text pages that you are to study are listed at the beginning of each assignment. Study these pages carefully before attempting to answer the questions. Pay close attention to tables and illustrations and read the learning objectives. The learning objectives state what you should be able to do after studying the material. Answering the questions correctly helps you accomplish the objectives.

## SELECTING YOUR ANSWERS

Read each question carefully, then select the BEST answer. You may refer freely to the text. The answers must be the result of your own work and decisions. You are prohibited from referring to or copying the answers of others and from giving answers to anyone else taking the course.

## SUBMITTING YOUR ASSIGNMENTS

To have your assignments graded, you must be enrolled in the course with the Nonresident Training Course Administration Branch at the Naval Education and Training Professional Development and Technology Center (NETPDTC). Following enrollment, there are two ways of having your assignments graded: (1) use the Internet to submit your assignments as you complete them, or (2) send all the assignments at one time by mail to NETPDTC.

**Grading on the Internet:** Advantages to Internet grading are:

- you may submit your answers as soon as you complete an assignment, and
- you get your results faster; usually by the next working day (approximately 24 hours).

In addition to receiving grade results for each assignment, you will receive course completion confirmation once you have completed all the

assignments. To submit your assignment answers via the Internet, go to:

**<https://courses.cnet.navy.mil>**

**Grading by Mail:** When you submit answer sheets by mail, send all of your assignments at one time. Do NOT submit individual answer sheets for grading. Mail all of your assignments in an envelope, which you either provide yourself or obtain from your nearest Educational Services Officer (ESO). Submit answer sheets to:

COMMANDING OFFICER  
NETPDTC N331  
6490 SAUFLEY FIELD ROAD  
PENSACOLA FL 32559-5000

**Answer Sheets:** All courses include one “scannable” answer sheet for each assignment. These answer sheets are preprinted with your SSN, name, assignment number, and course number. Explanations for completing the answer sheets are on the answer sheet.

**Do not use answer sheet reproductions:** Use only the original answer sheets that we provide—reproductions will not work with our scanning equipment and cannot be processed.

Follow the instructions for marking your answers on the answer sheet. Be sure that blocks 1, 2, and 3 are filled in correctly. This information is necessary for your course to be properly processed and for you to receive credit for your work.

## COMPLETION TIME

Courses must be completed within 12 months from the date of enrollment. This includes time required to resubmit failed assignments.

## **PASS/FAIL ASSIGNMENT PROCEDURES**

If your overall course score is 3.2 or higher, you will pass the course and will not be required to resubmit assignments. Once your assignments have been graded you will receive course completion confirmation.

If you receive less than a 3.2 on any assignment and your overall course score is below 3.2, you will be given the opportunity to resubmit failed assignments. **You may resubmit failed assignments only once.** Internet students will receive notification when they have failed an assignment--they may then resubmit failed assignments on the web site. Internet students may view and print results for failed assignments from the web site. Students who submit by mail will receive a failing result letter and a new answer sheet for resubmission of each failed assignment.

## **COMPLETION CONFIRMATION**

After successfully completing this course, you will receive a letter of completion.

## **ERRATA**

Errata are used to correct minor errors or delete obsolete information in a course. Errata may also be used to provide instructions to the student. If a course has an errata, it will be included as the first page(s) after the front cover. Errata for all courses can be accessed and viewed/downloaded at:

**<https://www.advancement.cnet.navy.mil>**

## **STUDENT FEEDBACK QUESTIONS**

We value your suggestions, questions, and criticisms on our courses. If you would like to communicate with us regarding this course, we encourage you, if possible, to use e-mail. If you write or fax, please use a copy of the Student Comment form that follows this page.

## **For subject matter questions:**

E-mail: n313.products@cnet.navy.mil  
Phone: Comm: (850) 452-1001, Ext. 2167  
DSN: 922-1001, Ext. 2167  
FAX: (850) 452-1370  
(Do not fax answer sheets.)  
Address: COMMANDING OFFICER  
NETPDTC N313  
6490 SAUFLEY FIELD ROAD  
PENSACOLA FL 32509-5237

## **For enrollment, shipping, grading, or completion letter questions**

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Phone: Toll Free: 877-264-8583  
Comm: (850) 452-1511/1181/1859  
DSN: 922-1511/1181/1859  
FAX: (850) 452-1370  
(Do not fax answer sheets.)  
Address: COMMANDING OFFICER  
NETPDTC N331  
6490 SAUFLEY FIELD ROAD  
PENSACOLA FL 32559-5000

## **NAVAL RESERVE RETIREMENT CREDIT**

If you are a member of the Naval Reserve, you may earn retirement points for successfully completing this course, if authorized under current directives governing retirement of Naval Reserve personnel. For Naval Reserve retirement, this course is evaluated at 5 points. (Refer to *Administrative Procedures for Naval Reservists on Inactive Duty*, BUPERSINST 1001.39, for more information about retirement points.)



# CHAPTER 1

## COPY PREPARATION

### Overview

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**Introduction** Computers have drastically changed prepress copy preparation for subsequent reproduction. The creation of artwork and text is becoming an electronic phenomena. Still, there are instances that require mechanical techniques. Thoroughly acquaint yourself with the traditional methods and techniques and aggressively incorporate new technology into your work space.

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### Objectives

The material in this chapter enables you to do the following:

- Evaluate paste-up mechanicals for reproducibility.
  - Identify and select suitable typefaces for headlines.
  - Select page sizes and formats.
  - Scale photographs and copyfit text.
  - Compare halftone, continuous tone, and combination copy for reproduction.
  - Eliminate or reduce backgrounds from photographs.
  - Define signature format and multipage spreads.
  - Recognize standard proofreaders marks.
- 

*Continued on next page*

## Overview, Continued

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### Acronyms

The following table contains a list of acronyms that you must know to understand the material in this chapter.

| Acronym | Meaning                  |
|---------|--------------------------|
| CAPS    | Capital Letters          |
| CL      | Center Line              |
| DPI     | Dots Per Inch            |
| LC      | Lower Case Letters       |
| LPI     | Lines Per Inch           |
| PPM     | Pages Per Minute         |
| RIFF    | Raster Image File Format |
| TIFF    | Tagged Image File Format |
| UP      | Upper Case               |

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*Continued on next page*

## Overview, Continued

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**In this chapter** This chapter covers the following topics:

| Topic                           | See Page |
|---------------------------------|----------|
| Press Processes                 | 1-4      |
| Copy Types                      | 1-8      |
| Prepress Preparation            | 1-11     |
| Dummies                         | 1-26     |
| Copyfitting                     | 1-34     |
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## Press Processes

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### Introduction

Before you prepare copy for reproduction, familiarize yourself with the type of press and processes available to you. Press capabilities and limitations will dictate the parameters of the copy you prepare.

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### Processes

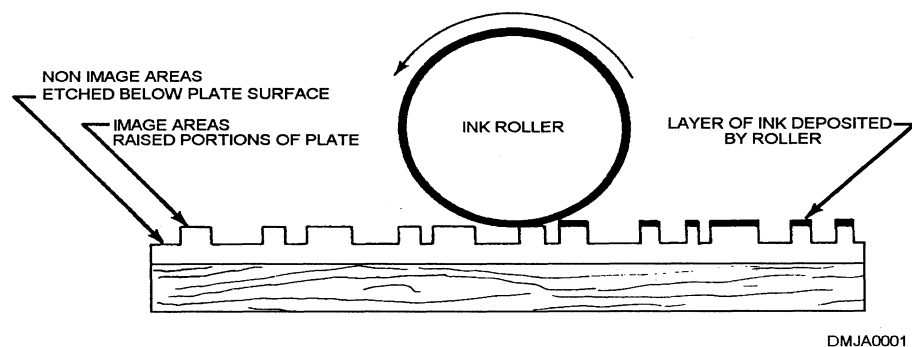
The four types of basic printing processes are letterpress, gravure, lithography/offset lithography, and electronic digitization. Letterpress and gravure are seldom used in Navy shops. Until recently, lithography/offset lithography has been the primary method of reproduction, and now electronic digitization and laser imagery are taking over.

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### Letterpress

Letterpress, the oldest form of printing, is a form of relief printing. A letterpress plate is carved or etched by hand or chemical with the image area left raised. The open or nonimage areas are etched below the surface of the plate. The raised portions of the plate receive ink from a roller. When paper contacts the raised (inked) portions of the plate, an image appears on the paper.

Figure 1-1 illustrates the letterpress printing process.



**Figure 1-1.**—Letterpress printing.

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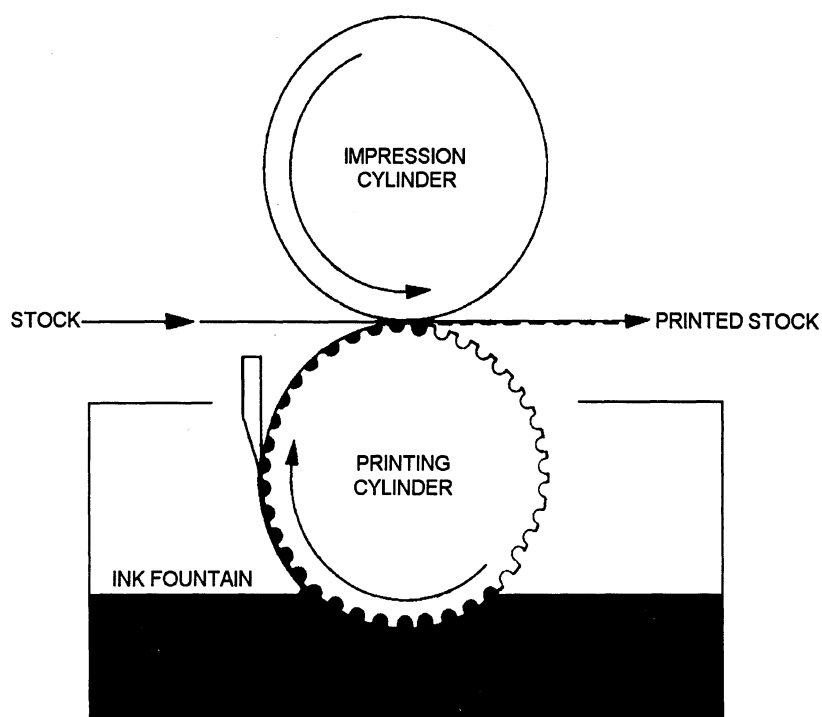
## Press Processes, Continued

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### Gravure

The gravure process is opposite that of letterpress in that the image area is etched below the surface of the plate. The raised nonimage portion of the plate is wiped clean of ink. Paper, pressed against the plate, lifts the ink out of the etched areas.

Figure 1-2 shows the gravure process.



DMJA0002

**Figure 1-2.**—Gravure printing.

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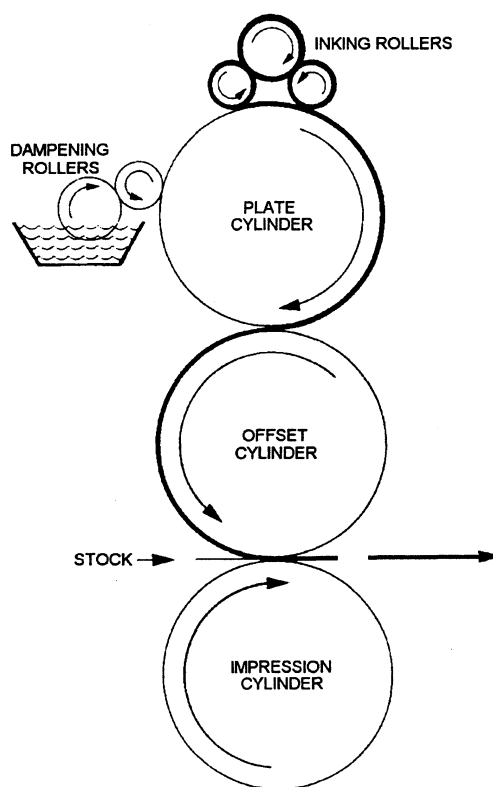
*Continued on next page*

## Press Processes, Continued

### Lithography/ offset lithography

Lithography is based on the principle that oil and water do not mix. Lithography originated with a hand drawing in greasy crayon on a flat surface of limestone. The greasy image repelled water and retained oily ink to transfer an image to paper. The nongreasy areas, flushed clean with water did not retain ink and resulted in a nonimage or open area. Offset lithography is the most widely used form of printing in Navy print shops. A photographically sensitive metal plate of aluminum or zinc retains the image on its surface after exposure to light and chemical development. The image area retains ink and transfers the image to a rubber blanket (blanket cylinder) which in turn transfers the image to an impression cylinder. The impression cylinder transfers the image to the paper surface.

Figure 1-3 shows the basic offset lithographic process.



DMJA0003

**Figure 1-3.**—Offset lithographic printing.

*Continued on next page*

## **Press Processes,** Continued

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### **Electronic digitization**

Electronic digitization and laser technology are replacing chemical-dependant printing and photographic processes. In addition to high-end copier options, these copier-printers incorporate servers to interface with microcomputers, scanners, and disk drives to accept electronic data from remote work stations. They allow you to edit, move, cut, paste, scan, merge files, create instant halftones from continuous tone masters, and enhance photography. These electronic copier-printers and digital duplicators have a signature setup and a bypass feature to eject jobs from the machine for traditional bindery operations. Some machines have collators, folders, stitchers, and trimmers to produce quality bindery in the finishing operation. Job orders are also part of the electronic programming feature of the machine. This new generation of printing technology allows total electronic prepress preparation of documents. Electronic printing equipment has excellent resolution of 600 dots per inch (DPI) and 1 GB (gigabyte) of memory. Scan rate is 20 plus documents per minute and press speeds exceed 135 pages per minute (PPM). This future generation of printing presses may be more in the domain of the Lithographer's Mate and isolated to a few shops and stations who can afford this costly machinery, but you should aggressively seek and learn it's processes.

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# Copy Types

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## Introduction

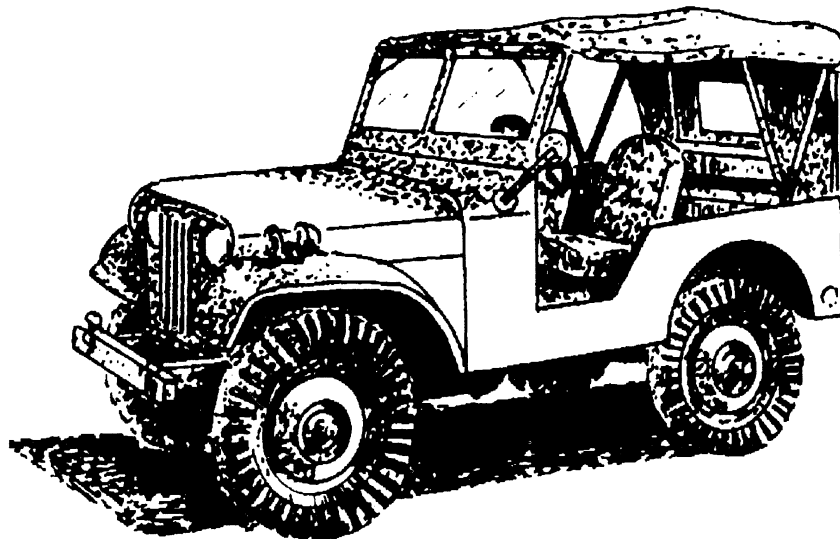
Copy is a broad term for any material intended for reproduction. It is artwork and/or text that is ready for the print shop in the form of proofs, drawings, photographs, and so forth. The three basic forms of copy material are line, continuous tone, and combination.

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## Line copy

Line copy is material that has no graduations in tone; that is, artwork composed of black lines, dots, or solid areas. Text, preprinted shading sheets, and black line illustrations made with pen and/or brush and ink are examples of line drawings.

Figure 1-4 shows an example of a line drawing.



DMJA0004

**Figure 1-4.**—A line drawing.

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*Continued on next page*

## Copy Types, Continued

### Continuous tone copy

Continuous tone copy is material in which graduations of tone occur in an uninterrupted flow. This type of copy includes original photographs, wash drawings, oil paintings, pencil and poster drawings, and airbrush work. Continuous tone copy must be converted into a halftone before printing. Traditional continuous tone copy requires the extra step of exposure through a special screen to produce a halftone. In digital duplication, a computer using a process called dithering produces halftones cells.

Figure 1-5 shows an example of continuous tone copy. Imagine this illustration without the halftone dot pattern required to reproduce the illustration in this book.



**Figure 1-5.** —Continuous tone copy.

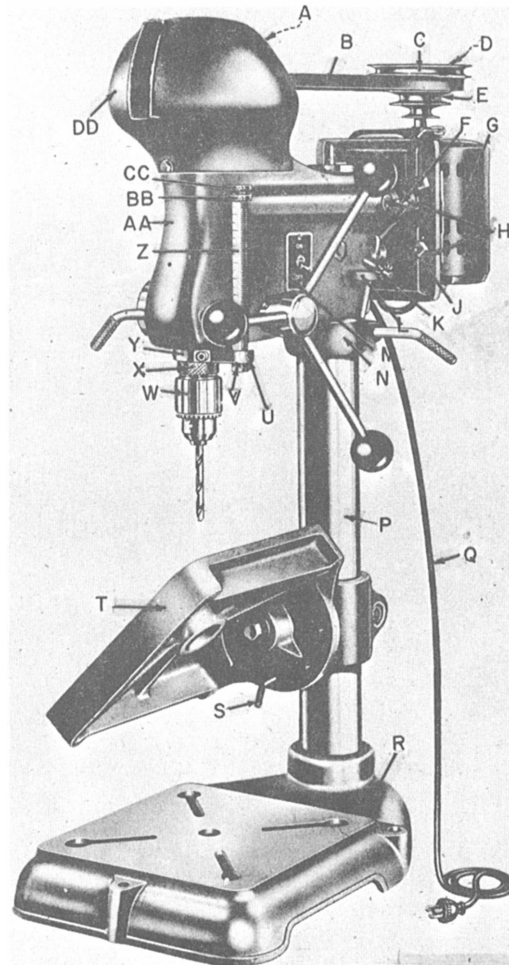
*Continued on next page*

## Copy Types, Continued

### Combination copy

Combination copy is artwork that consists of continuous tone copy and line copy. An example of this is a photograph with lettering or labels. To reproduce this type of copy, you must make two negatives; one negative is for the lettering (line copy) and one negative for the continuous tone copy (halftone). The two negatives combine to produce a combination image during printing.

Figure 1-6 shows an example of combination copy.



- A SPINDLE DRIVEN PULLEY
- B V-BELT
- C MOTOR DRIVE PULLEY
- D 1/8 SQ x 1 SQ-END KEY
- E NO 10-24 x 5/8 HDLS SET SCREW
- F MOTOR BRACKET STUD THUMBSCREW
- G MOTOR
- H MOTOR BASE AND BRACKET ASSEMBLY
- J 1/4-20NC 2 x 1 SQ-NECK RD-HD CAR-RIAGE BOLT AND 1/4-20NC-2 SQ NUT
- K DRILL CHUCK KEY
- L DRILL CHUCK KEY BRACKET
- M TOGGLE SWITCH PLATE
- N HEAD COLLAR SUPPORT
- P BENCH COLUMN
- Q CORD
- R BENCH BASE
- S TILTING TABLE LOCKPIN
- T TILTING TABLE ASSEMBLY
- U DEPTH GAGE ROD BRACKET
- V HEX NUT
- W DRILL CHUCK
- X CHUCK KNOCKOUT COLLAR
- Y SPINDLE AND QUILL ASSEMBLY
- Z DEPTH GAGE ROD
- AA HEAD ASSEMBLY
- BB DEPTH GAGE ROD ADJUSTING NUT
- CC DEPTH GAGE ROD LOCKNUT
- DD SPINDLE DRIVEN PULLEY GUARD

Figure 1-6.—Combination copy.

## Prepress Preparation

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### Introduction

You must understand the versatility of the printing process to avoid going beyond its limitations during prepress preparations. If you have a sound knowledge of this in preparing the mechanicals, you will eliminate or solve production problems. The actual process of printing is one of the last steps in the reproduction process.

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### Planning

Planning begins when the job enters the shop. Planning involves more than determining the operations involved and estimating the time, personnel, and materials to do the job. It includes specific prepress considerations that influence the creation of the mechanical.

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### Prepress considerations

Prepress considerations influence the construction of the mechanical. The first factor to determine is format. After you set the format of the finished product, select the stock and type.

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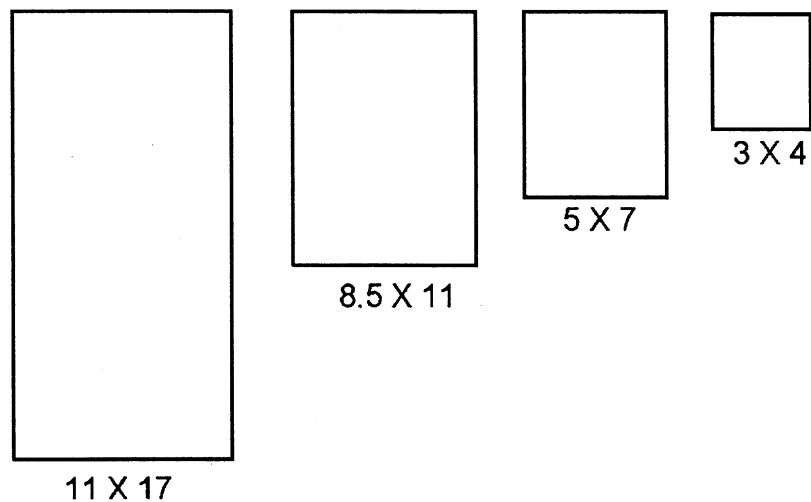
## Prepress Preparation, Continued

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### Format

Format is the general appearance of the formal printed product. It includes the size, shape, look, and feel of the finished product. Consider the physical limitations of your production equipment such as the presses, copy camera, plate size, screen limitations, and the finishing requirements of folding, binding, and trimming before setting a format. The maximum dimensions of a product are set by the size of the stock available, size of the presses, and the capacity of the bindery equipment.

Figure 1-7 shows format configurations.



DMJA0005

**Figure 1-7.**—Format configurations.

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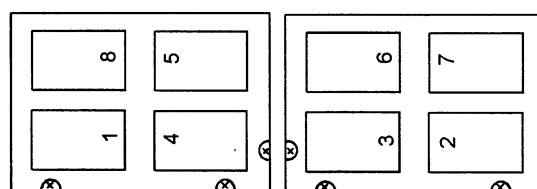
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## Prepress Preparation, Continued

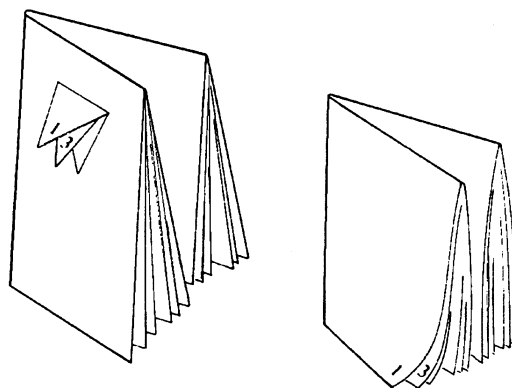
### Format size

Within the limits of your equipment, the nature of the publication and most economical use of stock determine product size. Select a page size that, when cut from stock sheets, produces the least amount of waste. Most page sizes are divisions or multiples of the standard 8 1/2- by 11-inch sheet. If you are working in signatures, make sure the overall size coincides with the dimensions of the press plate. Signatures are multiples of four pages, printed and folded as a unit.

Figure 1-8 shows a signature format.



A. FLAT



B. FOLDED

DMJA0006

**Figure 1-8.**—Signature format: A. Flat; B. Folded.

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## Prepress Preparation, Continued

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### Format shape

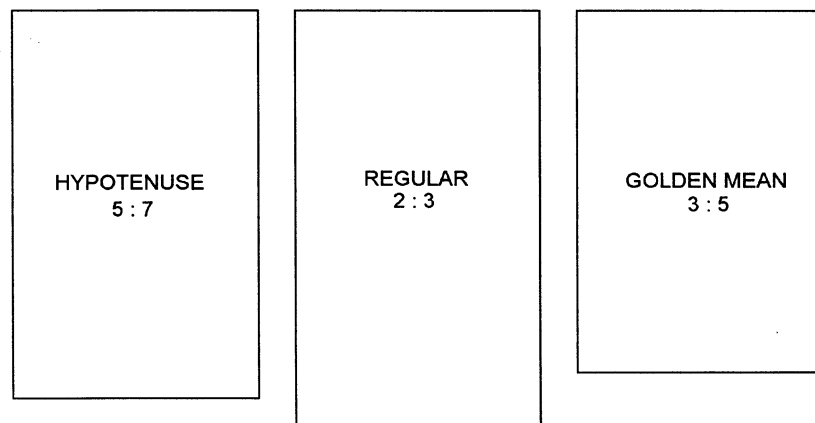
The shape the printed image makes on a page is a facet of format. Some rectangular forms are more visually pleasing than others. The three popular rectangular formats are the regular rectangle, the golden mean rectangle, and the hypotenuse rectangle. The dimensions of rectangles vary according to page size.

**REGULAR RECTANGLE:** The regular rectangle is two-thirds wide as it is long, such as 6 by 9 inches or 4 by 6 inches. These are common sizes for booklets and phamplets. The regular rectangle has a ratio of 2:3.

**GOLDEN MEAN RECTANGLE:** The golden mean rectangle has a ratio of 3:5.

**HYPOTENUSE RECTANGLE:** The hypotenuse rectangle has a ratio of 5:7.

Figure 1-9 shows proportional rectangles.



DMJA0007

**Figure 1-9.**—Proportional rectangles.

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*Continued on next page*

# Prepress Preparation, Continued

**Stock selection** When you select paper for a particular job, consider the printing process (if printing illustrations) and the purpose of the end product. Line drawings and text reproduce well on any stock, however, heavily laid paper is difficult to print with halftones. The purpose of the job also affects the selection of stock. If the job must be durable, select a good paper; if a job will ultimately be thrown away, select a thin, inexpensive paper stock. Consider the bulk of the stock for large publications and whether it will require a more rigid stock as a cover. A self cover is defined as using the same stock for the cover that you used for the text.

**Typography** Typography or type is divided into text type used for solid blocks of text and display type used for display advertising and headings. The design of a style of type is known as typeface and is identified by a name, such as Futura, Bodoni, or Clarendon. Select a typeface appropriate to the mood expressed by the copy. Although less a factor in the selection of body text, a dynamic typeface used in display text can make the difference between a successful and a mediocre product.

**Typesetting** Machine set text type ranges from 8 to 14 point. For small blocks of text and cut lines or captions for illustrations, 12-point type is ideal. For general purpose text use a 10-point letter.

Figure 1-10 shows examples of various typefaces.

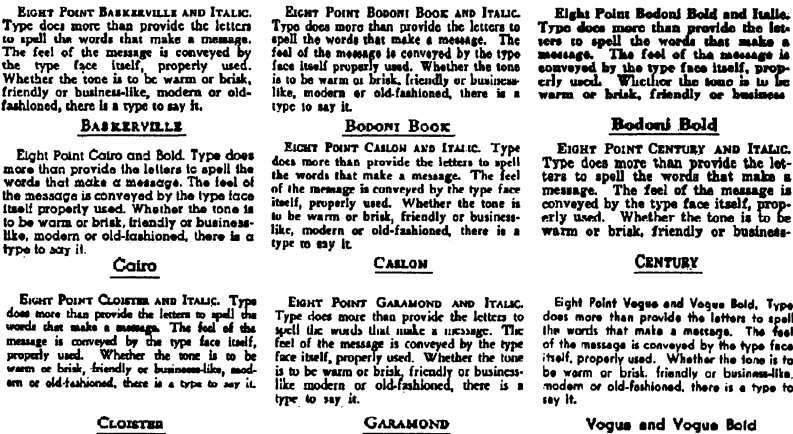


Figure 1-10. —A block of text set in various typefaces.

Continued on next page

## Prepress Preparation, Continued

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### Display type

Display type is letters that draw attention. These typefaces create an illusion as a result of thick and thin lines, curves, and the presence or absence of serifs or embellishments.

Figure 1-11 shows the effects of display type.



DMJA0009

Figure 1-11.—Display type.

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## Prepress Preparation, Continued

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### Legibility

Legibility is your primary concern when selecting typefaces. The factors that contribute to legibility are the style of the letter; the type size; the line length; the spacing between lines, words, and letters; the indentations; and the margins around the print.

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### Style of the letter

Letter styles denote the overall appearance of a letter. A letter has height, weight, and decoration. Letter height is the vertical height of the letter. Letter weight is how thick (boldface) or thin (lightface or open-faced) a letter appears and whether it is condensed, expanded, or geometrically symmetric. A letter may also have serifs, kerns, and other decorative elements that affect legibility and identify it as a particular style. Simpler letter styles, such as a Roman, Helvetica, or Bookface, have unobtrusive serifs and are easier to read than more ornate styles. Gothic, Stymie, or other letters that are sans serif or have unusual serifs are tiring to read for any length of time. Ornate and decorative typefaces lose impact when used extensively and repel readers when used as body text.

Figure 1-12 shows letters of different decor as body text.

**Times New Roman:** Type does more than provide the letters to spell the words that make a message.

**Geoslab:** Type does more than provide the letters to spell the words that make a message.

**Letter Gothic:** Type does more than provide the letters to spell the words that make a message.

**Antique Olive:** Type does more than provide the letters to spell the words that make a message.

*Coronet: Type does more than provide the letters to spell the words that make a message..*

**Humanist:** Type does more than provide the letters to spell the words that make a message.

**Modern:** Type does more than provide the letters to spell the words that make a message.

**Figure 1-12.**—Type styles as text.

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## Prepress Preparation, Continued

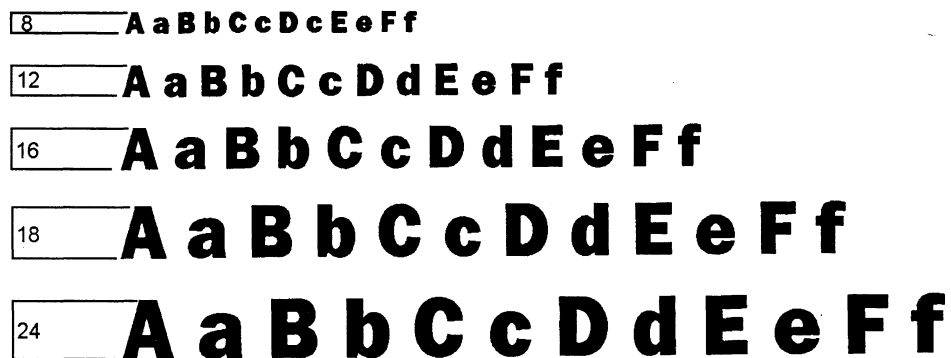
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### Type size - height

In type size, height is expressed in points. A point is a unit of measurement that approximates one seventy-second of an inch (1/72). There are approximately 72 points to an inch. The size of a typeface is measured by its height in points.

Figure 1-13 shows how point size affects letter height.

#### POINT SIZE



DMJA0011

Figure 1-13.—Point size and letter height.

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## Prepress Preparation, Continued

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Type size -  
weight

The weight of type may be lightface, open-face, regular weight, or boldface. Additionally, letter dimensions may be condensed, expanded, geometrically symmetric or italicized.

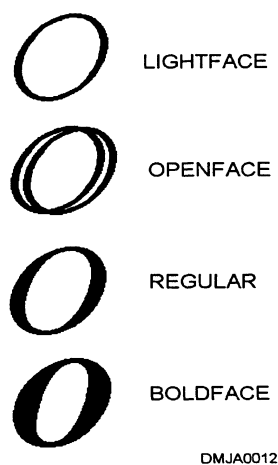
**LIGHTFACE:** Thin, hairline strokes that give a light, airy illusion to the letter style are characteristic of a lightface letter.

**OPEN-FACE:** An open-faced letter appears to be an outline of the letter with the center portions left open. Open-faced letters, when left open, appear lighter in weight than when filled in. You may fill in an open-faced letter with a contrasting color or colors for a creative effect.

**REGULAR WEIGHT:** Neither too thick or too thin, a regular weight letter reproduces at optimum legibility.

**BOLDFACE:** Boldface letters appear heavy and dense. They add emphasis and seem to jump from the page when used judiciously in body text.

Figure 1-14 shows letter weight.



**Figure 1-14.**—Using the letter "O" to demonstrate letter weight.

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*Continued on next page*

## Prepress Preparation, Continued

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### Type style - weight (Continued)

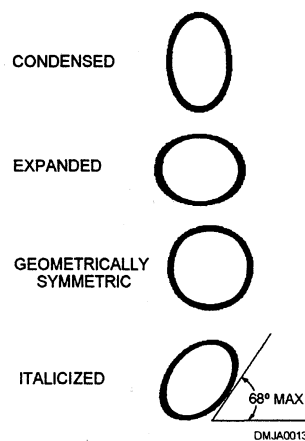
**CONDENSED:** Letters that appear vertically squeezed or pinched are condensed. Condensed letters can give the appearance of being heavier than they really are. Use condensed letters when the length of text exceeds the line space allotted.

**EXPANDED:** Horizontally stretched or flattened letters are called expanded. They appear lighter in weight than they really are. Used creatively, expanded letters can lengthen a short headline to fill a predetermined space.

**GEOMETRICALLY SYMMETRIC:** Geometrically symmetric letters have geometrically or mathematically correct dimensions and proportions. To determine if a letter is geometrically proportioned, look at the letter "O" and evaluate any distortions.

**ITALICIZED:** Italicized letters slant to the left or right of center. Before negatively affecting legibility, a letter can lean a maximum of 68 degrees from center. Italicized letters add emphasis.

Figure 1-15 shows the letter "O" in various typefaces.



**Figure 1-15.**—Using the letter "O" to demonstrate geometric proportions of various typefaces.

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*Continued on next page*

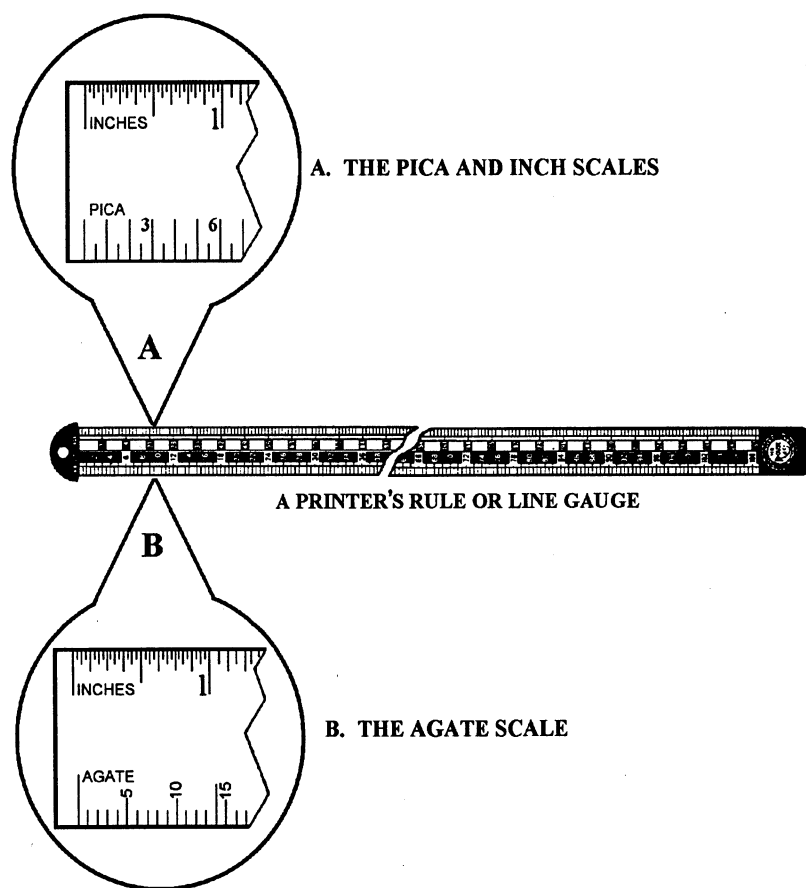
## Prepress Preparation, Continued

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### Line length

The length of a line is measured in picas. Picas are also used to measure the width and length of pages and columns. There are 12 points to a pica and approximately 6 picas to an inch. Do not use points and picas interchangeably as they do not precisely coincide as a unit of measure. Use the point system or a line gauge to specify instructions to a typesetter. Some typesetters prefer specifications in picas only.

Figure 1-16 shows a line gauge or printer's rule.



DMJA0014

**Figure 1-16.** —A printer's rule or line gauge; A. The pica and inch scale, B. The agate and inch scale.

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*Continued on next page*

## Prepress Preparation, Continued

---

### Spacing

Spacing between letters, words, and lines affect legibility.

**LETTERSPACING:** Letterspacing is the placement of extra space between the letters of words to improve or balance the type. Divide the spacing evenly between letters and words to maintain visual balance.

**WORD SPACING:** Word spacing is the adjustment of spaces between words to shorten or extend a line of type. This is often used to justify text. Justification is the alignment of both the right and left margins to a predetermined length. Mechanical word spacing uses an em space. The em space is the standard unit of measure for the typeface being used and equals the square of the body type based on the letter "M". One half of an em space is known as a en space. Too much space in between words causes a disturbing visual break in composition by creating rivers of white space on the printed page.

**LINE SPACING:** Spacing between the lines of text is called line spacing or leading. Line spacing is the distance in points from the base line of one line of type to the base line of the next line of type. Long lines of text require more spacing between lines. If no additional spacing is used between lines, the text is said to be set solid. Navy publications generally use 2-point leading.

Figure 1-17 shows examples of line spacing.

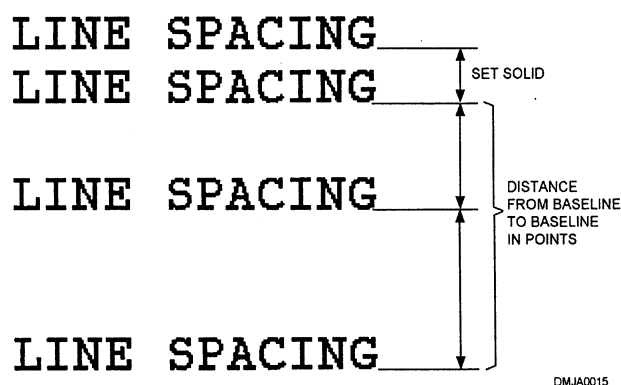


Figure 1-17.—Line spacing.

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*Continued on next page*

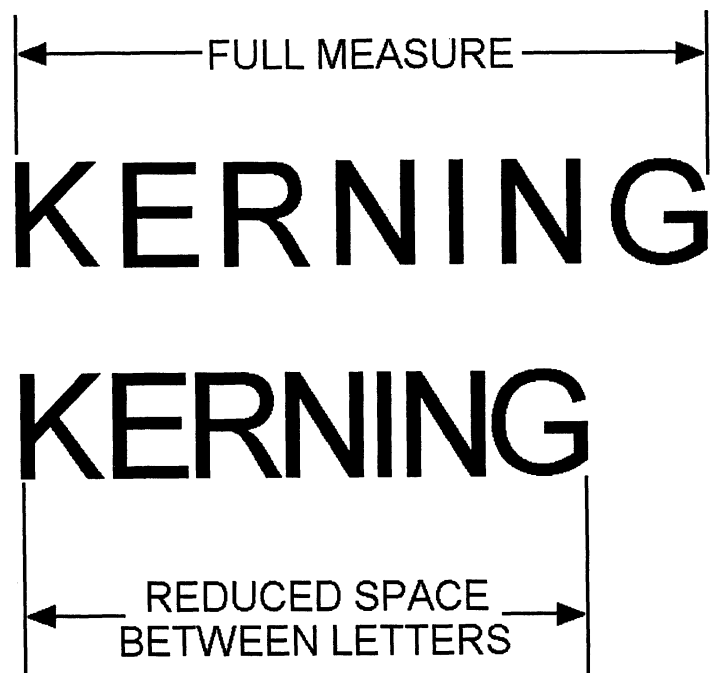
## Prepress Preparation, Continued

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### Spacing (Continued)

**KERNING:** Kerning reduces the amount of space between letters or combinations of letters to achieve visual balance. Kerning is the opposite of letter spacing.

Figure 1-18 shows an example of kerning.



DMJA0016

**Figure 1-18.**—Kerning.

---

*Continued on next page*

## Prepress Preparation, Continued

## Indentations

Indentions give emphasis and new starting points to a printed page.

Indenting text is the moving of one or more lines of printed or typewritten material in from the margins. Paragraphs, quotations, hanging, stepped or staggered indentations are all used to facilitate communication. Set poetry according to the style set by the author.

PARAGRAPHS: Indent paragraphs to indicate the beginning or end of a complete thought or idea.

LONG QUOTES: Place long quotations or quotations requiring special emphasis in a separate paragraph. They may be set full measure or indented from both margins.

SHORT QUOTES: Bury short quotations in the body of the text.

HANGING INDENTATIONS: The first line of a hanging indentation is set flush left with all other lines set one or more em spaces from the left. This type of indentation is used in tabular work, listings, legends, and captions when they exceed two lines.

**STEPPED or STAGGERED INDENTATIONS:** Progressively stepped or staggered indentations are normally used in newspaper headings and modern layouts with irregular indentations. Some poetry is also staggered or stepped.

Figure 1-19 shows an example of staggered indentation.

## The Navy Hymn

## Eternal Father, strong to save

Whose arm doth bind the restless wave,

Who bids't the mighty ocean deep,

**Its own appointed limits keep;**

**O hear us when we cry to thee**

**For those in peril on the sea.**

## STAGGERED INDENTATIONS

DMJA0017

**Figure 1-19.—Staggered indentations.**

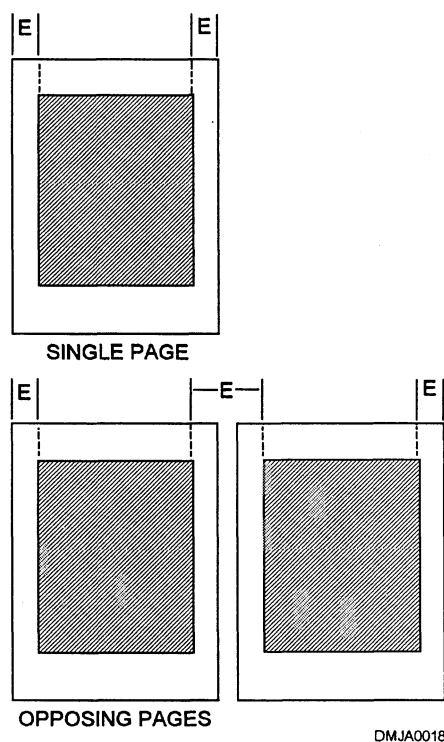
Continued on next page

## Prepress Preparation, Continued

### Margins

Margins act as a frame to keep the readers attention focused on the text. Even margins are monotonous and narrow margins make reading difficult. A well-designed page contains a mass of type pleasingly framed in white space. The margins of a single page layout should have equal left- and right-hand margins with the bottom margin slightly larger than the top margin. When setting opposing pages, the margins that join the pages together, or inner margins, are made narrower than all other margins. When opened, this gutter of white space should equal the width of the extreme left or right margin. The top margin is larger than the outside margins and the largest margin of all is at the bottom of the page.

Figure 1-20 shows the margins of a single page and an opposing page layout.



**Figure 1-20.**—Margins with the dimension "E" denoting equal amounts of space.

# Dummies

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## Introduction

You now have determined the prepress preparation required to proceed to the next phase of the reproduction process. This is the phase of preparing a mock-up, called a dummy, that you paste and bind together in exact reproduction size. Dummies show the areas in publications that illustrations and text occupy. They show the size, the binding, and the paper of the final product. They enable you, your crew, and the originator to visualize the end product, project problems, and settle controversial points while still in the planning stage. Once production begins, dummies also serve as a guide to keep the project on track. Prepare your dummies before the mechanicals. The two types of dummies are the preliminary dummy and the paste-up dummy.

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## Preliminary dummies

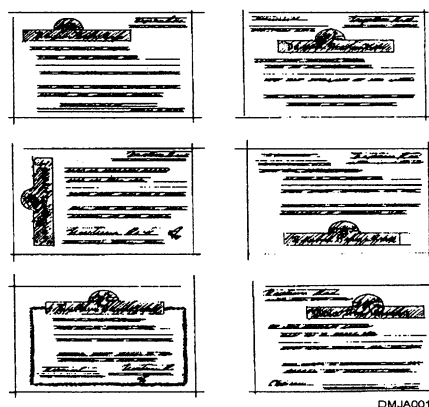
The preliminary dummy should be made up before the publication is typeset.

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## General construction of preliminary dummies

Start by making thumbnail sketches, building your design around the most important elements on the page. In a preliminary dummy for a lengthy publication, make the layouts for key pages first, such as the cover, the title page, and one or two of the text pages. This should give you an idea about how many pages the publication will take. You may be able to copyfit small publications to determine the number of overall pages.

Figure 1-21 shows a series of thumbnail sketches for a preliminary dummy.



**Figure 1-21.**—Thumbnail sketches for a preliminary dummy.

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*Continued on next page*

### Cover page

The cover page may have both illustrations and type, hand lettering and type, or type or illustration alone. If the publication is one of a series, the cover should match the others in the series. You may use different colors of stock, but it should have the same characteristics as the other publications. You can use almost any typeface on the cover. Historical content or the mood of the text may influence your choice. If the text consists of more than five or six words, vary the type size to reduce monotony.

Figure 1-22 shows cover pages.



DMJA0020

Figure 1-22.—Cover pages.

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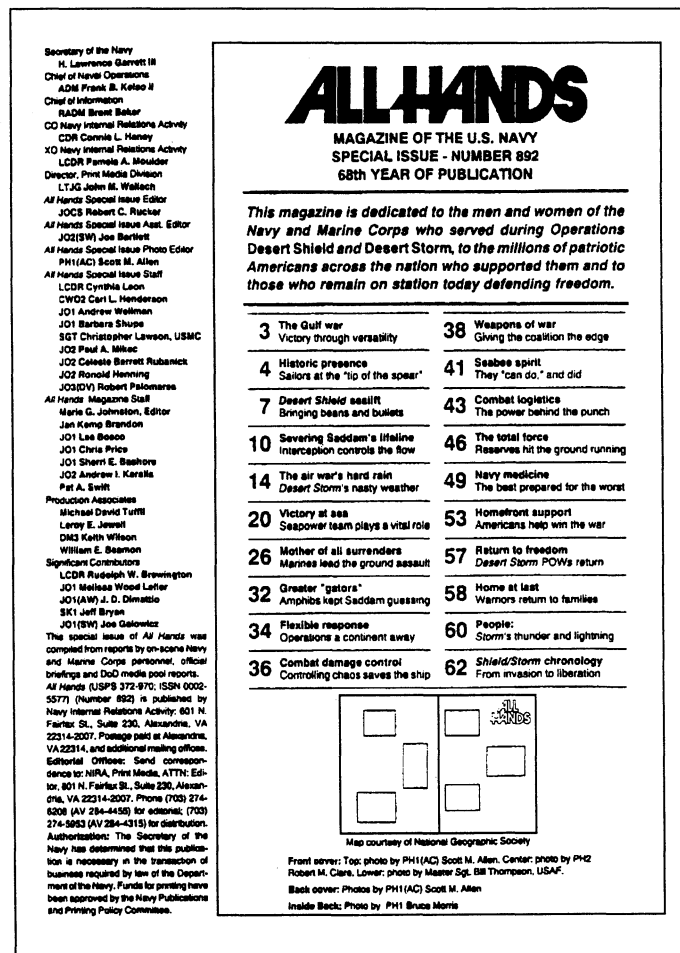
*Continued on next page*

## Dummies, Continued

### Title page

The type used for the title page is usually from the same series or family as the type used for the text unless you need another typeface for distinctiveness. Arrange the type in a pyramid, block, or as fluctuating lines. Set the title in the largest size of type and the other lines in order of importance. The dimensions of the title page are the same as the dimensions for the regular text pages.

Figure 1-23 shows a title page layout.



DMJA0021

Figure 1-23.—A title page layout.

Continued on next page

## Dummies, Continued

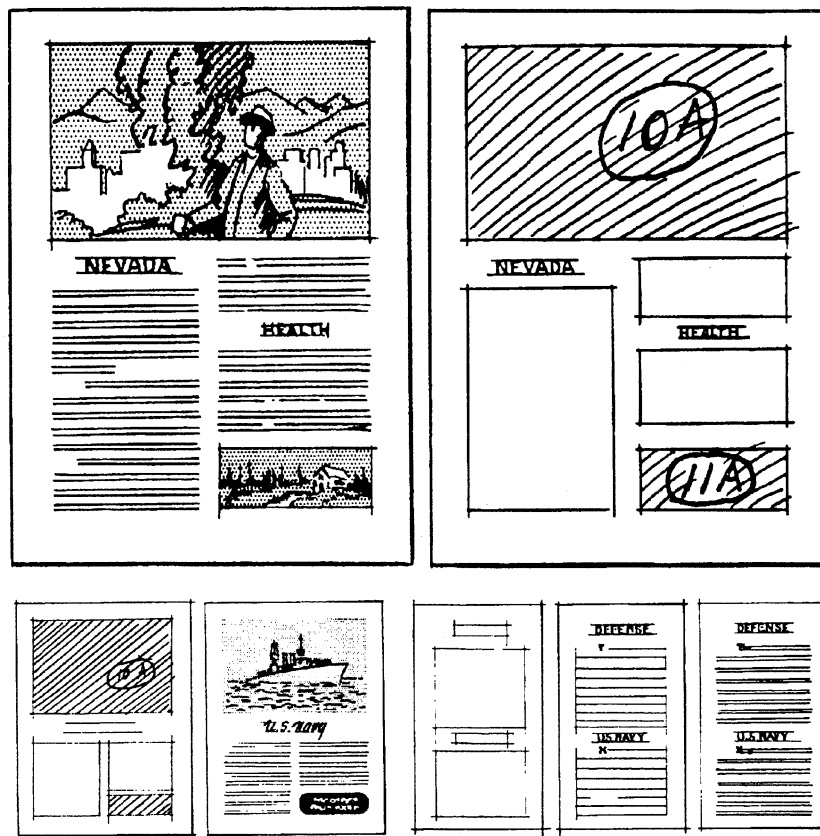
|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Other pages</b>                     | The principal requirement of the other pages, such as the preface or table of contents, are legibility and attractiveness. When you plan the index, place convenience for the reader ahead of artistic design. Index pages are set in 8-point type with hanging indentations and initials or words set in capitals or boldface type. Divide the index pages into two or three columns.                                                                                    |
| <b>Text</b>                            | Indicate areas of text by drawing a rectangle or ruling in a series of lines. Trace or rough-in display text. Cutlines (captions or legends) below the illustrations are text that pertain directly to the image. Set a caption a full column width regardless of the width of the illustration. If a legend consists of one or two lines, center it, otherwise, create a hanging indentation by setting the first line flush left and indenting the following line 1 em. |
| <b>Illustrations and photographs</b>   | Sketch or trace illustrations or draw a rectangle and indicate which illustration or photograph belongs in that area. Place them close to the text to which they apply. If an illustration is narrower than the type or if it does not have a square outline, run four or five lines of type above and below it to square up the page. For extremely narrow art, set the type on a narrow measure and place it beside the illustration.                                   |
| <b>Single illustrations</b>            | Place single illustrations at the top or at the optical center of the page. The optical center is one tenth (page length) above the mathematical center of the page.                                                                                                                                                                                                                                                                                                      |
| <b>Facing pages with illustrations</b> | In book work, consider facing pages as a unit. The right page predominates the left so if you have only one illustration, place it on the right-hand side of the layout. If you have two illustrations, share them between the two pages. Visually balance page layout, either symmetrically or asymmetrically.                                                                                                                                                           |
| <b>Unusual illustrations</b>           | One unusual creative technique is a bleed illustration. These illustrations have no margin between the edge of the image and the edge of the page. They appear to bleed right off the page. Use this technique sparingly. Do not bleed every illustration in the publication. If you have several related images, you may group them together as a montage and allow the overall montage to bleed from the page.                                                          |

*Continued on next page*

## Dummies, Continued

### Layout examples

Figure 1-24 shows a preliminary dummy with text and illustrations indicated.



