

# D'Asaro Designs 828 Film Punch Model 1 Build Instructions

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## Before you begin:

These instructions are intended for people who have access to a machine shop and are experienced with machine tools. This is not the sort of project that can be completed with hand tools in a garage.

**Operating machine tools is inherently dangerous. Be sure to follow all manufacturer recommended safety precautions. D'Asaro Designs accepts no liability for any injury which may result from attempting to build this device. Also note that these drawings are available for PERSONAL, NON-COMMERCIAL USE ONLY. In short, you are welcome to use them to build this punch yourself, but you must contact me to work out a commission if you wish to sell the completed punches or a significant fraction of the film you make with them.**

## Required Tools:

Although fairly simple, the tolerances in this device, especially in the punch and the die hole, are critical for proper operation. Thus, a CNC mill is required for making some parts. Specifically, you will need access to the following tools:

- 1) Collet lathe - A small lathe is required for making the ball detent sleeve, the punch sleeve, and the punch.
- 2) Milling machine - A CNC model is required for making the tip of the punch and the baseplate. A miniature model will work as long as it has a bed size of at least 2" x 6". A manual milling machine can be used for making the film guide and punch sleeve.
- 3) 1mm diameter end mill - This is used for creating the die hole and punch. It is available from McMaster Carr, P/N 8940A21.
- 4) Basic tools - Wire gauge and fractional twist drill set, end mill set (including a 5/64th diameter mill is recommended), non-marring hammer, tap and die set, assorted hand tools, etc.

## Required Parts:

Please refer to the parts list on Page 5 for a complete list of all the parts and stock required to build the punch. Note that all of these parts can be ordered directly from McMaster Carr except the Kapton® tape which is widely available elsewhere online.

**Selected Notes on Machining Parts:**

A complete set of measured drawings is provided starting on page 8 of this document. Use these as your primary reference for making each part. The notes below are meant only to provide some hints or clarify ambiguities. Please also refer to the parts diagram on page 6 to familiarize yourself with the overall construction of the device and the names of the various parts and features.

- Baseplate: The overall length of this part, the location of the die hole, and the location of the ball detent recess are critical. Be sure to place these features accurately. The only feature on this part that needs to be cut with a CNC machine is the die hole.
- Film guide: This part can be made entirely on a manual mill. Because it is in direct contact with the film, be sure to use a sharp end mill and set the feed rate for an optimally smooth surface finish to avoid roughness that can scratch the film. Once milled, taper the ends of the film recess with a file to allow the film to be inserted easily in the dark.
- Punch: The dimensions of the tip of the punch are critical and thus it needs to be cut on a CNC machine. The rest of the punch can be made on a lathe and a standard mill. The slot in the side of the punch for the setscrew can be most easily cut with a 5/64ths inch end mill on a manual mill, but using a CNC machine, a smaller end mill will work as well. When threading the back end of the punch be sure to keep the die square with the punch body and thus assure that the threads are cut correctly. If you have access to an engine lathe with an appropriate threading tool, you may find it easier to cut the threads on the lathe.
- Punch sleeve: This part can be made entirely on the lathe except for the setscrew hole in the side. Be sure to drill that hole with a milling machine as its location is critical for proper punch operation.
- Ball detent sleeve: This part can be cut entirely on the lathe. The depth of the hole in the sleeve is not critical and it can be made with a simple twist drill.

**Final Assembly Instructions:**

These instructions explain how to assemble the film punch once you have made each part. Before beginning final assembly be sure to review the parts diagram on page 6 to familiarize yourself with the names of the parts of the punch and how they fit together. Also be sure to clean all parts thoroughly before beginning assembly.

