

# VIVITAR SERIES 1 35-85 VARIFOCAL

Fig. 1 — spacer positions

Fig. 2 — helicoid assembly, front

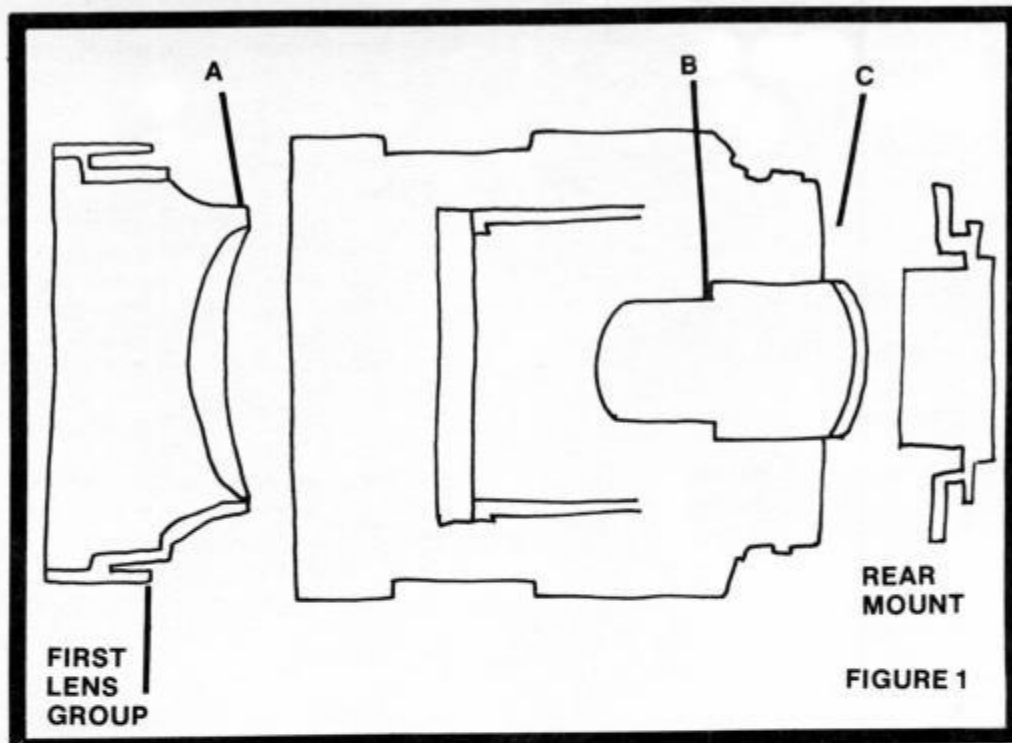
Fig. 3 — helicoid assembly, back

## ADJUSTMENT LOCATIONS:

|                                    |   |
|------------------------------------|---|
| Focus, 85mm focal length (spacers) | A |
| Curvature of field (spacers)       | B |
| Focus, 35mm focal length (spacers) | C |
| Centering                          | D |
| Aperture size                      | E |

## ADJUSTMENT PROCEDURES:

1. Focus. Change the spacers behind the front lens group to adjust the 85mm focus. If the focus ring passes the best infinity position, increase the spacer thickness. Spacers available in thicknesses of 0.1, 0.15, 0.2, and 0.4mm. If you install a new front lens group, start with an initial spacer thickness of 0.6mm. Change the spacers in the rear mount to adjust the 35mm focus. If the focus ring passes the best infinity position, increase the spacer thickness. Spacers available in thicknesses of 0.1, 0.15, and 0.2mm. If you install a new rear mount, start with an initial spacer thickness of 0.5mm.
2. Brake. Roll back the vinyl grip at the front edge of the zoom/focus ring. Turning in the adjustment setscrews, two on each side of lens, increases the pressure required to slide the zoom ring.
3. Aperture size. Rotate the diaphragm housing after loosening the 3 screws, Fig. 2, or shift the diaphragm stop. You can shift the diaphragm stop to adjust the smallest aperture and rotate the diaphragm housing to adjust



4. the other apertures. Diameter of diaphragm opening at  $f/16$  — 3.5mm.
4. Curvature of field. Use the shims behind the rear lens group to balance the curvature of field between the long and short focal lengths. The adjustment requires a forward-projection tester to compare the curvature of field.
5. Helicoid timing. With a 0.5mm space gap set between the middle and outer helicoids, there should be a 0.7mm distance between the edge of the outer helicoid and the edge of the inner helicoid, Fig. 3.