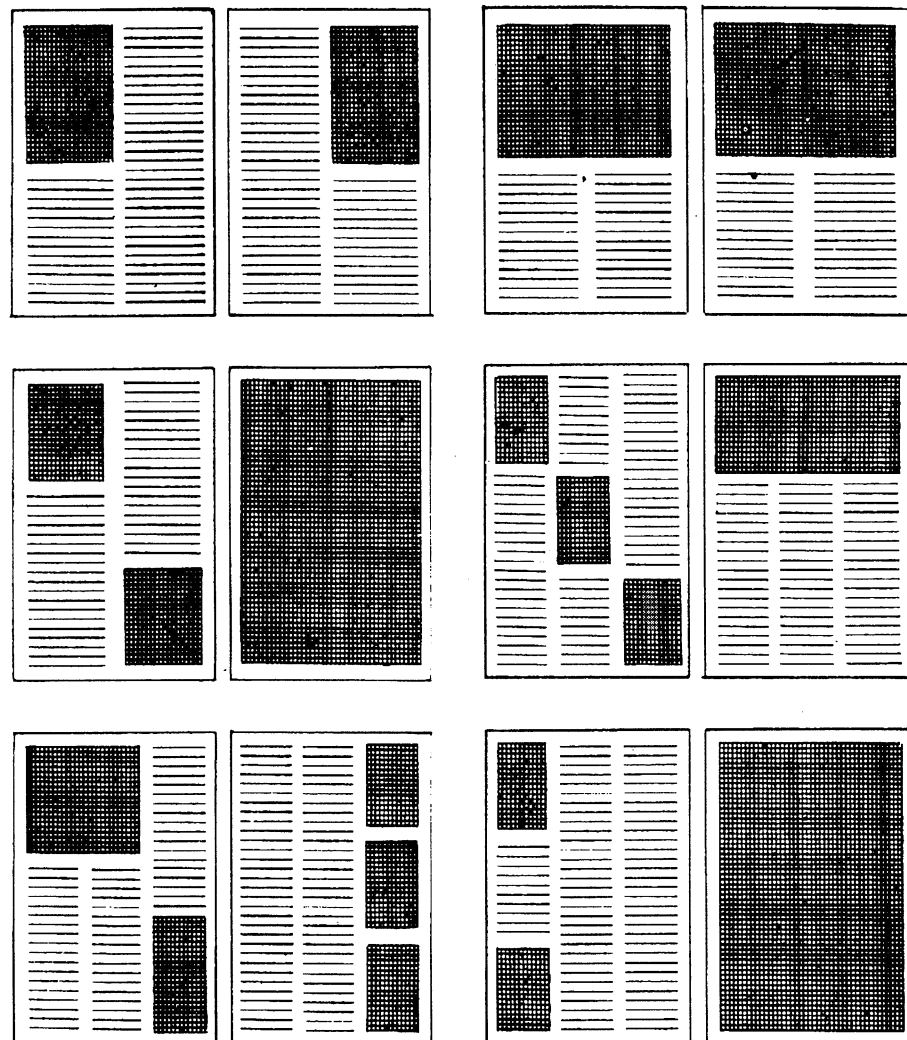
DMJA0022

**Figure 1-24.**—Text and illustrations on a preliminary dummy.

*Continued on next page*

**Layout  
examples  
(Continued)**

Figure 1-25 shows the position of illustrations or photographs on facing pages.



DMJA0023

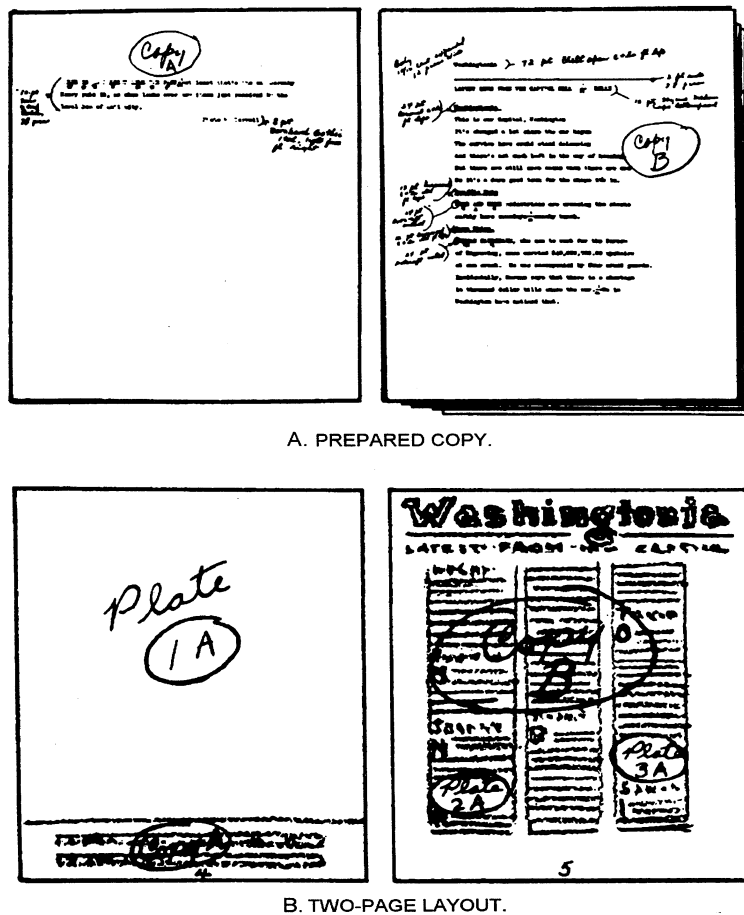
**Figure 1-25.**—Positioning illustrations or photos on facing pages.

*Continued on next page*

## Dummies, Continued

### Layout examples (Continued)

Figure 1-26 shows an additional method of indicating areas for illustrations and text on a preliminary dummy.



**Figure 1-26.**—Another method of indicating areas for illustrations and type on a dummy: A. Prepared copy, B. Two-page layout.

*Continued on next page*

## Dummies, Continued

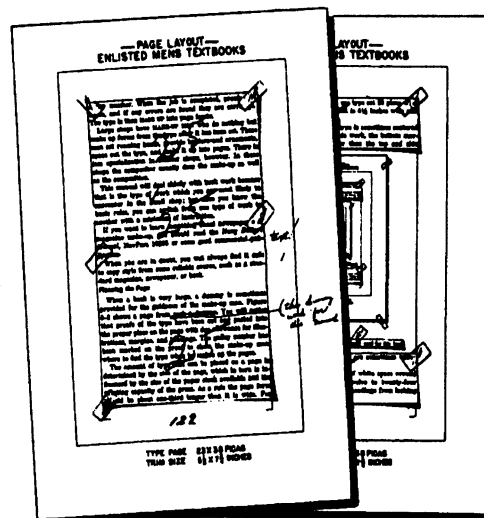
### Paste-up dummies

Paste-up dummies are dummies made from proofs pulled after the type is set.

### General construction of paste-up dummies

Proofs intended for dummy purposes are run on colored paper. Obtain extra proofs to catch typographical errors. At the top of each proof is a galley number. Mark this number several times throughout each column of typeset print with a heavy lead or grease pencil. By doing this, the printer can tell instantly which gallery the type is in when they make up the pages. Trim the proofs and paste them into place on the layout sheets along with the proofs of illustrations. Use a repositionable adhesive, such as transparent tape or wax. Unfortunately, type does not always measure out the way you would like it to and you will have too much or too little space. Keep several pages laid out in advance to check the fit of the material before you paste them into place.

Figure 1-27 shows preprinted layout sheets with text and illustrations pasted-up.



DMJA0025

**Figure 1-27.**—Preprinted layout sheets with text and illustration pasted-up.

# Copyfitting

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## Introduction

Copyfitting, or copy casting, is the process by which you plan and specify the setting of a given body of text to fit an available space. There are different methods for copy fitting; the two methods for copyfitting covered by this chapter are the character count method and the line measurement method. To begin, use a page of double spaced typewritten text on a sheet of 8 1/2 by 11-inch paper. The left-hand margin and the top margin should measure 1 1/2 inches while the right-hand margin and bottom margin should measure 1 inch.

---

## Character count method

To use the character count method of copyfitting, count the number of characters (letters, numerals, punctuation, and spaces) contained in a typewritten manuscript and the number of characters per typeset line length in a chosen size and style of letter to calculate the number of column inches required.

To use the character count method:

| Step | Action                                                                                                                                                                                                                                                                            |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Count the number of characters on each page of the typed manuscript.                                                                                                                                                                                                              |
| 2    | Determine the number of characters in one typeset line of determined length in the chosen typeface.                                                                                                                                                                               |
| 3    | Determine the number of lines per inch by <ul style="list-style-type: none"><li>● measuring 1 inch and counting the number of lines, then,</li><li>● divide this number into the total number of lines in the typewritten copy to get the length of the copy in inches.</li></ul> |
| 4    | Make allowances for headings and illustrations using good judgment and experience.                                                                                                                                                                                                |

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## Copyfitting, Continued

### Character count method (Continued)

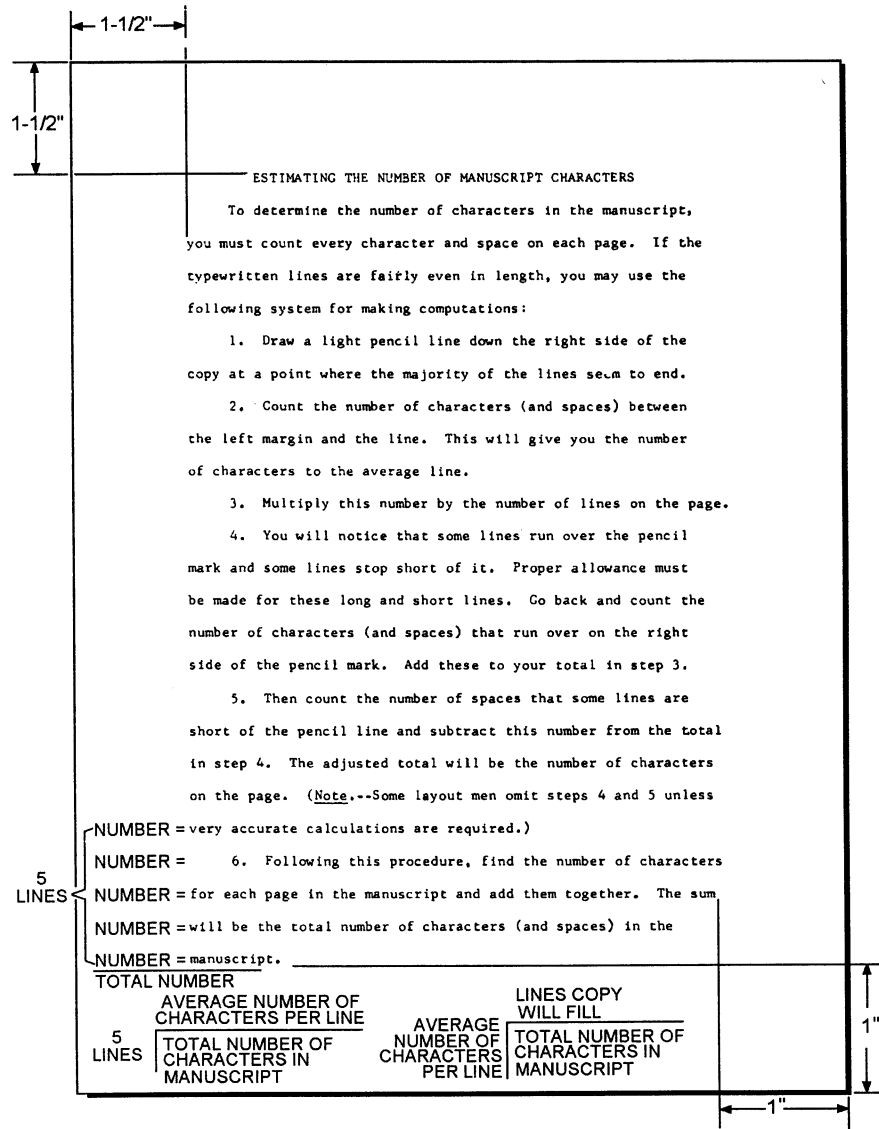
To determine the number of characters in a typeset line:

| Step | Action                                                                                                                                                                          |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Find a printed sample composed in the size and type style desired.                                                                                                              |
| 2    | Measure the length of the desired line in picas from the left margin and draw a vertical line at this point down the right side of the page.                                    |
| 3    | Count the characters between the left margin and the drawn line for five representative lines.                                                                                  |
| 4    | Divide the total number of characters by five to get an average of characters per line.                                                                                         |
| 5    | Divide the total number of characters in the typewritten manuscript by the average number of characters per line of type. The result is the number of lines the copy will fill. |

*Continued on next page*

## Character count method (Continued)

Figure 1-28 shows the character count method of copy casting.



DMJA0026

**Figure 1-28.**—The character count method of copy casting.

*Continued on next page*

## Copyfitting, Continued

### Line measurement method

The line measurement method is another process for measuring copy to fit into a predetermined space.

To use the line measurement method, use this table:

| Step | Action                                                                                                                                                                                           |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Measure a distance from the left margin of the copy and draw a line down the right side of the paper.                                                                                            |
| 2    | Multiply the distance from the left margin to the drawn line by: <ul style="list-style-type: none"><li>● 10 (pica; 10 elements per inch) or</li><li>● 12 (elite; 12 elements per inch)</li></ul> |
| 3    | Measure the depth of the copy by multiplying page length by: <ul style="list-style-type: none"><li>● 6 (single spaced copy) or</li><li>● 3 (double spaced copy)</li></ul>                        |
| 4    | Multiply the number of lines by the number of characters per average line to find the number of characters on the page.                                                                          |
| 5    | Add this number to the number of characters in the long lines that run beyond the drawn line on the right of the page.                                                                           |
| 6    | Subtract the number of characters required to fill short lines. The result is the total character count for the page.                                                                            |

# Scaling Artwork

## Introduction

Not all mechanicals are comprised of text only. You must know how to proportionally scale art and photographs to fit into a predetermined space. Scaling is calculating the dimensions for a reduction or enlargement of a given image. You can use a slide rule, a mathematical formula, the diagonal line method, or a scaling wheel to scale artwork. This segment will cover the most common and easily available methods, the diagonal line method and the scaling wheel which is often called a proportional scale.

## Diagonal line

The diagonal line method reduces or enlarges the size of the original artwork or the size of the allotted space in the paste-up or mechanical.

To use the diagonal line method, use this table:

| Step | Action                                                                                                                   |
|------|--------------------------------------------------------------------------------------------------------------------------|
| 1    | Cover the allotted space on the mechanical with tracing paper or an overlay.                                             |
| 2    | Using a straightedge and a pencil, draw the outline of the allotted space on the paper.                                  |
| 3    | Extend the left-hand vertical line and the lower horizontal line.                                                        |
| 4    | Using a triangle, draw a line from the lower left-hand corner through the upper right-hand corner of the outline.        |
| 5    | Place the overlay on top of your original artwork aligning the left side and the bottom.                                 |
| 6    | Determine whether the height or width is most important for your image.                                                  |
| 7    | Mark the line corresponding to your selection of the most important dimension and extend this line to the diagonal.      |
| 8    | Using your straightedge, draw a line from where the last line intersected the diagonal to complete the box or rectangle. |

*Continued on next page*

## Scaling Artwork, Continued

### Proportional scale

The proportional scale is a tool that calculates the new dimension of a piece of scaled artwork and the percentage of reduction or enlargement. It is composed of two disks joined at the center with a fastener that allows the disks to rotate. The disks are approximately 6 inches in diameter and made of a white laminate lettered in black.

Figure 1-29 shows a proportional scale.

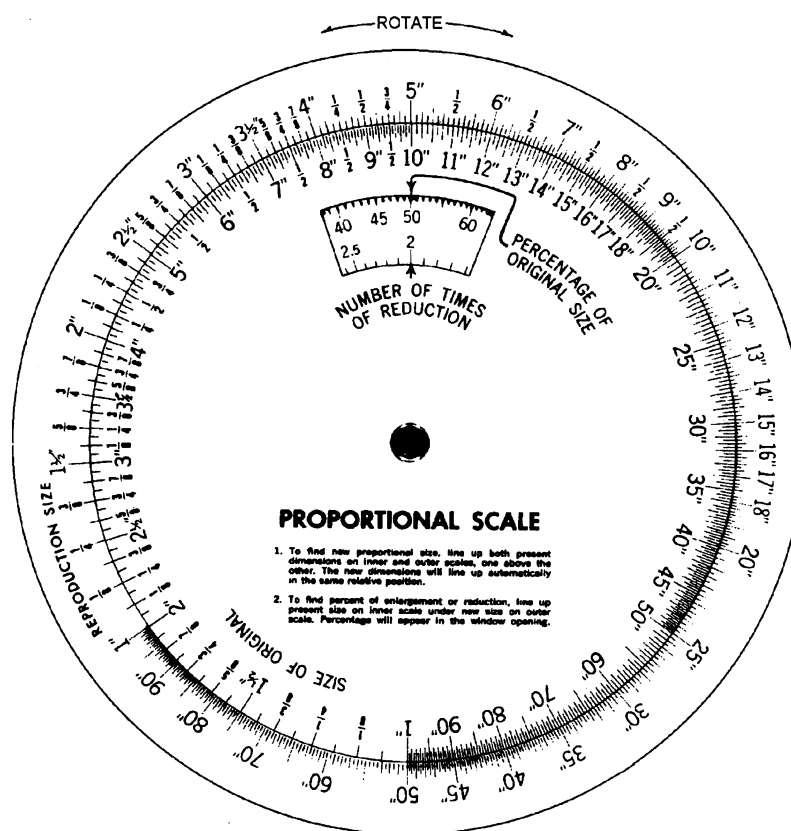


Figure 1-29.—A proportional scale.

*Continued on next page*

## Scaling Artwork, Continued

Use

To use a proportional scale for reduction, use this table:

| Step | Action                                                                                                                                                                                 |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Measure the dimensions of the allotted space.                                                                                                                                          |
| 2    | Measure the dimensions of the original artwork.                                                                                                                                        |
| 3    | Rotating the scale, align the dimension representing width of the original artwork across from the dimension representing the allotted width.                                          |
| 4    | Without moving the scale, read the dimension located directly across from the dimension for height on the original artwork. This is the proportional height of the allotted dimension. |
| 5    | A small window toward the center of the scale will give you the ratios of the percentage of the original size and the number of times the artwork is reduced.                          |

To use a proportional scale for enlargements, use this table:

| Step | Action                                                                                                                                                                                                 |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Measure the dimensions of the allotted space.                                                                                                                                                          |
| 2    | Measure the dimensions of the original artwork.                                                                                                                                                        |
| 3    | Using the measurements on the scale inversely, rotate the scale to align the dimension representing the width of the original artwork with the dimension representing the width of the allotted space. |
| 4    | Without moving the scale, read the dimension located directly across from the dimension for height on the original artwork. This is the proportional height of the allotted dimension.                 |
| 5    | The small window toward the center of the scale will give you the percentage of enlargement of the original artwork but, will not give you the number of times enlarged.                               |

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## Scaling Artwork, Continued

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### Uniformity

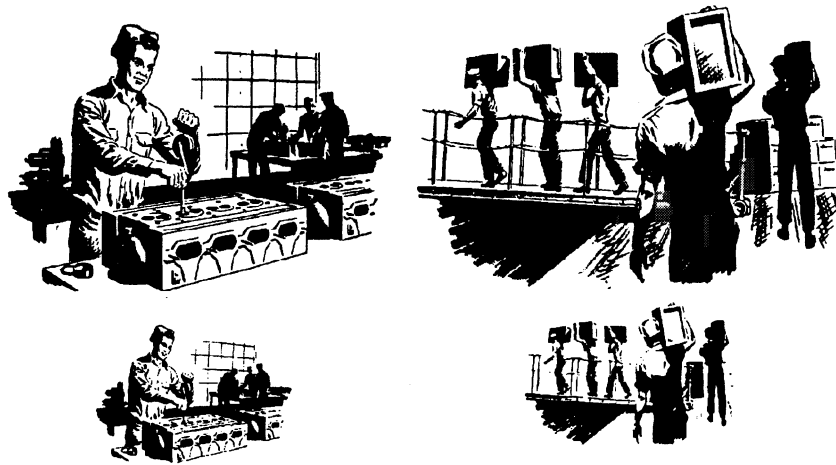
When you prepare a series of illustrations for a publication, draw them all to the same scale, if possible. This will save you time at the camera, in the darkroom, and in preparing the mechanical paste-up. This will also improve the overall appearance of the product. Carefully plan artwork that contain text to assure a uniform size of the text in the finished product.

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### Limitations

There are limitations on the amount of reduction or enlargement a piece of artwork can endure. Prepare your line copy for same size or smaller reproduction. In general, make your artwork a maximum of two times larger or a minimum of one and one-half times larger than the desired size, or at another scale in between the two, as long as it remains proportionally correct. This technique minimizes irregularities and makes the drawing appear more finished. Artwork drawn very large and extensively reduced will begin to fill in detail and appear dark and heavy. Artwork drawn small and enlarged will appear crude and rough because defects tend to magnify. Before beginning a drawing for reproduction, remember that both the lines and the spaces between the lines are reduced or enlarged.

Figure 1-30 shows the effects of enlargement and reduction on artwork.



DMJA0028

**Figure 1-30.**—Reduction and enlargement will lose detail and magnify defects in reproduced artwork.

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## Mechanical Preparation

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### Introduction

The printing process largely determines the quality of reproduction; however, the best machinery available cannot hide the flaws in a poorly constructed mechanical. It is through the mechanical that the DM exerts a direct influence on the resulting print, both in quality and cost.

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### Preparation

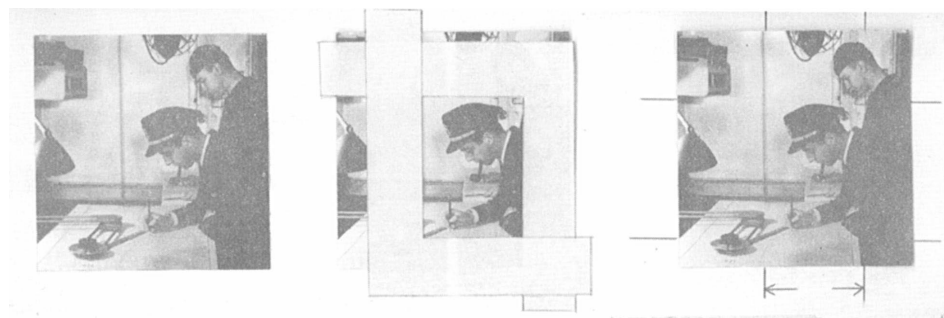
Before you begin creating artwork for reproduction, you must gather your materials and information. Determine the press operation involved and the materials to do the job. Settle on a format, finished stock, and type style. If the originator provides artwork, it may require cropping, retouching, eliminating background clutter, or halftone screening. If you must copyfit or scale artwork, do so before you commit yourself to paper.

---

### Cropping

Sometimes you use only a specific portion of the original artwork in a finished product. Cropping is the procedure of defining the desired reproduction image area within a larger piece of work. A simple method of cropping uses two right angles cut from opaque paper or board. By maneuvering the two pieces of angled paper, you can frame the desired subject in many different ways. You indicate crop marks on a drawing or photograph by lightly marking the borders of the artwork or print, by marking an overlay attached to the artwork or print, or by cutting a window in an opaque masking paper, such as goldenrod, to expose the desired portion of the artwork or print. Use a grease pencil if you mark on the borders of original artwork so it can be easily removed. Do not mark more than one set of crop marks on the same artwork.

Figure 1-31 illustrates the use of cropping arms.



**Figure 1-31.**—Cropping arms.

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*Continued on next page*

## Mechanical Preparation, Continued

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### Retouching

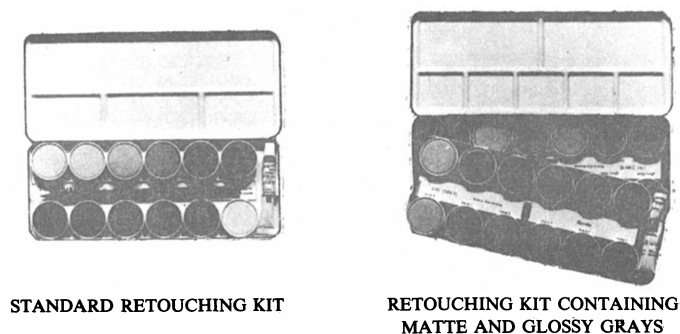
Photographs are rarely used for reproduction without some work being done to them to highlight important features or to suppress undesirable characteristics. You may eliminate minor flaws in a photograph by using a photo retouch pencil or opaque retouch greys applied by brush or airbrush. Handle a photograph carefully and avoid leaving fingerprints on the photo surface during preparation. Your natural oils will prevent the paint from adhering. The surface of a photograph has a slick resin coating which you must lightly abrade with Fuller's Earth, a fine, white powder, before you begin retouching. Paint the light values first, then the middle values. Paint the dark values last.

**RETOUCH PENCILS:** Retouch pencils are available in various shades of grey and color. Avoid digging into the surface of the photograph. Use a slow, fine, circular motion to match the values in the image and spray the finished print lightly with a fixative.

**RETOUCH GREYS (cake form):** Retouch greys are a series of opaque greys plus black and white in a premixed cake. Wherever you use white, use it pure or it will reproduce as a light grey. Spray the retouched print with a fixative.

**RETOUCH GREYS OR COLOR (liquid form):** Apply liquid form retouch greys or colors with an airbrush. Extremely detailed or extensive retouching is possible.

Figure 1-32 shows retouch greys in cake form.



**Figure 1-32.**—Retouch greys.

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*Continued on next page*

## Mechanical Preparation, Continued

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### Silhouetting or vignetting

Silhouette an object if you need to reproduce a subject in outline form. This process partially obscures or completely eliminates background clutter. Vignetting is a process of softening a background with a burned-edge effect. You may use either a photograph or a halftone. If you must preserve the original print, cover it with a clear acetate overlay in tight registration.

To silhouette an object, follow this table:

| Step | Action                                                                                                                                                                       |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Clean the surface of the photograph with Fuller's Earth.                                                                                                                     |
| 2    | Carefully outline the desired object with a 1/4-inch width margin of opaque white. Apply thin coats. Do not cake on the opaque white as it tends to chip and flake when dry. |
| 3    | Indicate to the printer the removal of all background material outside of the white border.                                                                                  |

To brush or airbrush a silhouette, follow this table:

| Step | Action                                                                                                                       |
|------|------------------------------------------------------------------------------------------------------------------------------|
| 1    | Clean the surface of the photograph with Fuller's Earth.                                                                     |
| 2    | Apply a stencil or mask to protect the areas of the image you wish to retain.                                                |
| 3    | Apply an even coat of pigment over the undesired area.                                                                       |
| 4    | Allow to dry.                                                                                                                |
| 5    | Remove the frisket or mask.                                                                                                  |
| 6    | Use a small cotton wad to remove excess pigment seepage and to soften the edges of the outline to make it look more natural. |

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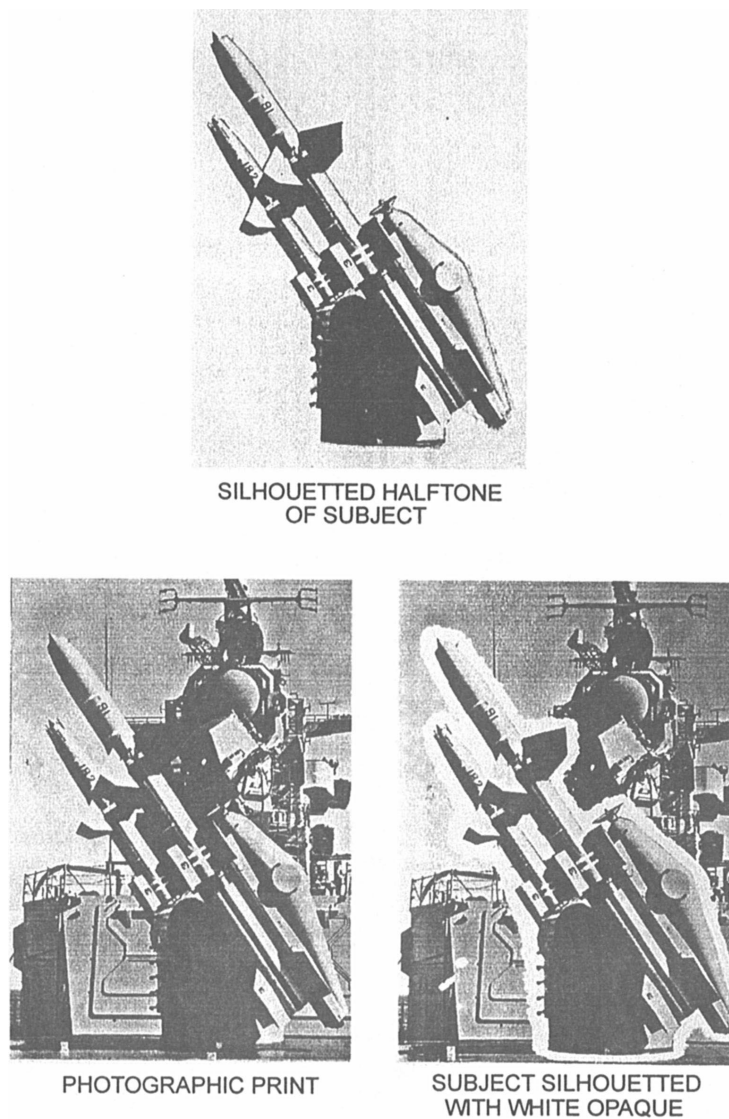
*Continued on next page*

## Mechanical Preparation, Continued

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### Silhouetting and vignetting (Continued)

Figure 1-33 illustrates the procedure for silhouetting.



**Figure 1-33.**—Silhouetting procedure.

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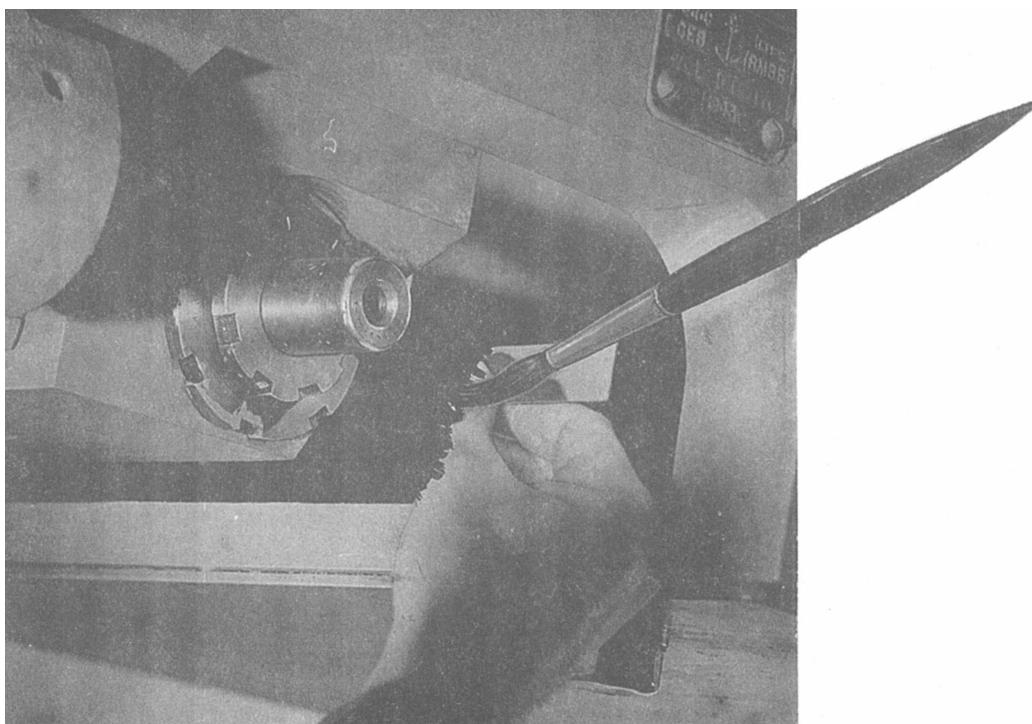
*Continued on next page*

## Mechanical Preparation, Continued

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### Silhouetting or vignetting (Continued)

Figure 1-34 shows the removal of background objects by eliminating the background with opaque pigment.



**Figure 1-34.**—Removing background objects.

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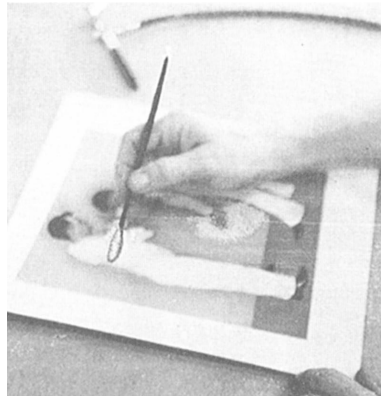
*Continued on next page*

## Mechanical Preparation, Continued

---

### Silhouetting and vignetting (Continued)

Figure 1-35 shows the process of removing excess paint with a moist cotton swab and feathering hard edges left by the silhouetting process to create a more natural appearance.



**Figure 1-35.**—Removing excess paint with moist cotton.

To vignette an object, follow this table:

| Step | Action                                                                                                                                                                    |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Prepare the surface of the photograph with Fuller's Earth.                                                                                                                |
| 2    | Apply a frisket or mask to protect the areas of the image to remain unaffected.                                                                                           |
| 3    | Airbrush pigment onto the photograph beginning with the four corners using a light, airy, circular motion.                                                                |
| 4    | Continue to rotate the photograph, spraying the four corners one by one, until the pigment covers the amount of the photograph desired. Strive to keep the coverage even. |
| 5    | Allow to dry.                                                                                                                                                             |
| 6    | Remove the frisket or mask.                                                                                                                                               |
| 7    | Clean the desired image area of seepage and soften the edges around the image to give a more natural effect.                                                              |

---

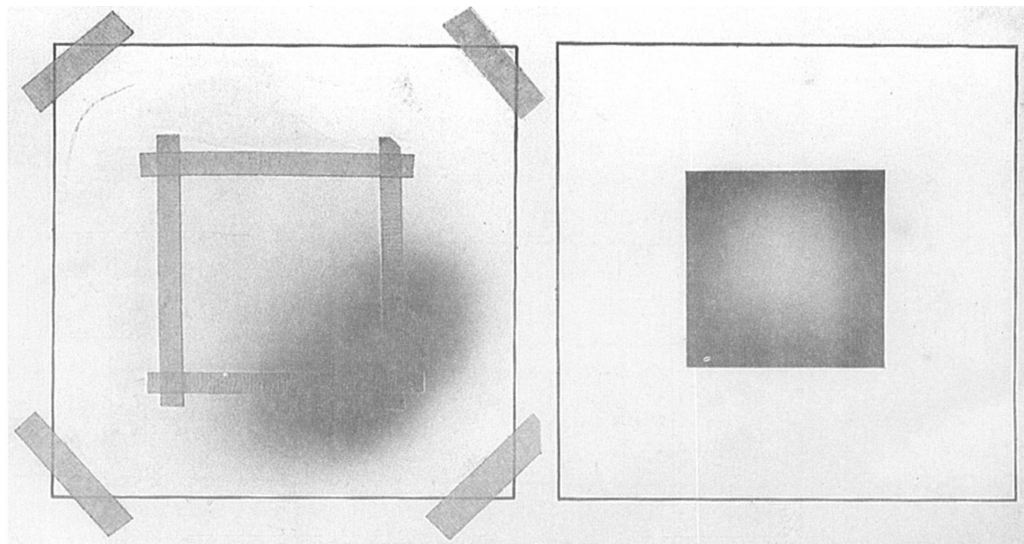
*Continued on next page*

## Mechanical Preparation, Continued

---

### Silhouetting and vignetting (Continued)

Figure 1-36 illustrates the vignetting process.



**Figure 1-36.**—The vignetting process.

---

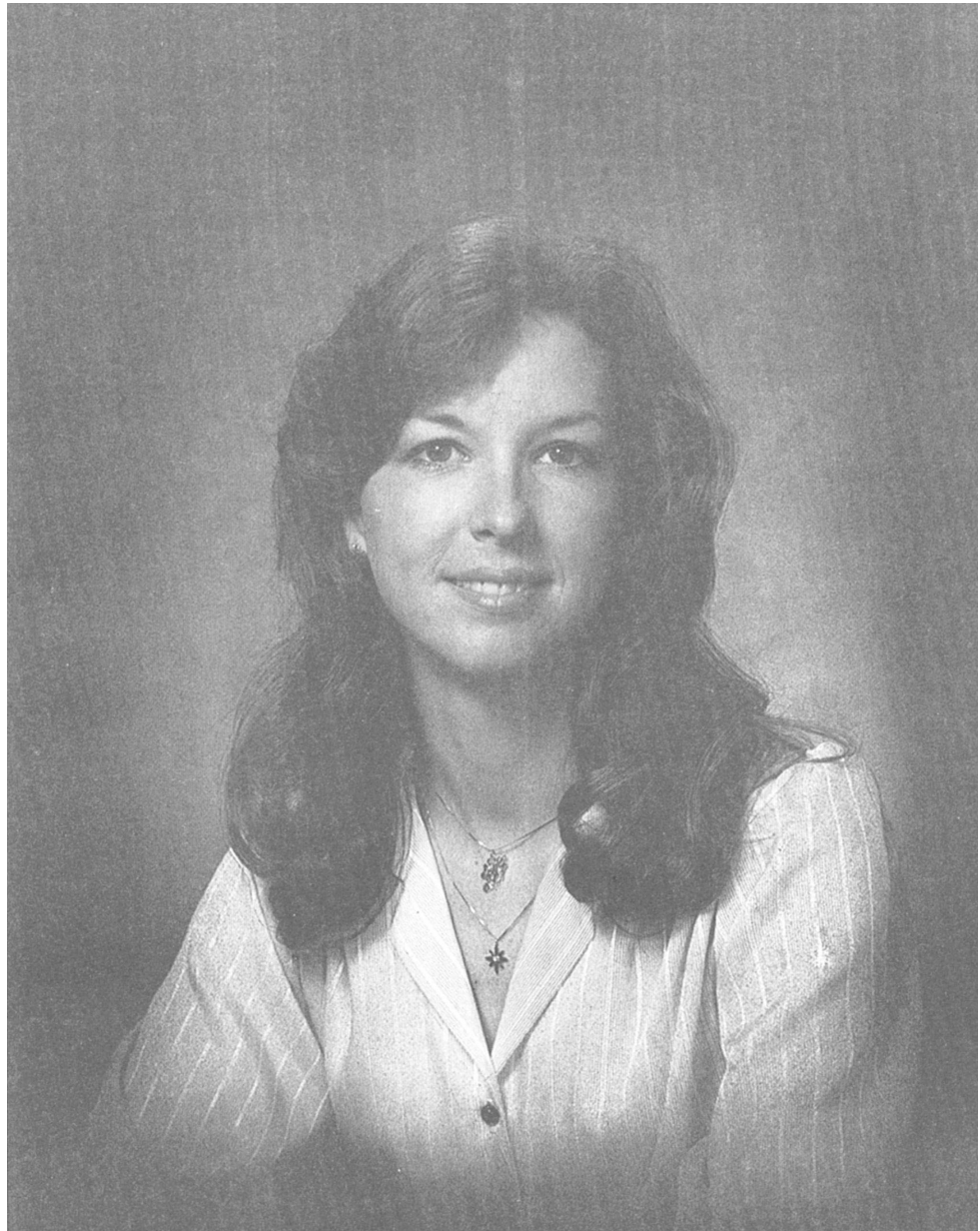
*Continued on next page*

## Mechanical Preparation, Continued

---

### Silhouetting and vignetting (Continued)

Figure 1-37 shows an subject with a vignetted background.



**Figure 1-37.**—Vignetted head-and-shoulders portrait.

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Continued on next page

## Mechanical Preparation, Continued

---

### Halftones

Some printing presses and machines are not capable of producing good quality continuous tone images. Continuous tone images, such as watercolors, drawings, oil paintings, photographs, and other works composed of a series of tones tend to blend together or lose detail. To separate these tones, the artwork must be shot through a screen that breaks the image up and records it as a series of dots. This process is known as halftone screening. Exposure, similar to that used in line photography, is determined by the intensity of the light reflected from the original copy, distance between the film and the screen, size and shape of the lens aperture, speed and contrast of the film emulsion, and the duration of the exposure.

**BLACK-AND-WHITE HALFTONE SCREENS:** Halftone screens used for black-and-white photography are generally rectangular and made of glass or acetate. Glass halftone screens are made of two sheets of optical quality glass, each etched with fine parallel lines filled with opaque pigment and sealed together with the lines crossing each other at right angles. Halftone screens are available in standard rulings from 50 to 400 lines per inch set at a 45-degree angle to the screen. The lines on the screen are the same width as the space between them. Therefore, a 50-line screen has 50 lines and 50 spaces to each inch. Screens are grey or magenta in color. The 45-degree angle makes the dot pattern less noticeable to the human eye. Position a glass halftone screen a short distance in front of the film plane. Position an acetate halftone screen in direct contact with the film.

**COLOR HALFTONE SCREENS:** Halftone screens used for color separation work are circular. You must set the angle of the screen and rotate it for each color shot. Halftone screens for color work are not in color. Color halftone screen are available in standard rulings.

**DIGITAL HALFTONE SCREENS:** A computer with a desktop scanner or video digitizer scans continuous tone artwork and photography transforming them into a digital format. The scanner must be a grey scale scanner. If you alter the image, do so before scanning. Limited image alteration is possible with the appropriate image-editing software. Scan the imagery at a resolution twice the final screen ruling. Save the image in a Tagged Image File Format (TIFF) or Raster Image File Format (RIFF). You can output these digital halftones to laser printers or high-resolution copier-printers.

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*Continued on next page*

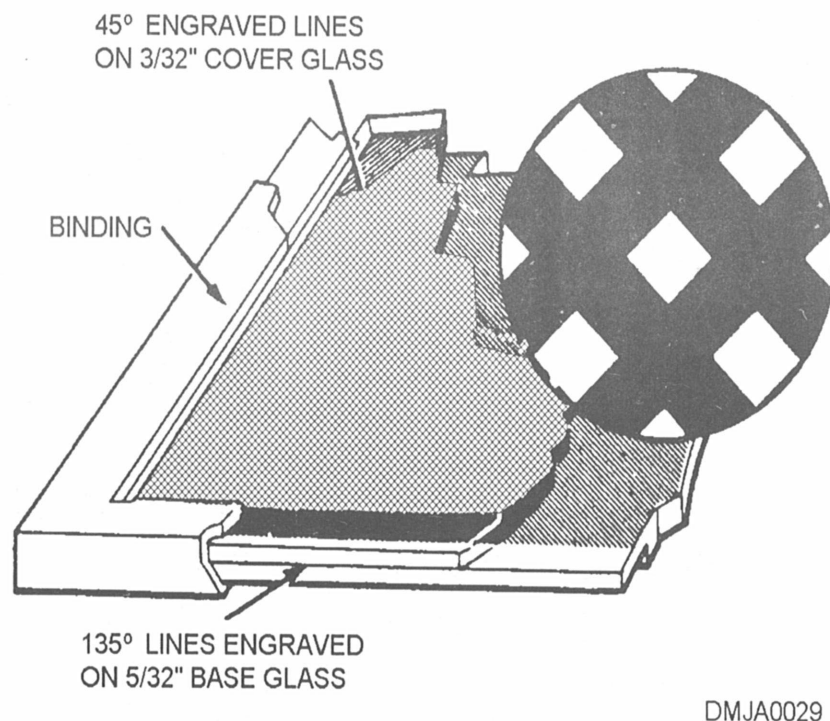
## Mechanical Preparation, Continued

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### Halftones (Continued)

On occasion, the individual requesting the job may not have the original continuous tone photograph but, a reproduced copy that has already been through the halftone screen. If the halftone screen used was coarse and open, you may be able to shoot it as a line shot. If not, you may have to rescreen the image. Rescreening a halftone image will create a wavelike or checkered pattern where the two dot patterns overlap. This is called moire. This pattern can be undesirable and distracting. You can reduce or eliminate this effect by turning the screen 15 degrees away from the halftone or using a screen 50 lines coarser or finer than the original screen.

Figure 1-38 shows a sectional view of a glass halftone screen.



**Figure 1-38.**—A sectional view of a glass halftone screen.

---

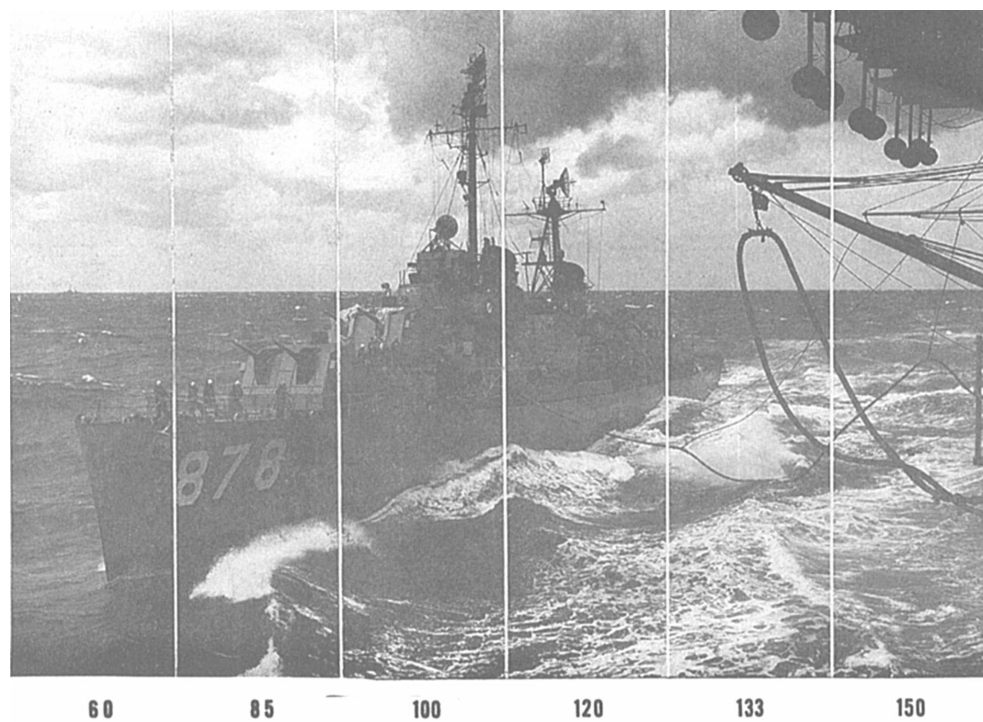
*Continued on next page*

## Mechanical Preparation, Continued

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### Halftones (Continued)

Figure 1-39 shows the effects of different screen patterns.



**Figure 1-39.**—The different screen rulings.

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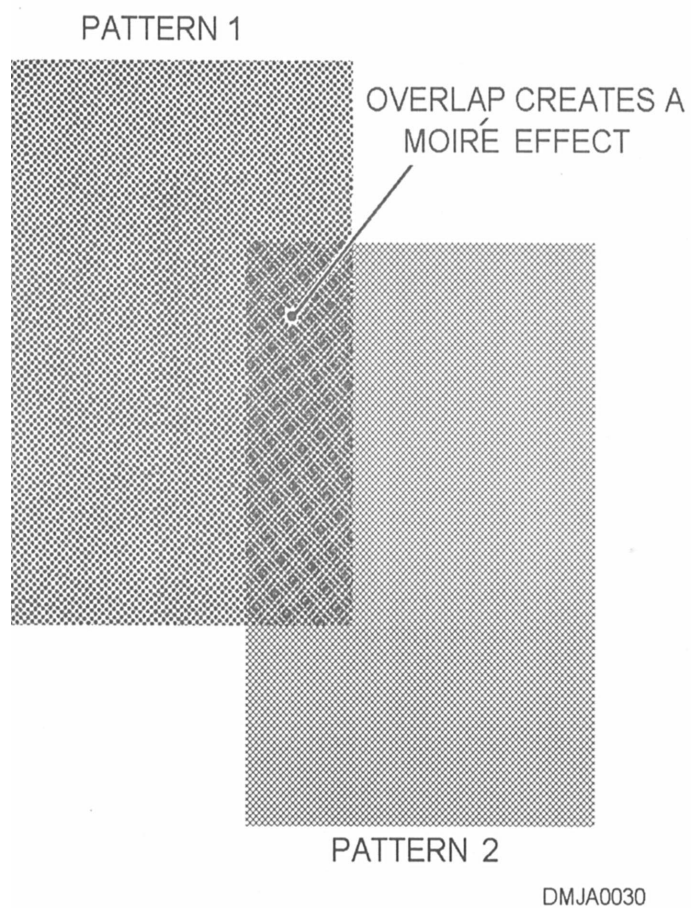
*Continued on next page*

## Mechanical Preparation, Continued

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### Halftones (Continued)

Figure 1-40 shows the moiré effect created by the overlap of differing screen patterns.



**Figure 1-40.**—The moiré effect.

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*Continued on next page*

# Mechanical Preparation, Continued

## Putting it all together

The finished mechanical must withstand considerable handling as it moves from one phase of reproduction to another. Prepare your mechanical on illustration board and cover it with a protective covering of tissue paper or acetate. The larger the mechanical, the heavier the illustration board. If the mechanical has one overlay, tape the overlay to the top of the illustration board. If the mechanical has multiple overlays, register each overlay to the illustration board so that they may be removed and easily replaced by the camera person. Leave ample border all around the image on the mechanical to insert instructions for the keying of separate copy elements. Mark these instructions in nonreproducible blue on white areas and yellow on black areas, such as a black patch. Use initials or numbers to key halftone negatives for insertion. Above all else, keep the mechanical clean; the camera records every stray mark, including marks that are ghostly visible.

Figure 1-41 shows a mechanical with a halftone insertion indicated.



Figure 1-41.—A layout containing masked-out areas for halftones.

