

Costs in Composition Plants

How the many kinds and sizes of type composition are analyzed and sold by trade composition plants. Linotype (and Intertype), Monotype and Ludlow production of the many kinds of typesetting are variously classified and their unit basis for time required is detailed in the *Guide For Estimating Composition*, issued by the International Typographic Composition Association. These "trade rules" are discussed here for their significant relationship to the sale of Linotype equipment to *all* branches of the Printing and Publishing Industries as well as to the special-purpose plants that deal principally in type

Costs, Estimating, and Productivity

THIS UNIT of the Sales Manual is directed first to sales trainees or to others in the Linotype organization who may not have had direct experience in actual typesetting. Boldface type is used for this reprinting of the *Guide for Estimating Composition*—the paragraphs in Roman type are explanatory comment by the Editors of this Manual. Readers who have a printer's experience will not need the explanations but they may find value, for the study of sales possibilities, in the *Guide's* classifications and cost factors.

The *Guide* demonstrates that different kinds of typesetting vary substantially in cost. It is a detailed comparison of the wide variety of composition used in commercial printing and book work, furnished by the trade composition plants to thousands of printers across the country. These printers usually sell competitively, with their sales based on prior estimates, in which the costs of typesetting are often a large factor. Working for the good of its membership, the ITCA constantly seeks to enlighten each member on his costs of production—thus to charge accordingly and make a profit. The *Guide* emphasizes many complications in typesetting, for which premium costs are incurred, that might be overlooked in making preliminary estimates. Such complications, as related to Linotype and other operations, should be recognized by all of us.

In thus stressing unit costs of typesetting as related to Linotype sales, however, we must realize that the costs of typesetting for *newspapers* are not computed

or surveyed by such a set of rules as comprise this *Guide*. Newspaper plant equipment and its operation are dictated by their peak loads, in terms of total numbers of columns or pages to be set for their biggest editions. Yet the content of newspapers includes many varieties of composition (stock tables, box scores, and the like) whose counterparts are classified in this *Guide*. In such comparisons of machine output these discussions may be applied to newspaper problems.

Hour Costs in Dollars vs Units of Production

FEDERAL LAWS now prohibit a trade association from issuing general price lists expressed in dollar values of its members' products. But it is permissible to make trade studies of methods of production and to publish tables of the recognized amounts of time required to perform various kinds of work. Under this restriction—and because actual costs vary in different regions and plants—the work classifications in the *Guide* are priced in *units*—each unit being 1/10 of an hour, or 6 minutes.

The estimator studies the "copy" to be set in type, breaking down the various kinds of composition required. He applies the data in the *Guide*, arriving at a total number of units which, by moving a decimal point, become the total hours for each of the major classifications of work: machine, handwork, proofreading, etc. His prevailing hour rate for each classification determines the overall probable cost of the job.

The Necessary Components of Costs

COST ACCOUNTING systems are now widely used in the Printing Industry. Composition plants, often staffed by working partners with or without other help, have been notoriously inclined to charge what seem to be prevailing rates (or enough less to get the job) and then hope for a profit. In connection with these discussions let's give thought to what makes up costs of product.

Hour costs (the basis of most estimating in the Printing Industry) are sometimes casually thought of in terms of the wages paid to the men who run machines or do other work. But that item, which the accountants call "flat labor costs," is a lesser part of the total cost. For instance, a Linotype operator may be paid \$2.50 an hour in a plant whose actual Linotype hour cost might be \$6.00 an hour.

The general factors of overall plant operating costs which enter into the hour costs used in estimating and billing include:

1. *Flat labor*—wages paid workers
2. *Supervisory*—management, office, maintenance personnel
3. *Sales expense*—wages or commissions and incidental expense
4. *Rent* or cost of plant ownership
5. *Light, heat, power and maintenance supplies*
6. *Depreciation* of equipment
7. *Cost of invested capital*
8. *Insurance*
9. *Taxes*

These major elements of cost (which do not include materials used in the product—type metal, etc. in composition plants, plus paper, ink, etc. in printing plants)—these essential phases of doing business are inevitable in every plant. Added up and divided by the number of hours of production, they yield a total hour cost.

But the element of productivity is likewise vital. Even in those businesses which are constantly active at full capacity there must be measurable periods when a machine or an entire department is not producing work that can be billed. But the overhead costs continue regardless of production, therefore the formula which divides total costs by the number of productive hours, thus arriving at the *chargeable* hour cost.

Profit, the incentive for engaging in business, is usually added to the chargeable hour cost to arrive at the hourly rate to be used in estimating and billing. Sometimes profit is added to estimated costs, but that practice is discouraged because of the temptation in strenuous competition to "forget the profit and get the job."

In printing plants separate hour costs must be established for various departments and classifications of machines and operations. In the composition plants, as discussed here, separate hour costs are recognized for

- a. *Linotype operation* (Intertype at same figure)
- b. *Monotype*—usually divided into keyboarding and casting
- c. *Floor work*—including Ludlow, make-up, hand composition, etc.
- d. *Proofreading*—sometimes carried in general overhead

Having recognized the purposes and uses of such cost data, we may study the *Guide* as an instrument for measuring probable productivity in terms of the complexity of the job to be composed. If some of its production standards seem low, in terms of what we know about the Linotype's capacity, then we read the statement by ITCA: "This guide, in its present form, is an expression of practices and customs which have been observed generally in the composition industry for the past 50 years, and are recognized as being established on production data as well as the expression of intelligent and experienced opinion."

Now let's study the *Guide*.

