

## The Ludlow System

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A Linotype competitor on display composition within keyboard sizes—its operation, incidental uses and its auxiliary machine, the Elrod strip material caster

**The Purpose** of this unit is to discuss the various competitive aspects of the Ludlow Typograph Machine and its auxiliary, the Elrod, with their direct bearing on the sale of Linotype's Rangemaster models and other display equipment. It will also describe Ludlow's Rule-form System and their claims for other unique advantages; and will also consider the printing qualities of Ludlow slugs and the incidental uses of Ludlow and Elrod products.

Readers of this unit who have had composing room experience will usually be familiar with the Ludlow, often through personal operation. For non-technical readers, a more detailed, illustrated description of Ludlow and Elrod may be found in the *PIA Composition Manual*. Every reader who is concerned with Linotype sales should be familiar with the *Ludlow Typefaces* book and the relationship of Ludlow faces to similar Linotype series.

**Ludlow System Equipment** provides:

- matrices in some 2000 sizes and kinds for about 150 series;
- cases and cabinets for matrix storage and handling;
- a variety of sticks for composing different kinds of matter;
- the Ludlow machine, casting slugs from handset matrices;
- the Elrod machine, casting strips of base material, slugs, leads and rules;
- the Ludlow Supersurfacers, to improve the printing quality of slugs.

The range of type sizes in the Ludlow system provides matrices from 4-point through 96-point, and in a few faces through 144-point, with large figures through 240-point. The average size range, however, is 6-through 72-point.

Ludlow slugs are cast in a single mold having one body size, regardless of face size. The body may be either 6- or 12-point, and the length either 21 or 22½ picas. Type faces larger than the body of the mold cast overhanging and the resulting T-shaped slug is characteristic of the Ludlow product.

To support any overhung portions of the slug, on each side of the 6- or 12-point body, underpinning or base material is required, .765" high. This must be cut and fitted in the right body sizes to support the head of the slug, a hand operation. Base material can be produced on other machines (such as Monotype or Universal strip casters) but the Ludlow system provides the Elrod, generally used for this need.

**No Special Operators.** Among the competitive claims for Ludlow they stress its simplicity—any hand compositor or floor man may readily learn the procedures of hand-setting matrices, turning to the machine and casting slugs for the lines thus marked in his copy. In making up his type form he then uses the base material which has been cast in strips (usually under the plant machinist's direction) and conveniently stored in pre-cut lengths.

The Ludlow "operator" thus employs this system as a method of semi-mechanical type composition for which the matrices are hand-assembled and must also be hand-distributed after the slug is cast. For assembling Ludlow matrices, the compositor uses one of a variety of sticks as needed for:

- normal roman composition;
- italics for which the matrices set at an angle;
- long lines, in which the slug length often breaks in the middle of a character, calling for the automatic handling of the successive casts to make the long line;
- quadding to left or right, to avoid setting spacing material;



self-centering, in which two jaws move equally toward the center; and

offset matrix alignment, to permit the base alignment of adjacent sizes of type (which otherwise center on the body of the slug).

**Matrix Cabinets** built specially for Ludlow requirements are placed near the machine and, in newspaper plants, as a central feature of the ad alley. Each font has its separate case, similar to a California job case, in which the mats are placed uniformly with casting edge down—this to facilitate the gathering operations of composition. Each mat carries an identifying character, stamped on the back.

As compared with setting single type (either foundry or Monotype), where the compositor moves his hand from case to composing stick for each individual character, Ludlow matrix assembling is more speedily handled. With the mats placed in the case in identical face-down position, it is possible to “gather” several mats with one general motion before moving the hand to the stick. The reverse procedure, for distributing matrices, adds to this sales feature for the time-saving with Ludlow as against the use of Monotype or foundry type. Compared with keyboard composition and automatic distribution, this aspect of Ludlow-Linotype competition is gently glossed over by the Ludlow man.

**The Ludlow Typograph** is, by the nature of the Ludlow system, merely a casting mechanism. Its essential features include:

Metal pot—gas or electric, with metal feeder a standard accessory. Standard Linotype metal is used.

Metal pump which forces molten metal upward, like the Monotype and similarly a handicap in casting.

Mouthpiece and mold against which the stick full of matrices is locked for casting.

Finishing mechanisms, functioning following the cast, to retract the mold, eject, trim and deliver the slug onto the galley at the front of the machine.

Duplicate slug casting, when desired, is possible at about six slugs a minute.