## Electronic Prepress Preparation

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|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b>     | Increasingly, more sophisticated digital presses are appearing in work spaces. These machines allow the DM or LI to electronically program (digitize) the job parameters into memory instead of using conventional mechanicals and press plates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Purpose</b>          | Because prepress preparation is minimal, short-run or small jobs are more economical to run. Digitized printing allows flexibility during the revision process of a book and eliminates the need for a stockpile or large inventory at distribution points. Rapid turnaround time, now defined in hours, not days, increases the customer base and customer satisfaction. The term on-demand printing is often, but not solely, associated with digitized printing.                                                                                                                                                                                                                                                           |
| <b>Digital printing</b> | Digital printing is a relatively new concept in the printing industry. This type of printing uses plates, created by a spark discharge, to print. This eliminates liquids, such as ink and water used in traditional offset lithography. Digital printing is defined as any printing using a raster-based process to produce an image carrier or replicate directly to a substrate from digital document files. Color applications, currently limited, are increasing as the new technology develops. Eventually, digital approaches will apply to every facet of graphics communication whether you print 1,000, 100, or 1 duplicate. Make sure you read and understand the operating manuals that pertain to the equipment. |

---

## Color Separation

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b>            | You may have an opportunity to create artwork intended for color printing using the traditional offset lithographic process. The three types of color separation processes are process color, spot color, and fake color. The format of the master artwork determines the type of separation process you use.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Process color</b>           | When you create the master artwork in a continuous tone medium, such as a watercolor or a photograph, the color separation process is left to the camera operator. This is process color. Very close reproductions result from using color in the artwork similar to the color available to press inks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>How process color works</b> | The printer makes four separate negatives and four separate press plates for each piece of continuous tone color artwork. Since colors photograph as black or shades of grey, the printer uses regular black-and-white film. A grey scale, photographed along side the artwork will assist the photographer in comparing densities and contrast for each negative. The negatives must have the same contrast and density or the resultant print will be out of balance. Shooting through a halftone filter and a series of color filters separates the colors of the original copy and breaks the image into a dot pattern. The printer changes the angle of the halftone screen for each negative to cause the dot pattern to overlap or print side by side in the final print. A blue filter records yellow, a red filter records cyan (blue), a green filter records magenta (red), and no filter or a combination of the three filters records the black in the original. Conventionally develop the film. Hand correct any negative aberrations. Expose and develop the press plates. Pull a proof from the press plate in the appropriate color. This is known as a progressive proof. The colors of the original artwork reproduce when the plates are run on the press in the proper colors of ink. Overprinting produces the color sensations of secondary and tertiary colors. Overlapping three or more colors produce black. |

*Continued on next page*

## Color Separation, Continued

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|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Spot color</b>     | Spot color is a process you use to indicate areas for color separation by placing an overlay over a simple black-and-white line illustration. Make precise instructions to the printer on this overlay. If the drawing is complicated or has detailed color areas, make the color separations yourself. Create an overlay for each primary color, register it to the master, and indicate the desired color of ink. This process produces flat color with no modeling or shading. You create modeling or single color variations by using a shading sheet in the artwork or requesting the camera person to use a benday sheet.  |
| <b>Fake color</b>     | Fake color involves printing from original line artwork or continuous tone photograph by indicating color or screen tints on a separate overlay. The outlines of the image define the various color areas to strip in color panels.                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Duotones</b>       | Using only two plates to print a color image with a dark dominant ink and a lighter secondary ink, results in a print known as a duotone. Two negatives are shot at different angles from a single piece of artwork. One of these negatives is shot flatter than the other so that one plate will supply color while the other plate supplies detail. The detail is usually printed in the darker or dominant ink. You may use any combination of inks or black ink and a grey ink (called a true duotone). The two plates printed together produce a duotone print that appears to have more dimension than the original image. |
| <b>Bourges sheets</b> | In the creation of artwork for color reproduction, you want to most nearly approximate the finished product before you commit yourself to the expense of color printing. Bourges sheets are transparent color sheets available in various colors and densities. By building up, removing, or cutting out sections of the sheets, you create color copy in separate overlays. The combined overlays simulate the printed product.                                                                                                                                                                                                 |

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*Continued on next page*

## Color Separation, Continued

### Benday or shading sheets

The benday process involves photographing negatives through percentage screens to filter the intensity of the image. Shading sheets are similar to the benday process except, the artist uses a light-tack adhesive-backed pre-printed percentage screen in the creation of the master artwork. The percentage of the screen represents the solidity of the image. For example, a 20-percent screen is light, whereas an 80-percent screen is dark. Screens are available as dots, lines, and patterns.

Figure 1-42 show example of flat color (black) with various screens.

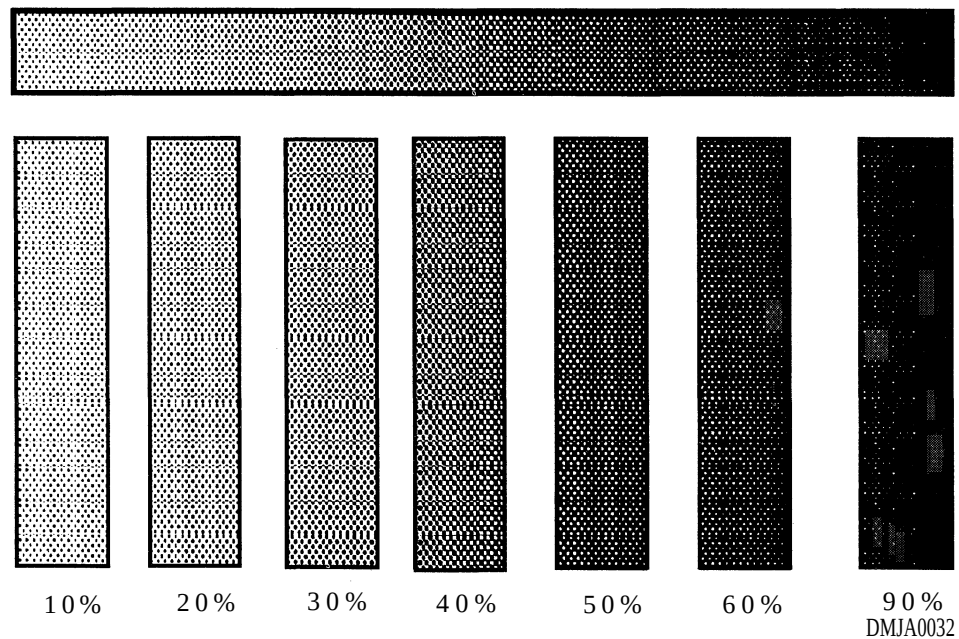


Figure 1-42.—Varying percentages of flat color.

# Registration

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## Introduction

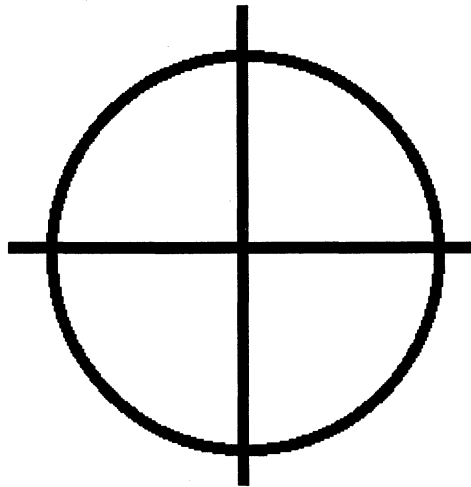
To print images requiring more than one plate and ensure that the plates print in sequence or in close proximity to each other requires a system of registration. The more complicated a multiplate image is, the closer you must work with the camera person and printer.

---

## Registration

Registration or register is the accurate placement of each overlay to a piece of master artwork. You should use three points on different planes for locating registration marks. Registration marks appear as circles centered on cross hairs. Place registration marks outside of the image area. Make sure the printer knows to remove registration marks before printing so they will not appear in the final product. The four types of registration are no register, loose register, lap register, and hairline register.

Figure 1-43 shows a registration mark.



DMJA0033

**Figure 1-43.—A registration mark.**

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*Continued on next page*

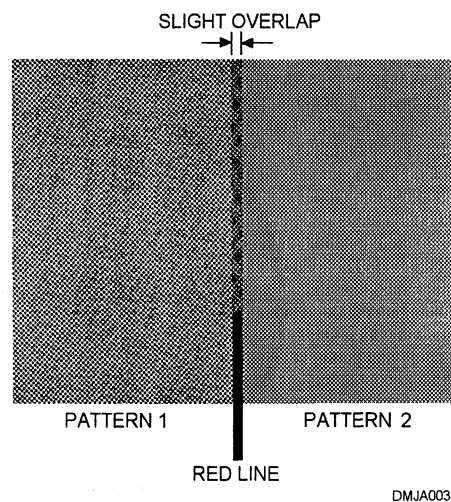
## Registration, Continued

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|                       |                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>No register</b>    | With no register, each color or plate prints independently or without relation to all other plates. It does not require registered overlays, merely instructions to the printer.                                                                                                                                                                                       |
| <b>Loose register</b> | Loose register is used for images not requiring highly accurate placement of the color portions. You make a separate overlay for each color and key this overlay to the master art. Simplicity in the master artwork is paramount.                                                                                                                                     |
| <b>Lap register</b>   | Lap register permits a slight overlap in the separate colors or plates. This simplifies the DM's task in creating the overlays and eliminates white gaps or spaces which occur if the registration is off. Colors of similar densities that overlay form a black line, while lapping patterns or textures requires you to draw a red line between them to avoid moire. |

---

Figure 1-44 shows lap registration.



**Figure 1-44.**—Lap registration.

---

|                          |                                                                                                                                                                                                                                         |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hairline register</b> | A hairline register should be left for photomechanical separation by the camera person or printer. The overlap in a hairline register is negligible. Save this registration technique for full color or full color continuous tone art. |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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## Proofreader's Marks

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### Introduction

Copy preparation symbols, accepted by the printing trade, are standard throughout the United States. Study the symbols and marks. Knowledge of copy preparation symbols enables you to intelligently communicate with print shops and photo labs. Careful application of these standards eliminates poor work before it reaches the printer.

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### Proofreader's and editorial marks

Proofreader's marks and editorial marks are essentially the same. The main difference is in their use.

EDITORIAL MARKS: Editorial marks are made directly to the manuscript in the body of the copy. If this is not possible, insert corrections above or below the line of type and indicate placement with a carot (Λ). If there are several corrections, place them in the right margin, in sequence and separated with a diagonal line.

PROOFREADER'S MARKS: Place proofreader's marks in the margins of a proof with their position indicated in the text with a carot. If there are several errors in the same line, place the marks in sequence, separated by a diagonal line. If the lines of type are long, divide the page down the center and place the corrections in the margins on the side of the page where the error occurs. If you are marking cold-type proofs, place a tissue overlay over the text and mark the corrections on the overlay.

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*Continued on next page*

## Proofreader's Marks, Continued

### Marks

Figure 1-45 shows editorial marks for copy preparation.

|                                                    |                                |                                             |                                    |
|----------------------------------------------------|--------------------------------|---------------------------------------------|------------------------------------|
| <u>Lieutenant</u> William Brown                    | ABBREVIATE, OR<br>MAKE FIGURES | Brownie was exhausted <u>at the end of</u>  | IGNORE<br>- CORRECTION             |
| <u>forty-five</u> destroyers                       | (CONVERSELY)                   | <u>the day</u>                              | Word "atlet" means "let it stand." |
| <u>Capt.</u> Overby                                | SPELL OUT                      | The ship's company reported on the          | INDENT                             |
| <u>6</u> enlisted men                              |                                | quarterdeck for inspection at 1300.         |                                    |
| <u>tradition</u>                                   | BOLDFACE                       |                                             | INSERT                             |
| <u>tradition</u>                                   | BOLDFACE CAPS                  | the fargd area                              | LETTER                             |
| there <u>were</u> three                            | BRACKETS                       | <u>Essex</u> carrier                        | WORD                               |
| yeoman Wilson                                      | CAPITALIZE:                    | Welsh added another ribbon to               | SECTION                            |
| <u>com Three</u>                                   | LETTER                         | his collection yesterday.                   |                                    |
| the <u>SEA</u> Watch                               | WORD                           | <u>gallantry in action</u>                  | ITALICIZE                          |
| the <u>Yellare</u> officer                         | SMALL CAPS                     | <u>gallantry in action</u>                  | BOLDFACE ITALICS                   |
| tarp <u>edoes</u>                                  | (CONVERSELY)                   | <u>gallantry in action</u>                  | ITALIC CAPS                        |
| Jones, who saw action at Saipan                    | LOWER CASE                     | McCloskey looks good. <u>He</u> is the best | PARAGRAPH                          |
| Seaman Smith not without effort climbed            | CLOSURE                        | pitcher in many seasons.                    |                                    |
| scuttlebutt                                        | COMMA                          | Here is proof: <u>g</u>                     | (CONVERSELY)<br>NO PARAGRAPH       |
| He said <u>that</u> Jones would receive the award. | DASH                           | McCloskey has been pitching no-run          |                                    |
| Lieutenant Smith, <u>who is well fitted</u>        | DELETE                         | games consistently since he hit the league. |                                    |
| <u>by experience and training to perform his</u>   | LETTER                         | he said nuts (sic)                          | PARENTHESES                        |
| <u>new duties</u> reported aboard today.           | DELETE                         | (X) or (O)                                  | PERIOD                             |
| Lieutenant Smith, who is well fitted               | SEVERAL                        | Spike Jones                                 | QUOTES                             |
| by experience and training to perform his          | WORDS                          | ball game                                   | SEPARATE                           |
| new duties, reported aboard today.                 | DELETE                         | Dickey, who found this an entirely new      | SUBSTITUTE                         |
| more                                               | ENTIRE                         | his head, hit                               |                                    |
| 30 or #                                            | PARAGRAPH                      | experience, drove one 230 yards.            |                                    |
| pellmell                                           | END OF PAGE                    | specifist                                   | TRANSPOSE                          |
|                                                    | END OF STORY                   | striker yeomen                              | LETTERS                            |
|                                                    | HYPHEN                         |                                             | WORDS                              |

DMJA0035

Figure 1-45.—Editor's marks.

Continued on next page

## Proofreader's Marks, Continued

### Marks (Continued)

Figure 1-46 shows proofreader's marks for text.

| TEXT                                         |                                   |                                      |
|----------------------------------------------|-----------------------------------|--------------------------------------|
| Text                                         | Margin                            | Meaning                              |
| X or X                                       |                                   | Broken type                          |
| ....                                         | <i>stet</i>                       | Let it stand                         |
| - or   or <i>e</i>                           | <i>e</i>                          | Delete                               |
| <i>e</i>                                     |                                   | Delete and close up                  |
| ⊙                                            |                                   | Correct position                     |
| ≡ or /                                       | caps or uc                        | Capitalize                           |
| ↑                                            | caps or uc                        | Capitalize word                      |
| =                                            | sm caps or sc                     | Small Caps                           |
| ≡ =                                          | caps and small caps or<br>uc & sc | Capitals and small<br>capitols       |
| / or \                                       | lc                                | Lower case                           |
| ↓                                            | lc                                | Lower case word                      |
| ↓                                            |                                   | Superscript                          |
| ½                                            |                                   | Subscript                            |
| <i>lf</i>                                    | lf                                | Light face                           |
| <i>bf</i>                                    | bf                                | Bold face                            |
| <i>ital</i>                                  | ital                              | Set in italics                       |
| rom                                          | rom                               | Set in roman                         |
| wf                                           | wf                                | Wrong font                           |
| <i>sp</i>                                    | <i>sp</i>                         | Spell out                            |
| <i>sp</i>                                    | sp                                | Mispelling                           |
| ...                                          |                                   | Ellipsis                             |
| <i>Move material to<br/>(shown by arrow)</i> |                                   | Move material to<br>(shown by arrow) |

DMJAA036

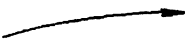
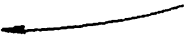
Figure 1-46.—Proofreader's marks for text.

Continued on next page

## Proofreader's Marks, Continued

### Marks (Continued)

Figure 1-47 shows proofreader's marks for spacing.

| SPACING                                                                             |                                     |
|-------------------------------------------------------------------------------------|-------------------------------------|
| Text                                                                                | Meaning                             |
| 1/N   or   1/EN                                                                     | En-dash                             |
| 1/M   or   1/EM                                                                     | Em-dash                             |
| 2/M   or   2/EM                                                                     | Two Em-dash                         |
| □                                                                                   | Indent one em or insert one em quad |
| □□                                                                                  | Indent two ems                      |
| ¶                                                                                   | New paragraph                       |
| No ¶                                                                                | No paragraph                        |
| ¶                                                                                   | Flush paragraph                     |
|    | Runover to next line                |
|  | Runover to preceding line           |
| out—see copy                                                                        | Omitted matter                      |
| ld>                                                                                 | Insert lead                         |
| #                                                                                   | Insert space                        |
| hr#                                                                                 | Insert hair space                   |
| l/s or ls#                                                                          | Letterspace                         |
| ^✓ or eq#                                                                           | Equalize space                      |
| ⌒                                                                                   | Less space between words            |
| ○                                                                                   | Close up space                      |

DMJAB036

Figure 1-47.—Proofreader's marks for spacing.

*Continued on next page*

## Proofreader's Marks, Continued

Marks  
(Continued)

Figure 1-48 shows proofreader's marks for punctuation.

| PUNCTUATION         |                                      |
|---------------------|--------------------------------------|
| Text                | Meaning                              |
| ⊙ or ./             | Period or full point                 |
| ^, or , /           | Comma                                |
| = or /=/            | Hyphen                               |
| ⊙ or :/             | Colon                                |
| ⊙ or /              | Semi-colon                           |
| ∨                   | Apostrophe or single quote           |
| !/                  | Exclamation point                    |
| ?/                  | Question mark or interrogation point |
| ⊙                   | Query to author                      |
| (/) or ( ) or (   ) | Parentheses                          |
| [ ] or [   ]        | Brackets                             |
| { } or { }          | Braces                               |
| ^ or ∨              | Carot (insertion)                    |
| “ ”                 | Double quotation marks               |
| ‘ ’                 | Single quotation marks               |

DMJAC036

Figure 1-48.—Proofreader's marks for punctuation.

*Continued on next page*

**Proofreader's Marks, Continued**

**Marks  
(Continued)**

Figure 1-49 shows proofreader's marks for alignment.

**ALIGNMENT**

| Text   | Meaning                     |
|--------|-----------------------------|
| =      | Align horizontally          |
| ∥      | Align vertically            |
| ⌋⌋     | Center horizontally         |
| ⌋<br>⌋ | Center vertically           |
| ⌋      | Move left                   |
| ⌋      | Move right                  |
| ⌋      | Bring indented matter left  |
| ⌋      | Bring indented matter right |
| ⌋      | Move up                     |
| ⌋      | Move down                   |
| ⌋ or ⌋ | Transpose                   |

DMJAD036

**Figure 1-49.**—Proofreader's marks for alignment.

*Continued on next page*

# Proofreader's Marks, Continued

**Preliminary review**

Before reviewing text and illustrations, do a preliminary review. Run through the copy several times, looking for different errors each time. A checklist will make sure the proofreader does a thorough job searching for errors. Start at the beginning of the copy for each step in the following checklist.

Preliminary review:

| Step | Action                                                                                                                                                                                                                                     |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Review the copy to see if all pages are in sequence and the artwork is available.                                                                                                                                                          |
| 2    | Locate the cover. Write the word "cover" in the upper-left corner and circle the word. If the cover is art, write on a blank piece of paper the same size as the artwork and write "cover-see artwork submitted." This is page number one. |
| 3    | Number the pages. At the end of the last page write "all" and circle it.                                                                                                                                                                   |
| 4    | Check to make sure the classification is correctly marked on each page and that the distribution statement is correct.                                                                                                                     |

Now you are ready to concentrate on the text review.

*Continued on next page*

## Proofreader's Marks, Continued

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### Text review

Once you complete the preliminary review, begin marking type styles and sizes. Stamp or write, in the upper-left corner of each page, the type style and size, desired leading, and the width of the line. Mark headings, legends, and display lines separately maintaining uniformity throughout the document. Mark legends for type size and length of line. Key artwork into the manuscript by inserting the notation "illustration no. \_\_\_\_ inserted here." Make sure all text to be set in italics, small caps, and caps are correct. Underlining a word indicates italics, two underlines means set the text in small caps, three underlines means large caps and a wavy underline means set the word in boldface.

---

### Margin and indentation review

Review the copy again, this time mark all indentations. It is not necessary to mark paragraphs if they are clearly indicated in type. Marks for paragraphs include the paragraph sign (¶), or the em square(□). Mark "fl" next to lines that run flush. Mark unusual indentations. Numbers 1 through 9 are indented 1 em or 1 en (1 nut), while two-digit numbers are set flush to align figures set in type. Set tables one type size smaller than the main body type and set box heads one type size smaller than table type.

---

### Clarity

Nothing should be left for the printer to question. Mark anything that is not easily understood. Emphasize mathematical symbols, Greek letters, unusual spellings and abbreviations. Indicate that these irregularities must remain by marking "stet" or "follow" next to them. If making notations on the copy, circle it so that the printer does not confuse it with the copy. Once you complete your review of the text, edit the copy again to make sure you are consistent with your marks and instructions.

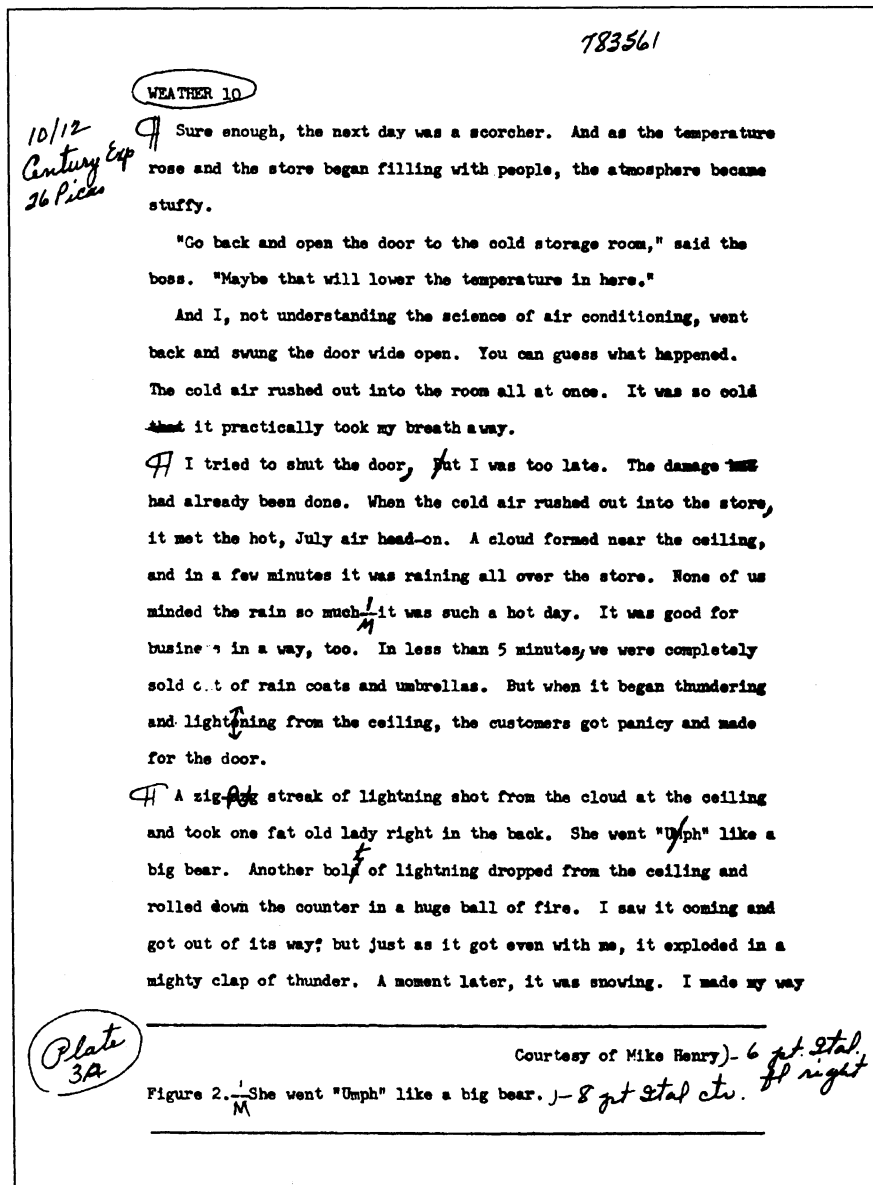
---

*Continued on next page*

## Proofreader's Marks, Continued

Clarity  
(Continued)

Figure 1-50 shows an example of text marked for the printer.



DMJA0037

Figure 1-50.—Text marked for the printer.

Continued on next page

## Proofreader's Marks, Continued

### Clarity (Continued)

Figure 1-51 shows an example of paragraph and indentation marking for the printer.

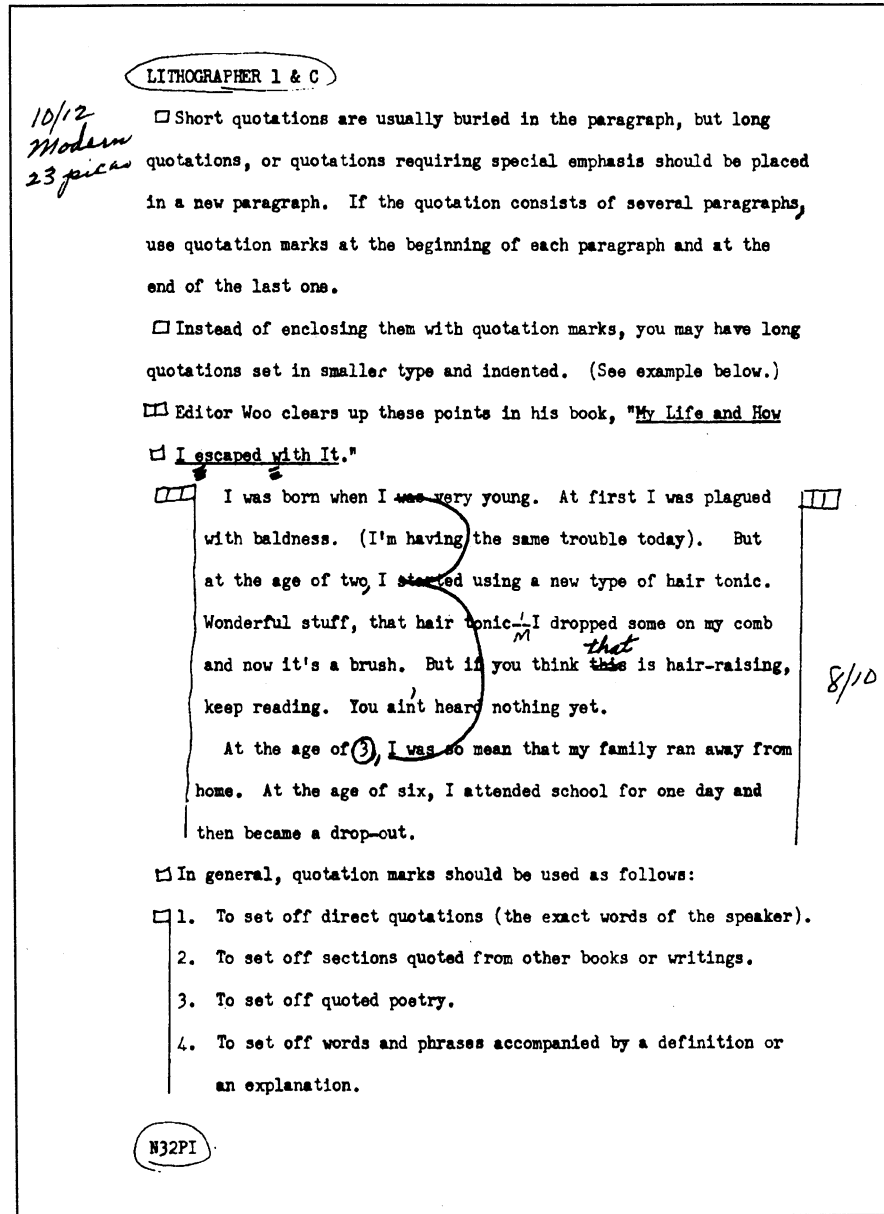


Figure 1-51.—Paragraph and indentation marking for the printer.

Continued on next page

## Proofreader's Marks, Continued

---

**Artwork review** In reviewing artwork, you must be able to determine if it will reproduce properly. Submit original art for reproduction. The artwork should be of higher contrast than the contrast desired in the final reproduction. Use the following checklist to review artwork.

Artwork review:

| Step | Action                                                                                                                                                                                                                            |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Check each piece of artwork for copyright. If you use copyrighted material, review the letter of permission to make sure your use falls within specified parameters and a credit line appears to indicate its source.             |
| 2    | Check line resolution. Lines should be dense and black without filling in or blurring.                                                                                                                                            |
| 3    | Check the accuracy of the crop marks.                                                                                                                                                                                             |
| 4    | Review the instructions to the camera operator for clarity.                                                                                                                                                                       |
| 5    | Check each overlay for the correct color notations and registration marks.                                                                                                                                                        |
| 6    | Make sure the preferred reproduction treatment and finished shape appears on each piece of art.                                                                                                                                   |
| 7    | Each piece of art should have the title of the job and a figure number assigned. Assemble all of the artwork in sequence, number them consecutively and write the plate number on the flap or cover attached to the illustration. |

---

*Continued on next page*

## Proofreader's Marks, Continued

---

**Paste-up review** The mechanical is ready for review after all text and illustrations are scaled, cropped, typeset, proofed, checked, and pasted into place. This is the last chance for correction before the printer begins to prepare press plates.

To review the mechanical, follow this table:

| Step | Action                                                                                  |
|------|-----------------------------------------------------------------------------------------|
| 1    | Review the mechanical for cleanliness.                                                  |
| 2    | Erase all pencil guidelines.                                                            |
| 3    | Remove excess adhesive.                                                                 |
| 4    | Examine line resolution for breaks or irregularities..                                  |
| 5    | Eliminate smearing and smudges.                                                         |
| 6    | Make sure all instructions are clear and convey exactly the preferred finish treatment. |

---

## Quality Control

---

|                     |                                                                                                                                                                                                                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b> | Vigorously control the quality of the mechanical before it leaves the shop to minimize production expenses and needless delays poorly executed mechanicals create. But, quality control extends beyond the shop and into your follow-up with the print shop.                                                           |
| <b>Precautions</b>  | Once the job is sent to the printer, periodically check on its progress. Anticipate problems and offer assistance. Do not change a job in progress. During lengthy preparation periods, inform the originator on the progress of the job and any problems with the job. Insist on quality at every stage of execution. |

---

## Summary

---

### Review

This chapter covers traditionally created mechanicals for offset lithography from prepress considerations to quality control of the finished publications. Good preparation and planning are paramount in typesetting, copyfitting, scaling, cropping, retouching, and pasting copy for reproduction. Follow the tables within this text or develop your own checklists to ensure professional quality mechanicals leave the shop. Avoid common pitfalls in printing. The time you save by thorough preparation is phenomenal.

---

### Comments

The skills Lithographer's Mates possess for reproducing material of uncompromising quality is greatly undervalued in the charged atmosphere of electronic digitization. For a real education on printing and the effects of good and poor mechanical preparation, find a Navy Print shop and follow a job from the time it enters the shop until the time it leaves. Obtain and complete the LI training manual. There is no better way to learn the subtiles of creating artwork for reproduction or halftones, and negatives of correct density than to experience it. Learn quickly before it becomes a skill lost to technology.

## CHAPTER 2

### AUDIOVISUAL PRESENTATIONS

#### Overview

---

##### Introduction

Part of your job as a DM is to prepare visual aids to support instructional activities, command briefings, conferences, and lectures. These events may use a variety of communication and projection devices to convey statistical data and operational information clearly and rapidly. An effective visual promotes efficient communications.

---

##### Objectives

The material in this chapter enables you to do the following:

- Match media products with intended audiences.
  - Catalog, file, and store graphs, charts, prints, slides, and viewgraphs.
  - Create master art for slides or viewgraphs.
  - Mount and mat artwork and photographs.
- 

*Continued on next page*

## Overview, Continued

**In this chapter** This chapter covers the following topics:

| Topic                            | See Page |
|----------------------------------|----------|
| Media Selection                  | 2-3      |
| Posters                          | 2-4      |
| Lecture Pads                     | 2-5      |
| Organization Charts              | 2-6      |
| Flow Charts                      | 2-16     |
| Graphs                           | 2-18     |
| Mounting                         | 2-25     |
| Matting                          | 2-32     |
| Viewgraphs                       | 2-35     |
| Slides                           | 2-48     |
| Computer-Generated Presentations | 2-51     |

## Media Selection

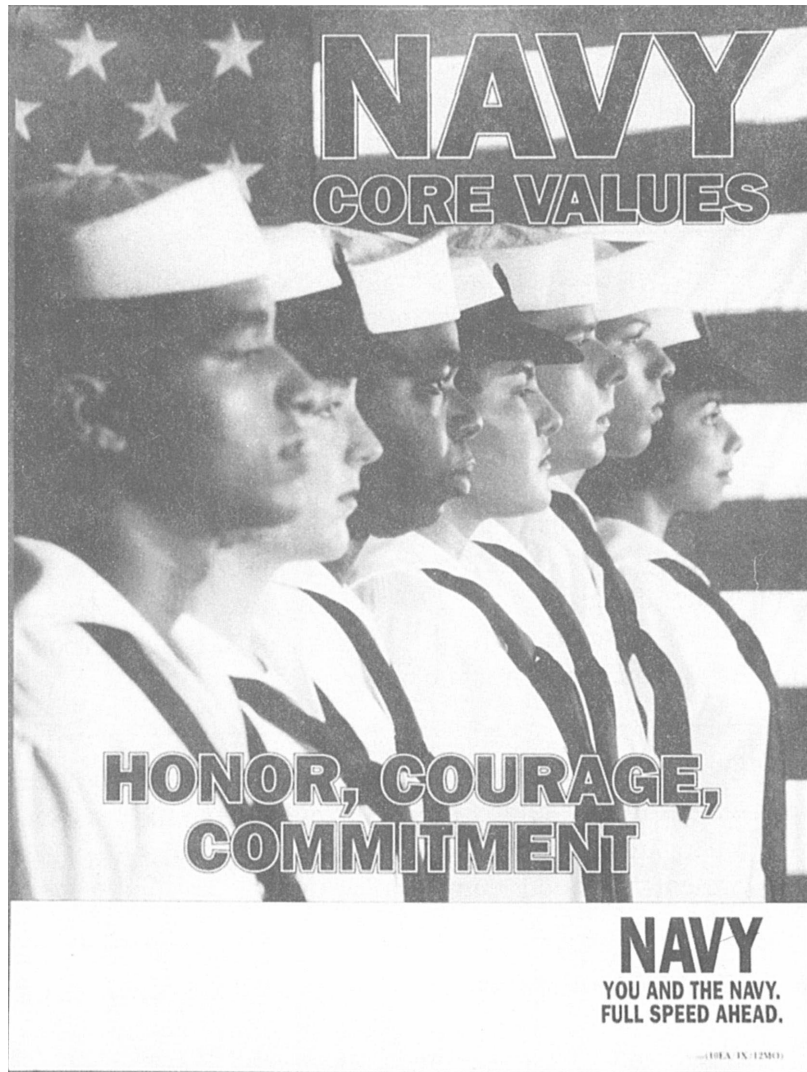
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b>       | Selecting the most appropriate method of presentation depends upon the objectives of the originator and the intended message. Often, the originator makes this decision before requesting artwork. However, if the choice has not been made, or the originator is open to suggestion, your expertise in presentation methods becomes invaluable.                                                                  |
| <b>Types of aids</b>      | Once the objectives and information have been set, make a decision on how to effectively convey the information and what type of training aids you intend to use. A flyer or poster may suffice, or perhaps the information warrants a lengthy brief. Regardless of the form of presentation, the two major types of briefing or training aids are manipulative aids and demonstrative aids.                      |
| <b>Manipulative aids</b>  | Manipulative aids are training aids that physically require audience participation. This method could be complicated and tax the intellectual and physical abilities of the student, such as a flight trainer, or simple, such as writing on a lecture pad. Manipulative aids teach skills.                                                                                                                       |
| <b>Demonstrative aids</b> | As a DM, most of your work involves demonstrative aids. These training aids present material or knowledge functions for the student to intellectually digest. Demonstrative aids show objects, processes, or concepts. They depict things that are naturally invisible (gases, electrons), hidden (internal parts), obscure (difficult to understand), or dangerous. Demonstrative aids can be dynamic or static. |
| <b>Dynamic aids</b>       | Dynamic aids are demonstrative aids that show movement, progressive disclosure, or some form of change. Examples of dynamic training aids are video, motion pictures, viewgraphs with overlays, and computer-generated presentations and animation.                                                                                                                                                               |
| <b>Static aids</b>        | Static aids are demonstrative aids that are static in nature and do not depict movement or change. Examples of static aids include lecture pads, posters, slides, and viewgraphs and cartoons.                                                                                                                                                                                                                    |

## Posters

### Posters

Posters are a form of static display. They convey short messages simply and directly. Their purpose is to attract attention and get a message across quickly. The lettering on a poster should be a part of the design, and the message should be as brief and clear as possible.

Figure 2-1 is an example of a poster.



**Figure 2-1.**—A poster.

## Lecture Pads

---

### Lecture pads

Lecture pads are large pieces of paper bound together on an easel. Lecture pads lend themselves well to impromptu or spontaneous briefing or training techniques. They create the illusion of an intimate presentation. They can also fail miserably as a presentation technique with an inexperienced presenter. Some presenters request the DM to letter the lecture pad before presentation.

---

### Constructing the lecture

Use freehand lettering to create the text. When you create a lecture on a lecture pad for presentation, use the following guidelines:

- Make the letters legible.
- Use capital letters for short titles and capitals and lower case letters for captions and phrases that exceed five or six words.
- Optically space letters to present visually pleasing information in a logical sequence.
- Maintain adequate white space between lines of lettering to promote legibility.
- Use fresh markers that contrast sharply with the background color of the lecture paper.
- Confine the copy to short, descriptive text.
- Limit each page to one major topic.
- Avoid smudging lecture paper. Use a piece of scrap paper between your arm and the paper surface.
- Place a sheet of paper in between sheets of the lecture pad to prevent markers from bleeding through and spotting the next page.

If you have many pages to letter, make a layout in black ink on a separate sheet of paper or cardstock to slip underneath the page you are working on. This will eliminate pencil lines and excessive erasures on the final product.

---

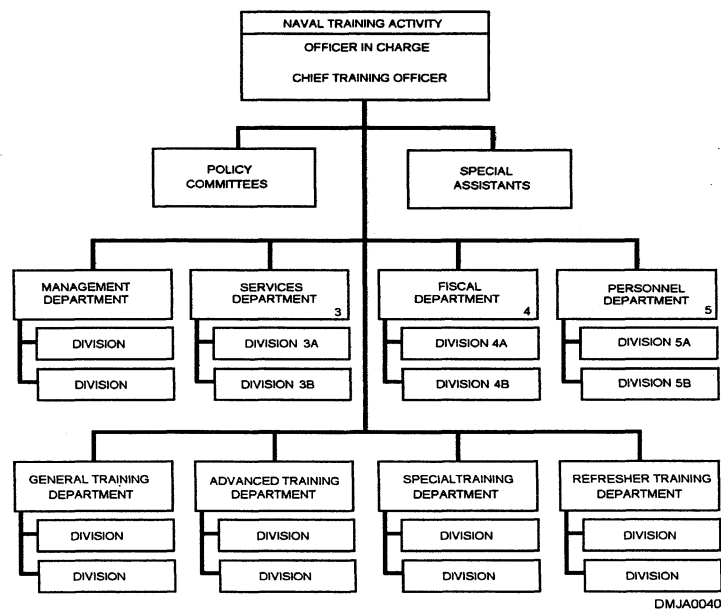
# Organization Charts

**Introduction** Organization charts or diagrams graphically show the structure of an organization. Organization charts may show the titles, departments, or responsibilities of personnel in an organization. They also serve to outline responsibilities and illustrate the chain of command. Create organization charts that are clearly understood.

**Organization charts** To be effective, limit organization charts to showing lines of authority, responsibility, the span of control, or functional relationships. Do not include individual names. The three types of organization charts are the structural chart, the functional chart, and the position or billet assignment chart.

**Structural chart** A structural chart is the most simple representation of an organization. It establishes basic control relationships and reporting responsibilities. It contains a minimal amount of information.

Figure 2-2 shows a structural organization chart.



**Figure 2-2.** —A structural organization chart.

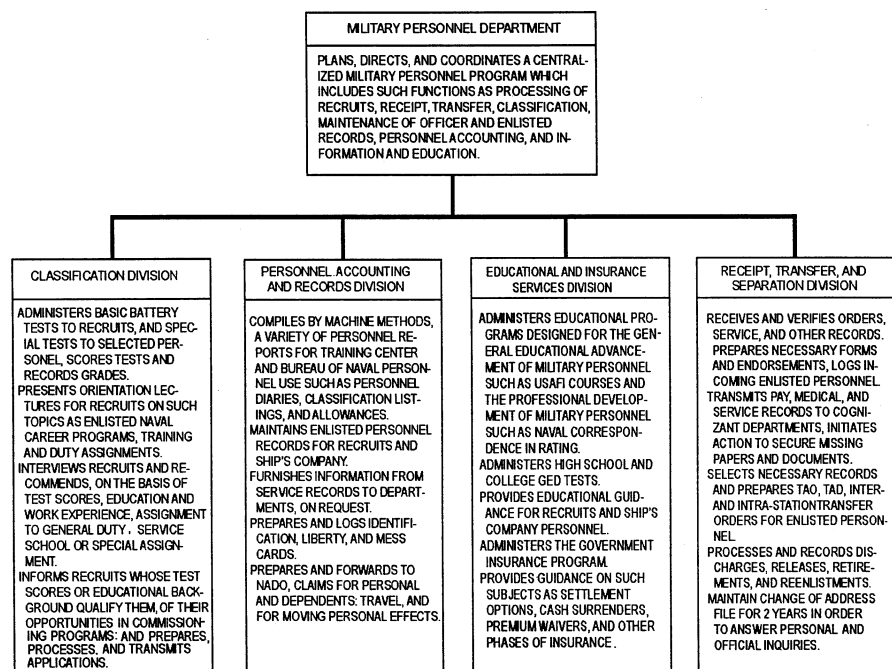
*Continued on next page*

## Organization Charts, Continued

### Functional chart

A functional chart shows the functions of the components represented. The blocks of the chart contain text explaining the function of each component on the chart.

Figure 2-3 shows a functional chart.



DMJA0041

Figure 2-3. —A functional organization chart.

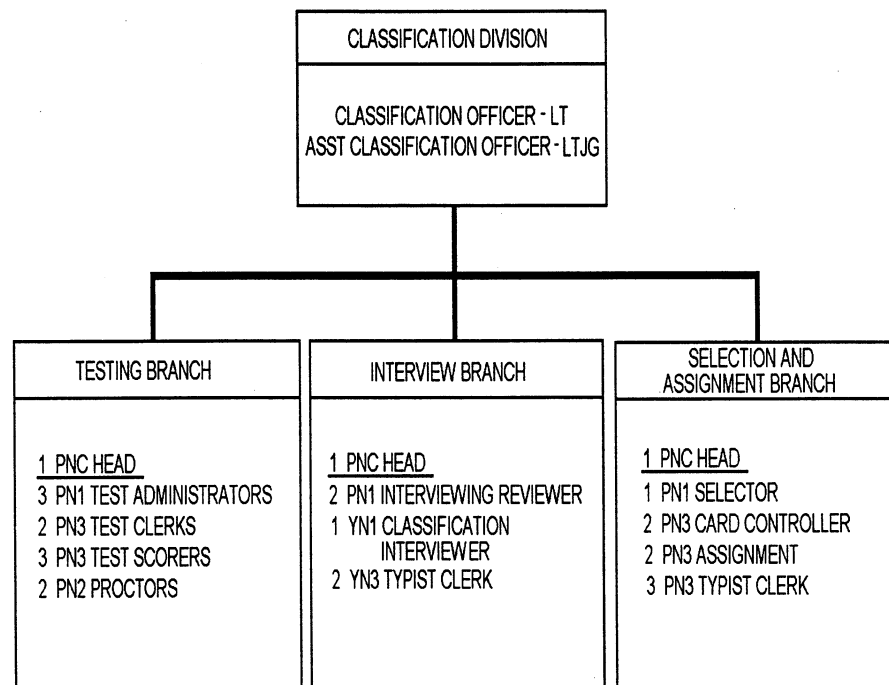
*Continued on next page*

## Organization Charts, Continued

### Position or billet assignment chart

A position or billet assignment chart shows the various billets required by the components of an organization. This chart may show names, billets or titles, and grades of personnel in the component positions. Because names and grades of assigned individuals change frequently, create a position or billet assignment chart framework to laminate or save on permanent disk memory before adding data that frequently change.

Figure 2-4 shows a position or billet assignment chart.



DMJA0042

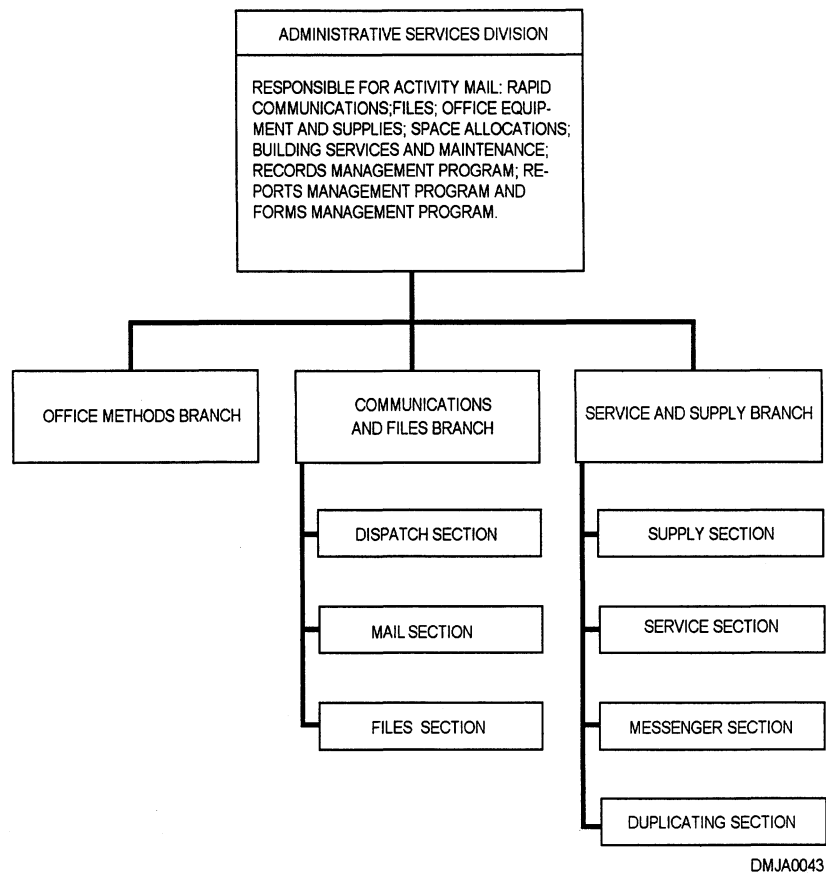
**Figure 2-4.** —A position or billet assignment organization chart.

*Continued on next page*

## Organization Charts, Continued

**Combinations** The intended use of a chart should guide you in selecting the type of chart to create. If the chart is small and simple, you may be able to combine all three types of charts into one, however, combining too much information into one chart makes the chart more difficult to use.

Figure 2-5 shows a combination chart.



**Figure 2-5.** —A combination organization chart.

*Continued on next page*

## Organization Chart, Continued

### Chart format

Organization charts should conform to specific standardized practices while maintaining the principal points of completeness, simplicity, clarity, symmetry, and unity.

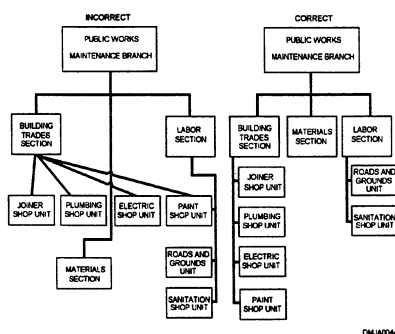
**STANDARDIZED PRACTICE:** Section blocks should be the same size, and drawn on the same level. In limited space, draw subsidiary components in a vertical line directly below the parent component. When drawing lines of authority to vertically drawn components, use one line and branch each subsidiary unit from it. Do not use diagonal lines. Avoid crossing lines of authority.

**COMPLETENESS:** Make an organization chart as complete as possible in identifying component relationships. Write notes on subsidiary activities, additional duties, inactive functions, and provide other clarifying statements. Place the date in the upper-left corner.

**SIMPLICITY:** Eliminate confusing or complicated elements. Arrange blocks to simplify lines of authority so long as the information on the chart remains correct.

**CLARITY:** Clarity and simplicity are similar, not identical. A chart with only a limited number of blocks is simple but if the lines are confusing or the blocks or titles omitted, the chart is not clear.

Figure 2-6 shows effective and ineffective organization charts.



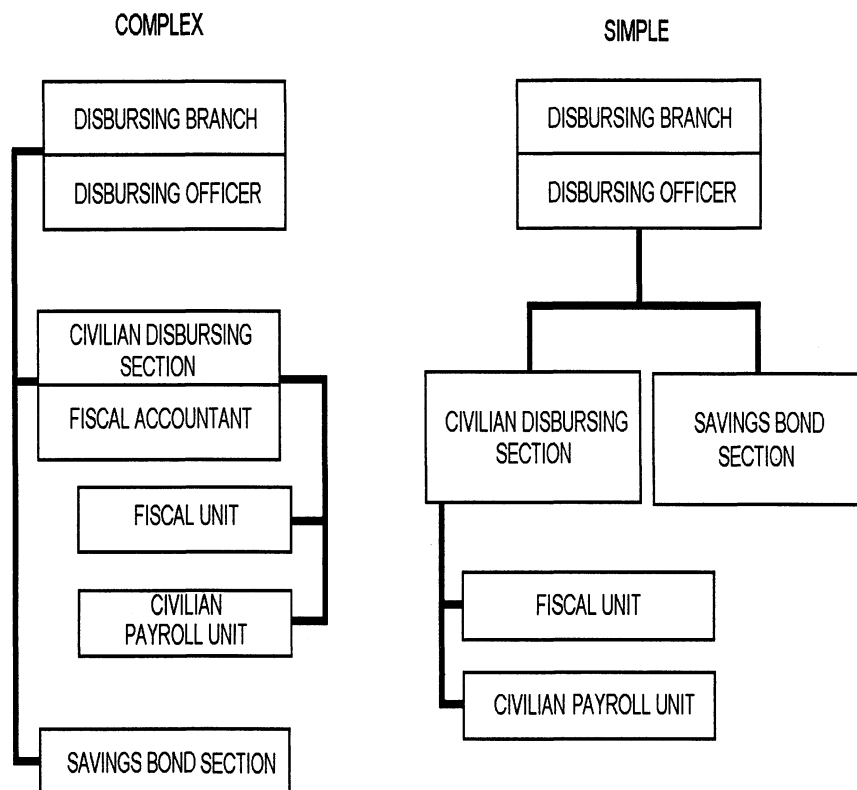
**Figure 2-6.** —A correctly and incorrectly drawn organization chart.

