Design and Layout

5

Learning Objectives

After studying this chapter, you will be able to:

- Summarize the role of the graphic designer.
- List and explain the elements of design.
- Utilize the principles of design.
- Identify the elements that make up a layout.
- Explain the factors that determine how a layout design is developed.
- Differentiate between the design methods used in layout.
- Demonstrate how copyfitting is used to estimate layout space.
- Describe the methods used in preparing illustrations for layout.
- List the layout materials needed to produce a mechanical.

Important Terms

comprehensive layout
copyfitting
elements of design
elements of layout
layout base sheet
photo cropping
principles of design
rough layout
specifications
thumbnail sketches

In graphic communications, *design* refers to the application of proper methods to produce a product that is both artistic and functional. A successful design requires the skillful use of design elements and principles.

This chapter will cover the primary elements and principles of design and layout. Knowledge of common design techniques is critical in producing a layout and evaluating the visual quality of a product.

The Graphic Designer

The role of the graphic designer varies greatly within the graphic communications industry. This is because of the overlapping duties that are performed throughout the process of design and layout. In some companies, the same artist who is responsible for producing artwork may also be required to perform certain layout tasks. See **Figure 5-1**. It is very important for the design person to work closely with the printer, since the planned design could cause problems when it arrives to be printed. Limitations relating to folding, press size, and paper capabilities could be potential problem areas.

Today's graphic designer might be an artist who prepares the artwork necessary for a portion of a product. Artwork could include freehand sketches, technical art, lettering, and calligraphy. In many cases, the graphic designer has little knowledge of the processes used in graphic reproduction. But the designer may also be responsible for pasting up camera-ready copy or producing a finished product with page layout software. This illustrates that the specific duties performed by design and layout personnel are very difficult to clearly define.

Figure 5-1. A graphic artist is commonly involved in several stages of production, from designing visual materials to performing layout tasks. (Screaming Color-Chapter One)

In the simplest of situations, a *design artist* would create the art images needed by the *layout artist*. Many companies, however, do not have the luxury of hiring people who only have specific design or layout skills. The design artist, in many companies, translates ideas into art and is also involved in layout and production in various stages.

Once the layout design is approved by a client or outside source, the elements are usually gathered and assembled by the same person who created the design. The design artist must initially express a visual idea. The idea becomes the foundation of the layout and is then developed into the final product.

Planning and organizing the design process is essential to having an efficient operation. A small printing facility, from a financial standpoint, often cannot afford to employ one person to perform design tasks. Therefore, designing may be left to the plant personnel, who may have very little design knowledge but are required to devise and complete layouts for production.

A knowledge of the fundamentals of design is required for both the design artist and the layout artist. The elements and principles of design are an accumulation of many factors that help solve the problem of producing an image that is both attractive and practical.

Elements of Design

Design involves the selection and arrangement of visual images to make a pleasing presentation. The text and illustrations used in a design will have a tremendous impact upon the viewer; therefore, it is essential to develop a strong layout of visual materials.

A successful graphic designer must apply the fundamental principles of design. The basic ***elements of design*** are *lines*, *shapes*, *mass*, *texture*, and *color*.

Lines

Lines are design elements that form the shapes of an image. Lines can be used to give the printed image a "personality." Lines can be loose and free or they can be straight and sharp. See **Figure 5-2**. The repetition of lines creates patterns and adds emotional impact to the visual image.

Figure 5-2. Lines can be used to denote a specific meaning. Curved, loose lines imply a free spirit. Lines drawn straight imply a more straightforward or disciplined theme.

Lines can also be used as a form of "universal language" in communication. In other words, lines can be designed to create a message. Arrows and other symbols are examples of lines used as a visual form. See **Figure 5-3**.

Lines are often used to enhance or change the visual quality of styles of type. They can appear very harsh or very delicate. Lines play a highly important role in designing a layout that communicates effectively.

Figure 5-3. Lines can deliver a visual message when they are drawn as arrows or other symbols.

Shapes

Shapes are elementary forms that define specific areas of space. In many cases, a shape is defined by a line. The three basic shapes are the square, circle, and triangle. See Figure 5-4.

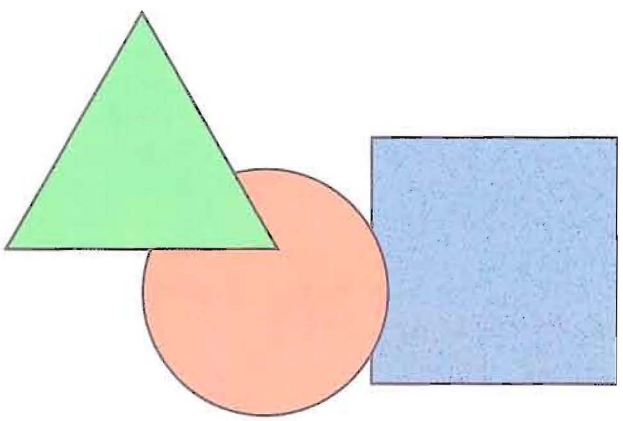


Figure 5-4. The three basic design shapes are the square, circle, and triangle.

Each of the three basic shapes is associated with a psychological meaning, as shown in Figure 5-5. The visual attitude portrayed by the *triangle* is one of conflict or action. The *square* projects an attitude of honesty or equality, while the *circle* conveys a feeling of protection or infinity.

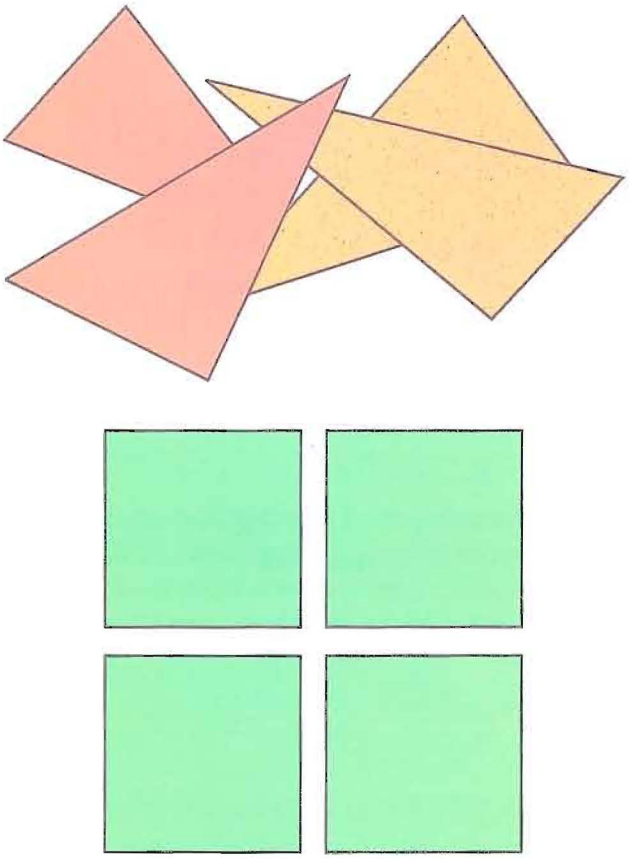


Figure 5-5. Different shapes are associated with psychological meanings. Squares show organization, while triangles display aggression and circles indicate motion.

Mass

Mass is a measure of volume that adds definition to shapes in a visual presentation. The mass or solid portion of the shape provides a visual relationship with the other elements. See Figure 5-6.

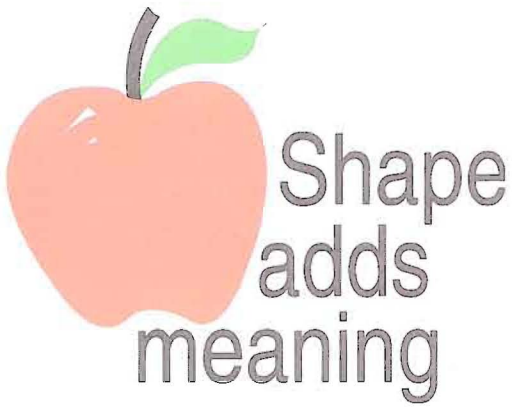


Figure 5-6. Mass adds volume or weight to a shape by emphasizing part of an image.

Different shapes of varying intensities, known as *weights*, can be used to emphasize or de-emphasize styles of type. See Figure 5-7. Physical forms are made by combining the three basic shapes. See Figure 5-8.

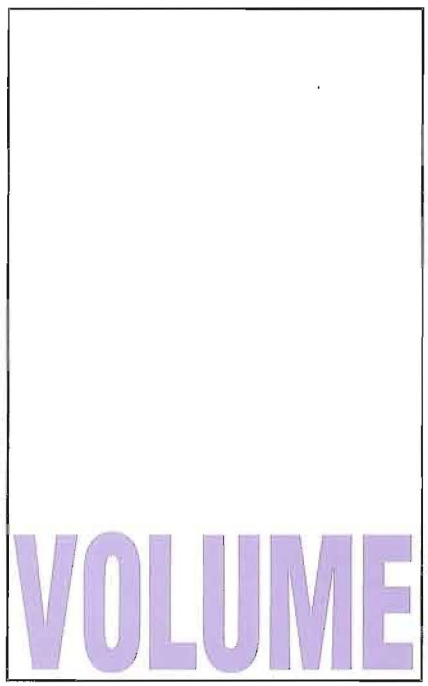


Figure 5-7. Visual emphasis can be achieved by varying the weights or sizes of type or other images.

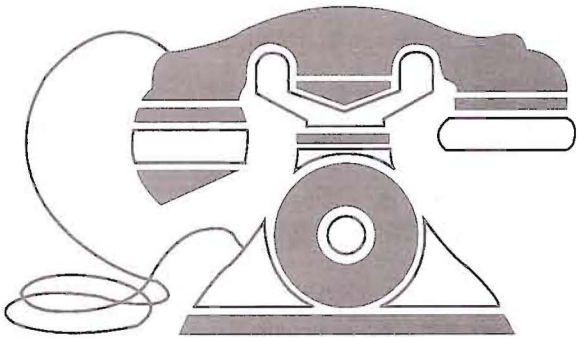


Figure 5-8. A combination of shapes creates the physical form of an image.

Texture

The *texture* of a visual image is a projection of emphasized structure or weight. When measuring the texture of an object, the first inclination is to touch the surface. In graphic communications, texture is usually visual; there is no feeling gained through the sense of touch. See Figure 5-9.

Figure 5-9. Lines can provide surface variation to give texture to an image.

Texture appears as a design element when the visual images reflect the meaning of lines, as shown in Figure 5-10, or when mass forms images that reflect a special technique. See Figure 5-11.

Texture varies and depends on the structure and weight of the individual letters, the amount of space between lines, and the amount of mass in a certain space. Actual texture for a printed image can be produced by embossing, which presses a shape or irregular surface into the substrate.

Color

Color is an important element to be considered when planning or designing a printed product.

