

Introduction



The final results

The Polaroid 110 to 4x5 Conversion requires you to permanently remove the entire back and drill several 3mm holes in the body. Ready to proceed? ***At your own risk! I have done more than five conversion at this point in time, all successful, but no warranty! Note also that this conversion don't expose the entire 4x5 film sheet, due to it's position (sample negative shown below).*** For that the filmback should have been further back and higher up, however that would have spoilt the compact design of the conversion as well as made use of the double window viewfinder and rangefinder of the 110A model way more difficult.



here are two major Polaroid 110 models, the A and the B. The main difference is that the B model has a single combined viewfinder and focus window on the far left side (camera body seen from the back) whilst the A model has separate viewfinder and focus windows slightly more to the right than the B model. Thus in the used market the B model commands a higher price than the A model.

Is it **difficult**? Do I need **special tools**?

The conversion is not particularly tricky nor complicated, and can be completed in a few hours. There are some dremel'ing/ drilling out rivets required to remove unwanted parts, and some new holes to be drilled using a 3d printed template to get the holes in the right place.

Tools required are a drill, 3mm and 8mm drill-bits, plier, a few screwdrivers and a 2mm hex/allen key.

The 4x5 converted Polaroid 110 weighs in at only 1,4 Kg compared to the 2 Kg of the unmodified camera.





Selecting a suitable camera body

This conversion is for the Polaroid 110 A or B only! (Most likely also usable for the a Polaroid 120, the back conversion is also suitable for the Polaroid 900 IF you the replace the lens and modify the front standard) Thus you need a Polaroid 110 with a bright and clear viewfinder and rangefinder, a fully functional and reasonable accurate shutter, smooth focus rail, and that the front closes correctly. If you get yours from ebay or some other online source, look at the overall condition, do the strap look worn? Etc.

Inspect rangefinder at infinity

Does it align correctly when at infinity, i.e do the double image completely overlapping both vertically and horizontally?

Does the double image separate as expected the using the focus knob on the camera?

If Yes, move on to the next section.

If No, you should be able to adjust the rangefinder back to normal using the procedure found at this [page](#).

Bill-of-material

Converting the camera to 4x5 uses the following material in addition to your Polaroid 110.



1. Filmback, 3d printed part
2. Film holder frame, 3d printed part
3. Lower clamp, 3d printed part
4. Back clamp, 3d printed part
5. Top clamp, 3d printed part
6. Ground glass holder, w plexiglass ground glass, 3d printed part
7. Infinity stop plate, 3d printed part
8. 2 x 25 mm M3 screws (filmback to camera body, right side)
9. 2 x 10 mm M3 screws (filmback to camera body, left side)
10. 5 x 12 mm M3 screws (filmholder frame to filmback)
11. 4 x 16 mm M3 screws (bottom and back clamp to film back.
12. 1(2) x 8 mm M3 screws (top clamp to film back.)
13. 4 x 10mm spring (bottom and back clamp)
14. 1(2) x 5mm spring (top clamp)
15. 14 x M3 brass threaded inserts.
16. Drill guide, 3d printed tool
17. Sunshade, 3d printed part.

Slight variation in screw lengths will be acceptable in most places.

Sources for the other parts:

If you have 3d printed the parts yourself, you need to source the following to make your BoM complete.

[3mm Screws](#), a kit like this or similar will get you there

[3mm brass inserts](#), OD 4.2, m3x3mm. note length of insert.

[10mm and 5mm springs](#) from this source.

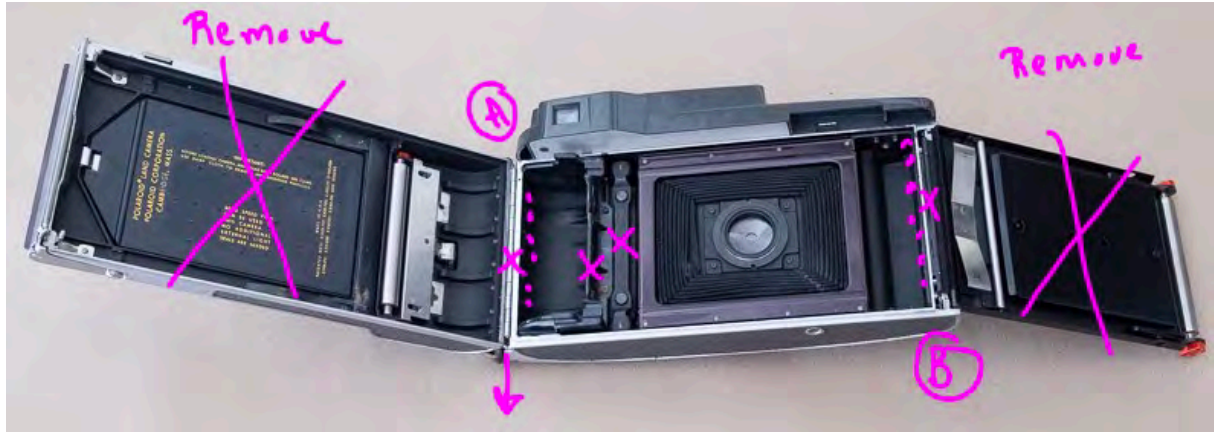
Plexiglass cut to size, matted with fine sandpaper, matt side towards lens, glued into the ground glass holder.

