



M A T R I X A T L A S
M A T R I X A T L A S
M A T R I T L A S
M A T R L A S
M A T L A S
M A T L A S

Original Document Prepared By
Paul Hayden Duensing

Digital Version Prepared by Rich Hopkins in 2008
Adding One Page from Duensing, Plus A
Photographic Appendix of Display Matrices
Originally Published in the *ATF Newsletter 32*

THE
PRIVATE PRESS & TYPEFOUNDRY OF PAUL HAYDEN DUENSING
1988



MATLAS
An Atlas of Matrices

The purpose of this essay is to examine the various kinds of type matrices a contemporary typefounder is likely to encounter today and to describe their differences and similarities with a view to how they may be cast as single types for hand composition.

Basic to this consideration are five factors which govern the success of casting from a given matrix. They are: depth of drive, mold height, metal quality, temperature and speed of casting. Foremost is the depth of drive of the matrix being coupled with a mold which will yield the desired height. There are five depths of drive most commonly encountered in the U.S., Canada and England, and they are: .030" (English 4½ point composition and all U.S. Lanston composition matrices); .050" (all English composition; U.S. and English display; some Thompson display); .043" (all Linotype and Intertype except APL, and the majority of older Thompson matrices); .065" (English Supercaster and U.S. Giant matrices from 42 point upwards); .168" (all Ludlow). Nuernberger-Rettig matrices are usually .065". Foundry matrices usually change depth every size or two, from .0309" for small point sizes to .240" or more for large sizes.

American composition matrices can, in theory, all be run together and the types will align. The exceptions to this are lining fonts such as the four sizes of 6 or 12 point Copperplate Gothic, some Old English and other exotics.

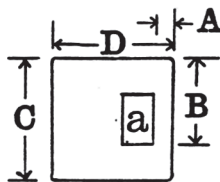


TABLE 1
Composition Matrix

A	Side bearing 0.021"
B	Matrix alignment 0.164"
C	Length
D	Width

The American cellular matrix is .2" x .2" across the face, has a depth of drive of .030" and a right-hand side-bearing of .021". The matrix alignment is .145" or 10½ points. The opposite end has a tapered cone-hole specific to an American centering pin, and side channels to receive the matrix case combs. (Table 11.) Matrices belonging to a given font are marked with the font number and a letter on one side, and the point size on another.

Standard English comp mats are drilled with a horizontal hole for the retaining rod. Early mats had no side grooves for a comb. Then, for a while, grooves were cut on two sides to accommodate a comb or rail. Still later someone decided this was not really necessary, and currently grooves are sometimes cut in comp mat sides, sometimes not. There is not even a pretense of standard alignment among English comp mats and if two fonts (other than, say, a related bold or italic) do align, it is pure chance.

In type alignment, one measures from the base line of the font to the back of the type (baseline-x line-ascender-edge of type). In matrix alignment, one measures from the base line of the character to the farther edge of the matrix (baseline-x line-ascender line-matrix edge).

The following standards are for the fixed-side sidewalls (that is the right side when the character reads right-side-up) of English composition matrices:

4½ to 11 pt = .035
12 pt = .025
Some special mats = .017
Border mats = .017
Didot Border mats = .011
Exotics, non-Romans &c = .050, .060, .070 according to design
5-10 pt Didot fonts = .035
11 pt Didot fonts = .025
12 pt Didot fonts = .015
Didot Fraktur sidewalls same as English.

Matrices which are part of a font carry a designation such as 327/10 (= 10 point Times New Roman 327). Those which do not belong in the regular font carry series, point and special numbers (269/10-3496). If there is no series number, a dash is placed above the point size. Borders and ornaments are marked with a B before the design number (B81-10pt). Superior figures series are prefaced by L.

Two kinds of space mats are made:
Low space--without cone-hole, but with steel insert
High space--with regular cone-hole

Note that the set width of mats are always in point of the Pica system, and this includes faces cut on the Didot system as well.