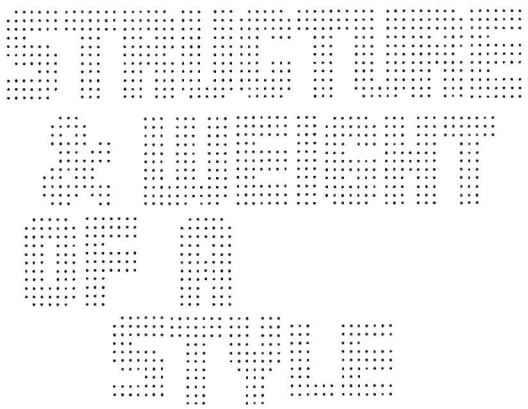


Figure 5-10. Texture of type can be a design element.

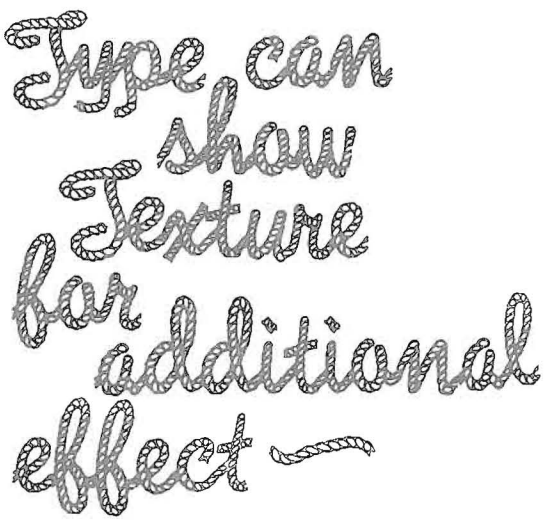


Figure 5-11. Lines added to type can provide texture. Here, they create a unique visual effect resembling rope.

Color can draw attention and produce a strong emotional and psychological impact. Different colors have traditional and symbolic meanings. A basic understanding of color is essential to creating a good design.

Color should be used to add interest and variety to a design. A small amount of color can heighten the visual quality of a page.

Color moods

Different colors project different moods. Yellow, orange, and red are considered to be *warm* colors and often denote aggression, excitement, and danger. Red is considered the most active of these three. Blue, green, and violet are considered to be *cool* colors and are associated with nature and passiveness.

Color wheel

A ***color wheel*** is a visual tool that illustrates the basics of color. It is an arrangement of colors that provides a means of identifying colors in a consistent manner. See Figure 5-12.

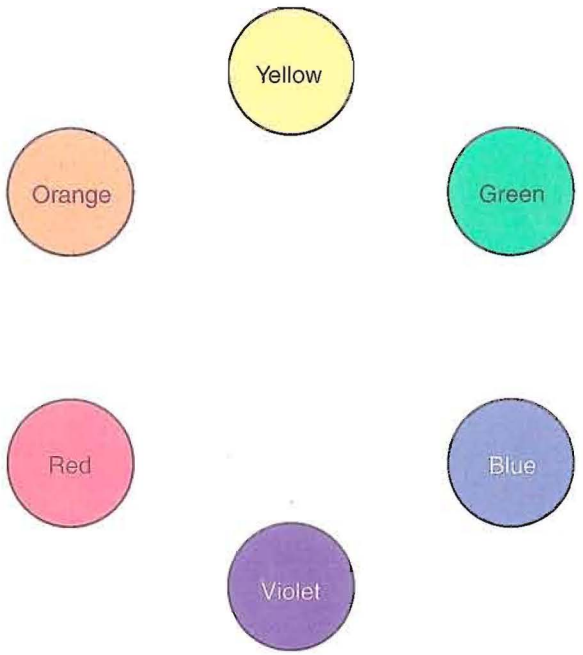


Figure 5-12. A color wheel is an arrangement of colors based on three primary colors, red, yellow, and blue.

The wheel is based on three ***primary colors***, from which all other colors can be made. The primary colors are red, yellow, and blue. Mixing any two will produce a secondary color. The secondary colors are green, orange, and violet.

Two systems of color formation, additive and subtractive, use different primary colors. The *additive* primaries are red, green, and blue. The *subtractive* primaries are cyan, magenta, and yellow. Color formation is covered in detail in Chapter 8.

The colors that are positioned across from each other on the color wheel are known as *complementary colors*. Red and green, orange and blue, and yellow and violet are complementary colors. See Figure 5-13.

Different shades and tints of a color, known as *values*, may be obtained by adding white or black to a color. A color can also take on a different intensity when it is mixed with its complement. For example, when green is mixed with red, it will probably produce a *brown*. Striking color effects may be

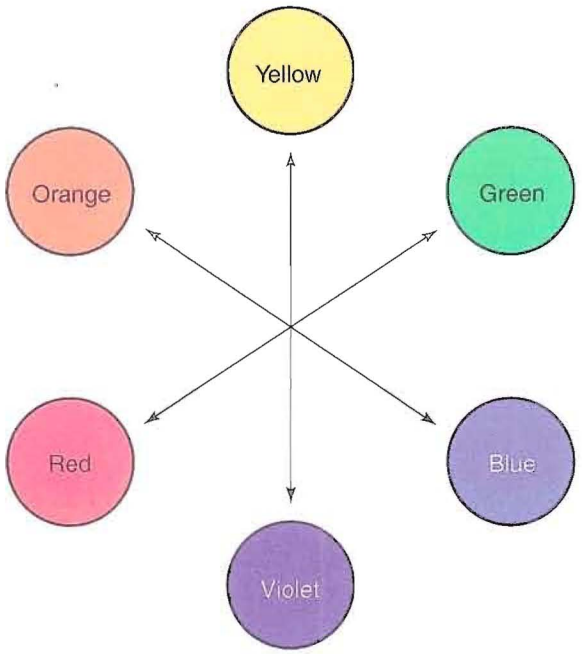


Figure 5-13. Complementary colors are the colors that are positioned across from each other on a color wheel.

produced not only by mixing colors, but also by arranging colors in a layout so they have a direct effect on each other. Chapter 8 includes a detailed description of color theory and how it relates to graphic communication.

Principles of Design

In the process of designing a printed product, many different ideas are generated through the use of design elements. To ensure the images have a pleasing relationship, design principles must be applied to sort out or select the right ideas.

The basic ***principles of design*** are *balance, contrast, unity, rhythm,* and *proportion*. These principles are used by the design artist to create an image that is both visually pleasing and functional.

Balance

Balance describes the even distribution of images to create a pleasing visual effect. Balance has one of the most important psychological influences on human perception. Consciously and unconsciously, people have a basic need for balance.

This principle can be illustrated by the placement of letters on a scale, as shown in Figure 5-14.

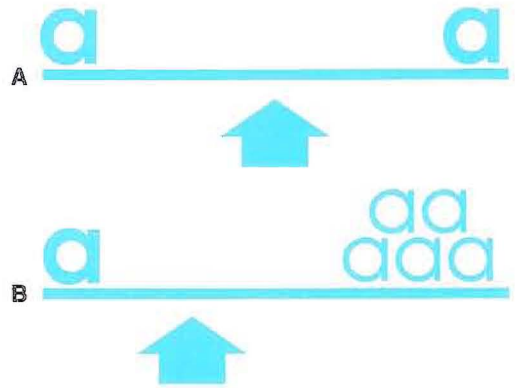


Figure 5-14. Balance in an image is produced through an equal positioning of elements. A—Letters placed symmetrically to achieve formal balance. B—Letters placed in uneven quantities to represent informal balance.

Visually, a judgment can be made by the value of each image. The type of balance in Figure 5-14A is symmetrical and is called formal. The type of balance in Figure 5-14B is asymmetrical and is called informal.

Formal balance is achieved when all of the elements on a page are of equal weight and are positioned symmetrically. ***Informal balance*** may be achieved by changing the value, size, or location of elements on a page. The use of various colors and color intensities can also create informal balance. For example, two squares of equal size but different color values (such as pink and dark red) will appear to be *unequal* in size when placed side by side.

Balance is a guiding principle of design. The layout should be considered as a whole when positioning the elements. See Figure 5-15.

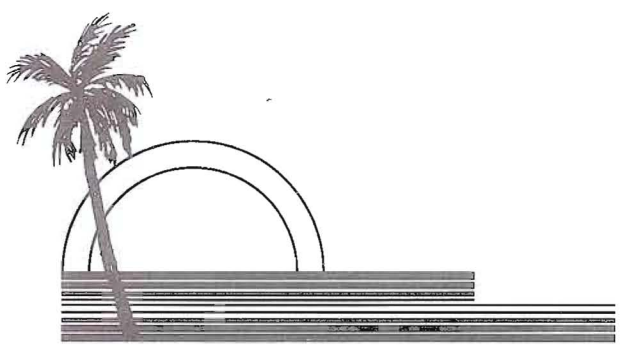


Figure 5-15. Balance in a design can vary depending on the desired visual effect. An unbalanced layout can be used to attract attention or imply leisure.

Contrast

Contrast is the variation of elements in a printed product. When used, contrast gives meaning to a design. Lines drawn thick might have little meaning by themselves. Adding thin lines, however, can enhance the design and eliminate monotony. See Figure 5-16.

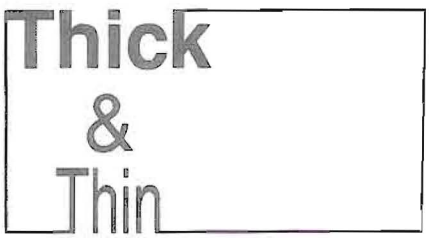


Figure 5-16. A variation of mass or other elements adds contrast and attracts attention to an area of an image.

Styles of type can be contrasted to produce greater legibility and design variation. Some useful contrasts are round and straight, ornate and plain, and broad and narrow. An example of contrast is shown in Figure 5-17. A tall tree looks much taller if it is standing on a flat plane.

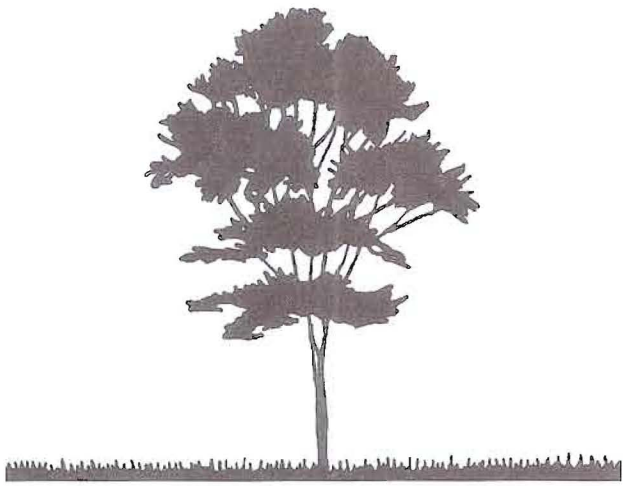


Figure 5-17. Using contrast emphasizes one element in relation to another. A tree appears taller when it is placed on a flat plane.