Filmback preparation

As a starting point for your Polaroid 110 4×5 Conversion some parts of the camera back has to be removed! This is a destructive process which once complete is tricky to reverse! So ensure that you are comfortable with this before proceeding!

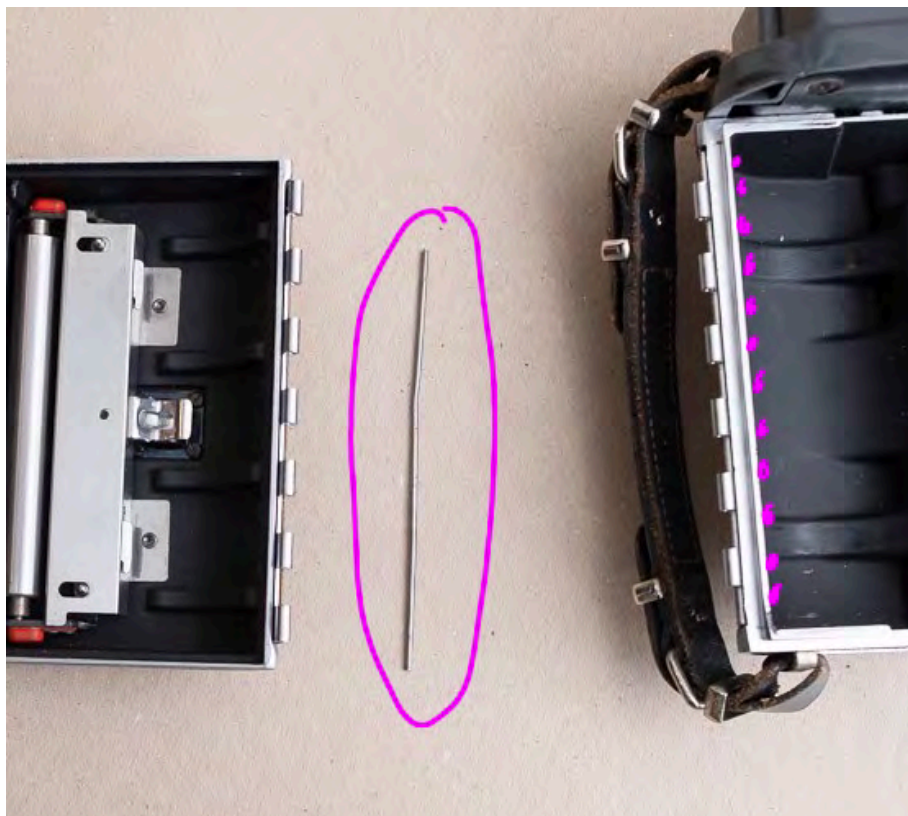


Now this is what needs to be done!



This was the the order I did it in, could be done in any order, its the end result that matters. See the more detailed pictures below.

1. (A) Remove the camera back by pulling out the hinge pin with a plier. Move it the first bit by insert a pointy thingy on the other side. (thin nail, screw driver, another pin etc)
2. Now the remaining hinge on the camera body needs to be removed.
3. Do this by drilling/ dremel'ing away the rivet heads.
4. The remove the leather on the hinge in order to remove it from the camera body. Or cut with a sharp knife just below the hinge to remove it.
5. (B) Then remove the right hand part, with the film pressure plate, by drilling (or dremel'ing) out the rivet heads.
6. This part then normally needs some physical encouragement on each rivet to be removed due to camera body construction. Use a large screw driver to leverage out one and one rivet.
7. Then its the parts on the left hand side looking at the camera body from behind.
8. Remove the screws for the film spool.
9. (May not be needed on your camera) on one of the 110As the film spool holder was riveted in place. Drill out the two rivet heads.
10. Remove spool holder.
11. The parts will the two springs are removed by drilling out the two rivets from the lens well. Be careful as this will be part of the camera fastening later.