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General

(Each "unit" listed hereinafter consists of 6 minutes or 1/10 of an hour.)

MACHINE—Composition produced on Linotype, and Intertype slug-casting machines and Monotype single-type composing machines.

Straight-matter—Defined as ordinary reading matter set in English in one size and face of type, not made up into pages or forms, minimum width of 20 ems of the type used.

HAND WORK—Composition set by hand in foundry or machine-cast type.

Make-up—The process of assembling type or slugs, spacing material and rules, etc., in completed pages or forms for printing.

1. Layout, mark-up of copy, paste-up of proofs, mortising and mounting plates, foundry lock-up and proofreading are separate chargeable operations and should be estimated or charged at time work.

1. *Layout* (the indication of type faces, sizes and measures, plus arrangement of type masses) may be fully indicated on the copy as received from the customer. Most printing is planned in advance of selling, but often on a "dummy" or sketch basis, leaving precise layout to follow completion of the sale. Then the typesetter must analyze the prospective job without sufficient actual indication of its complications.

Mark-up of copy is a plant function, similar to layout but often expressed with colors and symbols that form a shorthand notation understood by all the workers. Frequently this is a foreman's duty but in larger plants (and in the handling of display advertising in newspaper plants) mark-up is a specialist's job.

Paste-up of proofs is often required to combine typematter with illustrations or otherwise to present proofs to show the approximate arrangement of the ultimate printing.

Mortising covers the cutting out of areas in engravings or electrotypes to be filled by type masses.

Mounting plates may be required to bring up to type-high engravings, electrotypes or stereotypes received un-mounted.

Foundry lock-up covers the special preparation for electrotyping a type page or form. It requires suitable blank spacing materials, must be surrounded by type-high *bearers* or guards, all firmly and accurately locked within a heavy steel frame or *chase*. Only thus prepared

can typematter be molded under heavy pressure to form the matrix surface upon which copper or nickel is electrically plated.

Proofreading, as previously noted, is sometimes treated as a phase of operating overhead. But here it is listed as a chargeable item, thus promoted by ITCA in the effort to make its members more cost conscious.

2. Sizes above 10 point are measured as 10 point, both set-wise and point-wise.

2. This highly important general stipulation puts a "penalty" on type sizes larger than 10 point because experience has shown that the highest operating productivity on average composition is attained in 10-point faces in normal measures.

Set-wise measurement applies to length of type line. While normal shop practice uses the *pica* scale with its 12-point units, this 10-point limitation means that length of line is to be measured in 10-point ems. Thus a line of 12-point type to be set 20 *picas* wide, per layout, would be computed in estimating and billing as 24 10-point *ems* wide. The total of thousands of *ems* to be set is vital, because most production rates are established in *ems*, as will be noted.

Point-wise measurement is a trade term (growing out of the point-size definition of type body size) covering the depth of the column of type. Again the total depth in points is divided by 10 to find the equivalent number of 10-point lines which establishes the price. If the job would actually total 1,000 12-point slugs it would be figured with the penalty factor of 2/10 point-wise, thus adding 2/10 of 1,000 or 200 lines—making the estimate or bill based on 1,200 lines total.

If a job were figured for composition in 14 point, then the penalty factor would be 4/10, and 1,000 actual lines would become 1,400 lines for estimating and billing.

This application of *penalties* keeps the *Guide* far less complex than it must become if separate rates were stated to cover all the variables that affect productivity.

3. Leaded matter is measured as solid.

3. For example, 1,000 lines of 10-point type leaded 2 points by setting it on a 12-point slug, would be measured as 1,200 lines at the 10-point rate.

Offhand this may seem like an imposition on the customer, since the operator makes exactly the same

number of key touches to set matter either solid or leaded. Usually the leading is accomplished by casting on a correspondingly larger slug body (or type body with Monotype). But that involves more metal and the handling of more actual area of type. If the leading is done by inserting leads or slugs after casting that becomes a separate operation. Either method involves measurable added cost.

4. **Composition containing broken measures is calculated according to the longest line or a minimum line of 20 ems of the point size of type used.**

4. *Broken measures*, meaning varying lengths of line within one piece of composition, necessarily add cost for the machine changes they require. This factor is one of the prime sales arguments for the Mohr Saw on a Linotype—with it, such penalty work can be handled without much added time in operating.

It must also be recognized that broken measures, on Linotype composition, are usually handled by setting the entire job on the maximum slug measure. Then

all the slugs for other measures must be sawed later, except when the Mohr Saw is used.

5. **Author's alterations are chargeable as time work.**

5. *Author's alterations* are the unpredictable bugaboo in all kinds of composition. Writers traditionally get new ideas when they meet their brain-children in type proofs—and some degree of change affects almost any printing project between its start and the actual rolling of the presses. Some book publishers, in their contracts with authors, permit a stated percentage of composition costs to cover alterations and the author must pay for any further changes he demands. But the typesetter can never foresee the extent and cost of "A A" (the trade term), thus must charge it as a time item.

6. **When composition contains two different penalties the penalties are each added to the basic rate. If the sum total of the penalties amounts to more than double the price the matter should be estimated as time work.**

6. Needs no explanation if you have understood the foregoing examples of the application of penalties.

Linotype Composition—Single Price

For each complete change of machine, including magazine, sorts tray, liner, etc., estimate 2 units. Change of magazine and sorts tray only, 1 unit. Change of measure only, including liner, 1 unit. (This time does not include instructions on copy, for which a separate charge should be made).

