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REVISED EDITION

PRODUCTION FOR THE GRAPHIC DESIGNER

BY JAMES CRAIG

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*Dedicated to every graphic designer
whose printed piece did not quite measure
up to expectations.*

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Acknowledgments

Introduction

Although specifically written for the graphic designer and the design student, this book is equally intended for anyone connected with the production of printed matter, whether in editorial, promotion, or even production. It is also intended for those in specific areas of production—typographers, printers, etc.—who would like to learn more about how the other areas operate.

My purpose in writing *Production for the Graphic Designer* was to enable a person wishing to understand any area of production to locate the desired information, fast, within the covers of a single book. It was also my purpose to present the information in as simple and straightforward a manner as possible. To this end, the concepts have been kept basic enough to serve one purpose: to give the designer the necessary information so as to be able to make the most informed decisions all along the way, from rough comp to finished printed piece.

The designer should know enough about production to understand: (1) what the possibilities are in terms of typesetting, printing, paper, etc. (2) what factors to consider when choosing between systems, methods, processes, etc., and (3) how to *communicate* specifications to the people responsible for translating the designer's ideas into a printed piece.

Throughout, I have tried to keep the book simple and free from unnecessary or overly technical information. And I have tried to maintain the concept of the book as a working tool; that is, a book that contains *useful* information rather than information for information's sake.

Finally, the glossary, which contains over 1,100 entries, brings together definitions and explanations from every area of production to offer an up-to-date, comprehensive, single reference source for students, teachers, and professionals.

It is my hope that this book will help fill the gap between design and production, expanding the potential of the graphic designer, easing the transition from older methods to newer ones, and helping the designer plan ahead and work with production to get the desired results.

Comments on the Second Edition
In the 1967 film *The Graduate*, Dustin Hoffman is taken aside by a well-meaning friend of the family and given a single word of advice "Plastics." Today, the word would no doubt be "Electronics."

Since *Production for the Graphic Designer* was first published in 1974, electronics has completely revolutionized the communications industry and significantly changed the way in which graphic designers work. Copy can now be prepared on disks, designs created on video screens, images screened and separated by lasers, and entire jobs sent in digital form anywhere in the world at lightning speeds.

While computer technology has increased speed and cut down on drudgery, it has not altered what is expected of the product. We still look for excellence in design, quality printing, and paper suited to the job. The computer has merely provided new tools with which to achieve the same quality production that has always been the designer's primary goal. This marriage of new technology to traditional values means that much of *Production for the Graphic Designer* has not been altered. On the other hand, entire sections have been added to encompass desktop publishing, laser imagers, digital type, etc.

