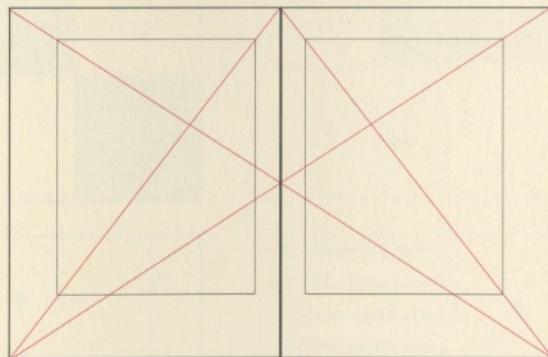


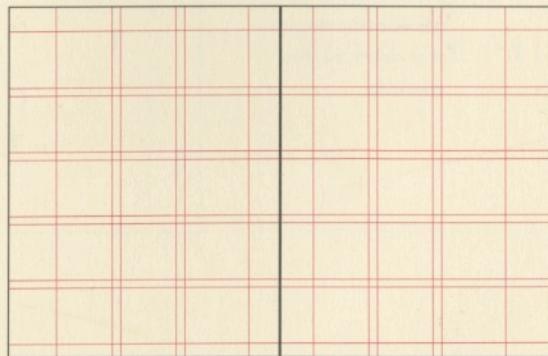
Structure is a key difference between traditional and modern pages. On the traditional page the margins define a box that is filled from top to bottom in a *linear* (sequential) manner. Margins are constructed from the proportions of the page. On the modern page, structure usually consists of a network of fields and intervals called a *grid*. The grid serves as an organizational framework by which the proportions, sizes, and locations of elements are determined. Structures such as grids help reduce the number of arbitrary decisions made during layout.

There have been numerous experiments in subdividing two-dimensional space. Formal structure was explored in design movements such as de Stijl, of which Mondrian was a leading force. The architect LeCorbusier introduced the *Modulor* in 1946—a modular system of dividing space based on the geometric relationships between those spaces. LeCorbusier is reported to have asked Albert Einstein for his opinion of the system and received the reply that it provided “a range of dimensions which makes the bad difficult and the good easy.” This is the prime objective of all grid systems.

Today, most printed pieces such as magazines and newspapers are based on a grid. Grid systems are objective by intent and provide a rational basis for layout decisions; they help establish proportional relationships between elements and ensure an overall consistency. Grids are often assumed to be essential, but are sometimes used unnecessarily or inappropriately and become more of a hindrance than a help.



Traditional page structure consists of margins that are filled with elements in a linear fashion.



The modern grid is a structure on which we arrange elements according to modern design principles.

## Subdividing the page

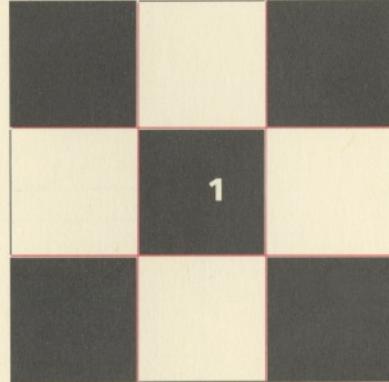
We draw lines on the page either as guides for positioning elements or to subdivide space. This concept of subdividing space is all around us: our homes are divided into rooms, our kitchen drawers are divided for utensils, and we may use segmented boxes to store and transport small items. We may need to modify these subdivided spaces for a specific use because they were designed for general use. When planning how a space will be divided, the way in which the space is to be used is a primary consideration.

In the three examples shown here, nine numbers have been arranged using three different approaches. The first two are simple networks of lines that have evolved into the layout grid commonly used today. The third example is a layout grid consisting of fields and intervals; it combines the properties of the first two approaches. By understanding the differences between these approaches we will better understand how and when to use a grid.

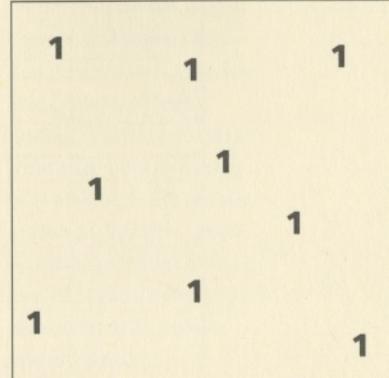
## Segment lines

*Segmentation* is the division of the page into smaller areas, each of which is the equivalent of a tiny page with no internal structure. Within each area, elements are placed at random; the segment lines offer no guide to exact placement. The lines creating the segments are simply *dividing* lines that define areas, just as fences in a meadow define fields.

Because segment lines define the edges of an area, each area, or segment, can be filled. In the example below, every other segment is filled; if all the segments were filled, the edges of the areas would disappear. By placing one element per segment, a relatively even distribution is achieved.



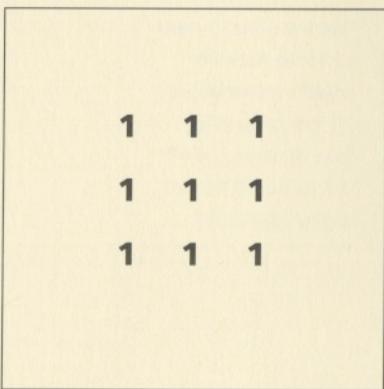
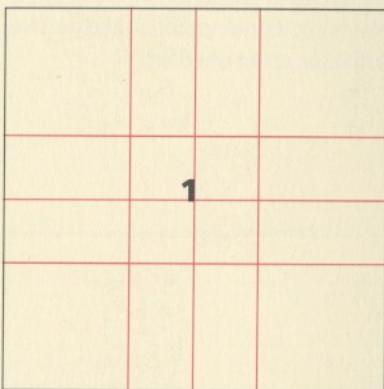
Of these three sets of examples (pages 132-33), the first only defines areas; the second only provides positioning guides for the placement of elements; the third does both.



Unlike segment lines, the positioning guides shown below do not define areas. Instead, the vertical and horizontal lines intersect to provide specific x-y coordinates for the positioning of elements.

In the example below, each number is positioned at the point where a vertical line and a horizontal line meet. In this example, elements have been aligned to this point by their bottom right corners. They could also have been centered on each intersection or aligned by their top left corners—what is important is that they were all aligned in the same way.

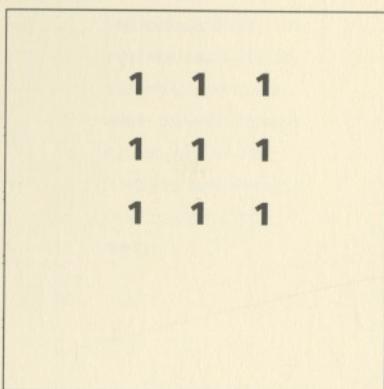
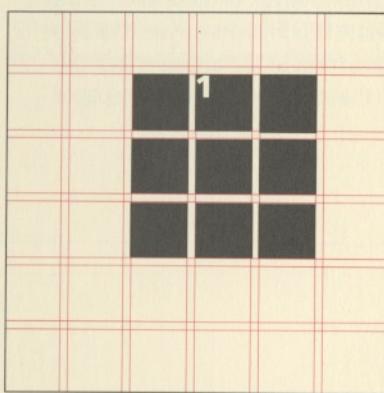
Because the positioning guides below were drawn closely together, the elements aligned to them appear to be grouped. Each new arrangement of positioning guides will yield a different layout result.



The grid shown below both segments and provides specific positions for elements. This is the most common type of layout grid.

Areas, or *fields*, are separated by strips of space called *intervals*. Both the fields and the intervals are consistent sizes. The corners of the fields act as the intersections required for positioning, and the edges of the fields define areas.

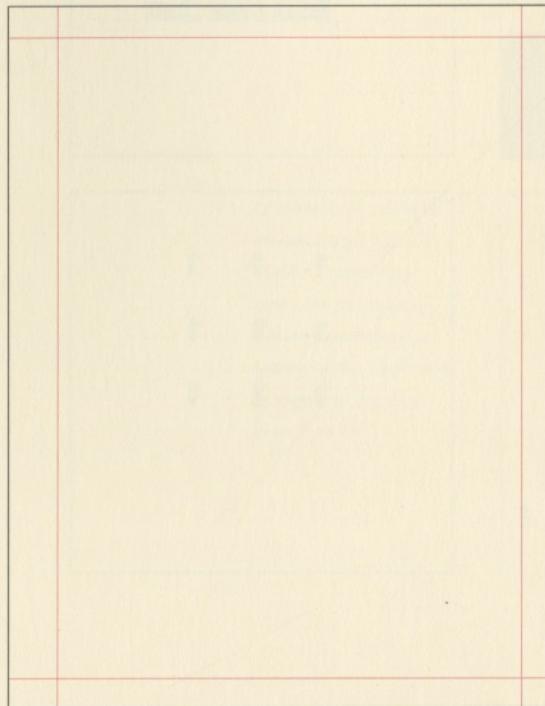
No margins have been added to any of these examples. Unlike on the traditional page, margins are not part of the essential structure, but are determined instead by the design and production limitations.



## Margins as minimum structure

On the traditional page, margins are the primary structure. On the modern page, margins are subordinate to the structure—usually a grid. Establishing a structure for the modern page begins with defining the space on the page that must be reserved for production requirements such as printing, binding, and trimming. The inside margin of a bound document, for example, must be wide enough to compensate for the space actually used by the binding, as well as the space lost to the curve of the page. In general, the thicker a document, the wider the inside margins must be, unless a mechanical binding is used. We can print either on pages already cut to size or on large sheets that are cut to size after printing; the specific requirements of the job and the size and type of press used will determine which of these alternatives is appropriate. If printing is on the final page size, space must be left at one end of the page so that the press can grip the paper.

Typical minimum margins are shown in the diagram below. Even when a page will have no other structure, it must respect the minimum margins dictated by production, except for those elements that are intended to print to the edge of the page, or *bleed*. Minimum margins are usually only a point of departure for the further development of page structure. Minimum margins only define the size and shape of the space in which the page structure can be developed. It is critical that layout structure be developed from the requirements of the elements and the design, and that final margins be determined after this structure is in place. This is a critical step in structuring the modern page. Unlike the traditional approach to page structure, in which margins are developed first, modern structure determines final margins last. It is interesting to note that the layout programs on personal computers tend to assume a traditional approach and require that margins be established first.



Typical minimum margins for a page that will be bound and trimmed are 3/4 inch for the inside (bound) margin, and 1/2 inch for the top, bottom, and outside margins.