Here is an ITCA rule which provides sales argument for multiple-magazine Linotypes on those classes of work wherein frequent changes of face may not require corresponding magazine changes. For bookwork, as an example, the machine might carry 6, 8, 10, and 12 point, with a flow of copy that stays for long periods within one type face in these sizes.

A complete change, as defined, requiring 2 units of time, would cost \$1.20 if the Linotype hour cost is \$6.00 (to use a fairly prevalent figure). Ten such changes during a day's work would thus cost \$12—in a week, \$60—in a year, \$3,120. Pretty good argument for a multiple-magazine machine.

In a newspaper plant, where costs are differently measured, they still exist as very real costs. Hence the general practice of keeping as many magazines "up" as is possible in a newspaper plant. News and classified type on a two-magazine machine form standard practice, with the ultimate in quick changing when the machine is a mixer to save waiting for distribution to be completed.

In trade plants, however, we sometimes find the philosophy that the wide variety in faces needed to meet customers' demands requires so many extra magazines that there is less advantage in a multiple-magazine machine.

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Straight matter is ordinary English set in one size and face of type on the galley, not made up. The "minimum" measure width is 20 ems of the type in which the job is set. The following figures show the equivalent in picas of 20 ems of different size types:

Point Size	Measure in Picas for 20 set ems
5	9
5½	9
6	10
7	12
8	14
9	15
10	17
11	18
12	20

With this definition of *straight matter* the non-technical reader has a simple application of printers' arithmetic, for which he must remember that an *em* in any type size is the square of the *body* size of the type. The reason for a *minimum measure width* is that composition in shorter lines demands more broken words and abnormal spacing conditions, thus slowing the production.

With the emphasis here on rates *per thousand ems* we must note these standards for production in trade composition and commercial printing as against the standards most familiarly used in the newspaper field. There we find comparisons of production stated in "lines per hour" or "lines per shift"—meaning the number of standard column lines of news body matter or classified thus produced. The newspaper composing room today never refers to thousands of ems.

In this ITCA *Guide* the comparative production rates and penalties on Linotype composition are based on a normal productivity of 3,000 ems per hour, setting 10-point straight matter on 10-point body in measures 17 to 28 picas inclusive. That rate of 3,000 ems per hour is conservative, as against many speed records, but it represents averages across the industry.

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In estimating the production time of lines set in "minimum" measures (less than 20 ems of the point size) it is recommended that the following be applied:

6 point:

- From 7 to 10 picas estimate at 20 ems per line.
- 6 picas estimate at 25 ems per line.
- 5 picas estimate at 40 ems per line.
- 4½ picas estimate at 50 ems per line.

7 point:

- From 7 to 12 picas estimate at 20 ems per line.
- 6 picas estimate at 30 ems per line.
- 5 picas estimate at 40 ems per line.

8 point:

- From 8 to 14 picas estimate at 20 ems per line.
- 7 picas estimate at 30 ems per line.
- 6 picas estimate at 40 ems per line.

9 point:

- From 9 to 15 picas estimate at 20 ems per line.
- 8 picas estimate at 25 ems per line.
- 7 picas estimate at 30 ems per line.
- 6 picas estimate at 40 ems per line.

10 point:

- 9 picas estimate at 25 ems per line.
- 8 picas estimate at 35 ems per line.
- 7 picas estimate at 40 ems per line.

11 and 12 point: Estimate set-wise at the 10-point schedule for "minimum" measures.

These detailed penalties for minimum measures provide convenient data for the estimator. Noting that a given block of matter is to be set narrower than the minimum in the specified type size, he uses this table to compute the total number of ems to be set—not the actual number, but the "penalty" number because of the narrow measure.

We may note that the minimums begin at 10 picas with 6 point, with 12 picas for 7 point, and so on up to 15 picas for 9 point. On 10-point type the spacing conditions become standard and the minimum begins with 9 picas.

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Composition set wider than the following measures should be estimated as 2 points smaller *set-wise* only.

Point Size	Maximum Measure
5	20 Picas
5½	21 Picas
6	23 Picas
7	24 Picas
8	26 Picas
9	27 Picas
10	28 Picas

The above table covers the maximum widths of line for which normal standards prevail. Still wider measures slow the production—the operator may have to wait for distribution if the font isn't large enough to keep three of the wider lines in continuous process of assembling, casting and distributing.

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The following "minimum" rates of production for jobs measuring less than 5,000 ems are suggested as the basis for estimating, *plus time for machine changes*:

Ems	Per Cent of Hour Rate
500 or less	25%
501 to 1,000	45%
1,001 to 2,000	75%
2,001 to 3,000	105%
3,001 to 4,000	140%
4,001 to 5,000	170%
5,000 and over.....	200%

This table reflects the traditional tendency to under-estimate the cost of handling small jobs, with which the incidentals of the work may consume as much time as the actual job.

These production figures may be used as a basis for estimating piece work above 5,000 ems (shop corrections included), time for machine changes to be added:

Point Size	
5	2.4 units per M
5½	2.4 units per M
6	2.4 units per M
7	2.6 units per M
8	2.8 units per M
9	3.0 units per M
10	3.3 units per M

Within recent years the piece work basis of salaries has largely disappeared. In the newspaper field among the last larger cities wherein piece work prevailed were Atlanta and Salt Lake City. It was usual, in the piece work cities, to find Linotypes speeded up and their operators able to set up to nine lines a minute of news and classified. The abolition of piece work was largely due to the objections of labor organizations and the subsequent drop in productivity on the Linotype was a big factor in the development of the Teletypesetter.

