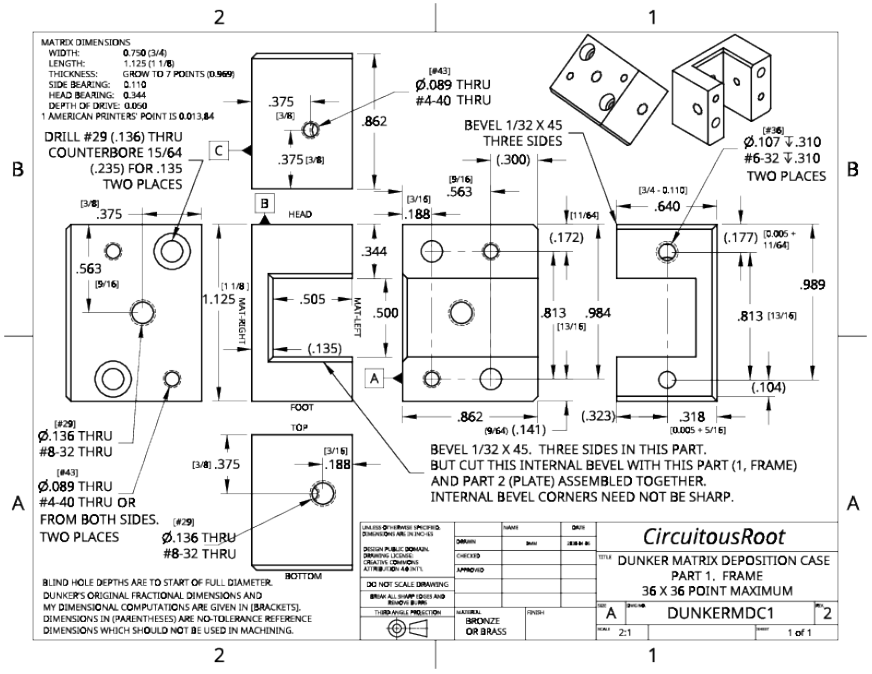
Drawing Portfolio for Workshop Notes on

Electroforming Matrices

(Dunker Method)

Dr. David M. MacMillan



The Typemakers' Society, Inc.

2020

About this Portfolio

This is a portfolio of drawings to accompany Dr. David M. MacMillan's *Workshop Notes on Electroforming Matrices* (Mineral Point, WI: The Typemakers' Society, Inc., 2020). For more information, including a Bill of Materials and a Bill of Tools, please consult that text. It is freely available on its publisher's website at:
`http://www.TheTypemakersSociety.org/publications/index.html`

These drawings illustrate one possible design of an apparatus for one method of typographical matrix electroforming (the method used by Andrew W. Dunker, in which the entire matrix is grown as a solid copper piece).

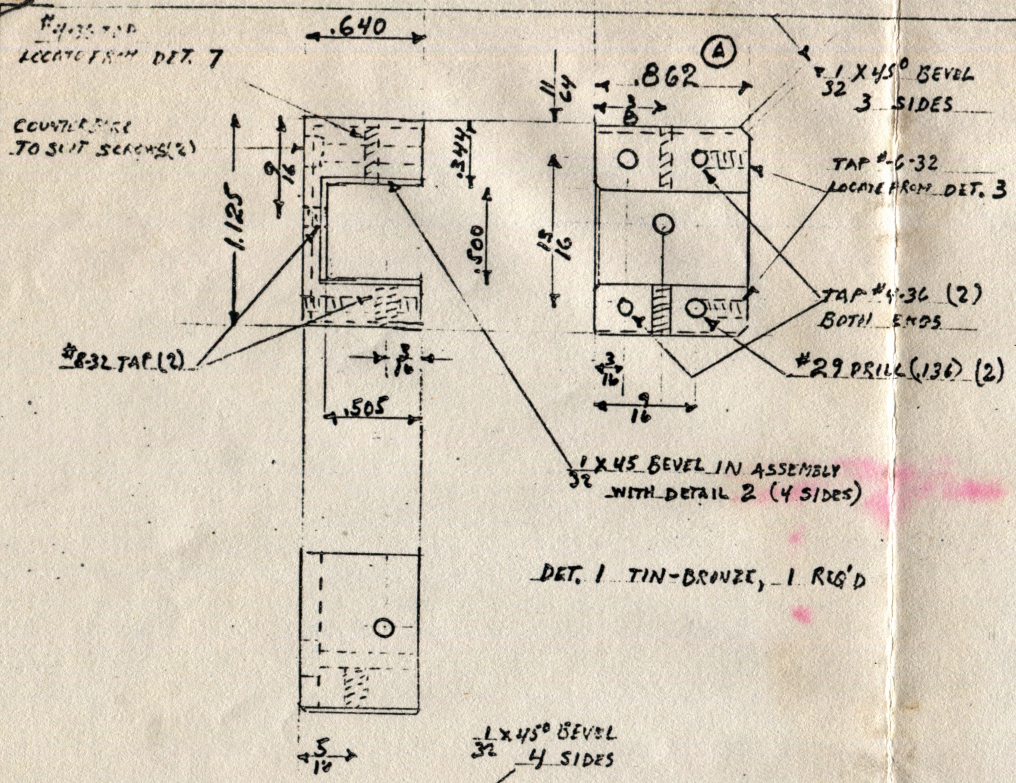
The first four drawings are scans of photocopies of drawings by the late Paul Hayden Duensing and the late Andrew W. Dunker. They appear through the kind permission of Ginger Duensing and the dedicated preservation efforts of Richard L. Hopkins. Ginger Duensing requests that Paul Hayden Duensing always be identified as the author of his work.

The remaining drawings are new drawings by Dr. David M. MacMillan which interpret, fairly closely, Duensing and Dunker's drawings for a Dunker-method matrix electroforming case. These were created from a 3-D CAD model of this electroforming case. This CAD model and the digital originals of these drawings are freely available via the Onshape.com cloud-based CAD service. To find them, search Onshape for "Dunker Matrix Deposition Case" or the public documents of Onshape user David M. MacMillan, or go to it directly at:
`https://cad.onshape.com/documents/0c412a5cb0e263a0c7c3711a/w/ae499bc626bab1ca697671e0/e/3dc0540e4ed9ffe5bfb65163`

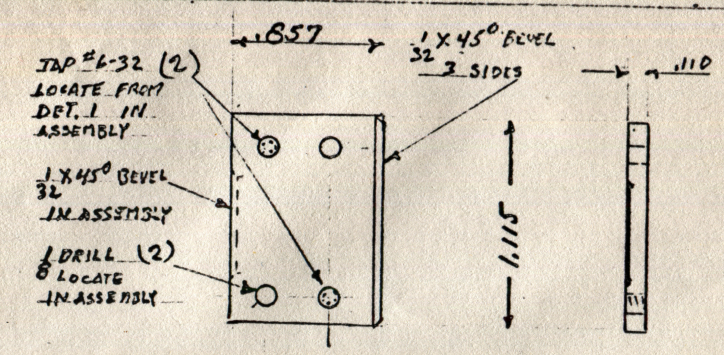
Obligatory Fine Print

Published by
The Typemakers' Society, Inc.,
PO Box 145
Mineral Point, Wisconsin
U.S.A.