These mats are castable on an English Comp Caster or an American Comp Caster fitted with an English bridge, centering pin and .868" mold; a Thompson with special mat carrier and mold (with the nick wire on the bottom, instead of the top).

U.S. Lanston Monotype Display

All mats are driven .050". Earlier mats were all electrotyped: a brass blank with a copper insert. Later mats were punched into aluminum blanks. They may be cast on an American Type & Rule Caster (also called an "Orphan Annie"), Thompson, Supercaster or Giant with proper attachments and molds.

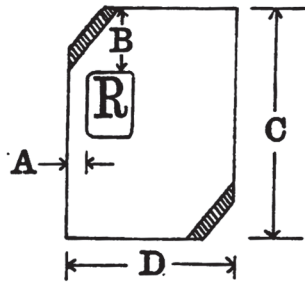


TABLE 4
American Display Matrix

- A** Side bearing
- B** Headbearing
- C** Length
- D** Width

All American Monotype Display Mats have uniform side-bearings of 8 points or .1107", length of 80 points or 1.125", width of 54½ points or .747", thickness of 7 points or .096" and 30° chamfered corners of the upper left and lower right.

MONOTYPE STANDARD			
	Point	Head Bearing	Foot Bearing
T-Mold	12	32	36
	14	30	36
	18	26	36
U-Mold	24	32	24
	30	26	24
	36	20	24

THOMPSON STANDARD		
Point	Head Bearing	Foot Bearing
12	18	50 pts
14	18	48
18	18	44
24	18	38
30	18	32
36	18	26

CODES FOR MODIFIED CHARACTERS

- H1 = Shortened characters
- H2 = Condensed on a narrower body
- H3 = Extended on a wider body
- H22 = Condensed on a narrower body
- H32 = Extended on a wider body
- H4 = Full face on body pointways
- H5 = Shortened ascenders
- H6 = Central on body pointways
- H61 = Central on body and safe on a smaller body
- H7 = Low alignment
- H8 = High line
- H9 = Means a multitude of things including long descenders and re-designed characters
- H12 = Shortened descenders and condensed
- H13 = Shortened descenders and extended

American Thompson

The mats were made in two sizes and may be identified by their having two chamfered corners at the head. Their dimensions are given in Table 5.

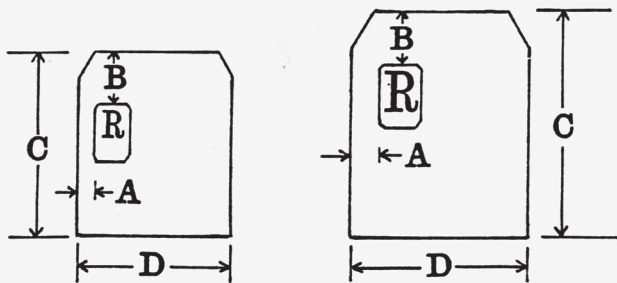


TABLE 5
Thompson Matrices

- A** Side bearing - 8 points
- B** Headbearing
- C** Length
- D** Width

	Head Bearing	Foot Bearing	Length	Width	Thickness
Old Thompson Small	-	24 pts	1.125	.750	.094-.099
Old Thompson Large	18	-	1.190	.875	.085-.086
Baltotype	18	-	1.181	.815*	.098*
Monotype Thompson	18	-	1.181	.875	.119
Iwata Bokei	18	-	1.125	.875	.125

*varies

The depth of drive of the standard early mats was .043" since the Thompson was originally seen as a device to cast single types from linecasting matrices.

