

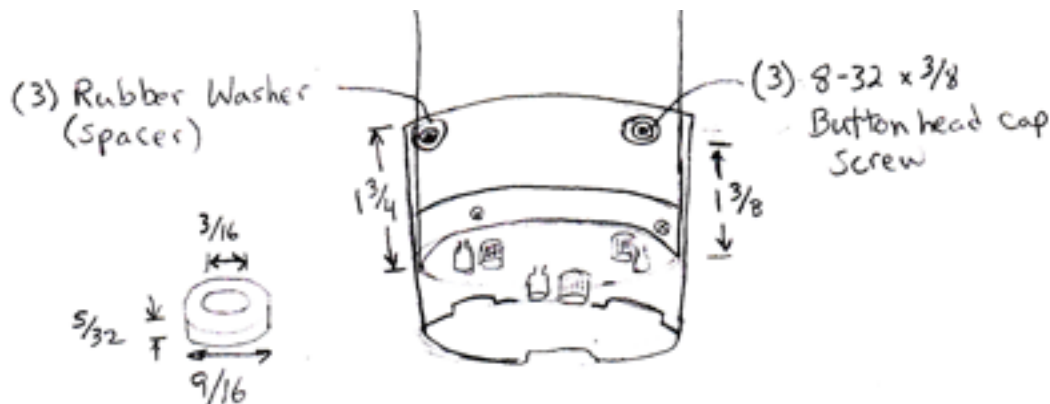


## Library Telescope Modifications

Check the collimation with the eyepiece cap provided (the one with the hole in its center) before starting on any modifications.

### Mirror Cap.

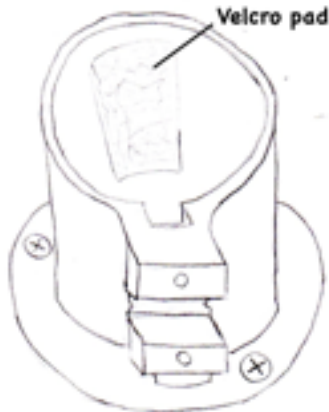
1. (1 gallon translucent plastic juice pitcher from Walmart: Sterilite Mainstays. Saw off bottom 3 inches, just below handle.
2. Equally space three holes in pitcher end. (3) 8-32x3/8 button head cap screws.
3. Tap and drill three holes in mirror end of telescope tube to match those in the pitcher. Leave 1/8 inch gap between bottom of pitcher and the end of the mirror collimation screws. Tap: 8-32



4. Slip pitcher over mirror end and align its holes with those of the telescope tube.
5. Carefully slide a rubber washer between each pitcher hole and telescope tube hole. They will act as spacers. Rubber washer: 3/16 x 1/2 x 1/16 to 3/32 inch thick
6. Insert screws, 8-32 x 3/8 button head cap screws (6/64 hex head wrench) through the pitcher and washers into the tube.

## Platform/Base Lock, if needed.

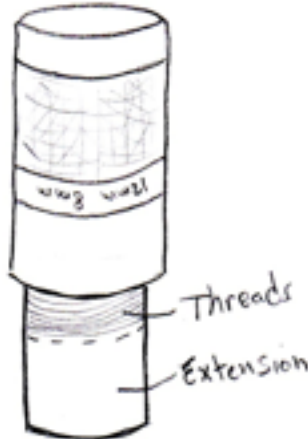
1. 1/4" x 1 3/4" (up to 2 1/4") hitch pin, cotterless
2. Align the base and the platform to the correct positions.
3. Drill a 5/16" hole at a 30-45° angle in the base and platform.
4. Insert pin and mark white registration lines on the base and the platform.



## Focuser.

1. Disassemble the focuser by the two screws between the knobs.
2. Pull out the focusing tube.
3. Remove the thin friction/spacer pad inside the focuser tube opposite the focusing knobs. Leave the other two pads.
4. In its place, adhere a 1/2 x 3/4" rectangle of velcro, fuzzy side. This will provide stiffness for the heavier zoom eyepiece.

5. Assemble the focuser.

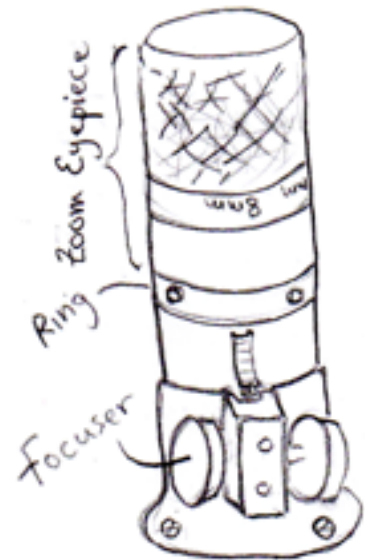
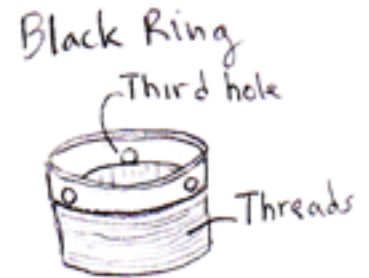


## Zoom Eyepiece.

1. Unscrew the black ring that supports the two eyepiece retaining knobs.
2. Add a couple of dabs of super glue to the black ring's threads and reattach to the focuser.
3. Remove the two knurled eyepiece holding knobs.
4. In their places, drill and tap 8-32 threads. Don't drill through the silver 1 1/4 inch extension barrel. Insert 8-32 x 5/16" allen set screws (5/64"

hex head wrench).