## DISASSEMBLY HIGHLIGHTS:

Control positions: focus setting — infinity.  
focal-length setting — 85mm

## Precautions:

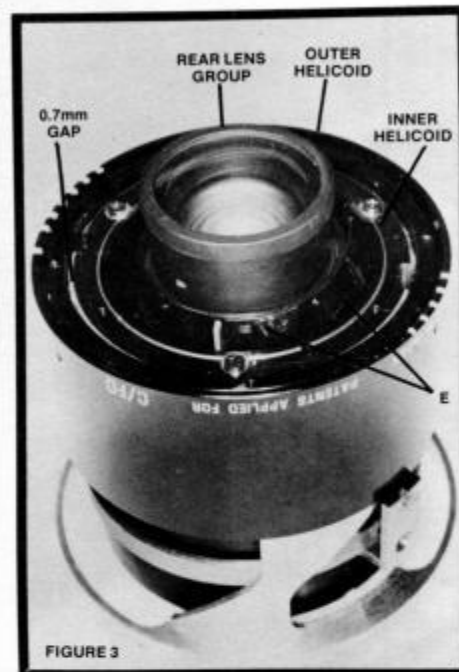
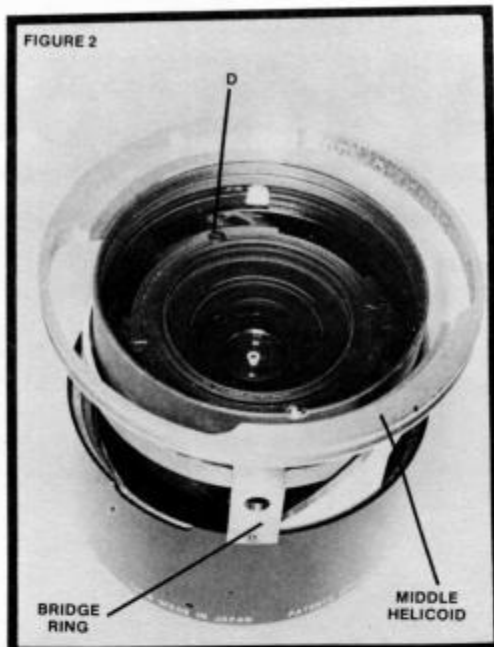
1. Do not remove the 4 screws holding the second lens group (zooming component), Fig. 1, unless you have a method of recentering the lens (such as a centering microscope). The screws clamp the second lens group and provide a shifting adjustment to align the optical center with the mechanical center of the tube. Failure to recenter the second lens group destroys the resolution. If it's necessary to replace the helicoid, you can obtain the complete assembly—including the zooming and compensating components — to avoid having to recenter the optics.
2. When unscrewing the rear lens group, be careful to keep the shims in place. The shims are used to balance the curvature of field between the long and short focal lengths.
3. Disassemble the lens no further than necessary to make the

repair. Complete disassembly will disturb the resolution adjustments. Unless you have a projection tester, it's difficult to readjust the resolution.

4. Threaded parts, including screws, are locked in place. Use acetone or M.E.K. as a solvent. On reassembly, reapply the M.E.K. to reactivate the original locking agent.
5. Do not disturb the eccentric rings in the diaphragm housing; these rings are used for centering the diaphragm-housing lens group.

Sequence:

1. apply solvent behind the front (hood) ring
2. unscrew the hood ring from the inner focus ring; slide the hood ring forward
3. unscrew the first lens group — in early models, a setscrew locks the first lens group (loosen the setscrew after sliding forward the hood ring); later models use cement on the threads to lock the first lens group (use solvent)
4. remove vinyl grip
5. remove guide screws and rollers from zoom-ring slots
6. apply solvent behind zoom ring
7. unscrew zoom ring from index ring (the ring with the red index dot)
8. loosen 6 setscrews at front of inner focusing ring
9. lift off inner focusing ring
10. rear mount (note spacers for short focal-length adjustment)
11. diaphragm ring, 4 screws (detent balls will be loose)
12. 2 screws and rollers, one on each side of cam ring
13. slide off cam ring toward rear of lens



14. 3 screws and washers holding diaphragm assembly, Fig. 3
15. unscrew rear lens group (note spacers for curvature-of-field adjustment)
16. drop out diaphragm assembly (held by setscrews on outer edge of barrel in early models; in new models, diaphragm assembly screws into barrel)

FREQUENTLY REPAIRED SECTIONS:

1. Helicoid damaged from impact.
2. Guide screws and rollers sheared off as a result of impact.

TIPS FOR TROUBLESHOOTING WITHOUT DISASSEMBLY:

If the front rings appear uneven, the lens has probably suffered impact damage. Also, try pulling forward the first lens group. If you can pull out the first lens group a slight distance, the guide screws and rollers have probably been broken by impact.

REVISED PARTS:

There are two different types of helicoids (difference is in the cam cut of the inner helicoid). The slidescrews which connect the first-lens-group slide ring to the inner helicoid are also different. If you have to replace the slide screws (possibly broken from impact damage), note whether the slots in the inner helicoid have straight sides or tapered sides. If straight, order the straight slide screws (#3513672). If tapered, order the tapered slide screws (#3513677).