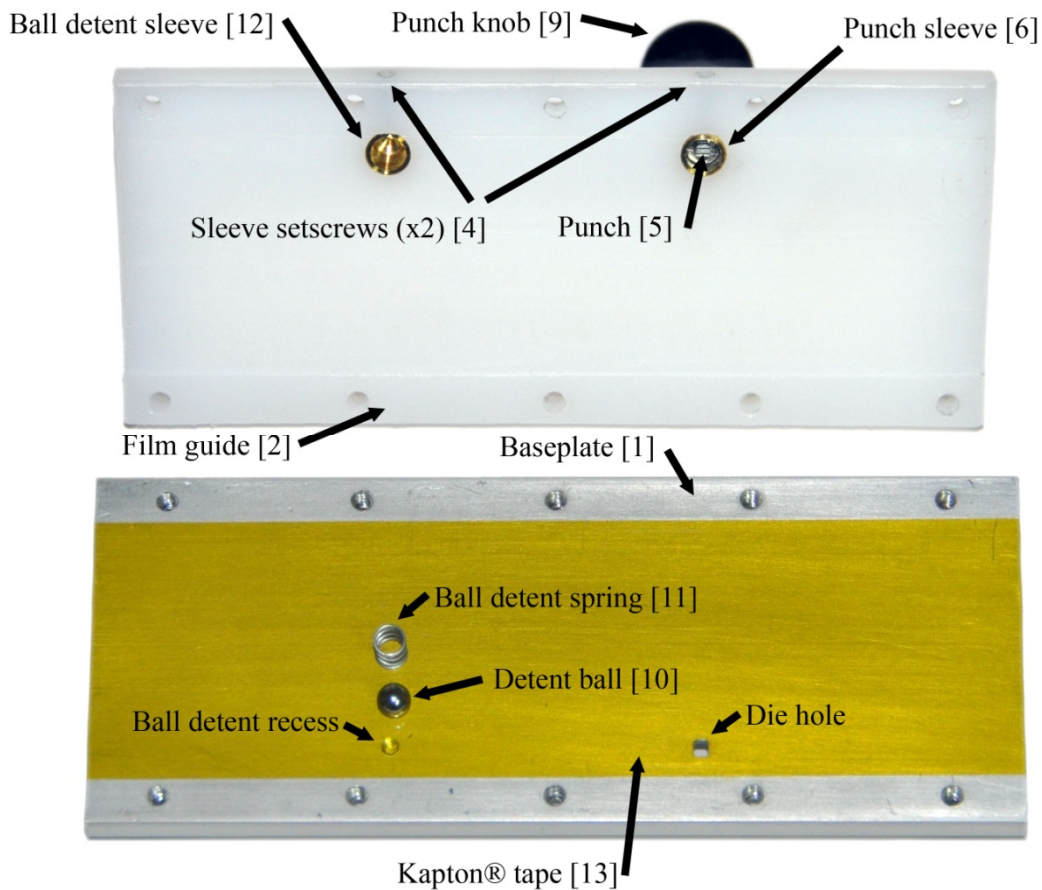
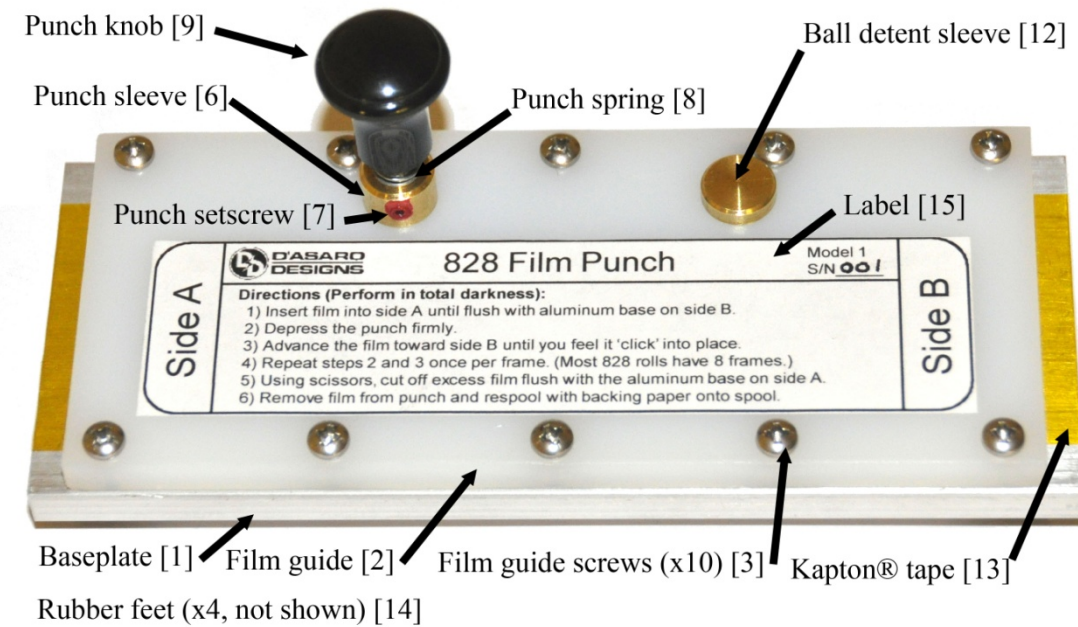
- Step 1: Insert the end of the punch into the die hole on the baseplate. It should fit tightly, but without binding. If it binds insert and remove it a couple times while wiggling it gently until it no longer binds when inserted. Then, using 1000 grit sandpaper on a sanding block, polish the surface of the baseplate until you can feel no burrs anywhere on its surface. Wipe the surface with a damp cloth.
- Step 2: Place the detent ball into the ball detent recess and strike it once with a non-marring hammer. This will very slightly round the edges of the recess to assure that they do not catch or scratch the film and that the ball fits properly into the recess.
- Step 3: Place a piece of Kapton® tape over the surface of the baseplate as shown in the parts diagram. Be sure it is centered properly and free from air bubbles. Then, using scissors or a sharp blade cut the tape so that it is perfectly flush with the ends of the baseplate.
- Step 4: Using a blunted probe, depress and carefully stretch the Kapton® tape which is covering over the ball detent recess. The goal is not to puncture the tape but rather to form it into a concave hemisphere over the recess such that it does not interfere with the detent ball protruding into the detent recess.
- Step 5: Lubricate the shaft of the punch with some fine silicone grease. Be sure to avoid getting the grease onto the end of the punch where it could contaminate the film. Then, insert the punch into the punch sleeve and install the punch setscrew. Adjust the setscrew until the punch will slide in the sleeve without resistance but also without being able to rotate more than a couple degrees. Use thread locking adhesive to secure the setscrew. Install the punch spring and the punch knob. Use thread locking adhesive to secure the punch knob onto the punch.