The camera back should now look like the picture below! Move on to next section!



Now is a good time to check if your rangefinder patch is overlapping correctly at infinity, and if not [reset it](#) before you proceed.

Reset rangefinder

Should the split image in the rangefinder not overlap at infinity, the rangefinder needs to be reset. To do this the rangefinder house needs to be removed in order to access the resetting screws.

This is a fairly straightforward process but patience, careful and slow moves are required. Twisting screws only 1/12 turn and then checking...

The best time to do this step is after you have prepared the camera back by removing the parts no longer needed, and before you mount the new 3d printed back as it will prevent access to two of the required screws.

Now in order to enable removal of the rangefinder house the top strap fastening needs to be opened and the strap removed from the rangefinder house. (Seems to be applicable only for the A model)

Then in order to remove the rangefinder house there are 4 carefully hidden screws that needs to be removed. All are Phillips type screws, but all are a different shape and size.

Note that there will be slight variations between the various models and even on the same model based on production date, however I have yet to find less than or more than four screws.



The different screws...

They are hiding;

1. In the top right corner of the lens "well".
2. Under the rangefinder/ seeker window on the back side.
3. In the film takeup spool centre on the right side.
4. In the flash hot shoe.



1 first screw, lens well Polaroid 110 A



1 Screw lens well, Polaroid 110B, note the slightly different location from the 110A.

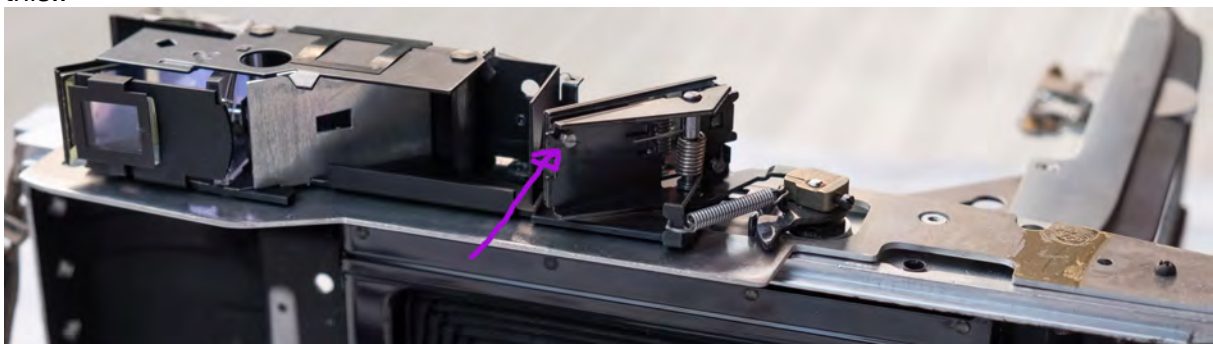


2 & 3 second and third screw, under finder window and center of take up spool



4 screw, flash screw

With all of the screws and the rangefinder house removed, you should see something like this..



Polaroid 900 110B rangefinder assemblage. Or this...



Polaroid 110A, rangefinder setup

Note that there are several varieties of the rangefinder house, thus if not shown here, please ask and I will try to provide guidance. Send images on email of YOUR rangefinder.

Or something else, but fairly similar.. if in any doubt take pictures and send me on email and I will do my best to provide advice.

Reset infinity procedure:

- Put camera on a tripod.
- Turn focus to infinity (i.e. all the way in)
- Point the focus patch in the rangefinder at an high contrast object at infinity (300m+); a light pole or flag pole is great or something which gives the same high contrast in the focus patch.
- How much are you out? And which way? Before infinity or past infinity?
- Now turn the rangefinder reset screw 1/12 turn counter clockwise. See image above.
- Check the rangefinder, what are the results?
- Wrong way? Or to much?
- Adjust screw (Shown with arrow above) in 1/12 turn increments or less until the rangefinder split image overlaps when the focus is at infinity.
- On some models this are done only once, on others both for the vertical and horizontal alignment.
- Then re assemble in reverse order.