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The Standard Lower-case Alphabet Length for each point size, as adopted and approved by the 30th annual ITCA convention held in Boston on October 13, 14 and 15, 1949, and used as the basis for determining the relationship of each Linotype and Intertype face and point size to the "standard" for that point size, follows:

5	79 points
5½	85 points
6	90 points
7	101 points
8	112 points
9	123 points
10	134 points
11	145 points
12	156 points
14	178 points

This table grows out of an effort by the ITCA toward a "standardization of type faces." As an industry they have recommended to the type founders and machine manufacturers certain idealistic concepts of type design, the uniformity of design and name for similar type families (such as Memphis, Cairo, Karnak, Stymie, etc.), and a general conformity to standard alphabet lengths. Thus far no results are apparent.

But it is important for an estimator to recognize that the thin, lean faces involve more composition effort per thousand ems than the extended faces. For example, with 12-point Corona a thousand ems would contain

about 2,250 characters; but a thousand ems of 12-point Cloister would contain about 2,700 characters. Thus there would be a difference of some 20% in the keyboarding of what might be assumed to be identical jobs. The ITCA "standard alphabet length" for a 12-point face is 156 points, while Corona is 155 points.

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Linotype—Price and One-Quarter

Estimate as straight-matter and add 25%. If the line count basis is used count every 4 lines as 5.

7. Lines containing roman and italic *or* roman and bold face (when the two faces are duplexed on the same matrix).

8. Lines set in all italic *or* all bold.

In items 7 and 8 we recognize that the time taken by an operator to lift matrices "on the rail" necessarily slows his production.

Such a *line* as this example is *typical* of this *condition*.

But the earlier portion of this unit, which is composed in 10-point Caledonia Bold with Bold Italic, would not involve this premium price for boldface except for lines in which the italic is used.

9. Tabular matter with single justification or one column of figures, with either leaders or quads.

Tabular matter, item 9, in its many styles, requires quite some study for a general understanding of its complexities. See *Linotype Keyboard Operation*, pp. 132 et seq. and 158 et seq.

10. Leader work in which the line is filled out with ordinary close leaders.

Leader work, item 10, may also be simple or complicated. See item 20.

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Linotype—Price and One-Half

Estimate as straight-matter and add 50% or count each 2 lines as 3.

11. Straight-matter composition in measures from 30 to 42 picas in width set on 42-pica machine.

In item 11 both the higher investment in a 42-em machine and the slower handling of wide-measure work

are reflected. While these factors probably do not result in a 50% increase in costs over a 30-em machine, this emphasis reminds the owner that the wide-measure machine calls for special consideration in costs.

12. Tabular matter up to 30 picas wide leadered out to a maximum of two columns. (See "Double Price" Schedule for this classification set on 42-pica machine.)

For an example of item 12, see p. 136 *Linotype Keyboard Operation*.

13. Composition set entirely in caps.

While it might be argued that composition entirely set in caps, item 13, requires merely the full use of the duplex rail in assembling, it remains true that all-cap lines are more difficult to space. Since they are also more difficult to read, sound typography rarely uses them.

14. Centered lines of all kinds up to 30 picas wide, including the product of centering and quadding machines. (See "Double Price" Schedule for this classification set on 42-pica machine.)

Every Linotype salesman will hotly debate the soundness of item 14 for its inclusion of "the product of centering and quadding machines." Here we have a 50% premium added to the product when the quadder itself adds only 10 or 12% to the investment in the machine, and the greatly increased output with a quadder becomes a further advantage in cost of product. Let's recognize in this particular bit of doctrine the basic reason for its existence—and that is the traditional habit of master printer or trade plant owner to give away to his customers any advantages in productivity that may come with new and more efficient equipment. All the trade associations, in their campaigns for sound cost finding practices, have deliberately over-emphasized this factor.

If a Linotype representative encounters ITCA *Guide* item 14 as a quoted objection to the installation of a quadder, he can properly argue that the machine user should get a price commensurate with his actual costs, but that few trade plants try to get a 50% premium on centered and quadded matter. These comments apply equally to item 15.

15. Lines quadded out in center, type lining at both ends of the line.

16. Counted lines and run-arounds of rectangular cuts only.

A typical example of item 16 is fully demonstrated on pp. 65-68 of the *Keyboard* book, although the rule

says "rectangular cuts only." The example quoted might be classified as double-price in its complexity—but it shows the procedures required for run-arounds. Modern typographic practice rarely uses such a layout as is cited for illustration, but the mechanical conditions often apply in miscellaneous jobs.

17. Type set in 5 point.

With the penalty on 5-point type, item 17, the estimator would check for a double penalty if the measures weren't within the averages.

18. Straight-matter "butted" slug composition set on 30-pica machine. (See "Double Price" Schedule for "butted" slug composition set on 42-pica machine.)

The "butted slug" composition, covered by item 18, is called "double or multiple slug composition" in our *Keyboard Operation* book. The trade generally calls it "butted slug matter." Pp. 46-49 in the book explain why it must carry a penalty cost. Because of the recognized difficulty in reading wide measures, unless they are very generously leaded, typographers avoid this practice. But large forms such as posters or display ads often contain such matter.

This is a minor element of competition with the Monotype, sometimes encountered. Both keyboard and caster are designed to set up to 60-pica measure—but that represents two 30-pica Linotype slugs when set "butted" and the 60-pica width is thus attainable (and rarely called for in average work).