- Step 6: Install the punch sleeve and the ball detent sleeve into the film guide and insert the sleeve setscrews. Tighten the setscrew for the ball detent sleeve but not the punch sleeve. With the film guide upside down, insert the ball detent spring and then the detent ball into the ball detent sleeve. Place the baseplate over the film guide being sure to orient it such that the die hole aligns with the punch. Turn the assembly over and insert, but do not tighten, the ten film guide mounting screws.
- Step 7: Align the film guide and baseplate as follows. Move the film guide until you feel the ball detent lock into place. Then, rotate the punch until it will pass freely into the die hole. Finger tighten the mounting screws and punch sleeve setscrew, then recheck the operation of the punch. If it does not operate without binding, loosen the screws, recheck the adjustment and repeat. Once the punch operates without binding tighten all screws firmly.
- Step 8: Install the four self-adhesive rubber feet onto the four corners of the underside of the baseplate. Print out the product label on page 13 and adhere it in the orientation and position shown in the parts diagram to the top of the film guide with double-sided adhesive tape, rubber cement, or any similar adhesive product.

**Parts List for D'Asaro Designs 828 Film Punch Model 1**

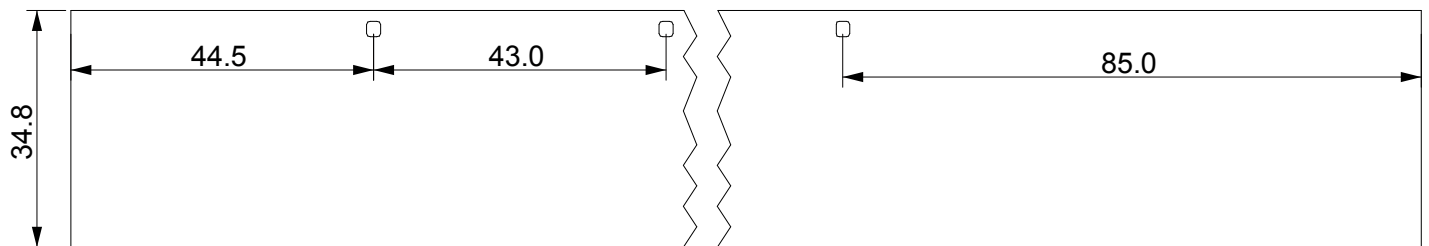
<b>Reference</b>	<b>Name</b>	<b>Quantity</b>	<b>Description</b>	<b>McMaster P/N</b>
1	Baseplate Stock	1x 6" segment	6061 Aluminum Bar, 1/4" thick X 2" wide	8975K71
2	Film guide	1x 6" segment	White Delrin® Tight-Tolerance Bar, 1/4" Thick, 2" wide	9123K72
3	Film guide screws	10	4/40 x 7/16 SS pan head phillips machine screws	91772A109
4	Sleeve setscrews	2	4/40 x 1/4 SS cup point socket setscrew	92313A106
5	Punch	1x 2" segment	6061 Aluminum Rod, 3/16" Diameter	8974K21
6	Punch Sleeve	1x 1" segment	360 Brass Rod, 3/8" diameter	8953K149
7	Punch setscrew	1	4/40 x 1/8 SS extended point socket setscrew	92845A001
8	Punch spring	1	Steel Compression Spring, .250" L, x .240" OD, x .020" Wire	6044K52
9	Punch knob	1	Push-Pull Knob, 8-32 Thread, 5/8" Diameter X 3/4" Height	6044K52
10	Detent ball	1	3/16" low carbon steel hardened bearing ball	96455K51
11	Ball detent spring	1	Steel Compression Spring, .250" L, x .180" OD, x .018" Wire	9657K258
12	Ball detent sleeve	1x 1" segment	3/8" diameter 360 alloy brass rod	8953K149
13	Kapton® tape	1x 6" segment	37mm - 40mm width Kapton® tape. Widely available, but not from McMaster Carr.	N/A
14	Rubber feet	4	Adhesive-Back Bumper Sq 1/2" W x 15/64" H	95495K24
15	Product label	1	Print page 13 to create label	N/A