The mold is water-cooled for better casting conditions, which vary as they do with Linotype according to size of slug and related metal temperatures. Thermostatic controls are provided to regulate metal in the pot crucible as well as throat and mouthpiece heating units.

The scheme of miscellaneous operation by numerous compositors has required safety devices on all the essential functions to protect the machine against errors.

**Matrices and Typographic Accessories.** Ludlow matrices are driven or engraved on brass, with methods of design and production generally similar to Linotype procedures. But Ludlow mats need no tooth combinations for distribution and are thus simpler to manufacture.

Type sizes through 48-point are punched on brass  $\frac{7}{8}$ " deep. Sizes larger than 48- through 96-point are made on brass  $1\frac{1}{4}$ " deep. Still larger sizes are made to cast the long way of the slug, one character at a time. These include large price figures or capitals for banner lines.

The spacing of Ludlow mats is accomplished with matrix-shaped pieces of brass, made in various thicknesses. The usual procedure is to keep all spacing material in centrally located cases, with no spaces in the various type cases. This makes both composition and distribution a two-stage operation, with a stop to insert and later to remove the spaces.

Italics in the Ludlow system are made on matrices which themselves slope at the italic angle of  $17^\circ$ . To preserve this angle the special italic stick has sloped ends and special italic spaces are also required. Thus italics and roman cannot be mixed in one line—such a combination must be cast separately and cut in together during makeup. Typographers object to the fixed  $17^\circ$  angle which prevents a true reproduction of certain faces. Bodoni Italic, for instance, has a  $14^\circ$  slope, while Caslon Old Face slopes  $21^\circ$ . When larger sizes of Ludlow faces are to supplement the keyboard sizes of equivalent Linotype faces, customers with a sensitive taste for type have sometimes objected to the lack of harmony, especially in the varying slopes of the italics.

Typographic accessories include a few lining faces. Adjacent sizes, differing not more than 6 points, may be aligned in a special “offset matrix alignment” stick.

Mortised matrices are made in a few faces to permit better fitting between capitals of such a word as FATHOM. The A is mortised on either side at the top to permit corresponding mortises of the F and T to fit. While this feature may have some merit for type shop needs, it is only a complication for newspaper work.

Miscellaneous accessories cover the usual needs for leaders, fractions, ad figures, food store logotypes, borders and ornaments. Rules are cast from full-length matrix blocks.

**The Ludlow Ruleform System** is popular among the type shops and commercial plants. It provides the necessary combinations of horizontal and vertical rule units to compose standard rule forms. Patented self-aligning rule matrices, made in the 12- through 24-point sizes of the rule elements, cast slugs with notches and projections which interlock and preserve close alignment of the form. Type matter for headings, etc. is composed and inserted in the form as needed.



Competitively, various systems for rule form production have been developed for the Linotype, such as Lino-Tabler. They have provided fair facilities for the average printer's incidental needs. But shops specializing in this field have shown preference for the Ludlow Ruleform equipment. However, process changes today are swinging increasing volumes of tabular and form production from letterpress to offset, using cold-type methods for the ruling of forms with draftsman's procedures instead of the more costly type-setting.

**Slug Heads in Display.** In food-store and similar advertising, using big price figures and sometimes curved or slanted display lines, considerable use is made of slug heads carrying such type characters. By sawing off the vertical portion of the T-shaped slug, evenly with the horizontal type portion, the printing face or slug head remains as a unit which can be placed anywhere on standard .765" base material. When properly located in the assembled form, double-faced adhesive tape holds such slug heads securely during subsequent steps of proofing and stereotyping. This use of slug heads has become sufficiently popular to warrant the making of a "Shell-Hi Slug Shear" to cut off the slug base accurately.

**Long Lines** on the Ludlow, as used for banner heads or wide-measure display lines, would be awkward to handle if cast on individual slugs and cut together as determined by the placing of the type characters. Frequently a character straddles the break between the 21- or 22½-pica slugs. This problem has been met with the Long-Line Stick, in which the entire line is set and properly spaced. This stickful of matrices is then moved through the casting mechanism in successive steps. A character that overhangs is cast on one slug, with shoulder space left for its overhanging portion on the next slug.

**The Printing Quality of Ludlow Slugs** has always been a variable factor. Casting with an upward surge of molten metal through the narrow mold into the spreading portions of larger type characters, the displacement of air in the matrices and a full flow of metal to produce a clean printing face has been difficult. Despite thermostatic control of metal temperatures for varying type sizes, and with careful attention to metal formula and machine adjustments, Ludlow slugs often show casting defects. The normal product usually meets newspaper requirements but, for general printing purposes, it is often necessary to burnish the slugs.