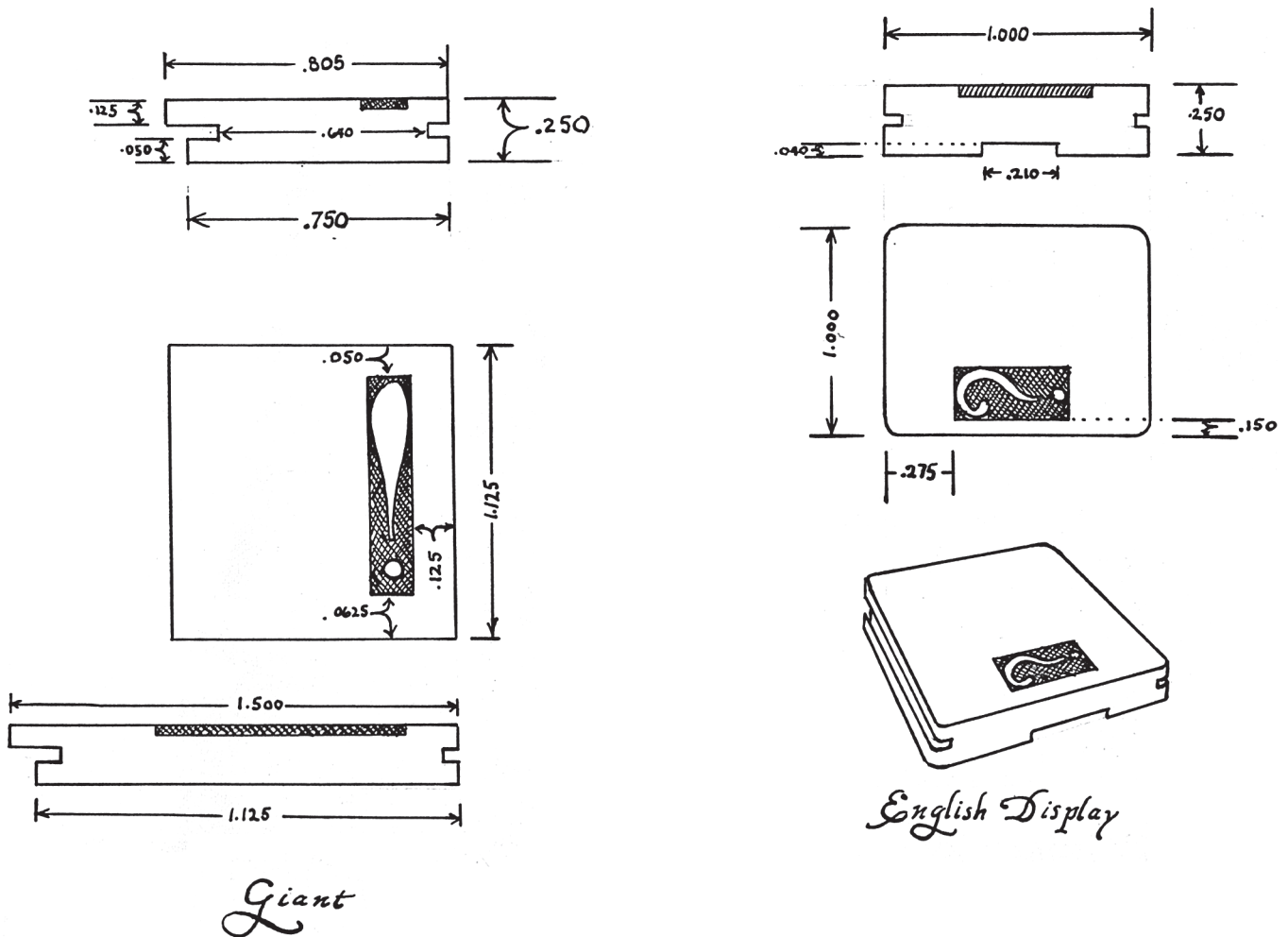
Linotype and Intertype Matrices

The familiar linecasting matrix is punched .043" deep. To cast these mats, a special holder is used on the Thompson (fitted with an .875" mold). An eight point space must be used at the sides to form the sidewalls. In sizes 30 and 36 point, the bottom lug must be filed away to fit the mold projection. Several mats may be cast together to form logotypes, but they must be carefully monitored to prevent fins or hairlines forming between the letters.