A basic layout grid subdivides the page into fields and intervals within the space defined by minimal margins. The grid is derived from the space provided on the page rather than from the specific elements themselves. In this sense, it could be considered more traditional than modern.

The basic grid has only limited usefulness because the number of fields and their proportions are decided arbitrarily. It is just such arbitrary decisions that often cause problems during layout.

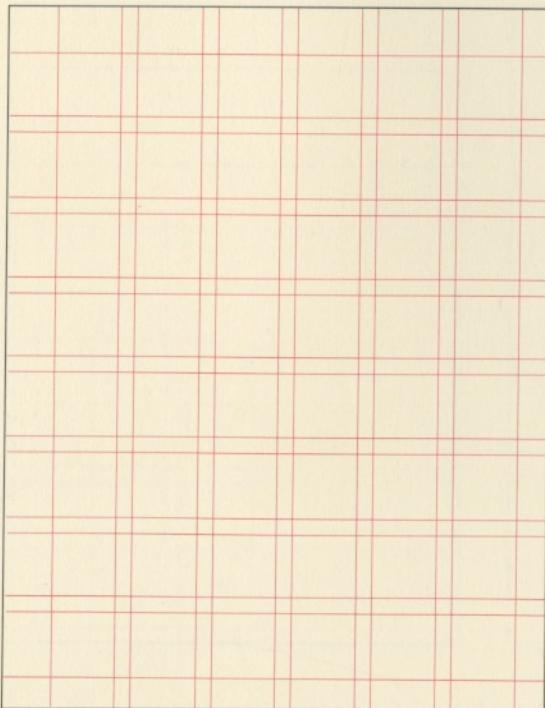
When more than a few paragraphs of text will be used per page, when communication through that text is essential, or when a dominant element has specific proportional requirements, the grid should be developed around those specifics rather than arbitrarily—form must follow function.

Generally, a grid can be developed from the designer's sketches so that the design determines the specifications of the grid. Once a grid is established it is used in turn to determine the specifics of the layout.

The grid helps us make final decisions about size, proportion, and placement. The number of fields in the grid determines how flexible it will be to use. Whereas too few fields do not allow enough flexibility, too many fields may not provide enough constraint. The appropriate balance is decided by the design and by the kinds of elements that will be included.

It is not necessary or desirable to fill all of the fields; the fields we leave empty are as important to the layout as the fields we use.

On the grid for this book, an empty band of fields across the top of the page makes it easy and predictable to find the beginning of the text and assures a minimum level of contrast between elements and space, no matter how much of the rest of the page is filled.



This layout grid with forty-eight fields is an arbitrary subdivision of the page within minimum margins. Its usefulness may be limited because elements may or may not fit the fields.

## Developing a typographic grid

Basic grids are relatively easy to develop and may be convenient for projects that do not contain much text; most projects, however, use text extensively. Although readable text fits neatly into some grids, it is as likely that text parameters will need to be compromised when the grid has been established arbitrarily.

*Typographic* grids develop from the requirements of text and assure us that the text will be readable. These, too, are developed from the designer's sketches, but they begin with the text specifications rather than with the subdivision of space.

The measurements of the fields and intervals are derived directly from the typeface, point size, kerning, line length, and leading of the text to be used (see workbook topic 9).

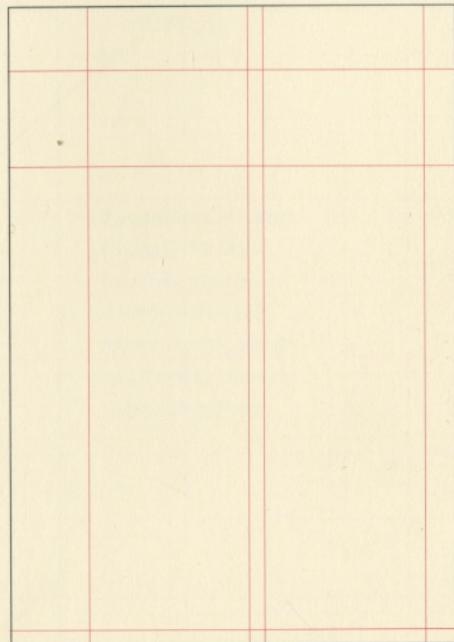
## Typography as point of departure

A typographic grid usually looks much like any other grid of fields and intervals. If text is the only element on the page, however, it may look more like the example below. This is because text has its own internal structure; very little additional structure is needed.

The grid shown below contains positioning for text and headings only. It consists of two large fields for text, a space interval separating them, margins, and a positioning guide for where the text should begin on the page. All other structure comes from text specifications such as leading.

This grid is designed to organize only text. The two grids on the next page are derived from this one and require no substantial changes to the structure established here.

This is a minimum structure for text. It provides positioning points for headings and columns of text only.



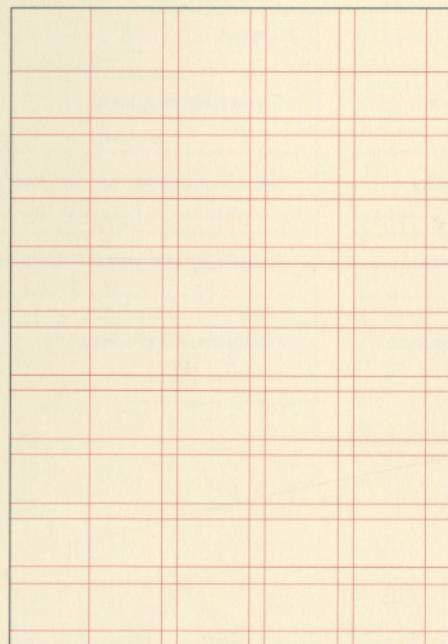
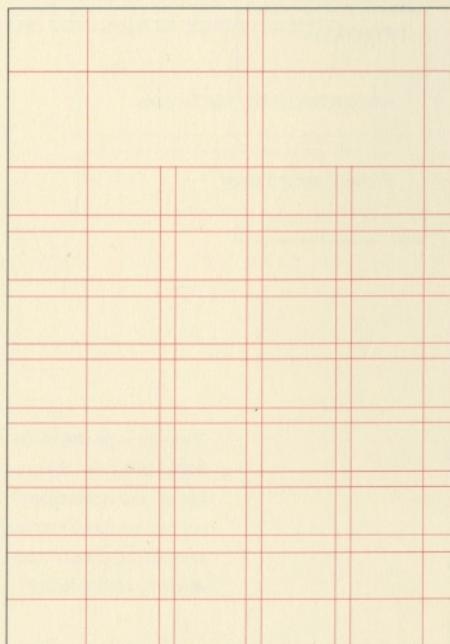
When a layout is to include elements in addition to text, additional fields are created within the minimum text structure already established. Both of the grids below build on the framework established on the previous page, and they provide enough flexibility for most applications.

While the initial text structure on the previous page provided only two fields, the first grid below provides twenty-eight fields. The space between the heading and text that was established in the first structure has been retained, independent of the pattern of fields and intervals. This space is not a field and elements other than the heading will not be placed in it.

The second grid below provides thirty-six fields and was also derived from the basic text structure on the previous page. Because fields begin the top left corner, the width of the space between heading and text has not been preserved.

In the minimum text structure this space was determined *subjectively* from the designer's sketch; that is, the space was determined by the designer's sense of visual balance rather than by measurement. In the grid below the space between heading and text is determined *objectively* by the spacing of the fields and intervals; that is, it is determined by a measurement system rather than by a personal sense of balance.

If we were to use this grid for a layout, the text would either be nearer to or farther from the heading than in the original structure.



These two grids use the same text structure as on the example on the previous page, but they provide a network of fields and intervals for positioning other elements as well.

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*Layout* is the arrangement, or *composition*, of elements in two-dimensional space. Layout is a step in the process of creating a printed piece, but it is not the first step. The design process as a whole begins with the first ideas about a project and does not end until the piece is produced and in the hands of the client.

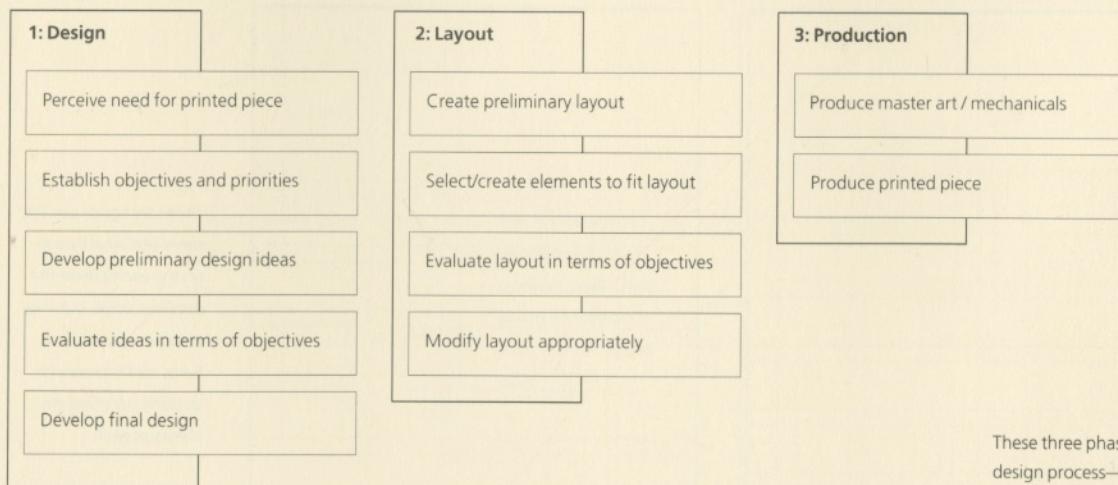
The design process can be divided into three key phases: design, layout, and production, as shown below. Each step in each phase must occur before the next step can begin. Before layout can begin, design decisions must be made about what elements will be included, the nature of those elements, the size and shape of the space in which they will be arranged, the relationships between the elements, and the relationships between elements and space.

All of the steps in the process will occur whether it is by default or with purpose. The objectives of a piece—why it is being printed, who the audience is, how it will be distributed and used, and so on—will either be determined as a whole by the designer or indirectly and in a fragmentary manner during the process of layout.

Once objectives have been established, the designer develops ideas within the context of the objectives, first as small sketches called *thumbnails*, and later as more comprehensive sketches, or *comps*.