This revised edition of *Production for the Graphic Designer* reflects, we hope, the same mix of traditional and new that the designer will encounter in the workplace and will help provide a balance between the time-honored information inherent in fine design and the ever expanding possibilities offered by computer technology.
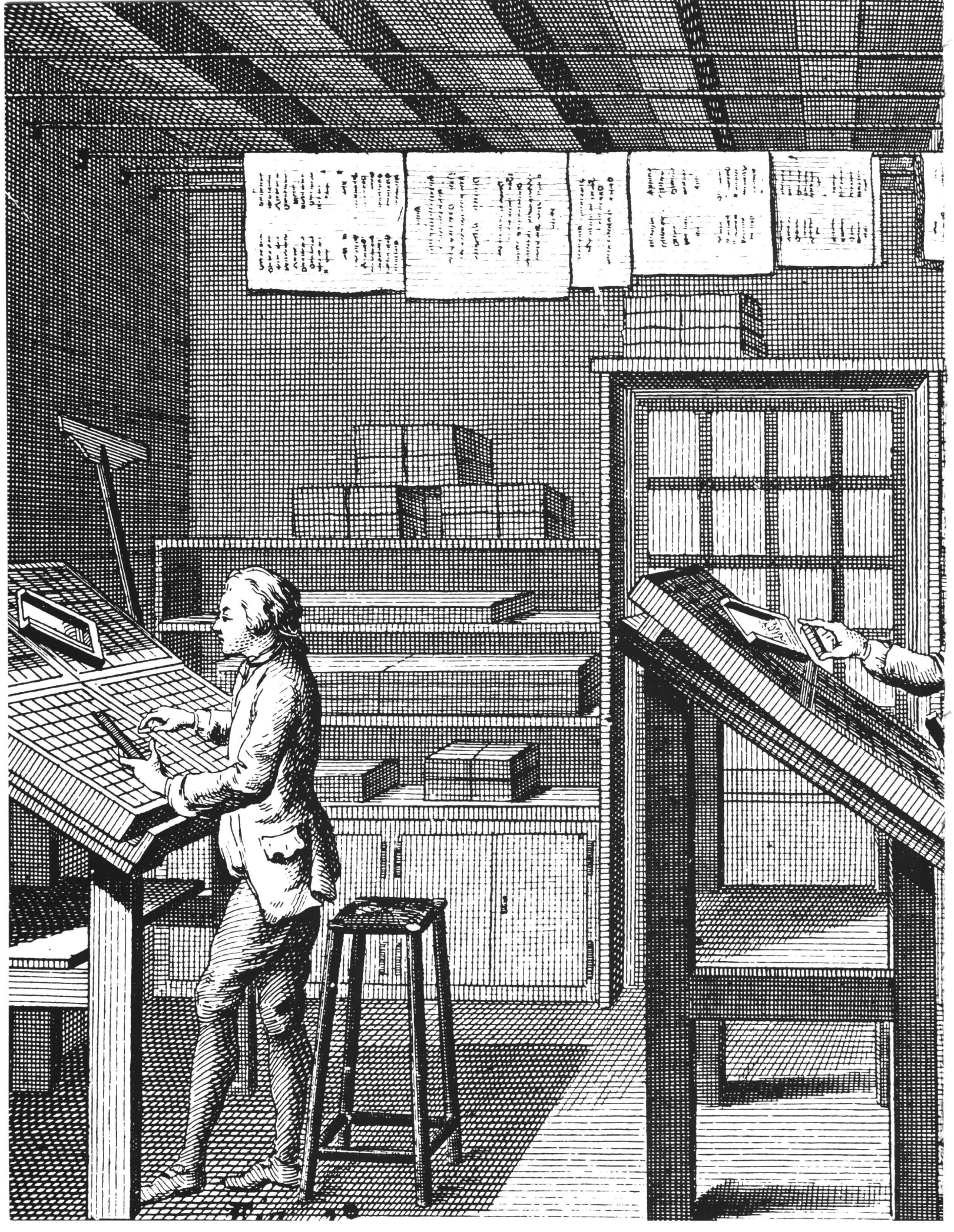
Typesetting

Typesetting, also called *composition*, was traditionally done by the printer. Until this century most printing shops had their own composing room and compositor, or typesetter. Today, most printers have given over the function of typesetting to typographers and service bureaus.

