

Mercury Da Yi 120mm Modification Instructions

Introduction

The Da Yi 6x12 120 back is designed in such a way that it can be easily modified from the standard 6x12 film aperture width of 114mm to a full 120mm if desired. You will need to machine two different plates on a milling machine, remount the back's pin rollers, and cut an entirely new darkslide out of thin stainless steel shim stock. However, if you have access to the equipment to do this, no special skills are required; it isn't hard to do.

Required

Milling machine

Tin snips or very good scissors that can cut metal

metal shim stock: 0.3mm thick

drill or drill press

Steps

1. Disassemble the back: Remove the four mask-retaining screws on the bottom of the back, then the rest of the screws holding the next plate—the Roller Plate. The Roller Plate has two more side plates attached to it that stick up a ninety degree angle. Remove both of these, but note which one goes on which side of the Roller Plate! To remove each side plate you must remove three screws on the side and two screws on the bottom. Set the side plates aside; you don't need to further disassemble them.

On the Roller plate, remove the eight small screws holding the pin rollers in place.

You should be left with two bare plates: the bottom Graflok plate and the Roller plate. Both of these must be milled.

2. Extend the aperture in the Graflok plate by milling an additional 3mm on the left and 3mm on the right (marked in green in the image below).



Graflok plate. Machine green areas all the way through and red area to the darkslide chamber height.

3. Enlarge the darkslide channel. In the same plate, extend the darkslide channel by approximately 4mm. Machine just slightly lower than the existing channel—not all the way through the back!
4. Cut out a new darkslide. Use your newly machined Graflok plate as a guide to the size. Make sure that the darkslide is long enough to cover the full channel, and be sure to leave enough for the handle to attach to. You can either use the small metal handle from the original darkslide, or 3D print the Mercury darkslide cover (pictured below). Or you can simply bend the darkslide a bit at the end in lieu of a handle.



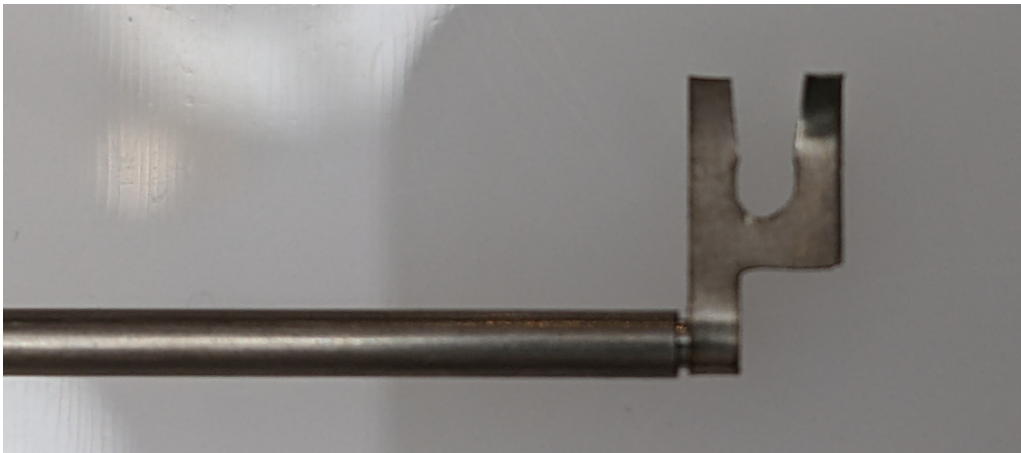
Note: If you don't have the material or means to make a darkslide, you can alternately trim 4mm off the right side of both the Graflok plate and the pin roller plate. Just cut the area where the darkslide

will enter. You will cut some of the light-blocking fabric inside the back, but you will be able to use the original darkslide.

5. On the pin roller plate, extend the area marked in yellow below an extra 3mm on the left and 3mm on the right.



6. Using tin snips or very tough scissors, cut part of the pin roller holding tabs off (approximately 3mm or a little more), then cut a channel in the remaining segment the same or a bit larger width as the diameter of the remaining screw hole.



7. With your four modified pin roller tabs, remount the pin rollers via the original screws, except that each roller will use only one screw, and it will anchor to the holes farther away from the film aperture. You can adjust the pin roller positions, now and later, so you can experiment with best placement. There should be about 0.5mm gap between the edge of each pin roller and the plate.

8. Add film path extenders. It is very important that there not be a significant gap between the pin rollers and the start of the metal film guide. Because we've extended this gap by 3mm on each side, the film path must be extended to remove the gap. Otherwise the tape and film itself, being pulled through by the backing paper, will catch and tear.