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Linotype—Double Price

Estimate as straight-matter and add 100%. Or count 1 line as 2.

19. Lines set in roman lower case and small caps, or roman lower case and caps and small caps.

Referring again to Monotype competition, the penalty in item 19 is not echoed in the rules for Monotype estimating later on. The distinction is theoretical, as is demonstrated by the major use of Linotype for thousands of trade books and textbooks every year.

20. Programs with interspaced periods or hyphens, lined up or staggered.

The conditions covered by item 20 are illustrated on pp. 63-64 of the *Keyboard Operation* book. An experienced operator would not cut his productivity in

half on work of this nature—but trade averages indicate the double-price penalty.

21. Matter in which each line is numbered, up to 30 picas.

Here again a good operator, having determined the conditions for numbered lines, would be very little handicapped in production. But the first computation takes a bit of time and the estimator must be alert for all such conditions.

22. Matter containing a large proportion of figures.

The double penalty on composition with many figures arises with the extra care required for accuracy, not in any mechanical aspect of composing numerals.

23. Straight-matter "butted" slug composition set on 42-pica machine.

Items 23 and 26 are further magnifications of the conditions discussed under item 18. Note that item 23, under a literal interpretation of the rules, would become time work. As straight-matter composition on a 42-em machine it would classify first as price-and-a-half matter—then as butted slug composition it also becomes double-price matter. Back in item 6 we note that "when the sum total of the penalties amounts to more than double the price the matter should be estimated as time work." Such a situation calls for the application of past experience and careful analysis of the prospective work—trade plants can all cite unhappy occasions when sad losses have occurred under just such conditions.

24. Modern foreign language composition set with roman characters including accents.

Modern foreign language composition is so highly specialized and in so few plants that general trade conditions are not applied. Item 24 becomes more of a warning signal than a custom and of course it does not apply to plants regularly employing foreign operators (such as Spanish, French, Polish, etc.).

25. Running heads with title and folio on same line.

Item 25 is illustrated by the running heads and folios of the *Keyboard Operation* book.

26. "Butted" slug composition requiring three slugs to complete a line.

27. Composition requiring varying indentions.

Varying indentions are used in this and other units of this Manual. It is apparent that they are a factor for lessened production.

28. "Butted" slug tabular matter set on 30-pica machine with one or two justified columns.

29. Tabular matter having more than two justified columns set in measures less than 30 picas wide.

The consideration of tabular matter and of butted slugs, as noted under items 9, 12, and 18, explains items 28 and 29.

30. Centered lines over 30 picas wide set on 42-pica machines.

The costs of quadder operation, as discussed under item 14, are obviously a bit higher on the more expensive 42-em machine—but we might debate the difference between 150% and 200%.

31. Tabular matter with one or two justifications set more than 30 picas wide on 42-pica machine.

Item 31 applies the factor of 42-em machine costs to the work discussed under item 12.

32. Type set in 4½ point and smaller.

Since neither Linotype nor Intertype currently lists a "4½-point" type, we may apply item 32 to the 4¼-point and 4-point faces that are available.

33. Foreign language composition set in measures over 30 picas wide.

Under conditions that may make foreign language composition worth double price it is equally true that its composition in wide measures must exact a penalty. The literal application of items 24 and 33 to one job would establish a 400% price, which thus becomes a time work job.

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Linotype—Time Work

34. Matter containing roman, italic, caps and small caps, small caps and bold face in the same line.

Items 34-45a cover conditions that depart so far from averages of cost on regular work that they cannot readily be reduced to standard formulas. Yet, in advance estimating, it is essential that the business be safeguarded against undue optimism on production probabilities. Any considerable amount of composition as classed here must call for the most careful study and appraisal.

The mixture covered by item 34 often occurs in bibliographies, technical matter, and textbooks. This definition is identical with the conditions in item 44, except that an occasional bold face word might be dropped in by hand, using a single distributor machine.

Competitively, this *Guide* gives Monotype the advantage on work of this nature (item 46), since the Monotype matrix case contains either 225 or 255 characters, including all the spaces, and this mixture can still be classified as Monotype straight matter.

But it is equally true that the higher hour costs for Monotype (with the necessary addition of keyboard time to caster time) may outweigh the occasional pages of such more complicated matter if the job be set on the Linotype. Production managers in book publishers' offices (who make such decisions for some ten thousand books a year) are forced to be probably the most acutely price-conscious buyers of machine composition. More than a majority of these books on Linotype (that counts in Intertype in the slug-vs-Monotype combat) have for some years demonstrated the economy of slug composition and the acceptance granted by these critical buyers to our Linotype faces. And the predominance of Linotype (or slug-set) books grows each year.

35. Composition containing ditto marks or line-for-line composition.

Ditto marks require careful alignment with their parent line above, and with each other if several lines repeat the ditto. Line-for-line composition requires careful comparison with the original copy and probably considerable advance figuring—all unpredictable as cost factors.

36. Matter containing a considerable proportion of technical characters, hand inserts, or technical words.

Item 36 covers the extensive use of side sorts, or possibly a complicated type style, as required by a dictionary.

37. Numbered lines over 30 picas measure.

38. Centered lines over 30 picas wide set on 30-pica machines.

In items 37 and 38, problems covered earlier are made more difficult by the over-30-picas measure.

39. Box headings.

Box headings are a general feature of tabular composition—see pp. 140 and 147 of the *Keyboard Operation* book.

40. Advertising figures or initials covering two or more lines.

The casting of big figures or letters on overhanging slugs is most familiar to us in foodstore advertising. The trade plants do some of this, but are more frequently concerned with initial letters, etc.