*Continued on next page*

## Organization Chart, Continued

**Chart format  
(Continued)**

Figure 2-7 shows an organization chart modified to make it less complex.



DMJA0045

**Figure 2-7.** —Simplifying organization charts.

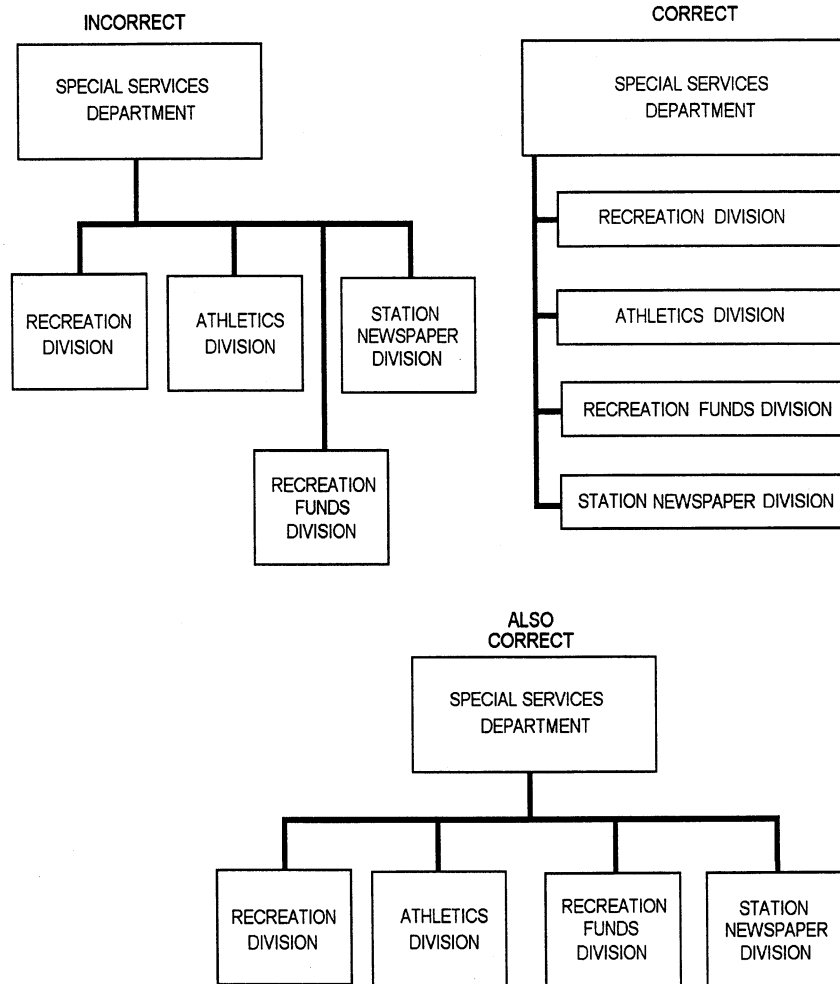
*Continued on next page*

## Organization Chart, Continued

### Chart format (Continued)

**SYMMETRY:** You should create a visual balance of the chart on the paper, either symmetrically or asymmetrically. A chart that is not balanced on the paper appears disconcerting.

Figure 2-8 shows an organization chart modified to make it balanced and symmetrical.



DMJA0046

**Figure 2-8.** —An organization chart modified to make it balanced and symmetrical.

*Continued on next page*

## Organization Chart, Continued

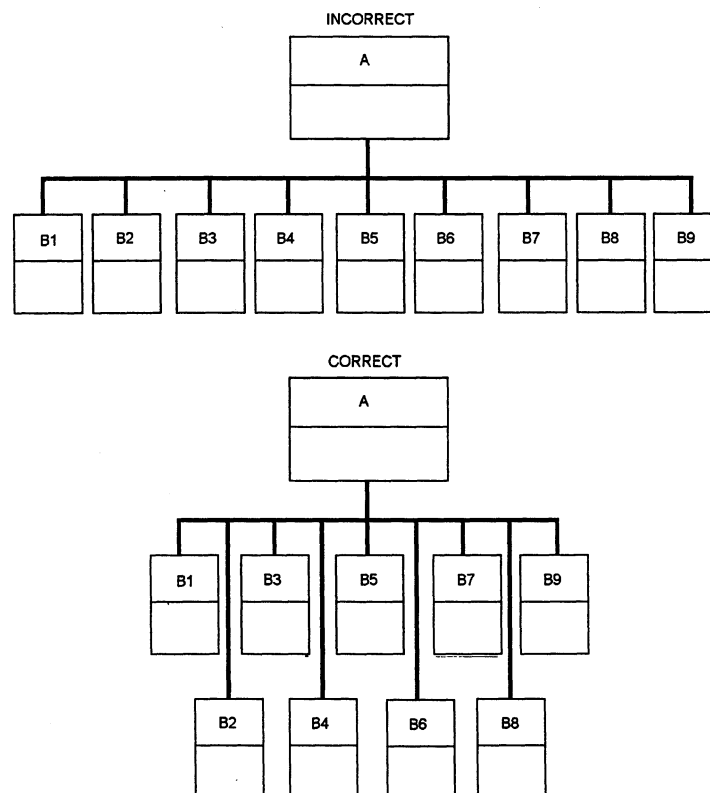
### Chart format (Continued)

UNITY: Unity involves each component on the chart relating to the other components. No branch, unit, or section can exist by itself. Each element must be clearly subordinate to a command authority.

### Block construction

As a general rule, make the blocks in an organization chart proportional. The command block is usually the largest with successive level blocks proportionally smaller. An exception is the functional chart where you should allow more room for descriptive statements. Stagger blocks on levels with numerous subdivisions to conserve space.

Figure 2-9 shows an organization chart redrawn with the numerous subdivisions staggered to conserve space.



DNJA0047

**Figure 2-9.** —Subdivision staggering.

*Continued on next page*

## Organization Charts, Continued

---

### Line conventions

The two types of line conventions used in organization charts are lines of authority and block lines. Create a legend on a chart that contains lines of many resolutions or definitions.

**Lines of Authority:** Lines of authority are solid lines that run either horizontally or vertically from or to the center of each block. Take care not to cross lines of authority as this confuses the path of command. To denote liaison or intercommunication, use a dashed line and explain the relationship in a legend.

**Block Lines:** You may use many variations of line resolutions to indicate special circumstances or relationships on an organization chart. If you do, place a legend on the chart to explain their meaning. Use the following table to determine the appropriate line convention for your organization chart.

| Line Conventions                         | Purpose                                                            |
|------------------------------------------|--------------------------------------------------------------------|
| Solid line                               | Existing, full-time subdivisions.                                  |
| Dashed (hidden) line - - - - -           | Proposed, full-time subdivisions.                                  |
| Alternating dot-dot-dash lines . . _ . . | Full-time subdivisions being abolished.                            |
| Dotted line . . . . .                    | Inactive command components or components manned upon mobilization |

---

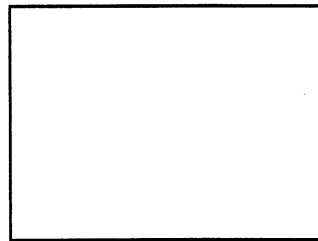
*Continued on next page*

## Organization Charts, Continued

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### Line conventions (Continued)

Figure 2-10 shows block line conventions.



EXISTING FULL-TIME  
SUBDIVISIONS



PROPOSED FULL-TIME  
SUBDIVISIONS



FULL-TIME SUBDIVISIONS  
BEING ABOLISHED



INACTIVE COMMAND  
COMPONENTS  
MANNED UPON  
MOBILIZATION

DMJA0048

**Figure 2-10.** —Line conventions.

# Flow Charts

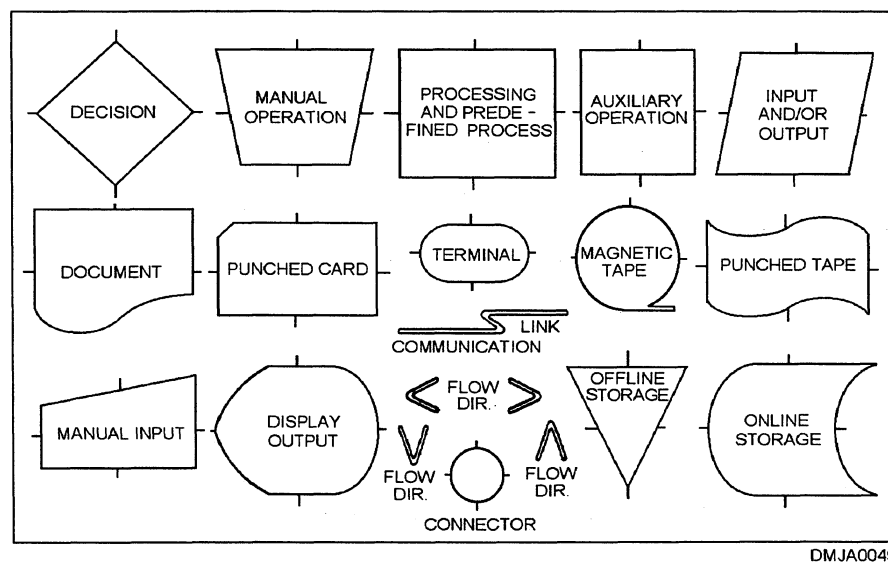
## Introduction

Flow charts show the steps or stages of a process. They show the sequence of operations and the operations performed. You must be able to interpret and translate various symbols to create a chart that is easy to visualize and follow.

## Symbols

The language of flow charts is symbols. These symbols represent decision points, devices, and functions. The symbols are uniform in meaning and always have the same meaning regardless of where they appear. Symbols drawn over themselves represent multiples or sequential steps. The multiple symbols are drawn from front to back. Use a flow chart template to construct a flow chart.

Figure 2-11 shows a flow chart template.



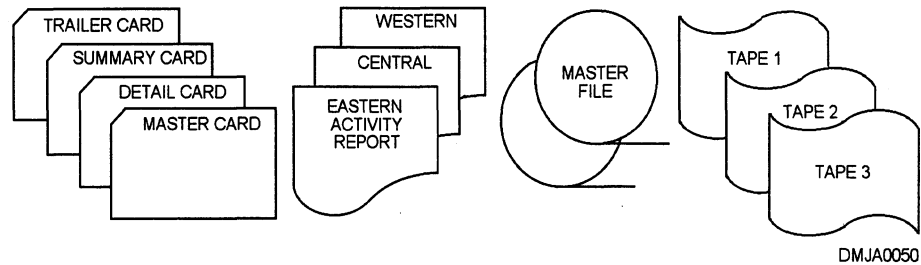
**Figure 2-11.** —A flow chart template.

*Continued on next page*

## Flow Charts, Continued

### Symbols (Continued)

Figure 2-12 shows flow chart symbols in multiples.



**Figure 2-12.** —Flow chart symbols drawn in multiples to represent multiple cards, reports, files, or tapes.

### Flow

The arrangement of flow chart symbols shows the direction of flow. Flow direction is from left to right and top to bottom. If the direction of flow is otherwise, indicate the direction with arrowheads placed at the point of entry to the symbol.

### Construction

Most flow charts are intended for distribution so you should make a flow chart on 8 1/2 by 11-inch paper or a size proportional to it.

To construct a flow chart, use the following table:

| Step 1 | Action                                                                                                                                                                         |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | Draw the primary flow lines in nonreproducible pencil. Allow enough space in between these lines for the largest symbols and any additional flow lines, arrowheads, and notes. |
| 2      | Using the template, draw the symbols in nonreproducible pencil. Set the symbols equidistant from each other.                                                                   |
| 3      | Ink over symbols.                                                                                                                                                              |
| 4      | Ink over flow lines and arrowheads.                                                                                                                                            |
| 5      | Add lettering.                                                                                                                                                                 |

# Graphs

## Introduction

Graphs are a graphic representation of quantitative data such as a table or chart. A graph, or chart, conveys information, data, and statistics for comparison, analysis, and prediction. Graphs are easier to understand than a table of text and figures. The graphs covered in this segment are rectangular coordinate graphs, bar graphs, line graphs, percentage bar graphs, and pie charts.

## Rectangular coordinate graphs

Rectangular coordinate graphs show the relationship between two or more variables. You can plot a large number of points and compare their related curves to show overall trends as opposed to absolute quantities. These points or coordinates reflect quantities in relation to a given reference frame.

## Reference frame

A reference frame of a rectangular coordinate graph is a vertical and a horizontal line that intersect at a 90-degree angle. The vertical line is the y-axis and the horizontal line is the x-axis. The point of intersection of the y- axis and x-axis is the coordinate 0, (0,0), or origin. This intersection creates four quadrants, numbered counterclockwise I, II, III, and IV. The following table lists the value of each quadrant:

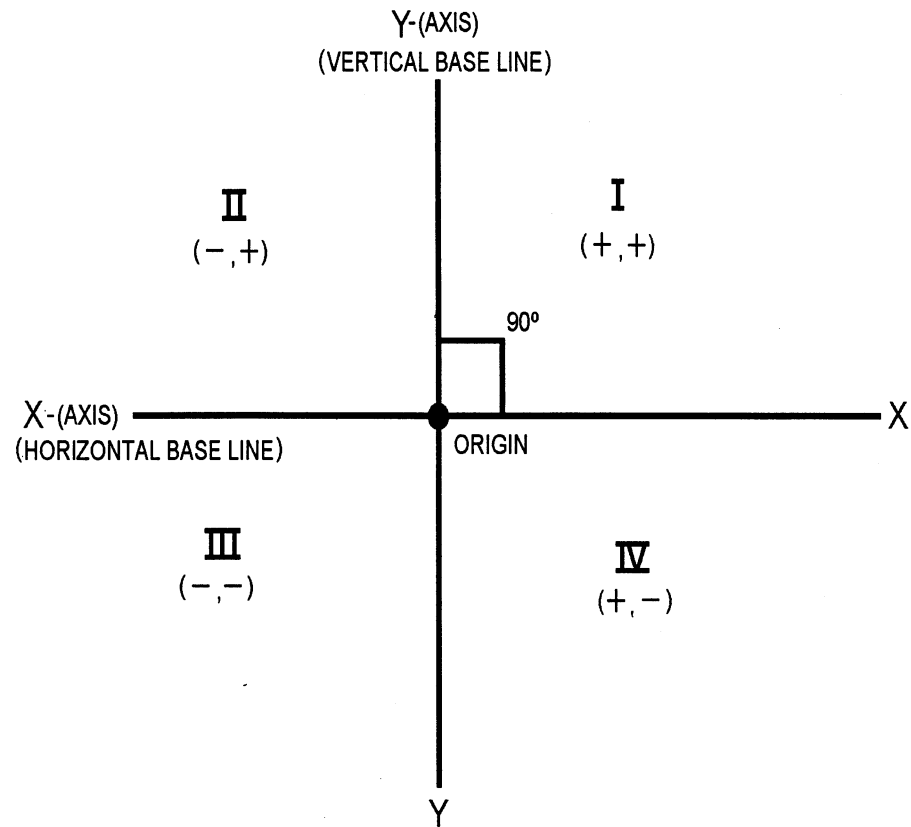
| Quadrant     | Value                                           |
|--------------|-------------------------------------------------|
| Quadrant I   | Positive values along each axis.                |
| Quadrant II  | Negative x-axis values, positive y-axis values. |
| Quadrant III | Negative values along each axis.                |
| Quadrant VI  | Positive x-axis values, negative y-axis values. |

*Continued on next page*

## Graphs, Continued

### Reference frame (Continued)

Figure 2-13 shows a reference frame of a rectangular coordinate graph with the quadrants indicated.



DMJA0051

**Figure 2-13.** —A rectangular coordinate graph.

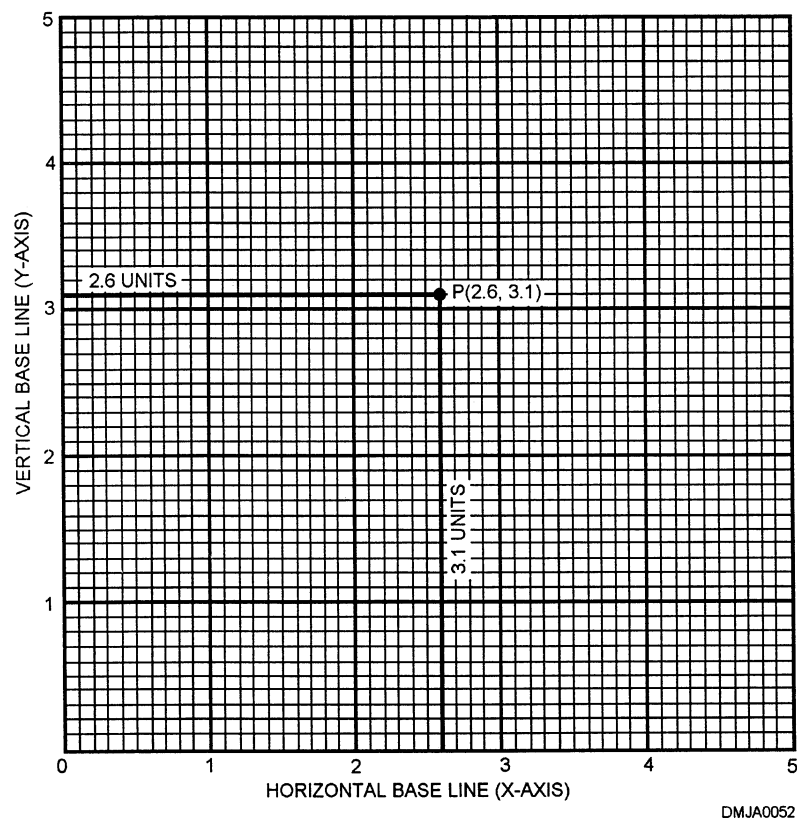
*Continued on next page*

## Graphs, Continued

### Coordinates or points

The coordinates or points on a rectangular coordinate graph represent quantities. You can plot a large number of points in a compact space to show several related quantities. Show the coordinates on the graph as a pair of numbers placed inside parentheses and separated by a comma. List the x-coordinate first, followed by the y-coordinate. If the point has a letter designator, for example P (point), place it to the left outside of the parenthetical coordinates.

Figure 2-14 shows a rectangular coordinate graph with designated points.



**Figure 2-14.** —The coordinates of point P.

*Continued on next page*

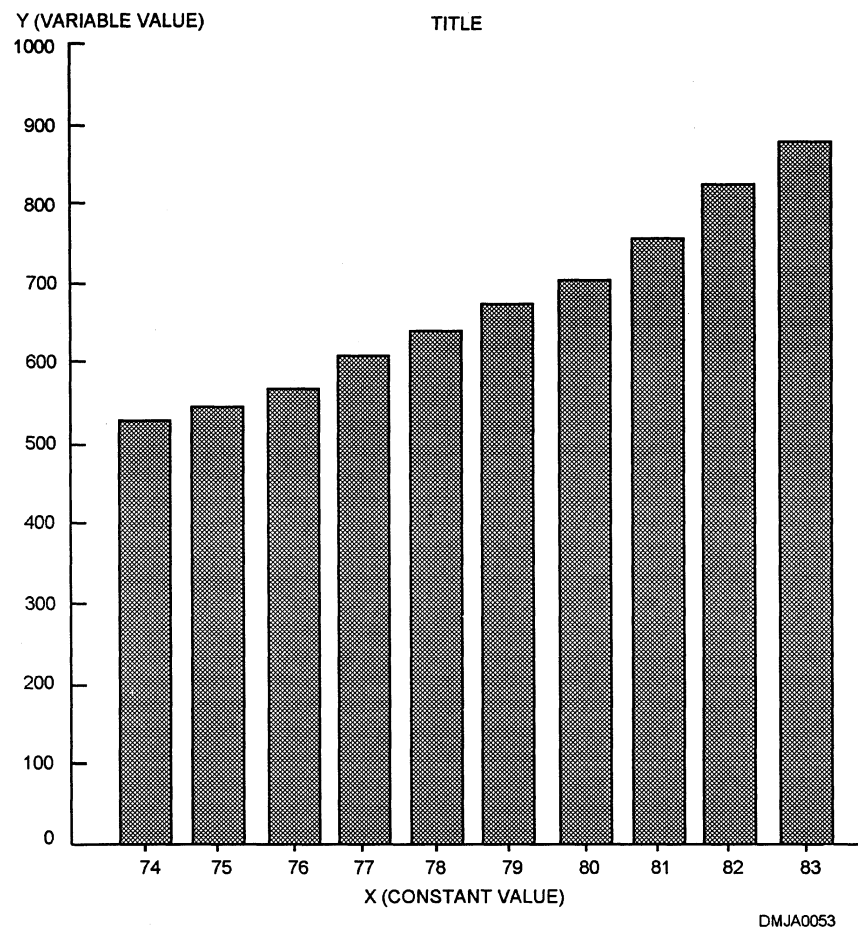
## Graphs, Continued

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### Bar graphs

A bar graph shows, by varying lengths of parallel lines, comparisons or trends in quantitative measure. Plot constant values along the x-axis and dependant or variable values along the y-axis. Providing the information is kept simple and a legend defines the bar representation, you can display more than one set of figures on a bar graph.

Figure 2-15 shows a simple bar graph.



**Figure 2-15.** —A bar graph.

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*Continued on next page*

## Graphs, Continued

### Bar graphs (Continued)

To construct a bar graph, use the following table:

| Step | Action                                                                                                                                                                                                                                                                                                                                                |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Use an x- and y-axis as a reference frame.                                                                                                                                                                                                                                                                                                            |
| 2    | Determine which axis to assign each value.                                                                                                                                                                                                                                                                                                            |
| 3    | Select a paper size. Fill the entire page proportionally. Allow for margins, figures, and explanatory notes.                                                                                                                                                                                                                                          |
| 4    | Determine a scale for the x-values. <ul style="list-style-type: none"><li>● Leave space between the y-axis and the first plot.</li><li>● Leave an equal amount of space after the last plot as you left between the y-axis and first plot.</li><li>● Center the parallel bar over the plot along the axis.</li></ul>                                  |
| 5    | Determine a scale for the y-values. <ul style="list-style-type: none"><li>● Use the largest value and round this to the next higher number.</li><li>● Make sure to leave space for the margins, title, and explanatory notes.</li><li>● Divide the remaining space by the number of values you require and select an appropriate dimension.</li></ul> |
| 6    | Lay out the x-axis.                                                                                                                                                                                                                                                                                                                                   |
| 7    | Lay out the y-axis.                                                                                                                                                                                                                                                                                                                                   |
| 8    | Plot the values.                                                                                                                                                                                                                                                                                                                                      |
| 9    | Ink or tape in the axes and bars.                                                                                                                                                                                                                                                                                                                     |
| 10   | Letter the graph.                                                                                                                                                                                                                                                                                                                                     |

*Continued on next page*

## Graphs, Continued

### Line graphs

Line graphs are similar to bar graphs except that instead of drawing parallel bars, you plot a series of points with the coordinates. You then connect these points with a line. The lines may be of varying resolutions or colors provided you have drawn a legend on the chart to explain the meaning of each line.

Figure 2-16 show a line graph.

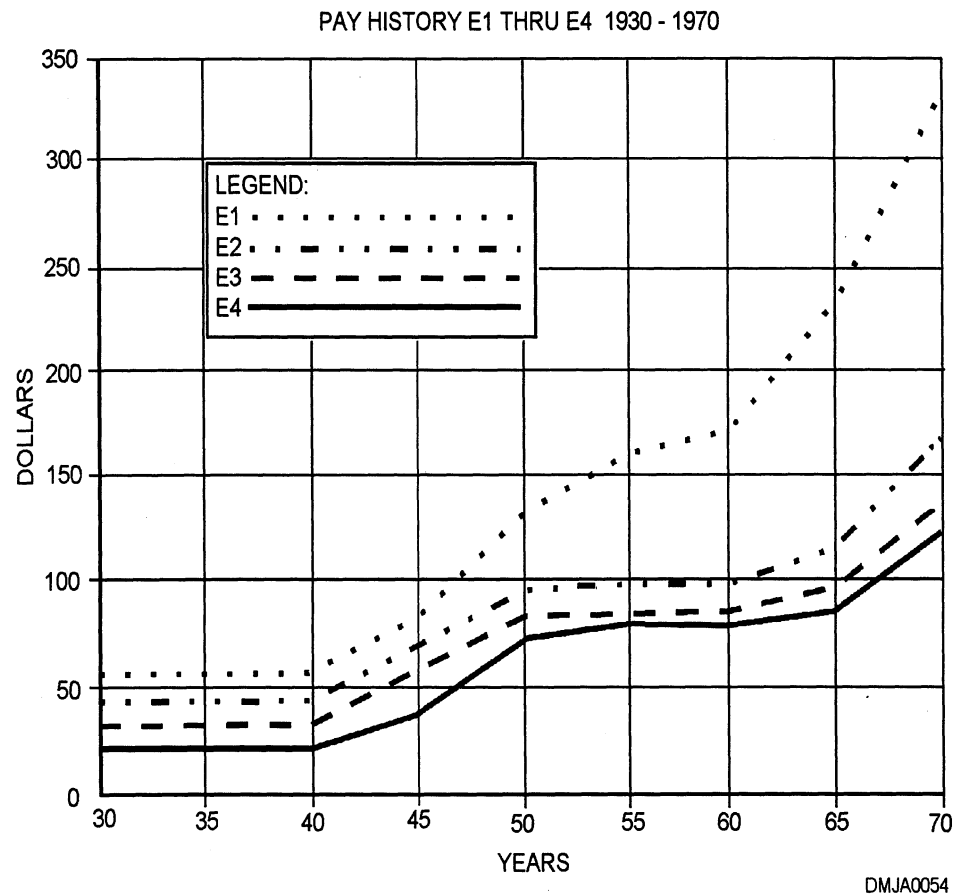


Figure 2-16. —A line graph.

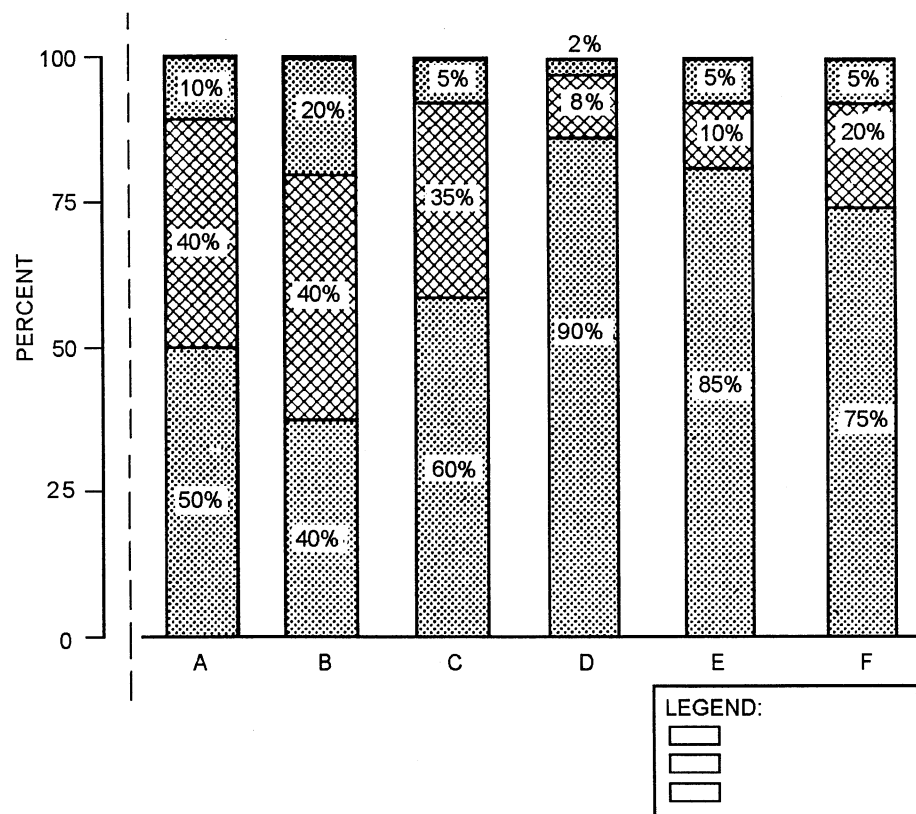
Continued on next page

## Graphs, Continued

### Percentage bar graphs

There are two graphs you may use to represent percentage breakdowns, percentage bar graphs and pie charts. Construct a percentage bar graph as you would a bar chart. However, each parallel bar extends full measure up the y-axis and has a sum total of 100 percent. Divide the parallel bar into percentages and indicate these figures within the section to which they pertain. To further clarify quantities, add color or shading to the various segments within the bar.

Figure 2-17 shows a percentage bar graph.



DMJA0055

Figure 2-17. —A percentage bar graph.

Continued on next page

## Graphs, Continued

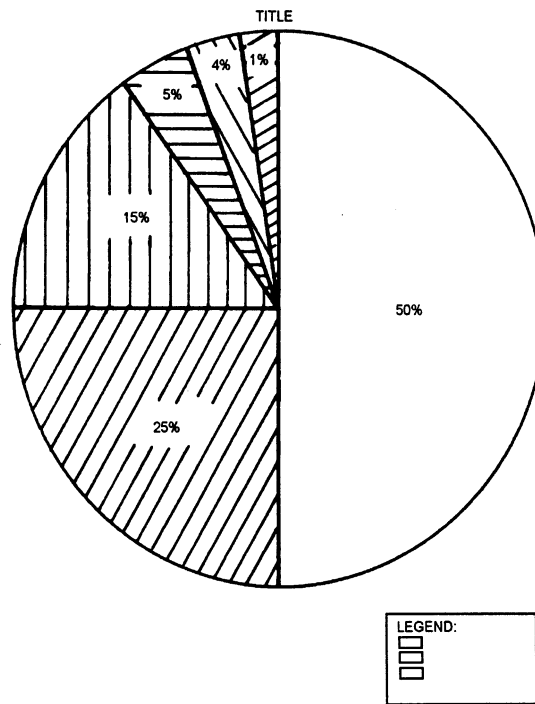
### Pie charts

Pie charts are another way of illustrating a percentage breakdown. Pie charts work well with information that is simple and has few divisions. To plot a pie chart, you should know angular measurement and how to use a protractor.

### Angular measurement

A pie chart is based on a 360-degree circle. Three hundred sixty degrees represents 100 percent. You should have solid information on the percentage value that the segments of the pie represent. Multiply the percentages individually by 3.6 to find the degree of angle to plot with the protractor on the pie. When you add up the plotted segments, you should have 100 percent. The formula for determining angular measurement on a pie chart is to take the given percentage and multiply by 3.6.

Figure 2-18 shows a completed pie chart.



DMJA0056

**Figure 2-18.** —A pie chart.

# Mounting

---

## Introduction

Sometimes, an originator asks only that you affix a photograph or artwork to a piece of cardstock. If the resultant work is used in a presentation, you must take great care to make the cardstock and image presentable and to keep all surfaces free of residual adhesive and dirt.

---

## Mounting

There are two ways to mount artwork to cardstock, the cold press technique and the hot press technique. Each technique uses wet and dry processes.

---

## Cold press

The cold press technique for mounting photographs and artwork involves using adhesive-backed paper or acetate, aerated rubber-based cement, aerosols, rubber cement, pastes, and wheat paste. The dry process uses adhesive-backed paper or acetate and aerated rubber-based cement. With the dry process, there is no liquid to spread. Dry processes allow little or no repositioning or correction. The wet process uses rubber cement, spray adhesive, pastes, and wheat paste. Wet processes are repositionable until dry, but their moisture could damage the image surface if the paper becomes saturated.

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*Continued on next page*

## Mounting, Continued

### Cold press (Continued)

To use an aerated rubber-based cement and associated press, use this table:

| Step | Action                                                                                                                                                                                                                                                           |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Unroll the adhesive and its backing sheet on a cutting surface, adhesive side up.                                                                                                                                                                                |
| 2    | Position image face up on the adhesive and lightly press around the edges with your hand.                                                                                                                                                                        |
| 3    | Trim adhesive and backing sheet to edges of the image.                                                                                                                                                                                                           |
| 4    | Place the adhesive sheet and image face down on the bedplate. Cover the item with the bedplate protective cover. If you do not have a bedplate, cover the item with scrap card stock and burnish the back with an agate burnisher, rubber roller, or spoon back. |
| 5    | Crank the bedplate handle to move the bedplate between a pair of rollers.                                                                                                                                                                                        |
| 6    | Remove the bedplate cover.                                                                                                                                                                                                                                       |
| 7    | Remove the paper backing sheet from the image to expose the cement.                                                                                                                                                                                              |
| 8    | Position the image on the presentation cardstock and repeat steps 4 through 6.                                                                                                                                                                                   |

*Continued on next page*

## Mounting, Continued

### Cold press (Continued)

To use rubber cement or an aerosol rubber cement, use this table:

| Step | Action                                                                                                                                                                                                                                   |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Cut out the artwork to correct size.                                                                                                                                                                                                     |
| 2    | Use a nonreproducing blue pencil to lightly mark the position of the artwork on the mounting board.                                                                                                                                      |
| 3    | Apply rubber cement or spray adhesive to the face of the mounting board within the area defined by the pencil marks and the back of the artwork.                                                                                         |
| 4    | Allow the cement to dry.                                                                                                                                                                                                                 |
| 5    | Place a slip sheet of paper or tracing paper over the cement covered surface of the mounting board leaving approximately 1/4-inch exposed at the top. Use two slip sheets when mounting large pieces and slide them out from the center. |
| 6    | Position the artwork face up and firmly press against the top (or center).                                                                                                                                                               |
| 7    | Slowly slide the slip sheet out of the way while smoothing the artwork against the mounting board. Smooth from the center of the artwork to the edges.                                                                                   |
| 8    | Place a clean paper or tracing paper over the image and continue to burnish the image into place with an agate burnisher or rubber roller until it is secure.                                                                            |
| 9    | Use a rubber cement pick-up (crepe laytex) to remove excess cement and cement residue.                                                                                                                                                   |

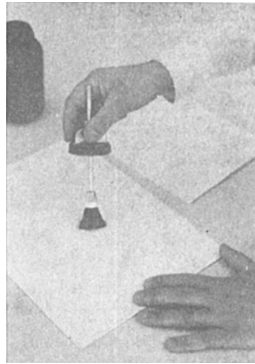
*Continued on next page*

## Mounting, Continued

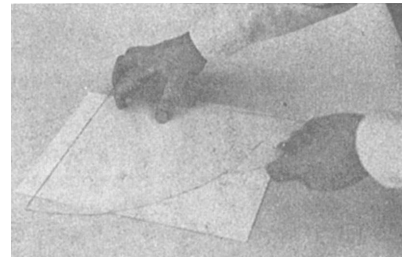
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### Cold press (Continued)

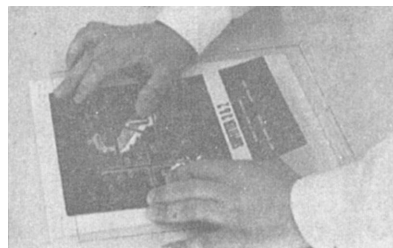
Figure 2-19 illustrates the steps involved in using rubber cement.



A. APPLY RUBBER CEMENT TO BOTH THE BACK OF THE ARTWORK AND THE MOUNTING BOARD, ALLOW TO DRY.



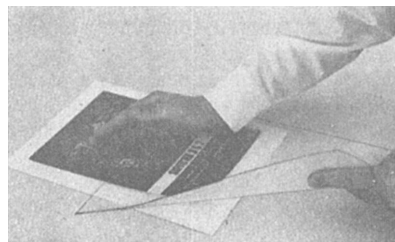
B. PLACE A SHEET OF CLEAN PAPER OVER THE ILLUSTRATION BOARD (IT WILL NOT ADHERE TO THE DRY RUBBER CEMENT). LEAVE A 1/4 INCH STRIP EXPOSED AT THE TOP. USE TWO SLIP SHEETS WHEN MOUNTING LARGE PIECES.



C. POSITION THE ARTWORK FACE UP. CHECK ALIGNMENT THROUGH TRACING PAPER.



D. APPLY PRESSURE ON THE TOP OF THE ARTWORK TO ACHIEVE A FIRM BOND.



E. SLOWLY SLIDE OUT THE SLIP SHEET BETWEEN THE ARTWORK AND ILLUSTRATION BOARD AS YOU SMOOTH DOWN AND MOUNT THE REST OF THE ARTWORK.



F. PROTECT THE ARTWORK WITH A SHEET OF PAPER AS IT IS SMOOTHED OUT. REMOVE EXCESS RUBBER CEMENT FROM THE EDGES OF THE MOUNTED ARTWORK.

**Figure 2-19.** —The steps involved in using rubber cement or an aerosol rubber cement.

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*Continued on next page*

## Mounting, Continued

### Hot press

A hot press technique uses heat or heat-activated adhesive to mount photographs and artwork to cardstock. The disadvantage of this method is that the high temperature may harm the artwork. Hot glue guns and waxers are wet processes. The hot adhesive is fluid until set. The dry process of hot press mounting uses a press set to a very high temperature to activate a thin sheet of adhesive placed between the art and cardstock. Use a lower temperature setting when you mount photographs as the heat ruptures the surface emulsion. Products using wax-based adhesives, such as shading sheets or lettering strips, melt in the heat of the process. Art mounted with hot glue or dry mount is not repositionable; art mounted with wax. is repositionable until it is burnished.

To use a dry mounting press, use this table:

| Step | Action                                                                                                                                                                                                                                                            |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Turn on the dry mount press. Set the temperature to 200 to 250 degrees.                                                                                                                                                                                           |
| 2    | Plug in and turn on a tacking iron.                                                                                                                                                                                                                               |
| 3    | Cut a piece of mounting tissue the same size as the artwork.                                                                                                                                                                                                      |
| 4    | Tack the mounting tissue to the back of the artwork with the tacking iron. If you have to use more than one sheet of mounting tissue, leave a narrow seam between pieces. Do not overlap the edges. Overlapping will leave a visible seam on the face of the art. |
| 5    | Position the art on the cardstock.                                                                                                                                                                                                                                |
| 6    | Cover the face of the print and using the tacking iron, lightly spot tack the art to the cardstock.                                                                                                                                                               |
| 7    | Place the art (covered with the protective paper) on the bed of the hot dry mount press.                                                                                                                                                                          |
| 8    | Apply pressure to the bail or handle that lowers the press for approximately 10 seconds.                                                                                                                                                                          |
| 9    | Remove the mounted print from the press.                                                                                                                                                                                                                          |

*Continued on next page*

## **Mounting,** Continued

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### **General**

Adding a chemical, particularly an adhesive, to a print or piece of artwork will eventually degrade the image. Petroleum-based adhesives yellow and discolor the image. Synthetic adhesive may yellow or darken, become brittle, or accelerate image deterioration. Select an adhesive carefully. Make sure the adhesive you choose will not harm the art. Apply an adhesive carefully. Make sure your work area and your hands are clean before you begin work. Try not to smear adhesives over the work area and clean the working surface after you complete the job. If there is a question of permanence, opt for an archival quality adhesive or adhesive tape and stick only the corner areas.

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# Matting

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## Introduction

A mat is a border made of paper or illustration board that compliments as it surrounds an image. Matting a picture is done for protection, ease of handling, framing, and appearance. Before displaying or presenting a certificate, a photograph, or a piece of artwork to an individual, you should mount, mat, and if possible, frame it. It takes skill to cut professional looking mats.

---

## Mats

A mat focuses your attention on the image within the mat. When used in a frame, mats protect image surfaces from direct contact with the glass that may trap moisture and cause mildew. When used alone, mats protect image areas from fingerprints and smudges.

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## Tools

To cut a mat requires skill and patience. You need a pencil, a rule, a steel straightedge, a crafts knife with a sharp blade, sandpaper or an emery board, tape, a matboard, and a backing board. You may be fortunate enough to have a hand-held mat cutter or, better still, a carriage-type mat cutter.

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## Mat proportions

The width of the top and the sides of a mat are equal. The width of the bottom of the mat is slightly larger in dimension than the top and sides. A good ratio to work with is 3 to 4.

---

## Cutting a mat by hand

The key to successful mat cutting is to use a sharp blade in your knife. The first thing you prepare should be the blade. Lightly mark the mat dimensions on the surface of the mat. Place the steel straightedge on the mat and cut along the inside edge. That way, should your knife slip, the cut would be on the portion of the mat you intended to discard. Begin your cuts at the corners. Hold the knife at a right angle to the mat to make a square cut and at a lesser angle to make a bevel cut. Maintain the same angle of cut for all sides of the mat.

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*Continued on next page*

## Matting, Continued

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### Cutting a mat by hand (Continued)

To cut a mat by hand, use this table:

| Step | Action                                                                                                                                                                                 |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Measure the opening of the frame or determine the overall dimension.                                                                                                                   |
| 2    | Measure the image area you want exposed through the mat.                                                                                                                               |
| 3    | Cut a matboard and a back board the same size as the opening in the frame or the overall desired dimension.                                                                            |
| 4    | On the surface of the mat, lightly mark the dimensions of the mat opening.                                                                                                             |
| 5    | Place the steel straightedge on the mat surface to guide your blade.                                                                                                                   |
| 6    | Beginning at the corners, cut through the matboard.                                                                                                                                    |
| 7    | Remove the unwanted portion of the mat.                                                                                                                                                |
| 8    | Using a piece of sandpaper or an emery board, remove jagged or rough edges.                                                                                                            |
| 9    | Carefully remove pencil lines with a nonabrasive eraser.                                                                                                                               |
| 10   | Place a piece of tape along the top edge of the image with the sticky side half on the back of the image and half exposed.                                                             |
| 11   | Carefully position the mat over the image area and press down over the tape.                                                                                                           |
| 12   | Put the back board behind the matted image and place in the frame. If you are not framing the matted image, secure the back board to the back of the matboard with double-backed tape. |

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*Continued on next page*

## Matting, Continued

### Cutting a mat with a carriage-type cutter

Cutting a beveled mat with a carriage-type cutter is easier than cutting one by hand. Some carriage devices cut straight-edged mats while other cutters cut oval or round mats. You can use a combination of both types of mat cutters for creative or decorative cut mats. The devices maintain a precise angle of cut while you draw the cutting blade across a fixed beam. The blade remains the primary key to cutting a successful mat.

To cut a mat with a carriage-type mat cutter, use this table:

| Step | Action                                                                                                                                                                                    |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Measure the inside dimension of the frame or determine the overall dimension of the desired mat.                                                                                          |
| 2    | Measure the image area that you want exposed through the mat.                                                                                                                             |
| 3    | On the back side of the mat, mark the dimensions of the desired opening.                                                                                                                  |
| 4    | Adjust the cutter stops on the carriage to correspond with the measurements of the inside diameter of the mat, or the major and minor axis of a round or oval mat.                        |
| 5    | Position the matboard face down and align with the left edge of the mat cutter. Apply pressure to the carriage to secure the matboard in place.                                           |
| 6    | Insert the blade approximately 1/16 th inch above the corner and draw the blade down the carriage beam to just beyond the bottom corner. The stops on the carriage will stop your stroke. |
| 7    | Reposition the matboard for each side. The carriage for a round or oval mat will cut the mat in one continuous circular movement.                                                         |
| 8    | Remove the unwanted portion of the mat.                                                                                                                                                   |
| 9    | Smooth out jagged or rough edges with sandpaper or emery board.                                                                                                                           |
| 10   | Place and attach the image into the mat and the mat onto the backboard.                                                                                                                   |

# Viewgraphs

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## Introduction

Viewgraphs are the most common and versatile media for visual presentations. They offer spontaneity and interaction. Once the media of choice, they lost popularity to the 35mm slide. However, computer-generated graphics and color printers have bolstered their popularity. Sometimes, the viewgraph is the appropriate media to recommend for a presentation.

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## Advantages

There are many advantages of viewgraph presentations. Viewgraphs are easy to change, right up to the last minute. They are large in format, allowing for easy preview. Their size approximates a notebook or binder. The projection device is easy to work and overhead projectors are commonplace. You can make paper copies from the same artwork used for the viewgraph to distribute to the audience and increase audience participation. Viewgraphs do not require a totally darkened room to project. Providing you use the right type of marker, you can reuse viewgraphs that have blanks to fill in from class to class.

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## Disadvantages

There are few disadvantages of viewgraphs. Primarily, viewgraph presentations require someone to switch viewgraphs as the presentation progresses. If left to an inexperienced person, the presentation may look amateurish or slipshod.

---

## Format

The standard aperture area of a viewgraph is 7 1/2 by 9-inch. Using a horizontal format maximizes presentation area by filling the viewing screen. Mixing horizontal and vertical formats in the same presentation may prove distracting and vertically oriented viewgraphs can bleed on to the floor or ceiling.

---

## Artwork

Keep images simple. Limit concepts presented by projectuals to a single topic. Break complicated visuals into a series of simple images for presentation. Use color purposefully to emphasize or clarify detail. Keep reduction in mind. Often, artwork created for a viewgraph will wind up as a slide.

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*Continued on next page*

## Viewgraphs, Continued

### Layout

Begin your artwork with a layout sheet placed under your transparent or translucent paper. Make this sheet from gridded paper and indicate the aperture outline for viewgraphs, slides, and television cards. Mark the true center and the optical center distinctly. Place three or four registration marks outside of the largest aperture opening to key masters and overlays for color separation work.

Figure 2-20 shows a layout sheet.

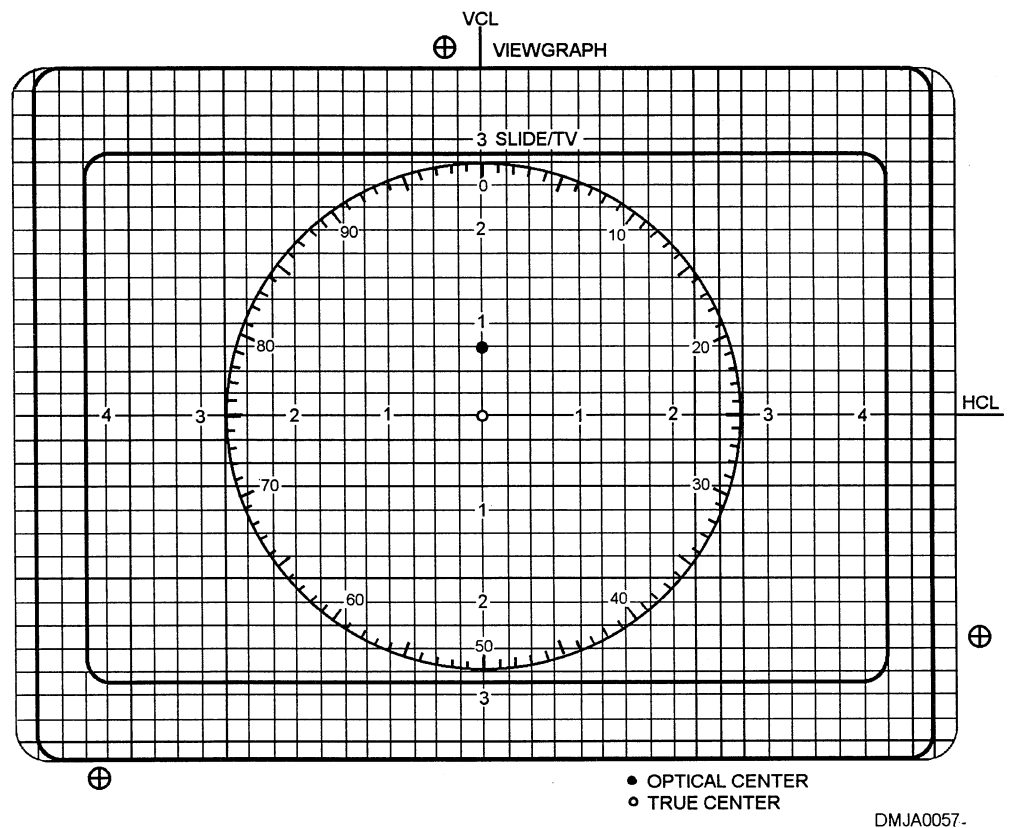


Figure 2-20. —A layout sheet.

*Continued on next page*

## Viewgraphs, Continued

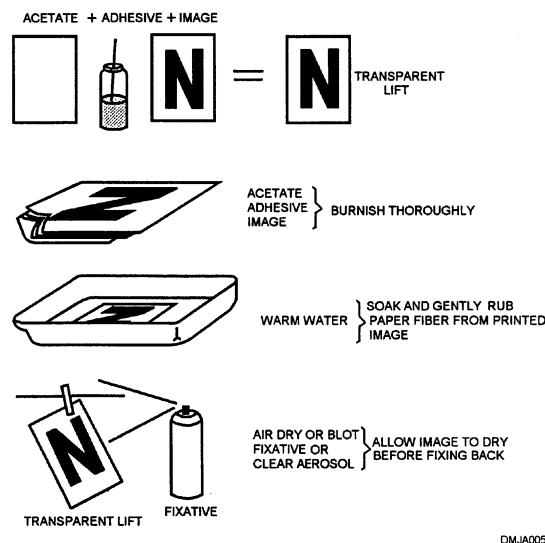
### Handmade viewgraphs

The quickest way to make a viewgraph is to take a felt-tipped marker or grease pencil and mark directly on the surface of an acetate sheet. Drawing inks do not adhere to the slick plastic surface of the viewgraph. Some felt-tipped markers are permanent and others erase with water. Strokes appear to pool or be uneven in density when you use markers to fill large areas with color. Use this unavoidable effect creatively. If you want areas of solid color without apparent strokes, use an adhesive-backed color acetate and burnish it carefully to the acetate surface.

### Lifts

You can use the lift method to create one-of-a-kind viewgraphs. You lift an image from a printed image using rubber cement, adhesive-backed acetate, or the dry mount press. Each technique destroys the page and can only be used once. The image you select to lift must be an image printed on a clay-based paper stock. To test for clay in the paper stock, moisten a small portion of the paper and rub your finger over the wet area. If you can easily rub away the paper surface and it leaves a white, chalky residue on your fingers, it is clay coated.

Figure 2-21 shows the steps involved in lifting images from a printed page.



**Figure 2-21.** —Lifting an image from a pre-printed page.

*Continued on next page*

## Viewgraphs, Continued

### Lifts (Continued)

To make a lift from an image on clay-based paper, use this table:

| Step | Action                                                                                                                                                                                                                             |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Select the image you intend to lift. Make sure it is not copyrighted and remember that you will destroy the paper copy.                                                                                                            |
| 2    | Test the paper for clay content. If the paper leaves a white chalky residue, you may proceed to lift the image. If the paper does not contain clay, you cannot lift the image.                                                     |
| 3    | Choose the method of lift. Lifting methods do not vary significantly. With the rubber cement method, you coat both the acetate and the image face with rubber cement. Allow the two surfaces to dry before adhering them together. |
| 4    | Place the image under the acetate and carefully burnish the image into the adhesive. With a dry mount press, place the acetate film and image into a dry mount press and heat them for 5 to 10 minutes.                            |
| 5    | Soak the acetate covered image in warm water. Mineral spirits also work well. Be careful not to dissolve the inks in the image.                                                                                                    |
| 6    | Gently rub the paper back by hand or with a sponge until the paper fibers disappear to expose clear acetate. Rubbing too hard will damage an already softened image.                                                               |
| 7    | Fix the back of the image with fixative or clear lacquer before using.                                                                                                                                                             |

*Continued on next page*

## Viewgraphs, Continued

### Diazo

Making a viewgraph with the diazo process involves using specially treated films and papers and a diazo printer. Diazo film, foils, and paper treated with a mixture of diazo salts and azo dyestuff form images in colors and black. The salts are light sensitive. After you expose a foil to a light source, particularly an ultraviolet light, develop it in an alkaline medium, such as the vapors of commercial ammonia (ammonia hydroxide) with a reading of 26° Baumè. The salts combine with the azo dyestuff during the development process to leave an image. Exposure time in the printer is critical, develop only long enough to obtain maximum color saturation.