Giant and Supercaster Matrices

These mats are .065" drive. Their dimensions vary as seen in the illustrations. Different mat holders are needed for the various kinds and sizes of mats. English mats are generally 1" x 1" through 48 point unless very wide characters are involved. The larger characters are 1½" x 1½". A few Giant mats were made with the characters turned 90 degrees to provide 108 point characters (mostly condensed advertising figures). See tables at end of text.

Giant Caster Matrices & English Display Matrices



A drawing depicting these two matrices was found among of Paul's materials after his death. It was not included in the original *Matlas* publication. Obviously Paul intended to add this material to his *Matlas*. The drawings are his and the calligraphy "Giant" and "English Display" also is his.

Giant matrices were generally punched in aluminum. Very old Giant matrices were electrodeposited and therefore were copper. Giant matrices appeared in three different sizes depending on the size and width of the letter image they would carry. Drive of all Giant matrices was .065".

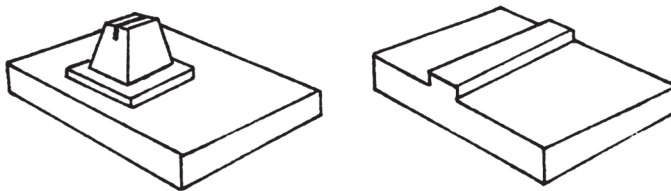
English display matrices were either 1 inch square or 1¼ inch square depending on the size of the letter image they would carry. Most English display matrices were made of copper encased in a very fine coating of chrome. Very old English display matrices were not chrome plated. Drive of these matrices was .050" for sizes up to and including 36 point. Sizes larger than 36 point had a drive of .065".

Rich Hopkins

Ludlow

These mats are punched .168" into brass blanks. A holder for them for the Thompson is available, and, of course, like the Linotype mats, the Ludlow mats need a space mat at the sides to prevent squirts. Since Ludlow slugs are designed to sit atop regular slugs, and since slugs and spaces (for display sizes) are both .750", it follows that Ludlow mats may be cast on a Thompson space mold. The counters of Ludlow mats are often quite shallow.

Recessed or quotation tuads may also be cast on the Thompson, using the special pyramid insert mats. Another insert placed alongside the Set-Adjusting-Liner-Banking-Plate M-935 in the mold allows casting low spaces on the .868" display mold with a .750" bodypiece.



Foundry Matrices

These are extremely varied in dimensions, drive and alignment, although the form is nearly always a rectangular solid. They may be engraved, punched or deposited, and often are nickel-plated to increase longevity. Some typical dimensions are given in Table 9.

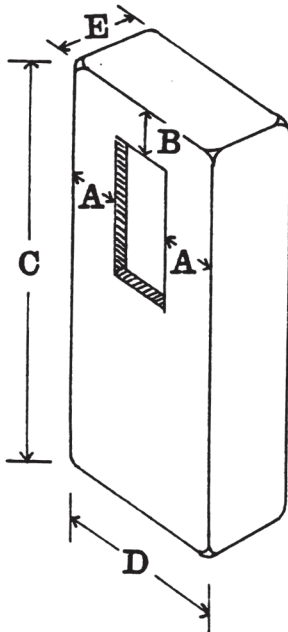


TABLE 8
Foundry Matrices

- A** Sidebearing
- B** Headbearing
- C** Length
- D** Width
- E** Thickness

TABLE 9

SOME DEPTHS OF DRIVE FOR ATF MATS MADE TO FIT MOLDS FROM THE
ST. LOUIS AND BOSTON SUBSIDIARIES

	Point	E THICKNESS	C LENGTH	A SIDE BEARING	B HEAD BEARING	DEPTH OF DRIVE
GROUP I	6	.284+	1.50+	9 pt	18 pt	.044
	8	.324+	1.62+	9 pt	18 pt	.044
	10	.329+	1.75+	9 pt	18 pt	.044
	12	.329+	1.62+	9 pt	18 pt	.044
GROUP II	18	.366+	1.93+	12 pt	24 pt	.065
	24	.377+	1.93+	12 pt	24 pt	.065
	30	.362+	1.95+	12 pt	24 pt	.065
	42	.384+	1.95+	12 pt	24 pt	.065
	48	.366+	2.12+	12 pt	24 pt	.065