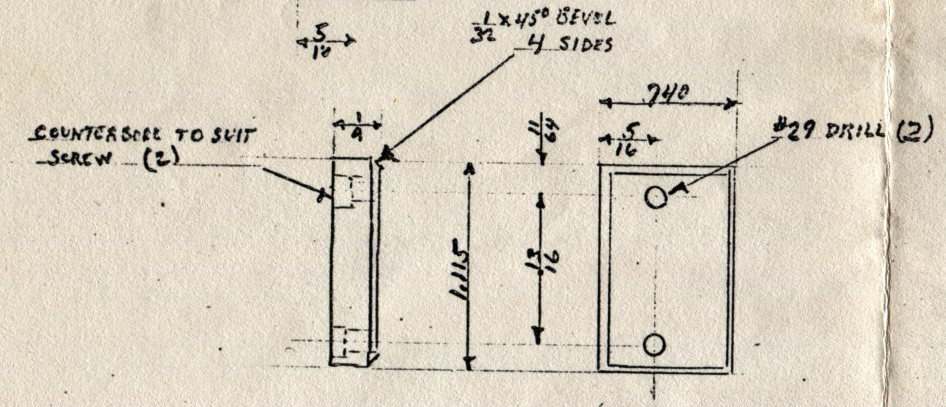
Revision 1, 2020-03-06.



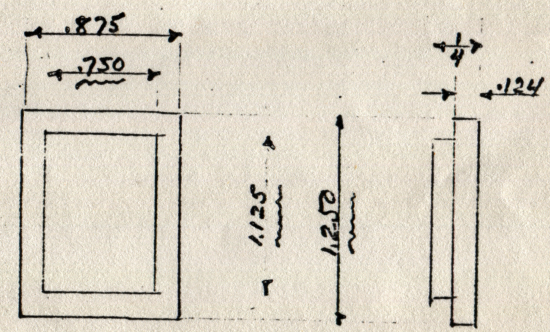
DET. 1 TIN-BRONZE, 1 REQ'D



DET. 2 TIN-BRONZE, 1 REQ'D.



DET. 3 PLEXIGLASS, 1 REQ'D.

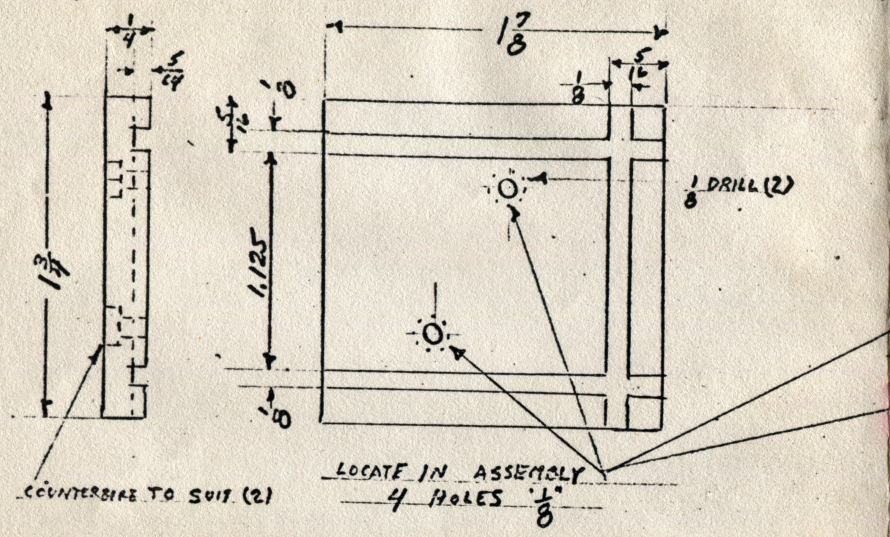


DET. 4, PLEXIGLASS, 1 REQ'D

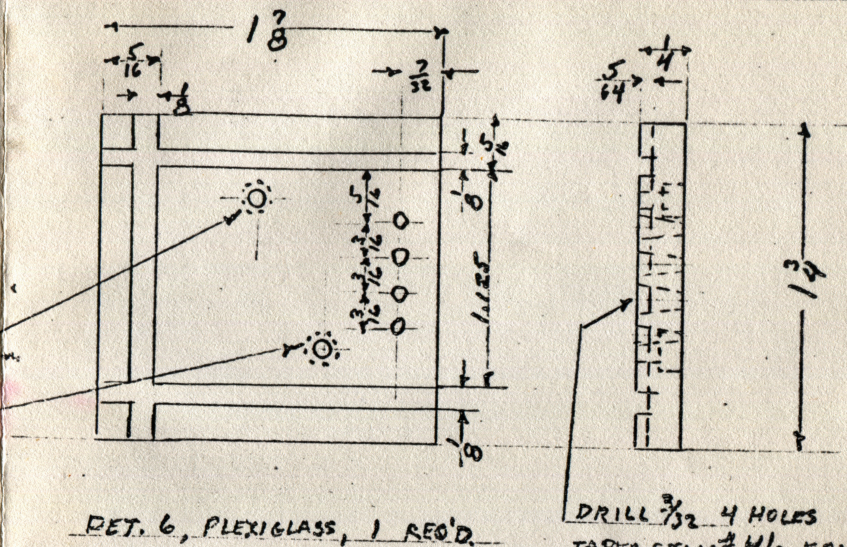
Ⓐ - CORRECT FOR .030 DRIVE MATS.

DEPOSITION CASE DETAILS.

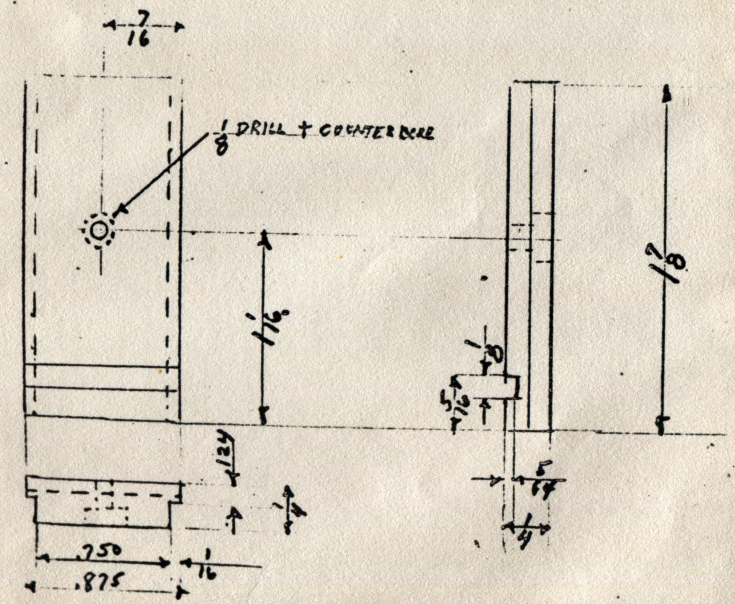
ANDREW W. DUNKER



DETAIL 5, PLEXIGLASS, 1 REQ'D



DET. 6, PLEXIGLASS, 1 REQ'D.



