VIVITAR SERIES 1 MACRO ZOOM 70-210

Fig. 1 -- adjustment positions

Fig. 2 -- back of prime lens group, early model

Fig. 3 -- prime lens group, recent model

Fig. 4 -- helicoid

ADJUSTMENT LOCATIONS:

Focus, 210mm	A
Focus, 70mm	B
Brake	C
Minimum aperture size	D
Other aperture sizes	E

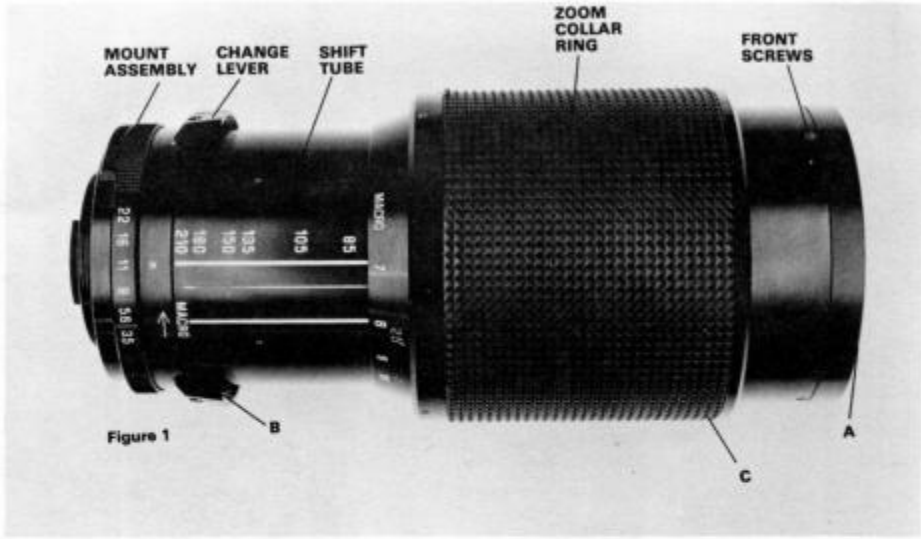

Figure 1

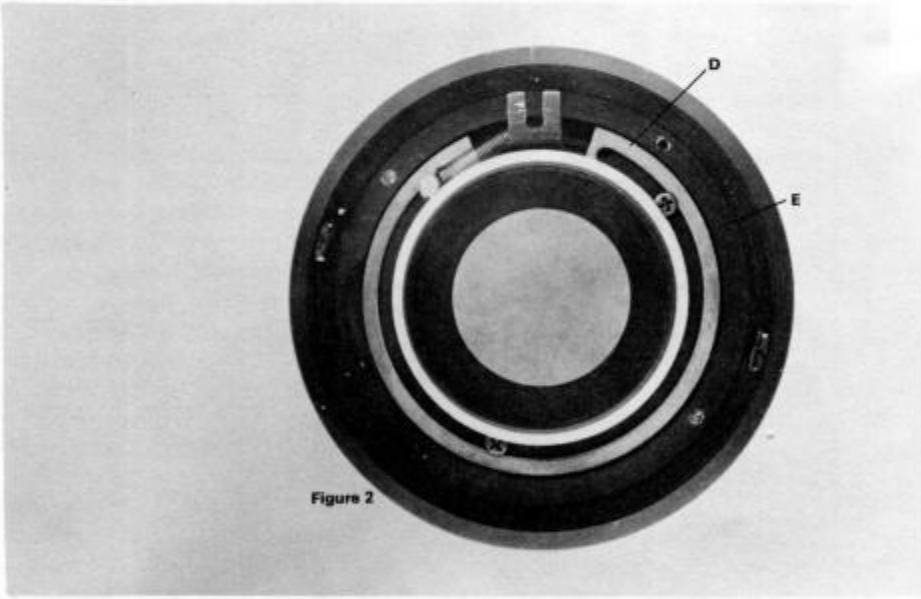

Figure 2

ADJUSTMENT VALUES:

1. Minimum aperture size — 4.6mm.
2. Make sure that the diaphragm opens slightly when going from f/22 to f/16. If not, loosen 2 setscrews and retaining ring to rotate the diaphragm assembly (early models, Fig. 2). Or loosen the screws and rotate the diaphragm plate(recent models, Fig. 3).
3. Screw the front lens group in or out to set the infinity focus at the 210mm focal length. If the lens goes past infinity, turn out (unscrew) the front lens group; if the lens does not reach infinity, screw in the front lens group.
4. Adjust the focus at the 70mm focal length by adding or removing shims behind the prime lens group (inside the mount assembly). Then readjust the front lens group for the 210mm focal length. The adjustment on the front lens group has an increasingly greater effect at the longer focal lengths; the shims behind the prime lens group have the same effect at all focal lengths. If you have to compromise the adjustment, make sure the infinity focus is correct at the 70mm focal length and that the lens will focus to infinity at the 210mm focal length (even though the focus ring may not quite reach the infinity stop).
5. To reach the brake adjustment, peel back the vinyl at the front edge of the zoom collar ring. Increase the pressure required to slide the zoom collar ring by turning in the setscrews; decrease the pressure by turning out the setscrews.

DISASSEMBLY HIGHLIGHTS:

Control positions: macro mode
70mm focal length

Precautions:

1. Threaded parts, including screws, are locked in place. Use acetone or M.E.K. as a solvent. On

reassembly, reapply M.E.K. to the threads. The M.E.K. reactivates the original locking agent.

2. If possible, avoid taking apart the prime lens group. Improper reassembly will disturb the resolution. If the repair requires disassembly of the prime lens group, avoid overtightening parts on reassembly. Overtightening the parts causes stresses which disturb the optical centering. Rely on locking agent to assure the parts won't work loose.

