Collimating a Jupiter 9

Over the past few years, I have been asked not only to service Jupiter9's but also to collimate them so that they work well with Leica and other Leica standard cameras. Recently I was asked to do another so I thought I would record it so that others can try if they so wish.

There are all sorts of arguments about the Leica standard v FSU standard and also about quality control. Personally, I think it is a mix of the 2. Certainly every one of the 20 or so lenses I have done has been a little different. However, the main problem is that if the lens is set to focus correctly at infinity, then at close distances the lens actually focuses slightly (or sometimes quite far) behind where the RF says it should.

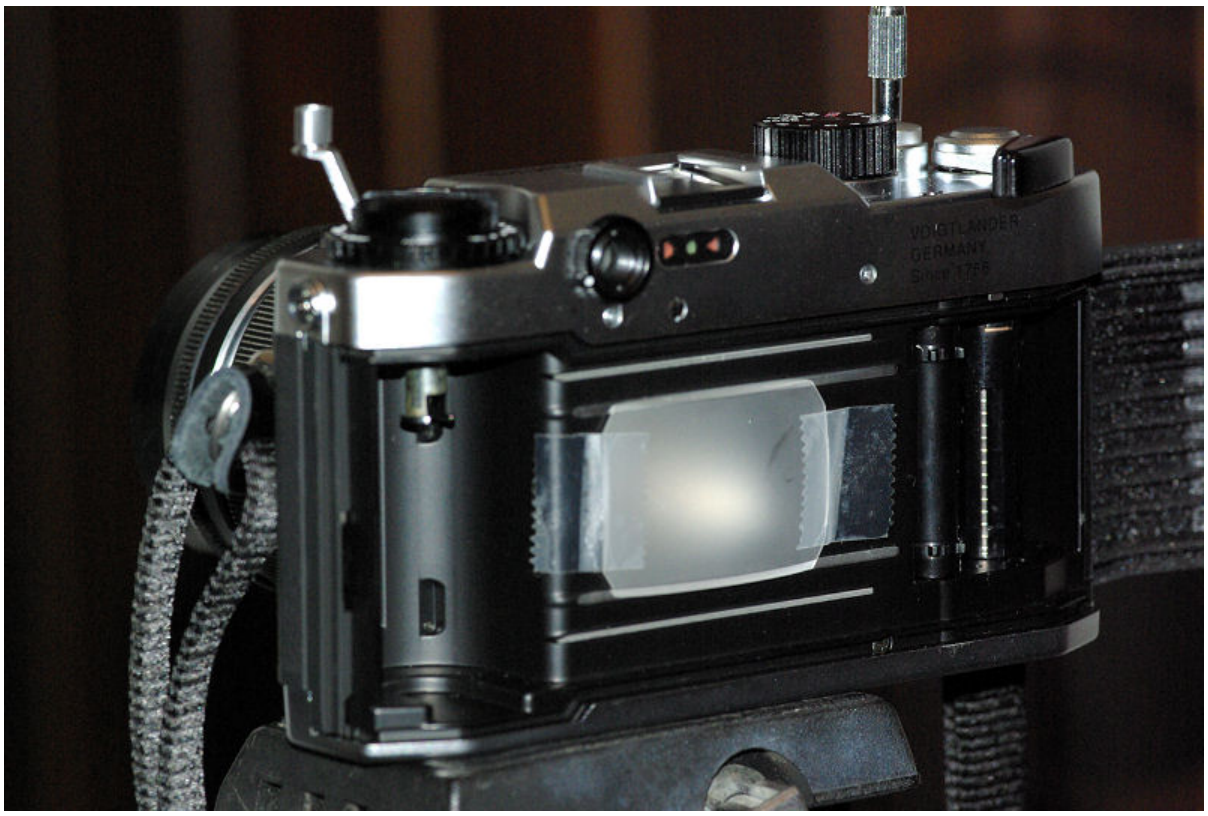
First a little theory. Any RF albeit Leica, Voightlander or FSU is set to focus a "standard" 50mm lens. Most 50 mm lens have an extension from the front (moving) barrel to act against the cam. To use any other lens, the RF tab must be "geared" so that it tab moves as for a 50mm lens despite the amount of movement actually required by the lens group. Hence the double helix in the J9. If this ratio is not correct, then the lens will not focus correctly throughout the range. To correct the problem, you would ether have to alter the gearing or change the focal length. In the case of a J9, altering the gearing would mean making a complete new back unit which for me is impossible.

It is however possible to alter the focal length slightly by altering the distance between the front and rear lens groups. As this is "set" using shims, it does become solvable problem. If the RF is set correctly and the lens actually focuses on a point further back, the focal length needs to be reduced slightly and vice versa.