The final design becomes the model on which layout decisions are based, and the objectives established at the beginning of a project become the objectives for the layout as well as the design.

When a design is contradictory or ambiguous, it raises questions and creates conflict; when a design is well conceived and well planned, layout is a relatively simple process.



These three phases of the design process—design, layout, and production—will occur either consciously and with purpose or inadvertently and by default.

Communication is a two-step process—the viewer's attention must be *attracted* before a message can be *transmitted*. The most readable of type and the most sensible of layouts will not transmit a message unless the potential viewer stops to look at it. The advertising field tends to overemphasize attraction. At the other extreme, attraction tends to be overlooked entirely in technical documentation and other such projects not concerned with "making the sale." At both ends of the spectrum there is a point of absurdity—the advertisement, for example, in which so little emphasis has been placed on transmitting information that we cannot read the product name; or the technical manual in which so little emphasis has been placed on attraction that a potential reader, even if attracted by its cover, is encouraged to close it rather than to read it. In both of these cases, the message has not been communicated. Clear communication is the function of a printed piece; function, in turn, is a primary concern of the modern designer. Although this concern for communication is common to client, designer, and writer alike, it is the designer who must find a solution that satisfies both steps of communication.

Two messages are communicated on the printed page—one is *explicit* and one is *implicit*.

Explicit messages are communicated by the content of the elements themselves. Implicit messages are communicated by the manner in which those elements are arranged, and by the use of such nonmessage elements as graphic elements, color, and photographs used only for their graphic impact.

Advertising is noted for its use of the implicit message—the car ad that sells power or the perfume ad that sells femininity—but implicit messages are communicated in more subtle ways as well. The style, color, paper, visual hierarchy, and juxtaposition of elements carry a message to the viewer as well, and should be chosen with an implicit message in mind.

The designer's task is to create a framework in which the explicit message is reinforced, rather than contradicted, by the implicit message.

## The nonlinear page

One of the key differences between the traditional page and the modern page is *linearity*, or the sequential organization of information from top to bottom on the page. Linearity is based on a *scroll* analogy in which information is perceived as a continuous, sequential flow. This analogy is so accurate a representation of the traditional page that it has been used as a model for word processing software. The scroll analogy explains why each traditional page is filled top to bottom before the next page begins; the pattern is broken only when text is broken into shorter scrolls called chapters.

Linearity often conflicts with the layout of the modern page. In modern layout, each page or spread is viewed as space (ground) on which elements (figures) are organized by principles such as grouping. In modern layout, these principles can be used to direct the viewer's eye.

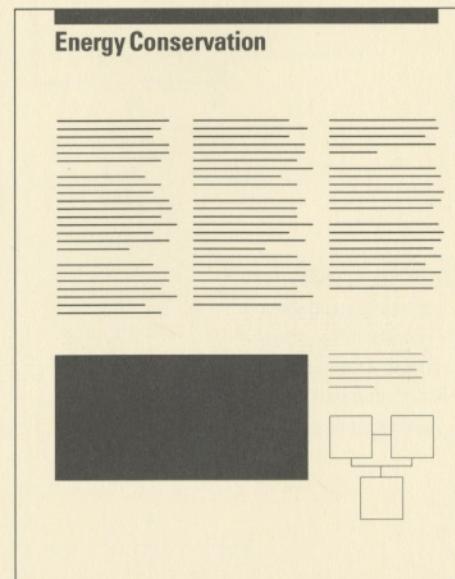
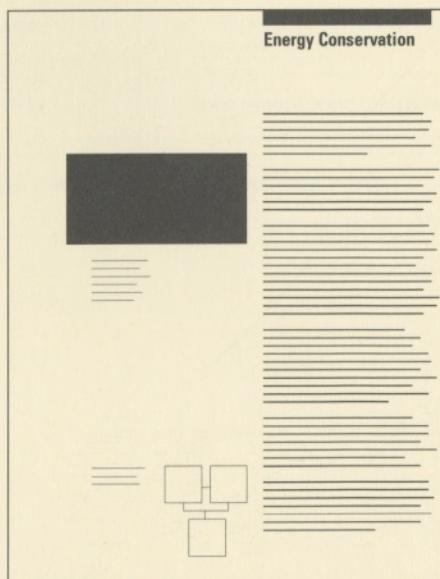
In the scroll analogy, new pages often begin midword, midsentence, or midparagraph. Because the modern page is no longer seen as a segment of a scroll, and columns and pages no longer need to be filled, the nonlinear page can begin and end with complete thoughts.

On the modern page text is a grouped object uninterrupted by other elements. The linear structure of language is preserved within the text, but this structure no longer dictates the structure of the page.

In the two examples below a linear and a nonlinear layout are compared. Both use the same typographic style and both contain the same amount of information. On the linear page, left, the text flows from top to bottom in a single column; the placement of images is determined by the position of the text that refers to them. Sequence is given priority over structure or visual impact.

On the nonlinear page, right, the text is a grouped element uninterrupted by other elements. Although the photograph and diagram remain readily available to the reader, their positions and sizes were determined on the basis of structure and visual impact rather than on the basis of sequence.

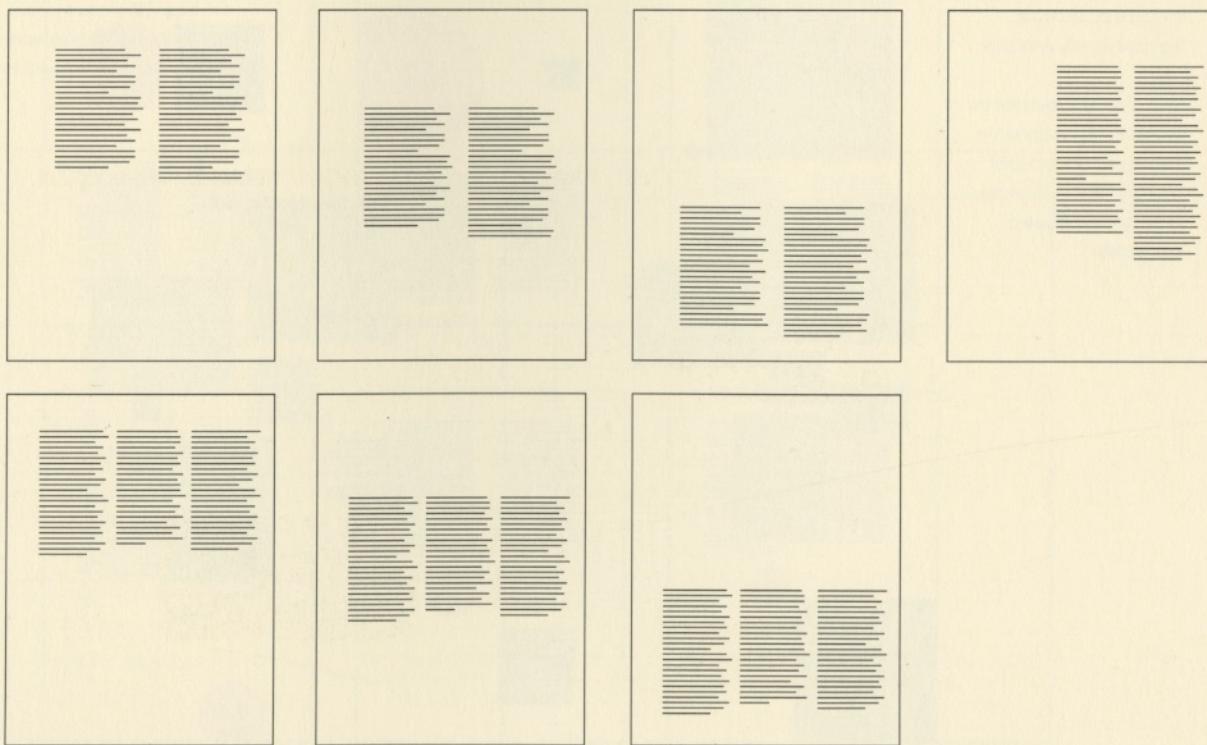
On a linear page, priority is given to arranging all elements in sequence. On a nonlinear page, priority is given to organizing by modern design principles.



The traditional style has long been considered the writer's style; its structure evolved from and gives priority to the linearity of language and text. The modern style, then, might be considered the designer's style; modern design principles take precedence over linearity. This is a source of potential conflict with writers, who generally create text in a linear manuscript format, even when it is to be used on a nonlinear page. When the page is to be organized in a nonlinear way, the designer is often faced with the task of segmenting linear text appropriately. This is a task that is often better done by the writer. It is often beneficial, then, for the writer to be aware of the page structure in advance, and to be aware of the impact that nonlinear formats have on writing structure. One difference is that the writing no longer needs to provide the sole structure for the page as it did in the traditional style. Another difference is that text will no longer be interrupted by other elements.

If the text on a standard 8 1/2-by-11 page is set following guidelines for readability, it will probably be arranged in one of the ways shown below. The designer's preliminary sketches of the page structure can help the writer envision the format during writing and can provide a word count per page. In considering the page structure in advance, the writer may structure the text differently. Conversely, thinking about the text will often change the way in which the designer structures the page. Because writer and designer both play key roles in the development of printed communication, the best results tend to be produced when writer and designer collaborate rather than compete.

The potential arrangements of readable text on an 8 1/2-by-11 page are limited. Within these limits, however, is an almost unlimited range of design possibilities.



The design principles described in chapter 2 are the basis on which we make layout decisions on the modern page. Principles such as figure-ground reversal can be used to engage the viewer's attention. Grouping creates and clarifies relationships between elements. Order, pattern, and unity are imposed on the page by the use of a grid and by the consistency of the text. Contrast and asymmetry add variety for balance.

Text almost always plays a passive role on the page; if it does not, readability may be impaired. This means that it is the other elements on the page, including the space, that create visual interest.

Contrast is a primary tool by which the designer establishes a visual hierarchy and directs the viewer's eye. Contrast and asymmetry together encourage diagonal eye movement. Contrasting scale may imply depth, which reinforces the visual hierarchy by causing some elements to advance in space and others to recede.

The same elements—a circle, a square, and two columns of text—appear in each of the layouts below. Modern design principles are applied differently in each because the size and relative positions of the circle and square change in each.