In this section we shall discuss the five ways type is set: by *hand*, *machine (casting)*, *typewriter*, *phototypesetting*, and *digital composition*. We shall begin with a brief review of the basics of typography in order to define the terminology that is used throughout this book.
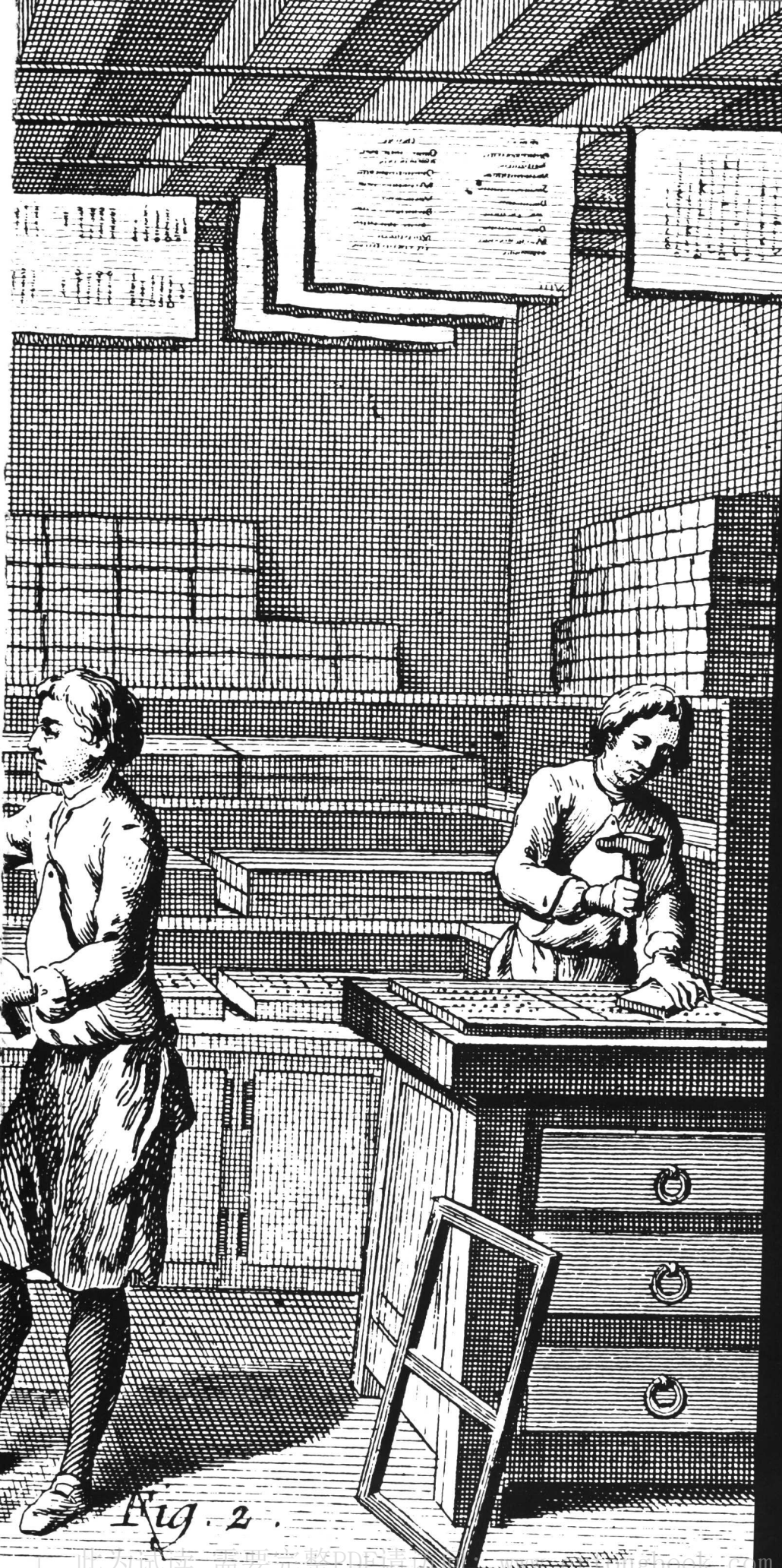
An 18th century composing room. The two compositors at left and center are setting type in composing sticks and assembling lines of type into wooden trays, called galleys. The "stoneman" at right is using a planer to level a form made up of pages of type locked up in a metal chase, like the one in the foreground.

Typography

The basic terminology used in all typesetting methods is derived from metal type. As we shall see later, some of the terms have been modified to accommodate the newer typesetting methods, such as photo and digital composition, but most are still in use today, regardless of the typesetting method.

ABCD
EFGHIJK
LMNOPQRST
UVWXYZ
abcdefghijklmno
pqrstuvwxyz
1234567890
& .,:;""?!()
• /#$%¢*

FONT OF TYPE

FACE
(PRINTING SURFACE)

POINT SIZE
OR
BODY SIZE
(DEPTH)

TYPE-HIGH
.918″
(HEIGHT)