41. Letter spacing of lines or any part thereof.

42. Matter set in 8 ems or less of the size type used, requiring considerable hand spacing.

Item 42, duplicating the cautions of the tables of minimum measures, suggests that the estimator is safer to keep such work on a time basis, if the conditions permit.

43. Intricate matter not otherwise covered in these schedules.

No comment needed.

44. Lines set on "mixers" containing matrices from two different magazines.

We may differ with the ITCA on this caution that mixer composition from two magazines should be considered as time work—except on miscellaneous job work in the trade plant. Where mixing machines are used on a steady production of work having similar characteristics, as in book composition, production standards and prices are readily established.

45. Composition for which copy is poorly prepared (not legible, not edited, interlined, written on both sides of sheets, etc.) or submitted in such form as to be not conveniently handled.

Poor copy handicaps any kind of composition—the same applying to the writing of Sales Reports!

45a. Author's alterations and revises.

Repeats item 5.

Monotype Composition—Single Price

Throughout the following sections of the *Guide* which deals with Monotype costs we Linotypers are constantly reminded of the competitive problems involved. We won't attempt here a full comparative discussion of Linotype vs Monotype, but the several items cover many of the arguments we encounter today. (No longer does a Linotype salesman combat Monotype for newspaper body composition nor on vast quantities of straight typesetting on which competition was formerly very active.)

The Standard Lower-case Alphabet Length for each point size, as adopted and approved by the 30th annual ITCA convention held in Boston on October 13, 14 and 15, 1949:

5 pt.	79 points
5½ pt.	85 points
6 pt.	90 points
7 pt.	101 points
8 pt.	112 points
9 pt.	123 points
10 pt.	134 points
11 pt.	145 points
12 pt.	156 points
14 pt.	178 points

The same comment made on the Linotype faces applies to the Industry's effort toward standardization of Monotype.

* * *

These "minimum" rates for jobs measuring less than 6,000 ems are suggested (based on average production of 3,500 ems of 10 point per hour):

<i>Ems</i>	
500 or less	25%
501 to 1,000	40%
1,001 to 2,000	70%
2,001 to 3,000	100%
3,001 to 4,000	130%
4,001 to 5,000	155%
5,001 to 6,000	180%
6,001 and over	200%

We note here the "average production of 3,500 ems of 10 point per hour" and we recall that Linotype's average, as the basis of the foregoing data, is established

at 3,000 ems. While this seems to give Monotype an advantage of 16% in productivity, be it noted that two operators (keyboard and caster) are usually employed on Monotype. If a "combination operator" works at the keyboard and keeps the caster going simultaneously (sometimes done in smaller plants), then the combined product must drop accordingly. Either way the cost per thousand ems of Monotype may range from 20 to 50% higher than Linotype, depending on the local conditions. And the costs of handling Monotype in subsequent composing-room operations after casting are higher than with Linotype through the fragile nature of single types vs easily-handled slugs.

These figures may be used as a basis for estimating piece work above 5,000 ems (shop corrections included), time for machine changes to be added:

<i>Point Size</i>	
4½ and smaller . . .	2.3 units per M
5	2.3 units per M
5½	2.3 units per M
6	2.4 units per M
7	2.5 units per M
8	2.6 units per M
9	2.8 units per M
10	3.0 units per M
11 and 12 measured as 10 pt.	

This data table is based on 3,500 ems per hour. It repeats the penalty rate on 11 and 12 point which applies to Linotype also.

* * *

46. Straight matter is ordinary English, set in one size of type on the galley, not made up, including roman and italic, roman and bold, when the two faces are combined in the same keyboard arrangement, in measures from 20 to 60 ems of the set size.

We have found (item 7) that a price penalty applies to Linotype matter which conforms to this definition of straight matter on the Monotype at the base cost. "The same keyboard arrangement," for Monotype production of a mixture of roman and italic with roman and bold, means the combining of such faces as will run together thus. Their set widths must agree—then the 225- or 255-character capacity of the Monotype matrix cases and keyboards permit such composition as straight matter. On the Linotype, a similar combination of faces might require either a mixer machine or the use of an auxiliary magazine plus sorts. However, despite the apparent cost penalty against Linotype on such work,

we note again the predominant amount of book work now set on the slug machines—a field in which Monotype held a strong advantage in earlier years.

47. Medium grade book or magazine work.

48. Tabular matter leadered out or quadded out to one column of figures.

At this point let us further recognize that the trade plant must be prepared to deliver the products demanded by their printer-customers. Most of the larger and some of the smaller trade plants operate Monotype equipment. Some of them use its casting facilities to make and sell display type in bulk—thus competing with the type foundries. And the adaptability of Monotype to more complicated kinds of tabular work makes for its preference in such fields, even though we can usually demonstrate that Linotype, properly handled, can produce the same results.

* * *

Monotype—Price and One-Quarter

We need not analyze the following items separately—they compare with the classifications for Linotype, giving the previously-noted advantage to Monotype on a penalty basis. But again the penalty is usually outweighed by the lower first cost of Linotype.

We find no specific reference in the *Guide* to the recently-introduced centering device on the Monotype, a feature of the so-called 1517 keyboard (which carries 17 rows of 15 characters each). Centering is readily accomplished with the Monotype system, but at an expenditure of time on the keyboard which puts it in the penalty group.

Estimate as straight work and add 25% or count each 4 lines as 5.