Figure 2-22 shows the diazo process simplified.

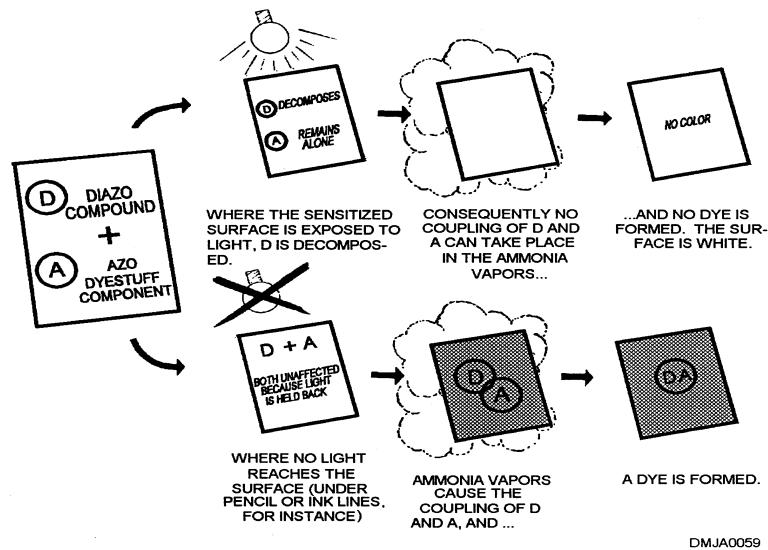


Figure 2-22. —The diazo process simplified.

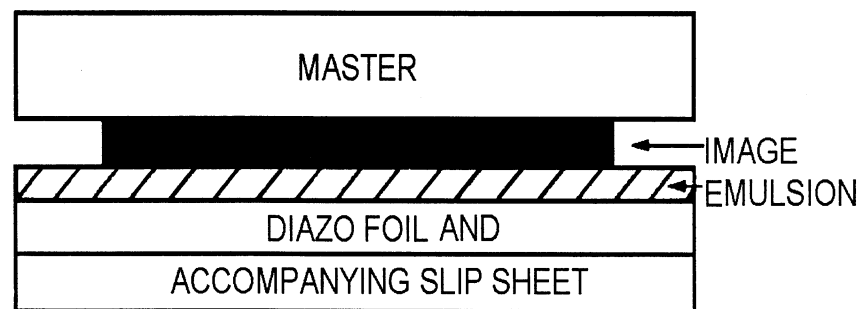
*Continued on next page*

## Viewgraphs, Continued

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**Master artwork** The diazo process requires the creation of master artwork. Prepare this art on a good quality, fine fiber translucent or transparent paper. Make the image area opaque. Light must pass through areas that are not to result in an image, while opaque areas are necessary to block the ultraviolet light for an image to appear. Use the same paper stock for all images in the series. This procedure eliminates changing exposure time in the diazo printer and minimizes film waste. Master artwork for the diazo process is a one-to-one reproduction ratio. For enlargements or reductions, use a copy camera. You can use the same master artwork repeatedly.

Figure 2-23 shows a simplification of the diazo sandwich.



DMJA0060

**Figure 2-23.** —A simplified diazo sandwich.

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*Continued on next page*

## Viewgraphs, Continued

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### Exposure and development

The exposure and development of diazo foils and papers are by trial and error. The variables that effect exposure and development are the translucency of the master, the color foil selected, the age of the foil, the intensity of the light source, and the degree of saturation of the ammonia vapors. Once you make an acceptable exposure, write the exposure time down on paper and keep it near. Refer to it for the basis of all other exposures in that series of foils. When running multiple overlays for registration on a master viewgraph, run all foils for that viewgraph in the same direction to minimize the distortion caused by shrinkage or expansion from exposure to the heat of the light source.

To expose and develop a diazo foil, use this table:

| Step | Action                                                                                                                                                                                                     |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Remove a foil from its light-proof package.                                                                                                                                                                |
| 2    | Locate the manufacturer's nick and place it in the upper-left corner as you face the foil. This ensures that the emulsion side is up.                                                                      |
| 3    | Place the master artwork either face up or face down on the foil. Emulsion to emulsion between art and foil results in images with the least distortion.                                                   |
| 4    | Feed combined art and foil into the machine for exposure. Exposure is variable. Once you obtain the correct exposure, write it down and use it as a basis for all other exposures.                         |
| 5    | The art and foil will exit the exposure section of the diazo machine and the machine will automatically separate the art into the forward bin while the diazo foil continues into the development section. |
| 6    | Develop the foil only long enough to obtain maximum color saturation. In some cases, you may have to slow down the speed of the machine.                                                                   |
| 7    | The developed foil exits the machine either to the top bin or the bin in the back of the machine.                                                                                                          |

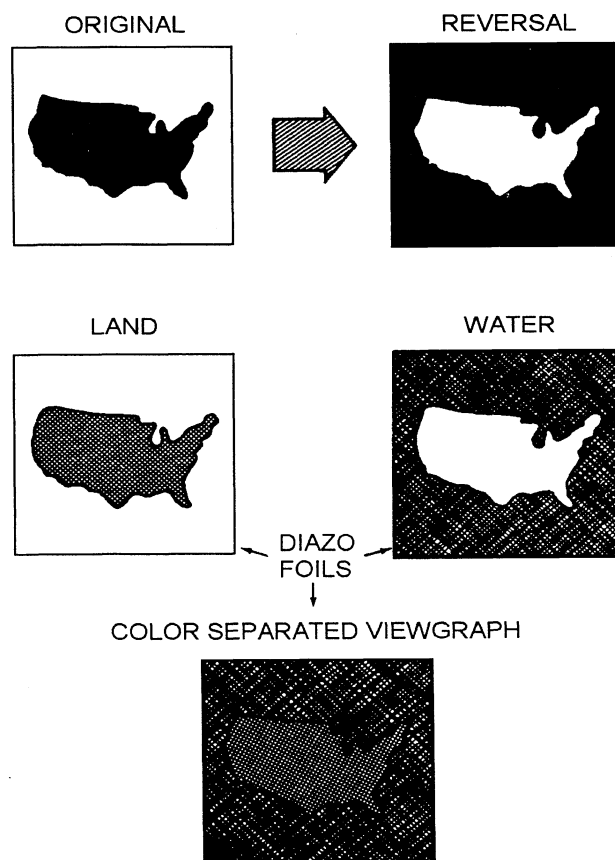
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*Continued on next page*

## Viewgraphs, Continued

**Diazo reversals** Using a negative image instead of a positive image can be advantageous when you want to focus viewer attention on the screen. Negative transparencies are known as reversals. They have a clear image on a dark or colored background. Reversals are easier on the eyes than positive images. To prevent eyestrain, do not mix reversals with positive image viewgraphs. Start with a negative image master or make your own negative by using a commercially available reversing film in the diazo machine.

Figure 2-24 shows an example reversal.



DMJA0061

**Figure 2-24.** —A reversal.

*Continued on next page*

## Viewgraphs, Continued

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### **Diazo intermediates**

You may duplicate artwork to distribute or exchange with other commands. Duplication eliminates the need to redraw existing art. Duplicate the original artwork on a diazo intermediate foil such as a sepia, sepia matte, or orange sepia. Make sure the image is dense. Corrections, additions, or deletions are easily made on intermediates.

---

### **Thermographic or electronic production**

You can use a copier to produce viewgraphs. The master art need not be translucent to reproduce on a copier. The only requirement is to change the paper in the paper tray for acetate. The acetate foil produces a black image on a clear or colored background. The primary disadvantage of a thermographic or electronically produced viewgraph is that the image is a surface deposit of toner that may crack and flake off or be easily scraped.

---

### **Computer-generated production**

Computers are capable of producing viewgraphs. Several software packages offer image and text integration for export as a viewgraph and/or paper products. The computer is also capable of displaying these images on a monitor or projecting images on a screen much like an overhead projector. With some presentation software packages, you can command a computer to change images automatically by entering the seconds of display desired and the mode of transition.

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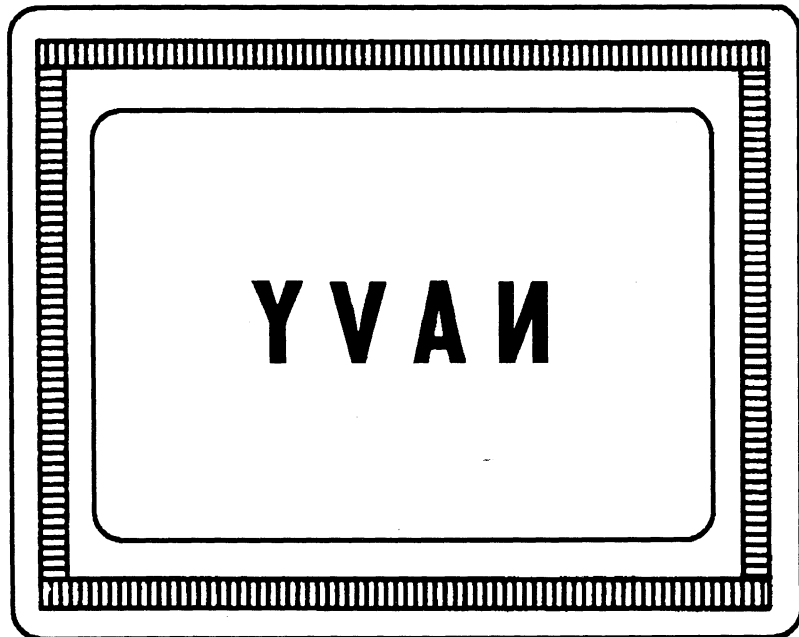
## Viewgraphs, Continued

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### Mounting a viewgraph

Once you produce a viewgraph, you should mount it, particularly if it is part of a canned or permanent brief. Standard sized precut mounts are available with generally similar aperture openings. Mounts may be plastic or cardboard. If you have to make your own mount, any lightweight, opaque material will suffice. Position the viewgraph face down in the aperture opening, tape all around the edges of the foil out of the way of the image area with transparent plastic tape. Masking tape does not hold up well under excessive handling and heat. Cellophane tape will become brittle with age. When mounting more than one foil on a multi-foil static projectural, tape the edges of each foil with a 2-inch strip of tape and the final foil all the way around.

Figure 2-25 shows a foil taped to a mount.



DMJA0062

**Figure 2-25.** —Taping foils to the back of the frame.

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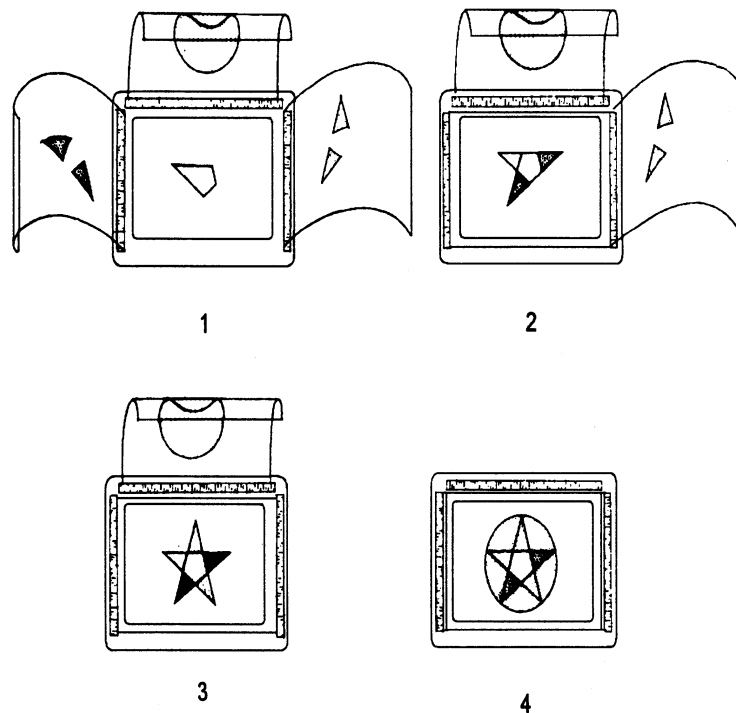
*Continued on next page*

## Viewgraphs, Continued

### Overlays

The use of overlays is one of the most effective features of overhead projection. Using overlays is one way to turn a static display into a dynamic display. Overlays progressively and selectively reveal elements and portions of information to enhance communication. Mount the base foil to the mount first. Fasten each overlay with tape or commercially available hinges on the left or right side of the viewgraph. If mounting multiple overlays in a given sequence, tape them all on one side of the mount. This ensures that they will always appear in order. If there are many overlays for consecutive disclosure, start taping the overlays on the right side, working clockwise until the last overlay is taped along the top edge. Trim off any excess acetate to make the overlay lie smoothly against the mount. Attach small tabs of tape to the edges and number in sequence.

Figure 2-26 shows a multiple foil overlay.



DMJA0063

**Figure 2-26.** —Multiple foil overlays.

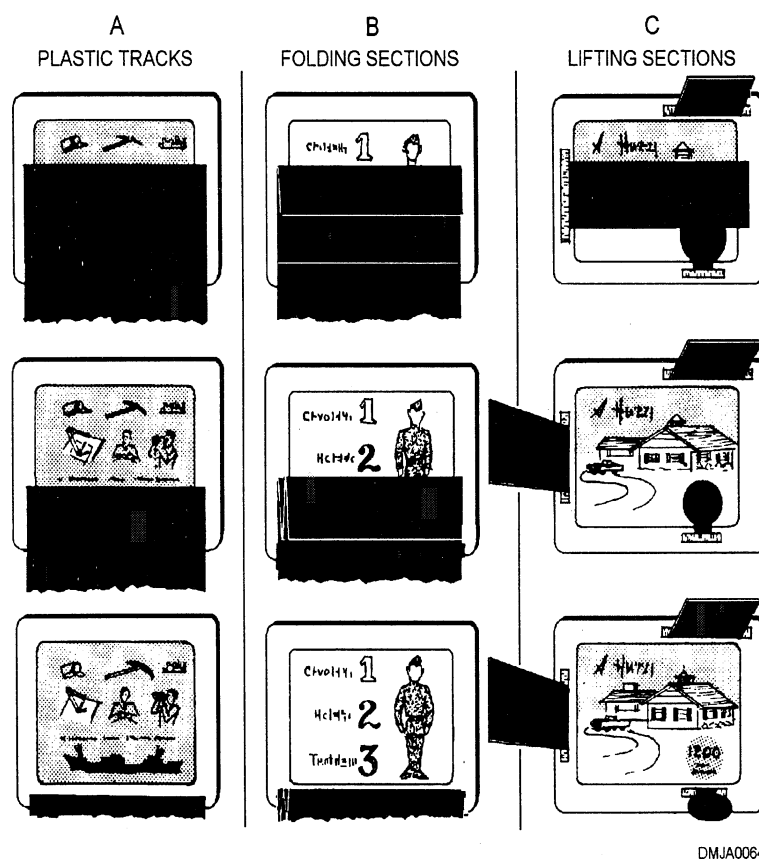
*Continued on next page*

## Viewgraphs, Continued

### Progressive disclosure

Another method of creating progressive disclosure on a static viewgraph is to block or mask portions of it with an opaque card. The items you may use to block viewgraph portions include solid, opaque cards slid down the projected surface of the viewgraph, or hinged cards gradually peeled away to reveal information. Irregularly cut masks block selected images and create interest.

Figure 2-27 shows a static viewgraph illustrating the progressive disclosure techniques for presentation.



**Figure 2-27.** —Viewgraphs that show progressive disclosure techniques.

*Continued on next page*

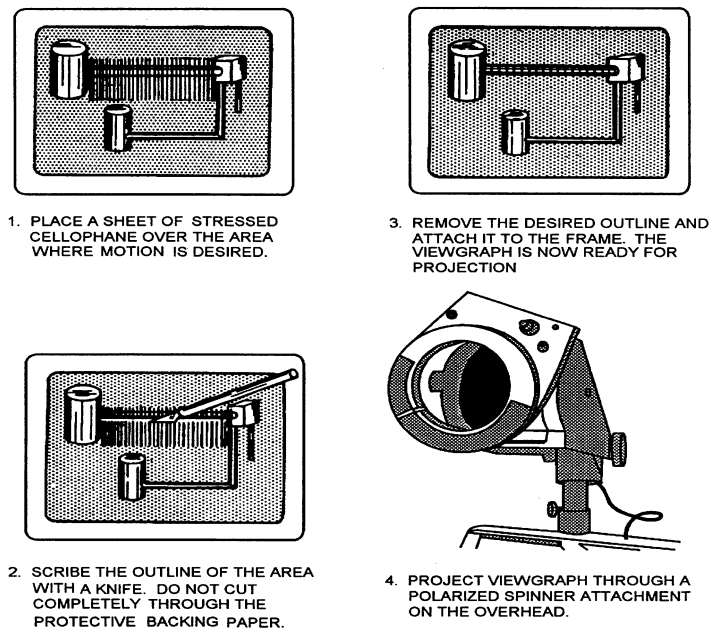
## Viewgraphs, Continued

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### Motion

You can simulate the effects of motion by using stressed cellophane and a rotating polarized spinner. As light travels through stressed cellophane and the polarized spinner, the light waves vibrate and the axis of the light wave turns. The severity and direction of vibration depend upon how the stressed cellophane and polarized spinner are oriented relative to each other. Commercially available products to simulate motion are available from a variety of manufacturers.

Figure 2-28 shows how to achieve the effects of polarized motion.



**Figure 2-28.** —Creating the illusion of motion.

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# Slides

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## Introduction

Color slides are a popular and effective media for presentation. Much of the artwork you produce for a viewgraph, you may use for a 35mm slide with little alteration. At times, you may produce slides by directly photographing a scene or machinery. Slides are often the most appropriate method to recommend.

---

## Advantages

One of the advantages of a slide presentation is economy, particularly if multiple copies are needed. Their compact size makes them easy to transport and distribute. Users can adapt or combine presentations merely by adding or deleting slides. You can reverse the slide sequence or select any slide in a tray at any time during a presentation. Projected slides are large visual displays that make it easy to point out specific elements.

---

## Disadvantages

The primary disadvantage of using slides in a presentation is the requirement to dim the light to achieve maximum color saturation of the projected image.

---

## Format

The format of the artwork created for 35mm slides is different from the format for art created for use in a viewgraph. The format for art intended as a 35mm slide is 6 4/10 by 9 1/2 inches. Create the artwork on a horizontal format to maximize the total viewing area. Keep in mind that some theaters and classrooms are not set up to project a vertically oriented slide without silohetting overhead structures or bleeding on to the deck. Do not mix horizontal and vertical formats in the same presentation.

---

## Artwork

You create artwork for a 35mm slide using any and all methods and medias. You may have to travel to a job site to photograph machinery or scenes the originator wants to include as part of the brief. When you create art for color reproduction as a 35mm slide, no stray marks may appear and the image surface must remain scrupulously clean. The sensitive nature of color slide film reproduces every flaw including fingerprints.

---

## Layout

Create a layout sheet as previously covered for veiwgraphs and use this sheet to layout all master artwork. To improve convenience and versatility, select the aperture that corresponds to the majority of the media you produce and use the same aperture for every piece of art.

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## Slides, Continued

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**Mounting** Slide mounts may be plastic or light cardboard. Generally, the photo lab that develops the slides will also mount them for you.

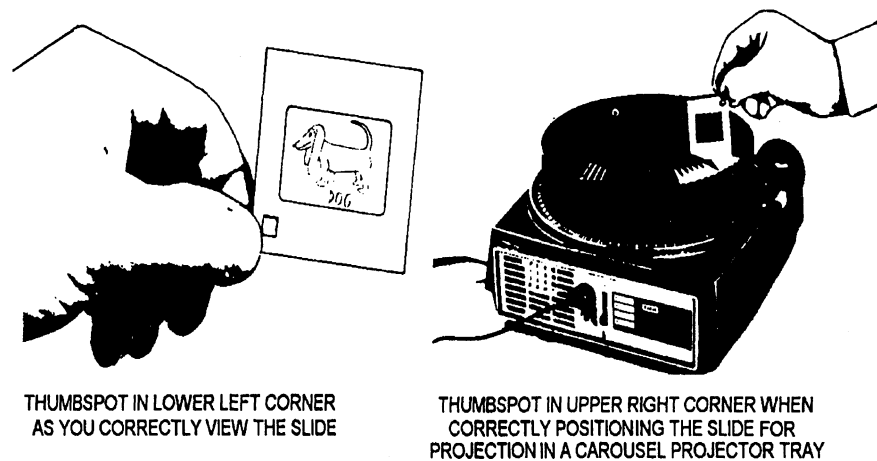
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**Marking** Slide mounts offer very little space to mark on. Use a permanent marker to indicate the general subject and the classification. You may also want to mark the slide to indicate the numerical sequence of the slide and to indicate how to position the slide (thumbspot) in the slide tray for correct projection.

---

**Thumbspots** Thumbspots are marks or dots placed on the lower-left corner of the slide mount (as you view the slide) that indicate the orientation of the slide for correct projection. When you need to load a slide tray for front screen projection, load the slides so the thumbspots are in the upper-right corner when the slide is facing you. For rear screen projection, rotate the thumbspot to the upper-left corner when the slide is facing away from you.

Figure 2-29 shows a slide marked with a thumbspot and the correct positioning for placing the slide in the tray.



DMJA0066

**Figure 2-29.** —Thumbspots.

---

*Continued on next page*

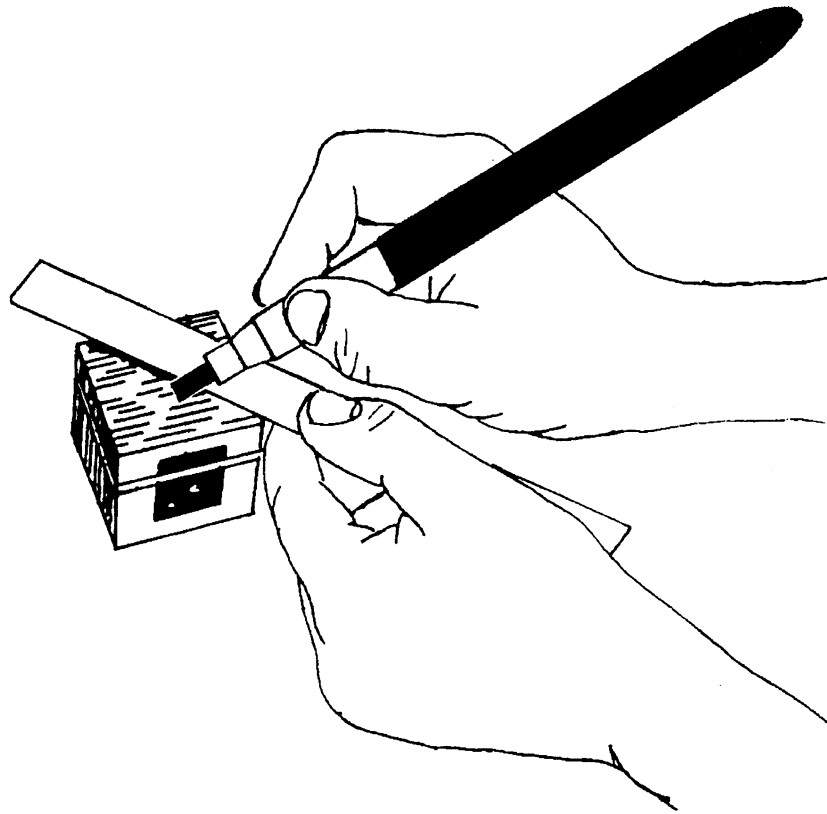
## Slides, Continued

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### Diagonal line method

Another way to indicate the correct orientation of a slide is to draw a line diagonally across the top of the slide mounts as you hold them all together. If a jagged line occurs in this diagonal, you know that a slide is missing. This procedure works primarily for canned slide shows that rarely change.

Figure 2-30 shows the procedure for marking a stack of slides with a diagonal line.



DMJA0067

**Figure 2-30.** —Marking slides with the diagonal line method.

---

## Computer-Generated Presentations

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|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b> | As more commands install computer equipment, computers assume a larger role in the production of art and in the presentation of it. Inevitably, you will interface with a computer.                                                                                                                                                                                                                                                                                |
| <b>Generics</b>     | Because so many software programs exist, and Navy shops have not standardized the purchase of computer hardware or software, it is impossible to cover in detail the steps required to operate the computer system in front of you now. The best source of information remains the owner/operator manuals.                                                                                                                                                         |
| <b>Production</b>   | Although the actual production of a viewgraph, a slide, or artwork has metamorphosized into a sequence of keystrokes on a computer, knowledge of graphic fundamentals, layout and composition, and color theory still determine the success of the end product.                                                                                                                                                                                                    |
| <b>Presentation</b> | The role of the computer as a presentation device is still evolving. You can view a presentation of static visuals directly from the computer monitor or you can project them onto a screen. You create the visuals, set the viewing time of each visual, and cue a dissolve or disintegrate the image into the next image. You can also use the computer to create animation or motion.                                                                           |
| <b>Animation</b>    | In animation, you draw the key positions of the figure in the extreme positions of the desired movement. Then, you draw the drawings in between the extremes. When you view the drawings in rapid succession, you simulate the effect of motion. All of this took many drawings in tedious repetition. With computer animation software, you click and drag the element into the desired position and anchor it. The computer generates the transitional drawings. |
| <b>Motion/video</b> | Video imagery altered by computer and spiced with text integration provides a dynamic presentation and powerful teaching device. Film footage on beta tape fed through the computer can be altered and edited. Text integration with a voice or music overdub creates a very polished professional presentation. A limiting hardware factor is the amount of hard drive or RAM memory.                                                                             |

---

## Summary

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**Review**

This chapter covers presentation media from the simplest, most direct lecture pad to the more sophisticated computer-generated presentation. The reliable viewgraph and slide presentations are still used in commands that do not have the means to purchase computer equipment.

---

**Comments**

Match an originators needs with a presentation method. Traditional presentation media all have specific purposes for which they are ideal. At times, the computer may be the choice. Irregardless, the DM must have a good foundation in layout, composition, color theory, and graphics fundamentals. No amount of computer savvy can compensate for a lack of visual literacy. Make sure you have a traditional education in graphic media. In the absence of Navywide standard software, presentations intended for travel or distribution might require more traditional methods.

# CHAPTER 3

## TELEVISION GRAPHICS

### Overview

---

#### Introduction

Shipboard closed-circuit television and shore commands with their own television broadcast systems use graphics material. Television and video are a visual imaging media. You should have a basic understanding of television graphics and their preparation to fully exploit television as a communications device.

---

#### Objectives

The material in this chapter enables you to do the following:

- Compare the impact of televised media to slide or viewgraph presentations.
  - Identify the transmission sequence in television theory.
  - Identify the aspect ratio of graphics prepared for television transmission.
  - Select a value scale or color key to use in television presentations.
  - Differentiate between disclosure devices in television transmission.
  - Construct a storyboard.
- 

*Continued on next page*

## Overview, Continued

### Acronyms

The following table contains a list of acronyms you must know to understand the material in this chapter:

| Acronym | Meaning                  |
|---------|--------------------------|
| CCD     | Charge Coupled Device    |
| CG      | Character Generator      |
| CPU     | Computer Processing Unit |
| CRT     | Cathode-Ray Tube         |
| RAM     | Random Access Memory     |
| TV      | Television               |

**In this chapter** This chapter covers the following topics:

| Topic                         | See Page |
|-------------------------------|----------|
| Television Theory             | 3-3      |
| Television Graphics           | 3-5      |
| Character Generators          | 3-8      |
| Studio Cards                  | 3-9      |
| Disclosure Devices            | 3-14     |
| Basic Production              | 3-18     |
| Series Production             | 3-21     |
| Computer-Generated Production | 3-22     |

# Television Theory

---

## Introduction

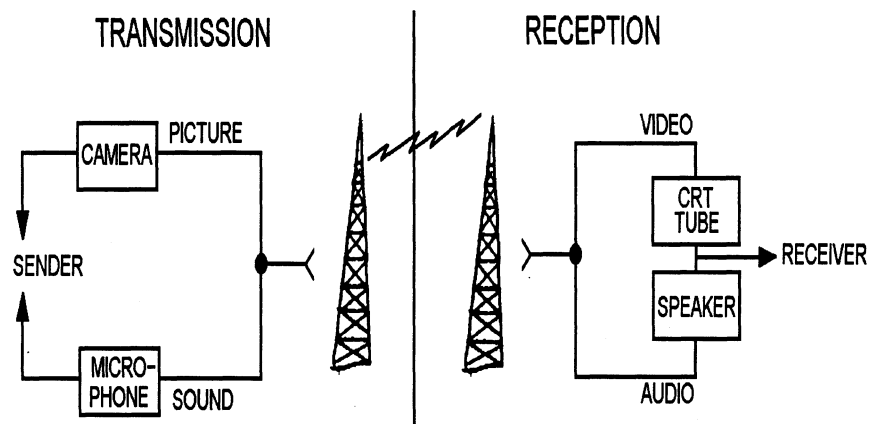
Television is the offspring of three media-theater, film, and radio. Numerous technical advances include programmable television, unlimited channel access, stereo sound, vivid color, and video cassette and computer hook-up. The basic theory remains focused on the cathode-ray tube (CRT).

---

## Basic theory

Television and video cameras detect and digitally convert light rays reflected from a scene or subject into electrical impulses. These cameras use charge coupled device (CCD) technology to perform this conversion. Microphones pick up and transmit sound as electrical impulses. These electrical impulses are simultaneously sent to a transmitter or recorded on tape. To view the program, the transmitter sends a signal to a television set that acts as a receiver for the signal. Inside the receiver, the signals are separated into impulses of video and audio. The video and audio circuits change the signals into pictures on the face of the CRT tube and sound from the loudspeakers.

Figure 3-1 shows a pictorial diagram of the concept of television.



DMJA0068

**Figure 3-1.** —The concept of television.

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*Continued on next page*

## Television Theory, Continued

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### Television and video cameras

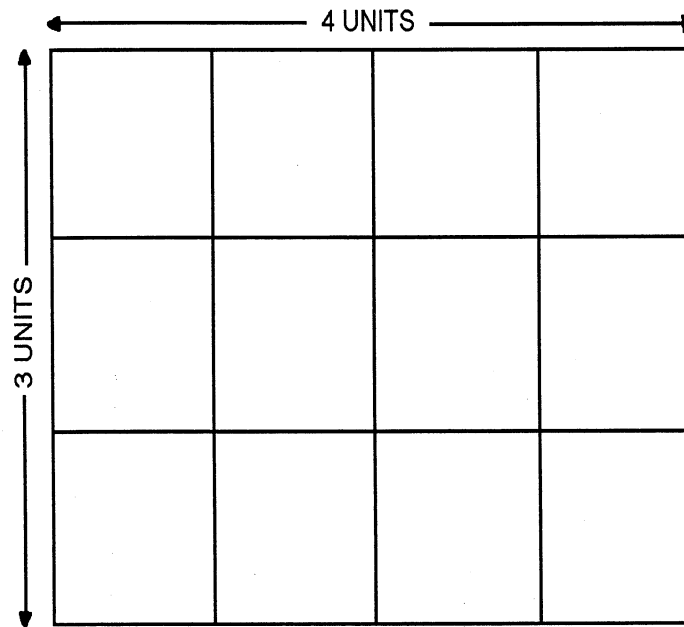
Television and video cameras see light reflected from objects in a scene. This light varies according to the lighting and shade on an object. A television camera is optically similar to a movie camera but it does not use film.

---

### Picture tube

The shape of a normal picture tube, or the aspect ratio is 3 to 4. It is the ratio of the height to the width of a video frame or television tube. This dimension approximates the dimensions or ratio of the normal range of vision.

Figure 3-2 shows a representation of the aspect ratio of television.



DMJA0069

**Figure 3-2.** —Television aspect ratio.

---

# Television Graphics

---

## Introduction

The images you see on television are a combination of human talents, television (TV) graphics or recorded films. Color slides, credit captions, titles, photographs, diagrams, and film footage all fall into the category of TV graphics. Graphics intended for TV transmission are created on studio cards or with a character generator (CG).

---

## Limitations

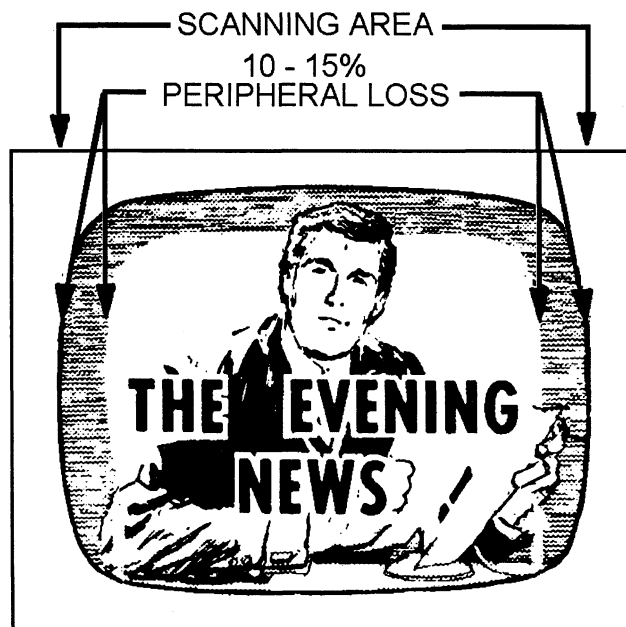
Within the 3:4 aspect ratio, there are three area limitations that affect the creation of graphics intended for transmission. The three area limitations are the scanning area, the essential area, and the border area.

---

## Scanning area

The total picture or area the camera sees is called the scanning area. The transmission and reception of electrical impulses include a peripheral loss of 10- to 15-percent of the total scanning area. This loss results in distortion and is less visible in scenes, where it appears as blurred resolution, and most visible with text, where it renders text illegible.

Figure 3-3 shows the scanning area of a TV screen.



DMJA0070

**Figure 3-3.** —Scanning area.

---

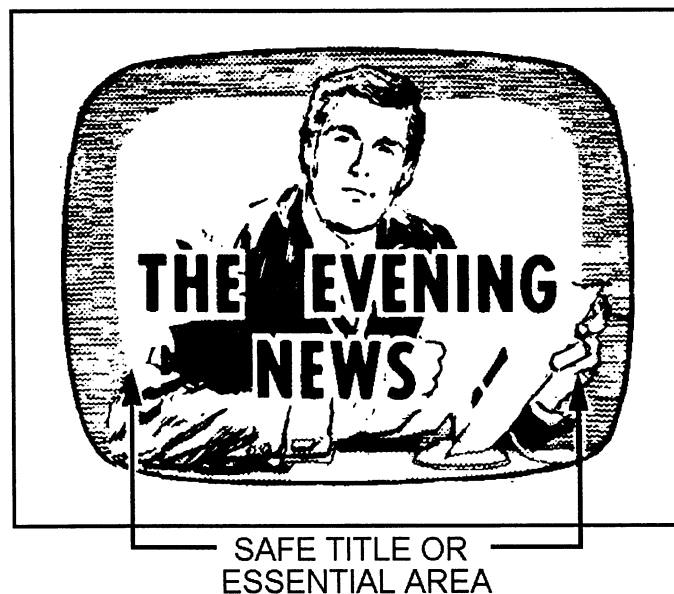
*Continued on next page*

## Television Graphics, Continued

---

**Essential area** The essential area is the part of the screen that displays images with maximum resolution or clarity. Include all titles and lettering in the essential area or the lettering will not project without distortion. The essential area is also referred to as the safe title area.

Figure 3-4 shows the essential area, or safe title area of a TV screen.



DMJA0071

**Figure 3-4.** —Safe title area.

---

*Continued on next page*

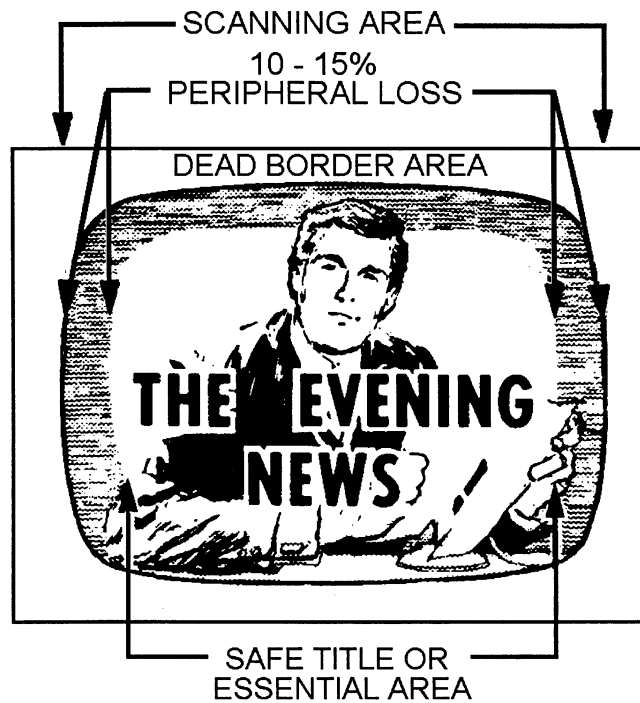
## Television Graphics, Continued

---

### Border area

The border area is as important to a graphic as the scanning and essential areas even though the border area is part of graphic designed not to be seen. The border area around a graphic protects it from damage by mishandling. The border also prevents the camera from seeing past the art or card at some behind-the-scenes activity.

Figure 3-5 shows-all the area limitations for TV graphics that we discussed.



DMJA0072

**Figure 3-5.** —Area limitations.

# Character Generators

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## Introduction

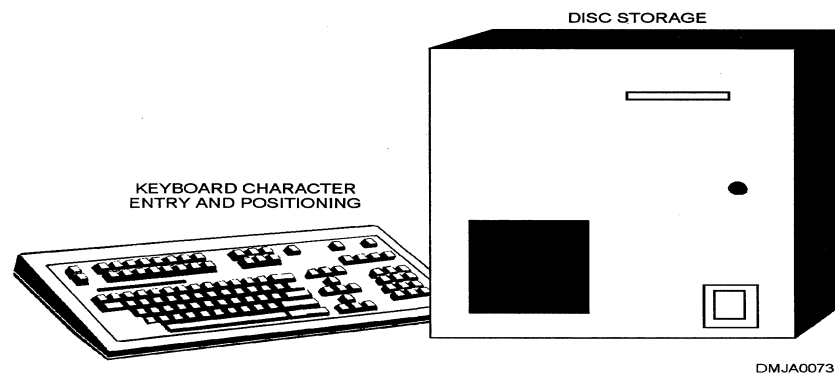
When you intend to use only printed information on a graphic, you should use a character generator (CG) to generate the text. A CG saves time and removes the tedium of laying out mass quantities of text.

---

## Character generators

A character generator is a computer graphics system used widely in closed circuit and broadcast television. It creates text (letters and numbers) in a variety of sizes and fonts. A CG has a keyboard similar to a microcomputer and can store text on a floppy or hard disc drive system. A CG requires no special skill to operate and allows the user to make flawless letters.

Figure 3-6 is a character generator (CG).



**Figure 3-6.** —Character generator.

## Studio Cards

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### Introduction

Studio cards are artwork created for television transmission and are frequently created on a cardstock or rigid backing. Rigidity makes cardstock easier to handle in front of the camera. Studio cards are classified according to function.

---

### Size

No single card size is appropriate for all television artwork or pictures. A generally accepted standard for cards is 10 by 12 inches. Using this standard size card offers the following advantages:

- Easy handling. There is enough boarder to prevent damage to the art. It is also easier to handle many cards on a card stand in front of the camera when they are all the same size.
  - Easy filing. The size of this card easily fits into a standard size office filing cabinet.
  - Economy. You can cut 9 standard size cards from 30- by 40-inch board stock without waste.
  - Convenience. Most art and photographs fit this size card.
- 

### Style

The style of a graphic should match the style of the program or subject. Titles should reflect the character of the show without being tactless or obtrusive.

---

### Contrast

The contrast of graphics cards for television reproduction refers to the amount of light and dark areas in the picture. This is critical for good reproduction, particularly in black and white transmission. Limit your palette on a color graphic to three tints and two shades of each intense hue. More than six values of a single hue are hard to distinguish. Light tints of hues, such as a yellow, will fade into white. Shades of blues and reds may appear black. Greys are difficult to reproduce accurately. Use a mat finish paint or medium. The best way to determine the most responsive palette for your television system is to experiment with it.

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*Continued on next page*

## Studio Cards, Continued

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### Legibility

Content (text or image) and image size affect the legibility of television graphics. Contrast text sharply with the background. Reduce large or complicated material to simple and essential elements or rearrange and divide information into units. You should set standards of uniformity in text size by defining the limitations in maximum and minimum height. Attempt to confine text to no more than 10 words on the screen at a time. Eliminate very fine detail from the imagery. Keep it simple and bold to increase emphasis and strengthen impact.

---

### Types

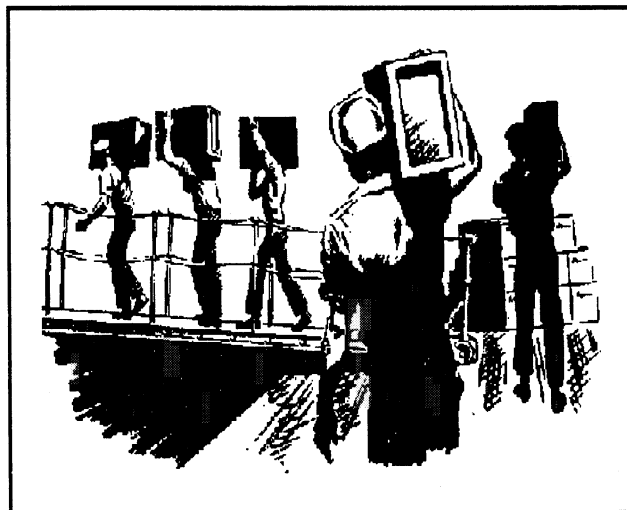
The four types of studio cards are the standard studio card, the plain title card, the illustrated title card, and the super title card.

---

### Standard studio cards

Standard studio cards contain only illustrations or pictures. Lettering never appears on a standard studio card. Often, viewgraphs or 35mm slides are made from the standard studio card.

Figure 3-7 is an example of a standard studio card.



DMJA0074

**Figure 3-7.** —Standard studio card.

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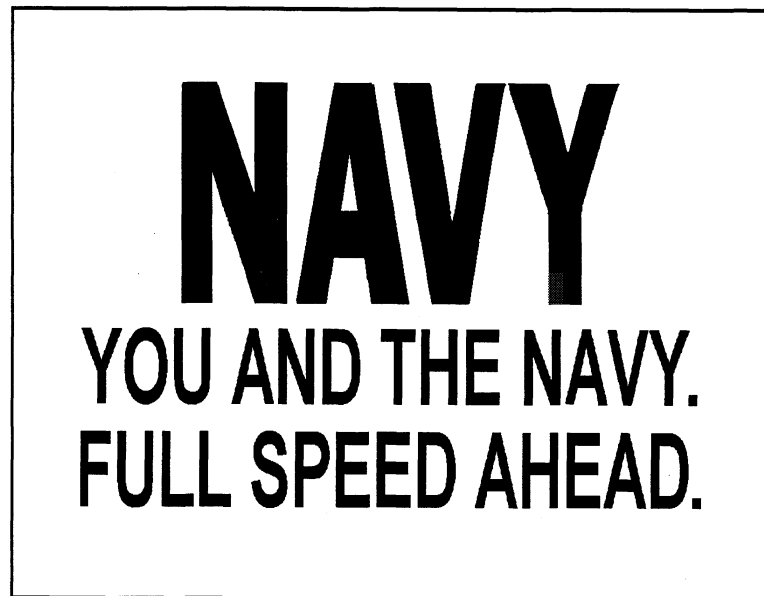
*Continued on next page*

## Studio Cards, Continued

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**Plain title cards** Plain title cards contain printed information or text only. The card is dark or light with contrasting letters to give the needed information in as few words as possible.

Figure 3-8 is an example of a plain title card.



DMJA0075

**Figure 3-8.** —Plain title card.

---

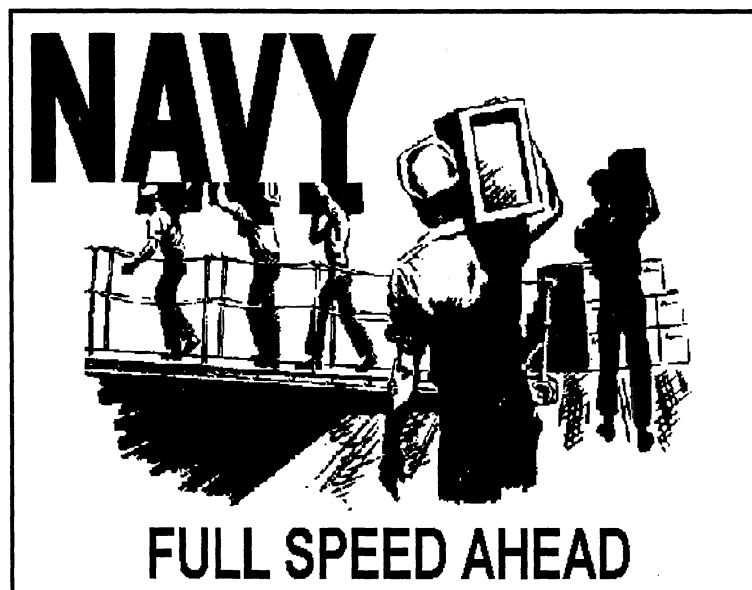
*Continued on next page*

## Studio Cards, Continued

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**Illustrated title cards** Illustrated cards have both text and images. Image may be artwork or photographic. Lettering may be on the card itself or on an overlay.

Figure 3-9 is an example of an illustrated title card.



DMJA0076

**Figure 3-9.** —Illustrated title card.

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*Continued on next page*

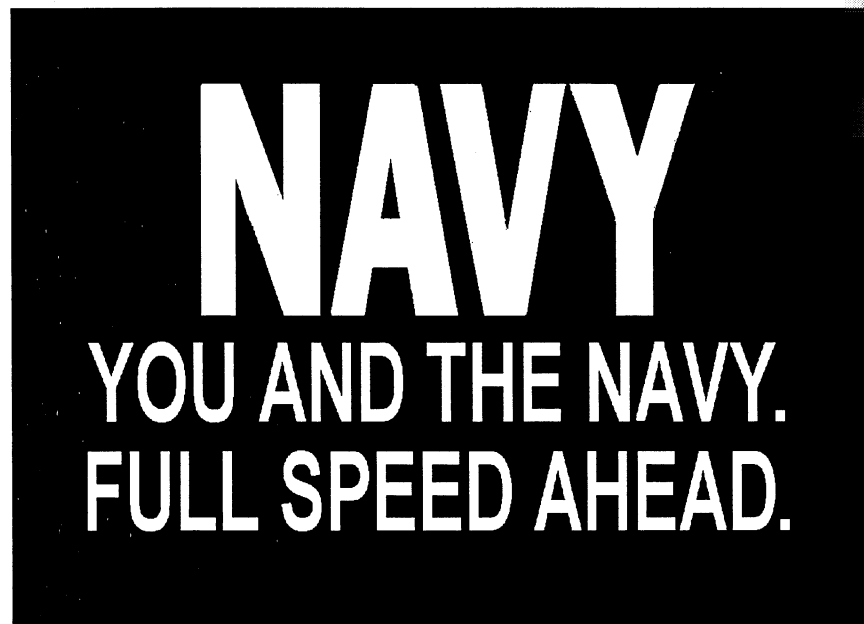
## Studio Cards, Continued

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### Super title cards

Super title cards have white lettering over a black background. The background is later dropped out and the image transposed over the image seen by another camera. Closing credits of a program are telecast with super title cards. Do not superimpose text over faces.

Figure 3-10 shows a super title card.



DMJA0077

**Figure 3-10.** —Super title card.

## Disclosure Devices

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### Introduction

Controlling the amount and the sequence with which information is shown to a viewer is known as progressive disclosure. Any device or method used to control disclosure is a disclosure device.

---

### Analog or digital programmers

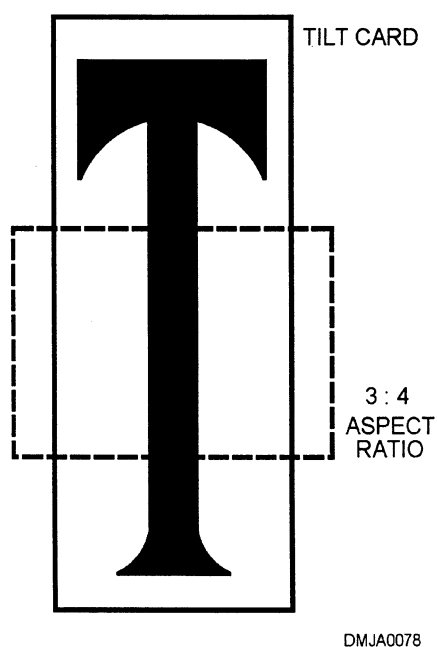
Analog or digital programmers are disclosure devices that make text appear to roll onto the screen without disrupting regular television programming. Weather bulletins are an example of the use of an analog or digital programmer.

---

### Tilt cards

Vertically oriented cards whose information exceeds the capabilities of the camera and requires an up and down motion of the camera to transmit all information are known as tilt cards. Use tilt cards only for creative effects or when it is not possible to divide visuals into smaller segments.

Figure 3-11 is a tilt card.



**Figure 3-11.** —A tilt card that vertically exceeds the vertical limitations of the aspect ratio.

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*Continued on next page*

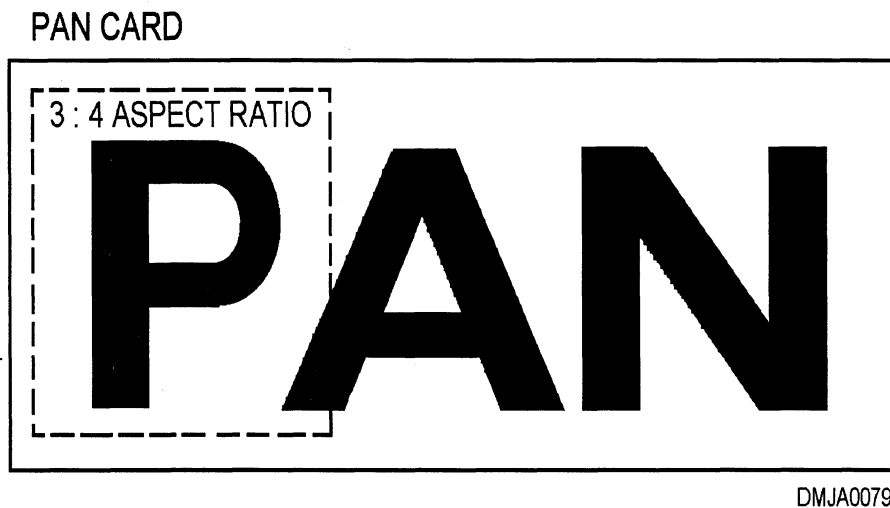
## Disclosure Devices, Continued

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### Pan cards

A card where the information exceeds the horizontal angle of view of the camera and requires the camera to travel side-to-side, the length of the card, is known as a pan card. Use pan cards only for creative effects or when you cannot simplify visuals.