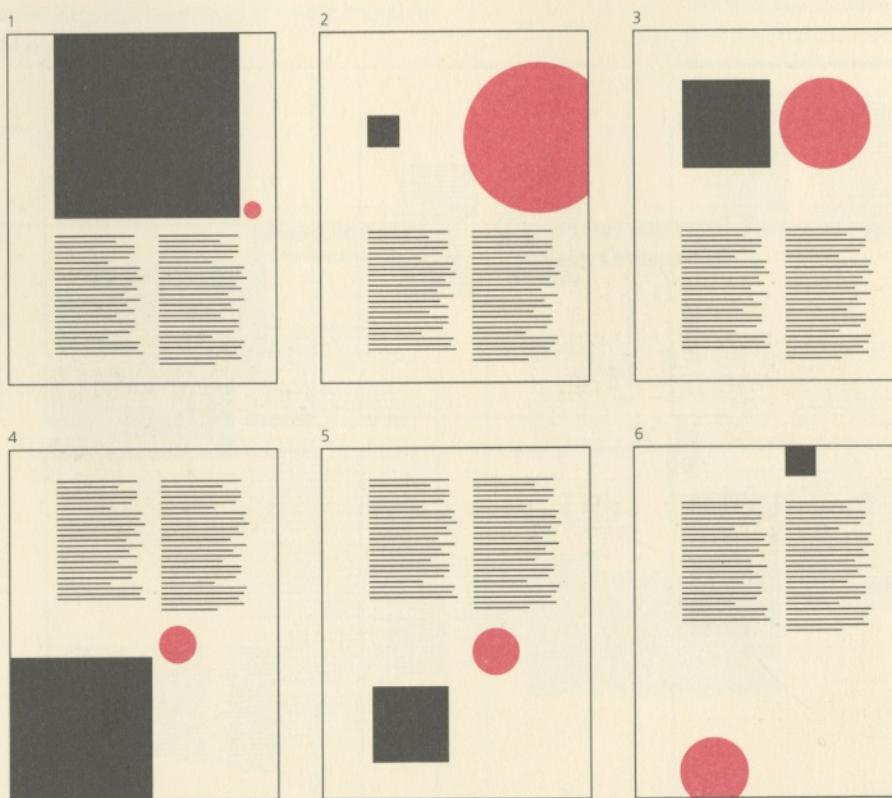
In the first layout, for example, the square is so large that the layout loses its potential for asymmetry; space is inactive. The third layout also lacks asymmetry; because the elements are so similar in size, it lacks contrast as well. Both the first and the third layouts are passive and are therefore inappropriate for the modern style. The same relative positions for the square and circle are used in the fourth and fifth layouts; the fourth uses scale to create contrast. In the sixth layout, space becomes a more active and dominant element.

In the second and fourth layouts, there is an illusion of depth; this helps to make these layouts more dynamic.

Layout is affected by subtle changes—modifying the position or scale of an element only slightly can transform a passive layout into a dynamic one; the converse is true as well.

Contrast and asymmetry in combination create the most visually arresting page.

Each of these layouts should be viewed separately rather than as part of a group of layouts so that each composition can be evaluated individually.



Some elements, such as photographs, are virtually always considered a single object. Other elements, such as text and charts, are comprised of separate elements that we treat as a group during layout. These have an internal structure independent of the structure of the page; text, for instance, is structured by words and leading. In placing a group, we do not interfere with this internal structure.

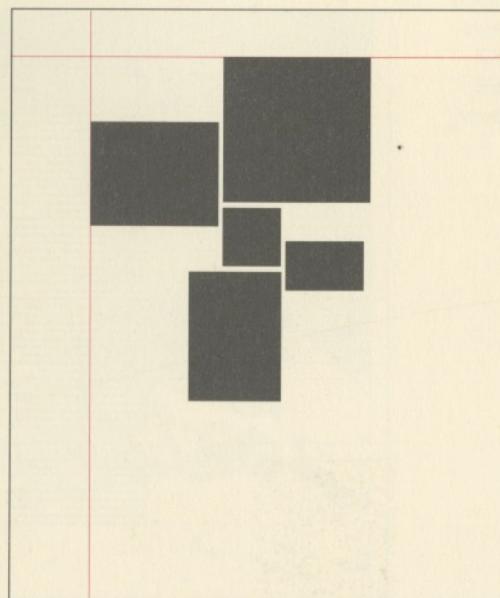
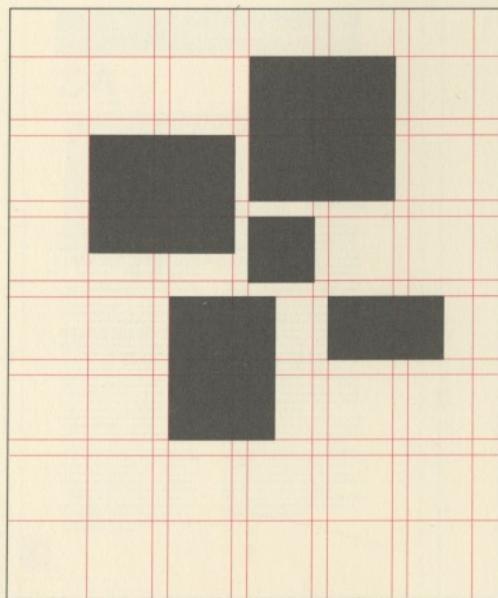
How we group determines how we place elements on the page. If we think of five photographs as separate objects, for instance, we position them one at a time on the grid. We can also treat them as a group; as such, we would arrange them independent of the grid. The group, with its own internal structure, would align to the grid only as a single object.

Elements may be placed either as separate objects or as a group. The group must have its own consistent structure. If placed separately, structure is derived from the grid.

Grouping is a key factor not only in creating the layout but in how it will be perceived. In evaluating a layout we must look for inadvertent as well as intentional groupings. The viewer will inevitably group elements by proximity unless there are other visual clues, such as similarity, that offer a different grouping interpretation.

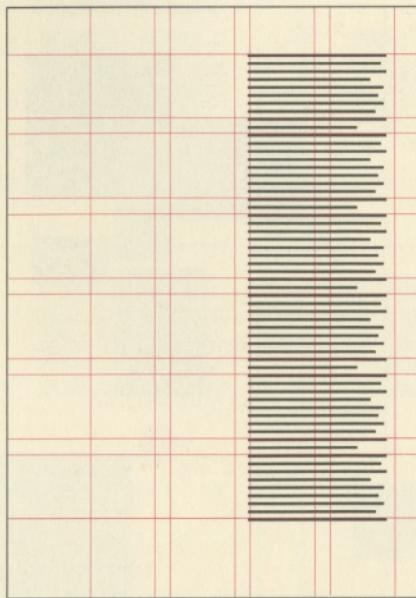
Consider how grouping works on the page you are reading now, for example. The sub-head is a separate object, even though it is similar to the text, because it does not group by proximity with the text. The illustrations at the bottom of the page are seen as a group because of similarity and proximity, so the caption relates to this group rather than to only the illustration on the right.

Sometimes grouping is ambiguous; such ambiguity should always be intentional. In each of the six layouts on the left, for example, it is unclear whether we are to group the circle and square together, or group one of them with text, or view each as a separate object. How we group determines how we interpret what we see. This is one of the key principles in Gestalt psychology.

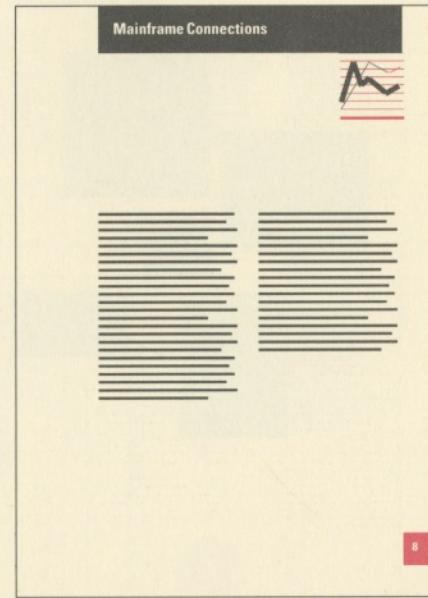


- Each project varies in a number of ways, any of which could affect the design and the layout decisions made: the number of elements that have already been created; the nature of the elements that need to be created; the amount of text and images that must fit on the page; the relationships between those elements.
- Because so many variables are involved, it is common for a designer to create a new grid for a new project. Because so many projects have the same general kinds of elements and requirements, however, it is not uncommon for a designer to use or modify an existing grid. The designer who uses grids regularly may have developed an array of grids that suits his or her style and needs. This is a particularly efficient practice for designers who work with desktop technology or other typesetting equipment.
- In addition to the grids the designer creates, ready-made grids are available, primarily as *templates* to be used with desktop technology. Templates offer both grid and type specifications, but may or may not suit the requirements of the project at hand.

Each of these layouts uses a modified version of the typographic grid shown. Fields are added or subtracted according to the needs of the project. Each follows the guidelines presented above; each is different in character.



It is often during the process of creating a grid that many of the details of a design are considered and clarified, and potential layout problems are resolved. In creating the grid, the assumptions made during the design phase are confirmed or challenged. Because of these factors, grid development remains an important step in the design of a printed piece. Particularly for the beginning designer, ready-made templates leave many questions unanswered and may thus encourage arbitrary decisions. Ready-made design may be useful as a point of departure, however, and inspire layout and design ideas that would not otherwise have arisen.

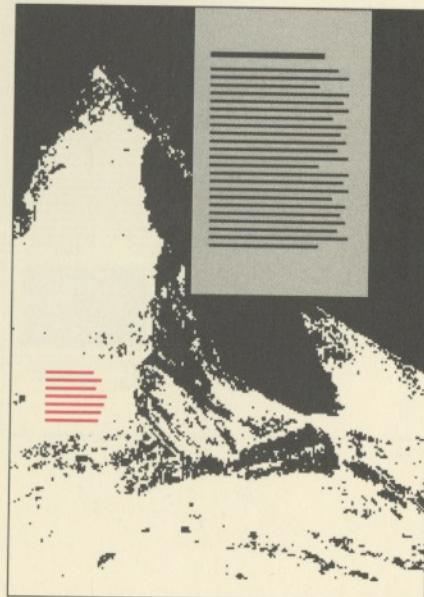
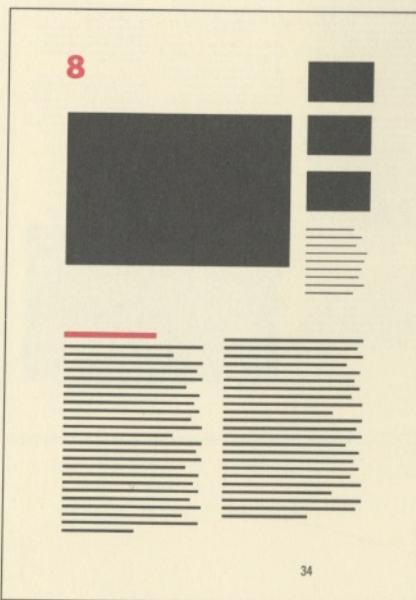


A grid that has been designed appropriately provides the designer with a fast and easy way to create interesting and effective layouts. When the grid satisfies the needs of the project there is seldom a need to deviate from it. The urge to deviate from it is another matter—it may imply that the grid is being viewed as a restriction limiting the freedom of the designer rather than as a framework in which creativity can take place. This is a conflict that must be resolved before a grid can be used effectively.