50. Catalog work with not more than 6 accents on the keyboard.

51. Tabular matter including leaders or quads and two columns of figures.

52. Tabular matter—single justification, entirely figures, fractions, etc. Not more than 10 figure columns containing spaces.

53. Matter requiring varying indentions.

54. Lines containing all caps.

55. Centered lines, lines set in roman, small caps or caps and small caps, italics.

56. Running heads with folios on one line.

57. Composition quadded in the center with type lined up at both ends of the line.

* * *

Monotype—Price and One-Half

Estimate as straight work and add 50% or count 2 lines as 3.

58. Roman, italic and bold face mixed in one line, when set in one operation.

In item 58 we find apparent conflict with item 46. Both seem to cover the same mixture of roman and italic with roman and bold face. But the difference comes with the “same keyboard arrangements” noted under item 46. If the bold face differs in set widths then the added handling requires the penalty.

59. Composition containing technical characters and sorts.

60. Modern foreign languages using roman characters and accents: German, Spanish, Italian and French.

61. Matter set 8 picas or less requiring letter spacing.

62. Intricate book, catalog and textbook composition with all the accents the keyboard will carry.

Item 62 seems to duplicate item 69. The difference between price and one-half or double price on such matter must lie in the nature of the copy to be set—the estimator’s judgment (or the competitive situation) will determine which.

63. Technical book or magazine work with all the diacriticals the keyboard will carry. (No. 64 omitted.)

65. Tabular matter—short tables set for rules (see rate for box headings under Double Price). Tables set for rules containing fractions or characters requiring changes in keyboard layout.

Since tabular work is most frequently assigned to Monotype, the Linotype sales trainee should compare the various references to tabular work and, by study of the tabular subjects in the *Keyboard Operation* book, be prepared to recognize the several degrees of complexity in setting tables.

66. Program matter with periods or hyphens interspaced.

67. Counted lines—run arounds—rectangular cuts only.

68. Matter requiring the numbering of each line.

* * *

Monotype—Double Price

Estimate as straight work and add 100% or count 1 line as 2.

69. Intricate book work with all the accents the keyboard will carry.

70. Technical book and magazine work with all the diacriticals the keyboard will carry.

71. Dictionary work.

72. Matter repeated with ditto marks.

73. Box headings. In figuring lines use the box containing the maximum number of lines as the basis. For example, if there are 6 boxes, with the largest contain-

ing 3 lines, there are 6 x 3 or 18 lines. Many plants will figure all box headings as time work only.

74. Double justification parallel reading columns.

In item 74 "double justification" is a composing-room term which we must recognize. We first define justification as "the spacing out of a type line to a given measure." When a table is set there may be two or more fixed locations for words whose length varies from line to line. Thus they must be justified to the pre-determined locations. This procedure involves double justification. It is accomplished automatically on the Monotype keyboard, and by careful use of the assembler scale and pointer on the Linotype. The extra penalty in item 74 arises with the need for parallel reading columns.

* * *

Monotype—Time Work

The time work items for Monotype are all comparable with the items previously discussed.

75. All composition more difficult than listed above.

76. Run-around irregular outlines.

77. Composition in which faces are keyboarded and cast separately and collated by hand.

78. Matter set over 60 ems in width.

79. Type 4½ point and smaller.

80. Type matter flush left and right with leaders between.

Hand Composition and Makeup, Including Ludlow

(Note—Operations under this section are exceedingly difficult to compute. The suggested estimating rates will be subject to later revision when more data is available. Users of this Estimating Guide are requested to send to the Committee any accurate data they may have covering the operations listed.)

In trade parlance it is the floor men who perform the following operations, although in smaller plants (and notably in the country plants) the Linotype operator is also expected to be competent as an all round printer. The non-printer user of this Manual should read such textbooks as *The Practice of Printing* by Ralph W. Polk or the *PIA Composition Manual* for a general understanding of composing-room procedures.

81. Hand composition is time work. An additional charge should be made for Monotype used in display composition to cover the cost of casting the type. This is likewise true in the case of an excessive amount of spacing materials used in makeup, as well as outside purchases especially for the job. Jobs containing both machine and hand composition are divided and estimated at the respective rates.

The following time allowances are suggested for estimating various operations:

82. Handset lines, 22½ pica maximum (including Ludlow and A-P-L)	1 unit
Each 22½ picas or fraction additional	½ unit
Letterspaced, double the above.	
83. Justifying cut or initial	1 unit
84. Mitering rule border (4 corners)	1 unit
84a. Each additional border	½ unit
85. Mortising, rectangular in shape	
Outside	1 unit
Inside	3 units
Each additional change of direction	½ unit
86. Tie-up, proof, storage, per page	½ unit
87. Break for color, minimum for one color unit	2 units
Each additional color unit	1 unit

88. It should be noted that certain operations, such as collating several faces, hand leading, inserting column rules, etc., are not covered. These items are so variable each job must be judged on its particular requirements.

89. A single line or a few lines of display type, whether foundry, Monotype, Ludlow, or A-P-L, cannot be charged on the above basis. Foundry type is usually sold by the running inch or running pica. For lines set in other types, when not part of a larger job, the following times at the hour rates are suggested:

First line, 22½ pica maximum	2 units
Each succeeding line	½ unit
Longer lines, each additional 22½ picas or fraction	½ unit
Letterspaced, double the above.	

In every case the metal should be charged.