Figure 3-12 is a pan card.



**Figure 3-12.** —A pan card that horizontally exceeds the horizontal limitations of the aspect ratio.

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*Continued on next page*

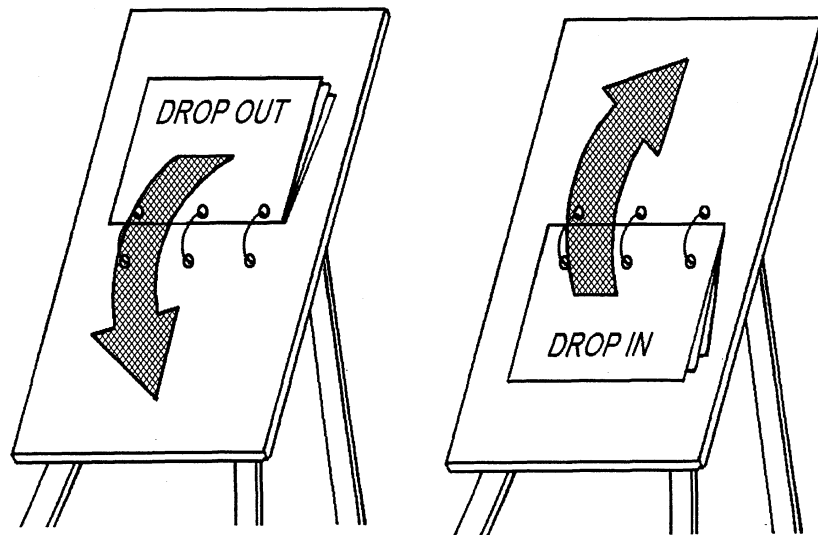
## Disclosure Devices, Continued

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### Drop-in or drop-out cards

Information displayed on drop-in or drop-out cards appear to fall into or out of view. These cards are advantageous for presenting large amounts of information. These devices resemble a three-ringed binder rigged horizontally. Perforations appear on the top or bottom of each card.

Figure 3-13 is an example of a drop-in/drop-out device.



DMJA0080

**Figure 3-13.** —Drop-in/drop-out device.

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*Continued on next page*

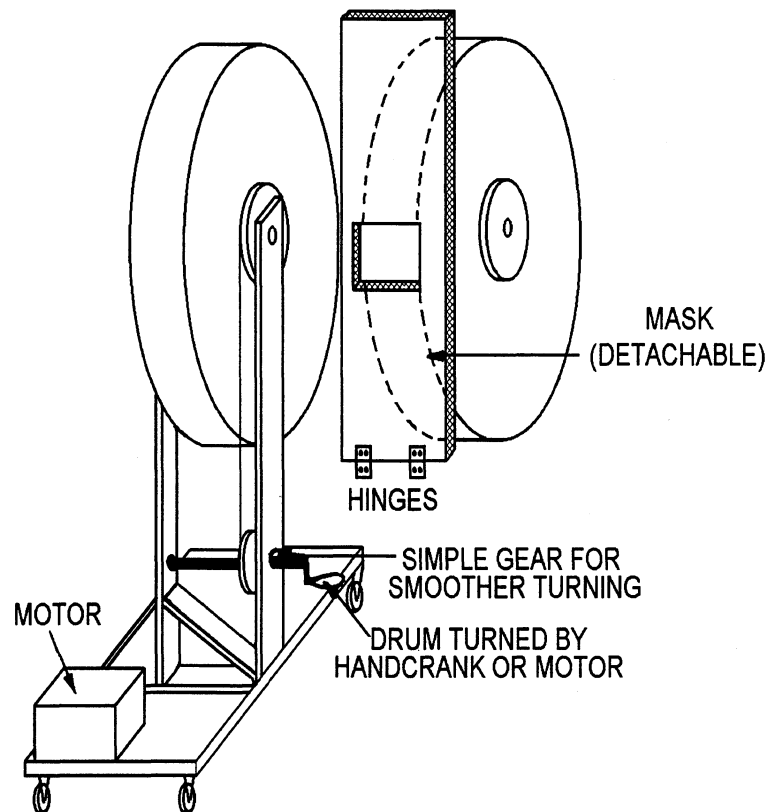
## Disclosure Devices, Continued

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### Crawl

A drum, called a crawl, rotated by hand or by motor to which you attach a series of lettering on a long strip of paper, is known as a crawl device. The lettering appears to scroll onto the screen and off again. Most often, the lettering contrasts against a background and is superimposed over an image. Many TV shows use a crawl device to display closing credits.

Figure 3-14 shows examples of crawl devices.



DMJA0081

**Figure 3-14.** —A crawl device.

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## Basic Production

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### Introduction

Television production is extremely complex and expensive. It requires a high degree of coordination among many people. Standardizing procedures as much as possible alleviates confusion. Breaking each scene into basic elements or steps by story treatment, storyboarding, and scripting also helps simplify the task of creating television productions.

---

### Story treatment

The story treatment is a word picture of the proposed presentation and is usually written in the form of a scenario of the production on story cards. Make decisions regarding the overall treatment, prevailing mood, and the production content at this time. Make a detailed written treatment to clearly define the direction the production is to take.

Figure 3-15 shows a blank story card.

NO. \_\_\_\_\_

NARRATION:

REMARKS:

IMAGE

DMJA0082

**Figure 3-15.** —A blank story card.

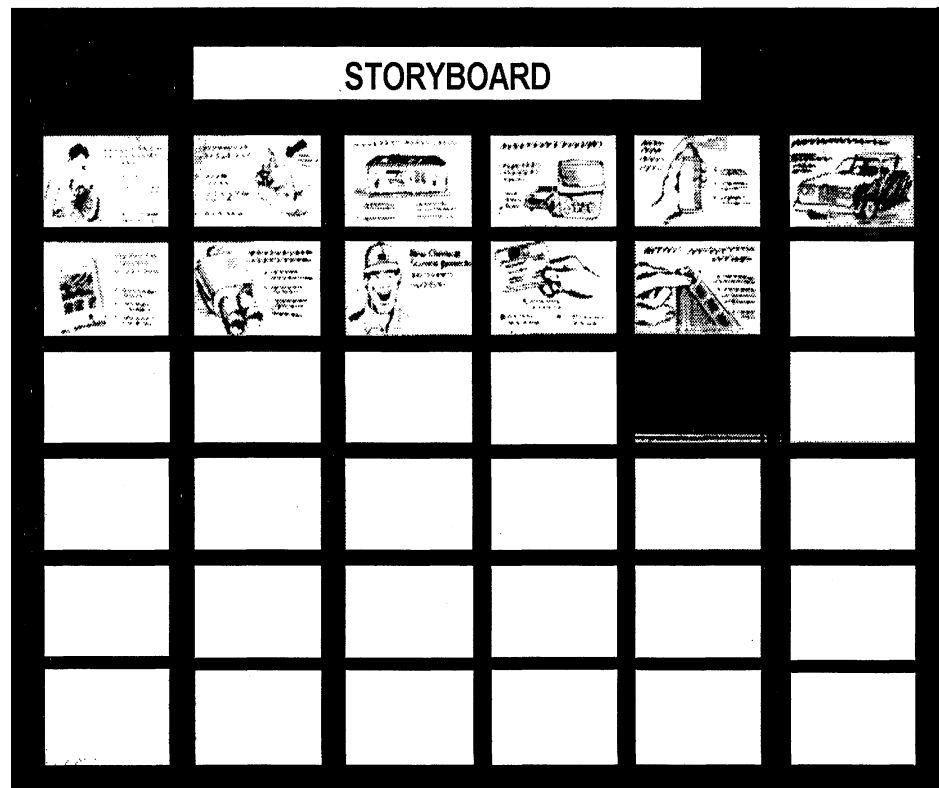
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*Continued on next page*

## Basic Production, Continued

**Storyboarding** A storyboard displays all the story cards associated with a production. A storyboard or a planning board organizes the visuals or scenes in logical progression. Write key scenes or points on 3- by 5-inch cards, one idea per card. Repeat the process until no more ideas come to mind. Arrange the cards in logical sequence. Edit by adding or deleting cards from the storyboard. Arrange the cards to represent the continuity or flow of the complex production.

Figure 3-16 shows a storyboard.



DMJA0083

**Figure 3-16.** —A storyboard.

*Continued on next page*

## **Basic Production,** Continued

---

### **Script**

The script is the producer's blueprint. It is a working plan used to translate ideas into audiovisual productions. Script are necessary regardless of the length or apparent simplicity of a production. The time and money they save are worth the extra effort to create them. Scripts follow a planned pattern beginning with an original idea for a scenario and ending with a word diagram. A script contains more than the spoken dialogue; it also contains the proposed production treatment (media), the action outline, the shot breakdown, and the shooting order. In short, scripts should contain all information required to complete the project, including scene locations, costumes, camera set-ups, lighting requirements, props, and special photographic and sound effects.

---

## Series Production

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### Introduction

At times, you may create a series of training segments or briefs. Make each installment of a series similar in format and attitude. Maintaining uniformity allows you to concentrate on the production without having to make the preliminary decisions over again. Uniformity also identifies a particular segment as part of a larger series and relieves the audience of having to switch gears or mind set for each training segment.

---

### Documentation

When you create a training series, complete a folder for each installment. Write down all the production information as accurately and detailed as possible. Maintain continuity throughout the production by regularly referring to the data compiled in the first production folder. When necessity demands alterations or changes, incorporate these changes throughout the production, if practical.

---

# Computer-Generated Production

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## Introduction

Computers produce most of the graphics you see on TV news programs. Although most commands do not require the high a degree of sophistication that the networks do, there are several flag staff commands that use similar technology. Some staff briefs require imagery manipulation and the integration of supplemental information may appear in some flag briefs or command indoctrinations. Two types of television production you should understand are infographics and infomercials.

---

## Infographics

Infographics is any artwork you create electronically (by computer) for transmission via CRT. These stills should conform to the correct aspect ratio of conventionally prepared artwork. Infographics is created primarily to inform or instruct.

---

## Infomercials

Infomercials involve live action, video footage electronically (by computer) enhanced or altered for transmission via CRT as opposed to direct film footage without electronic manipulation. Infomercials are not documentaries. Their primary motivation is to sell or influence thoughts or actions. Infomercials have a clearly intended commercial message.

---

## Hardware

Hardware requirements for text integration and video manipulation vary. Video and graphics consume extensive amounts of RAM memory in addition to the applications software occupying hard drive memory.

---

## Software

To add text to a video production requires a text integration software package. Let the needs or projected needs of the shop dictate the selection of software. Remember that software packages require extensive memory and a CPU capable of high processing speed.

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## Summary

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### Review

This chapter covers elementary theory of television transmission. Graphics, produced within area limitations and color restrictions, project well. Progressive disclosure adds dimension to an otherwise static display of information. Computer-generated art or video footage is rapidly replacing standard studio television graphics.

---

### Comments

It is unfortunate so few Illustrator Draftsmen have the opportunity to interface on a large scale with computer-generated television graphics. Video manipulation is a fascinating and mushrooming field. Prime examples of the fluidity of the medium are the movies *Forrest Gump* and *Toy Story*. In *Forrest Gump*, familiar images were inperceptivley manipulated to give false impressions. *Toy Story* is the pinnacle of animated three-dimensional sophistication. Should you have the opportunity to use computer graphics in an official capacity for the Navy, you have a moral, ethical, and legal obligation to portray imagery truthfully. Research the instructions that pertain to audiovisual imagery and follow them.



# CHAPTER 4

## DISPLAYS AND EXHIBITS

### Overview

---

#### Introduction

At times, a display or exhibit is the appropriate way to communicate with a large audience. You must plan your displays and exhibits to present a professional and careful arrangement.

---

#### Objectives

The material in this chapter enables you to do the following:

- Evaluate the location or space to set up a display or exhibit.
  - Recognize the differences between displays and exhibits.
  - Distinguish between the impact of displays or exhibits and presentations.
  - Identify a target audience for a display or exhibit.
- 

#### In this chapter

This chapter covers the following topics:

| Topic      | See Page |
|------------|----------|
| Displays   | 4-2      |
| Exhibits   | 4-3      |
| Hanging    | 4-4      |
| Cataloging | 4-7      |
| Storing    | 4-8      |

---

# Displays

---

## Introduction

A display illustrates a process, an evolution, or a development. Displays may be simple or elaborate. A display may be a chart for hanging in a passageway or a series of posters in a spacious Quarterdeck. The impact of a display depends upon your ability to organize material into a comprehensive statement.

---

## Displays

The material for a display should have a central theme or message. Set up a display when the intended audience is transitory and large, and the material is general in nature. You do not need to advertise a display. You can create a display that is loud and colorful or sedate and somber. Let the nature of the material dictate the overall mood. Displays allow audiences to sift through information and focus on information that interests them. Displays can make the audience feel like a participant.

---

## Location

Select a spacious and secure area with maximum pedestrian traffic, such as a Quarterdeck, conference room, or passageway. Plan the placement of the display material where it can be seen and read without choking traffic flow or interfering with set routine. Place the display items at the eye level of the average viewer. If display items are fragile or highly pilferable, arrange for a secure enclosure. Locate items in secure enclosures away from the main traffic areas to encourage lingering without creating a choke point.

---

## Presentation

The material presented in a display should be professional in appearance. The quality of lettering, in particular, is an indication of the ability of the draftsmen who created the display. Keep all labels in the same typeface and on the same size and color of card. When you vary letter style, make it a part of the display design. Mount illustrations and photographs without bubbles or wrinkles. Cut the edges of presented material with a sharp knife blade. Remove feathered edges and correct crooked ones. Keep all presentation materials clean and ready for the next show.

---

# Exhibits

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## Introduction

An exhibit is a presentation of a body of work. Exhibitions are similar to displays, with subtle differences. You will not often have an occasion to set up an exhibit, but you should know the fine line between a display and exhibit.

---

## Exhibits

The work in the exhibit may be by one creator or by many creators in one style. There need not be an overriding theme. For example, an exhibition of Salvadore Dali will have only work created by Dali but, an exhibition of Surrealists will contain work by Dali, Magritte, and other artists in the same school of thought. Exhibits are usually somber, surrounded by as much neutrality as possible so as not to interfere with the impact of the work presented. Exhibits are intended for large, transitory audiences with a fundamental interest in the material on exhibit. Advertise an exhibit to create pre-opening interest.

---

## Location

Locate an exhibit near heavily trafficked areas. Keep the exhibit room quiet, scrupulously clean, and the room temperature cool. Select a spacious and secure area, such as a conference room or classroom. When an exhibit closes, you should be able to lock the space.

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# Hanging

## Introduction

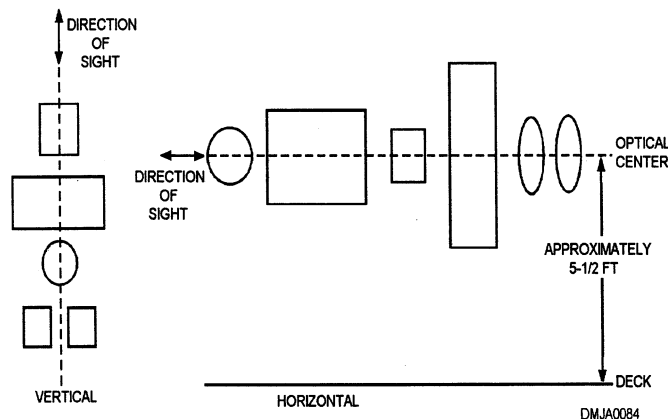
Items in a display or exhibit should present a professional appearance. Mount all illustrations and photographs. Although not mandatory, consider matting and framing the work. Arrange the material either chronologically or by a theme. Pay attention to the way you direct the viewer's line of sight.

## Hanging images

Hang material to a common reference point. The four basic reference points are the vertical or horizontal center line, the flush base or top, the grid arrangement or a stepped arrangement. Place all material at the eye level of the average viewer. Leave a large amount of space between each item. Make sure all presented work is clean and free of defects. Keep the exhibit room quiet, scrupulously clean, and the room temperature cool.

**VERTICAL or HORIZONTAL CENTER LINE:** A vertical or horizontal arrangement of elements is the strongest presentation. Vertical arrangements are more active than horizontal arrangements. A horizontal center line of an image is its optical center which is approximately 1/10th above the mathematical center. Locate the horizontal axis of a horizontal arrangement approximately 5 1/2 feet from the floor.

Figure 4-1 shows a horizontal arrangement and a vertical arrangement.



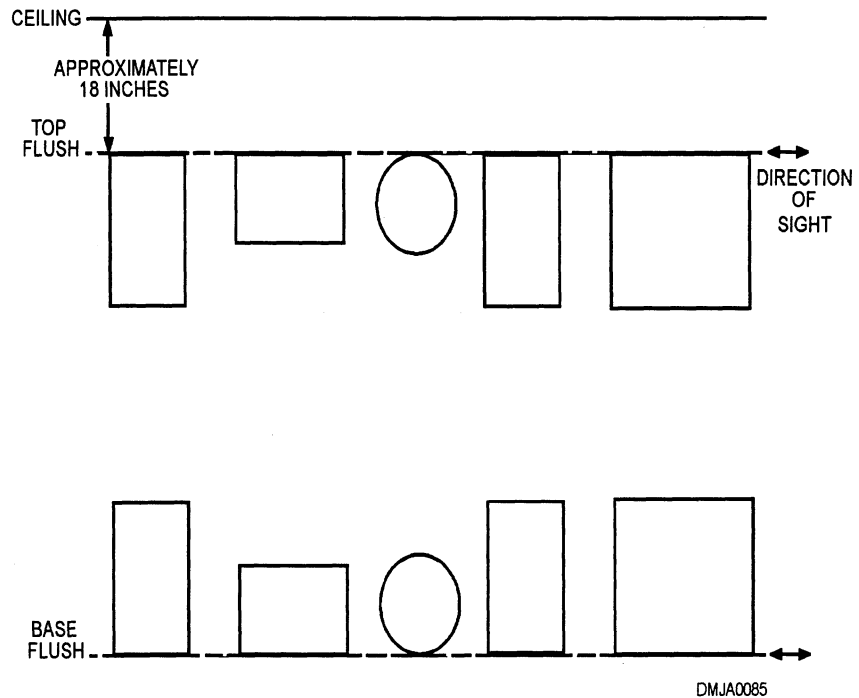
**Figure 4-1.** —A common vertical and horizontal reference point.

*Continued on next page*

## Hanging, Continued

**Hanging images (Continued)** BASE or TOP FLUSH EDGE: The flush edge arrangement is most often found in more formal settings such as museums and art shows. Select an arbitrary height at which to hang the images and consider the average eye level. Do not hang images closer than 18 inches from the ceiling. A viewer easily progresses through images with one image leading into another.

Figure 4-2 shows a flush arrangement of images with the common reference points at the top and at the base.



**Figure 4-2.** —A flush edge common reference point.

*Continued on next page*

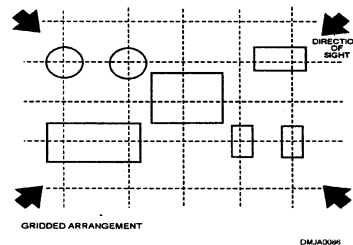
## Hanging, Continued

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### Hanging images (Continued)

**GRID ARRANGEMENT:** A gridded arrangement is the most dynamic arrangement particularly if the items are irregularly sized. This arrangement is also the best choice for unrelated display items. Divide the display area or wall into sections or a grid. Place the most important work in the center and place the other work on the cross sections of the grid. This technique draws viewers in and directs their line of sight toward the center.

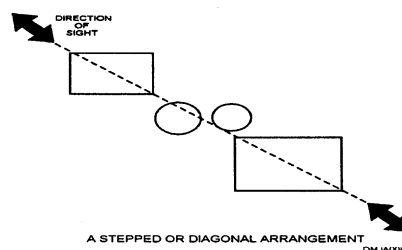
Figure 4-3 shows a gridded arrangement.



**Figure 4-3.** —Cross sections of the grid direct the placement of images.

**STEPPED or DIAGONAL ARRANGEMENT:** A stepped or diagonal arrangement is the most difficult arrangement to create successfully. It is hard to follow and requires some effort on the part of the viewer. The viewer's line of sight is led away from other images toward the floor or ceiling. Use it sparingly.

Figure 4-4 shows a stepped or diagonal arrangement.



**Figure 4-4.** —A stepped or diagonal can direct a viewer's attention away from the image.

## Cataloging

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### **Introduction**

Displays and exhibits require some form of identification. Even the simplest display can turn into a nightmare when you must return the items or retrieve items for an additional display.

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### **Marking**

Annotate a display as you would other artwork retained on file. Include in the information you write on display material, the date, any copyright material, and the sequence number of the display. Mark display or exhibit items you retain in storage or in the shop. Mark them inconspicuously on the back in the lower-right corner. Use a pencil or another media that will not bleed or stain through. It is not customary to retain original art from an exhibit. It is usually sold or returned to the owners who have lent it. For retained art from an exhibit, mark it as you would other art in the file and include in the information recorded, the year of creation, the media, the foundation, the overall size, any series numbers, and the name of the artist.

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## Storing

|                     |                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction</b> | Artwork, if not properly stored and protected, will deteriorate and ruin. If you retain art for regularly staged displays or exhibits, make sure it is safe from water and excessive heat. Make sure the artwork is away from high traffic areas and protected from rats, roaches, and moths.                                                                                                     |
| <b>Preparation</b>  | Before you store art after a display or exhibition, clean it. Remove fingerprints, smudges, and dust balls. Fingerprints and dust accelerate the deterioration of the media. Direct and intense light also prematurely age media. Mark the art and wrap it in a soft protective tissue or ph-neutral paper. Mark the protective paper so that you can easily tell what the contents are.          |
| <b>Temperature</b>  | Store the protected work in a cool, dry area. Professional storage facilities should have hermetically protected rooms to control temperature and humidity.                                                                                                                                                                                                                                       |
| <b>Storage</b>      | Store artwork off the deck. Select a location that offers protection without wedging it between pipes or lagging. Place the art where there is the least amount of traffic or movement. Roaches and other types of bugs are drawn to the flavorful egg and milk emulsions in some media, such as poster paints, gouache, and tempura. Keep the storage room clean and regularly sprayed for bugs. |

## Summary

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### Review

This chapter addresses the differences in displays and exhibits. Careful marking and storage of display and exhibit items will ensure their availability for the next setup.

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### Comments

Displays can be fun. They should be positive experiences for you and for the audience, even when the subject is serious. You have a great deal of freedom in tactics and strategy. You can let your imagination go. The point is to draw attention to the information. Don't let a display inhibit you. After all, you have been creating displays, albeit in their simplest form, since you designed the bulletin board in elementary school.

Exhibits may be scary if the work displayed is your own. This should be your best work. You are not only showing your artistic prowess, but also revealing your most personal feelings. If the work is not yours, your understanding of the body of the work should guide you in organizing the exhibit.

Most ships and stations offer many opportunities for displays and exhibits. Conference rooms, classrooms, passageways, and gedunks all have displays or commemorative memorabilia. Nearly every Quarterdeck has a testimony to the accomplishments or the history of the ship/station. Keep an eye on your Quarterdeck. Take the initiative. Don't allow that hallowed area to become a tattered eyesore. Look for the opportunities to display and exhibit.



# APPENDIX I

## GLOSSARY

### Glossary

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#### Introduction

One important key to success in any technical rate is mastery of the language associated with it. Learn the glossary as an integral part of your learning process. Use the terms other professionals are using in your field.

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#### A

**ACCENT LIGHT**—A light that highlights or emphasizes the subject in a scene.

**ACETATE**—Tough, transparent, or semitransparent sheets available in various thicknesses used as overlays in color separation, friskets in retouching, cels for animated drawings, and displays. Treated acetate readily accepts ink and paint.

**ACHROMATIC**—Black, white, and the grays in between.

**ACRYLIC PAINTS**—*See* POLYMER.

**ACTINIC LIGHT**—The short waves of the light spectrum (green, blue, and ultraviolet) that cause chemical changes in light-sensitive photographic emulsions.

**ACTION LINES**—Extra lines drawn around or following a cartoon figure or object to emphasize motion.

**ACTIVATOR**—The solution or chemical that starts the reaction of the developing agent in a photosensitized emulsion.

**ADDITIVE PROCESS**—A process that produces white light by starting with darkness and combining colored light.

**ADHESIVE**—( 1) A gelatin or casein used as a binder in pigment; (2) A chemical compound used as a glue.

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*Continued on next page*

## Glossary, Continued

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- A (Continued)**    **ADVANCING COLORS**—Colors that appear to come forward, such as red, yellow, and orange.
- AESTHETIC**—Pertaining to the beautiful, particularly in art.
- AGATE**—Type size of 5 1/2 points.
- AIRBRUSH**—An atomizer that applies a fine spray of paint under pressure from a tank of compressed air or carbonic gas.
- AIRBRUSHING**—Using an airbrush to create art or improve the appearance of art.
- ANALOGOUS COLORS**—Colors closely related to one another on a color wheel, such as blue, blue-green, and green.
- ANATOMY**—The bone and muscle structure of humans and animals as it affects the appearance of surface forms and contours.
- ANGLE**—A figure formed by two lines or planes extending from, or diverging at, the same point.
- ANHYDROUS AMMONIA SYSTEM**—A system that uses a mixture of water and ammonia in the developing section of some whiteprint machines.
- ANILINE COLORS**—Brilliant colors derived from coal tar that tend to fade in time.
- ANIMATED CARTOON**—A cartoon drawn in a series of progressive actions to give the effect of continuous movement.
- ANIMATION**—Sequentially drawn pictures displaying a range of motion which, when viewed in rapid succession, appear to be moving.
- ALIGNED SECTION**—A sectional view that revolves some internal features into or out of the plane of view.
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*Continued on next page*

## Glossary, Continued

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### A (Continued)

**AMERICAN STANDARDS ASSOCIATION**—*Also called ASA. See ISO or EXPOSURE INDEX.*

**ANTIQUE STOCK**—A rough-surfaced paper, such as wove or laid.

**APERTURE**—An opening behind the lens that allows exposure to one frame of film.

**APPLICATION BLOCK**—The part of a drawing of a subassembly, showing the reference number for the drawing of the assembly or adjacent subassembly.

**ARC**—A portion of a curved line.

**ARC LAMP**—A light source resulting from the application of current to two carbon electrodes that form an electric arc.

**ARCHITECT'S SCALE**—A scale used when dimensions or measurements represent feet and inches.

**AREA (PICTURE)**—The flat surface within the border of a picture.

**ARROWHEAD**—An indicator shaped like an elongated triangle used at the end of a lead line to direct attention to an object or a point of reference.

**ART**—Any copy other than text; any photograph, painting, or drawing in line, halftone, or continuous tone.

**ART BRUSHES**—*See BRUSHES.*

**ART GUM**—A soft, grit-free eraser used to clean drawings and remove unwanted pencil lines.

**ARTIST'S BOARD**—*See ILLUSTRATION BOARD.*

**ARTWORK**—Illustrations, drawings, photographs, renderings, paintings, sketches, and copy.

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*Continued on next page*

## Glossary, Continued

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### A (Continued)

**ASCENDERS**—The part of lowercase letters that project above the main body waistline, such as h, d, and f.

**ASPECT RATIO**—The proportion of the media format that governs the size of the original artwork.

**ASSEMBLE EDITING**—Putting scenes in chronological or progressive order.

**ASYMMETRICAL**—An informal balance of objects or sections of equal mass and weight on each side of a center line.

**ATTITUDE**—A position or action of the body or part of the body that approximates an emotion, character, or personality.

**ATTRIBUTES OF MEDIA**—Specific characteristics of a chosen medium.

**AUDIO**—Sound that is heard.

**AUDIO-TUTORIAL**—*Also called AT.* Instructions given to a student that uses primarily sound.

**AUDITABLE PICTURE ADVANCE SIGNAL**—An audible signal that indicates the moment to change the image to another.

**AUTO-TRACE**—A software option that allows the tracing of one image into another file option.

**AUXILIARY VIEW**—A drawing showing the true shape of objects that have features not parallel to the three principal planes of projection.

**AXONOMETRIC PROJECTION**—A drawing that shows the inclined position of an object in an isometric, dimetric, or trimetric format.

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### B

**BACKGROUND ART**—Design, texture, pattern, or other form of artwork used to create a background effect for type and illustration.

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## Glossary, Continued

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### B (Continued)

**BACKUP**—The registration of two sides of a printed sheet.

**BALANCE**—A harmonious arrangement of the various components in a picture plane in a symmetrical (formal) or asymmetrical (informal) format.

**BALL-AND-SOCKET JOINT**—A flexible joint that rotates in all directions.

**BALLOON**—(1) A space containing the words spoken by cartoon characters; (2) A distortable shape used as a base to draw a cartoon head.

**BALLOON LETTERING**—Informal, single-stroke lettering used in comic strip balloons.

**BAR CHART**—A graphic representation comparing numerical values by means of rectangles of equal width.

**BASE ART**—*Also called BASIC ART and BLACK ART. See BLACK ART.*

**BEADED SCREEN**—A screen comprised of glass or plastic beads that reflect light from a projected image.

**BEAM COMPASS**—A compass capable of drawing circles and arcs that exceed the limits of a standard compass.

**BEND ALLOWANCE**—An additional amount of metal used in a bend in metal fabrication.

**BENDAY**—Mechanical shading applied to artwork to give a variety of tones to line drawings. Benday is named for its inventor, Benjamin Day.

**BÉLZIER CURVES**—A computer tool that draws precise curves with great accuracy.

**BILL OF MATERIALS**—A list of standard parts or raw materials needed to fabricate items.

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## Glossary, Continued

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### B (Continued)

**BINDER**—An adhesive, coagulate, reducer, or extender added to pigments to maintain consistency, to promote adhesion, and to facilitate application.

**BISECT**—To divide into two equal parts.

**BIT**—The smallest unit of electronic information a computer can handle.

**BIT MAP**—*Also called* PIXEL MAP. A matrix of dots or pixels.

**BLACK ART**—*Also called* BASE ART. Art used in making process plates for illustrations of two or more colors.

**BLACK-AND-WHITE**—(1) Line art executed in a black-and-white medium only; (2) Continuous-tone art executed in black, white, and intermediate tones.

**BLACK PATCH**—A black masking patch pasted into the exact size and location on artwork where a photograph is to appear on the reproduction copy.

**BLEED**—The borders on the artwork and printing plate that extend beyond the final trimmed edge of the sheet.

**BLENDING**—Mixing or incorporating one color or tone with another.

**BLOCKING IN**—Indicating the broad outline of an object or shapes in a picture using preliminary lines.

**BLOCK OUT**—Eliminating an unwanted section of a picture.

**BLOWUP**—An enlargement.

**BLUEPRINT**—A direct, positive print made on chemically treated paper from a translucent or transparent drawing.

**BOARD**—Any heavy material used for mounting art or making displays.

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## Glossary, Continued

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### B (Continued)

**BOARD ART**—Any artwork mounted on heavy board stock.

**BODY TYPE**—Type used for the main body of text in printed matter.

**BOLDFACE**—Type emphasized by darkening or increasing letter weight.

**BOOKLET**—A pamphlet bound within paper covers.

**BOOT-UP**—Start-up of the computer.

**BONE**—An instrument with a plastic, agate, or metal tip used for burnishing shading sheets, pressure-sensitive letters, and paste-ups.

**BORDER AREA**—The areas around a graphic that represents a protective perimeter.

**BOUNCE LIGHT**—Lighting set up to reflect from nearby surfaces onto a subject.

**BOURGES PROCESS**—A method of color separation using prepared colored or toned papers or acetate sheets.

**BOW INSTRUMENTS**—Drafting tools that draw circles and arcs less than one inch in diameter.

**BOX**—To enclose with borders or rules.

**BREAK LINE**—Lines to reduce the graphic size of an object, generally to conserve paper space.

**BRIEFING CHART**—*Also called BRIEFING PAD.* A visual aid that presents information on large paper or board.

**BRIGHT**—A short haired, flat, chisel-shaped brush.

**BRISTLE.**—A hog hair brush used primarily in oil painting.

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## Glossary, Continued

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### B (Continued)

**BRISTOL BOARD**—A drawing surface made of fine, tough, flexible cardboard available in several thicknesses and in a variety of surfaces.

**BROADSIDE**—*Also called* BROADSHEET. A large, folded advertising piece.

**BROCHURE**—A bound pamphlet.

**BROKEN COLOR**—Two or more colors applied simultaneously to artwork without prior mixing or blending.

**BROKEN OUT SECTION**—An auxiliary view used when a partial view of an internal feature is insufficient.

**BROWNPRINT**—A photographic print or silverprint that produces a brown image.

**BRUSHES**—A collection of bristles or hairs used to apply pigment and glues.

**BULLET**—A symbol (●) used to preface listed items.

**BURNISH**—The application of pressure to secure paste-ups, shading sheets, and lettering to artwork.

**BURNISHER**—*Also called* BONE. An instrument made of plastic, wood, glass, metal, stone, or ivory used to flatten, smooth, or polish a surface with hand pressure.

**BUSY**—Excessive or competing detail.

**BUTTON BAR**—*Also called* TOOL BOX. A program specific legend of options available to a computer user.

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*Continued on next page*

## Glossary, Continued

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### C

**CABINET PROJECTION**—A type of oblique drawing with the angled receding lines drawn to one-half scale.

**CALLOUT**—To call attention to a part or item in an illustration.

**CAMCORDER**—A video camera and recorder in one unit.

**CAMEO PAPER**—Paper of a dull, smooth finish used frequently for carbon and graphite pencil drawings.

**CAMERA LUCIDA**—*Also called LACEY LUCY.* An instrument with prism lenses used for enlarging or reducing artwork.

**CAMERA-READY COPY**—*See* REPRODUCTION COPY.

**CANVAS**—A surface made of cloth, usually cotton or linen, for painting.

**CANVAS BOARD**—Cardboard covered with cotton or linen used as a surface for painting.

**CANVASKIN**—A paper with a textured surface resembling canvas.

**CAPTION**—Any descriptive heading or title for an illustration or table.

**CARBON PENCIL**—Pressed carbon in a wood casing.

**CARICATURE**—The deliberate exaggeration and distortion of prominent features or mannerisms.

**CARPENTER'S PENCIL**—A wide, flat lead pencil ideal for chisel point lettering or laying in broad tones.

**CARTOON**—A comic or satiric drawing.

**CARTOUCHE**—A scroll-like design used ornamentally in printing or hand lettering.

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## Glossary, Continued

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### C (Continued)

**CASEIN**—A curd of milk and lime used as a binder in tempura paint.

**CAVALIER PROJECTION**—A form of oblique drawing with the receding lines drawn full scale at 45° to the orthographic front view.

**CD**—*See* COMPACT DISK.

**CD ROM**—*See* COMPACT DISK READ-ONLY MEMORY.

**CEL**—Acetate overlays used in television art and animation.

**CEL LEVEL**—The number of cels placed one over another on the same background and photographed at the same time.

**CENTER DISK**—A drafting instrument that protects the paper surface from damage when drawing multiple concentric circles with a compass.

**CENTER OF INTEREST**—The part of the picture that attracts the most attention.

**CENTER LINE**—Lines that indicate the center consisting of alternating long and short dashed evenly spaced.

**CENTER SPREAD**—Two facing pages formed by one folded sheet of paper.

**CENTRAL PROCESSING UNIT**—*Also called* CPU. The integrated circuit (IC) chip that controls the speed and processing power of the computer.

**CHAIN or CIVIL ENGINEER'S SCALE**—A scale, generally triangular, divided in decimal units or units of 10.

**CHARACTER**—Any letter, number, punctuation mark, or space in printed matter.

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## Glossary, Continued

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### C (Continued)

**CHARACTER GENERATOR**—A computer hardware or software device that provides a means for formulating a character font and as a controlling function during printing.

**CHARCOAL**—Specially charred willow sticks used for drawing on a paper with tooth.

**CHARCOAL DRAWING**—A drawing made with charcoal.

**CHARCOAL PENCILS**—Charred willow sticks encased in wood for strength.

**CHIAROSCURO**—Rendering forms using a balanced contrast between pronounced light and dark elements.

**CHINESE WHITE**—An opaque white watercolor pigment.

**CHISEL POINT**—Drawing or lettering with a wide, flat point.

**CHOKES**—Used to trap a dark element over a light background to avoid or minimize white space showing around the element during press plates misalignment.

**CHROMA**—*See* INTENSITY.

**CIRCULAR SCREEN**—A photographic screen used with a process camera, which allows screen adjustment to eliminate the wavelike or checkered effect, called moire.

**CIRCUMFERENCE**—The length of a line that forms a circle.

**CIRCUMSCRIBED**—To draw around or enclose within one geometric form another form or object.

**CLICK ON**—To select a computer function by clicking the buttons on a mouse.

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*Continued on next page*

## Glossary, Continued

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### C (Continued)

**CLIP ART**—A collection of artwork filed away for future use.

**CMYK**—An acronym for cyan, magenta, yellow, and black, a color specification system for color separation and printing.

**COATED PAPER**—Paper coated with a finely ground filler or clay to produce a smooth surface.

**COBALT DRIER**—A liquid agent used in a medium to accelerate the drying of oil paints.

**COLD COMPOSITION**—Composition of type that uses no molten metal to form the image.

**COLD MOUNT**—A method of mounting artwork or photographs to a surface.

**COLD PRESSED**—A paper or illustration board with a medium to rough surface texture.

**COLLAGE**—Artwork made by arranging and pasting pieces of cloth, newspaper, and various other materials on a surface to form a composition.

**COLLATING**—Gathering single sheets or leaves in sequence.

**COLLOTYPE**—A method of reproducing paintings and drawings using a gelatin plate.

**COLOR**—A sensation caused by light waves of different lengths comprised of three elements: hue, value, and intensity.

**COLOR BARS**—Bars of color that appear on a video screen to facilitate fine tuning of the color resolution.

**COLOR BLENDING**—Blending or combining different colors to form another color or smooth gradient.

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*Continued on next page*

## Glossary, Continued

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### C (Continued)

**COLOR CHART**—An arrangement of colors.

**COLOR CYCLING**—A spectral effect that creates the illusion of movement on the computer screen.

**COLOR DIMENSIONS**—The three elements of color: hue, value, and intensity.

**COLOR GRAPHICS ADAPTER BOARD**—*Also called CGA or a Video Graphics Adapter (VGA).* This IC chip defines the ability of the computer to execute commands during the creation of artwork in the computer.

**COLOR HARMONY**—A unified or aesthetically pleasing effect produced by a combination of colors.

**COLOR INTERVAL**—The degree of visual difference between two colors as measured by hue, value, and intensity.

**COLOR KEY**—The overall effect of the selected palette, for instance, a high-key illustration of light, bright or vibrant color and a low-key illustration of dull or monotonous colors.

**COLOR NOTATION** —The specification of color by written symbols and numerals based on an established color system used on sketches for future reference.

**COLOR PROOF** —An engraver's or printer's proof showing the effect of final color in perfect registration.

**COLOR SCALE** —A series of colors that display a change or gradation in hue, value, and intensity.

**COLOR SCHEME** —A group of colors that dominate a picture or create a unity within it.

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## Glossary, Continued

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### C (Continued)

**COLOR SEPARATION**—( 1) The photographic. process of separating full-color originals into the primary printing colors; (2) An artist manually separating the originals for full color reproduction in the creation stage of a master artwork.

**COLOR SKETCH**—A rough drawing or layout approximating the color in the final picture.

**COLOR SYMBOLISM**—The use of color to signify or suggest an emotion, idea, or characteristic.

**COLOR WHEEL**—A circular color chart with colors arranged according to their positions as a primary, secondary, or tertiary color.

**COLUMN**—(1) A section of text or other matter that makes up a vertically divided page; (2) A vertical section of a table.

**COMBINATION PLATE**—A press plate that combines both halftones and line work.

**COMIC STRIP**—A series of drawings, in panel format, portraying the adventures of characters, humorous or otherwise, usually published in newspapers.

**COMMERCIAL ART**—Artwork of any kind prepared for commercial advertising and general promotion.

**COMPACT DISK**—*Also called CD.* A small disk of electronic files encased in a plastic casing.

**COMPASS**—An instrument for drawing circles and arcs.

**COMPUTER DISPLAY MONITOR**—An output device that allows the computer operator to see an image of electronic media on a cathode-ray screen similar to a television monitor.

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## Glossary, Continued

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### C (Continued)

**COMPUTER PLATFORM**—The use of a particular brand of computer to develop software programs specifically for that brand.

**COMPLEMENTARY COLORS**—Any two opposing hues on a color wheel.

**COMPOSITE**—Comprised of two or more parts.

**COMPOSITION**—The arrangement of forms, colors, lines, and other pictorial units.

**COMPOSITOR**—A machine that converts electronic data into an acceptable format for a printer.

**COMPREHENSIVE**—A layout of art or type, either in black-and-white or color.

**COMPREHENSIVE SKETCH**—A finished layout that defines all of the elements, such as type, illustration, and spacing.

**COMPRESSED FILES**—Compacting computer-generated files to save disk and memory space or to facilitate faxing.

**COMPUTER GRAPHICS**—Artwork created by the use of a computer.

**CONSTRUCTION**—The drawing of objects so that they appear solid or three dimensional.

**CONSTRUCTION LINES**—Lightly drawn lines used in the preliminary layout of a drawing.

**CONTACT SCREEN**—A screen placed in direct contact with the film or plate to obtain a halftone pattern from a continuous-tone original.

**CONTINUOUS-TONE ART**—Artwork created using any medium that does not use a halftone process to represent tone.

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*Continued on next page*

## Glossary, Continued

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- C (Continued)**
- CONTOUR PEN**—Adjustable pen nibs on a rotatable shaft used for drawing curvilinear lines.
- CONTRAST**—The range of tonal differences.
- COOL COLOR**—Colors that appear to project cooler temperatures.
- COOLED COLOR**—A color resulting from the addition of a cool color to a warmer color.
- COPY**—Any matter, including photographs, rules, designs, and text, used for producing printed matter.
- COPYBOARD**—A table or frame that holds original copy during a photographic exposure.
- COPYFIT**—Scaling copy to fit into an allotted space.
- COPYRIGHT**—Exclusive protection of ownership given to a creator of an original work.
- COQUILLE BOARD**—A drawing board that comes in a variety of roughened surfaces that break up crayon or brush strokes into texture more suitable for line reproduction.
- COURSEWARE**—All materials pertaining to a software program or course of instruction.
- CPU**—*See* CENTRAL PROCESSING UNIT.
- CRAWL DEVICE**—A rotating drum used to display credit lines for television transmissions.
- CREMNITZ**—*See* WHITE LEAD.
- CROP**—To cut off.
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## Glossary, Continued

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### C (Continued)

**CROP MARKS**—Marks used to define the limits of an image for reproduction.

**CROPPING**—Defining the limits of an image for reproduction.

**CROSSHATCH**—Parallel lines drawn across other parallel lines to indicate tone.

**CROW QUILL**—A fine, stiff pen nib with little spring used for drawing fine lines and lettering.

**CRT**—*Also called* CATHODE-RAY TUBE. A screen or monitor that converts light rays to electrical impulses for transmission or receiving.

**CURE**—A solid form of six equal square sides.

**CURSOR**—A position indicator on a computer monitor.

**CUTAWAY DRAWING**—A drawing where a portion of the object is cut away revealing the internal structure.

**CUTLINE**—The placing of a caption in an illustration.

**CUTTING PLANE LINE**—A sectional view showing a theoretical cut on the item.

**CYAN**—Light blue-green color.

**CYCLE OF ACTION**—The completion of a single action of animated movement.

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### D

**DAISY WHEEL PRINTER**—A spinning wheel with spokes having raised letters and numbers.

**DAMAR FINISH**—Varnish used as a final protective coat over a painting or mixed as part of the painting medium.

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## Glossary, Continued

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### D (Continued)

**DATA POINTS**—Symbols used to plot information or events on a graph or chart.

**DATUM LINE**—A line that indicates the position of a datum plane.

**DEADLINE**—Final delivery date.

**DEBUGGING**—Locating and eliminating software deficiencies.

**DECAL**—*See* DECALCOMANIA.

**DECALCOMANIA**—An image printed on specially prepared paper or film for transfer to another surface.

**DECKLE EDGE**—The rough or uneven edge of paper intentionally produced during manufacturing.

**DELINEATE**—To give depth to line art by making particular lines heavier.

**DENSITY RANGE**—*Also called* DENSITY SCALE. Measured differences between the minimum and maximum densities of a particular negative or positive.

**DEPICT**—To represent.

**DEPTH**—Thickness as measured downward from the surface of an object.

**DEPTH OF FIELD**—The distance between the closest sharply focused point to the farthest point in focus.

**DESCENDERS**—The parts of lowercase letters that fall below the main body base line, such as g, p, and q.

**DESIGN**—A planned or intended arrangement of the elements in a composition.

**DESIGNER'S COLORS**—Opaque watercolors of high quality.

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## Glossary, Continued

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- D (Continued)**    **DESKTOP PUBLISHING**—The preparation of copy ready to go directly to press.
- DETAIL DRAWING**—A drawing that gives specific information.
- DETAIL PEN**—*Also called* SWEDE PEN. A broad nibbed, adjustable ruling pen with greater ink capacity than a standard ruling pen.
- DETAIL VIEW**—A view that shows part of the principal view of an item using the same plane and arrangement but in greater detail and in a larger scale.
- DEVELOPER**—A chemical that causes a reaction in an exposed emulsion to reveal an image in that emulsion.
- DIAZO FILM**—A flexible transparent base coated with an emulsion of diazo salts and couplers.
- DIAZO PAPER**—Paper treated with a diazo compound and azo dyestuff component.
- DIAZOCHROME**—Diazo sensitized films that produce colored dye images on a transparent plastic base.
- DIFFUSED LIGHT**—Evenly spread light.
- DIMENSION LINE**—A thin, unbroken line with each end terminating in an arrowhead used to define the dimensions of an object.
- DIMETRIC PROJECTION**—An axonometric projection of an object where two axes make equal angles with the plane of projection and the third axis makes a smaller or larger angle with the plane of projection.
- DINGBATS**—Stars or ornaments used to embellish type.
- DISCHORD**—Color or elements that compete or are not in visual harmony that creates an uneasy or unattractive image.
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## Glossary, Continued

### D (Continued)

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**DISK**—*Also called DISC.* (1) A flat photomatrix used in phototypesetting and computer equipment; (2) A layer of magnetic oxide used to store electronic data.

**DISK DRIVE**—A device that reads, adds, or deletes information stored on a disk.

**DISPLAY LETTERING**—Any large, prominent lettering used to attract attention.

**DISPLAYS**—A collection of objects and images arranged to tell a story.

**DISPLAY TYPE**—Large type used for headings and titles.

**DISSOLVE**—The fading of one scene as another replaces it.

**DISSOLVE UNIT**—An electronic device that automatically pulses a slide projector to dissolve an image and replace it with another.

**DISTORTION**—Changed or twisted out of natural shape.

**DIVIDERS**—An instrument used for dividing lines into equal segments and transferring measurements.

**DOMINANT**—Prominent or most important.

**DOT MATRIX PRINTER**—A printer that uses a number of pins to form letters and numbers.

**DOTS PER INCH**—*Also called DPI.* A standard measurement for resolution in the computer graphics industry.

**DOUBLE-ACTION AIRBRUSH**—An airbrush that requires the user to push down a button to expel air through the brush and to pull back the button to release paint.

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## Glossary, Continued

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### D (Continued)

**DRAFTING MACHINE**—A machine that combines the functions of a T-square or straightedge, a triangle, a ruler, and a protractor.

**DRAWING**—The representation of objects, ideas, or emotions on a flat surface using line, tone, or color.

**DRAWING THROUGH**—Sketching in the structural lines of an object as if it were transparent.

**DRIER**—A substance used to hasten the drying times of paint or ink.

**DROP CARDS**—Drop-out or drop-in title cards rigged to fall in and out of camera view.

**DROP OUT**—Masked or opaqued areas present in the halftone negative, print, or plate.

**DROP-OUT HALFTONE**—A halftone reproduction that eliminates the screen dots in white areas, often accomplished photographically by the platemaker or by re-etching.

**DRY BRUSH**—Drawing or painting with a brush that contains very little substance to create a textural effect.

**DRY MOUNT**—Mounting photographs without paste or rubber cement.

**DRY MOUNT PRESS**—An electrically heated press that activates an adhesive sheet or foil placed between the image and the illustration board.

**DUCK**—A lead weight used to position a spline while drawing irregular curves.

**DUMMY**—A rough draft or proposal of printed material pasted or bound together in exact reproduction size that show the areas illustration and text will occupy.

**DUOTONE**—Two-color halftone print made from a screened photograph.

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*Continued on next page*

## Glossary, Continued

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### E

**EARTH COLORS**—Pigments made from earth minerals.

**EDGE**—The border or outline of a form or shape.

**EDIT**—To check, add, or delete.

**EDIT CONTROLLER**—A machine that locates the beginning and end of a scene used for cuing VCRs for presentation.

**EGG-OIL TEMPERA**—An opaque watercolor similar to egg-based tempura but with an added oil that makes the medium easier to handle and adaptable to a wider range of effects.

**EGG TEMPURA**—An opaque watercolor paint that uses egg yoke as a binder.

**ELECTRONIC IMAGING**—The creation, enhancement, and alteration of images through electronic or computer digitization.

**ELEVATION**—A four-view drawing of a structure showing front, sides, and rear.

**ELITE**—A type size for typewriters approximating 10 point printing type having 12 characters to the linear inch of copy and 6 lines to the vertical inch.

**ELLIPSE**—The enclosed plane forming a regular oval where the shortest dimension through the center is the minor axis and the longest dimension is the major axis.

**EM**—A measure of type equal to the square of the type body, derived from early type practices in which the letter *M* was cast on a square body.

**EMPHASIS**—Stress or accent on any part of a design or picture.

**EMULSION**—A suspension of fine drops or globules of one liquid in another liquid.

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## Glossary, Continued

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### E (Continued)

**EN**—A measure of type equal to one half of an EM.

**ENCRUSTING**—Taking a video image and wrapping it around an image of an object.

**ENGINEERING DRAWING**—An orthographic drawing of a piece of equipment or of its detailed parts containing information and instructions sufficient for manufacture.

**ENGINEER'S SCALE**—A scale used whenever dimensions are in feet and decimal parts of a foot, or when a scale ratio is a multiple of 10.

**ERASING SHIELD**—A small, thin spring metal plate with variously sized and shaped openings used to protect the surrounding area of a drawing while erasing in an adjacent area.

**ESSENTIAL AREA**—The part of a picture that contains all of the title or lettering intended for viewer consumption and often corresponding with the safe title area.