To do this, you need a method of checking both the infinity focus and the close focus with regards to the RF. At times I think a digital RF would make life much easier but at the same time there are times when using my method works better.

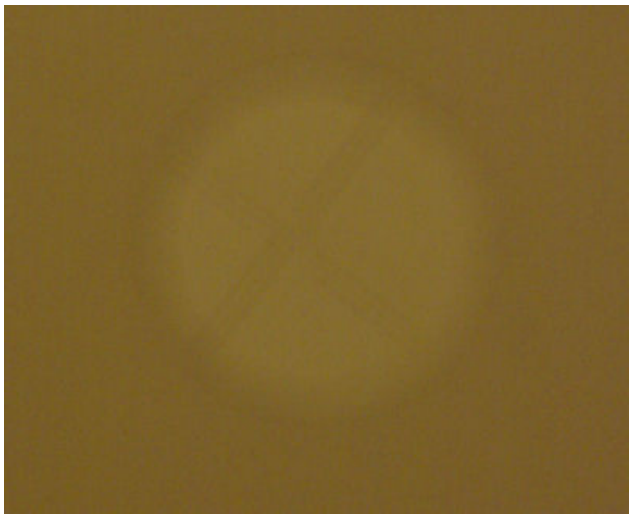
I used to use a modified Fed 2 body. On this the rear of the body casing has been cut away, the shutter curtains have been removed and an old SLR focus screen has been glued to the film rails. When the camera is mounted on a tripod, I use an 8x lupe to check the focus on the film plane.

Although this worked, I started to look for a more accurate way and one easier to see. I now use my Bessa T body with another focus screen lightly taped to the film rails. I then lock the shutter open on B using a cable release.

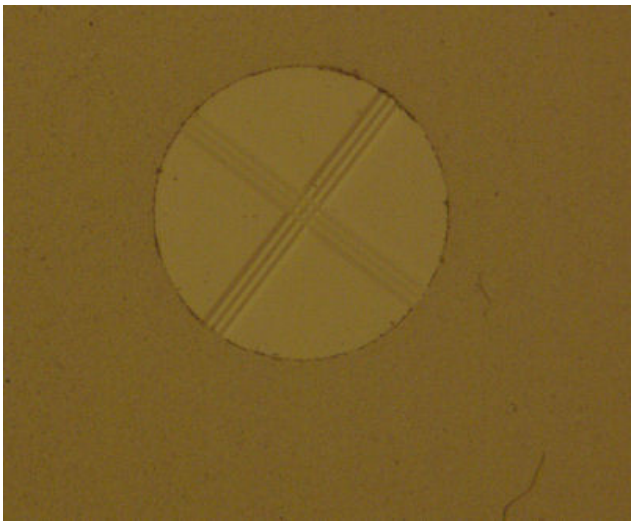


If you need to do a service do this first. First you will need to check the infinity focus. I do this indoors by using my Pentax LX with a 2x magnifying finder and a 200mm F2.5 lens. (Using this method the longer the focal length and the faster the aperture of the SLR lens and the more accurate it will be. Set up both cameras on tripods facing each other with both lens set if infinity.

On one of my screens there is a central cross hair. If you are using a plain screen, you may need to mark the inside (i.e. on the focal plain) with a pencil. If the lens is set correctly, you should see it in focus. If not, move the focus on the RF lens to see if it will focus. If it does, you need to increase the shimming between the lens module and the focus module. If not reduce the shims until it is correct.