* * *

Lino-Tabular Composition

91. Time work.

Some composition houses compute such work on the following basis: A charge per square inch to cover the cost of materials, broaching and fitting rules, plus a charge per line. In this case each line within a box is counted as a separate line, even though it may actually be set on the slug with other wording coming in a different box. Such schedules can only be worked out by the individual on the basis of plant experience and cost.

See p. 145 of the *Keyboard Operation* book. The patented process for insertion of triangular brass rules through broached Linotype slugs was called Lino-Tabular when the book was published. This system is now promoted by the Universal Mono-Tabular Corporation, Dallas, Texas.

* * *

Standing Pages and Forms

91a. It is recommended that a charge be made for holding standing pages and forms, based on the cost of supervision, use of materials and equipment, floor space, insurance, overhead, etc., and that such charge be for a fixed amount per square inch per month face measurement as shown by a proof of the page or form; in cases where the spacing or tie-up material on the outside of the type page amounts to not less than 10 per cent of the total weight a charge per pound, based on actual cost of the space used, should be made.

Hand Proofs

92. Ordinary or correction proofs (as distinguished from Reproduction Proofs) are sometimes required in quantities exceeding the customary number furnished, which is usually two to five. Estimated time for excess proofs on News, Super or Dull Coated stock are at these rates:

<i>Minimum Charge Six Extra Proofs or Less</i>	<i>Over Six Additional Proofs</i>
6 x 9 in. 1 unit	1 unit for each 10
9½ x 12½ in. 1¼ units	1¼ units for each 10
12½ x 19½ in. 1½ units	1½ units for each 10
14 x 22 in. 2 units	2 units for each 10
Extra galley proofs, 6 in. x 22 in.	1 unit for each 10

* * *

Reproduction Proofs

93. The time consumed in pulling reproduction proofs will vary in different plants. The following figures may serve as a basis for estimating, with adjustments as required. Forms with extra small type or very complicated forms should take the next higher rate than that called for by the area. Very open forms or forms with just a few lines can take the next lower rate. Lock-up of forms, if required, should be estimated extra at rate for foundry lock-up.

	<i>4 Black & White Impressions</i>	<i>2 Transparent Impressions</i>
Up to 6 in. x 9 in.	2 units	2½ units
Up to 9½ in. x 12½ in.	3 units	4 units
Up to 12½ in. x 19 in.	4 units	5½ units
Above 12½ in. x 19 in.	5 units	7 units

When the nature of the form demands a press lock-up and make-ready an additional charge should be made for such work.

Demands for proofs vary in different plants, some of which find it necessary to operate power proof presses to supply large quantities. We are particularly interested in reproduction proofs on whose sharpness and uniformity depends the final quality of our Linotype faces. The trade plants are meeting constantly increasing demands for "repro proofs" with the growth of offset lithography. ITCA convention programs always include some discussion of this technical problem on which the industry has yet to reach full agreement on the best methods and materials.

* * *

Foundry Lock-Up

94. Estimated on time basis based on form size according to the following scale, inclusive of proof-reading.

Area of type form: Up to 50 sq. in.	3 units
Area of type form: 50 to 100 sq. in.	5 units
Area of type form: 100 to 200 sq. in.	7 units
Area of type form: 200 and up sq. in.	8 units

95. Larger forms estimated on time basis. Form size area is determined from size of form inside bearers or guards and includes any legends or miscellaneous matter.

Every type form (however composed) must be specially prepared for the plate-making processes (electrotyping, stereotyping, plastics, etc.). Special, heavy steel frames or chases are used and the type matter must be surrounded by type-high bearers to equalize the severe pressures of molding. Since a foundry-locked form cannot be used for printing without subsequent change of the lock-up materials this step in production properly becomes the basis of specific charges.

* * *

Proofreading

The general practice is to include one proofreading and one revise of each galley or page. In no case does the typesetter assume responsibility for errors beyond the correct resetting of the error.

If a separate charge is made for proofreading it should be in accordance with the actual cost. In this case the proofreading department should be a separate department and be so treated on the management's cost records, thus arriving at a proofreading hour cost.

In estimating proofreading the following percentages of the cost for proofreading per thousand ems are suggested as proofreading charges when made separately:

Type of Work	<i>Per Cent of Cost Per M ems</i>
Straight Matter (plus the minimum charge)	10%
Price and One-Quarter	15%
Price and One-Half	20%
Double Price	25%
Time Work	20%
Foreign Languages	20%

As noted earlier, the costs of proofreading are sometimes carried in the general overhead of the business, the theory being that this function is part of the necessary procedure for the customer to receive a clean proof.

This section of the *Guide* recognizes that the increased difficulty and responsibility in reading proofs of complicated matter make it proper to charge accordingly. Hence the table of penalties.

Business Conditions Among the Trade Compositors

THESE DISCUSSIONS of costs of operation naturally lead to the question: "How's business?" From industry reports, covering 1951-1952 operating statements, we may compare a few branches. Note that such reports come from firms that operate cost systems and thus are usually in better business condition than the indifferent proprietors whose cost accounting is casual.

Reports from 181 Trade Composition plants show an average net profit, for the above period, of 6.14% of sales (before Federal Income taxes).

Trade Binderies (19 plants) as a service branch report 6.32% of similar profit.

Commercial Printers (386 plants) who include some of the customers of the typesetters and binders, show 8.40% of similar profit.

These comparisons show the need for ITCA, as an alert trade association, to hammer away at its members to recognize their costs and to charge properly for them.

And in these studies of costs in one special division of our field we realize why the Executive Offices always want to find in a Sales Report a comprehensive answer to the question: "Does this concern have a cost-finding system—and do they apply it?"

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