SET
(WIDTH)
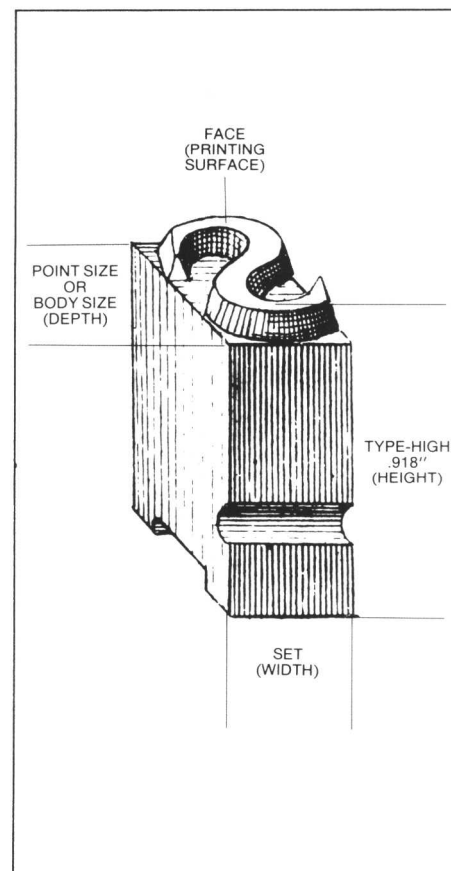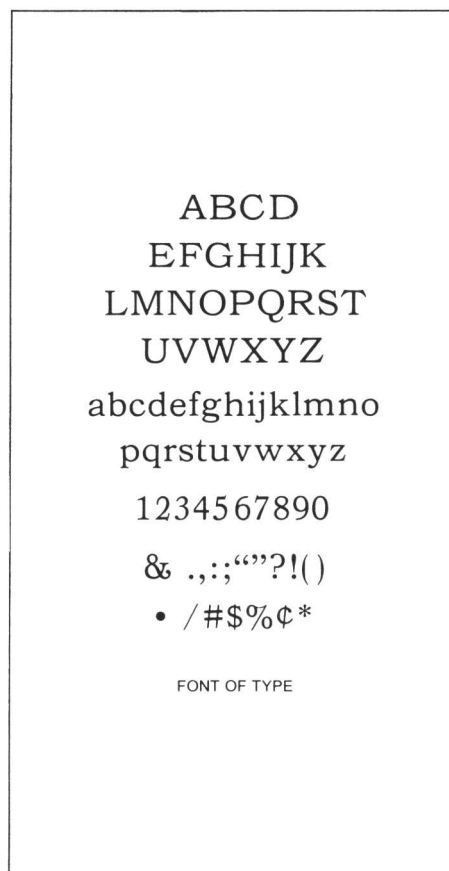
Type. The individual letter, figure, or punctuation mark is called a *character*. The large letters are called caps or *uppercase* characters; the small letters are called *lowercase* characters. Traditionally, a complete alphabet of one style of uppercase and lowercase characters, with figures and punctuation marks, is called a *font*. Today, the term is used more freely and may represent all the sizes of a particular typeface.

If we group together all the type sizes and type styles of a particular typeface (roman, italic, bold, extended, condensed, etc.), we get a *family* of type.

Measuring Type. There are two basic units of measurement in typography: *points* and *picas*. There are 12 points in a pica and 6 picas in an inch. Type is measured in points; the line length, or *measure*, is measured in picas.

To understand how we arrive at the point size of type, let's examine a piece of type: it is a rectangular block of metal with a printing surface on top. The block is called the *body*, and the printing surface is called the *face*.

The height of the body is .918″ and is known as *type-high*. Although this dimension is not important to the designer, it is very important to the printer that all type be exactly the same height in order to print evenly.

The width, called the *set width*, is dictated by the width of the individual letter, the letters *M* and *W* being the widest and *I* being the narrowest.

The depth, known as the *point* or *body size*, is the dimension by which we measure and specify type.

Type comes in many sizes, the most popular typefaces ranging from 5 point to 72 point. Type sizes 12 point and smaller are referred to as *text types*, those larger are called *display types*.

EM QUAD (SQUARE OF THE POINT SIZE)

EN QUAD (1/2 OF AN EM)

3-TO-THE-EM SPACE (1/3 OF AN EM)

4-TO-THE-EM SPACE (1/4 OF AN EM)

5-TO-THE-EM SPACE (1/5 OF AN EM)
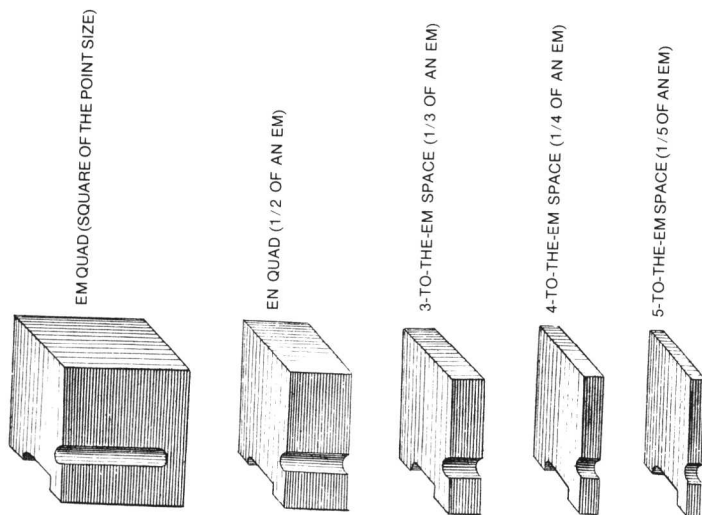
This   line   is   spaced   with   em   quads
This line is spaced with en quads
This line is spaced with 3-to-the-em spaces
This line is spaced with 4-to-the-em-spaces
This line is spaced with 5-to-the-em spaces