The relationship between an unprinted area and a printed area of an image can also be enhanced through the use of contrast. White space, when used effectively, creates contrast in an image. See Figure 5-18.

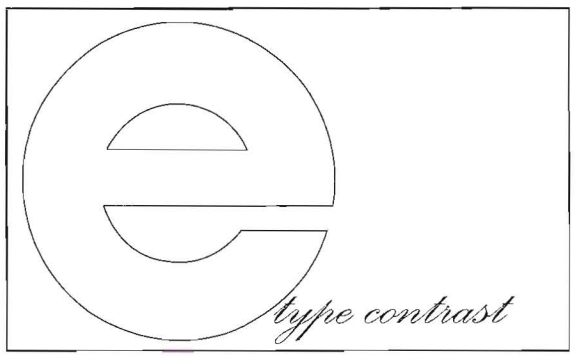


Figure 5-18. The use of white space creates contrast between the printed and unprinted areas of an image.

Care must be taken when combining contrasting elements so that the uniform effect of the total design remains unaffected. A page of many contrasting designs might create confusion. See Figure 5-19.

Figure 5-19. Too much contrast between elements can cause confusion.

Balance must be maintained to ensure that one primary element dominates the layout. This principle can be used to draw attention and keep the reader's attention from jumping from one element to another.

Unity

Unity is the proper balance of all elements in an image so that a pleasing whole results and the image is viewed as one piece. Every element must be in proper position to create a harmonious image. A design can be moved and manipulated to create an interesting and functional combination of elements.

Choosing type styles is also important to achieving unity. See Figure 5-20. A unified design is the result of viewing the layout as a whole and not as separate elements. This principle is also called *harmony*. See Figure 5-21.

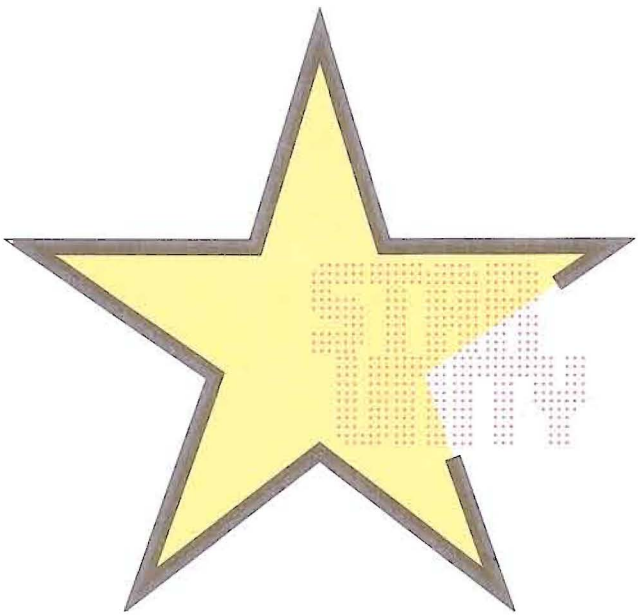


Figure 5-20. A type style that corresponds visually to the subject reflects unity in the design. Small dots forming the type represent stars in the sky.

Figure 5-21. Unity results when all of the elements in an image are arranged as a whole.

Rhythm

The movement of a reader's eye is often determined by the shapes used in the image. The square reflects horizontal and vertical movement. The triangle reflects diagonal movement, and the circle reflects a curve.

Rhythm in a design results when the elements have been properly used to create visual movement and direction. See Figure 5-22. Rhythm can also be achieved through the use of a pattern or repetition. Patterns can be used in contrast with an element to create an effective design. See Figure 5-23.

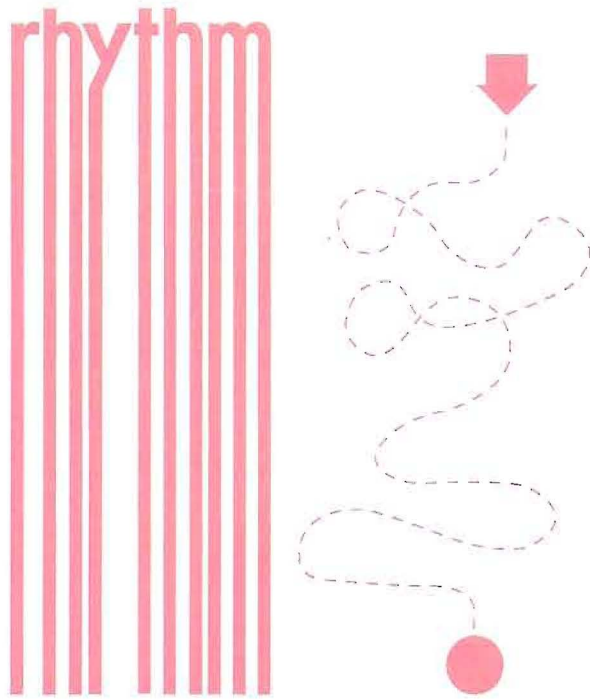


Figure 5-22. Images that imply movement or direction give rhythm to a design.

Proportion

Proportion is the relationship between elements in an image. The use of proportion helps to achieve balance and unity in a layout. All elements should be in proportion to each other. See Figure 5-24.

When using different type styles, it is important that they are in proportion to the other elements on the page. See Figure 5-25. Using proportion is a means of developing an aesthetically pleasing relationship between each of the elements in the layout.

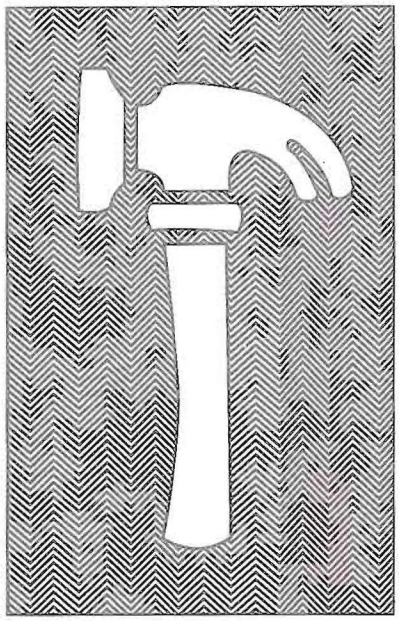


Figure 5-23. A balanced pattern of lines provides rhythm by contrasting with the rest of the image.

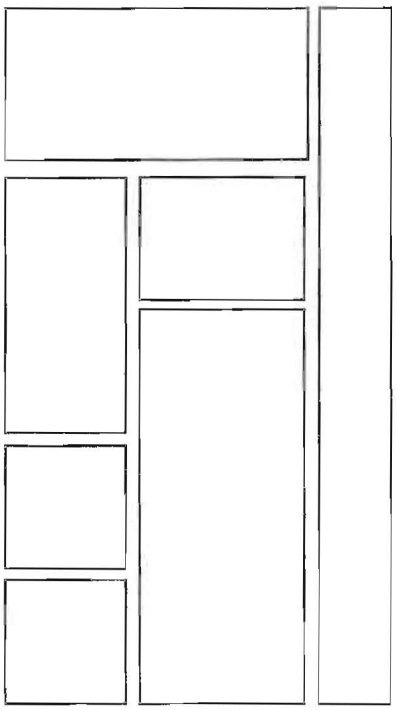


Figure 5-24. Elements arranged in proportion to each other produce a unified design.

A basic knowledge of design elements and principles is key to understanding the guidelines used in layout. The finished layout or *mechanical* must exhibit sound principles of design. The process of preparing a layout sheet is often performed by the same artist responsible for the design.

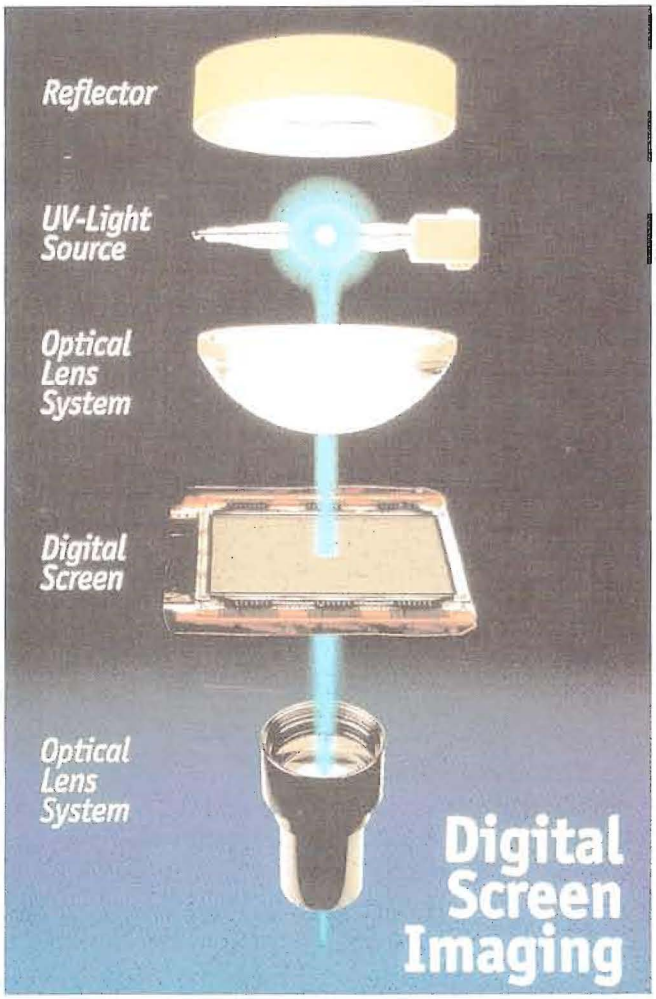


Figure 5-25. The size of type used in a design should be in proportion to the other elements.

Layout Elements

Layout is the arrangement of printing elements on a layout sheet. The paste-up version of the base sheet, or mechanical, is made up of the elements ready for reproduction. Planning a layout involves choosing elements that best represent the design. The ***elements of layout*** are *body type, display type, illustrations,* and *white space.*

The arrangement of elements in a layout must be pleasing to the eye and easy to read. The layout artist or designer is responsible for assembling the elements to make a composition. The layout artist plays a very important role in planning each job.

If the same elements were given to several artists, it is very probable that different layouts would be submitted. If each layout applies valid principles of design, it might be impossible to say one is better than another. Layouts may be judged differently by different people.

The major objective of the layout is that the printed material must be clearly seen and read. The layout artist must consider each element independently and determine how each one relates to the complete product.

Body type

Body type is the printed type that makes up the text in a layout. Body type must be chosen to reflect the intent of the message. The text must be clearly legible and must relate to the topic. Typically, a topic aimed at a contemporary audience would use a modern typeface. See **Figure 5-26**. The placement of type requires proper spacing or *air*. White space can be just as important as the type itself.