A burnishing tool is used to rub down minor defects, but the more particular type shops use the Ludlow Supersurfacers. This motor-driven machine feeds the slugs through a high-speed milling cutter, with

micrometer controls to permit close control. While the resulting slug surface is usually better for printing, the cut-off may thicken the type characters. Matrices must be made with slightly tapered side-walls—otherwise the cast type couldn't be readily withdrawn from the line of mats. Thus each element of the type character tapers upward from the shoulder of the slug to the printing face. When that face is cut down a few thousandths, the type elements are thereby widened and the type, thus surfaced, will print somewhat heavier. Good typographers dislike this phase of the Ludlow system.

Linotype slugs, in display sizes, can usually be produced with more satisfactory printing face because of the more favorable mechanical principles involved. Linotype display molds provide more open space for the quick injection of molten metal, which is pumped more horizontally than in the Ludlow, with more effective displacement of air in matrices and mold.

**Ludlow Type Design** is criticized by typographers because some of the more popular faces do not wholly harmonize, in the Ludlow cutting, with the same faces as cut by Linotype and others. The various members of the Bodoni and Caslon families are an example. Ludlow Garamond is a good face but no match for other Garamonds, whereas their Eusebius is much closer to Linotype or ATF Garamond. The Ludlow sans serif faces are not an identical match for any Linotype faces. These factors are sometimes the cause of objection by critical advertisers—in the type shops they become serious.

**Linotype vs. Ludlow** becomes a direct competitive tussle in terms of volume of production. We cannot deny the usefulness of Ludlow for the bigger sizes of headings and display—Ludlow definitely beats out Monotype or foundry in that corner. But, for any type sizes that run in Linotype magazines, the situation becomes a challenge—and the answer to such challenge is frequency of use. Today's composing room wage scales throw unprecedented weight on any such comparisons of hand-work and machine production.

To meet these obvious general conditions we cannot derive a precise formula to specify the daily number of lines in one Ludlow face which will warrant equivalent Linotype equipment. Rather does the answer come from a study of the numerous type faces which form the plant's equipment.

The sale of Linotype display equipment usually develops in a plant which has been using Linotypes (or maybe some Intertypes) for normal body sizes, with probably a scheme of heads and moderate keyboard display. Monotype (or foundry) may have been in use for larger sizes—possibly Ludlow has been installed for larger faces and increasing advertising volume now calls for more production. All such conditions call first



for a line-count survey of current production against which to project probable future demands.

While the factors of direct investment in Ludlow or Linotype equipment to produce a specified list of faces must remain potent, that element of cost is less significant today in the face of all-time highs in wage rates. Working procedures are the key.

For a Linotype slug to fill a copy specification requires only the quick fingering of the keyboard, with the machine doing the rest.

For the same line in Ludlow (if we are comparing identical faces within the keyboard range), the compositor must perform each one of the following successive procedures:

- 1) Select the proper stick.
- 2) Go to the right case for the specified face.
- 3) Assemble the line of mats.
- 4) Go to the space cabinet, maybe waiting for access to it.
- 5) Space the line of mats.
- 6) Go to the Ludlow machine, or often await his turn at it.
- 7) Lock the stick in place and throw the starting lever.
- 8) Wait for the slug to be cast and ejected (yes, that happens with Linotype, too, when a single line is needed).
- 9) Release the stick and pick up the slug, which may need burnishing or surfacing.
- 10) Return to the space cabinet.
- 11) Distribute the spaces.
- 12) Return to the matrix cabinet.
- 13) Distribute the matrices.
- 14) Return the stick to its place on the rack.
- 15) Select or cut the necessary underpinning for slug to make it comparable to the Linotype full-bodied slug as a printing unit.

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We agree that the foregoing comparison did not include a Linotype magazine shift, or, at the utmost extreme a change of Linotype magazines. But efficient production methods reduce the number of magazine and mold changes, whereas the 15-point routine for Ludlow composition is fixed for virtually every slug.

And it all adds up to the necessity for a plant study as the more positive basis for a Linotype display sale against existing Ludlow equipment. If the conditions

happen to contemplate either Linotype or Ludlow to replace existing Monotype or foundry faces, then the same studies of lines to be set within the keyboard range are equally essential. Throughout such studies it remains apparent that we must be familiar with the competitive type specimen books. The machines or the case type may be unlike as operation. But their end product is type, for which all the economic factors and standards of quality favor the Linotype method.