Once an appropriate grid has been established, layout is a matter of fitting information into the space allocated for it, so that the reader perceives the pattern and logic of the organization. The single overriding rule for using grids is to use them consistently. Consistency provides a background of order, pattern, and unity.

The guidelines presented here act as a checklist for making layout decisions when working with a grid.

- Place and scale elements consistently according to the grid.
- Make elements only as large as necessary for communication unless they are also being used as graphic elements.
- Establish a visual hierarchy between the elements—everything cannot be dominant.
- Hang elements from the tops of fields; align elements to the left edges of fields. Place text as a group so that it is uninterrupted by other elements.
- Be systematic; for example, place similar elements in a consistent position from page to page in a multiple-paged document or series of pages.
- Limit text to about half of the fields on a page whenever possible.
- Leave about one-third of the fields on a page empty to help ensure layout flexibility.
- Use contrast, asymmetry, and other design principles to avoid creating a passive page.



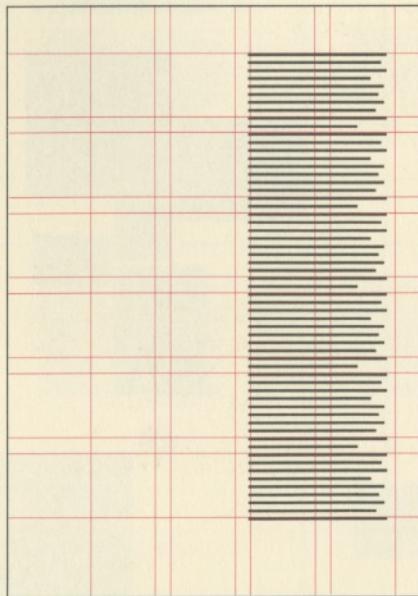
Each project varies in a number of ways, any of which could affect the design and the layout decisions made: the number of elements that have already been created; the nature of the elements that need to be created; the amount of text and images that must fit on the page; the relationships between those elements.

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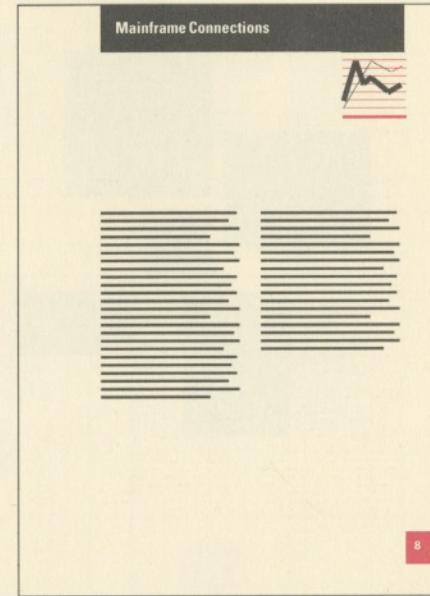
In addition to the grids the designer creates, ready-made grids are available, primarily as *templates* to be used with desktop technology. Templates offer both grid and type specifications, but may or may not suit the requirements of the project at hand.

It is often during the process of creating a grid that many of the details of a design are considered and clarified, and potential layout problems are resolved. In creating the grid, the assumptions made during the design phase are confirmed or challenged. Because of these factors, grid development remains an important step in the design of a printed piece. Particularly for the beginning designer, ready-made templates leave many questions unanswered and may thus encourage arbitrary decisions. Ready-made design may be useful as a point of departure, however, and inspire layout and design ideas that would not otherwise have arisen.

Each of these layouts uses a modified version of the typographic grid shown. Fields are added or subtracted according to the needs of the project. Each follows the guidelines presented above; each is different in character.



Mainframe Connections

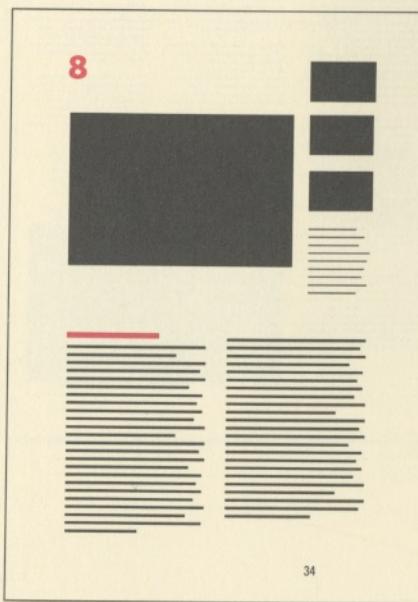


A grid that has been designed appropriately provides the designer with a fast and easy way to create interesting and effective layouts. When the grid satisfies the needs of the project there is seldom a need to deviate from it. The urge to deviate from it is another matter—it may imply that the grid is being viewed as a restriction limiting the freedom of the designer rather than as a framework in which creativity can take place. This is a conflict that must be resolved before a grid can be used effectively.

Once an appropriate grid has been established, layout is a matter of fitting information into the space allocated for it, so that the reader perceives the pattern and logic of the organization. The single overriding rule for using grids is to use them consistently. Consistency provides a background of order, pattern, and unity.

The guidelines presented here act as a checklist for making layout decisions when working with a grid.

- Place and scale elements consistently according to the grid.
- Make elements only as large as necessary for communication unless they are also being used as graphic elements.
- Establish a visual hierarchy between the elements—everything cannot be dominant.
- Hang elements from the tops of fields; align elements to the left edges of fields. Place text as a group so that it is uninterrupted by other elements.
- Be systematic; for example, place similar elements in a consistent position from page to page in a multiple-paged document or series of pages.
- Limit text to about half of the fields on a page whenever possible.
- Leave about one-third of the fields on a page empty to help ensure layout flexibility.
- Use contrast, asymmetry, and other design principles to avoid creating a passive page.



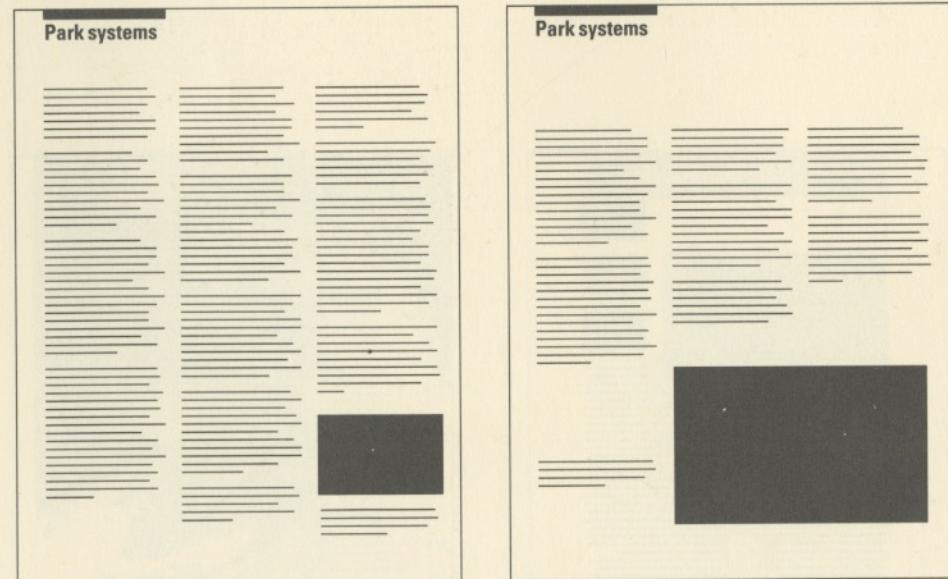
When the designer is presented with too much information for the space allocated, design principles cannot be used to advantage and both aspects of communication are impaired: the page may not attract the viewer because it lacks visual interest; information cannot transmit its message effectively if elements are forced into inappropriate groupings because there is so little flexibility on the page. Once adjustments have been made so that it is set as compactly as possible, only two solutions remain: to decrease the information by editing or to increase the space on which the information appears.

On a crowded page we cannot take advantage of modern design principles. The message is more likely to be read if we edit the text or expand the space.

When the length of a document is fixed (e.g., a four-page brochure, a forty-eight-page catalog) the information may need to be edited. This may involve eliminating such elements as photographs as well as editing the text.

When a preliminary layout is created early in the design process using a preliminary draft of the text, problems of fit become apparent immediately. This stage in the process is a good time to edit copy to fit the space allocated for it. Reviewing the layout and the text together also provides the writer with useful information about how the words will appear on the page.

When the layout and text are not compared for fit until the manuscript has reached its final draft, changes and editing are considerably more difficult and more expensive.



If the length of the document has been decided arbitrarily and the information has already been edited, and when it is appropriate to place more emphasis on the first step in communication than the second, then the only option remaining is to add space. If the document must retain a standard 8 1/2-x-11 page size, this means doubling the amount of space for the information.

The layout below contains the same amount of copy as the first layout, but it is in twice as much space. There is space to make elements such as photographs and headings larger. The reader may perceive that there is less to read. (This is an example of the contrast illusion at work—the space is larger so the amount of text seems smaller.)

Magazine designers often use expanded space at the beginning of an article to make it more appealing, then they compensate for the loss of space by packing the remainder of an article into the back of the magazine. It is likely that readers will never finish reading such articles.

When the options have all been explored—when the space has been expanded as much as the budget will allow, the designer has explored alternative page structures and typesettings to gain space, and the writer has edited the copy so that it is as compact as possible, and content and space still do not balance—options outside the realm of design must be explored as well. These include options such as revising the budget and finding additional sources of revenue. These decisions affect the potential success of a printed piece as much as the design itself.