You are now ready to proceed with the conversion.

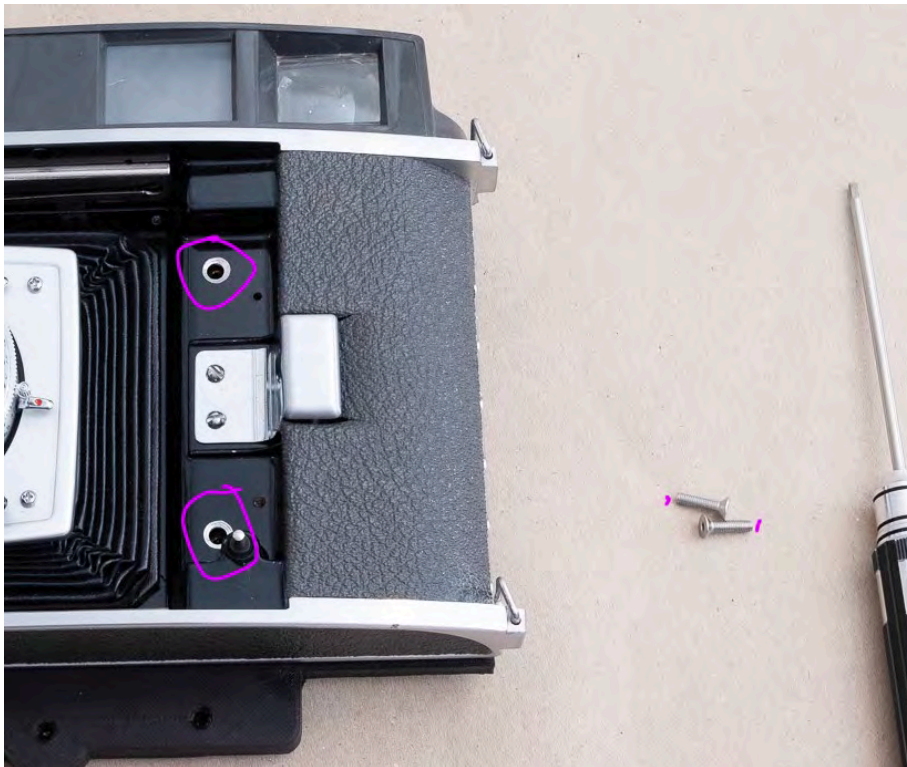
Filmback assembly



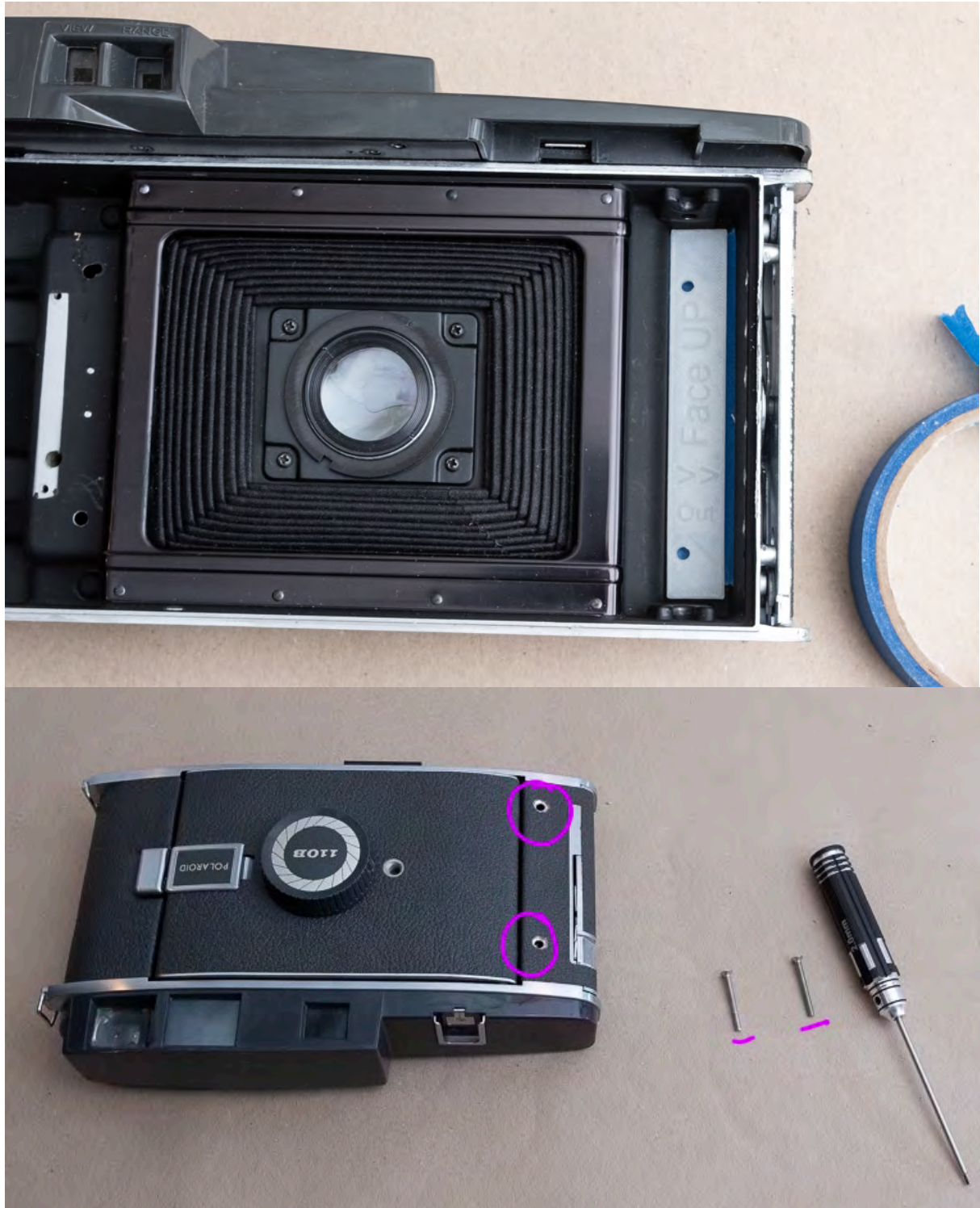
Your Polaroid 110 back should now look like the picture below.