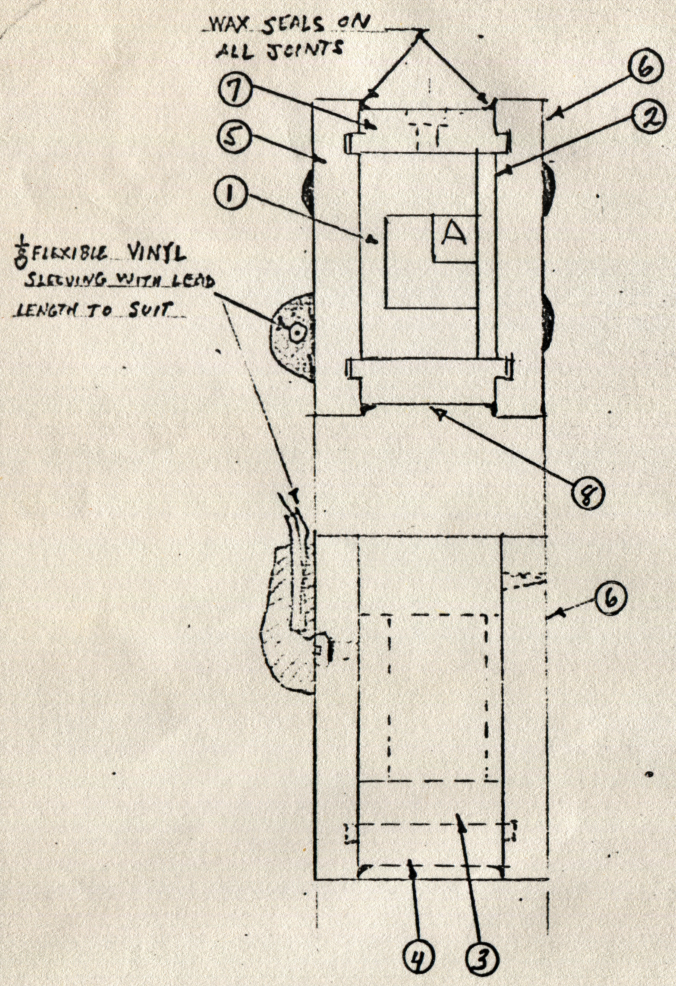
DET. 7 PLEXIGLASS, 1 REQ'D

DET. 8, SAME AS DET. 7, BUT OMIT SCREW HOLE

PLEXIGLASS, 1 REQ'D.

DEPOSITION CASE DETAILS

ANDREW W. DUNKER



ASSEMBLY - TOP VIEW

ASSEMBLY - FRONT ELEVATION.

SCREWS REQ'D (BRASS OR BRONZE)

2 - #6-32 X 5/8 LONG
2 - #6-32 X 3/8 SHORTENED TO 11/32 OR LESS
2 - #4-36 X 1/2 LONG
3 - #4-36 X 3/8 LONG
1 - #8-32 X 1/8 SET SCREW
1 - #8-32 X 1/4 SET SCREW.