Usually, the body type itself is not the focal point of the layout. The text will contain a message that expands upon the other elements. All of the elements, including type, are positioned in a logical progression of importance to meet the layout objectives. Some layout elements will be primary, while others become secondary, according to the objectives of the layout.

Figure 5-26. Selecting a proper typeface and type size for the layout is an important part of the design process.

Display type

Display type is the type that conveys the main message of the layout. It is intended to draw attention. Newspaper and magazine headlines are typical examples of display type. See **Figure 5-27**. The display line is key to the success of a message. If the display type creates interest, the reader will proceed to the body.

Figure 5-27. Headlines are a form of display type. They should draw attention and create interest in the image.

The display line in an advertisement leads the reader to other information. After reading the display material, the person must be satisfied or directed to continue reading the text.

The style of display type is very important because it must correspond to the visual message. Some type styles can be very dramatic, as illustrated in **Figure 5-28**. In such cases, the topic and type style must be compatible. Fine-line display type, for example, is usually not appropriate when used with heavy mass images.

Some type styles are directional and lead the eye of the reader. Sometimes, the layout designer organizes the display line for an ad using hand-lettered display type.

The entire layout must be looked at when choosing a display typeface. The display line must be distinctive and appropriate. To properly select a typeface, the job objective must be fully understood by the layout artist.

Figure 5-28. The style of display type used should reflect the message of the printed piece.

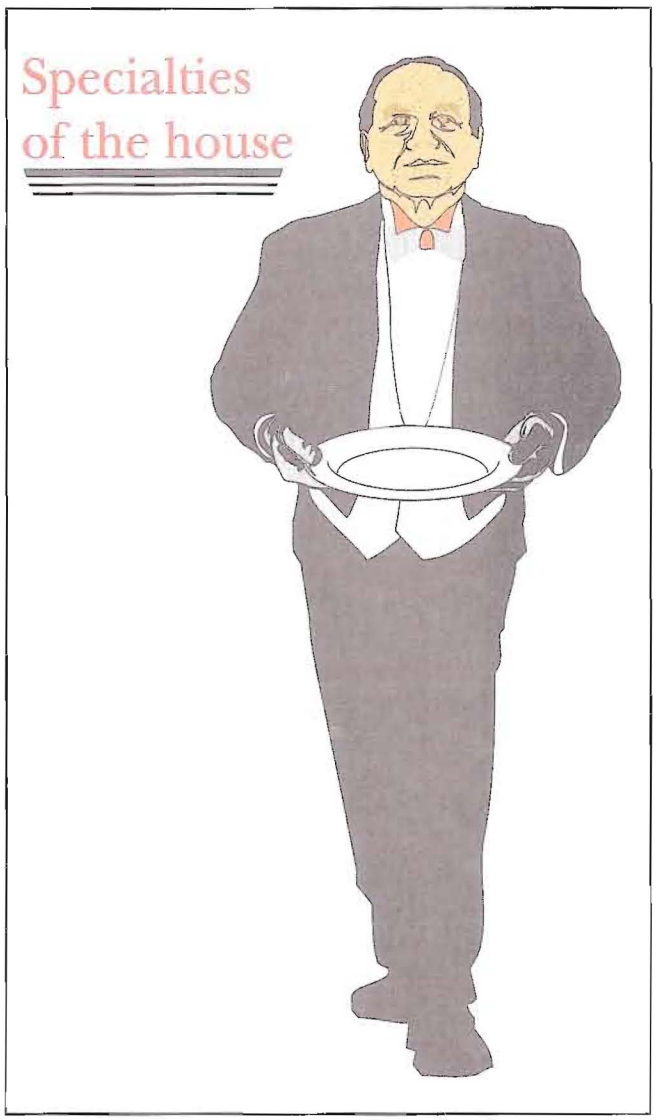


Figure 5-29. A meaningful illustration can be used to convey a strong message.

Illustrations

The *illustrations* in a layout include the ornamentation, photographs, and artwork, such as line art. Illustrations are common in most printed materials. For example, display ads typically include illustrations of the product.

The message provided by an illustration can be very revealing. See Figure 5-29. The old saying, "A picture is worth a thousand words," applies to many printed materials. Pictorial images are a very strong way of conveying a message. In some cases, an illustration may convey the message by itself. See Figure 5-30. Illustrations add another dimension to the layout; they can increase understanding of the product, as well as interest in the product.

White space

White space includes areas of the layout that are void of printed images. Filling up the entire design space will usually not produce good results. The utilization of white space or air can add to the visual quality of a layout.

The distance between elements can be very valuable when white space is used according to sound design principles. It provides a brief period for absorbing the printed matter.

If used excessively, white space can be disorienting. When ideas are too greatly separated, flow and meaning can be lost. White space is very important and must be used properly to create flow, unity, and organization for the reader.

Figure 5-30. Illustrations used in road signs can deliver a message with a minimum use of words.

Developing a Layout

There are a number of factors to consider in developing a layout. Five areas that must be addressed by the layout artist are the *objective* of the project, the *message* the product will send, the *style and format* to be used, the *layout* requirements for production, and *printing* requirements. Each factor contributes to making decisions that will influence production of the final product.

Layout objective

The layout objective is a statement that describes the intent or purpose of an identifiable end product. The objective outlines the goal of the layout artist. For example, an objective might state that the final printed piece should inform the reader, through text and illustrated material, how a piece of equipment will help in a specific production situation.

The objective describes what the information on the printed page is intended to do. Knowing the purpose helps the layout artist determine which text and illustrations will be best for the job.

Conveying a message

The message or visual effect delivered by a printed image helps determine how the layout will be planned. Identifying the audience gives direction to the layout artist. For example, one ad might be designed for young people, while another might be aimed at the elderly. The design of each ad should be unique and must reflect the intent of the printed piece.

Design of the end product also determines the tone or *mood* of the message. If a lighthearted or humorous mood is intended, a dramatic photograph might not achieve the desired effect. All of the elements should reflect the message of the end product.

Style and format

Style includes the text type, display type, and illustrations of the design. Some printed pieces will require a set style, while others do not. For instance, the style used in this textbook is quite different from the styles used in advertisements. The designer must choose the elements that will work best.

Deciding how to organize the ***format*** of the printed piece is of primary importance. Will a single sheet carry the message, or will a booklet do a better job? The format will also be determined by its intended use. For example, if the printed piece is to be posted, it should not be printed on both sides.

Layout requirements

The different methods of layout and the schedule to complete the job must be considered in planning a layout. A layout may need to be developed as a sketch, a rough, or a comprehensive. It may be necessary to perform all three.

A *sketch* is an idea in pictorial form with little detail. Sketches are often helpful because they provide a picture indicating possible placement of the elements. A *rough* is more illustrative of the final product; it provides the style of the type as well as the position of the elements. A *comprehensive* is the third and final method of layout. It is the presentation of what the finished product will indeed look like. When planning a layout, the artist should decide which methods will be necessary to reach the final product in a timely manner.

An estimate of the time it will take to complete the job is essential from a planning standpoint. Most printed pieces are produced to meet a deadline and must be delivered by a specified date. The planner must decide whether the job can be completed in the time allowed.

Printing requirements

The printing process that follows production has a strong influence on how a layout is developed. The size of the product, the quantity to be printed, paper requirements, color use, and operations following the printing must all be considered.

The finished dimension of a printed piece must be determined before beginning layout. The finished size will have a bearing on every production step. One important concern is the size of the press required to run the job. The finished size also determines the size of the paper to be used in printing.

The number of pages to be printed and the number of copies required are also factors to consider because they will help determine the printing requirements. Deciding the most economical way of printing the job is essential. The designer or editor must estimate the approximate number of pages to be printed so that final plans for printing can be made.

Printing requirements include the kind of stock or paper to be used. The necessary stock must be available at the designated time for printing. A custom stock may need to be ordered and may require additional time. Other considerations in ordering stock are the size of the order, paper weight (thickness), and opacity.

Multicolor printing is another factor to consider when planning a layout. Different jobs require different uses of color. Printing a one-color or black and white job requires different layout methods than a two-color, or four-color job. The layout artist must decide whether to use color when planning the layout.

Once the job is printed, further finishing operations might be required, such as trimming the job to the final size. Other finishing operations may include folding, scoring, creasing, varnishing, and binding. Knowing the operations that will be required after printing is important in planning the job.

Layout Methods

Choosing the right method to develop a layout can be very difficult and requires careful planning and thinking by the layout artist. The design methods used in layout are thumbnail sketches, the rough layout, and the comprehensive layout. Much of the decision depends on the factors that have already been discussed. The size of the job, the objective, and use of color are all important considerations. The layout artist must have a vision of how to arrive at the final product.

The layout can make or break the appearance of the final product. Many times, a number of layout ideas are discarded before one is chosen. Each method must be carefully analyzed to produce a strong, functional layout.

Thumbnail sketches

Thumbnail sketches are simple, rapidly drawn designs for a layout. See Figure 5-31. Different approaches can be taken in drawing sketches. Sketching is a means of testing the visual appeal of a printed piece.

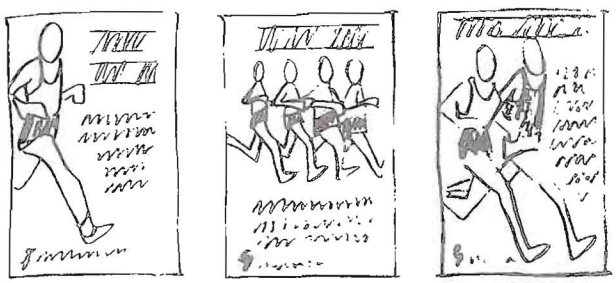


Figure 5-31. Sketches showing the general relationship of elements provide a basis for the design.

The size of a *thumbnail* is not important. The sketch is generally smaller than the size of the printed product. The first sketch might not be the design selected, but each one will help the artist visualize the end product.

A soft pencil or felt tip pen is typically used to draw thumbnail sketches. Even though the size is not important, the general proportion is required to indicate image relationships. The purpose of the sketch is to evaluate the weight of each element. The sketch shows the basic shape and tone of the total piece.

Rough layout

A *rough layout* is a redrawn version of a thumbnail sketch, Figure 5-32. Once a specific thumbnail has been selected, refinement is necessary. The elements in a rough layout or *dummy* offer a truer visual meaning. In many cases, the dummy must be checked and approved by the designer, client, and sometimes the printer.