**EQUILATERAL**—Equal angles and equal sides.

**EXPLODED VIEW**—A pictorial view of a device in a state of disassembly, showing the appearance and interrelationship of parts.

**EXPOSURE INDEX**—The degree of light sensitivity of film.

**EXPORT**—The transfer of files to another software application.

**EXTENSION BAR**—A leg extension to a standard compass which expands the diameter of a circle that the compass is able to draw.

**EXTENSION LINE**—A line used to indicate the extent of a dimension.

**EYE LEVEL**—*Also called* HORIZON LINE. The horizontal plane at the artist's eye level to which that person relates linear perspective.

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*Continued on next page*

## Glossary, Continued

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### F

**FACE**—Also called TYPEFACE. A style of type.

**FADE-IN**—To bring an image from a pale version into full contrast gradually.

**FADE-OUT**—To bring an image from a full contrast of darks and lights to a pale version gradually.

**FEATHER**—A bleeding effect where small featherlike indications surround the characters.

**FEATURE**—A cartoon panel or strip appearing regularly in a publication.

**FELT NIB PEN**—A drawing pen with a felt nib or tip that ink soaks through from a reservoir.

**FERRULE**—The part of a brush that holds the hairs or bristles.

**FIGURE**—A line illustration or photograph of any kind used in a publication.

**FILLS**—Color, shades, or patterns added to computer-generated imagery.

**FILM NEGATIVE**—A photolithographic negative produced by a process camera.

**FILM POSITIVE**—A film- or acetate-based material having a black area or image and a translucent or clear background.

**FILM SPEED**—The degree of light sensitivity of film.

**FINE ART**—The personal expression of the artist who creates it.

**FINISHED ART**—Any piece of artwork complete or ready for reproduction.

**FINISH MARKS**—Marks used to indicate the degree of smoothness of the finish on machined surfaces.

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Continued on next page

## Glossary, Continued

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- F (Continued)**     **FIRST GENERATION**—Photographically reproduced copy made from the original.
- FIX**—To spray with a clear coat to protect or preserve an image surface.
- FIXATIVE**—Any clear solution sprayed or coated on a surface to stabilize, protect, or preserve an image.
- FIXER**—A solution or chemical that stabilizes the development of photosensitized films.
- FLEXIBLE CURVE RULE**—A scale or rule that bends in shape to irregular curved surfaces.
- FLAKE WHITE**—*See* WHITE LEAD.
- FLANNEL BOARD**—*Also called* FELTBOARD. A presentation board covered in felt or flannel that cut out shapes backed with a slightly abrasive backing will cling to.
- FLAPPING**—*See* MOUNTING AND FLAPPING.
- FLAT BRUSH**—A flat oil painting brush that is thicker and with longer bristles than the bright brush.
- FLAT COLOR**—Color that is dull or grayed or has a matte surface.
- FLAT TONE**—An area of uniform or even color.
- FLIP CARD**—One of a series of photographs or drawings shown in sequence to tell a story or deliver a message.
- FLOP**—To reverse from right to left or vice versa.
- FLOPPY DISK**—A disk of magnetic oxide that stores electronic data for retrieval by a computer disk drive.
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## Glossary, Continued

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- F (Continued)**
- FLOW CHART**—A chart that shows the flow of data through a data processing system and the sequence of their performance.
- FLOUROGRAPHIC**—*See* DROP-OUT HALFTONE.
- FLUSH**—Even with the margin or the widest line in a column or page.
- FOCAL POINT**—Center of interest.
- FOCAL LENGTH**—The distance from the center of the lens to the film plane.
- FOCI METHOD**—A method of drawing ellipses by plotting a series of points as their circumference using two points on the major axis (foci) as reference and connecting these points with french curves.
- FOCUS**—Image sharpness.
- FOLIO**—A sheet of paper folded once giving four pages.
- FONT**—Typeface designs and sizes.
- FORESHORTEN**—To depict an object or line in less than its true length.
- FORM**—The shape and structure of an object or figure.
- FORMAL BALANCE**—*See* BALANCE or SYMMETRY.
- FORMAT**—A general structure or composition.
- F/STOP**—Settings on the lens diaphragm of a camera lens that measure the amount of light allowed to reach the film.
- F/16 RULE**—Setting the camera for an f/stop of f/16 and the shutter speed close to the ASA/ISO rating of the film.
- FRAME**—A single unit in a storyboard, a cartoon feature or a film strip.
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## Glossary, Continued

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### F (Continued)

**FRAME GRABBER**—Also called VIDEO CAPTURE. A device that isolates one frame of a video image and inputs this frame into a computer.

**FREEHAND DRAWING**—Drawing without the use of mechanical aids.

**FRENCH CURVES**—Instruments used to draw smooth, irregular curves.

**FRESCO**—Painting on freshly spread, moist plaster with pigments.

**FRESNEL LENS**—A intense prismatic lens of concentric divisions, which concentrate and focus light through a transparent image onto a mirror and to a screen in an overhead projector.

**FRISKET**—A covering placed over part of a drawing or photograph to protect that section while working on the rest of the artwork.

**FRONTISPIECE**—An illustration preceding and usually facing the title page of a book.

**FULL-COLOR PAINTING**—A painting in which the three primary colors or some variation of them is evident.

**FULL MEASURE**—The entire width of a line of type flush with both margins measured in picas.

**FULL SECTION**—A sectional view that passes entirely through the object.

**FULLERS EARTH**—A fine white powder used for preparing the surface of a photograph to accept retouching.

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### G

**GALLEY PROOF**—A rough proof of type made for proofreading, submitted before pages are made up.

**GANG RUN**—Several different jobs printed simultaneously on a large press in the same colors on one sheet to save time and reduce costs.

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*Continued on next page*

## **Glossary,** Continued

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### **G (Continued)**

**GANG SHOOTING**—Photographing several pages of original copy at the same time.

**GELATIN**—A pure glue made from animal or vegetable matter.

**GENERATION**—A single step in a reproduction process.

**GIGABYTE**—Approximately one billion bytes of information, a kilobyte to the third power (1,024 x 1,024 x 1,024).

**GLAZE**—An application of a transparent color or value over another color or value.

**GLOSSY PRINT**—A print having a shiny finish, which does not readily absorb inks or paints.

**GLYCERIN**—A heavy oil, colorless and odorless, used in the preparation of watercolor pigment.

**GOLDENROD**—Paper or plastic mask material used to support negatives in making press plates.

**GOTHIC**—An alphabet or typeface characterized by strokes of equal or almost equal thickness, usually without serifs.

**GOUACHE**—An opaque watercolor.

**GRADED WASH**—A wash that blends a light tone to a dark tone or vice versa.

**GRADUATED FILL**—To fill with color, shade, or pattern that variegates from dark to light or vice versa.

**GRAPHIC ARTS**—A form of art specializing in work prepared primarily for conveying information.

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## Glossary, Continued

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### G (Continued)

**GRAPHIC INTERFACE**—Screen graphics on the computer screen that make the computer easier to use.

**GRAPHICS PRINTER**—A high-resolution printer capable of printing graphic images.

**GRAPHICS TABLET**—An electronic input device that allows the user to draw on the tablet before committing the image to memory.

**GRAPHITE**—The black marking substance in a lead pencil.

**GRAVER**—A needle or square pointed tool used to scratch lines into scratchboard.

**GRAVURE**—A photomechanical printing process (intaglio) with the images recessed below the surface of the plate.

**GRAY**—A color formed by mixing black and white or complementary colors.

**GRISAILLE**—A decorative gray monochromatic painting designed to create the illusion of a bias-relief sculpture.

**GUM ARABIC**—A water soluble gum used as a binder in some watercolors and tempura paints.

**GUTTER**—(1) The inner margin of a printed page extending from the printed portion to the fold or binding; (2) The area between two columns on a printed page.

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### H

**HALF SECTION**—A combination of an orthographic projection and a section view to show two halves of a symmetrical object.

**HALFTONE**—A tonal pattern of shades from white through black defined by a series of dots.

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## Glossary, Continued

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- H (Continued)**
- HALFTONE SCREEN**—A screen placed in front of the negative material in a process camera to break up a continuous-tone image into a dot formation.
- HARD COPY**—Copy of any kind produced on paper or any substrate except film, used for proofing, checking, revising, or redrawing.
- HARMONY**—A pleasing arrangement of the picture elements, because of the similarity of one or more qualities.
- HEXAGON**—A six-sided figure.
- HIDDEN LINE**—Thick, short dashed lines used to show a hidden part or edge.
- HIGHLIGHT HALFTONE.**—*See* DROP-OUT HALFTONE.
- HIGH SURFACE**—*See* HOT PRESSED.
- HINGE JOINT**—A joint limited to back-and-forth movement.
- HOLDING LINE**—A line usually drawn in black on a mechanical intended for reproduction.
- HOOK AND LOOP BOARD**—A briefing board covered with nylon hook material to which items backed with a nylon loop material will stick.
- HORIZON LINE**—An imaginary horizontal line representing the observer's line of sight.
- HOT PRESSED**—*Also called* HIGH SURFACE. A smooth art paper or illustration board.
- HUE**—The name given to distinguish any color.
- HYPO**—*See* SODIUM THIOSULFATE.
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## Glossary, Continued

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### I

**ICON**—Onscreen computer symbols that portray functions by graphic images.

**ILLUMINATION**—The hand decoration of text in a book, a manuscript, or a diploma.

**ILLUSTRATION**—A picture designed to interpret a story or an article.

**ILLUSTRATION BOARD**—Heavy paper board manufactured especially for artists available in a variety of sizes, surfaces, and weights.

**IMAGE AREA**—An area that encompasses a printed, drawn, or photographed image and the light or dark background space around the image.

**IMPORT**—The transfer of files from other software applications.

**INDEFINITE BLENDING**—Adding paint or ink to a wet surface to promote indefinite effects.

**INDIA INK**—Pigment made of lampblack and a binder suspended in water as a fluid ink.

**INFINITY**—The farthest distance marking on a lens.

**INFORMAL BALANCE**—*See* BALANCE.

**INK JET PRINTER**—A high-resolution printer that uses a minute jet spray of ink to create an image.

**INPUT**—Text or parameters entered into a computer memory or saved on disk.

**INPUT DEVICE**—*See* KEYBOARD or JOYSTICK. An accessory used to provide text or commands into a computer or disk.

**INSCRIBED**—An object completely enclosed by another.

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## Glossary, Continued

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### I (Continued)

**INTAGLIO**—Printmaking from engraved or etched lines and surfaces.

**INTENSITY**—The degree of strength, saturation, or purity of a color.

**INTERFACE**—Interaction between accessories.

**INTERMEDIATE**—A copy of an original on translucent or transparentized film, paper, or cloth, which now becomes a master to make other copies.

**IRREGULAR CURVES**—Curvilinear forms that do not contain arcs easily replicated by a compass or circle template.

**ISOMETRIC PROJECTION**—A set of three or more views of an object that appears rotated, giving the appearance of viewing the object from one corner.

**ITALICS**—Letters whose form has an oblique slant to the right or left.

**IVORY BLACK**—A fine black pigment.

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### J

**JOYSTICK**—*See* TRACKBALL or MOUSE. A computer input device used for remote manipulation of a cursor.

**JUSTIFICATION**—Spacing within the line of type of a predetermined measure to align the margins.

**JUXTAPOSITION**—Side-by-side placement for a desired effect.

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**KERN**—Part of a letter that appears as a hairline connection between adjacent letters.

**KERNING**—The addition of space between characters.

**KEY**—A scale of values, tones, or hues.

**KEY ART**—*See* BLACK ART.

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## Glossary, Continued

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- K (Continued)**
- KEY LINE**—A line drawn in red on a mechanical to indicate position and size of a piece of copy that will not be visible in the reproduction.
- KEYBOARD**—A computer input device based on the principle of a typewriter keyboard used to input text and commands into a computer.
- KEYSTONE EFFECT**—Onscreen distortion created when the projector is not parallel to the deck or screen surface.
- KID FINISH**—A medium-textured surface of art paper or illustration board.
- KILOBYTE**—Abbreviated as K, a kilobyte is 1,024 bytes of data.
- 
- L**
- LAMINATE**—(1) A transparent plastic or acrylic cover material; (2) To cover a surface with a transparent plastic or acrylic material.
- LAMINATION**—A plastic or acrylic used to cover a surface.
- LAMPBLACK**—A very fine black pigment used in various black paints and inks.
- LASER**—An acronym for Light Amplification by Stimulated Emission of Radiation.
- LASER PRINTER**—A high-resolution printer that uses laser technology to create an image.
- LAYING IN**—The initial broad application of tone to a picture.
- LAYOUT**—The arrangement of a book, a magazine, or other publication so that text and illustrations follow a desired format.
- LEADING**—Spacing between lines of type, measured in points.
- LEADER LINE**—Thin, unbroken lines used to connect numbers, references, or notes to appropriate surfaces.
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## Glossary, Continued

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### L (Continued)

**LEAF**—A single sheet that includes both sides.

**LEAK**—An accidental escape of fill color or texture from an object or shape not completely enclosed by pixels.

**LENS**—Optical glass components arranged in a formation that creates a focal point at a specific distance from a screen.

**LENS DIAPHRAGM**—Controls the amount of light allowed to reach the film.

**LEGEND**—A description of any special or unusual marks, symbols, or line connections.

**LENTICULAR SCREEN**—A projection screen with a surface patterned to reflect a projected image with minimum glare.

**LETTERHEAD**—(1) The printed matter, usually the name and address of a company, at the head of a sheet of letter-quality paper; (2) A sheet of paper bearing a letterhead.

**LETTERING**—Letters and words formed or printed by hand.

**LETTERPRESS PRINTING**—A printing process in which the raised, inked surfaces of the type and/or plates transfer an impression directly to the paper.

**LETTER-QUALITY PRINTER**—A printer that imitates letters with resolution similar to a typewriter.

**LETTERSPACING**—Placing additional space between the letters of words to expand the length of a line or to improve and balance typography.

**LIFT METHOD**—(1) The process of using laminate material to remove or lift an image from clay-coated stock; (2) scanning text or graphics onto disk for importation to another application.

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## Glossary, Continued

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- L (Continued)**
- LIGHT BOX**—A box with a translucent glass or plexiglass top illuminated from underneath, used for tracing and layout.
- LIGHTFACE**—The lightest and thinnest form of a type series.
- LIGHT PEN**—An electronic input device used to draw freehand against a CRT screen.
- LIMITED PALETTE**—(1) A palette with a restricted number of pigments; (2) A palette that lacks one or more of the three primary colors.
- LINE**—A continuous, unbroken mark made by a pen, a pencil, a brush, or other drawing instrument.
- LINE AND WASH**—A technique combining a black line with transparent wash.
- LINE COPY**—A composition of black lines and masses without gradation of tone.
- LINE DRAWING**—A drawing composed entirely of lines, dots, and areas of solid black.
- LINE OF DIRECTION**—The line the eye follows when looking at the picture.
- LINES PER INCH**—Also called LPI. A standard measurement of resolution for the color printing trade.
- LINE WEIGHT**—The thickness of pencil, ink, or other lines in artwork.
- LINSEED OIL**—An oil obtained by pressing the seeds of a plant, which produces linen fiber used as a medium in oil painting.
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## Glossary, Continued

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**L (Continued)**    **LITHOGRAPHY**—*See* OFFSET PRINTING or OFFSET LITHOGRAPHY. A reproduction process in which grease crayon lines and masses drawn on a flat, polished stone print through the affinity of grease to grease (grease crayon and printer's ink). The wetted stone repels the ink from the other areas not covered with crayon.

**LITHOGRAPHIC PENCILS**—An oily pencil or crayon used to mark lithographic plates.

**LOCAL COLOR**—The actual color of an object without regard to the effect of changing light and shadow conditions.

**LOCAL COLOR VALUE**—The actual lightness or darkness of a color without regard to the effect of changing light and shadow conditions.

**LOGOTYPE**—*Also called* LOGO. The lettered signature, nameplate, or trademark of a commercial firm.

**LONGSHOT**—A picture showing a full figure or a distant view.

**LACEY LUCY**—*See* CAMERA LUCIDA.

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## M

**MACHINE COMPOSITION**—Type set by a machine.

**MACRO LENS**—A short focal-length lens specifically designed to allow closeup photography.

**MAHLSTICK**—A rod used in the palette hand to support or steady the painting hand.

**MAKEUP**—*See* LAYOUT. The arrangement of text and illustrations on a page in conformance to standard practices in the industry or to publication requirements.

**MAGNETIC CHALKBOARD**—A briefing board that accepts chalk markings and magnetic attachments.

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## Glossary, Continued

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### M (Continued)

**MARS COLORS**—Artificial earth colors.

**MASKING**—To block out a portion of an illustration by pasting paper over it to prevent it from reproducing.

**MASKING TAPE**—An opaque, paper tape used to cover the edges of a picture while painting and to fasten artwork temporarily to a drawing board.

**MASTER**—An original typed, drawn, or typeset copy intended for reproduction.

**MAT**—A cardboard or paper decorative enclosure around a picture.

**MATCH DISSOLVE**—Holding one element on a screen as one scene dissolves into another.

**MATTE**—Dull or without shine.

**MATTE PRINT**—A print having a dull finish.

**MATTE SCREEN**—A projection screen with a dull surface to reduce glare from overhead lights.

**MEASURE**—The length of a line of type measured in picas.

**MEATBALL**—*See* BULLET.

**MEDIA INTEGRATION**—*Also called* MULTIMEDIA. Mixing various presentation devices in the same presentation.

**MECHANICAL**—A page or layout prepared as an original for photomechanical reproduction.

**MECHANICAL DRAWING**—A method of drawing using precision tools to produce mathematically precise layouts, diagrams, and engineering drawings.

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## Glossary, Continued

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- M (Continued)**    **MEDIUM**—(1) A liquid that dilutes a paint without damaging its adhesive; (2) The mode of expression employed; (3) The actual instrument or material used by the artist.
- MEGABYTE**—Abbreviated MB or M, approximately one million bytes of data.
- MEMORY**—That portion of computer hardware that retains data for later retrieval.
- MENU**—A selection of options displayed on a computer screen.
- MICROCOMPUTER**—Another name for a personal computer or computer workstation not attached to a mainframe system.
- MILITARY STANDARDS**—*Also called MIL-STD.* A formalized set of government standards.
- MIXED MEDIUM**—*Also called MIXED MEDIA.* A combination of two or more mediums.
- MODEM**—An electronic input/output device that connects computer workstations for communications.
- MOIRÉ**—An wavy or checkered pattern that results when photographing a halftone through a screen.
- MONOCHROMATIC**—Shades or tints of one color.
- MONTAGE**—*See COMPOSITE.* (1) Arranging a number of pictures or designs in a combination, often with some overlapping, so that they form a composite whole; (2) The resultant arrangement or composition.
- MONITOR**—The viewing screen of a computer system.
- MOOD**—An outward projection of a feeling or emotion that affects behavior communicated by action, situations, or symbology in a picture.
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## Glossary, Continued

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**M (Continued)**    **MORGUE**—*See* PICTURE MORGUE, CLIP ART, or RESEARCH FILE.

**MOUNT**—To fasten onto another surface.

**MOUNTING AND FLAPPING**—Fastening original artwork or copy to a board allowing sufficient excess around the picture borders to accommodate attaching a protective overlay along one side.

**MOUNTING BOARD**—Heavy paper boards used as backboards to support drawings, paintings, and photographs.

**MOUSE**—A hand-held computer input device that allows rapid movement and selection.

**MULTIMEDIA**—*Also called* MEDIA INTEGRATION. A combination of presentation devices used in the same presentation.

**MULTIPURPOSE BOARD**—A briefing board with a slick, bright, white surface that accepts erasable marker, marker, and magnetic backed accessories.

**MUNSELL COLOR SYSTEM**—A system of color analysis and identification that distinguishes between the three measurable dimensions of hue, value, and chroma (intensity).

**MURAL**—Any picture painted or fixed permanently on a wall or ceiling.

**MYLAR**—Tough, highly stable, polyester film used as a base for engineering drawings, laminating, overlays, and a wide variety of other applications.

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**NARRATION**—*Also called* VOICE OVER. The description or commentary that accompanies television and video presentations.

**NCR PAPER**—No Carbon Required paper; chemically coated paper that transfers a copy of an image to the sheet directly behind it without the use of a carbon.

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## Glossary, Continued

### N (Continued)

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**NEGATIVE, PHOTOLITHOGRAPHIC**—A film negative having a translucent image and a black background produced by a process camera and used primarily to make printing plates.

**NEUTRAL COLOR**—(1) A color that lacks hue and intensity; (2) A color that contains some amount of its complementary; (3) An earth color.

**NIB**—A point at the end of a pen or marker.

**NOISE**—Adding a random pattern of pixels over an image to add texture, create a new value, or give a painterly effect.

**NORMAL LENS**—*Also called* STANDARD LENS. A 50mm focal-length lens, which most closely approximates normal vision with minimal distortion.

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### O

**OBLIQUE PROJECTION**—A view produced when the projectors are at an angle to the plane of the object illustrated.

**OCTAGON**—A figure having eight sides.

**OFFSET LITHOGRAPHY**—*See* LITHOGRAPHY. Lithographic printing where an inked plate prints on a rubber blanket, which then offsets the image to paper stock.

**OFFSET SECTION**—A section view of two or more planes in an object to show features that do not lie in the same plane.

**OIL PAINT**—Any pigment ground in linseed oil or poppy oil.

**OILSTONE**—A stone or abrasive used to sharpen needlepoints and blades.

**ONE POINT PERSPECTIVE**—*Also called* PARALLEL PERSPECTIVE. When the height and width of an object are parallel to the plane of projection.

**ONION SKIN**—*Also called* MANIFOLD PAPER. Thin, translucent paper used to make a typewriter carbon copy or to serve as a tissue overlay for work requiring correction or protection.

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## Glossary, Continued

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- O (Continued)**    **ONSCREEN**—An image that appears on the computer or television screen.
- OPAQUE**—(1) Impermeable to light; not transparent or translucent; (2) To paint over unwanted portions of a negative with a solution to prevent light from seeping through.
- OPAQUE PROJECTOR**—A device that projects an opaque object to a desired size on another surface.
- OPAQUE WATERCOLOR**—*See* WATERCOLOR. A creamy, opaque paint-like gouache or tempura, available in tubes, jars, or by mixing white with transparent colors.
- OPAQUING**—Covering up with opaque paint.
- OPTICAL CENTER**—A point slightly above (10%) the geometric center of a layout that the eye perceives as the center.
- OPTICAL ILLUSION**—An unreal or misleading image perceived by the eye as real.
- OPTICAL SPACING**—The arrangement of spacing between letters for legibility and appearance, which varies with the shape of the letters to achieve optical equalization.
- ORGANIZATION CHART**—A block chart or diagram showing the names, titles, departments, and responsibilities of personnel in an organization.
- ORIGINAL**—*See* MASTER. Copy submitted to the printer for reproduction.
- ORTHOGRAPHIC PROJECTION**—A method of projection with six principal views.
- OSCILLATING AIRBRUSH**—An airbrush with a reciprocating needle used for fine detailed work.
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*Continued on next page*

## Glossary, Continued

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### O (Continued)

**OUTPUT**—The end product generated by an electronic device, such as a computer, printer, or copier.

**OUTPUT DEVICE**—An electronic accessory to a computer system that provides some type of end product either visually or as a hard copy.

**OUTLINE**—The outside edge of a shape or form.

**OUTLINE DRAWING**—A drawing where lines define the outer limits of the forms without the representation of modeling, light, or shadow.

**OVERHEAD PROJECTION**—A projector that uses of a system of mirrors and a fresnel lens to project a transparent image or object to another surface or screen.

**OVERLAP**—To cover a part of one shape or line with another.

**OVERLAY**—A transparent or translucent sheet taped over the original art for protection or to indicate instructions or corrections.

**OVERPRINTING**—Printing an image over another impression.

**OZALID MACHINE**—An ammonia process printmaking machine that produces the same-size copy from transparent or translucent originals.

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### P

**PAINTING KNIFE**—*See* PALETTE KNIFE. A type of palette knife made for applying paint to a picture.

**PALETTE**—(1) The surface on which the artist places paint and mixes colors before applying them to canvas or other painting surface; (2) A group of colors or gray values chosen for use in the same picture.

**PALETTE KNIFE**—A thin, flexible, steel blade set in a wooden or plastic handle available in a variety of shapes used for mixing paints and impasto, applying paint directly to a canvas or to create special textures directly on the surface of a picture.

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## Glossary, Continued

### P (Continued)

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**PALETTING**—Moving the pigment back and forth across a palette with a paint brush to achieve a certain consistency in texture or color or to load the brush with pigment adequately.

**PANEL**—(1) A given area in which a cartoon is drawn, with or without a defined frame; (2) One box or frame of a comic strip; (3) One unit of a storyboard.

**PANORAMA**—*Also called PAN.* Slow, steady camera movement from side to side.

**PANTOGRAPH**—A mechanical device based on the shape of a parallelogram, used to reduce, enlarge, or copy pictures.

**PANTONE COLOR SYSTEM**—An industry accepted system of color analysis and identification which distinguishes between the three measurable dimensions of hue, value, and chroma (intensity).

**PARABOLIC REFLECTORS**—Lamp reflectors that assist even illumination and shorten exposure time.

**PARALLAX**—Distortion present when exposing film through a lens not aligned with the viewfinder, distortion corrected by a rangefinder camera.

**PARALLEL PROJECTION**—*See ONE POINT PERSPECTIVE.*

**PARALLEL STRAIGHTEDGE**—A long, straight edge supported at both ends to maintain parallel motion.

**PARTIAL SECTION**—A sectional view consisting of less than a half section.

**PASTEL**—(1) A dry pigment mixed with a variety of binders to form a stick or crayon for application to a picture surface; (2) A picture executed in the pastel medium.

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## Glossary, Continued

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### P (Continued)

**PASTEUP**—The process of pasting an image or part of an image on a reproduction page or sheet before photographing for platemaking or printing.

**PATTERN**—(1) The regular or irregular distribution or arrangement of elements; (2) Regularly repeated flat designs used to create two-dimensional textures.

**PENS, PLOTTER**—A pen nib or jet spray attached to a plotter output device.

**PENS, STEEL BRUSH**—Steel pen nibs designed to create large poster size lettering.

**PENS, TECHNICAL**—Conical or tubular tipped pen nibs designed to produce a consistently even line of a predetermined weight in a standard or metric measurement available with and without a reservoir.

**PENTAGON**—A five-sided figure generally having equal sides and angles.

**PERCENTAGE CHART**—*Also called* PIE CHART. A circular chart divided into wedges whose sum equals 100% or 360°.

**PERPENDICULAR**—A vertical line meeting or intersecting a horizontal line at 90°.

**PERSONIFICATION**—Attributing human qualities to animals or inanimate objects.

**PERSPECTIVE**—The visual impression of lines moving closer together as distance increases.

**PHANTOM LINES**—*Also called* ALTERNATE POSITION LINES. Lines consisting of one long and two short dashes, evenly spaced, terminating in a long line, used to indicate an additional position of a part or object.

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*Continued on next page*

## Glossary, Continued

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### P (Continued)

**PHANTOM VIEW**—A view showing an alternate position of a movable object.

**PHOTOGRAPHIC TYPESETTERS**—*See* TYPESETTERS, PHOTOGRAPHIC.

**PHOTOLETTERING**—A method of simulating hand lettering or display type by photographic means.

**PHOTOLITHOGRAPHY**—The transferring of a drawing to a lithographic plate by photography.

**PHOTOMECHANICAL**—Pertaining to any process of printing or duplicating images by mechanical means from a photographically prepared printing plate.

**PHOTOSTAT**—*Also called* STAT. A photographic image recorded by a camera so constructed that it photographs and develops directly on paper, in negative values.

**PHOTOTYPE**—Type set by photographic means.

**PICA**—A unit of measure equal to 12 points or 1/6 of an inch.

**PICKUP**—A square of gum rubber used to remove excess rubber cement.

**PICTORIAL DRAWING**—Any drawing that depicts an object with recognizable clarity.

**PICTURE AREA**—The flat surface within the borders of a picture.

**PICTURE MORGUE**—*Also called* MORGUE. *See* CLIP ART.

**PICTURE PLANE**—An imaginary plane placed between the observer and the object, usually at right angles to an observer's line of vision.

**PIE CHART**—*See* PERCENTAGE CHART.

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*Continued on next page*

## Glossary, Continued

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- P (Continued)**    **PIGMENT**—Dry color matter that becomes paint when mixed with a vehicle or binder.
- PINHOLE**—A small light spot that appears on a developed photographic negative resulting from particles of dust and lint on the unexposed negative, the camera lens, the vacuum board glass, or other parts of the camera.
- PIN REGISTER**—A method of holding elements in place in overlay work and animation.
- PIXEL**—*Also called* PICTURE ELEMENT. A small bit of digital data from a computer screen.
- PIXEL MAP**—*Also called* BIT MAP. A matrix of pixels that form a digital image on the computer screen.
- PIXILATED**—Having jagged edges.
- PIXEL**—Specifying the size of a pixel on the computer screen.
- PLAIN TITLE CARD**—Printed information only on a card for television transmission of credit lines.
- PLAN VIEW**—A view of an object or area as it would appear if viewed from directly above.
- PLANE**—A flat surface.
- PLANNING CARDS**—A small card containing a idea or point placed in sequence on a storyboard.
- PLAT**—A map or plan view of a lot showing principal features, boundaries, and location of structures:
- PLATE FINISH**—A smooth surfaced paper.
- PLY**—A single layer of drawing paper.
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## Glossary, Continued

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- P (Continued)**
- POINT**—A standard type measure of 1/72 of an inch or 72 points equals 6 picas.
- POLYMER**—Paints that have polyvinyl acetate or acrylic resin as a binder used as either a transparent or opaque medium.
- POLYGON**—Common geometric constructions.
- PORTRAITURE**—The process or art of depicting an individual by drawing, painting, or photographing from life.
- PORTRAY**—To delineate or depict.
- POSTER**—A large cardboard or paper display sign.
- POSTER BOARD**—A medium weight cardboard suitable for show cards.
- POSTER COLOR**—An opaque watercolor used for making show cards.
- POSTERIZATION**—A technique for adding poster-like qualities to a photograph, a film, or an illustration by separating the normal tones of a subject into distinctly separated, strong tones.
- POUNCE**—A powdered substance that improves the ink-absorbing qualities of tracing cloths and papers.
- PRELIMINARY DRAWINGS**—Drawings done in preparation for a finished piece of art.
- PRE-PRESS**—The preparatory stage of art or copy immediately before committing the image to a plate.
- PRIMARY COLORS**—The red, yellow, and blue in a subtractive process and the red, yellow, and green in the additive process of color theory.
- PRINT**—An image made from a master negative or plate.
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## Glossary, Continued

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### P (Continued)

**PRINTING**—A process for reproducing copy.

**PRINTING PLATE**—*Also called CUT.* A flat piece of metal used on a printing press that contains the image either engraved or etched photographically on the surface.

**PRISM**—A transparent piece of crystal or optical glass having two plane surfaces which are not parallel that separate white light into the visible colors of the spectrum.

**PROCESS COLOR REPRODUCTION**—A combination of halftone plates, usually red, yellow, blue, and black, which when printed in perfect register, combine to produce a full-color reproduction.

**PRODUCTION DEPARTMENT**—The people responsible for purchasing and maintaining schedules on printing, typography, engravings, bindings, paper, and sometimes the purchase of art for an organization.

**PROGRESSIVE PROOFS**—Proofs showing the order of printing and shade of ink for each required plate.

**PROGRESSIVE DISCLOSURE**—Systematically revealing information on a partially obscured visual.

**PROJECTION**—The act or art of projecting lines and planes in orthographic and perspective drawings.

**PROJECTOR**—A device containing a light and lenses for projecting an image onto another surface.

**PROJECTURAL**—(1) An image projected onto another surface; (2) The image so projected.

**PROOF**—A printed impression from a negative, a plate, or a body of type submitted for examination or correction.

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## Glossary, Continued

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| <b>P (Continued)</b> | <b>PROOFREADER'S MARKS</b> —Standard marks placed in the margin nearest the word that indicate corrections in typeset copy.                                                                                                              |
|                      | <b>PROPORTION</b> —The relation to size of one part or thing to another or one portion of something to the whole.                                                                                                                        |
|                      | <b>PROPORTIONAL DIVIDERS</b> —A drafting instrument used for transferring measurements from one scale to another or to divide lines and circles into equal parts.                                                                        |
|                      | <b>PROPORTIONAL SPACING</b> — <i>Also called</i> DIFFERENTIAL LETTERSPACING. The spacing of characters in proportion to size by means of the typewriters and office composing machines used in the preparation of cold composition copy. |
|                      | <b>PROPS</b> —Accents or accessories that identify the time frame or location of a subject.                                                                                                                                              |
|                      | <b>PROTRACTOR</b> —A circular or semicircular rule for measuring off the degree of an angle.                                                                                                                                             |
| <b>Q</b>             | <b>QUILL PEN</b> — <i>See</i> CROW QUILL. A pen nib made from a feature quill.                                                                                                                                                           |
| <b>R</b>             | <b>RADIAL FILL</b> —To fill an object with color, pattern, or shade that appears to radiate from the center of the object.                                                                                                               |
|                      | <b>RADIATION</b> —A divergence of lines, tones, or colors from a common point to different directions.                                                                                                                                   |
|                      | <b>RADIUS</b> —A straight line from the center of a circle or sphere to a point on its circumference.                                                                                                                                    |
|                      | <b>RADIUS CURVE</b> —A drawing tool used to draw arcs of a predetermined radius.                                                                                                                                                         |

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## Glossary, Continued

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- R (Continued)**    **RANDOM ACCESS MEMORY**—*Also called* RAM. Retrievable computer memory accessible at will without sequential reading.
- RANGEFINDER**—The ground glass in a camera used to focus an image.
- RASTER-BASED**—An image based on the manipulation of a matrix of pixels or dots.
- RASTER IMAGE PROCESSOR**—*Also called* RIP. A device for converting vector-based imagery to high resolution raster images.
- READ**—To access electronically stored data.
- REAR PROJECTION SCREEN**—A matte surface, translucent screen used when projecting an image from behind to a screen.
- REBOOT**—Restart the computer system.
- RECEDING COLORS**—Colors that appear to move away or create the illusion of distance.
- RECTANGULAR COORDINATE GRAPH**—A graph based on a grid system where values are plotted by X and Y coordinates.
- REFERENCE NUMBERS**—Numbers used on one drawing to refer to another drawing for further details.
- REFERENCE PLANE**—The normal plane used to reference all information.
- REGISTER**—To align a page or any elements of an image or impression to match the position of successive impressions.
- REGISTER MARKS**—Marks used to key an overlay to a drawing or mechanical as in color separation or combination plates.
- REMOVED SECTION**—A drawing of the internal cross section of an object located near the basic drawing of the object.
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## Glossary, Continued

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### R (Continued)

**RENDER**—To represent, portray, or depict in a drawing or painting.

**RENDERING**—A drawing or painting in which tonal values vary from white through black or from light to dark shades.

**REPRODUCIBILITY**—The ability of line and halftone copy to reproduce as acceptable and legible.

**REPRODUCIBLE ART**—Second-generation art made from the original art and mortised or pasted onto the reproduction page.

**REPRODUCTION**—Making one or more copies of an original piece of work.

**REPRODUCTION COPY**—*Also called CAMERA-READY COPY.* Copy ready in all respects for photomechanical reproduction.

**REPRODUCTION PROOFS**—*Also called REPOS.* Exceptionally clean, sharp proofs on a highly coated paper used for reproduction.

**REPROGRAPHICS**—The reproduction of images by copying machines and their methods and processes.

**RESCALE**—To enlarge or reduce in size or to change in shape without changing proportion to fit new space configurations.

**RESEARCH FILE**—*See MORGUE, PICTURE MORGUE, or CLIP ART.*

**RESOLUTION**—Clarity, focus, or density.

**RETOUCH**—To delete unwanted image areas or make repairs to copy by painting out with an opaque solution.

**RETOUCH GRAYS**—A series of opaque watercolors ranging from white to black.

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*Continued on next page*

## Glossary, Continued

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- R (Continued)**    **RETOUCHING**—The alteration of detail or removal of spots and blemishes in a photographic print or negative.
- RETOUCH VARNISH**—A light, colorless varnish sprayed on a dull, dried-out area or an unfinished oil painting to restore the "wet" colors or values, making it easier to mate with new paint.
- REVERSE**—*See* FLOP. To turn over.
- REVERSAL**—*See* REVERSE PRINT.
- REVERSE PRINT**—A print where the black values of the originals are white.
- REVISION BLOCK**—Space located in the upper-right corner of a drawing to record any changes to the original drawing.
- REVOLVED SECTION**—A drawing of the internal cross section of an object superimposed on the basic drawing of the object.
- ROMAN**—One of a group of alphabets or typefaces characterized by thick and thin strokes and often with serifs.
- ROSS BOARD**—An illustration board that comes in a variety of roughened surfaces that divide crayon or brush strokes into broken textures suitable for reproduction.
- ROTATION**—A view in which the object is rotated or turned to reveal a different plane or aspect.
- ROUND BRUSH**—A cylindrical brush having an evenly tapered point.
- RUBBER CEMENT**—Semitransparent glue consisting of gum rubber and a petroleum or benzol solvent.
- RUB-ONS**—Transfer sheets containing reprinted characters, symbols, and numerals applied by burnishing over an acetate or paper back sheet.
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*Continued on next page*

## Glossary, Continued

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|                      |                                                                                                |
|----------------------|------------------------------------------------------------------------------------------------|
| <b>R (Continued)</b> | <b>RULING PEN</b> —An instrument that holds ink between two adjustable blades.                 |
|                      | <b>RUNNING HEAD</b> —The title repeated at the top of consecutive pages in a book or magazine. |

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|  |                                                                                                                                                      |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>SABLE BRUSH</b> —A flat or round-shaped brush made from the tail hair of a Kolinsky (Asiatic) mink.                                               |
|  | <b>SAFELIGHT</b> —A colored light used to illuminate a darkroom without harming photosensitive film or paper.                                        |
|  | <b>SANDPAPER PAD</b> —A pad of sandpaper sheets mounted on a strip of wood used to sharpen a pencil lead or pastel.                                  |
|  | <b>SANS SERIF</b> —Without serifs, a letter that does not have a finishing stroke.                                                                   |
|  | <b>SATURATION</b> —The purity or intensity of color.                                                                                                 |
|  | <b>SCALE</b> —(1) Proportions or relative dimensions; (2) To enlarge or reduce without changing the original proportions.                            |
|  | <b>SCALE CLIP</b> —A clip attached to a scale that focuses on the scale currently in use.                                                            |
|  | <b>SCALE DRAWING</b> —A drawing that shows relative sizes and proportions.                                                                           |
|  | <b>SCALING</b> — <i>Also called</i> DIMENSIONING or SIZING. Enlarging or reducing copy or an image to the correct dimensions to occupy a given area. |
|  | <b>SCANNING AREA</b> —The total area or picture that the camera sees.                                                                                |
|  | <b>SCRAP FILE</b> — <i>See</i> RESEARCH FILE.                                                                                                        |
|  | <b>SCRATCHBOARD</b> —A type of illustration board with a chalky surface uniformly covered with ink.                                                  |

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## Glossary, Continued

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- S (Continued)**
- SCREEN**—A glass plate or film with crosshatched lines which photographically produces a halftone for reproduction from a continuous-tone original.
- SCREEN PROCESS PRINTING**—*Also called* SILKSCREEN. A form of stencil printing that uses silk, nylon, or metal screen to contain the image.
- SCREEN REFRESH**—A continuous update of computations that create the image on a computer screen.
- SCRIPT**—(1) Lettering based on hand writing; (2) A paper or papers which describe in detail all of the elements of a commercial or story.
- SCROLL**—A rapid up-or-down movement of a computer screen image during a search function.
- SECONDARY COLORS**—The colors (orange, green, and violet) that lie halfway between the three primary colors.
- SECTION LINE**—Thin, diagonal lines used to indicate the surface of an imaginary cut in an object.
- SECTIONAL VIEW**—The view obtained by cutting away part of an object in an illustration to show the shape and construction of the interior.
- SEPIA**—A dark, warm brown color of low brilliance.
- SEPIA INTERMEDIATE**—An intermediate used in making duplicate transparencies by the whiteprint process.
- SERIF**—The finishing stroke or line projecting from the end of the main stroke of many letters in some typefaces.
- SET PALETTE**—One hue mixed with a group of colors to create color harmony or unity in a chosen palette.
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*Continued on next page*

## Glossary, Continued

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### S (Continued)

**SETTING**—Background or surrounding.

**SHADE**—A mixture of pure color and black.

**SHADING**—Lines, values, or color applied to create form, shadow, or pattern.

**SHADING MEDIUMS**—Preprinted tones and patterns used to enhance the appearance of copy and artwork.

**SHADING SHEETS**—Sheets of cellophane or acetate preprinted with tones and patterns with a low-tack adhesive for applying to artwork.

**SHAPE**—The flat silhouette or two-dimensional form of an object.

**SHELF LIFE**—The length of time before sensitized material deteriorates.

**SHIP'S CURVES**—Instruments for drawing elongated, irregular curves that closely approximate the curves found in shipbuilding.

**SHUTTER SPEED**—A method of controlling the length of time that light can reach a film.

**SIGHT LINE**—An imaginary line extending from the eyes of a figure in a drawing to an object indicating that person's direction of glance.

**SINGLE-ACTION AIRBRUSH**—A device that releases both air and pigment by pressing down on a button.

**SIGNATURE**—A sheet of paper printed on both sides and folded to make up part of a publication.

**SILHOUETTE**—An outline of an object or figure filled in solidly without indication of modeling or surface structure.

**SILKSCREEN**—A method of printing through a stencil fixed to a screen of natural or synthetic fiber or metal mesh.

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## Glossary, Continued

### S (Continued)

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**SIZE**—Also called *SIZING*. Various gelatinous materials made from starch, clay, glue, and casein used for glazing or coating papers and cloths.

**SKETCH**—A quickly executed drawing as a preparation toward more finished work.

**SKETCHING PENCIL**—See *CARPENTER'S PENCIL*. A soft-leaded pencil used for freehand sketching.

**SMALL CAPS**—Capital letters smaller than the standard capitals of a typeface and the size of the body of the lowercase letters.

**SODIUM THIOSULFATE**—Also called *HYPO*. A salt with water solution that dissolves the silver halides used in photographic papers and films.

**SOFT EDGE**—A blended or graduated transition from one value or color to another.

**SOFTWARE**—Computer programs that direct the output devices and determine the input devices effectivity.

**SPECIAL EFFECTS GENERATOR**—A device that adds or creates effects to visual images during recording on videotape.

**SPECIAL IRREGULAR CURVE**—Irregular curves for a specific purpose, such as ship's curves, mechanical engineer's curves, conic sections, logarithmic spirals, and flexible curve rules.

**SPECTRUM**—The arrangement of colors side-by-side as refracted by a prism.

**SPEEDBALL PENS**—Lettering and drawing pens manufactured by the Hunt Manufacturing Company that are the hallmark of hand lettering pen nibs.

**SPEED LINES**—Extra lines following a moving figure or object in a cartoon representing the disturbance the movement causes in the atmosphere.

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*Continued on next page*

## Glossary, Continued

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### S (Continued)

**SPHERE**—A form where all points are equidistant from the center.

**SPINE**—The bound edge of a book.

**SPLINE**—A flexible rule, held in place by lead ducks, used to draw irregular curves.

**SPLIT BRUSH TECHNIQUE**—*Also called DRY BRUSH TECHNIQUE.* Painting or drawing with a brush having the hairs separated to form more than one point.

**SPLIT COMPLEMENT**—A color scheme that uses a key hue with the two colors that lie adjacent to its opposite on the color wheel.

**SPLIT FIELD**—A rangefinder that focuses an image by dividing the image in half and requiring alignment into a whole.

**SPOT COLOR**—Using a combination of two individual colors, a main color, usually black, and an accent color instead of a full-color output.

**SQUEEGEE**—(1) An implement used on silk process printing presses that forces ink and ink compounds through the screen and stencil onto a printing surface to form the image; (2) The process of forcing pigment across a surface with other than a brush.

**STABILIZER**—A chemical that arrests the continued development of an image and fixes that image into the surface.

**STABILO PENCIL**—A pencil that uses grease or wax as a binder for pigment and is capable of writing on glass.

**STAT**—*See* PHOTOSTAT.

**STATIC**—Lacking in movement.

**STATION POINT**—The point of observation in the making of perspective drawings.

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*Continued on next page*

## **Glossary,** Continued

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- S (Continued)**
- STILL LIFE**—A pictorial arrangement of inanimate objects.
- STIPPLE**—The effect obtained by using a series of dots or flicks in drawing.
- STOCK**—Material printed or worked on by printers or artists.
- STOP BATH**—A chemical solution that stops photographic development.
- STOPPER**—An eye-catching device in a picture that grabs and holds a viewer's attention.
- STORYBOARD**—A panel presentation of rough sketches of a proposed series of views.
- STRAIGHTEDGE**—An instrument with long, straight edges
- STRIP IN**—To position copy-not pasted up on the mechanical before platemaking.
- STRIPPING**—Cutting out and placing in position.
- STUDIO CARD**—Illustration or pictorial information on a card intended for television transmission.
- STUMP**—A pencil-shaped roll of paper used to blend pastel, pencil, and charcoal.
- STYLIZED**—Characterized by an emphasis on style and design.
- STYLUS**—A scraping instrument with sharp or chiseled edge.
- SUBHEAD**—A secondary headline or title.
- SUBTRACTIVE COLOR PROCESS**—The process of forming colors by mixing pigments.
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*Continued on next page*

## Glossary, Continued

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**S (Continued)**    **SUBORDINATION**—Subduing part of a picture to make it less important than another part.

**SUPERIMPOSED**—*Also called* SUPER. One image or text placed over another without totally obscuring the first.

**SUPERIMPOSED IMAGE**—A rangefinder that focuses an image by requiring the alignment of two images over each other.

**SUPPORT**—The reinforcement or backing for a painted surface.

**SURREALISM**—An art movement whose objective is to explore the realm of unconscious emotion and dreams.

**SWATCH**—A small sample specimen.

**SWEDE PEN**—A broad nibbed, adjustable ruling pen.

**SWIPE FILE**—*See* RESEARCH FILE.

**SYMBOL**—A visual element that represents something else.

**SYMMETRY**—Similarity in size, shape, and relative position of parts on opposite sides of a dividing line.

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**T**    **TABOURET**—A portable cabinet used to hold the artist's drawing tools and materials.

**TEAR SHEETS**—*Also called* CLIP ART and PICTURE MORGUE.

**TECHNICAL ILLUSTRATION**—Drawings for technical reports, proposals, manuals, and catalogs, as well as visual aids, briefing charts, projecturals, slides, and posters.

**TECHNIQUE**—(1) The method of using a tool or medium; (2) The characteristic appearance of a medium; (3) The particular style of an artist.

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Continued on next page

## Glossary, Continued

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|                      |                                                                                                                             |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>T (Continued)</b> | <b>TELEPHOTO LENS</b> —A long focal-length lens that has the effect of bringing far objects nearer.                         |
|                      | <b>TELEVISION GRAPHICS</b> —Graphics created specifically for transmission via television.                                  |
|                      | <b>TEMPURA</b> —Dry pigment mixed with an emulsion of egg yolk or milk to form an opaque watercolor.                        |
|                      | <b>TEMPLATE</b> —A guide made to ensure the uniform consistency of frequently used symbols.                                 |
|                      | <b>TERTIARY COLORS</b> —Any intermediate hue that contains some part of each of the three primary colors.                   |
|                      | <b>TEXT</b> —Typewritten or printed matter forming the main body of a work.                                                 |
|                      | <b>TEXTURE</b> —The feel or appearance of a surface created by the repetition of forms or design.                           |
|                      | <b>THERMAL TRANSFER PRINTER</b> —A printer that uses heat to fuse the image to a paper surface.                             |
|                      | <b>THIRD DIMENSION</b> —The effect of depth or bulk achieved by the artist on a flat surface.                               |
|                      | <b>THREE DIMENSIONAL</b> —Possessing height, width, and depth.                                                              |
|                      | <b>THREE-QUARTER VIEW</b> —A view of an object rotated to a position halfway between a front and a side view.               |
|                      | <b>THREE-POINT PERSPECTIVE</b> —A view where no dimension, height, width, or depth, is parallel to the plane of projection. |
|                      | <b>THUMBNAIL SKETCH</b> —Page layouts showing the allocation of space for headings, photographs, line artwork, and text.    |

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## Glossary, Continued

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### T (Continued)

**THUMBSPOTS**—Visual indicators placed on a slide mount to identify the emulsion side of the film and simplify tray loading.

**TILING**—A fill pattern effect that repeats a pattern over and over.

**TILT CARD**—A vertical card that requires up-and-down camera movement.

**TIME LINE**—A projected plan of execution outlining significant milestones and deadlines used to monitor work in progress closely.

**TINT**—A mixture of pure color and white.

**TISSUE OVERLAY**—Thin, translucent paper placed over artwork for protection and corrections.

**TITANIUM WHITE**—An opaque white.

**TITLE BLOCK**—Space in the lower right corner that contains the identity of the drawing, the subject matter, the origins, the scale, and other data.

**TITLE CARD**—A television card that contains text only.

**TONAL**—Having gradations of gray or intermediate values.

**TONE**—(1) A value usually predominate which sets the key; (2) A thin layer of paint applied to a ground to eliminate the whiteness of the surface before painting.

**TOOL BOX**—*See* BUTTON BAR.

**TOOTH**—The ability of the paper surface to accept various mediums.

**TORTILLON**—*Also called* STUMP or STOMP. Tightly rolled paper, leather, or felt used to blend charcoal, pastels, pencil, chalk, or crayon.