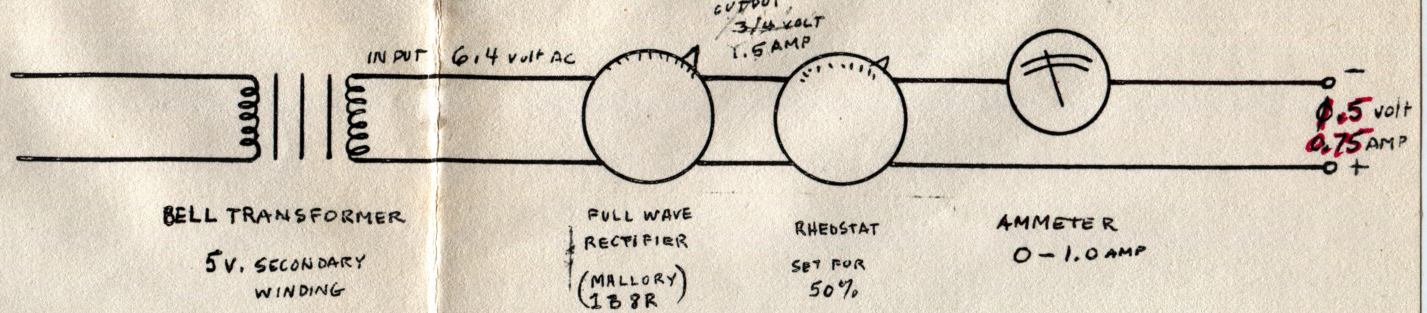
DEPOSITION CASE DETAILS

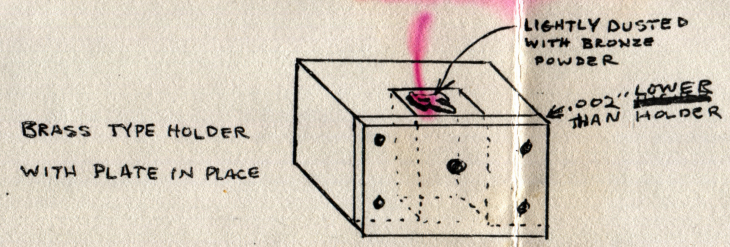
ANDREW W. DUNNER

The private press and typefoundry of

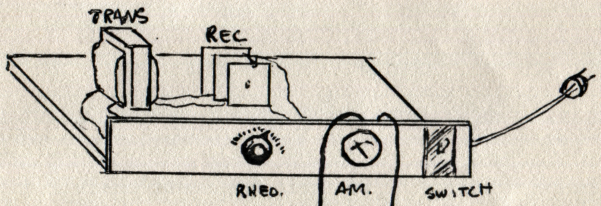
Paul Hayden Duensing

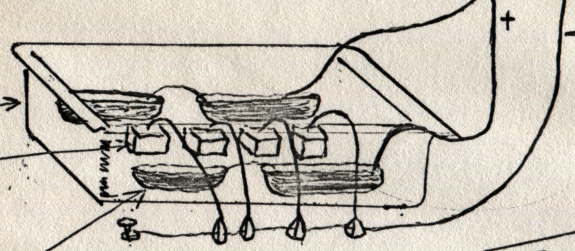
~~426 Dorset St.~~, Kalamazoo, Michigan





BRASS TYPE HOLDER WITH PLATE IN PLACE

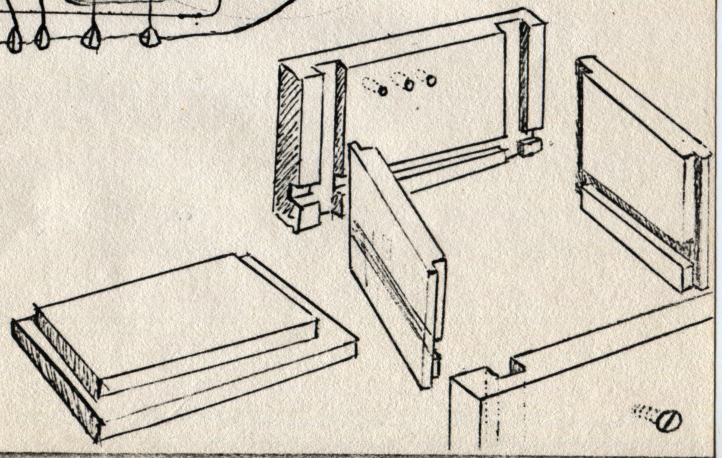




PYREX BAKING DISH

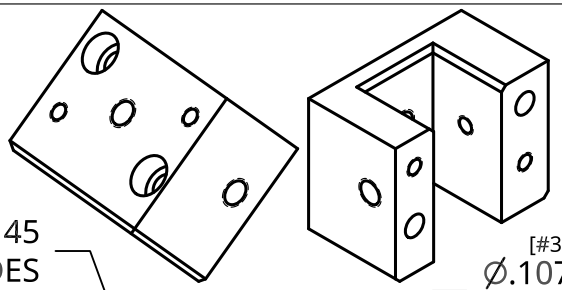
MAT CASES BEING PLATED

INVERTED TOPS TO PLASTIC BUTTER DISHES, FILLED WITH COPPER SHAVINGS



PLEXIGLASS MEMBERS FOR ASSEMBLING NON-CONDUCTIVE PROTECTIVE CASE FOR TYPE HOLDER

MATRIX DIMENSIONS
WIDTH: 0.750 (3/4)
LENGTH: 1.125 (1 1/8)
THICKNESS: GROW TO 7 POINTS (0.969)
SIDE BEARING: 0.110
HEAD BEARING: 0.344
DEPTH OF DRIVE: 0.050
1 AMERICAN PRINTERS' POINT IS 0.013,84



BLIND HOLE DEPTHS ARE TO START OF FULL DIAMETER.
DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND
MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS].
DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE
DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES		NAME	DATE
DESIGN PUBLIC DOMAIN. DRAWING LICENSE: CREATIVE COMMONS ATTRIBUTION 4.0 INT'L	DRAWN	DMM	2020-01-05
	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL: BRONZE OR BRASS	FINISH	

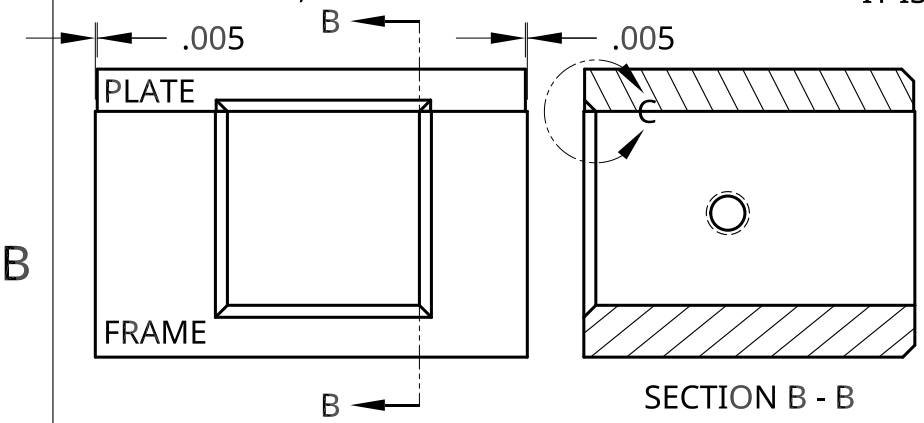
CircuitousRoot

TITLE: DUNKER MATRIX DEPOSITION CASE
PART 1. FRAME
36 X 36 POINT MAXIMUM

SIZE	DWG NO.	REV.
A	DUNKERMDC1	2

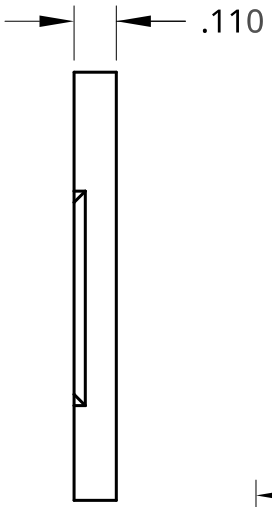
SCALE 2:1 SHEET 1 of 1

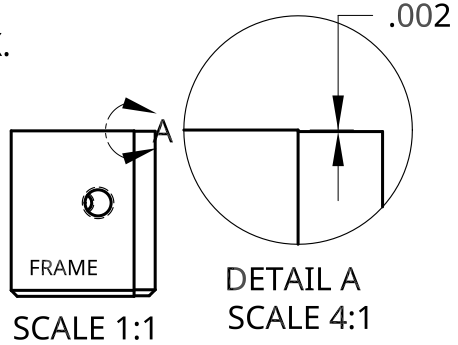
PLATE IS CENTERED LENGTHWISE
ON THE FRAME, .005 EACH SIDE.



SECTION B - B

THICKNESS DIMENSION IS IMPORTANT.
IT IS THE LEFT SIDE BEARING OF THE MATRIX.