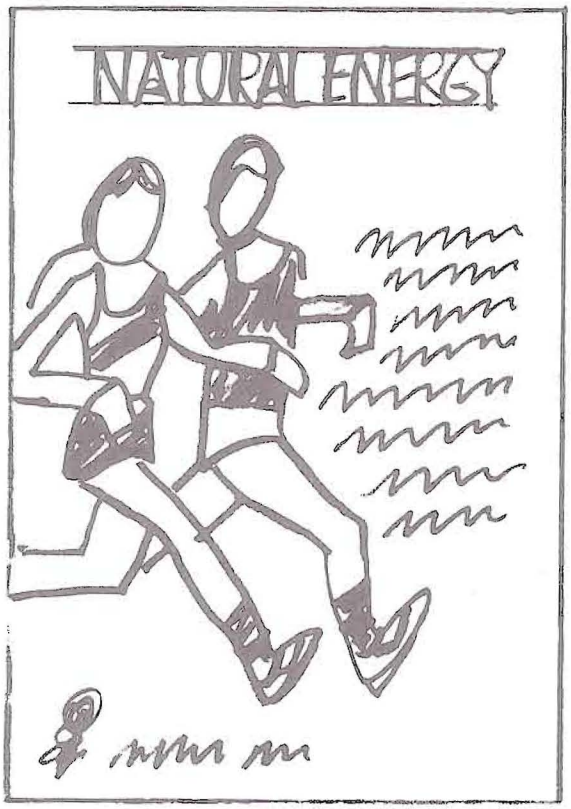


Figure 5-32. A rough layout is a sketched version of the final product.

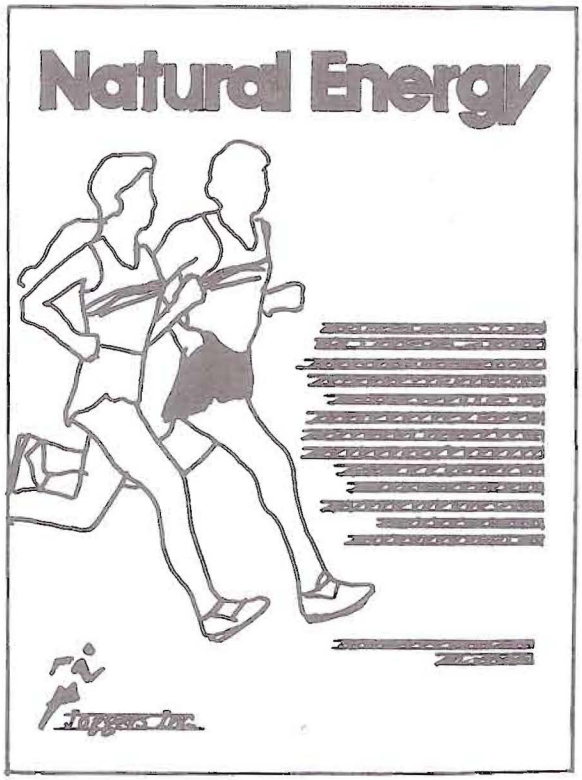


Figure 5-33. A refined layout is sometimes made before doing a comprehensive layout.

The display lines and illustrations of a rough are very similar to the elements of the final product. The text material is located in a greeked (illegible) block or whatever form it will take in the finished product. The rough has a closer resemblance to the intended printed piece than the thumbnail sketches.

Sometimes, a refined layout may be made, Figure 5-33. Since the refined layout is closer to the final layout, it can be used as the final layout when time is a major factor. Special notations for type size, type style, or color can be made on a tissue overlay or on the layout.

Comprehensive layout

A *comprehensive layout* shows how the printed piece will look when finished. The layout artist is making a close version of the finished product; therefore, exact detail is essential. See Figure 5-34.

The body type is usually ruled in and the display type is drawn as it will appear in the finished piece. Any art sketched previously now has a photograph or accurate line art in its place. Special effects become a part of the comprehensive layout, and colors can also be added.

Instructions, specifications, and notations are not placed directly on the comprehensive. A common practice is to attach an overlay sheet with tape at the top of the base sheet. The overlay sheet is usually translucent tissue paper so that the comprehensive can be easily viewed along with any notations. The information is written on the tissue and serves as the specifications for the final preparation of art and copy.

The comprehensive should not be confused with the *mechanical*. The mechanical is pasted up and completed in the next step of production. The mechanical is the final stage of layout. It includes the body text and any other camera-ready images that are converted to film by a process camera or other means. See Figure 5-35.

Specifications

Specifications provide the information relating to type style, type size, line or column width, color use, page organization, and other facts pertaining to a printed product. Specifications or *specs* are the overall guidelines used in layout.

Figure 5-34. A comprehensive layout is a detailed representation of the final layout.

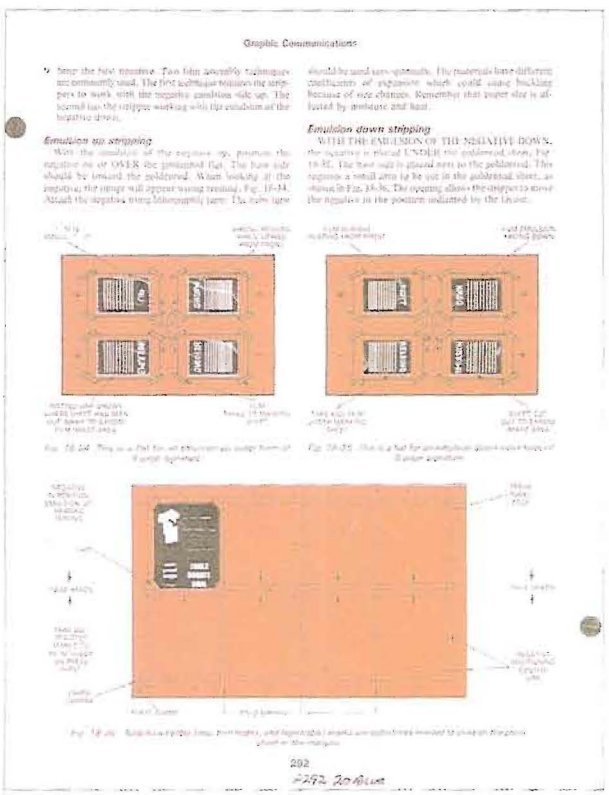


Figure 5-35. A completed mechanical ready to be photographed and converted to film.

Manuscripts are commonly marked with specifications identifying the typeface and type size to be used. The specs are used to convert the original copy on the manuscript to the text in the final layout. See Figure 5-36.

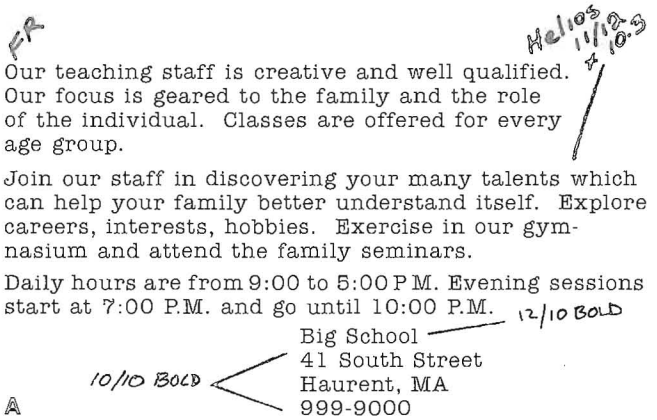


Figure 5-36. Specifications identify the styles and sizes of type to be used in a design. A—The manuscript is marked to indicate type specs. B—Text in the final layout is arranged according to the specs.

A *spec sheet*, sometimes called a *style sheet*, lists the specs used in production. See Figure 5-37. The spec sheet is created before beginning a job. It contains information on type styles and sizes, art to be used, and color usage.

Specifications for *Graphic Communications*

Trim: 8-1/2 x 10-7/8
Gutter: 5p
Bottom Margin: 5p
Thumb Margin: 4p
Top Margin: 3p to the base of the running head, 5p to the top of the first line of text
2 column format: 20p3 x 1p6 x 20p3

4-color process

Chapters are always to start a new right.

Typefaces used: Palm Springs, Helvetica (all in roman, bold, italic and/or bold italic).

Running Heads: Left hand pages, set folio flush left on left hand margin of left column. Folio sets in 10pt Helvetica Bold. On 3p indent set Book Title. Book Title sets in 10pt Helvetica. Right hand pages, set folio flush right on right hand margin of right column. Folio sets in 10pt Helvetica Bold. On 3p indent from right margin set Chapter Number and Title. Chapter number and title sets in 10pt Helvetica, flush right on indent. Allow an em space between the number and title.

Chapters: Are to start a new right. The chapter opener takes a drop folio, 10pt Helvetica Bold, prints black, flush left on the outside margin, 2p below the normal text bed.

Chapter Opening Graphic: Falls in the first column, and is made up of squares. Large black square is 10p3, and sets flush left on first column. Three large squares are each 3p, second set of squares is 1p6, and smallest set of squares is 1p3. There should be 3pt space between the various squares, follow the sample pages for general layout of graphic. The large squares should be 100% Cyan; 100% Magenta; and 100% Yellow. Secondary squares should be 100% Cyan, 100% Yellow; 100% Yellow, 50% Magenta; 50% Magenta, 50% Cyan. Tertiary squares should be 50% Yellow, 100% Cyan; 100% Yellow, 50% Cyan; 20% Magenta, 100% Yellow; 80% Magenta, 100% Yellow.

Chapter number: 190pt Arabic number, Helvetica Bold, 30% Black Screen, 2 digit numbers track -20, do not use the word chapter. Set so its top aligns with the top of nominal text bed, flush right. Underprints chapter title.

Chapter title: 30/30 Helvetica, Track -5, build down from top line, flush left, ragged right, in second column, with ascender of first line aligning with the top of the nominal text bed.

Objectives: Heading sets Helvetica Bold, 14/auto, Clc, flrr x 20p3, 6p below the bottom of the chapter graphic to the ascender of the heading. 0p3 after. Opening state-

Figure 5-37. A spec sheet lists type styles and sizes, along with information on art, the use of color, page margins, and other specific information needed to produce the printed piece.

Specifications are also used in printing, binding, and finishing. A printing spec sheet may list information on the type of paper to be used, color specifications, and other requirements. See Figure 5-38.