LETTERSPACE
REGULAR

LETTERSPACE
1 POINT

LETTERSPACE
2 POINT

LETTERSPACE
3 POINT

LETTERSPACE
4 POINT

Wordspacing. Spacing between words, with metal type, is accomplished mechanically by inserting pieces of metal between words. Being lower than the printing face of the type itself, they do not come in contact with the paper and therefore do not print.

These pieces of metal, called *spaces* and *quads*, are related in size to the *em quad*, which is the square of the type size. For example, if the type is 60 point, the em quad is a square 60 points x 60 points; if the type is 10 point, the em quad is 10 points square.

Since an em quad would produce too much space between words, smaller pieces of metal, which are subdivisions of the em quad, are used. *Normal* word-spacing assumes the use of ⅓ of an em space between words, or 3-to-the-em spaces; *tight* wordspacing, 4-to-the-em spaces; and *very tight*, 5-to-the-em.

Letterspacing. The materials used for spacing between letters are very thin. Most fonts have spaces of 1 point (made of brass) that can be used singly or in groups. Others are even thinner: ½ point (copper) and ¼ point (stainless steel). There is even a letterspace made of paper. Consider how thin a piece of paper is—this will give you an indication of just how finely letterspacing can be adjusted.

Note: With some technologies letter-spacing is also referred to as tracking.
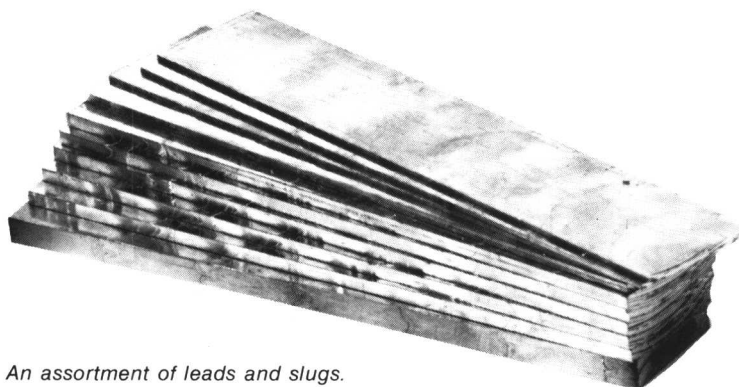
An assortment of leads and slugs.

1 POINT LEAD

2 POINT LEAD

3 POINT LEAD

4 POINT LEAD

6 POINT SLUG

There are five basic ways to arrange lines of type on a page; the style you choose is dictated by esthetics, legibility, and the amount of copy to be set.

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Leading. In addition to the space between words and letters, it is also possible to vary the space between the lines of type. To accomplish this, metal strips of various thicknesses are placed between the lines. This is called *leading* (pronounced *ledding*) or *linespacing*.

The metal strips themselves, called *leads (leds)*, are measured in points. The most common sizes are 1, 2, 3, and 4 point. Leads 6 points or more in thickness are called *slugs* and are cast in 6, 12, 24, and 36 point. Both leads and slugs are less than type-high and therefore do not print.

Type that is set without leading is said to be set *solid*. If 10-point type is set with 1-point leading, it is set "10 on 11," which is indicated 10/11: the first figure indicates the type size; the second figure, the type size *plus* the leading. The type you are now reading is 9/11 Helvetica; that is, 9-point Helvetica type with 2 points of leading.

Arranging Lines of Type. There are five basic ways to arrange lines of type on a page. (1) *Justified:* all the lines are the same length and align both on the left and on the right. (2) *Unjustified:* the lines are of different lengths and align on the left and are ragged on the right. (3) A similar arrangement, except now the lines align on the right and are ragged on the left. (4) *Centered:* the lines are of unequal lengths with both sides ragged. (5) An *asymmetrical*, or random, arrangement which has no predictable pattern in the placement of the lines.