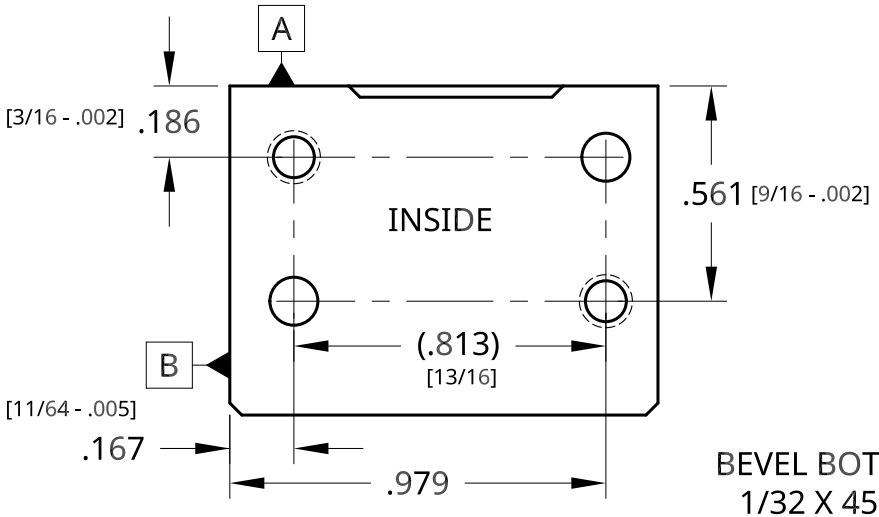


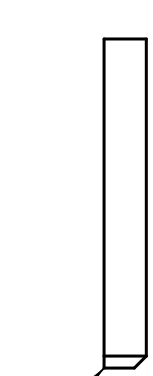
SCALE 1:1

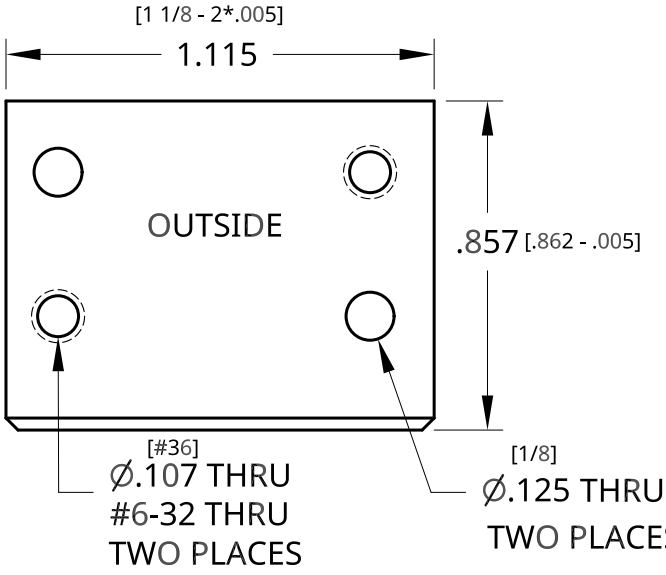
DETAIL A
SCALE 4:1

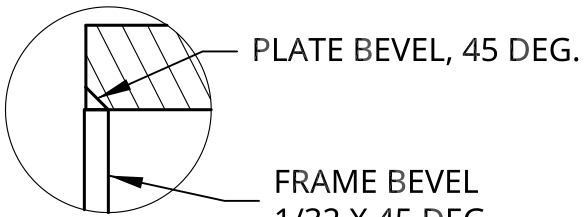
AS ASSEMBLED, THE TOP OF
THE PLATE IS 0.002 LOWER THAN
THE TOP OF THE FRAME (AND
THUS (0.003) ABOVE THE BOTTOM).

MILL TOP ("INSIDE") BEVEL WITH FRAME AND PLATE ASSEMBLED
SO THAT BOTTOM OF PLATE BEVEL MATCHES 1/32 FRAME BEVEL.
SEE DETAIL C (ABOVE RIGHT AND FAR BELOW LEFT).









DETAIL C
SCALE 4:1

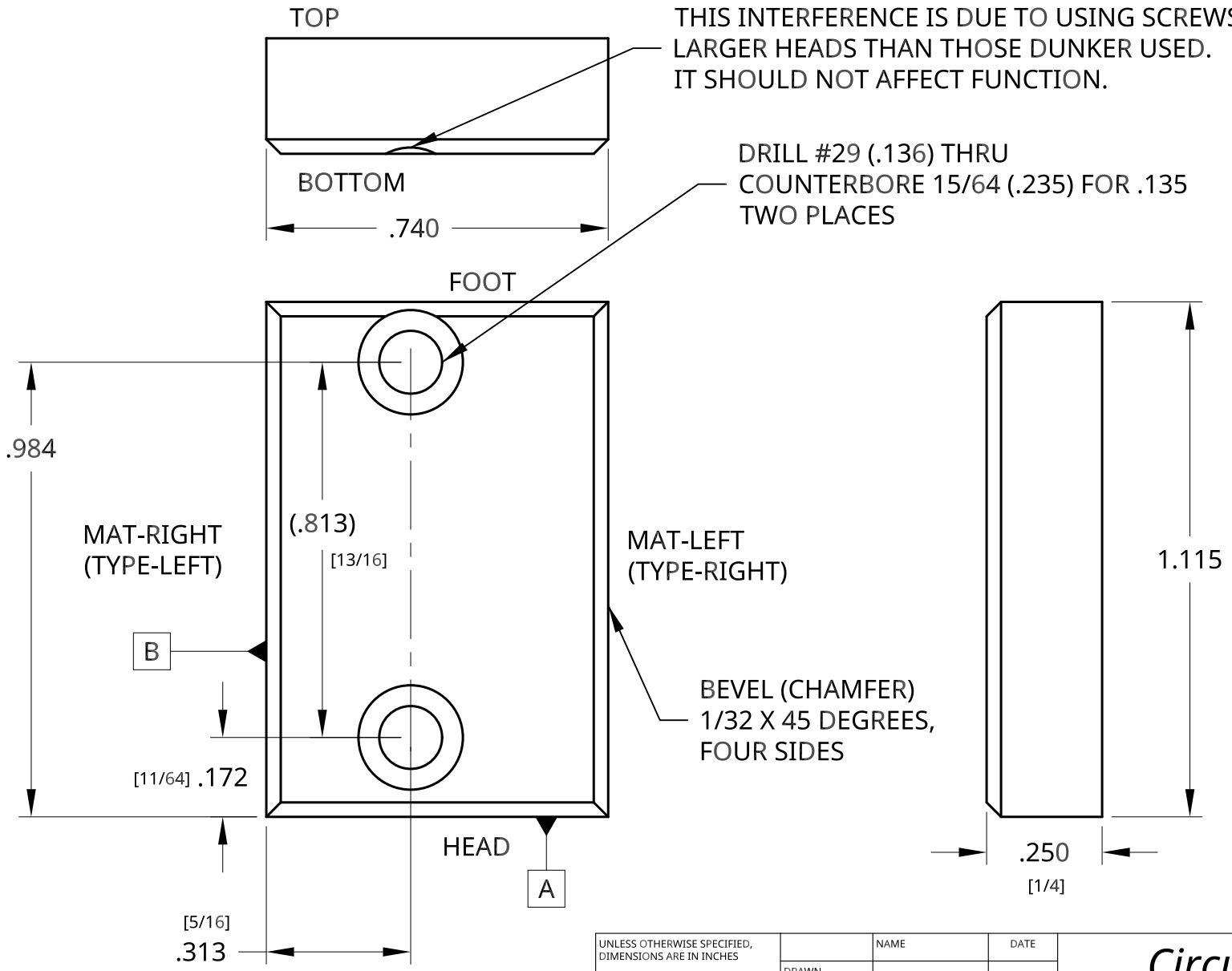
DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND
MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS].
DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE
DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

		NAME	DATE
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES	DRAWN	DAVID M.	01/04/2020
DESIGN PUBLIC DOMAIN. DRAWING LICENSE: CREATIVE COMMONS ATTRIBUTION 4.0 INT'L	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL: BRONZE OR BRASS	FINISH	

CircuitousRoot

TITLE: DUNKER MATRIX DEPOSITION CASE
PART 2. PLATE

SIZE	DWG NO.	REV.
A	DUNKERMDC2	2
SCALE 2:1		SHEET 1 of 1



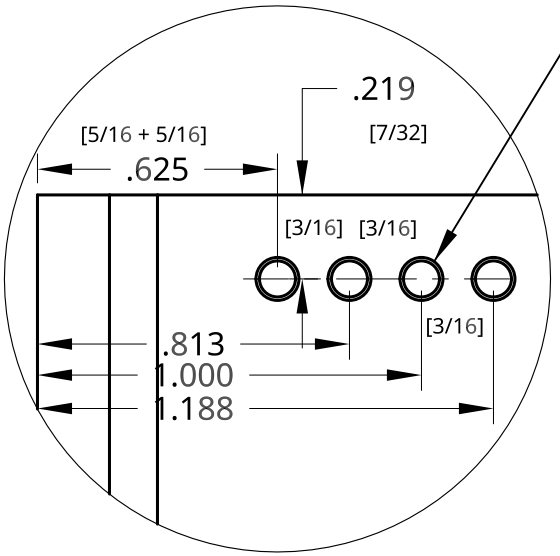
DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND
MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS].
DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE
DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