Now we need ensure that the camera body has the required holes to fix the 3d printed filmback in place. This will require holes for 4 3mm screws, each hole gently tapered with a 10mm drill bit. Nb make sure you don't drill to far! don't ask why I know this!

First two holes in lensboard well, in the holes from where the rivets were removed in the preparation stage. Drill first two 3mm holes, then taper them lightly with a 8-10mm drillbit.

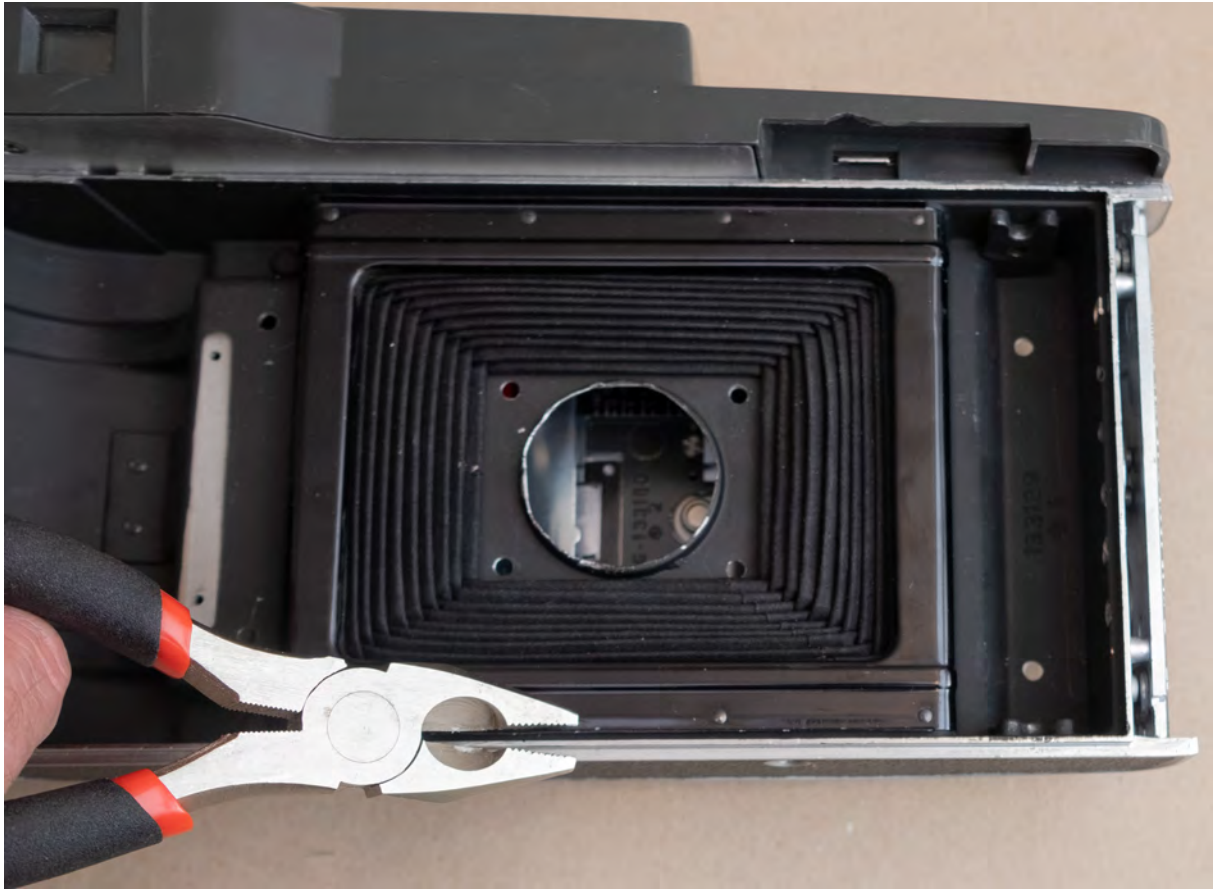


Now on the other side of the camera body we need to drill two new holes. First put a piece of painters masking tape, then using the 3d printed template