36-POINT EM   36-POINT EM DIVIDED INTO 18 UNITS   72-POINT EM DIVIDED INTO 18 UNITS   18 UNITS   10 UNITS   6 UNITS
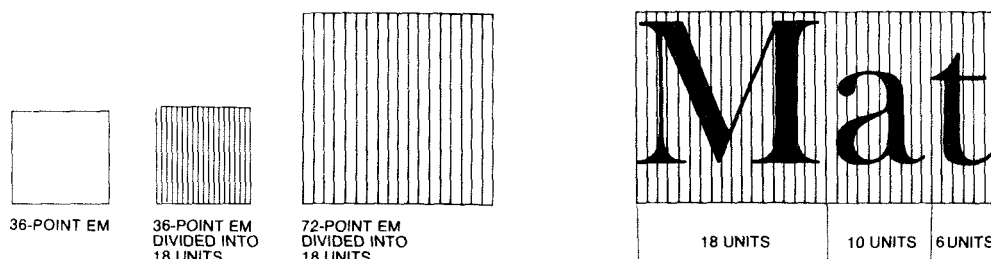
PLUS 1 UNIT LETTERSPACING   The quick brown fox jumped over the lazy sleeping dog.

NORMAL LETTERSPACING   The quick brown fox jumped over the lazy sleeping dog.

MINUS 1 UNIT LETTERSPACING   The quick brown fox jumped over the lazy sleeping dog.

MINUS 2 UNITS LETTERSPACING   The quick brown fox jumped over the lazy sleeping dog.

MINUS 3 UNITS LETTERSPACING   The quick brown fox jumped over the lazy sleeping dog.

Unit System. The unit system is a measuring and counting system used by photo- and digital typesetting systems to determine when a line of type is ready to be justified. It is based on the division of the em (the square of the type size) into equal, machine-recognizable increments called *units*.

If you examine the illustration above you will see that the em has been divided into 18 equal segments, thus forming the basis of an 18-unit system. You will also notice that the size of the unit, like the size of the em, varies from one type size to another. For example, a unit of 72-point type will be larger than a unit of 36-point type.

Measuring Type in Units. The set width of individual characters and spaces is designed with a fixed unit width or *unit value*. This unit value also includes a small amount of space on either side of the characters to prevent them from touching when set.

To get an idea how this system works let's set the word *Mat* on an 18-unit system. The cap *M* is 18 units wide, the lowercase *a* 10 units wide, and the lowercase *t* 6 units wide. So the entire word is 34 units wide, regardless of the type size.

By thus totaling the unit values of the characters and the spaces between the words, a counting mechanism is able to measure a line of type in units and determine when it is ready to be justified.

Advantages of the Unit System. One advantage of using the unit system is that the "color" of the setting can be controlled by adjusting the units of space between the letters. This means that the type can be set with regular, loose, tight, or very tight letterspacing.

Letterspacing can also be adjusted on a selective basis, reducing space between certain letters while the rest of the setting remains the same. This is called *kerning* and is usually used in letter combinations that are improved by the deletion of one or two units of space, such as *Te, Ta, Ve, AW, YA,* etc.

The number of units to the em varies with the manufacturer and may be 4, 9, 12, 18, 32, 36, 48, or more. The greater the number of units to the em, the closer together the letters can fit (letterfit) and the more flexibility there is in word-spacing and letterspacing. Although a greater number of units to the em results in a greater possibility of typographic refinement, for the average job there is a point beyond which further refinement is either unnecessary or unnoticeable.

Handset

The process of setting type by hand has changed little since Johann Gutenberg's time in the 15th century. The compositor, or typesetter, works with the same tools now as then: a composing stick, a type case (a shallow tray, divided into compartments, that holds the type), and the metal type itself (letters, punctuation marks, figures, and spaces). The type is known collectively as the *font* and individually as *characters*. Characters that are not part of a regular font are called *sorts*.

Setting. First, the compositor adjusts the composing stick to the desired pica measure, or line length. To set type, the composing stick is held in one hand and with the other hand type is selected from the type case. To justify the lines of type additional wordspaces or letterspaces are added.