Copyfitting

Copyfitting is the process of fitting together copy and illustrations in a specific amount of space. It can be done by altering type size, leading, line

PRINTING SPECIFICATIONS

Company ______ Contact ______
Address ______
Phone ______ Fax ______
Project Title ______
Description ______

☐ Early budget ☐ Late budget ☐ Based on specs ☐ Based on art
Date ______
Date prices required ______
Release date ______
Delivery date ______
Quantities ______

Page count	☐ Plus cover, no. pages ___ ☐ Self cover	Proofs: No: ☐ Blueline ___ ☐ Colorkey ___ ☐ Matchprint ___ ☐ Other ___ ☐ Press check
Flat size	Finished size	

☐ Overs up to ___%
☐ Unders up to ___%
☐ No overs/unders

☐ New project
☐ Exact reprint
☐ Reprint w/changes

Paper

Form	# of Pages	Color	Basis Weight	Specify Cover or Book Weight	Name or Grade	Finish
Single Sheet						
Cover						
Fly						
Text 1						
Text 2						

Preparation

Electronic Prepress Output
Type of output ______
Software used and version no. ______
Fonts: ______
Disk Format ☐ Single pages ☐ Readers spreads ☐ Printers spreads

Customer Furnish
☐ Complete camera ready art
☐ Windows on art for images
☐ Flapped for colors and screens
☐ Key lined for color break
☐ Masks furnished for outlines
☐ Composite negs. in ___ pg spreads

Maps charts: No. ___ Size ___ (×3)
Half-tones: No. ___ Size ______ Outline ___ (×3)
Screens: No. ___ Size ___ (×3)
Line strip-ins: No. ___ Size ___ (×3)
Duo-tones: No. ___ Size ______ Outline ___ (×3)
Reverses: No. ___ Size ___ (×3)

Color Seps

No.	Original size		Finished size	Trans.	Refl	Scan	Cam.	Outline	Crossover	Scan to file	Lo/Hi res.
No. ___	___ x ___	To	___ x ___	☐	☐	☐	☐	☐	☐	☐	☐
No. ___	___ x ___	To	___ x ___	☐	☐	☐	☐	☐	☐	☐	☐
No. ___	___ x ___	To	___ x ___	☐	☐	☐	☐	☐	☐	☐	☐
No. ___	___ x ___	To	___ x ___	☐	☐	☐	☐	☐	☐	☐	☐
No. ___	___ x ___	To	___ x ___	☐	☐	☐	☐	☐	☐	☐	☐

Press

Cover ___ ___ out ___ in ___ % Coverage ___	Fly ___ Side 1 ___ Side 2 ___ % Coverage ___	Text 1 ___ Side 1 ___ Side 2 ___ % Coverage ___	Text 1 ___ Side 1 ___ Side 2 ___ % Coverage ___
Varnish ☐dry ☐wet ☐spot ☐overall	Varnish ☐dry ☐wet ☐spot ☐overall	Varnish ☐dry ☐wet ☐spot ☐overall	Varnish ☐dry ☐wet ☐spot ☐overall
Solids ☐yes ☐no	Solids ☐yes ☐no	Solids ☐yes ☐no	Solids ☐yes ☐no
Bleeds ☐yes ☐no	Bleeds ☐yes ☐no	Bleeds ☐yes ☐no	Bleeds ☐yes ☐no
Coating ☐ aqueous	Coating ☐ aqueous	Coating ☐ aqueous	Coating ☐ aqueous
Coating ☐ UV ☐ spot ☐ overall	Coating ☐ UV ☐ spot ☐ overall	Coating ☐ UV ☐ spot ☐ overall	Coating ☐ UV ☐ spot ☐ overall

Bindery

☐ Soft fold Fold to ___ x ___ No. of folds ___ ☐ Letter fold ☐ Accordion ☐ Round corner ☐ Remoistenable gum
☐ Saddle stitch ☐ Double saddle ☐ Side stitch & tape ☐ Perfect bind ☐ Case bind ☐ Spiral ☐ Wire-O ☐ GBC
☐ Perforate ______ ☐ Die Cut ______ ☐ Collate ______
☐ Drill ______ ☐ Emboss/size ______ ☐ Shrink wrap ______
☐ Score ______ ☐ Deboss/size ______ ☐ Mail ☐ Label ☐ Ink jet
☐ Glue pockets/size ______ No. ___ ☐ Foil stamp/size ______ ☐ Cust. supplies: ______
☐ Pockets no glue/size ______ No. ___ ☐ Trim only ___ x ___ ☐ Other ______

Shipping

Special packing ______
(Bulk pack in cartons unless otherwise specified.)
No. of samples required ______ Delivery date ______
F.O.B. point ______ No. of local deliveries ______

Pricing

Vendor ______ Contact ______ Phone ______
Quantity ______ Estimated price ______

Figure 5-38. A printing spec sheet provides the guidelines used in printing a finished product.

length, or letter spacing. The layout planner or artist is heavily involved in copyfitting during various stages of production. If the amount of copy is greater than the space allocated, the total design is affected.

Copyfitting also involves estimating the amount of space needed for a certain amount of text. The amount of space needed must be known by the layout artist to design a comprehensive layout.

In desktop publishing, copyfitting is commonly completed for layout on a computer screen. See Figure 5-39. A desktop publishing system can be used to copyfit text and illustrations, move copy, draw line art, and finalize layout.

Figure 5-39. Copyfitting for layout is commonly performed electronically using a desktop publishing system.

There are also manual counting techniques used in copyfitting. The most common method is counting the total number of characters in a body of text.

To determine the number of characters in the text, a vertical line is drawn through the printed copy at the end of the shortest line in the copy. See Figure 5-40. The number of characters in a single line to the left of the vertical line is then counted. Characters include all letters, spaces, and punctuation. The number of characters in one line is then multiplied by the number of full lines. If there is a partial line, the number of characters it contains is counted and added to the total from the preceding step. This total represents the number of characters to the left of the vertical line. Next, the number of characters to the right of the vertical line is counted. The total number of characters from all lines on the right side is then added to the total number of characters on the left side. As shown in Figure 5-40, the number of characters in this example is 290.

Once the number of characters in the text is determined, a type style and size is selected for the text. The line length and character size for the text, in picas, must then be determined. Typeface tables or catalogs showing different sizes of type and the number of characters per pica are commonly used. See Figure 5-41.

Suppose that you wish to set type in a 10-point sans serif typeface with a line width of 18 picas, and there are 310 total characters in the text. The following steps are used to determine the space required for the text:

1. Referring to Figure 5-41, find the number of characters in 10-point type that will fill one pica of space. Multiply that figure (2.9) by the line length to find the number of characters in an 18-pica line:

   $2.9 \times 18 = 52.2$ characters per line

2. Find the number of typeset lines by dividing the total number of characters in the text by the number of characters per line (rounded to the nearest whole number):

   $310 \div 52 = 5.96$ or 6 lines

3. To find the total depth of the text, multiply the point size by the number of typeset lines:

   $10 \times 6 = 60$ points

4. Convert the measure from points to picas. One pica is equal to 12 points.

   $60 \div 12 = 5$ picas

The text will measure 5 picas deep and 18 picas wide. This example was for type that is set solid. If leading is added, the amount of leading space in points must be added to the type size. If the type were set as 10 points with 2 points of leading (10/12), the calculation would be as follows:

10-point type + 2-point leading = 12 points

12 points × 6 lines = 72 points

72 ÷ 12 = 6 picas

The depth of the text, with leading added, would be 6 picas. The text would measure 6 picas deep and 18 picas wide.

Processing Illustrations

Photographs and pieces of line art used in layout are commonly edited or sized for reproduction

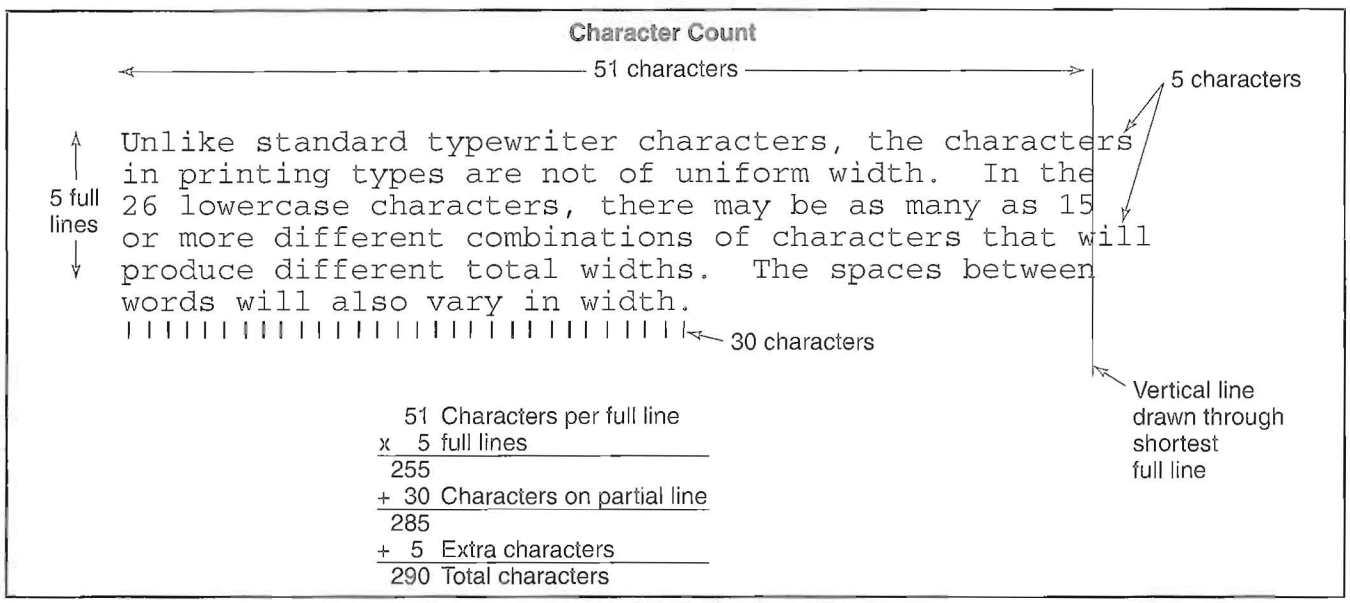


Figure 5-40. The number of characters in a block of text can be determined by drawing a vertical line through the shortest line of copy and counting characters on both sides of the line.

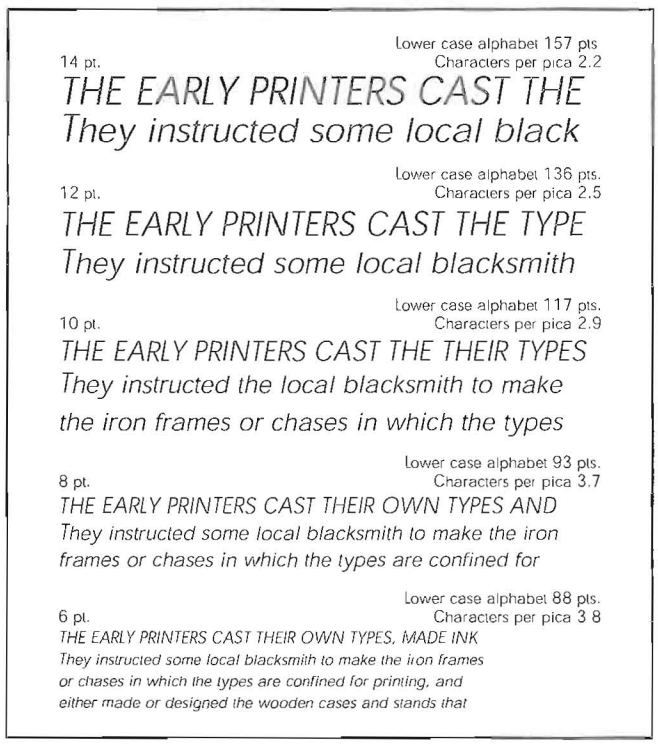


Figure 5-41. A list of typefaces showing the number of characters per pica for different type sizes. Characters per pica will differ from one typeface to another as well.

by the layout artist. The principles used in design and layout must be followed when processing illustrations. The layout artist must make sure that the illustrations are sized properly, and that they have the right contrast, unity, and proportion.