tool to mark the hole locations. (The tool has printed instructions on location and orientation)

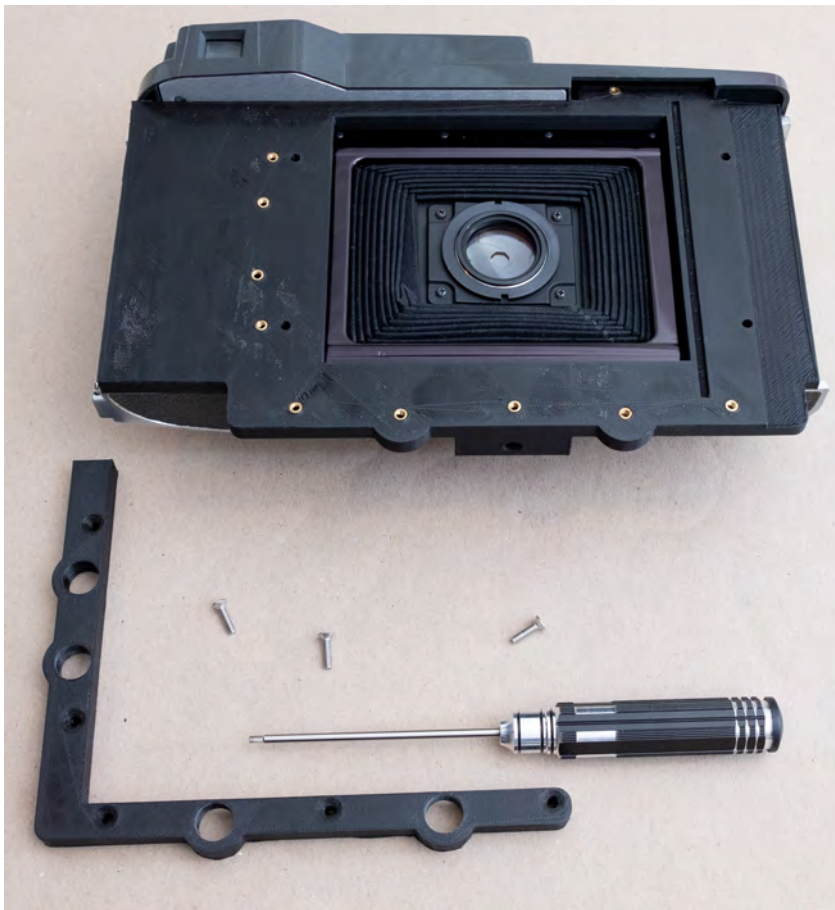


With the 4 holes in place we are ready to mount the filmback. First place in gently in place towards the underside of the rangefinder house, and press it against the camera body. Ensuring that it snaps in place correctly all the way around the back of the camera body. Then mount the 4 screws. Ensure that they are all entered and flush with the camera body before starting to tighten (lightly) them down. Nb do not over tighten, they “only” holds the filmback flush against the camera body!