		NAME	DATE
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES	DRAWN	DAVID M.	01/05/2020
DESIGN PUBLIC DOMAIN. DRAWING LICENSE: CREATIVE COMMONS ATTRIBUTION 4.0 INT'L	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL: ACRYLIC OR POLYCARBONATE	FINISH	

CircuitousRoot

TITLE: DUNKER MATRIX DEPOSITION CASE
PART 3. TYPE HOLDER BOTTOM

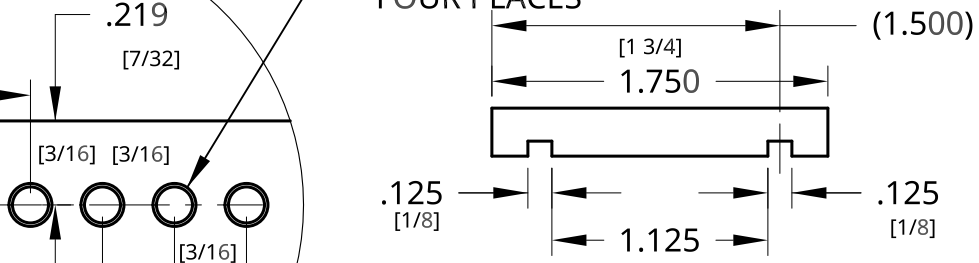
SIZE	DWG NO.	REV.
A	DUNKERMDC3	2
SCALE 3:1		SHEET 1 of 1



DETAIL A
SCALE 2:1

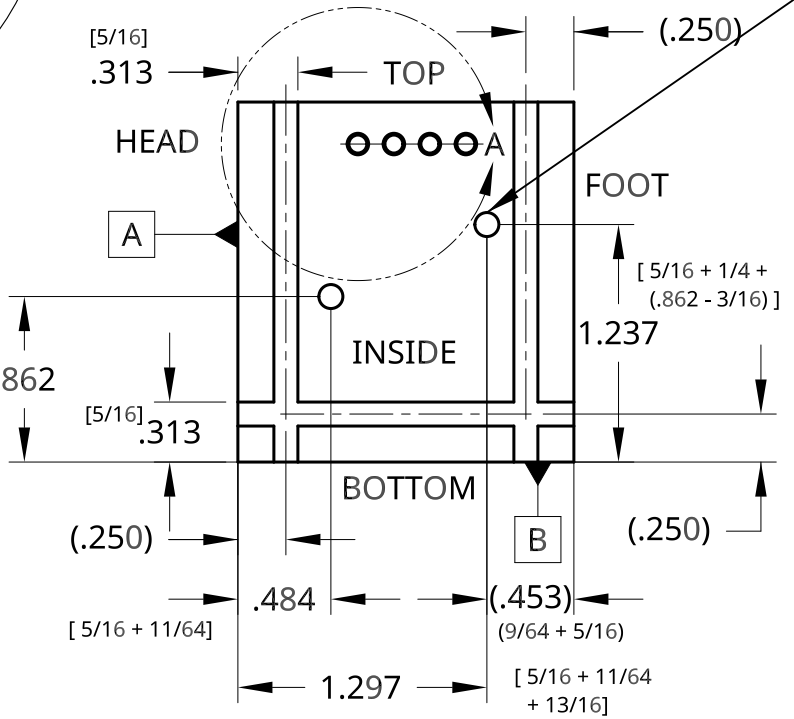
FLOW HOLES

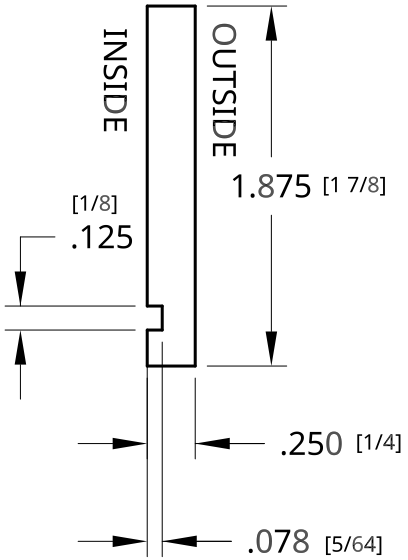
DRILL 3/32 THRU.
TAPER REAM #4/0 FROM THIS SIDE
FOUR PLACES



[DUNKER SPECIFIED 1.125 DECIMALLY.
IT IS THE MATRIX LENGTH, AND IS IMPORTANT.]

ATTACHING HOLES:
DRILL 1/8 THRU
COUNTERBORE FROM OTHER
SIDE 7/32 (.219) FOR .110
TWO PLACES





ACTUALLY, DUNKER LOCATED
THE TWO ATTACHING HOLES
"IN ASSEMBLY" AND DRILLED
AND COUNTERBORED THEM
TO FIT.

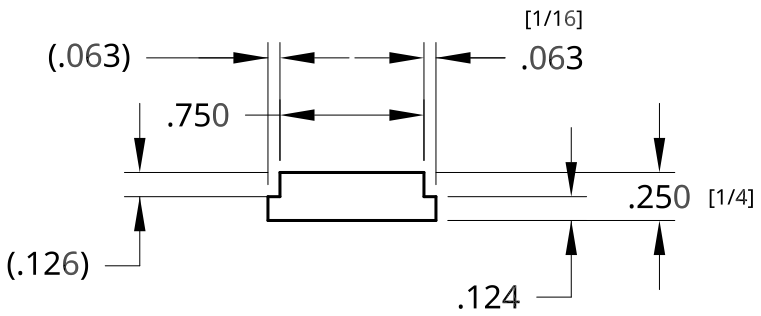
DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND
MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS].
DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE
DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

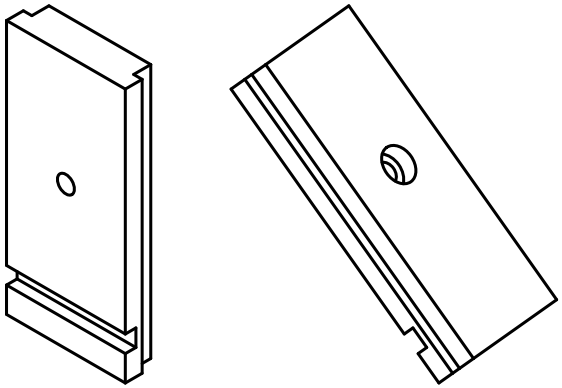
		NAME	DATE
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES	DRAWN	DAVID M.	01/06/2020
DESIGN PUBLIC DOMAIN. DRAWING LICENSE: CREATIVE COMMONS ATTRIBUTION 4.0 INT'L	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL: ACRYLIC OR POLYCARBONATE	FINISH	