**TOUCHE**—A liquid-masking agent or lithographic crayon applied by brush to a lithographic plate or stone.

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## Glossary, Continued

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- T (Continued)**    **TOUCH SCREEN TECHNIQUE**—Activating the pixels on a CRT screen through the touch of an electronic light pen or the fingertip.
- TRACING PAPER**—A thin, transparent, or translucent paper used for transferring an image from one surface to another by tracing.
- TRACKBALL**—*See* JOYSTICK or MOUSE.
- TRAMMEL**—A mechanical device used to draw an ellipse.
- TRANSFER SHEET**—Preprinted characters and symbols on cellophane or acetate used in preparing cold composition, camera-ready copy.
- TRANSLUCENT**—The characteristic of allowing light to pass through without permitting objects to be seen clearly through it.
- TRANSPARENCY**—Any transparent material intended for projection that bears an image.
- TRANSPARENT**—The characteristic of allowing light and objects to be seen clearly through it.
- TRAPS**—A slight overlap of the outline of an element to prevent white space from showing around the edges minimizing the effect of press plate misalignment.
- TRIAD**—The use of any three pigments equally spaced on a color wheel.
- TRIANGLE**—A triangular shaped ruling guide available in various sizes and angles usually made of clear plastic or metal.
- TRIM MARKS**—Marks used on printed sheets or other substrate to indicate where to cut or trim stock both vertically and horizontally.
- TRIMETRIC PROJECTION**—An axonometric projection of an object where no two axes make equal angles with the plane of projection requiring three different foreshortening ratios.
- 

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## Glossary, Continued

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- T (Continued)**     **T-SQUARE**—A ruling guide with a 90° angled crosspiece at one end used in making horizontal lines.
- TURPENTINE**—A solvent distilled from the sap of pine or from pine wood used as a thinner and to clean brushes.
- TUTORIAL**—A lesson guide.
- TWO DIMENSIONAL**—Flat, without depth, having only width and height.
- TWO-POINT PERSPECTIVE**—*Also called* ANGULAR PERSPECTIVE. The most common type of perspective drawing where the object is sitting at an angle to the plane of projection and each object has two vanishing points.
- TYPEFACE**—The printing surface of an alphabet judged by its design, printability, wearability, and position on the letter body.
- TYPE FAMILY**—A group of typefaces similar although not exactly alike in design.
- TYPE SERIES**—Different sizes of the same typeface.
- TYPESETTERS, PHOTOGRAPHIC**—Machines that supply a variety of type designs and sizes, automatically letterspaced and justified on transparent film or plastic-coated opaque paper.
- TYPOGRAPHY**—The art of type selection and arrangement.
- 

- U**                **ULTRAVIOLET LIGHT**—Actinic (shorter wavelength) or useable part of the light spectrum needed to react or harden light-sensitive coatings.
- UNDERTONE**—A color whose effect is modified by other colors imposed over them.
- UNRETOUCHED**—Not altered or improved by any means.
- 

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## Glossary, Continued

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### U (Continued)

**UPPERCASE**—The capital letters of an alphabet.

**USER INTERFACE**—The visual and physical attributes of a software program including tools-, text-, and graphics-handling characteristics.

**UTILITY PLAN**—A floor plan of a structure showing locations of heating, electrical, plumbing, and other service components.

---

### V

**VALUE**—The relative lightness and darkness of different areas of the picture represented in tones, shading, line balance, and layout.

**VALUE SCALE**—The complete range of values from the lightest to the darkest.

**VAN DYKE**—A brownprint negative and sometimes a brownline positive.

**VANISHING POINT**—The point at which parallel lines receding from the observer appear to converge in a perspective drawing or photograph.

**VARIGRAPH**—A lettering device that allows manipulation of letter size, slant, and shape.

**VARNISH**—A solution made of a resin in a volatile medium.

**VEHICLE**—A liquid used as a carrier of pigment in paint.

**VECTOR-BASED**—Images based on a series of plotted points that define precise lines and geometric shapes.

**VELLUM**—A kind of fine, translucent paper resembling parchment or onion skin used for duplicating copies made with a whiteprint machine.

**VELOX**—A print of a photograph or other continuous-tone copy prescreened before paste-up or platemaking with line copy eliminating the need for a, composite negative.

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## Glossary, Continued

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- V (Continued)**    **VERTICAL SCAN RATE**—*Also called* FRAME RATE. The number of times per second a screen redraws an image.
- VIDEO DIGITIZING CAMERA**—A camera or film recorder attached to the front of a CRT screen used to record images.
- VIDEO DISPLAY TERMINAL (VDT)**—A visual display used in photocomposition work in conjunction with a keyboard.
- VIEWING PLANE LINE**—*See* CUTTING PLANE LINE.
- VIEWGRAPH**—*See* PROJECTURAL.
- VIEWPOINT**—The eye level of the viewer and the distance from the scene.
- VIGNETTE**—Fading an image from heavier to lighter tones blending it into the background or eliminating the background altogether.
- VISIBLE LINE**—The outline used for all edges seen by the eye.
- VISUALIZING PAPER**—A white, semitransparent paper used for making layouts and preliminary drawings.
- VISUAL LITERACY**—The ability to communicate effectively using only visual language.
- 
- W**    **WARM COLORS**—Colors associated with heat or fire.
- WASH**—A monochromatic rendering with a brush and transparent watercolor.
- WASH DRAWING**—A watercolor painting consisting mainly of washes.
- WATERCOLOR**—A dry pigment bound by an adhesive, such as gum arabic, and applied, greatly reduced by water, to a surface in a transparent fashion.
- 

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## Glossary, Continued

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- W (Continued)**    **WAXER**—A device that applies a thin layer of hot, adhesive wax to the back of a surface.
- WET BRUSH**—A blending technique of laying two pigments side-by-side and blurring the line of demarcation while the pigments are still wet.
- WHITE LEAD**—A fine, poisonous, opaque white pigment used in flake white and Cremnitz white oil paints.
- WIDE ANGLE LENS**—A very short focal-length lens that encompasses a larger horizontal view than a standard lens. This lens, depending on the focal length, records an image with increasingly pronounced (barrel) distortion.
- WINDOW**—*See* BLACK PATCH.
- WORD PROCESSING**—The transformation of a concept or idea into printed communication media by using mechanical or automated systems, methods, or processes.
- WORD SPACING**—The adjustment of spacing between words to shorten or extend a line to achieve justification.
- WORKING DRAWING**—A thorough preliminary drawing done on tracing paper then transferred to a working surface for the finished rendering.
- WOVE PAPER**—A broad range of papers having an even fiber formation produced over fine wire mesh.
- WRAPPING**—(1) A computer feature that automatically enters a soft return reveal code and continues to enter data from the same sentence on another line; (2) Selecting a pattern or design and wrapping it around an object on the screen.
- WRICO**—A hand-lettering system using a set of templates and a drop fed pen.
- 

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## Glossary, Continued

### X

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**XEROGRAPHY**—A copying process that uses electrostatic forces to form an image.

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**ZINC WHITE**—A zinc oxide based pigment that is less opaque than titanium and lead white.

**ZIP-A-TONE**—A transparent acetate sheet preprinted with patterns of dots or lines that create tone.

**ZONE NUMBERS**—Numbers and letters on the border of a drawing to provide reference points to aid in locating specific points in the drawing.

**ZOOM LENS**—A variable focal-length lens that functions as a telephoto lens but allows you to select the range of the object magnification.

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## APPENDIX II

### References Used to Develop The NRTC

**NOTE:** Although the following references were current when this NRTC was published, you will need to ensure you are studying the latest revision.

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|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Chapter 1</b> | <p>Adams III, Richard M., <i>Halftone Characteristics</i>, Graphic Arts Technical Foundation, Pittsburgh, PA, 1992.</p> <p>Destree, Thomas M., <i>The Lithographers Manual</i>, Graphic Arts Technical Foundation, Inc., Pittsburgh, PA, 1994.</p> <p>Fenton, Howard M. And Frank J. Romano, <i>On-Demand Printing: The Revolution in Digital and Custom Printing</i>, Graphic Arts Technical Foundation, Pittsburgh, PA, 1995.</p> <p>Lucas, Charles J., <i>Typography</i>, Graphic Arts Technical Foundation, Pittsburgh, PA, 1981.</p> <p>Pearl, Bill, <i>Scaling Copy</i>, Graphic Arts Technical Foundation, Pittsburgh, PA, 1980.</p> |
| <b>Chapter 2</b> | <p>Kemp, Jerrold E., and Don C. Smellie, <i>Planning, Producing, and Using Instructional Technologies</i>, 7th Edition, Harper Collins College Publishers, New York, NY, 1994.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Chapter 3</b> | <p>Kemp, Jerrold E., and Don C. Smellie, <i>Planning, Producing, and Using Instructional Technologies</i>, 7th Edition, Harper Collins College Publishers, New York, NY, 1994.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>Chapter 4</i> | <p>Brown, Charlene, <i>The Art Of Framing</i>, Walter Foster Publishing, Tustin, CA, 1991.</p> <p>Kemp, Jerrold E. And Don C. Smellie, <i>Planning, Producing, and Using Instructional Technologies</i>, 7th Edition, Harper Collins College Publishers, New York, NY, 1994.</p>                                                                                                                                                                                                                                                                                                                                                            |

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# *Assignment Questions*

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**Information:** The text pages that you are to study are provided at the beginning of the assignment questions.



# ASSIGNMENT 1

Textbook Assignment: “Copy Preparation,” chapter 1, pages 1-1 through 1-50.

---

1-1. What printing process is the oldest form of printing?

1. Gravure
2. Letterpress
3. Electronic digitization
4. Lithographic/offset lithographic

1-2. In letterpress printing processes, what part of the press causes an image to appear on paper?

1. The rollers
2. The cylinders
3. The open areas of the plate
4. The raised areas of the plate

1-3. In offset lithographic printing, the paper surface receives ink from what press component?

1. Zinc plate
2. Ink rollers
3. Blanket cylinder
4. Impression cylinder

1-4. Which of the following operations does electronic digitization and laser copiers NOT allow?

1. Editing
2. Photographing
3. Halftone creation
4. Job order completion

1-5. Which of the following terms is a broad term that refers to material intended for reproduction?

1. Copy
2. Text
3. Proofs
4. Artwork

1-6. What basic form of copy material has no graduated tones?

1. Line
2. Halftone
3. Photographs
4. Continuous-tone

1-7. What term refers to artwork, photos, and proofs that are ready for the print shop?

1. Copy
2. Printing plates
3. Black-and-white artwork
4. Reproduction mechanicals

1-8. What term denotes the process of electronically converting continuous-tone originals to halftones for digital duplication?

1. Photographing
2. Halftoning
3. Dithering
4. Screening

IN ANSWERING QUESTIONS 1-9 THROUGH 1-11, SELECT FROM THE FOLLOWING LIST THE COPY CATEGORIES THAT BEST DESCRIBES THE QUESTION.

- A. Continuous-tone
- B. Screen
- C. Line
- D. Combination

1-9. Artwork containing continuous-tone and line art together.

1. A
2. B
3. C
4. D

- 1-10. Black line illustrations.
1. A
  2. B
  3. C
  4. D
- 1-11. Material that has graduations of tone in a uninterrupted flow.
1. A
  2. B
  3. C
  4. D
- 1-12. What is the next step you should take after you select the proper printing process?
1. Type
  2. Format
  3. Paper stock
  4. Press schedules
- 1-13. What planning step should you take first after you receive a job in the shop?
1. Estimate the time required to do the job
  2. Divide the job into smaller tasks
  3. Consider prepress requirements
  4. Order material
- 1-14. The format of printed products includes which of the following attributes?
1. Look
  2. Feel
  3. Shape
  4. All of the above
- 1-15. Your decision as to the shape and size of the pages of a job should depend on which of the following information?
1. Press capacity
  2. Bindary capacity
  3. Available stock
  4. All of the above
- 1-16. How many printed pages result from printing a pamphlet in which both sides of the sheet will be offset printed in signature format?
1. Six
  2. Two
  3. Eight
  4. Four
- 1-17. You should design most booklets and pamphlets to conform to what rectangular format?
1. Regular
  2. Golden mean
  3. Hypotenuse
  4. Pythagorean
- 1-18. What type of stock should you use for a printing job that will be read once and thrown away?
1. Cover stock
  2. Colored stock
  3. Inexpensive paper
  4. Good durable paper
- 1-19. What term refers to the design of a style of type?
1. Type weight
  2. Type class
  3. Type size
  4. Typeface
- 1-20. How do display typefaces create illusions?
1. By using curves
  2. By using thick and thin lines
  3. By using the presence or absence of serif and embellishments
  4. All of the above
- 1-21. Which of the following factors contribute(s) to the legibility of copy?
1. Margins
  2. Type size
  3. Line length
  4. All of the above

- 1-22. What dimensions compose an overall letter?
1. Weight
  2. Height
  3. Decoration
  4. All of the above
- 1-23. The letter height of a typeface is expressed in what unit of measure?
1. Picas
  2. Points
  3. Pixels
  4. Fractions
- 1-24. Which type weight reproduces with optimum legibility in the finished product?
1. Boldface
  2. Lightface
  3. Openface
  4. Regular weight
- 1-25. What should you do to the letters in a line of text that are too long to fit into an allotted space?
1. Italicize them
  2. Condense them
  3. Expand them
  4. Redraw them
- 1-26. You can determine if a typeface has been expanded or condensed by examining the geometric proportions of what letter?
1. D
  2. G
  3. O
  4. Q
- 1-27. There are (a) what number of picas in one inch, and (b) what number of points in one pica?
1. (a) 12 (b) 6
  2. (a) 2 (b) 6
  3. (a) 6 (b) 12
  4. (a) 6 (b) 2
- 1-28. To order typeset copy, you should specify the line measure in what unit(s) of measure?
1. Picas
  2. Points
  3. Picas and inches
  4. Picas and points
- 1-29. What term refers to the placement of additional space between the letters of words to improve and balance typography?
1. Leading
  2. Letterspacing
  3. Justification
  4. Indenting
- 1-30. What term is known as the spacing of lines of type to a predetermined length so that the left and right margins align?
1. Justification
  2. Letterspacing
  3. Legibility
  4. Leading
- 1-31. What typographic procedure causes "rivers" of white space on a printed page?
1. Removing the short words from the text
  2. Improper letterspacing
  3. Improper indentations
  4. Improper word spacing
- 1-32. What typographic procedure reduces the amount of space between letters or combinations of letters?
1. Lettespacing
  2. Work spacing
  3. Line spacing
  4. Kerning
- 1-33. What is the purpose of indentations?
1. To make the page of text less readable
  2. To give the reader's eye a new starting point
  3. To give the reader eye strain
  4. To move the text in equally from the margins

1-34. Hanging indentations are used for which of the following purposes?

1. Poetry
2. Legends
3. Special emphasis
4. Short quotations

1-35. In an open book, the back margin should appear to equal what other margin(s)?

1. Top margin
2. Bottom margin
3. Either side margin
4. All other margins

IN ANSWERING QUESTIONS 1-36 AND 1-37, REFER TO FIGURE 1A AT THE BOTTOM OF THIS PAGE.

1-36. What page shows correct margin proportions for a single-page layout?

1. A
2. B
3. C
4. D

1-37. The margin proportions shown in C cause which of the following impressions?

1. Balance
2. Monotony
3. Inbalance
4. Irritation

1-38. When should a preliminary dummy be created?

1. When filling out the job order with the originator
2. After accepting the job
3. Before the job is typeset
4. After the job is typeset

1-39. In a layout, what is the purpose of a dummy?

1. To show the size of a final product
2. To show how the product will be bound
3. To show the areas that the text and illustrations will occupy
4. All of the above

1-40. A preliminary dummy should be what size?

1. 1/2 actual job size
2. 3/4 actual job size
3. 80% actual job size
4. 1/1 actual job size

1-41. You can improve the appearance of a long title of a publication by varying which of the following characteristics?

1. Color
2. Type size
3. Type style
4. Each of the above

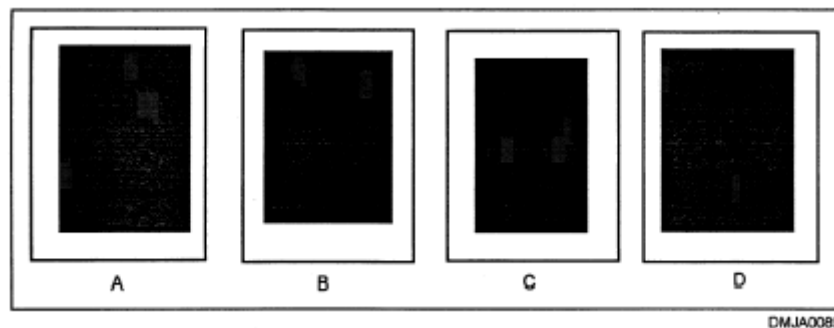


Figure 1A

- 1-42. What are the principal design requirements for pages such as the table of contents?
1. To match all other pages
  2. Attractiveness and legibility
  3. To match typefaces and attractiveness
  4. To be convenient and contain an artistic design
- 1-43. What does the term "cutlines" pertain to?
1. Text
  2. Captions
  3. Illustrations
  4. Cropping instructions
- 1-44. In what way should areas of text be indicated on a preliminary dummy?
1. By the use of thumbnail sketches
  2. By drawing a rectangle only
  3. By using lines drawn horizontally by a ruler only
  4. Either by drawing a rectangle or using lines drawn horizontally by a ruler
- 1-45. Where should you place a single illustration on a page?
1. At the mid-point of the base surrounded by text
  2. Just above the optical center of the page only
  3. The top of the page only
  4. Either just above the optical center or at the top of the page
- 1-46. For the purpose of page layout, what page visually outweighs the others?
1. Right
  2. Cover
  3. Title
  4. Left
- 1-47. What method should you use to add interest to a page that requires several illustrations?
1. Make the illustrations one column wide
  2. Group them as a montage and let the panel bleed
  3. Use each illustration separately and bleed each one
  4. Box each illustration and place them throughout the page
- 1-48. When should you create a paste-up dummy?
1. When the job is submitted
  2. When the job is accepted
  3. After the type is set
  4. Before type is set
- 1-49. What materials should be used for a paste-up dummy?
1. Preprinted rub-on lettering sheets
  2. Printed layout sheets
  3. Manuscript copy
  4. Type proofs
- 1-50. You should lay out several pages of a book in advance to avoid what problem?
1. Misnumbering final copy pages
  2. Repeated shifting from one job to another
  3. Work delays while waiting for adhesives to dry
  4. Changing the layout of the pasted pages to fit copy and illustrations
- 1-51. Specifying the type and set of a given body of text is known as what process?
1. Copyfitting
  2. Justification
  3. Planning the layout
  4. Indentational letterspacing

- 1-52. When you use the character count method of copyfitting, what step should you take after finding the total number of characters on a manuscript page?
1. Set the margins
  2. Divide the total number of characters by five
  3. Count the characters in five representative lines
  4. Determine the number of characters in one line
- 1-53. What is the procedure for determining the length of copy in inches using the character count method?
1. Divide the number of lines per inch into the total number of lines in the copy
  2. Divide the total number of characters in the manuscript by the average number of characters per line
  3. Count the number of characters in 5 lines and multiply by 20
  4. Count the characters in one line, multiply by the number of lines on the page and divide by 12
- 1-54. To determine the number of characters in a typeset line using the character count method of copyfitting, how many representative lines should you count?
1. 5
  2. 7
  3. 6
  4. 4
- 1-55. To properly use the line measurement method of copyfitting to determine copy depth, you should multiply page length by (a) for single-spaced, and (b) for double-spaced manuscripts?
1. (a) 12 (b) 10
  2. (a) 10 (b) 12
  3. (a) 3 (b) 6
  4. (a) 6 (b) 3
- 1-56. What term refers to the process of determining the reduction or enlargement of an image to occupy a given area?
1. Reproduction size
  2. Control dimension
  3. Cropping
  4. Scaling
- 1-57. Which of the following methods is the easiest and most popular method for scaling artwork?
1. Mathematical formulation
  2. Proportional dividers
  3. Proportional scale
  4. Slide rule
- 1-58. Normally, what is the controlling dimension for scaling artwork?
1. Width
  2. Height
  3. Length
  4. Paper size
- 1-59. What part of a proportional scale displays the ratio of the percentage of the original size and the number of times the art is reduced?
1. The outer disk
  2. The center disk
  3. The window near the center of the disk
  4. The LED readout in the upper-right corner
- 1-60. What should you do when scaling series artwork to improve the appearance of a job and save time in the camera room?
1. Reduce all art proportionally
  2. Enlarge all art to the same size
  3. Enlarge all art uniformly in size
  4. Prepare all art to the same scale
- 1-61. Which of the following percentages of enlargement or reduction will reproduce with optimum results?
1. 175
  2. 80
  3. 50
  4. 33

- 1-62. What effect will reducing the overall size of artwork have on the reproduction copy?
1. The weight of the center and extension lines decreases
  2. All lines except the object outline decreases
  3. All lines increase in weight
  4. All lines decrease in weight
- 1-63. What is the major drawback to enlarging artwork for reproduction?
1. Crudity
  2. Distortion
  3. Disproportion
  4. Spaces fill in
- 1-64. What aspect of reproduction can you directly influence through the preparation of a mechanical?
1. End use
  2. Quality
  3. Distribution
  4. Press process
- 1-65. What material should you acquire before starting a job intended for reproduction?
1. Ink
  2. Paper stock
  3. Bindery products
  4. All pertinent information
- 1-66. What do crop marks describe?
1. Reduction of an image
  2. Enlargement of an image
  3. Selected portion of an image
  4. Clean border area of an image
- 1-67. What material should you use to make a pair of cropping arms?
1. Large sheets of white paper
  2. Large sheets of black paper
  3. White cardstock cut at right angles
  4. Black cardstock cut at right angles
- 1-68. What procedure should you use to indicate crop marks on a photograph?
1. Mark the borders of the image
  2. Mark an overlay attached to the image
  3. Cut a window in an opaque mask or goldenrod
  4. All of the above
- 1-69. What product should you use to remove the light resin coating from the surface of photographs?
1. Rottenstone
  2. Talcum powder
  3. Fuller's earth
  4. Eraser particles
- 1-70. Which of the following media contains a photographically matched series of pigments containing white, black, and greys?
1. Watercolors
  2. Retouch greys
  3. Acrylic colors
  4. All of the above
- 1-71. What process isolates an image and removes the background?
1. Cropping
  2. Opaquing
  3. Vignetting
  4. Silhouetting
- 1-72. What procedure should you use to silhouette an object in a photograph when you must retain the original image untouched?
1. Cut the image area out of a copy image
  2. Mask the image area of a copy and airbrush the background
  3. Cover the image with an acetate mask and airbrush the acetate
  4. Alter the image for the best quality reproduction and tell the originator afterward

1-73. What process should you use to prepare continuous-tone images for reproduction?

1. Halftone screening
2. Combination copy
3. Image separation
4. Redrawing

1-74. What device should you use to reduce tonal art to a series of dots for reproduction on a printed page?

1. Combination film
2. Halftone film
3. Glass screen
4. Glass lens

1-75. Which of the following types of screens is/are used in making halftones?

1. Wire
2. Glass only
3. Acetate only
4. Glass and acetate

## ASSIGNMENT 2

Textbook Assignment: "Copy Preparation" chapter 1, pages 1-50 through 1-71; and "Audiovisual Presentations," chapter 2, pages 2-1 through 2-31.

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- 2-1. What type of screen should you place in direct contact with film emulsion when making a halftone?
1. Wire
  2. Glass
  3. Acetate
  4. Halftone
- 2-2. Where in relation to the camera and the negative, should you place a glass halftone screen?
1. In direct contact with the film
  2. Between the film plane and the lens
  3. Between the film plane and the camera
  4. In direct contact with the camera lens
- 2-3. What resolution should you select when scanning copy through a grey scale digital scanner?
1. 1X
  2. 2X
  3. 3X
  4. 4X
- 2-4. What situation creates a moiré pattern?
1. Anti-newton rings on the halftone screen
  2. Overlapping two different patterns
  3. Rescreening a halftone image
  4. Overlapping two different patterns and rescreening a halftone
- 2-5. You should prepare a mechanical on what type of material?
1. Acetate
  2. Construction paper
  3. Illustration board
  4. All of the above
- 2-6. Where on or in a mechanical should you place the instructions to the printer?
1. On the overlays
  2. In the work area
  3. In the border area
  4. On the back of the mounting board
- 2-7. Why should you remove every stray mark from continuous-tone artwork?
1. Stray marks appear as red lines in the finished product
  2. Stray marks confuse the printer
  3. Only stray marks appear
  4. All stray marks appear
- 2-8. Desktop publishing programs that output directly to inkjet printers are an elementary form of digital printing.
1. True
  2. False
- 2-9. Reproducing halftone copy from continuous-tone originals in full process color requires what total number of plates?
1. Five
  2. Two
  3. Three
  4. Four
- 2-10. Through what device should you photograph each color in a multicolor printing process?
1. Mate
  2. Filters
  3. Screens
  4. Templates

- 2-11. When you photograph color images through a halftone screen, what, if anything, happens when you rotate screen positions?
1. The color print contains a diagram dot pattern
  2. Filters are changed to produce the desired colors
  3. Some dots overlap and some print side-by-side to produce secondary and tertiary colors
  4. Nothing
- 2-12. What color process term denotes a simple black-and-white illustration with a registered color overlay that contains instructions to the printer?
1. Spot
  2. Flat
  3. Process
  4. Overprint
- 2-13. What combination of colors exemplify a true duotone?
1. Pink and red
  2. Black and grey
  3. Blue and green
  4. Light blue and dark blue
- 2-14. What is the purpose of register marks on overlays?
1. To key it to the master
  2. To show areas for trimming
  3. To indicate areas for reduction
  4. To indicate areas for enlargement
- 2-15. What action should you take to avoid moiré when lap registering patterns?
1. Avoid the overlap
  2. Opaque the overlap
  3. Cut out the overlap
  4. Draw a red line to cover the overlap
- 2-16. Where should editorial marks be made?
1. On a separate sheet of paper
  2. On a separate overlay
  3. On the manuscript
  4. On the proofs
- 2-17. What should you use to separate multiple error marks from the same line of text?
1. Commas
  2. Hyphens
  3. Semicolons
  4. Diagonal lines
- 2-18. What symbol or line should you use to indicate errors in the body of text?
1. Slash
  2. Carot
  3. Carrot
  4. A long line
- 2-19. What is the definition of a nut?
1. ee space
  2. en space
  3. em space
  4. mm space
- 2-20. To avoid confusion, how should you mark copy with instructions to the printer?
1. Underline notations
  2. Make notations in red
  3. Circle your notations
  4. Attach a sheet of notations to copy
- 2-21. When developing training aids, you should discuss which of the following factors with the originator?
1. Intended message
  2. Lecture pads
  3. Viewgraphs
  4. Slides
- 2-22. What are the two major types of training aids?
1. Dynamic and static
  2. Manipulative and static
  3. Demonstrative and dynamic
  4. Manipulative and demonstrative
- 2-23. Training aids used for skills instruction are referred to as what type of aid?
1. Fundamental
  2. Manipulative
  3. Demonstrative
  4. Informational

2-24. Training aids designed to present a series of ideas or steps in a process are referred to as what type of aid?

1. Fundamental
2. Manipulative
3. Demonstrative
4. Informational

2-25. Which of the following training aids are dynamic in nature?

1. Slides
2. Posters
3. Cartoons
4. Animation

2-26. A lecture pad is an example of what type of training aid?

1. Demonstrative aid
2. Manipulative aid
3. Dynamic aid
4. Static aid

2-27. What is the primary purpose of a poster?

1. To reach a large audience
2. To attract attention
3. To convey a message
4. To attract attention and to convey a message

2-28. What kind of training aid, if any, can be produced with only a large pad of paper?

1. Lecture pad
2. Animation
3. Slide
4. None

2-29. When lettering lecture pads, which of the following guidelines should help improve legibility?

1. Use caps and lowercase letters
2. Add space between words and letters
3. Confine the copy to short, descriptive text
4. All of the above

2-30. For an organization chart to be effective, you should draw it to show which of the following types of information?

1. Span of control
2. Functional relationships
3. Authority and responsibility
4. All of the above

IN ANSWERING QUESTIONS 2-31 THROUGH 2-34, SELECT FROM THE FOLLOWING LIST THE TYPE OF ORGANIZATIONAL CHART GIVEN IN THE QUESTION.

- A. Structure
- B. Functional
- C. Position
- D. Billet Assignment

2-31. Establish basic control relationships.

1. A
2. B
3. C
4. D

2-32. Indicate function of components.

1. A
2. B
3. C
4. D

2-33. Establish reporting responsibilities.

1. A
2. B
3. C
4. D

2-34. Identify billets.

1. A
2. B
3. C
4. D

- 2-35. Organization charts should meet which of the following requirements?
1. Show greater detail on subsidiary activities
  2. Show simplicity, completeness, unity, and clarity
  3. Combine different types of information
  4. Conform to a format
- 2-36. To avoid confusion when making an organization chart, which of the following actions should you take?
1. Avoid crossing lines of authority
  2. Make all blocks the same size
  3. Use asterisks
  4. Use colored ink

IN ANSWERING QUESTIONS 2-37 THROUGH 2-40, SELECT FROM THE FOLLOWING LIST THE PRINCIPAL POINTS DESCRIBED IN THE STATEMENT.

- A. Completeness
- B. Simplicity
- C. Symmetry
- D. Unity

- 2-37. Eliminating complicated elements.

1. A
2. B
3. C
4. D

- 2-38. Well-balanced arrangement.

1. A
2. B
3. C
4. D

- 2-39. Indicate clarifying statements and date.

1. A
2. B
3. C
4. D

- 2-40. Interrelating components.

1. A
2. B
3. C
4. D

- 2-41. When drawing a structural organization chart, what method should you use to achieve unity?

1. Make all blocks one size
2. Make blocks proportional in size
3. Make each block relate to another block
4. Make lines of authority smaller than block lines

- 2-42. In some functional charts, the blocks for lower echelon levels are made larger than the blocks for higher echelon levels. For what reason is this done?

1. To balance the chart
2. To unify and clarify the chart
3. To make the chart easier to read
4. To provide space for written descriptions

- 2-43. What line convention should you use to show the liaison of the command master chief to the commanding officer?

1. Solid line
2. Dashed line
3. Dotted line
4. Alternating dot and dash line

- 2-44. Authority lines should be drawn as what type of lines?

1. Hidden vertical or diagonal
2. Solid horizontal or diagonal
3. Solid vertical or horizontal
4. Hidden vertical or horizontal

- 2-45. To make an organization chart better looking and easier to read, you should take which of the following actions?

1. Lay it out with nonreproducible blue pencil
2. Create a legend for different line resolutions
3. Use a heavier line weight for the lines of authority than for the blocks
4. Use a heavier line weight for the lettering

2-46. What kind of subdivision on structural charts is shown with dotted-lines (.....)?

1. Existing part time
2. Proposed full time
3. Abolished full time
4. Mobilized components

2-47. Flow chart symbols represent what elements?

1. Decision points
2. Quantities and positions
3. Functions and direction of flow
4. Devices and direction of motion

2-48. How should you illustrate the use or creation of multiple files in a flow chart?

1. Use arrowheads at the point of entry
2. Use symbols with the appropriate text
3. Use symbols in an overlay pattern
4. Use numerals to indicate multiples

2-49. How should you draw the symbols on a flow chart to indicate the direction of flow?

1. Top to bottom only
2. Left to right only
3. Top to bottom and left to right
4. Right to left

2-50. When you are laying out a flow chart using the flowchart template, how should the symbols be drawn?

1. Right to left
2. Centered on the paper
3. With a 1-inch margin all around
4. With equal distances between symbols

2-51. For presenting statistics in comparisons, for conveying information, and for analyzing data, which of the following tools are most useful to you?

1. Graphs
2. Flow charts
3. Organization charts
4. All of the above

2-52. To designate the position of a point in relation to a given reference frame, you should use what device?

1. A rectangular coordinate graph
2. A percentage chart
3. A bar chart
4. A pie chart

2-53. In what way are the quadrants of a rectangular coordinate graph numbered?

1. Clockwise
2. Counterclockwise
3. Along the x and y axes
4. Numerically from right to left

IN ANSWERING QUESTIONS 1-54 THROUGH 2-56, REFER TO FIGURE 2A.

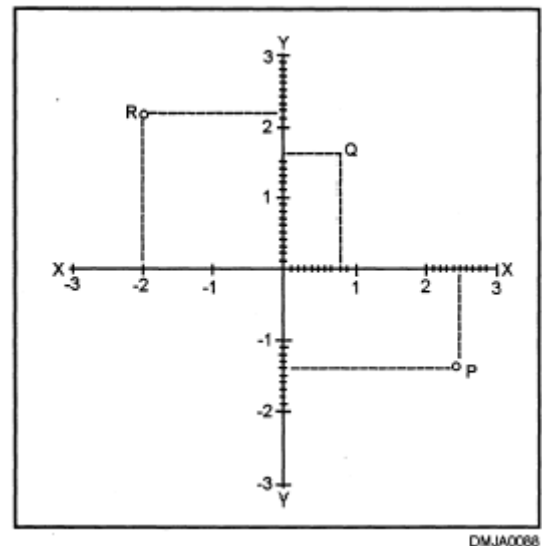


Figure 2A.

2-54. Which of the following coordinates represents point R?

1. (-2, -2.2)
2. (-2, 2.2)
3. (2.2, -2)
4. (-2.2, -2)

2-55. Which of the following values assigned to the x and y coordinates locates point Q?

1.  $x = 1.6, y = -1.4$
2.  $x = -.8, y = 1.6$
3.  $x = .8, y = 1.6$
4.  $x = -.8, y = 1.6$

- 2-56. What are the values of coordinates x and y for point P?
1.  $x = 2.5, y = -1.4$
  2.  $x = -2.5, y = 1.4$
  3.  $x = -1.4, y = -2.5$
  4.  $x = -2.5, y = -1.4$
- 2-57. To illustrate such things as comparative costs and quantity, what type of graph should you chose?
1. Rectangular coordinate graph
  2. Percentage chart
  3. Bar graph
  4. Pie chart
- 2-58. When constructing a bar graph, what step should you take first?
1. Determine the scale
  2. Select the page size
  3. Determine the reference frame
  4. Determine the length of the bars
- 2-59. After you determine the reference frame for a bar graph, what should be your next step?
1. Plot values
  2. Select the paper size
  3. Find a suitable scale
  4. Choose appropriate axes
- 2-60. When a bar graph is drawn on the right side of a sheet of paper, for what are the margins at the sides of the sheet used?
1. Distance scales
  2. Additional bars
  3. The title of the graph
  4. Explanatory notes and figures
- 2-61. When selecting a scale for the y-axis of a bar graph, what action should you take before plotting the values?
1. Use an engineer's scale
  2. Find the largest values to be plotted
  3. Add additional values to the largest value
  4. All of the above
- 2-62. When comparing several related percentages, what type of graph or chart should you use?
1. Pie chart only
  2. Percentage bar chart only
  3. Pie chart and percentage bar chart
  4. Bar chart
- 2-63. What total percentage does each bar in a percentage bar chart represent?
1. 10
  2. 100
  3. 360
  4. The value of each item
- 2-64. What is the angular measurement of 32% on a standard pie chart?
1.  $120^\circ$
  2.  $125^\circ$
  3.  $130^\circ$
  4.  $135^\circ$
- 2-65. When laying out a pie chart, what information do you determine by multiplying the percentage of each segment by 3.6 degrees?
1. Percent of each sector
  2. Number of sectors in the chart
  3. Number of degrees in each sector
  4. Percent of degrees in each sector
- 2-66. In what application method do you apply rubber cement to the underside of a piece of artwork and move it around to position it?
1. Spray method
  2. Thinner method
  3. Wet mount method
  4. Dry mount method
- 2-67. When mounting art with rubber cement, what should you do to properly align the art on the board?
1. Use register marks to center the artwork
  2. Use an old triangle to slide the artwork
  3. Use a nonreproducible blue pencil to mark the position of the artwork
  4. Place the artwork directly on the mounting board while still wet and slide it around

- 2-68. When mounting artwork using the rubber cement method, what action should you take when the artwork is properly positioned?
1. Remove the excess cement
  2. Press the top of the artwork firmly to anchor it to the board
  3. Use an old triangle to press the artwork flat
  4. Draw a scale down the artwork to press it flat to the board
- 2-69. What implement should you use to remove the residual cement and dirt from the surface of newly mounted artwork?
1. A kneaded eraser
  2. Rubber cement thinner
  3. Rubber cement pick-up
  4. The end of your finger
- 2-70. What feature of the artwork you are mounting with rubber cement should prompt you to use two slip sheets under it?
1. It is too large
  2. It is too small
  3. It is too flimsy
  4. It is too valuable
- 2-71. What causes blistering in a color photograph mounted by the dry hot press technique?
1. Temperature set too low
  2. Temperature set too high
  3. Temperature set at 200 degrees
  4. Overlapping adhesive layers underneath the photograph
- 2-72. When, if ever, should you use a dry mount press to mount artwork containing wax-based products?
1. Always
  2. Only when a slip sheet is used
  3. Only when the artwork is face down in the press
  4. Never
- 2-73. When using the dry mount press, what should you do if it requires two sheets of adhesive laying side-by-side to adhere a picture?
1. Overlap the sheets and fold the edges under so they do not extend beyond the borders of the picture
  2. Leave a space between the sheets and trim their edges even with the borders of the picture
  3. Overlap the sheets and let their edges extend beyond the borders of the picture
  4. Leave a space between the sheets and let their borders extend beyond the picture
- 2-74. When you are using a dry mount press, the cover or slip sheet serves what purpose?
1. As a mounting surface
  2. As an additional adhesive
  3. Keeps the face of the artwork and press bed clean
  4. Keeps the mounting board and the artwork clean
- 2-75. What adhesive quality should you consider when mounting original artwork to a board?
1. Stink
  2. Process
  3. Availability
  4. Deterioration

## ASSIGNMENT 3

Textbook Assignment: "Audiovisual Presentations," chapter 2, pages 2-32 through 2-53; "Television Graphics," chapter 3, pages 3-1 through 3-23; and "Displays and Exhibits," chapter 4, pages 4-1 through 4-9.

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- 3-1. What is the purpose of a mat?
1. To focus attention
  2. To protect from fingerprints
  3. To prevent direct contact between artwork and glass in a frame
  4. All of the above
- 3-2. If the top and both sides of a mat measure 3/4 inch wide, what should be the width of the bottom edge?
1. 1 inch
  2. 3/4 inch
  3. 7.8 inch
  4. 15/16 inch
- 3-3. Why should you cut against a straightedge along the inside edge of a hand-cut mat?
1. To protect your leg
  2. To protect your hand
  3. To protect the useable portion of the mat
  4. To guide the blade straight from corner to corner
- 3-4. What is the key to successful cutting of both hand-cut and carriage-cut mats?
1. Angle of the blade
  2. Depth of the blade
  3. Profile of the blade
  4. Sharpness of the blade
- 3-5. What is a major difference between cutting a mat by hand and cutting a mat on a carriage cutter?
1. The mat board is face -up when cutting a mat by hand and face down when cutting with a carriage
  2. The corners of a hand-cut mat are exact while the corners of a carriage cut mat are not
  3. The hand-cut mat has a straight edge and the carriage-cut mat has beveled edges
  4. The hand-cut mat can be very large but the carriage-cut mat is limited in size
- 3-6. What are the most common types of projecturals used in the Navy today?
1. Videotape and 8mm movie film
  2. 35mm slides only
  3. Viewgraphs and 35mm slides
  4. Transparencies and viewgraphs
- 3-7. What is the most common aperture area of a viewgraph?
1. 6 4/10 by 9 1/2 inches
  2. 7 1/2 by 9 1/2 inches
  3. 10 by 9 1/2 inches
  4. 10 by 10 inches
- 3-8. When you design projecturals, the horizontal format is preferable for what reason?
1. It ensures that the projected image fills as much of the viewing screen as possible
  2. Suspended light fixtures and low ceilings do not usually interfere only
  3. Horizontal formatting is easier to layout then vertical formatting only
  4. It ensures that the projected image fills the screen as much possible and it is easier to lay out than a vertical format

- 3-9. To eliminate confusion in a crowded viewgraph, what should you do?
1. Add color
  2. Reduce the viewgraph to a slide
  3. Limit the viewgraph to one topic
  4. Remove unnecessary information
- 3-10. A viewgraph layout sheet should contain which of the following features?
1. Grid paper and registration marks
  2. Aperture outlines for viewgraphs, slides, and TV cards
  3. Optical center and true center
  4. All of the above
- 3-11. Which of the following techniques is the quickest way to make a viewgraph?
1. Diazo
  2. Photographic
  3. Marker on acetate
  4. Computer generated
- 3-12. You have limited resources but want to create a handmade viewgraph with color. What technique, when used creatively, will give your viewgraph a professional appearance?
1. Spraying color on acetate
  2. Pooling color from the strokes of a marker
  3. Cutting out cellophane and sticking it to the viewgraph
  4. Limiting color to the black letter on a clear background
- 3-13. A liftable magazine picture has what characteristics?
1. It leaves a white deposit when rubbed with a wet finger
  2. It remains intact when a hot iron is pressed over it
  3. It is vivid in color
  4. All of the above
- 3-14. The emulsion used on diazo foils is made up of what two components?
1. Azo dyestuff and diazo salts
  2. Diazo salts and ultraviolet light
  3. Azo dyestuff and ammonium hydroxide
  4. Ammonium hydroxide and an alkaline medium
- 3-15. You are proofing master art for diazo reproduction on foil and you see that the solid areas are irregular in opacity. How will the resulting foil appear?
1. Dense
  2. Light
  3. Irregular
  4. Solidly opaque
- 3-16. When you are using diazo materials to produce viewgraphs, how do the images on the diazo foils form?
1. By exposing the emulsion to ultraviolet light and developing in ammonia vapors
  2. By exposing the emulsion to ammonia vapors and developing in ultraviolet light
  3. By developing the foil in ammonia vapors after total exposure to ultraviolet light
  4. By developing the foil in ammonia vapors, causing the diazo salts to combine with the azo dyestuff
- 3-17. What is the purpose of the opaque image area of a diazo master?
1. To keep all light rays from striking the foil
  2. To enable ultraviolet light to reach the foil
  3. To prevent ultraviolet light from reaching the foil
  4. To prevent ultraviolet light from reaching the foil
- 3-18. When preparing a series of diazo masters, what will eliminate changing exposures and prevent film waste?
1. Use a fine fiber opaque paper
  2. Use a fibrous paper
  3. Use acetate
  4. Use the same paper stock for all masters

- 3-19. At what scale should you make a diazo master?
1. Any scale
  2. Same as reproduction size
  3. Larger than reproduction size
  4. Smaller than reproduction size
- 3-20. When making diazo viewgraphs, you can minimize distortion by taking what action?
1. Turn the machine blower to high
  2. Run diazo foils alternately at right angles to each other
  3. Run diazo foils at the highest allowable speed
  4. Run all foils in the same direction through the machine
- 3-21. What is the indication that the emulsion on a diazo foil is facing you?
1. The nick on the foil is in the upper-right corner
  2. The nick on the foil is in the upper-left corner
  3. The dot on the foil is in the upper-left corner
  4. The master is reversed and facing down
- 3-22. What is the most critical step in exposing and developing diazo foils correctly?
1. Use ammonia with a 26° Baume reading
  2. Use only dimensionally stable products
  3. Develop only as long as necessary, exposure varies
  4. Develop for lengthy periods
- 3-23. Reversals are effective for which of the following reasons?
1. They are easy on the eyes
  2. They contain a clear image on a darkened background
  3. They focus the viewer's attention on a small section of the screen
  4. All of the above
- 3-24. Why should you never use a positive format viewgraph in the same presentation as negative formatted viewgraphs?
1. To prevent eyestrain
  2. To avoid having to completely darken the room
  3. To avoid using dark colored backgrounds
  4. To prevent having to project front and rear simultaneously
- 3-25. To update a sepia intermediate without having the original artwork, you should take what action?
1. Redraw the intermediate
  2. Correct the intermediate
  3. Request a revision from the originating authority
  4. Throw the intermediate away and start over
- 3-26. What total number of colored diazo foils may be run from a single sepia intermediate?
1. One
  2. Two
  3. Six
  4. Unlimited
- 3-27. If commercial mounts are not available, which of the following materials can you use as a viewgraph frame?
1. Acetate
  2. Making tape
  3. Tracing paper
  4. Illustration board
- 3-28. You should use what type of tape to attach a transparency to a transparency mount?
1. Masking tape
  2. Packing tape
  3. Cellophane tape
  4. Transparent plastic

- 3-29. When mounting multiple overlays on a viewgraph frame, what foil should you mount first?
1. Base
  2. Blue
  3. Black
  4. Bottom
- 3-30. What is the reason you should mount several overlays to the same side of the viewgraph mount?
1. To strengthen one side of the mount
  2. To attach all overlays neatly on one side
  3. To ensure that each overlay appears in the correct sequence
  4. To reduce the amount of tape required to mount all of the overlays
- 3-31. What is/are the reason(s) for using tabs on multiple overlay viewgraphs?
1. To indicate sequence
  2. To indicate the ordering of fastening
  3. To fasten each overlay equally to the frame
  4. All of the above
- 3-32. For what reason are 35mm slides used at many Navy commands?
1. They are low in production costs
  2. They are versatile
  3. They are compact
  4. All of the above
- 3-33. How should you position a slide in a carousel for rear screen projection?
1. Upper-left corner, facing away from you
  2. Upper-right corner, facing away from you
  3. Lower-left corner, facing you
  4. Lower-right corner, facing you
- 3-34. When you are designing artwork for 35mm slides, you should use what format?
1. 3.5
  2. 5.7
  3. Vertical
  4. Horizontal
- 3-35. To make sure that 35mm slides are in the proper order and in correct position, you should place thumbspots where on the frame?
1. Upper-right corner when slide is facing you
  2. Upper-left corner when slide is facing you
  3. Lower-right corner when slide is facing you
  4. Lower-left corner when slide is facing you
- 3-36. Where should you locate the thumbspots to position slides in a carousel tray for front screen projection?
1. Lower-left corner
  2. Upper-left corner
  3. Upper-right corner
  4. Lower-right corner
- 3-37. When you use the diagonal line method for marking slides, what does a break in the continuity of the line mean?
1. The rubber band is out of position
  2. The slides are in the correct position
  3. A missing or improperly sequenced slide
  4. The thumbspots are improperly positioned on the slides
- 3-38. The success of the end product in any graphic media depends upon what factor(s)?
1. Budget
  2. Supplies
  3. Computer savvy
  4. Fundamental graphics knowledge
- 3-39. What is a limiting hardware factor in the creation of computer-generated graphics for presentation?
1. Keyboard
  2. Monitor
  3. Memory
  4. Mouse
- 3-40. Television and video cameras detect what type of light?
1. Deflected
  2. Reflected
  3. Diffused
  4. Bounce

- 3-41. A receiver separates transmitted signals into what two impulses?
1. Audio and CRT
  2. Visual and CRT
  3. Audio and sound
  4. Visual and audio
- 3-42. Which of the following statements best describes what a TV camera “seeS”?
1. Everything within lens range
  2. Electrical impulses of varying strength
  3. Varying amounts of light reflected from a scene
  4. All of the above
- 3-43. Which of the following factors has the greatest effect on light position reflected from an object recorded by a TV camera?
1. Object size
  2. Object color
  3. Shade on the object
  4. Location of the object
- 3-44. The normal range of vision to which most artwork should conform has what aspect ratio?
1. 3 to 4
  2. 3 to 5
  3. 3 to 6
  4. 5 to 7
- 3-45. The peripheral loss to the scanning area during TV transmission is what percentage?
1. 22%
  2. 20%
  3. 17%
  4. 15%
- 3-46. Which of the following media are referred to as television graphics?
1. Photographs
  2. Color slides
  3. Credit captions
  4. All of the above

IN ANSWERING QUESTIONS 3-47 THROUGH 3-50, SELECT FROM THE FOLLOWING LIST THE TYPE OF STUDIO CARD GIVEN IN THE STATEMENT.

- A. Border area
- B. Essential area
- C. Scanning area
- D. Safe title

- 3-47. Maximum resolution or clarity.
1. A
  2. B
  3. C
  4. D
- 3-48. Total picture area.
1. A
  2. B
  3. C
  4. D
- 3-49. Safe title area.
1. A
  2. B
  3. C
  4. D
- 3-50. Protection from damage.
1. A
  2. B
  3. C
  4. D
- 3-51. To present a great deal of textual information in a TV graphic, you should use what type of equipment?
1. Rub-on letters
  2. Phototypesetter
  3. Character generator
  4. Electric typewriter
- 3-52. Generally, cards used in preparing artwork or picture for TV transmission are what size?
1. 8 1/2 by 11 inches
  2. 10 by 13 1/3 inches
  3. 10 by 12 inches
  4. 11 by 14 2/3 inches

3-53. To give some clue to the type and character of a television show, you should make graphics with which of the following characteristics?

1. With motion
2. With an introduction
3. To match the style of the program
4. Containing a variety of background settings

3-54. The most critical consideration in assuring good television artwork reproduction is what factor?

1. Subject size
2. Simplicity
3. Legibility
4. Contrast

3-55. When a television receiver displays color art in a black-and-white transmission, what legibility standard is most important?

1. Image size
2. Color content
3. Tonal contrast
4. Lettering style

3-56. When color artwork for TV is created, for what reason should you limit your palette to about two shades and three tints of each intense hue?

1. More than six values of a single hue is hard to distinguish when transmitted
2. To emphasize center of interest items
3. To prevent greys from transmitting
4. To set video levels

3-57. Which of the following techniques does NOT improve legibility of television graphics?

1. Changing tonal contrast
2. Rearranging information
3. Enlarging overall dimensions
4. Reducing information to essential elements

3-58. Since the essential area of a TV screen limits the amount of text you can transmit, you should limit the number of words on a graphic to what number?

1. 8
2. 10
3. 12
4. 14

3-59. Simplicity in television graphics is absolutely necessary for what reason?

1. To maintain the aspect ratio
2. To increase emphasis and strengthen impact
3. To standardize size and resolution
4. To establish a camera-to-graphic distance

3-60. Which studio card contains only illustrations?

1. Illustrated
2. Standard
3. Plain
4. Super

IN ANSWERING QUESTIONS 3-61 THROUGH 3-63, SELECT FROM THE FOLLOWING LIST THE STUDIO CARD DESCRIBED IN THE STATEMENT.

- A. Standard
- B. Plain
- C. Illustrated
- D. Super

3-61. White letters, black background.

1. A
2. B
3. C
4. D

3-62. Text only.

1. A
2. B
3. C
4. D

- 3-63. Text and images.
1. A
  2. B
  3. C
  4. D
- 3-64. To present text and illustrations in sequence at a controlled rate of speed is known by what term?
1. Scrolling
  2. Progression
  3. Storyboarding
  4. Progressive disclosure
- 3-65. With what card does the camera tilt up and down to cover the information?
1. Pan
  2. Tilt
  3. Plain
  4. Drop-in
- 3-66. When a camera pans a graphic, what motion, if any, is the camera making?
1. Up-and-down
  2. Side-to-side
  3. Vertical
  4. None
- 3-67. What disclosure technique makes information scroll on and off the screen?
1. Drop-in/out binder
  2. Tilting
  3. Panning
  4. Crawl
- 3-68. Computer-generated graphics created to influence your decisions or thought and intended for TV transmission are known by what term?
1. Inforgraphics
  2. Inforercials
  3. Teleconference
  4. Animation
- 3-69. A display should have a central theme or message.
1. True
  2. False
- 3-70. A display should target what type of audience?
1. Large
  2. General
  3. Transitory
  4. All of the above
- 3-71. Which of the following spaces are appropriate for a display?
1. A small alcove in a back wing of a building
  2. Under a stairwell
  3. Near a deepsink
  4. Coffee mess or lunch room
- 3-72. Which of the following factors is most important in how you are hanging display and exhibits?
1. Viewer participation
  2. Viewer's line of sight
  3. Conveniences of location
  4. Location security
- 3-73. At what level should display and exhibit items hang?
1. 4 feet from the ceiling
  2. 18 inches from the ceiling
  3. 6 feet from the floor
  4. At eye level
- 3-74. Why should you clean exhibit items before storing them away?
1. To remove agents that will deteriorate the item
  2. To prevent bug damage
  3. To prevent moth damage
  4. To make sure they are ready for the next use

3-75. Why should you mark the protective wrap you place on display or exhibit items you are storing?

1. So you know which sheet of wrapping paper goes with each item
2. To easily identify items without unwrapping them
3. To create more documentation
4. Just for safe measure