# Parts Diagram for D'Asaro Designs 828 Film Punch Model 1



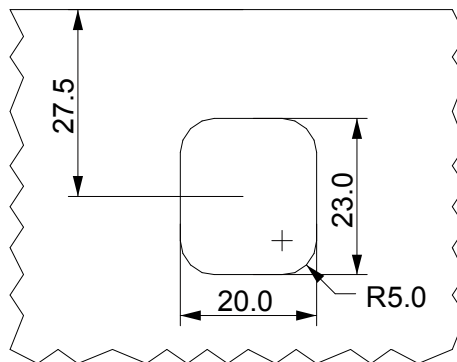
# Type 828 Photographic Film

8 index holes, 43.0 mm spacing

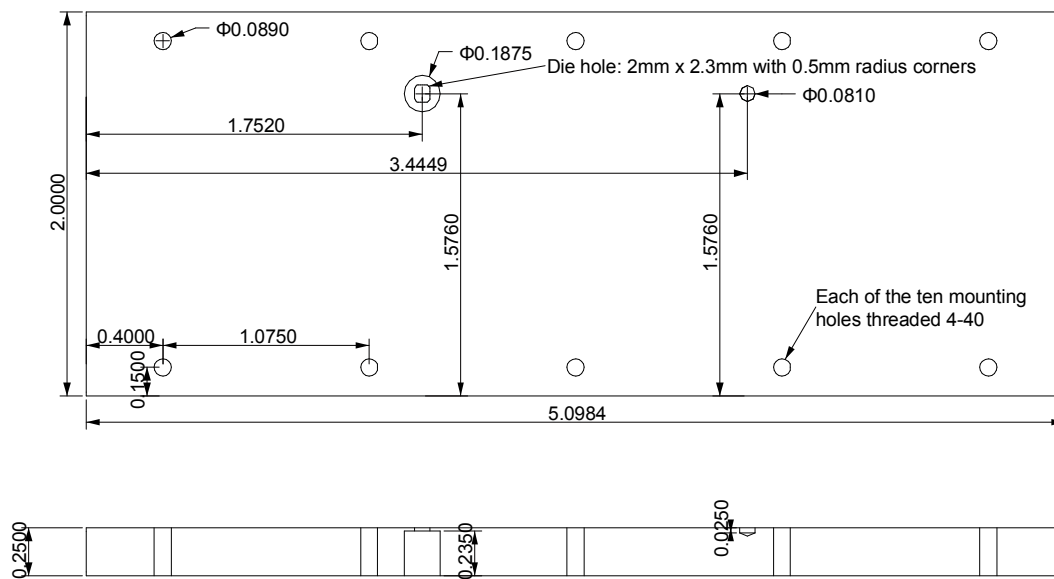


All dimensions in millimeters

## Index hole detail



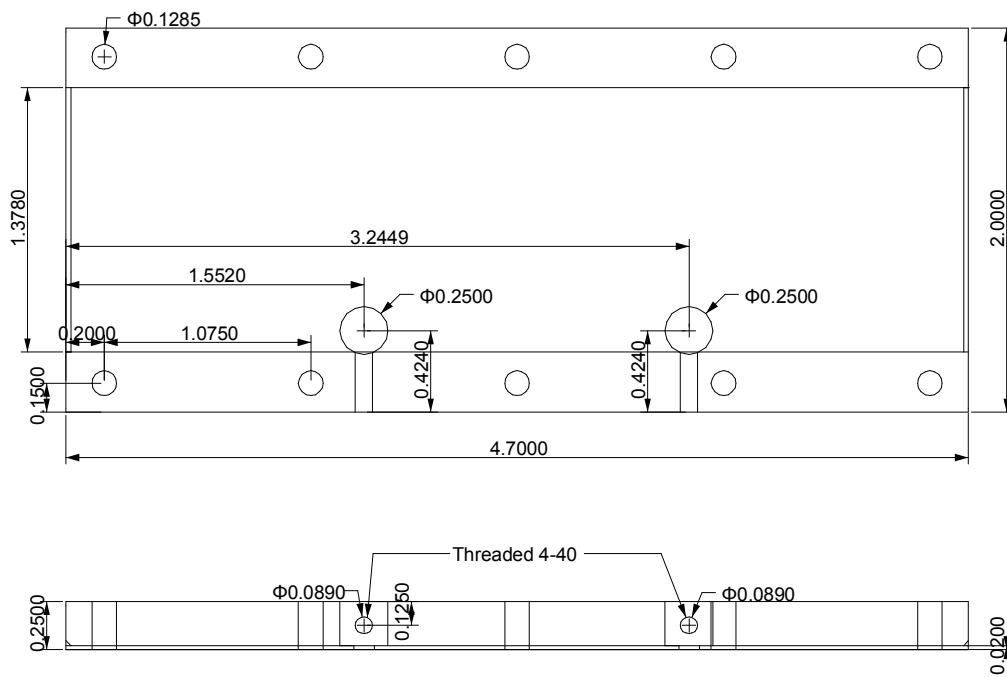
## Baseplate for D'Asaro Designs 828 Film Punch Model 1