Photo cropping

The complete image of a photograph often cannot be used because some portion of the print is not needed. In many cases, the composition of the photo must be edited or cropped.

Photo cropping is a method of indicating what portion of the print is to be used or reproduced. A cropped photo separates the desired image from the unwanted areas. Crop marks border the area to be used. Marks are placed in the white margin of the print with a grease pencil or a similar marker that will not damage the photograph. See Figure 5-42.

Crop marks set the photograph dimensions. Two sets of marks can be used along the top and bottom of the image to establish width. Pairs of marks on each side of the image indicate depth or height. The final image will only use the portion of the photograph that lies within the crop marks.

Photo sizing

In graphic production, it is often necessary to use photographs at sizes other than the original. Many times, the photo must be enlarged or reduced by a certain percentage to fit the space. For example, if a photo measures 6" × 6" and the design space is only 3" × 3", the photo would have to be reduced to half its original size or by 50 percent. A 35 mm slide might have to be enlarged to twice its original size (200 percent) or more to provide a printed image of the required size.

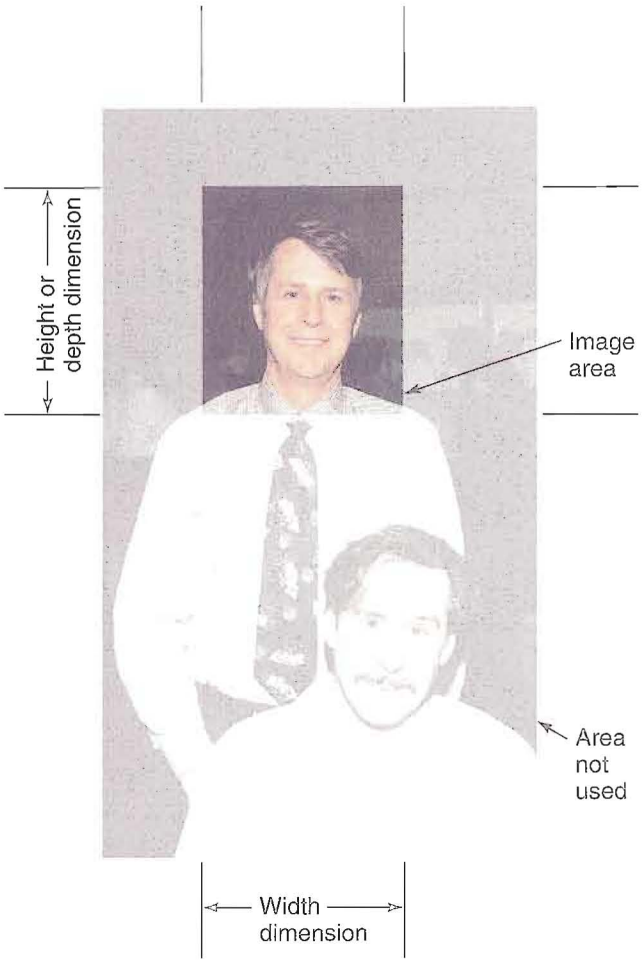


Figure 5-42. Crop marks drawn along the border of a photograph show the area of the image to be used.

A ***proportional scale*** or "proportion wheel" is commonly used to size illustrations for enlargement or reduction. See Figure 5-43. The scale can be used to determine the correct reproduction percentage by comparing the original size of the photo with the reproduction size. The numbers along the inner portion of the scale represent the original size, and the numbers along the outer portion represent the reproduction size. When the scale is rotated to match the two sizes, the resulting percentage of enlargement or reduction is indicated by an arrow pointing to a windowed scale located on the inner portion of the proportion wheel.

When sizing a photo, it is important to remember that the image will retain the same shape and proportion. For example, a rectangle will reproduce as a smaller or larger rectangle. The dimensions change, but the proportion remains the same.

Figure 5-43. A sampling of proportional scales used to determine reproduction sizes for photographs or for other illustrations.

Precise reproduction percentages and often, cropping are necessary to produce the required results and fit the design space. Sometimes, it might be necessary to use a different photograph or illustration to meet the specifications of the job.

Photo layout

Photographs are not pasted down along with the other elements on a mechanical. Usually, a space for the photo is outlined on the layout with a thin black line (called a *keyline*). A block of opaque material the exact size of the photo is sometimes used, instead of a keyline. A figure number is assigned to the space and the photo. The number indicates where to place the screened halftone of the photo when making the mechanical. See Figure 5-44.

Photo markup

Photo markup involves writing directions or specifications for the visual images used in layout. A marked-up photo is shown in Figure 5-45. Markings should be carefully placed on the border or outside the image area of photos. Crop marks should appear in the margin or in an area that will not be reproduced.

Photographs must be handled very carefully when they are used in layout. The surface of the image can scratch very easily; never write on an overlay that is placed on top of a photo. The pressure from a pen or pencil can indent the surface. Damage to a photo can leave an unwanted mark or reflection during reproduction or screening.

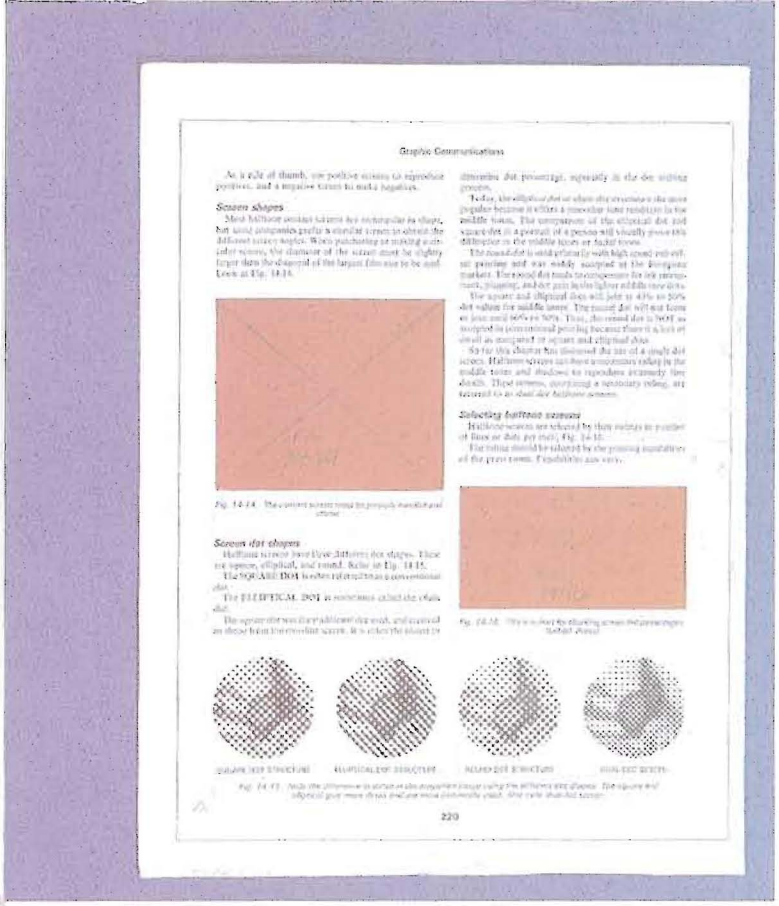


Figure 5-44. Spaces are reserved as holes to indicate where photos are to be placed for a mechanical.

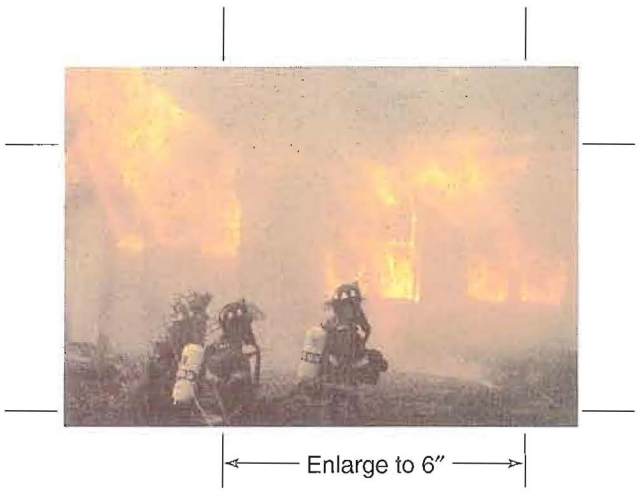


Figure 5-45. A photo marked up with crop marks indicates the size for reduction or enlargement.

Line art

Line art is artwork that is drawn by hand or electronically and is normally pasted up at the same size on a mechanical. If necessary, the original art can be enlarged or reduced. Then, the correctly sized line art can be pasted onto the mechanical. See Figure 5-46.

Figure 5-46. Line art is drawn to the necessary size and pasted up on the mechanical.

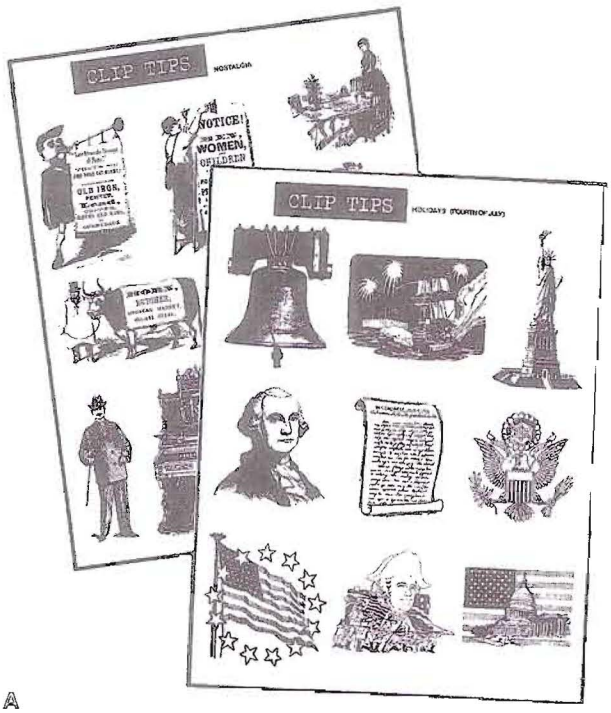
Sketches and drawings are marked in the same manner as photographs. They must be cropped, sized, and located. Information that is marked up on illustrations might include the job title and number, location in the printed piece, a figure number if applicable, the percentage for enlargement or reduction, the reproduction size, and the name of the layout artist.

When line art and *tone material* are used together, the tone material is placed on an overlay. For example, if the tone material is going to be used to place color in line art, it must be cut to the shape of the art and placed in register on the overlay.