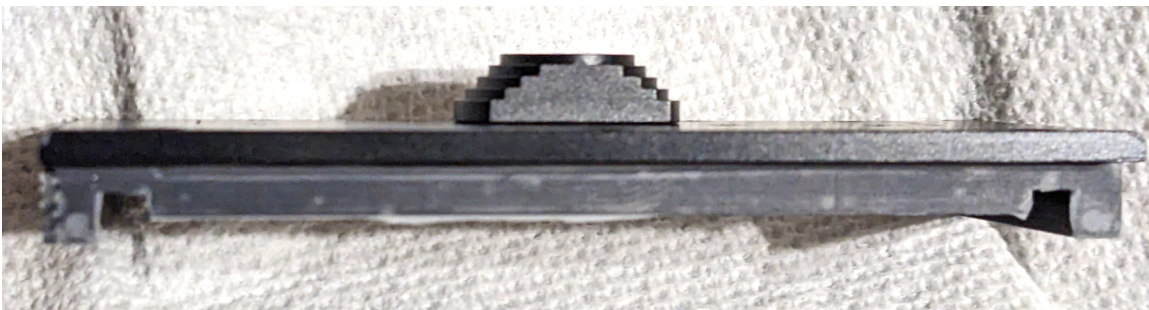
A template is included to laser cut path extenders out of very thin plastic (such as 0.7mm or 0.8mm thick Kydex). This is the recommended method, but you can also 3D print the attached file, or use the included 2D template to machine something out of shim stock. If machining, the guides should be about 0.6mm thick.

Glue each of the four extenders into place so that the larger/wider leg of the “L” extends the film path.

Note that it may be necessary to sand, file, or cut your film path extender so that they fit properly.

Once glued in place (with Superglue that has fully cured). Use a piece of medium grit sandpaper to sand these spacers down to the exact height/surface of the metal film guide it is extending. Only the silver strip closest to the back's film aperture matters. It is along this silver strip that the film runs. When you can run your finger down the metal strip and it feels relatively seamless to the extenders, you're done!

9. Before reassembling the back, there is another modification that you should make in order to make the back work smoother, without damaging film: add 1-2 layers of Scotch Magic Tape to the bottom side of each of the two metal “wings” you removed from the base plate in order to machine and then rebuild it.



Apply the tape (recommended: two layers), press into place, and then use an X-Acto knife or razor blade to cut it down until it contours the metal surface.

Note that you might find a Da Yi factory applied piece of tape or other spacer. This is their attempt to correct the design flaw in the back. Remove it and use the tape method, which more evenly and precisely solves the problem.

10. Reassemble the side plates on the Roller plate, then the Roller plate onto the Graflok plate. Do not replace the mask retaining screws; those should remain off.

Your back will now shoot full 120mm wide frames, with reduced gaps between them.



11. The enlarged segments of the mounting plate that have been milled will now be shiny aluminum. These can actually reflect light onto your film, generating vertical white lines in your images. We suggest blacking them out with a matte enamel or other durable paint. You can also, after cleaning with steel wool, treat with Aluminum Black, which will create a dark oxidized surface that removes the silver reflective surface (this is what we do when we modify these in-house).

FURTHER RECOMMENDED MODIFICATIONS

These are highly recommended:

1. File the sharp corners off of the bottom of the film insert (the part that you push down into the mounting plate, between the wings). This will make it much easier to insert this into the bottom assembly.



2. 3D print the two parts of the “Mercury Da Yi Memo Holder.” Glue the two pieces together with Superglue or use a bit of acetone to ABS weld them together (if you printed them in ABS; recommended).

Remove the bottom left screw on the brass-colored “Da Yi” plate.

Place the assembled film memo holder in the bottom left corner, attaching it to the back using the screw you removed.

This will hold the memo flap from a 120 roll film box. Or you can cut your own piece of cardstock to write whatever you wish! Note, however, that you will need to cut or tear the corner of whatever you insert, to avoid obstructing the spring head.



This covers the irrelevant text on the back, and more importantly, covers the redundant (unused) window.

If you don't wish to use the Mercury film memo clip holder, you can cover the left most window through some other method. Just be careful not to get any glue or tape on the sliding metal sheet below!

IN USE

The Da Yi back can leak light through the darkslide slot and on the left side (opposite the darkslide slot), near the base of the side "wings." The modification described above that slightly spaces up the wings, easing some of the excessive pressure on your film, can exacerbate the light leak problem. If you experience any light leaks, we recommend using black cloth gaffer's tape to cover the left and right sides of the back, near the base. It is especially recommended to remove the darkslide and tape over the darkslide slot whenever you can: i.e., when you won't be changing backs, front spacers, or lenses for awhile.

These measures can be helpful when shooting in bright daylight.