Sequence to clean and lubricate focus assembly and zoom lens groups:

1. unscrew filter ring (use solvent)
2. unscrew front-lens group (disturbs focus adjustment)
3. unscrew second lens group (may have 0.02mm shim for 70mm focus adjustment) and third lens group from front of lens
4. clean and lubricate the exposed helical threads and guide slots

Reassembly highlights: Screw in the front-lens group while checking the focus at the 210mm position. After setting the proper focus with the front-lens group, apply cement to the threads.

Sequence to reach diaphragm and zooming components:

1. change levers (latch-release lever will be loose)
2. limiting screw under one change lever
3. 5 setscrews (6 in some models), outer circumference of shift tube
4. slide shift tube toward front of the lens to expose 4 screws holding prime lens group (early models have loose ball detent and spring under shift tube; ball detent and spring were eliminated in later models)
5. prime lens group (latch ring loose — note position for reassembly reference)
6. slide off shift tube
7. loosen 3 setscrews, rear edge of zoom collar ring (just above distance scale)
8. slide zoom collar ring toward back of lens — rotate the zoom collar ring until its clearance hole is over the roller screw (near the front edge of the zoom collar ring)

Figure 3

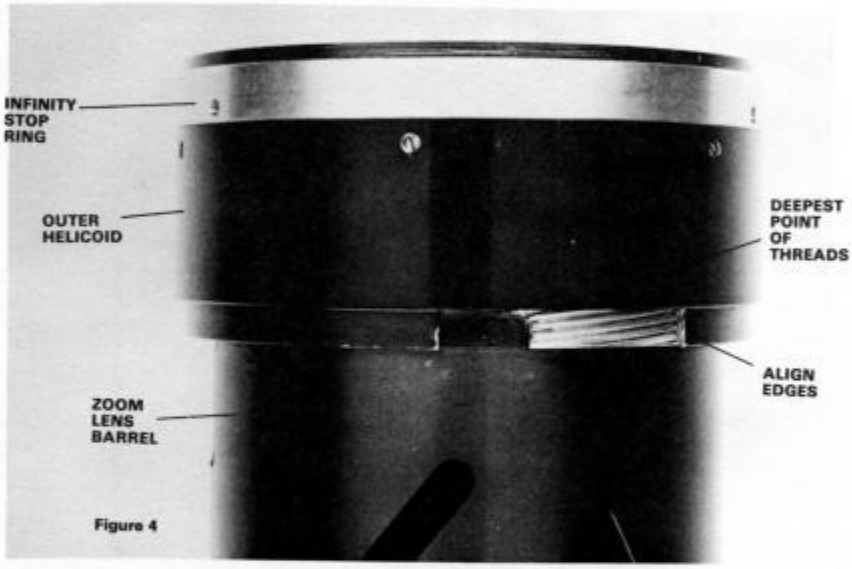

Figure 4

9. roll back vinyl grip, lower edge of zoom collar ring
11. peel back acetate tape over slots in zoom collar ring
12. unscrew rollers, one in each of the two slots in the zoom collar ring
13. slide off zoom collar ring
14. 3 screws, front of inner focusing tube
15. zoom lens barrel containing the focusing assembly and the zoom groups, Fig. 4

Reassembly highlights:

1. Before replacing the prime lens group, seat the latch ring in the macro position.
2. As you seat the prime lens group, align its red index dot with the notch at the bottom of the zoom lens barrel.

Sequence to disassemble helicoid:

1. unscrew outer helicoid, but stop just as the threads disengage
2. mark the position of the starting thread by placing a scribe line on the zoom lens barrel, Fig. 4
3. loosen the setscrews holding the infinity stop ring to the outer helicoid
4. remove infinity stop ring

Reassembly highlights:

To find the correct starting thread for the outer helicoid if you don't have a scribe line for reference:

Screw on the outer helicoid until its bottom edge is flush with the bottom edge of the helical threads on the zoom lens barrel, Fig. 4. The deepest point of the

cutout in the zoom-lens-barrel threads, Fig. 4, should now center on the slot in the outer helicoid. If not, unscrew the outer helicoid and change its starting thread.

FREQUENTLY REPAIRED SECTIONS:

Zoom lens barrel, Fig. 4, damaged as a result of impact. In most cases, you'll have to replace the zoom lens barrel; it's very difficult to make a satisfactory repair without replacing parts.

TIPS FOR TROUBLESHOOTING WITHOUT DISASSEMBLY:

1. If the zooming action feels stiff and uneven, the lens has probably suffered impact damage. If the zooming action feels stiff but even, the lubricant is probably dry.
2. It's sometimes difficult to identify impact damage without disassembling the lens. However, you can usually spot impact damage by looking at the screws toward the front of the lens, Fig. 1. If the screwheads appear slightly raised or tilted, suspect impact damage which will probably require replacing the zoom lens barrel.

OTHER COMMENTS:

a. Parts for the first model of the 70-210 are no longer available. You can identify the first model by the screws near the front of the lens, Fig. 1. In the first model, the screws are around 30mm from the front edge of the lens. The screws are much closer to the front of the lens in the later models.

b. Revised parts:
Zoom lens barrel, Fig. 4. In the new style, the holes at the bottom of the zoom lens barrel are around 4.5mm from the bottom edge; the holes are less than 4mm from the bottom edge in the older models. Not interchangeable, specify new style or old style when ordering.

Outer helicoid, Fig. 4. Fig. 4 shows the early style. Later styles have either three holes or four holes at the top (outer circumference). The three-hole and four-hole models will interchange. But you can't replace the type shown in Fig. 4 with a later version. The early-style outer helicoid is no longer available. If you have to replace an early style with a later style, you must replace the complete assembly shown in Fig. 4 (including the zoom-lens groups).

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