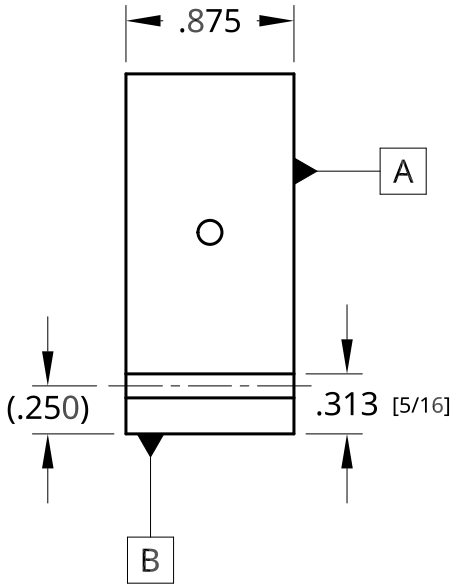
CircuitousRoot

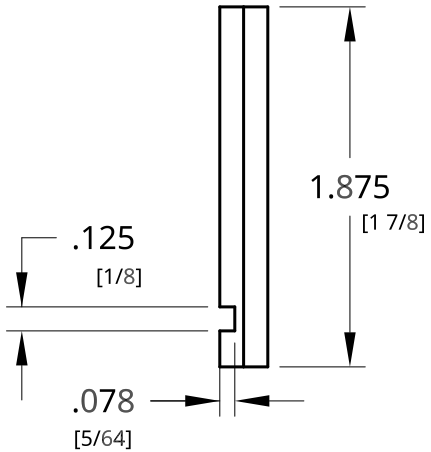
TITLE: DUNKER MATRIX DEPOSITION CASE
PART 4. BOX SIDE A
(MATRIX-LEFT / TYPE-RIGHT)

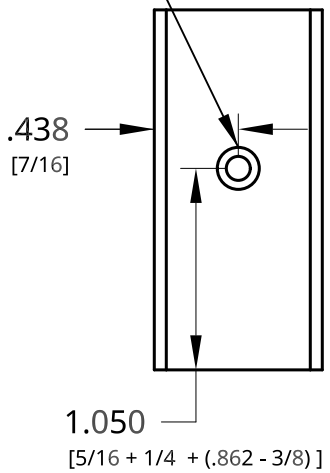
SIZE	DWG NO.	REV.
A	DUNKERMDC4	2
SCALE 1:1		SHEET 1 of 1











[DUNKER'S DRAWING CALLS OUT 1 1/16 (1.063) , WHICH MUST BE AN ERROR.]

DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND
MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS].
DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE
DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

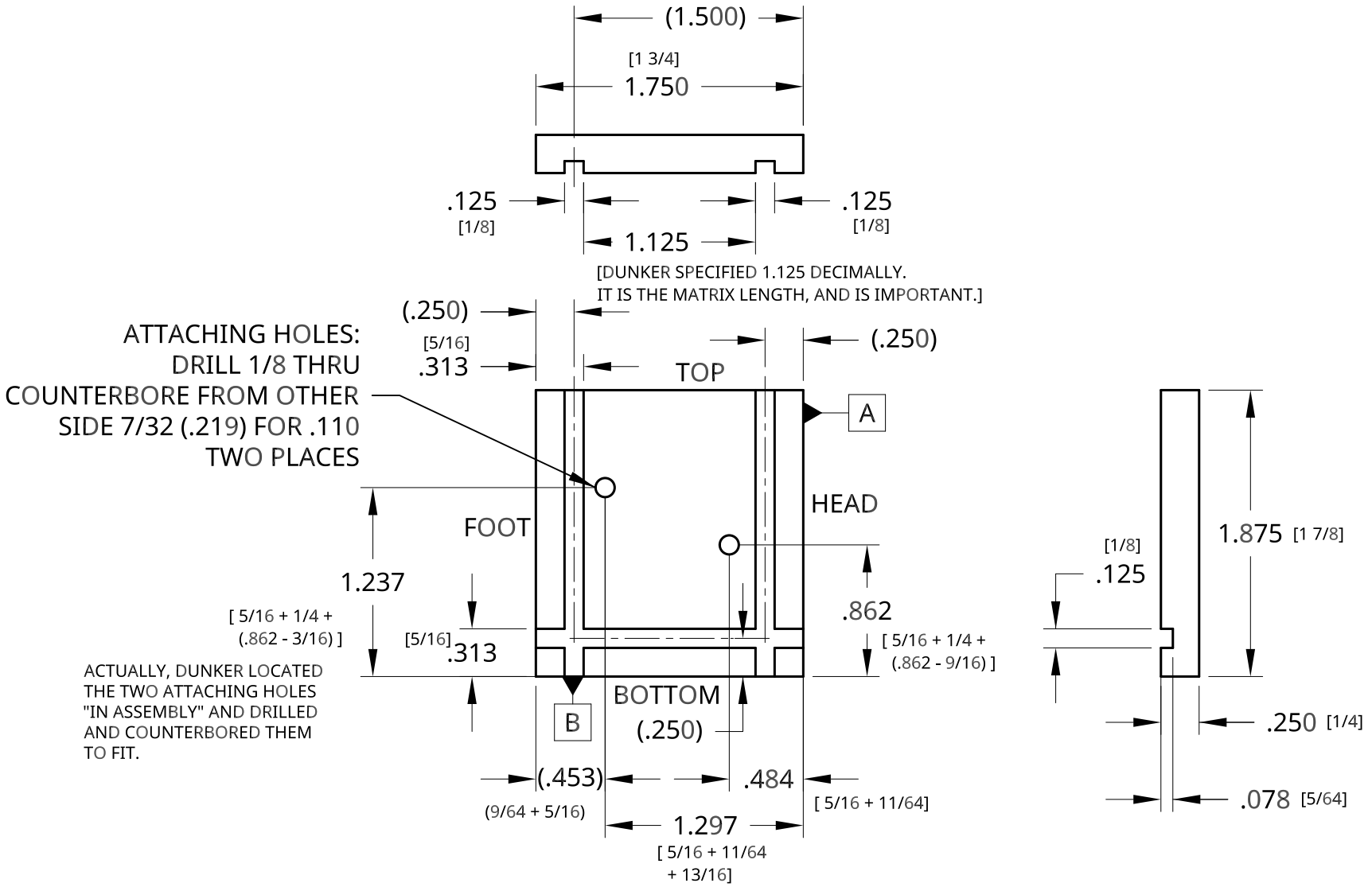
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES		NAME	DATE
DESIGN PUBLIC DOMAIN. DRAWING LICENSE: CREATIVE COMMONS ATTRIBUTION 4.0 INT'L	DRAWN	DAVID M.	01/06/2020
	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL: ACRYLIC OR POLYCARBONATE	FINISH	