In exploring options, not only must the printed piece in question be examined, but also the context in which it will exist. Priorities must be established that take into consideration such factors as the image the company wants to project and the reasons for producing the piece. Once these objectives have been clarified and given priority, other decisions tend to fall into place.

## Park systems



## The objective approach

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Design can be approached either *subjectively* or *objectively*. In the subjective approach, the designer works somewhat like an artist in that decisions tend to be made spontaneously and are based on his or her personal taste. In the objective approach, design is seen as a problem-solving activity, as well as the visual arrangement of objects. In this sense, design has more in common with architecture than with art.

Whatever the approach, however, successful results depend to a great extent on the visual awareness and sensitivity of the individual making the decisions. In this sense, no design is purely objective.

During the design process, subjective decisions are inevitable and desirable. In developing ideas, for example, the designer must respond subjectively to the goals of the project, which were established objectively.

Once a structure has been developed objectively, layout decisions are subjective within that framework.

Although many of the art and design movements that spawned it were subjective in nature, modern design has evolved into an objective style, incorporating principles of functionalism and Gestalt psychology. Swiss design in particular has come to represent an objective approach to graphic design, in which modern design principles have been systematically and objectively applied.

In the Swiss style, communication is seen as a common goal that is achieved by the systematic application of modern design principles. Within the seemingly rigid structure of Swiss design, a wide variety of alternative solutions can be found for any design problem. Swiss design emphasizes typography; typography, as visual language, requires a systematic and practical approach. Objective structure, principles, guidelines, and style offer a broader and more reliable basis for design than the subjective approach. Within this objective framework, success is not as dependent on the state of mind of the designer. Only within the objective approach can systems be developed that can be used consistently by a variety of layout artists and designers.



On this mailer for an exhibit of Japanese ceramics and textiles, designer Russell Leong worked objectively to develop the basic concept, that of using a circular red image in a white field to suggest the Japanese flag. The concept and design style are objective; specifics, such as the exact size of the image and its level of abstraction, require subjective design decisions.

In using asymmetry and applying such design principles as contrast between elements and between elements and space, we ensure a dynamic page. The grid is an objective structure that provides the framework for unity; the elements then provide the variety needed for balance and visual interest.

Without the grid the designer must have an inner sense of rhythm—a subjective sense of grid—that can be applied to the arrangement of an assortment of objects, so that the viewer clearly perceives the pattern to the arrangement intended by the designer.

Laying out the unstructured page is a keenly subjective process that has only the individual's awareness as a basis on which to make decisions. This is the "art" part of design, which can only be taught indirectly and which some may never learn. Even with all the theory at our fingertips, we still may not be able to fit the pieces together in a satisfactory way.

A designer, asked for a copy of a brochure she had designed because of its outstanding use of a grid, replied, "Grid?" Her structure is a built-in awareness of space, proportion, organization, and design principles that has been developed through years of training and practice.

In the final analysis, there is no substitution for visual awareness, and it seldom develops without nurturing, training, and practice. It is only after our visual awareness has become a well-developed skill that we can produce consistently good work without objective structure.

A trapeze artist cannot freely experiment when learning new skills without a safety net to rely on. The designer's safety net is the grid; the grid provides a safe environment within which the designer can experiment.

In both cases the safety net helps avoid potential disaster. Once a sufficient skill level has been developed, the designer (or the trapeze artist) may choose to eliminate the net. In both cases, there is a temptation to remove the net too soon.

A basic grid is a regular subdivision of space into intervals and fields. Intervals are usually between one and two picas wide. The number of fields is generally determined by the amount of flexibility needed in layout—the more fields, the more flexibility. The aspect ratio of the fields can be determined either by a specific element to be included on the page, such as a photograph, or decided arbitrarily.

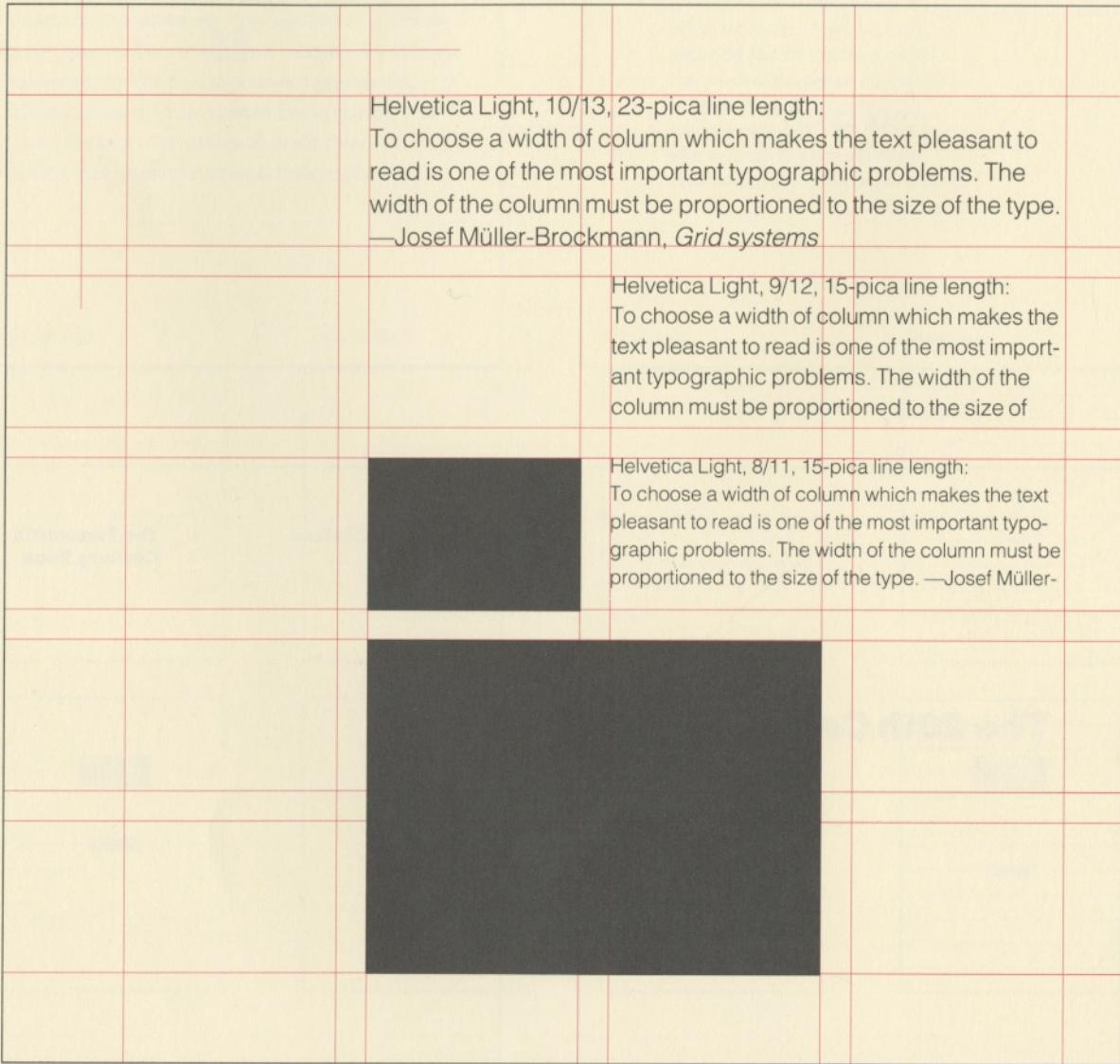
### 1. Margins, fields, and intervals

Minimum margins are drawn first as a reminder of production limitations; the remaining space is divided into fields and intervals. Once the space is divided into a grid, elements are tailored to fit it. This grid has 20 fields that are 7 picas wide and 5 picas high, separated by intervals of 1 pica. The fields are arranged in 4 columns and 5 rows.

### 2. Fitting text to the grid

Based on an average line length of 40 to 50 characters per average line, there are 3 possible text settings for this grid. Increasing the number of grid fields will increase the number of possible line lengths, because the text can span the width of multiple fields. Leading and field height seldom fit neatly together as they do on a typographic grid.

Minimum margins



### 3. Using the basic grid

As with all grids in the modern style, elements align at the top and left of grid fields. When possible, elements should be drawn or cropped and scaled to fit the grid. In the example below, the first diagram was scaled to fit a single grid field; the second diagram is slightly smaller than a grid field—it was scaled to match the first diagram because of their similarity and proximity.

It is characteristic in the modern style to align the tops of text blocks and to leave the bottoms of the columns *ragged*; that is, to let information in columns end at a logical point rather than midthought. This is shown below. Were the bottoms of the columns aligned as well as the tops, a subhead would begin at the bottom of the first column.

### Exercises

1. Set up a basic 4-column grid on a standard 8 1/2-by-11 page. Show a range of possible text settings.
2. Set up a second grid on an 8 1/2-by-11 page that will accommodate 3-inch square photos. Determine settings for readable text on this grid, and create 3 layouts, each of which includes 2 square photos and about 250 words of text.

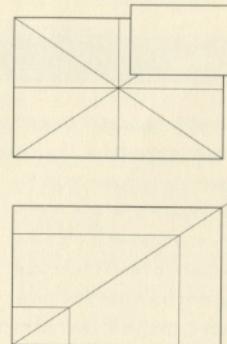
# 1

## Construction Basics

Construction requires no calculation—only a straightedge and a compass or software with the equivalent drawing tools. Construction techniques are useful in layout and design, especially for the traditional style. Before beginning to do the constructions on the following pages, review these basics.

### Subdividing with Diagonals

Diagonals subdivide a rectangle evenly, whatever its proportion. Diagonals intersect at the exact center of a rectangle. Using diagonals to find a center is often faster than measuring, especially when a measurement is not evenly divided or requires rounding off.



### Area vs. Length

By drawing vertical and horizontal lines through the center of a rectangle we divide each edge length in half, but divide the area into fourths. A photostat at 50 percent yields the same result—original lengths divided in half, and original area divided in fourths.

### Comparing Proportions

Rectangles whose corners fall on the same diagonal have the same proportions. We can compare the proportions of rectangles, no matter how different they are in size, by using diagonals. This is useful in layout, since we often need to block out a space that represents a photograph. By first finding the diagonal of the original photo, we can then draw a rectangle in our layout that has the same diagonal. Pantographs work on this same principle, and they are used in layout for this same purpose.