To create the proper amount of leading, the compositor inserts metal strips called *leads* between the lines. When the composing stick is full, the lines of type are transferred to a long shallow tray called a *galley*. The compositor continues to set type until the galley is full or the job is completed.
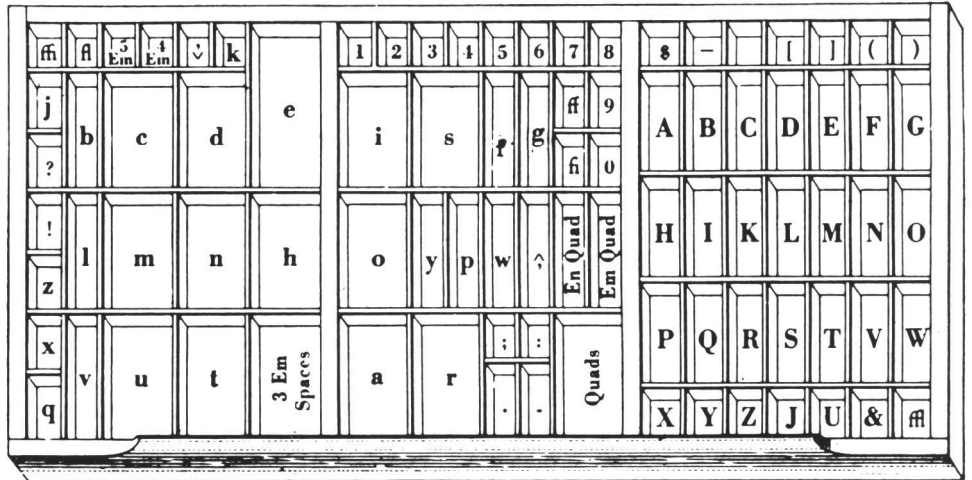
California type case.

The next step is to "make up" the job; that is, to assemble the various elements (text type, display type, rules, cuts, etc.) according to the designer's layout. If the job is small, it may be made up directly on the galley; if larger or more complex, it may be made up on an imposing table, traditionally known as the "stone."