In order to make the 3d printed film back fit correctly you may have to bend the previous film guide out towards the edge using a plier. See image below.



Then the film holder frame, put it in place and screw tight with the 5 x yy mm screws.

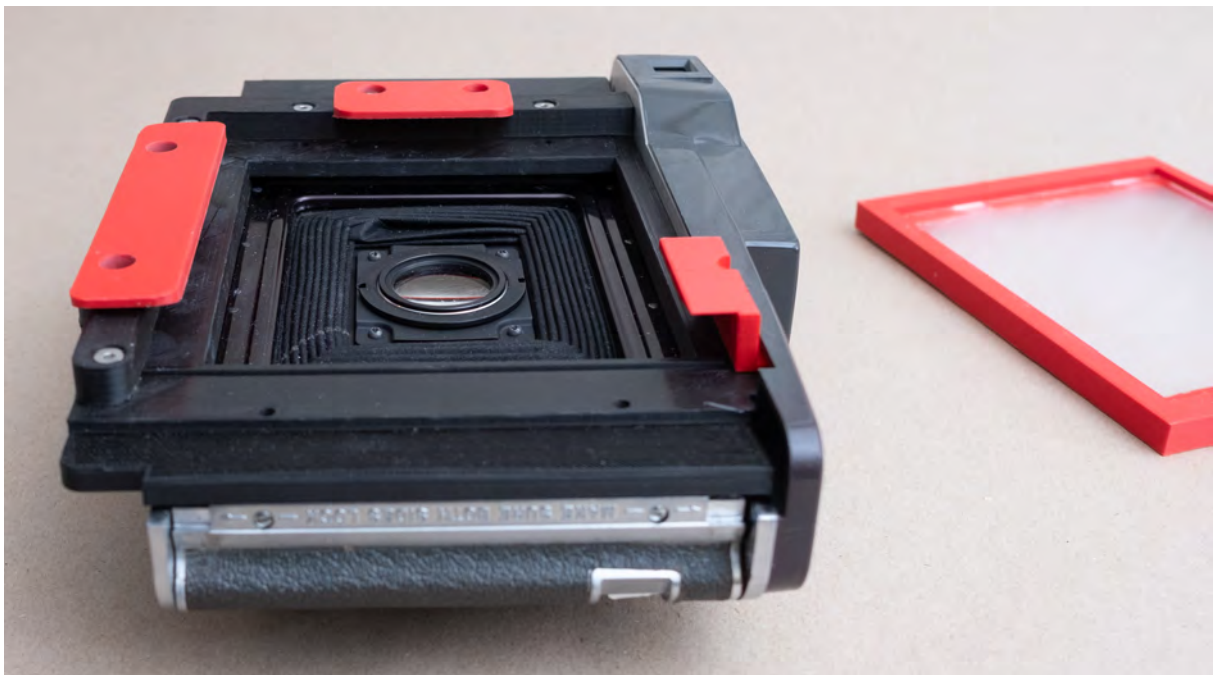




Then it's the film holder clamps. Give the glide surfaces a light lick with a wax candle, also the outer surface of round parts which goes into the film holder frame.

Now put the clamps into place, then the springs and lastly the screws. Screw them down to the point shown in the picture. Also ensure that they are able to move freely under spring tension.

New topclamp (January 20) requires that you cut away approx 2-3mm of the grey top cover with a hobby knife



Lensboard conversion

The old infinity stop or lens stop needs to be replaced due to the new filmplane position. See description below and then the images,

1. Remove the two screws
2. Drill out and remove the two rivets
3. Use the two screws to mount the new infinity stop, approximately as shown.
4. The position will be adjusted as the last part of the conversion