The width may depend on the casting machine in use. In some systems, the width of the character plus a fixed number of points on each side determines matrix width. In other cases, overall matrix width is constant and the character may be either centered on that width, or there may be a fixed side bearing on one side, and a variable bearing on the other.

TABLE 10
Alignment of Type

This table reflects the beard and alignment standards for ATF as compared with Monotype; the standards are a reflection of the justification standards of the matrices.

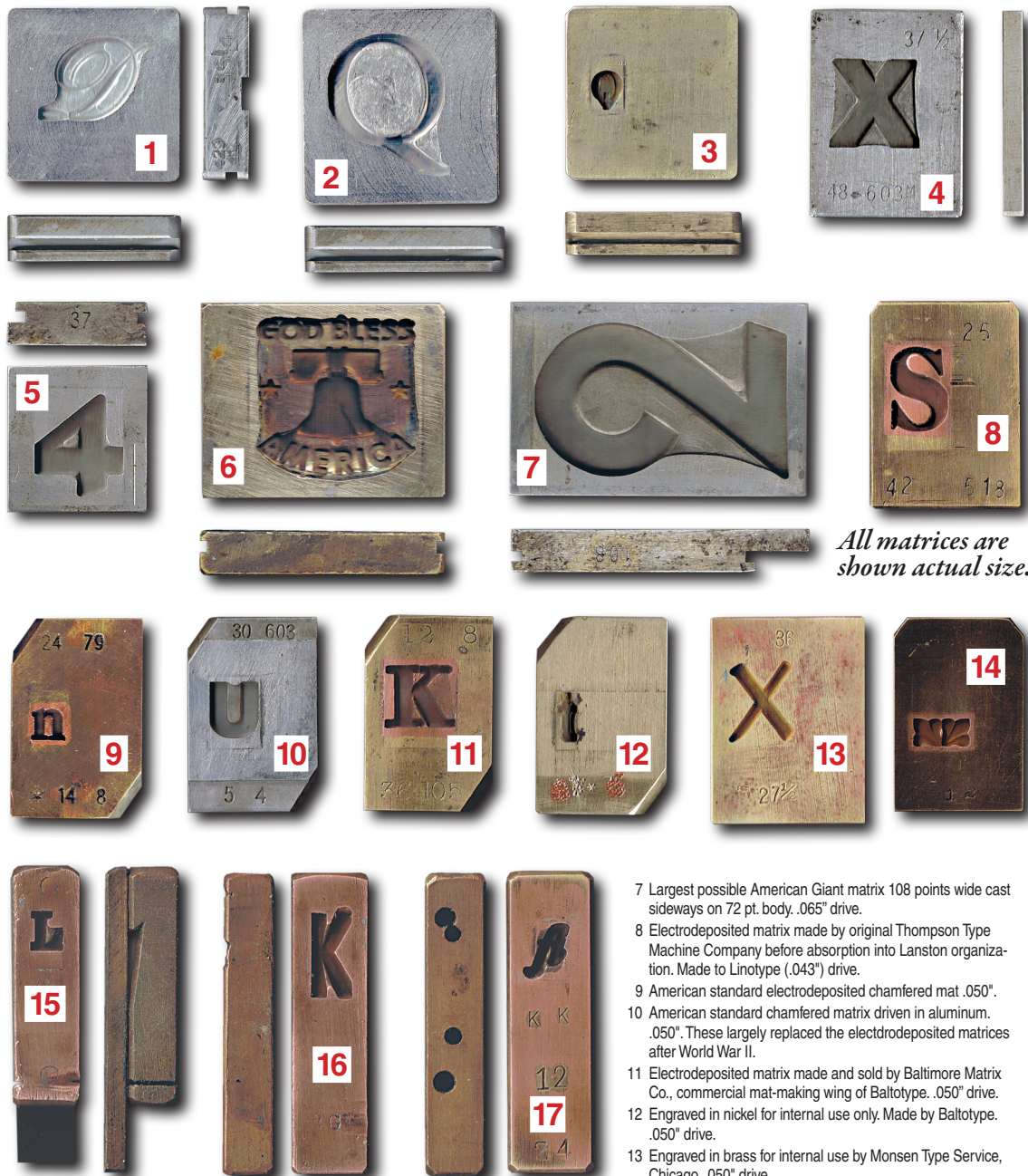
Body	ATF Standards			U. S. Monotype	English Monotype
	Beard	Line in Points	Line as Decimal		
6	1	5	.0692	.0650	*
8	2	6	.0830	.0850	
10	2	8	.1107	.1050	
12	3	9	.1245	.1250	
14	3	11	.1522	.1450	
18	4	14	.1937	.1850	
24	5	19	.2628		
30	6	24	.3320		
36	7	29	.4012		