Because text is the most critical element on the page and has the most specific requirements, it is logical that a grid be built around it. This approach to grids is consistent with modern design philosophy in that it allows form (the grid) to follow function (readability) rather than the other way around. Once a typographic grid is established, additional columns may be added for flexibility, but only as many as necessary.

The procedure for establishing a typographic grid may seem burdensome at first, but once grids are established for a range of text settings they can be modified and reused for different applications.

### Exercises

- Find at least 6 examples of pages that you personally find readable. Once you have collected the samples, count the number of characters per line. Are there more or fewer characters per line than in the range specified here? Check your samples against the readability guidelines in book 2, chapter 4. How do your examples correspond to the guidelines?
- Following the procedure presented here, create a typographic grid for an 8-inch square page, based on the text of your choice at its shortest possible line length. The grid should have from 25 to 35 fields. Also create a grid based on its longest line length.
- Using one of these grids, redesign a traditional page from a book with a page size no larger than 6 by 9. The page should include at least one image in addition to the text. Include all of the information that appears on the original; work in the modern style.
- Choose a page from a mail-order catalog that has a page size smaller than or equal to the page size you used for your grids. Use a grid you set up to create 3 layout variations of the catalog page. Include all of the information that is on the original, but modify it to suit your design.

#### 1. Set sample text

Find or develop sample text that meets readability requirements. It should have an even texture and color appropriate for the design, but it need not have an ideal line length. Use the text specimens provided by a typesetter if available or set your own. Text from magazines and brochures can be used as well if their text specifications can be determined.

#### 2. Determine a line length range

Count characters in the specimen text as shown in the example below. Because we are seeking average line lengths, we determine the line length a little beyond 40 characters for a minimum line and 50 characters for a maximum line. Although 60 characters per line would be permissible on the basis of readability, longer lines are not as typical of the modern page, because they may require extra leading for readability. This means text will not be as compact.



Page structure provides a way of dividing space so that an infinite number of layout possibilities are reduced to a relative few. A structure of consistent subdivisions, consistently followed, provides an inherent balance between elements in a layout. The method we choose to use for creating structure affects, subtly or dramatically, the way the final page will look. Structure, no matter how simple or complex, is almost always apparent on the final page. Lack of structure is apparent as well. There are three key ways that we can subdivide the page. The simplest is segmentation, in which the page is subdivided into smaller areas. Within a segment there is no structure, and elements are placed at random within a segment. Segmentation assures a somewhat even distribution of elements. Segment lines are dividing lines. They do not provide specific positioning, but simply limit the area in which elements can be placed. Because segment lines define areas, these areas could be filled checkerboard style. While segmentation defines areas, it provides no exact position for elements. Positioning guides are another way to structure the page, and offer specific coordinates for positioning elements. Positioning guides, however, do not define space. The modern layout grid offers both segmentation and positioning. Segments called fields define space and are separated by intervals of space. The edges of the fields can act as positioning guides. It is most common to use the top left corner for positioning, but it is possible to use another corner as long as it is done consistently.

+50 characters: 16 picas

Helvetica Light, 8/12, FLRR

+40 characters: 12 picas

### 3. Establish the page frame

Determine the page size, then define minimum margins based on how the page will be used. The page shown below is a right-hand page; the left margin is an inside margin. The left-hand page would be a mirror image of this page.

### 4. Divide the vertical space

Fill the page with text. As shown below, text goes to the edge of the page—the minimum margins are drawn as reminders, not as final margins. Lines marking fields and intervals are drawn so that the top of a field touches the tops of ascenders and caps and the bottom of a field touches the bottoms of descenders. Fields usually contain 4 to 6 lines.

An interval is the distance from the tip of the descender in the line of type above the interval line to the top of the ascender in the line of type below it. Study the diagram below to see how this works. The interval, then, is determined by the specific text and leading settings used rather than by an arbitrary width. Changing the typeface, point size, or leading will change the heights of fields and intervals.

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**5. Determine field width**

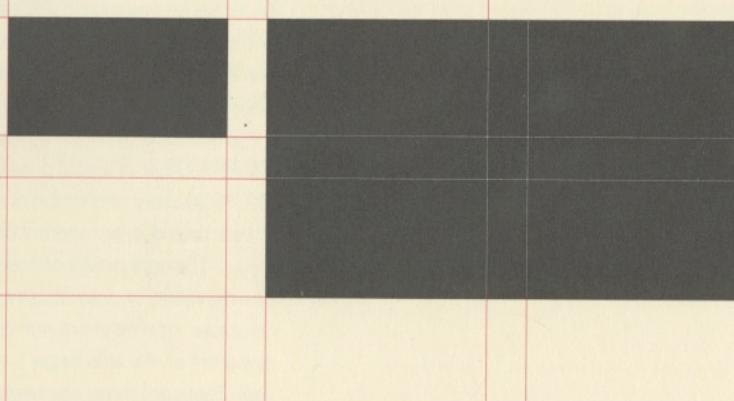
The grid on the page below is based on a 15-pica line length—the longest line that can be used to fit 2 columns on the page area shown within minimum margins. The grid on the next page is based on a minimum line length of 12 picas. Both use the text developed in step 1. Longer lines of type tend to create a horizontal stress on the page; shorter lines create a vertical stress.

**6. Add columns as necessary**

Once text requirements are met, additional columns can be created by subdividing text columns. In the example below, 4 columns have been created from a 2-column text grid; 1 column is just under 7 picas wide. In the example on the next page, 2 text columns were subdivided into 4 columns; the area within the minimum margins was wide enough to allow a fifth column to be added.

**7. Adjust the aspect ratio**

When a specific aspect ratio is desired, a grid can be adjusted by subdividing text columns or by adjusting the number of text lines per field. These options in combination will produce a wide range of aspect ratios. The aspect ratio of a single field is not the same as that of multiple fields, so the relative size of the desired aspect ratio should be considered when making these adjustments.

	<b>Structuring the page</b>	
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### Comparing these grids

The 4-column grid (the grid on the previous page) can hold more words. Contrast and asymmetry are more difficult to achieve with a 4-column grid than with the 5-column grid below. The 5-column grid reserves space which will assure a minimum amount of contrast and asymmetry. The 4-column grid has fields with a horizontal stress, which will add to an overall horizontal feel to the page; the 5-column grid has a more vertical stress.

### Leading restrictions

A typographic grid is based in part on leading. Leading must remain consistent throughout the text. No additional points of leading can be added between paragraphs. Instead, paragraphs can be indicated by a blank line between them, by the way in which lines end short, or by indents. Of these options, indents are the least modern. Grid, text, and leading are a whole, and one cannot be separated from the other.

### Structuring the page

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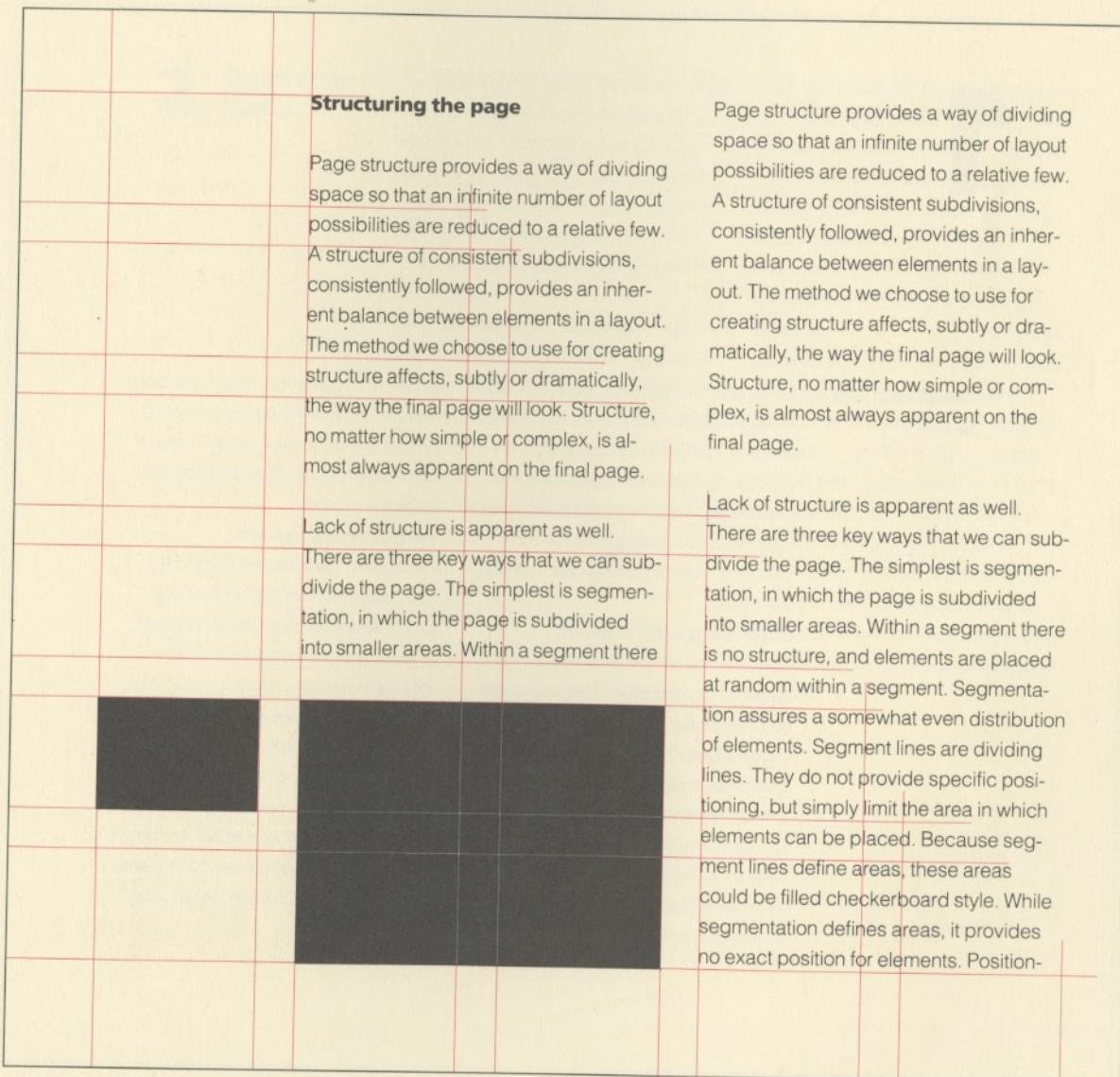
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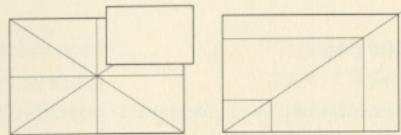
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Any grid can be used a variety of ways without breaking the basic rules for using a grid. Differences in the use of a grid arise because of the way in which the designer interprets emphasis, hierarchy, the relationship between elements, the grouping of elements, and the flow of information. All six layouts shown below and on the following pages use exactly the same grid and information (with the exception of the heading number, which changes in sequence with the variation.)