All dimensions in inches unless otherwise noted

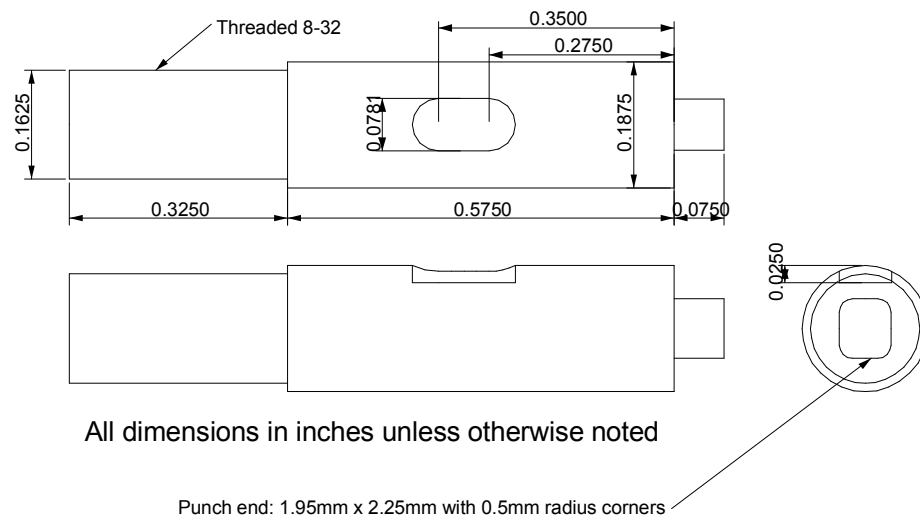


## Film Guide for D'Asaro Designs 828 Film Punch Model 1

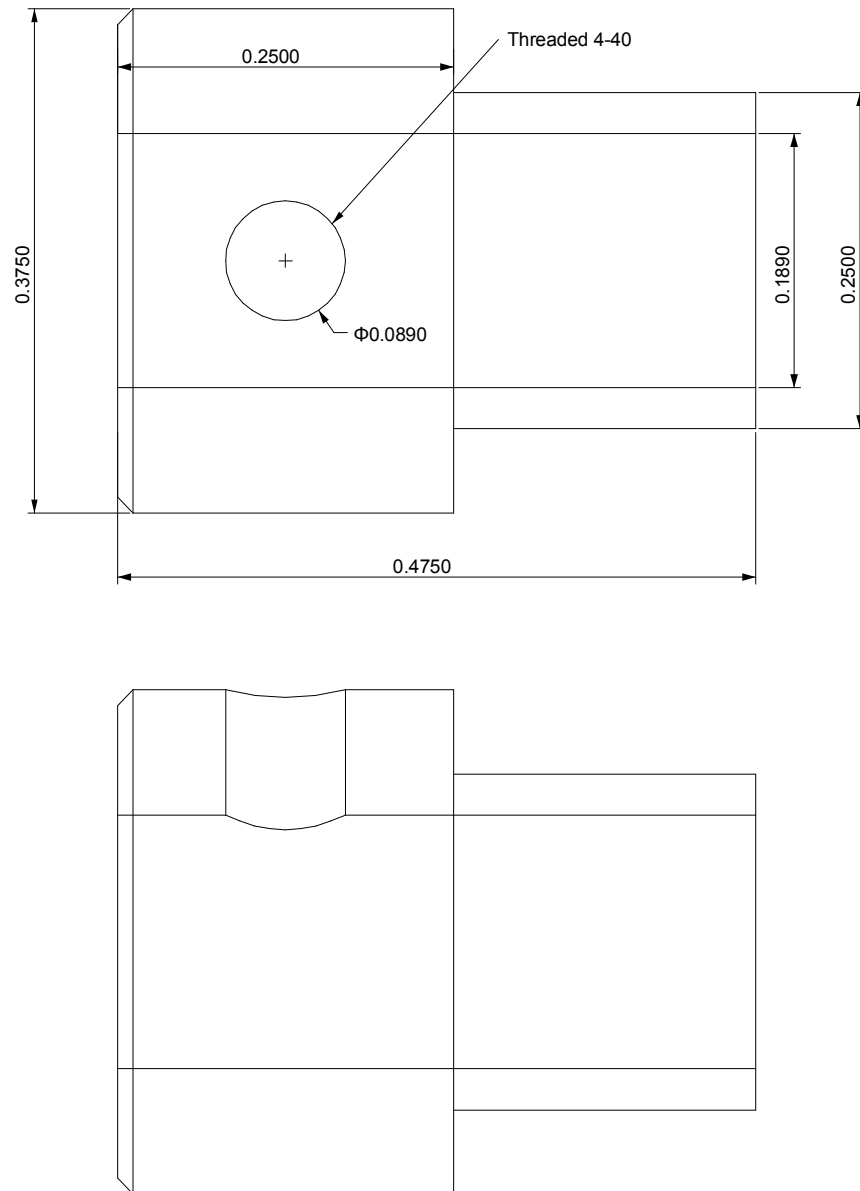


All dimensions in inches unless otherwise noted

## Punch for D'Asaro Designs 828 Film Punch Model 1

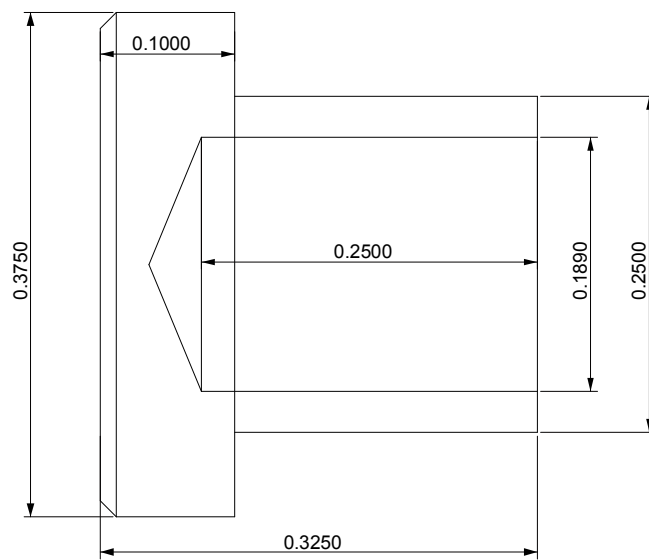


## Punch Sleeve for D'Asaro Designs 828 Film Punch Model 1





All dimensions in inches unless otherwise noted


## Ball Detent Sleeve for D'Asaro Designs 828 Film Punch Model 1





All dimensions in inches unless otherwise noted


	<b>828 Film Punch</b>	Model 1 S/N _____
	<b>Directions (Perform in total darkness):</b> 1) Insert film into side A until flush with aluminum base on side B. 2) Depress the punch firmly. 3) Advance the film toward side B until you feel it 'click' into place. 4) Repeat steps 2 and 3 once per frame. (Most 828 rolls have 8 frames.) 5) Using scissors, cut off excess film flush with the aluminum base on side A. 6) Remove film from punch and respool with backing paper onto spool.	


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