In this short survey, I have attempted to cover some aspects of greatest probable use to members of the American Typecasting Fellowship on the subject of matrices.

In the pages which follow are some data which may be of occasional help in dealing with the various markings and kinds of typecasting matrices likely to be encountered.

Paul Hayden Duensing
Vicksburg, Michigan
July, 1988

Display Matrices for Individual Casting



All matrices are shown actual size.

Legend

All matrices are 7 points (.096") thick unless shown with side view, which is provided to show unique configuration, where it exists.

- 1 English display matrix 1 inch square. Drive .050" except all over 36 pt. .065".
- 2 English display matrix 1 1/4 inch square for larger characters. Drive same as 1 above. Chrome plated copper.
- 3 English-style display matrix 1 inch square. Drive .050". Engraved in nickel by the firm Experto Industrial in India.
- 4 American Lanston flat matrix made for Thompson caster in 42 and 48 pt. only. Drive .050".
- 5 American Giant punched in aluminum 42 pt. and larger .065" drive. Matrix dimensions became larger as the image itself required.
- 6 Engraved (in nickel) matrix made to Giant Caster specifications by Ballotype.

- 7 Largest possible American Giant matrix 108 points wide cast sideways on 72 pt. body. .065" drive.
- 8 Electrodeposited matrix made by original Thompson Type Machine Company before absorption into Lanston organization. Made to Linotype (.043") drive.
- 9 American standard electrodeposited chamfered mat .050".
- 10 American standard chamfered matrix driven in aluminum. .050". These largely replaced the electrodeposited matrices after World War II.
- 11 Electrodeposited matrix made and sold by Baltimore Matrix Co., commercial mat-making wing of Ballotype. .050" drive.
- 12 Engraved in nickel for internal use only. Made by Ballotype. .050" drive.
- 13 Engraved in brass for internal use by Mosen Type Service, Chicago. .050" drive.
- 14 Matrix made for Composotype machine by that company before it was absorbed by the Thompson Type Machine Company. Drive uncertain, but probably .043".
- 15 Original foundry matrix made for hand casting and here modified for use on pivotal caster. Drive and dimensions vary from one font to another.
- 16 Original foundry matrix made before advent of American Type Founders. Drive and dimensions vary from one font to another.
- 17 American Type Founders electrodeposited matrix. Drilling on side makes the matrix usable with two different Barth-style casters. Drive varies from font to font. Dimensions vary greatly.

This page is extracted from the *ATF Newsletter*, Number 32, published in August, 2008.