The first four variations are modern; the last two show traditional typography used on the same (modern) grid. Although the typeface is traditional, it is set to fit the grid. These are only a few of many layout variations possible with a single grid. An even wider diversity can be generated by making minor changes to the grid, such as altering the proportions of the fields.

# 1



## **Construction Basics**

Construction requires no calculation, only a straightedge and a compass or software with the equivalent drawing tools. Construction techniques are useful in layout and design, especially for the traditional style. Before beginning to do the constructions on the following pages, review these basics.

### **Subdividing with Diagonals**

Diagonals subdivide a rectangle evenly, whatever its proportion. Diagonals intersect at the exact center of a rectangle. Using diagonals to find a center is often faster than measuring, especially when a measurement is not evenly divided or requires rounding off.

### **Area vs. Length**

By drawing vertical and horizontal lines through the center of a rectangle we

divide each edge length in half, but divide the area into fourths. A photostat at 50 percent yields the same result—original lengths divided in half, and original area divided in fourths.

### **Comparing Proportions**

Rectangles whose corners fall on the same diagonal have the same proportions. We can compare the proportions of rectangles, no matter how different they are in size, by using diagonals. This is useful in layout, since we often need to block out a space that represents a photograph. By first finding the diagonal of the original photo, we can then draw a rectangle in our layout that has the same diagonal. Pantographs work on this same principle, and they are used in layout for this same purpose.

**Variation 1** (opposite)

The number and diagrams have dominance because they are isolated at the top of the page. The number acts as a graphic element, as well as being informational. Both the diagrams and the number are a single grid field high. The layout is nonlinear: the viewer can begin at the number and either scan across the top of the page or read down to the heading and across to the text.

**Variation 2**

This page has a diagonal emphasis that is achieved primarily because columns are broken so that they become progressively longer. The strong diagonal emphasis tends to direct the eye from the number at the top left to the diagrams at the bottom right rather than to the first column of text.

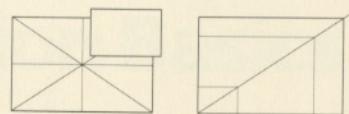
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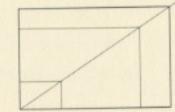
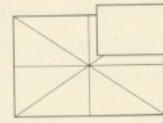
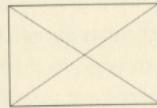
**Variation 3**

This layout is very linear in nature. The introductory text has been separated from the descriptions and placed in a box with the number and heading, both of which have been given considerably less emphasis than in the first 2 variations. The descriptions, as defined by the subheads, are fit into a single column.

An additional but perhaps unnecessary diagram has been added for consistency, and each diagram is aligned to the grid near the text that describes it. A conflict arises: if linearity is to be preserved, each diagram must align with appropriate text. If the grid is to be preserved, however, each diagram must align with the grid. This is an example of how linear layout conflicts with the structured modern page.

**3 Construction Basics**

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**Variation 4**

In this layout, the heading contrasts so much with the other elements and the page that it is likely to be the first element you see, even though it is last in sequence. The eye is also attracted to the bottom of the page because the diagram is located there.

In variation 3 a diagram was added; in variation 4, diagrams have been combined into a single diagram. It is about the width of two grid fields. The wide left margin helps keep the layout asymmetrical even though the text, diagram, and heading are compactly grouped.

Construction requires no calculation, only a straightedge and a compass or software with the equivalent drawing tools. Construction techniques are useful in layout and design, especially for the traditional style. Before beginning to do the constructions on the following pages, review these basics.

**Subdividing with Diagonals**

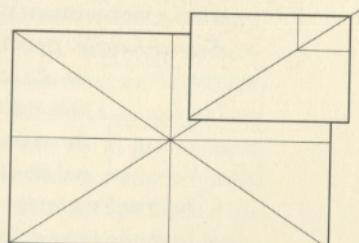
Diagonals subdivide a rectangle evenly, whatever its proportion. Diagonals intersect at the exact center of a rectangle. Using diagonals to find a center is often faster than measuring, especially when a measurement is not evenly divided or requires rounding off.

**Area vs. Length**

By drawing vertical and horizontal lines through the center of a rectangle we divide each edge length in half, but divide the area into fourths. A photostat at 50 percent yields the same result—original lengths divided in half, and original area divided in fourths.

**Comparing Proportions**

Rectangles whose corners fall on the same diagonal have the same proportions. We can compare the proportions of rectangles, no matter how different they are in size, by using diagonals. This is useful in layout, since we often need to block out a space that represents a photograph. By first finding the diagonal of the original photo, we can then draw a rectangle in our layout that has the same diagonal. Pantographs work on this same principle, and they are used in layout for this same purpose.

**4****Construction Basics**

**Variation 5**

At first glance this layout may not seem to use the same grid as the last 4. This is because traditional rather than modern typography and layout principles have been applied to the modern structure. The traditional typeface has been set on the same leading, but it is 1 point size larger to compensate for the smaller x-height.

Positions for the heading and text were determined by the grid. The diagrams have been placed by their relationships to the text rather than by the grid. Because each is one grid field high, and the height of the grid fields corresponds to the text leading, they fit easily into the text. Contrast and asymmetry have been minimized, and details such as the small caps help give this layout a traditional flavor despite a modern structure.

**Variation 6 (opposite)**

This layout is based on the same grid as used for the previous layouts, and the same traditional typeface and size has been used as in variation 5. An even texture was difficult to achieve because text was justified on a short line length. The text and heading are positioned on the grid, but the diagrams have been centered within the text columns without regard for any other structure except the writing.

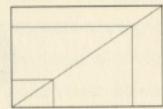
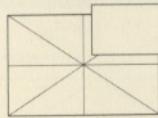
## 5 : Construction Basics

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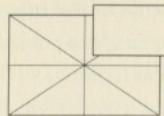
### Exercises

1. Evaluate each of these 6 variations on a scale of 1 to 10 (10 being the best) on each of the following criteria: visual interest; readability; appropriate hierarchy for the information; easiest to scan for information; easiest to associate text with appropriate diagram; best application of design principles.
2. Create your own set of at least 4 variations on the grid you developed for topic 9, exercise 2. Evaluate your variations on the criteria listed in exercise 1.
4. Collect a set of at least 12 variations for a single category (e.g., tables of contents, chapter openings in novels, technical specifications for cars or electronic products, etc.) Evaluate them in terms of structure and style.
5. Find related printed pieces (e.g., data sheet and product brochure). Determine whether they use a grid and whether it is the same grid.
6. Apply what you have learned about using grids from this series of exercises to the redesign of a page from a textbook or technical journal. Be sure to include all of the information presented on the original page.

## 6 : CONSTRUCTION BASICS

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The following two examples both use the same information presented in the previous six examples, but the page shape has been changed to more traditional proportions, and the structure has been changed to traditional constructed margins. These two examples show traditional and modern typography on a traditional structure; linearity is an integral part of such a structure.

#### Variation 1

This traditional typography has a characteristic light color and even texture, which is reflected in the diagrams, subheads, and headings. The only contrast on the page is provided by the wide margins and the initial cap marking the beginning of the text.

The unity achieved on a traditional page is fragile: if the texture is broken by uneven leading or spacing, if elements are too large or too bold, or if the diagrams are placed out of balance with the page's symmetry, for example, the effectiveness of the style is lost. No page structure exists for positioning elements except margins and text.

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**Variation 2**

Although the structure of this page remains traditional, the typography is modern, with characteristically tight leading and kerning. Headings are bold and the right margin is ragged. As the structure offers no guidance for the placing of diagrams, spacing between elements is adjusted by leading or simply

by eye. The text is broken into groups by the extra space that has been added before the subheads. This space in conjunction with the bold type provide contrast on the page. Nevertheless, the subtle spacing and proportioning provided by a grid is missing; the page remains relatively passive.

**Exercises**

- Find at least 6 examples of traditionally structured pages, and determine whether the type used on them is modern, traditional, or a combination of the two.
- Find a traditional page with traditional type and redesign it with modern type. Use the same structure and page size as on the original.
- Find a page of modern type and redesign it with traditional type. Use the same structure and page size as the original.
- After completing exercises 2 and 3, answer the following: Which is more space efficient, modern or traditional typography? Why? Which was easier for you to work with, modern or traditional? Was it easier because you liked it better, because you were already familiar with it, or because that style is just naturally easier to use?

**1: Construction Basics**

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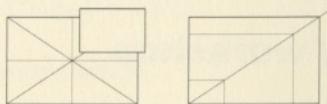
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Graphic elements serve not merely to decorate the page, but to direct the eye and to help us differentiate levels in a hierarchy. When adding graphic elements we must strike a balance between unity and variety—too much unity and graphic elements do not attract the eye; too much variety and they serve to distract the eye rather than to direct it.

All of the variations shown here have exactly the same type and layout; the only elements changed are the graphic elements. All of these graphic elements could be created with typesetting equipment, and they are only a few of many variations possible without modifying the size and position of the type itself. It is useful to think about the graphic elements when planning the type, however, so that appropriate leading is established.

### Exercises

1. Evaluate each of these variations on a scale of one to ten (ten being the best) on how well the graphic elements reinforce the relative importance of headings, direct the eye, enhance communication, and use modern design principles. On the basis of this objective evaluation, which is best? Does this agree with your subjective judgment (taste)?
2. To which of these variations could you easily and logically add a third hierarchical level higher than those levels shown? Lower than those levels shown? To which of these variations would it be difficult or impossible to add more levels?
3. Which of the examples shown here could be readily adapted to a multiple-column page? Which ones could not?
4. Apply one of these variations to some other text. Compare it to the original, and look for differences in the width and length of the graphic element and the proximity of that element to the type. What changed? Was the change intentional, and if so, why?
5. Add a third hierarchical level to the same text you used in exercise 4 and add graphic elements to all three levels to reinforce the hierarchy. Use either one of the variations shown here or develop your own graphic elements.

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#### Enrollment

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