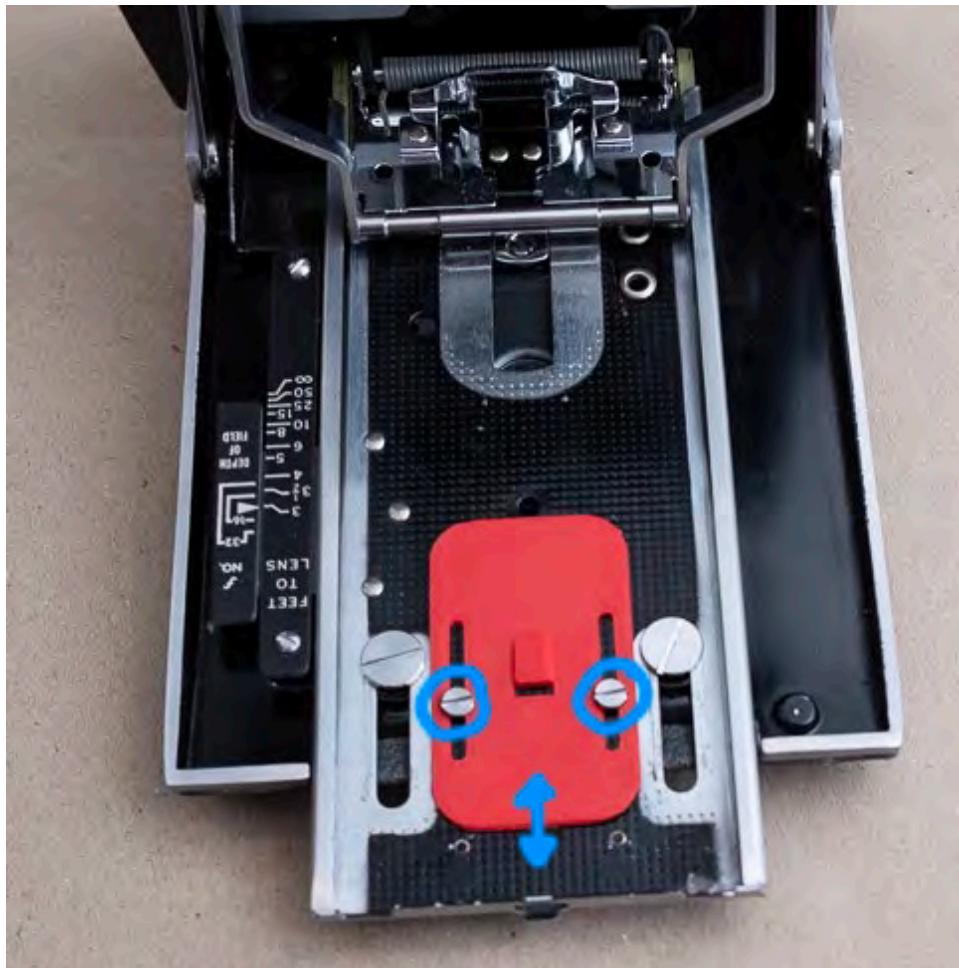
Adjusting rangefinder

In order to adjust the position of the infinity stop which allow the RangeFinder (RF) to work correctly, the camera needs;

- To be mounted on a tripod.
- The ground glass inserted in the filmback.
- The shutter kept fully open, using a shutter release with the shutter cocked and set to "B". Then release the shutter and lock it with the shutter open.
- Aperture set to f4.7 to reduce DoF and increase brightness.

If your rangefinder patch don't overlap at infinity, it needs to be reset using [this procedure](#).

Then you need clear sight to infinity (200m +) and some close in high contrast objects to focus on as well. A small screwdriver is needed to loosen the two screws that hold the infinity stop plate.



1. Loosen (but just) the two screws so that the infinity lock plate may slide back and forth.
2. Slide out the lens to the click in in the infinity plate, then set shutter to B, release with cable and lock it open. Aperture set to 4.7.
3. Using the camera RF and focus on the object at infinity, a high contrast object is best.
4. Use a loupe on the ground glass (GG) under a dark cloth to check that you have correct focus on the filmplane. You will probably not have this correct the first time.
5. While looking through the loupe at the GG adjustment focus with the camera focus knob. If you then are able to bring infinity into focus the infinity stop plate should be moved forward with the same amount. If you not are able to get focus on infinity move the infinity stop plate further back i.e. closer to the filmplane.
6. Jump back to point 3 and repeat until you have infinity in focus when the RF is at infinity.
7. Hold the infinity lock plate in place with your thumb and move the front standard back to expose the two screws.
8. Tighten the two screws.
9. Check infinity again! (Not loosening the screws)

Now the camera should be all good to go! However I would suggest that you check RF vs focus on the GG for more close in distances, where I suspect the camera will see most use.

- Same procedure as for adjusting infinity, but now for the close in object.
- If there is some discrepancy, I would suggest that you adjust the RF to be most correct in your preferred shooting range. If everything is in good order with your camera you might not have to do this tradeoff.

Now get out there and shoot some film!