Because the type consists of hundreds of individual pieces, it is important that they be held together securely, or "locked up." This is done by tying up the type with string, or by surrounding it with "furniture": strips of wood, metal, or plastic. These in turn are held firmly in place with metal clips or magnets. Type can be locked up in three ways: on the galley, in a metal frame called a *chase*, or directly on the bed of the press.
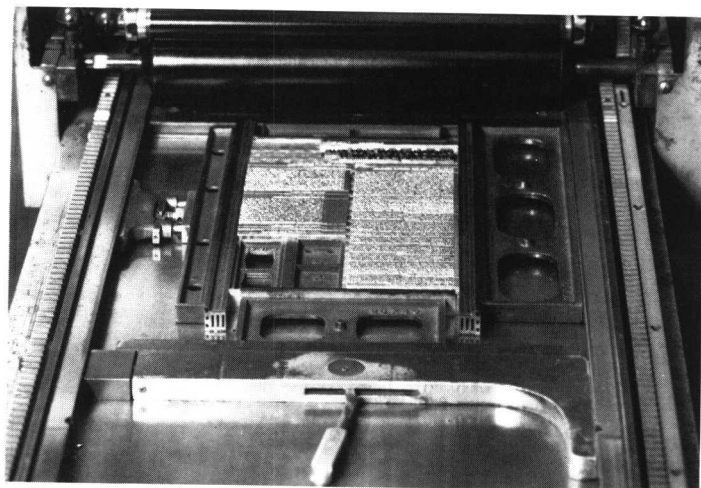
Collectively, type and other printed matter locked up and ready to be proofed or printed are called a *form*.
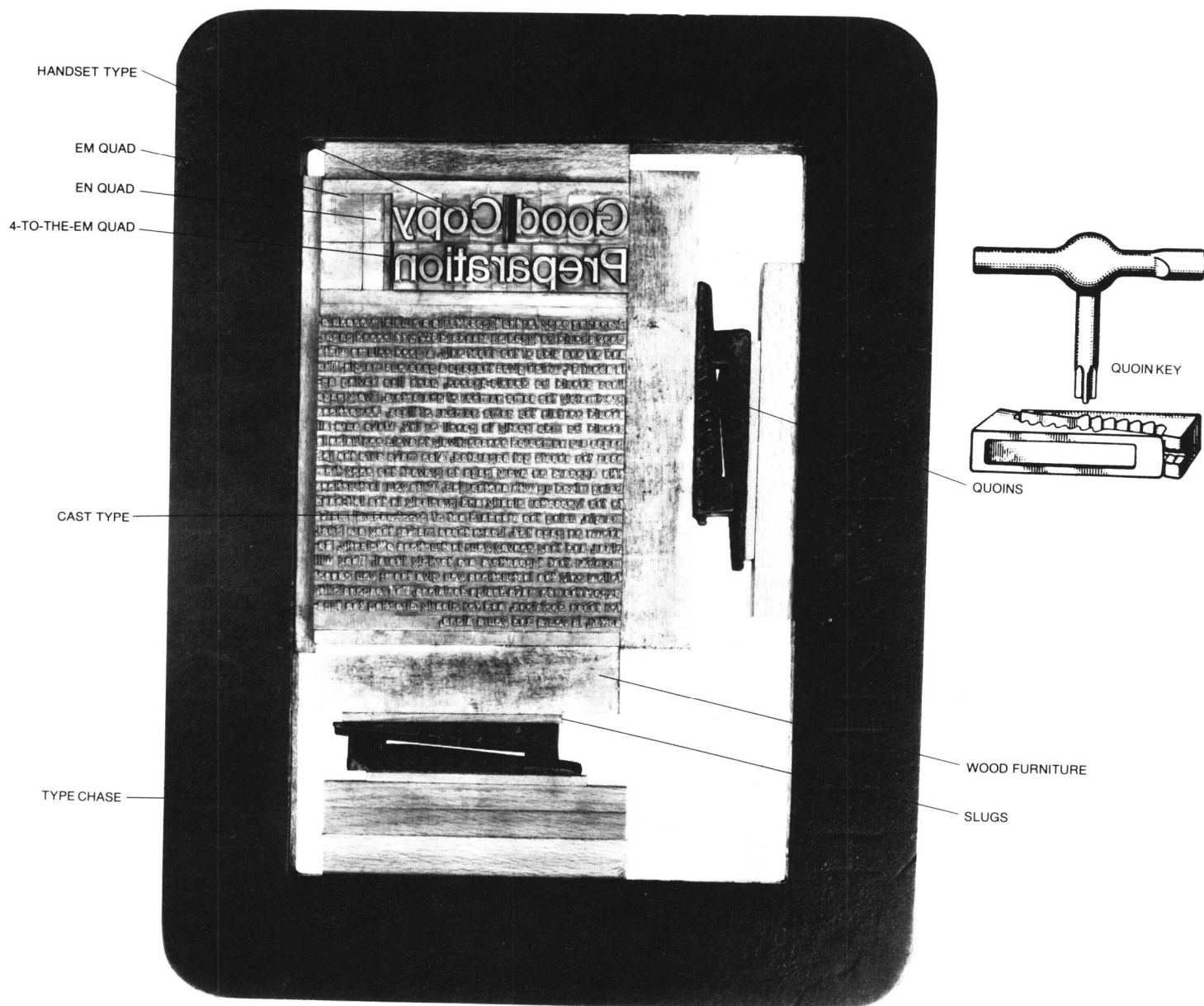

INDIVIDUAL PIECE OF TYPE

SLUG

WORDSPACE

Composing stick.
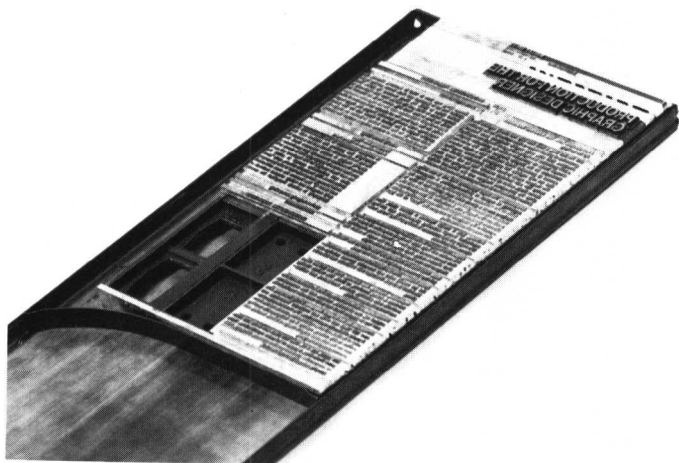
Type in a galley, held in position with galley clips.

Type form, locked up on the bed of a proofing press.

HANDSET TYPE

EM QUAD

EN QUAD

4-TO-THE-EM QUAD

CAST TYPE

TYPE CHASE

QUOIN KEY

QUOINS

WOOD FURNITURE

SLUGS

Type locked up in a chase ready for proofing.