Lens needs adjusting

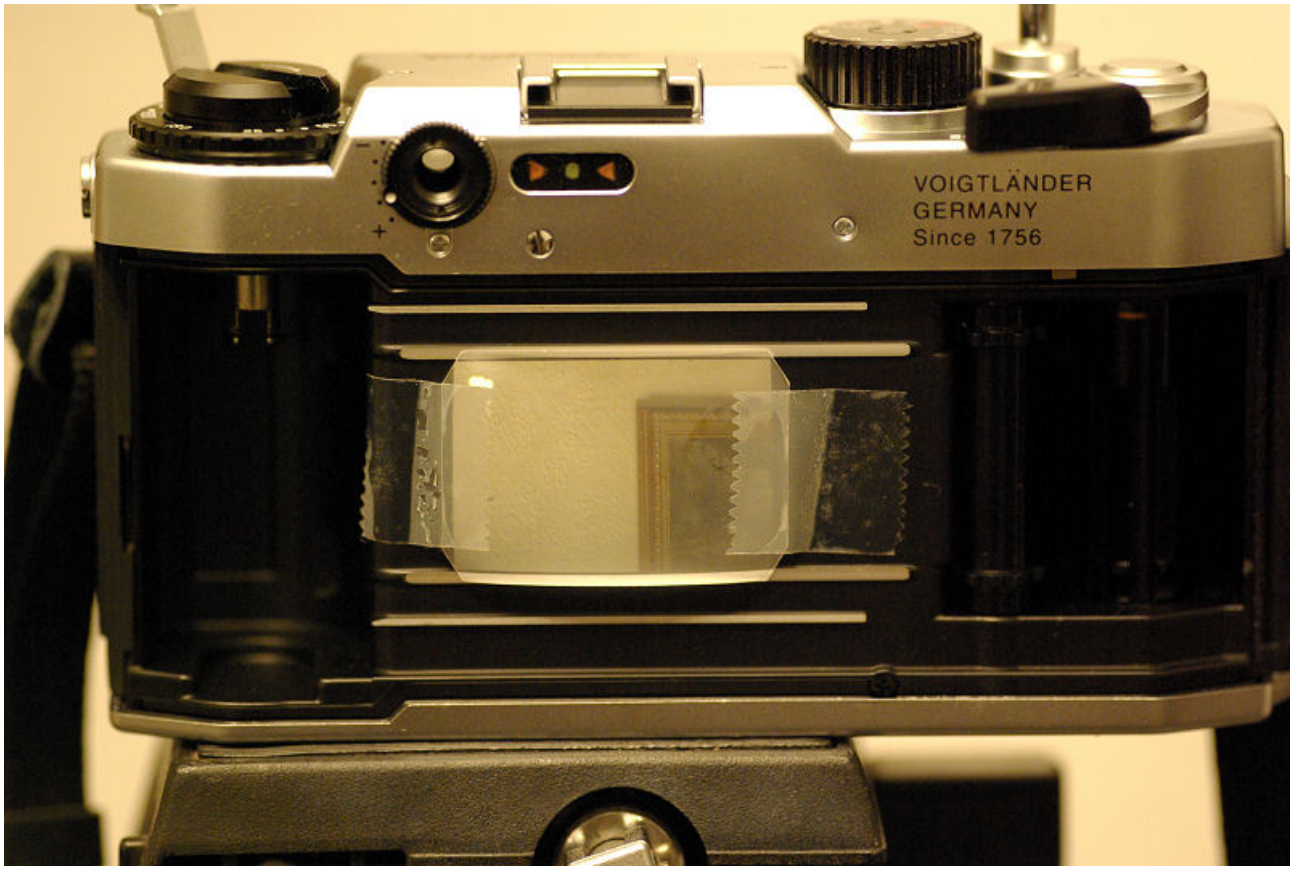


Infinity focus correct

I was doing this indoors but it can be done outside. Mount the camera on a tripod and point at an object at least 3-400 yards away. Check the focus with a lupe.

Now that the distant focus has been set, check the near focus. Indoors I use a painting in the lounge with the camera set at about 45 degrees.

I use the edge of the frame to focus the RF. I then check the focus on the screen using a lupe. If all is well both should match! (This was taken having finished doing the lens!)



For this lens the actual focus point was slightly down the frame. (This is why I use the camera at 45 degrees!) That meant I had the thin the lens group shim. As it turned out, the original was 1.17mm thick and the final one was 0.96mm. However, this lens was only slightly out.

Now having adjusted this, the infinity focus will also be out. So the next stage is to reset the infinity focus first. Once that is done, check the close focus again. If it is better but not quite there, redo the whole sequence. If it now focuses in front, you have gone too far and need to thicken the shim slightly. It is all a matter of trial and error. It is far better to take it in very small steps.

I now have several shims for both the front and rear shims and I use these to get into the right area. I also have some shims that I have made. I do this by solders rings of wire and then either beating them flat or filing them or using emery or a combination of all 3. It can take quite a long time!

One “trick” is the leave the shim between the lens module and focus module out. Re-shim the distance between the lens groups and “set” the infinity focus by gently screwing in the whole lens unit. Hold this with some tape. Then take away the SLR and check the close focus. Once You have got this right, You can adjust/manufacture the main shim .

Outdoors, the procedure is much the same. I have a very convenient tree with a spindly top for the infinity focus and I use a thermometer I happen to have on the rear wall of the house. On a good sunny day, I prefer to do it outside especially when I was using the Fed body. With the Bessa T, I can now do it indoors in the lower light levels.

Hopefully once you have done it all, the picture on the screen should look something like this once it is focussed using the RF.

This lens was only slightly out. There is one other “problem” I have come across. On 2 lenses so far, once the inter lens shim was set, the whole module would not quite sit far enough back in the focus unit to be accurate at infinity (and therefore indeed at close focus). In these cases I had to remove the aperture setting ring and very gently thin the back of it by gently rubbing it down with a piece of very fine emery held down on a flat surface.

Kim