CircuitousRoot

TITLE: DUNKER MATRIX DEPOSITION CASE
PART 5. BOX SIDE B
(MATRIX HEAD)

SIZE	DWG NO.	REV.
A	DUNKERMDC5	2

SCALE		SHEET
1:1		1 of 1



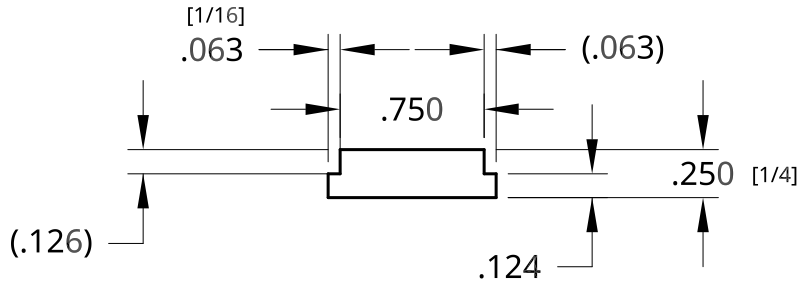
DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND
MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS].
DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE
DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

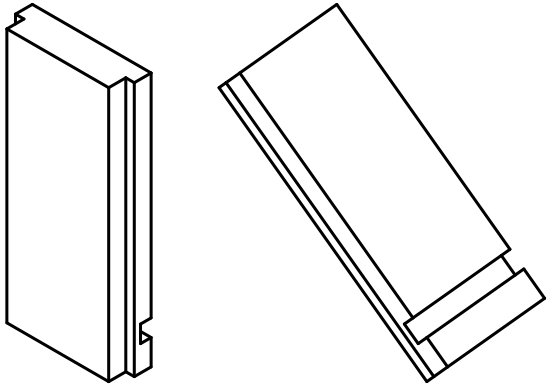
		NAME	DATE
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES	DRAWN	DAVID M.	01/07/2020
DESIGN PUBLIC DOMAIN. DRAWING LICENSE: CREATIVE COMMONS ATTRIBUTION 4.0 INT'L	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL: ACRYLIC OR POLYCARBONATE	FINISH	

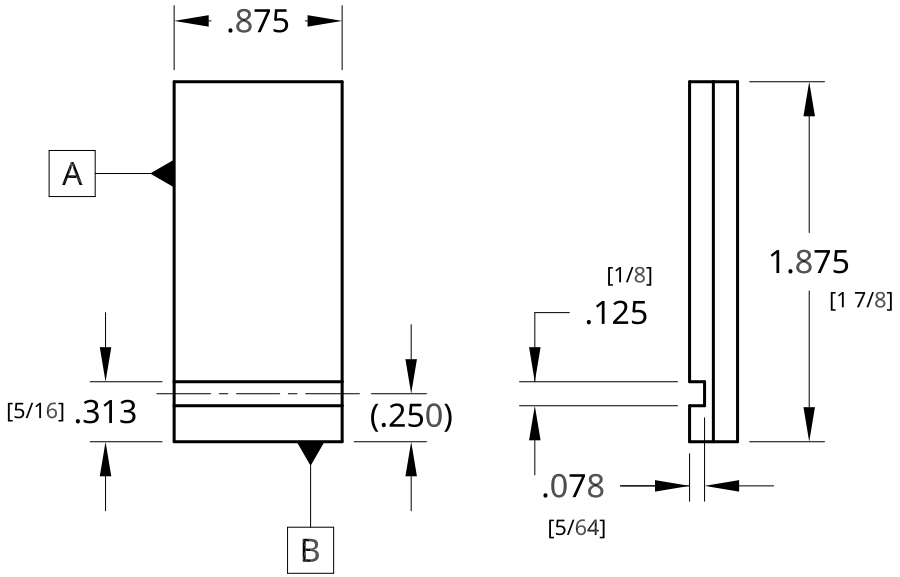
CircuitousRoot

TITLE: DUNKER MATRIX DEPOSITION CASE
PART 6. BOX SIDE C
(MATRIX-RIGHT / TYPE LEFT)

SIZE	DWG NO.	REV.
A	DUNKERMDC6	2
SCALE 1:1		SHEET 1 of 1







NO HOLES

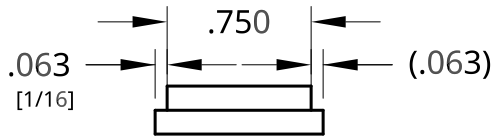
DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND
MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS].
DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE
DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

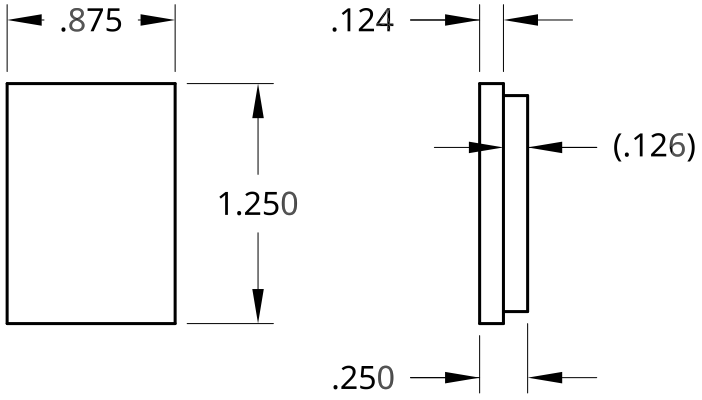
		NAME	DATE
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES	DRAWN	DAVID M.	01/07/2020
DESIGN PUBLIC DOMAIN. DRAWING LICENSE: CREATIVE COMMONS ATTRIBUTION 4.0 INT'L	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL: ACRYLIC OR POLYCARBONATE	FINISH	

CircuitousRoot

TITLE: DUNKER MATRIX DEPOSITION CASE
PART 7. BOX SIDE D
(MATRIX FOOT)

SIZE	DWG NO.	REV.
A	DUNKERMDC7	2
SCALE 1:1		SHEET 1 of 1





THIS IS THE ONLY FRACTIONAL DIJMENSION IN DUNKER'S DRAWING OF THIS PART.

DUNKER'S ORIGINAL FRACTIONAL DIMENSIONS AND MY DIMENSIONAL COMPUTATIONS ARE GIVEN IN [BRACKETS]. DIMENSIONS IN (PARENTHESES) ARE NO-TOLERANCE REFERENCE DIMENSIONS WHICH SHOULD NOT BE USED IN MACHINING.

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES		NAME	DATE
	DRAWN	DAVID M.	01/07/2020
	CHECKED		
	APPROVED		
DO NOT SCALE DRAWING			
BREAK ALL SHARP EDGES AND REMOVE BURRS			
THIRD ANGLE PROJECTION	MATERIAL	ACRYLIC OR POLYCARBONATE	FINISH

CircuitousRoot

TITLE: DUNKER MATRIX DEPOSITION CASE PART 8. BOX SIDE E (BOX BOTTOM)

SIZE	DWG NO.	REV.
A	DUNKERMDC8	2

SCALE		SHEET
1:1		1 of 1