Clip art

Clip art is preprinted artwork that is designed to be cut and pasted up on the mechanical. The artwork is normally cut from a sheet of clip art. See Figure 5-47. Today, clip art is commonly available in electronic form. It can be printed out and pasted up in the traditional manner, or added directly to an electronic page layout.

Clip art is commonly used for seasonal designs, such as Thanksgiving or Christmas newspaper ads. Pieces of clip art save the artist from having to draw Christmas trees, wreaths, turkeys, and other common images.



A

B

Figure 5-47. Clip art. A—Preprinted clip art is available in common designs and is ready to be pasted up. B—Electronic clip art is now widely used.

Clip art must have high image quality and density so that it will reproduce properly. The most common form of clip art is made up of black images on a white background. Some clip art is also available as separations for color printing. See **Figure 5-48.** Four-color clip art can be very effective if the artwork is appropriate for the layout.

Layout Materials

The two most common working surfaces used in layout and design are a ***drawing board*** and *light table.* A drawing board provides an area where the layout can be taped down for paste-up. A T-square is used to align the mechanical on the board. See **Figure 5-49.**

A light table is used in layout for the placement of translucent images, such as page negatives or color separations. Light passing through the images allows for easier alignment or registration.

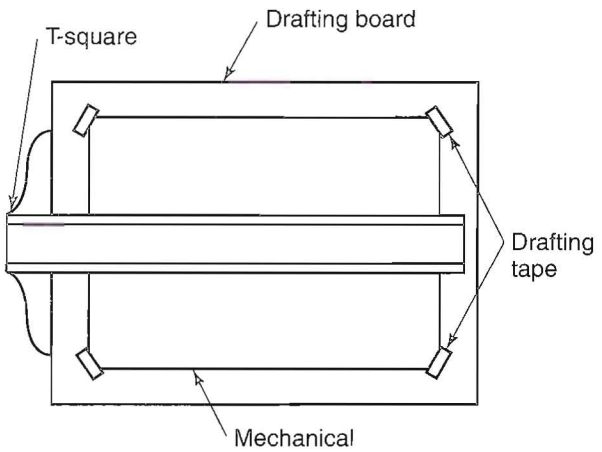


Figure 5-49. A drawing board serves as a working surface to paste up the mechanical.

Figure 5-48. Clip art used in multicolor printing. Each image is a color separation and can be used to make a plate for a primary color.

Layout base sheet

A *layout base sheet* is the paste-up surface or board used in layout. The elements making up the layout design are pasted up on the base sheet as it is developed into a mechanical.

Various kinds of base sheet stock are available. Base sheets must have a surface that can accept a variety of adhesives and ink drawings. Sizes typically depend on the size of the copyboard of the process camera used to photograph the finished mechanical.

Preprinted base sheets are often used to make mechanicals when the same type of job is done repeatedly. Artists using preprinted sheets do not align paste-up materials with a T-square. Preprinted base sheets have grids printed with nonreproducing blue lines that serve as a guide for image placement. The grid lines are often measured at intervals of one pica. See **Figure 5-50**.

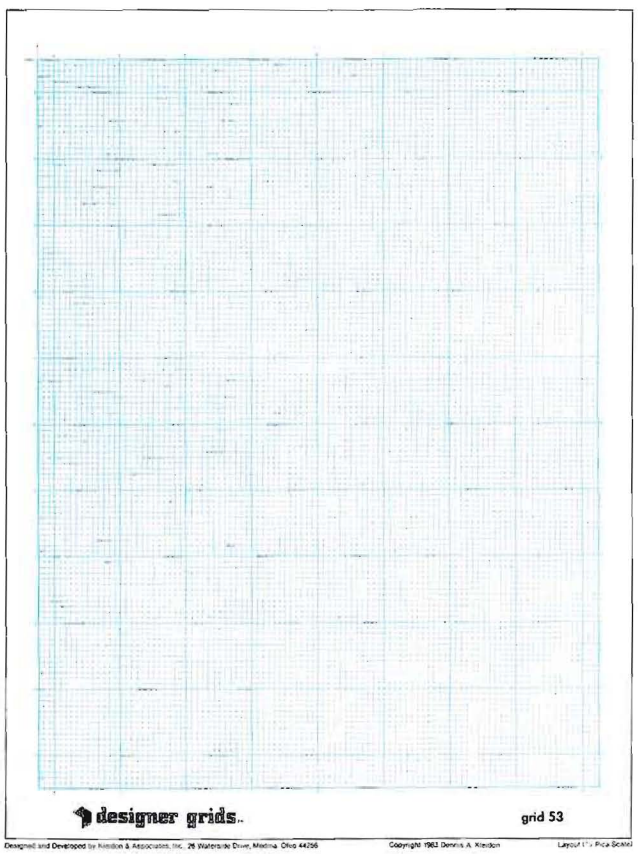


Figure 5-50. A preprinted layout base sheet often is used to make the mechanical. Grid lines serve as guides for positioning copy and art.

Thin plastic sheets are used with base sheets as *overlays* when preparing a mechanical. Overlays are usually frosted or clear plastic and are used to align images supporting color on top of the base sheet. They contain the elements that will print as color or screened color. Register marks are used to align the overlay with the mechanical. See **Figure 5-51**.

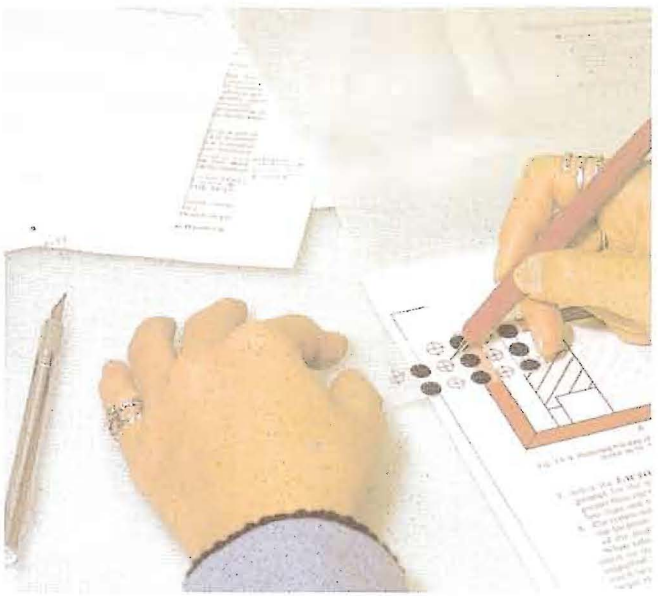


Figure 5-51. A plastic overlay sheet is used with a mechanical to align images that will print in a second color or as a percentage of black. Register marks are applied to align the parts.

Workmarks

Workmarks are lines that guide the placement of materials on a base sheet. Corner or trim marks are always placed on the sheet. Center marks are usually positioned and are essential for color work. See **Figure 5-52A**. Workmarks serve as guidelines for the paste-up artist as well as the mechanical stripper.

A nonreproducing blue pencil or pen is commonly used to draw workmarks on a layout base sheet. These lines or other marks will not appear when the page is shot.

Trim marks are usually drawn one-eighth inch in length for paste-up or to designate bleeds. Refer to **Figure 5-52B**. A *bleed* is an image that extends to the end of a printed sheet. A bleed image, when printed, appears outside the trim area of the sheet and is cut away when the sheet is trimmed to the final size.

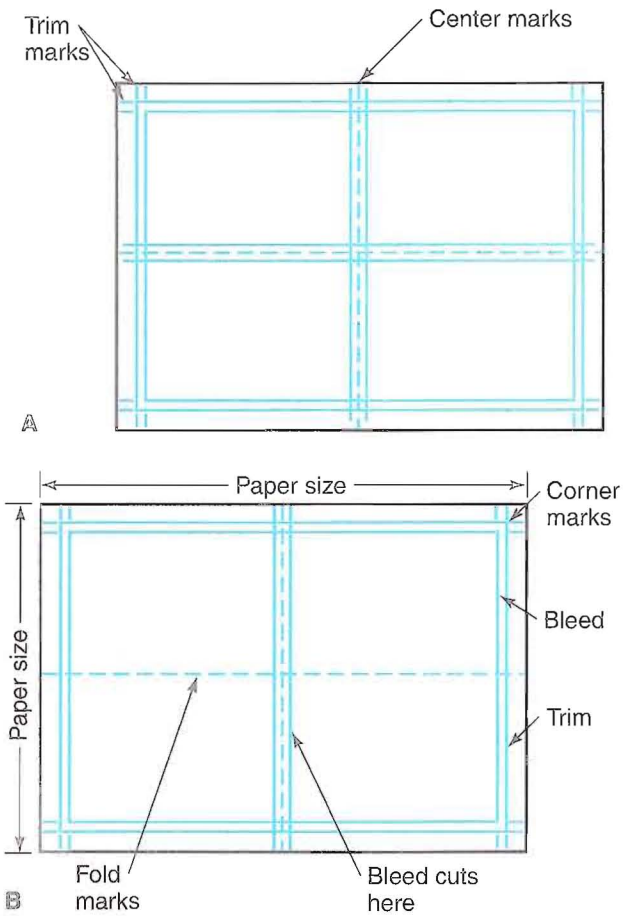


Figure 5-52. Workmarks. A—Layout sheets are commonly printed with trim and center marks to serve as guidelines when preparing the mechanical. B—Bleeds that extend to the end of a printed sheet are designated as trim margins measuring one-eighth inch.

Graphics Programs

The programs used to produce graphics electronically appear as object-oriented images or bitmapped images. Using these programs, the designer can create very complex documents. These illustration packages will be discussed in greated detail in a later chapter.

Review Questions

Please do not write in this text. Write your answers on a separate sheet of paper.

1. In graphic communications, design refers to the use of proper methods to produce a product that is both _____ and _____.
2. Explain the role of the graphic designer.
3. Which of the following is *not* an element of design?
   a. Shape.
   b. Texture.
   c. Mass.
   d. Beauty.
4. What are the three basic design shapes?
5. The _____ is a tool that illustrates the basics of color.
6. What are the three primary colors?
7. Name the five principles of design.
8. _____ is the proper balance of all elements in an image so that a pleasing whole results and the image is viewed as one piece.
9. List the four elements of layout.
10. _____ is intended to draw attention to the printed piece.
11. What are the factors to consider in developing a layout?
12. A _____ is a rapidly drawn design of a layout.
13. A _____ layout shows how the printed piece will look when finished.
14. The guidelines that list information about the type style, type size, line width, color use, and page organization of a printed product are called _____.
15. _____ is the process of fitting together copy and illustrations in a specific amount of space.
16. What is photo cropping?
17. A ____ is used to size illustrations for enlargement or reduction.
18. *True or False?* Line art is normally pasted down as the same size on the mechanical.
19. What are the two most common working surfaces used in layout and design?
20. Why is a light blue pencil or pen commonly used in paste-up?