5. On the opposite side of the ring, tap and drill 8-32 threads. Insert a third 8-32 x 5/16" allen set screw. This will add stability.
6. Unscrew silver field barrel of the zoom eyepiece.
7. Dab a small amount of super glue on the threads.
8. Screw the field barrel onto the eyepiece.



## Moon Port.

1. Need 2" OD knock out seal, plastic, dark gray. It can be found at hardware stores.
2. Use hole saw to cut away a 2" hole. Center the hole 1 1/2" from the edge of end cap.
3. The knock out seal snaps in the hole.



## Strings Attached.

1. Drill a 1/8" hole near the center of the end cap, at the center of the moon port, and off center of the eyepiece cap.
2. Thread string through the end cap and through the moon port and tie off the two ends.
3. Drill a 1/8" hole in the telescope stand just above the handle.
4. Thread string through that hole and through the end cap hole and tie off the two ends.
5. Thread string through the eyepiece cap and tie off the end. The other end attach it to the focuser base at one of the screws.

## Finder.

The advantage of the EZ Finder is that its modifications don't take very long to do. Its disadvantages are that it is battery powered and needs to be aligned with the main optical tube. The user can do this, but it may be intimidating and difficult to fiddle with the knobs while collimating finder.

The Tube Finder requires more effort to fabricate. It is not battery powered and should not need collimating once installed.

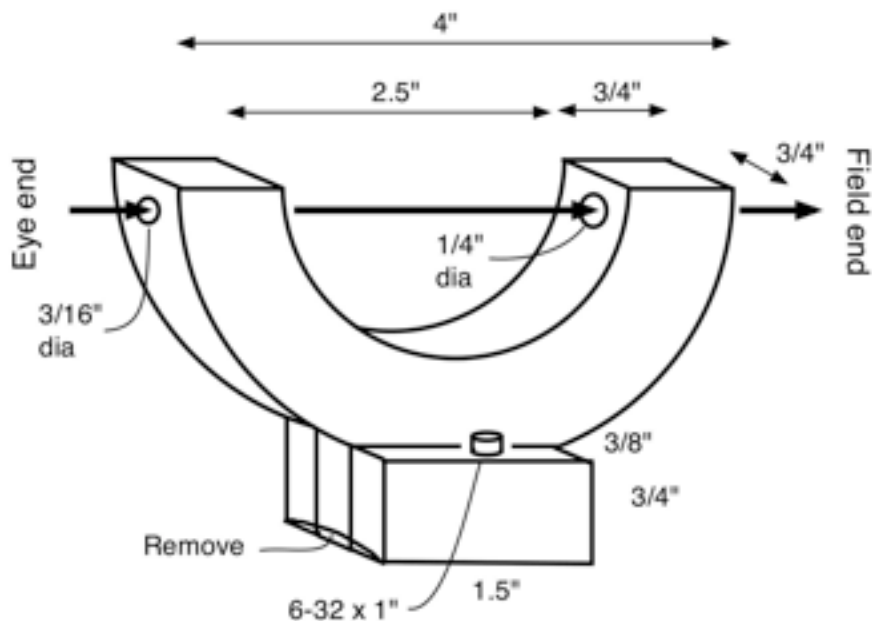
### A. Tube Finder.

1. For a 4 inch long tube, the eye end should have an opening of 3/16 inch. The field end of the tube finder should have an opening of 1/4 inch.
2. Place finder on telescope tube.
3. Secure with (2) 6-32 x 1" socket head cap screws (7/64 hex head wrench), (2) #6 washers, (2) #6 nuts. Or with (2) 8-32 x 1" Phillips flat machine screws; (2) #8 washers, (2) #8 nuts.
4. Align finder, tighten the screws.
5. Place and tape guides abutting both sides and the back of the finder base.
6. Remove finder, leaving the guides.
7. Place double sided adhesive squares on bottom of finder.
8. Put the finder back on the telescope tube so that it abuts the guides.
9. Secure with the screws. The finder should now be aligned to the telescope tube and secured to it.

10. Remove the guides.

### Tube Finder fabrication.

1. 1 x 4 wood board thickness: 3/4" To cut the board, use either a jig saw, a band saw, or a coping saw.
2. Inside radius: 1.25", Outside radius: 2.5"
3. Bottom of arc: 3/8" thick, 3/4" high, 1.5" long.
4. Two sides of arc bottom: 3/8" x 3/4" x 1.5"
5. Glue two sides to bottom of arc
6. Drill 3/16" diameter hole in eye end and 1/4" diameter hole in field end.
7. Drill holes for 6-32 x 1 inch hex head knurled knob screw, or 8-32 x 1 inch Phillips flat machine screw. If the flat machine screw is used, it will be flush with the surface of the wood base.
8. Remove material along bottom to conform to the shape of the telescope tube. This can be done with saw cuts and with sanding.
9. Paint black.
10. Place on scope and align.



## B. EZ Finder Modifications.

If the Tube Finder is not used, the EZ Finder can be modified to make it less frustrating to you. Since the button battery can be short lived and can be relatively expensive to repeatedly replace, two AA batteries are substituted.

Before adding the AA battery pack, prevent the EZ finder from sliding and losing collimation by placing a strip or two of double sided tape to its mounting surface. 3M Foam Mounting Squares (double sided) do the job quite well.



1. Obtain a AA battery box from Radio Shack; No. 2700408, "2 'AA' Enclosed Battery Holder."

2. At some point, remove the label on the left side of the EZ Finder.

3. Cut a notch in the left side of the battery cover on the EZ Finder.

4. Cut a 3/4 inch diameter disk out of a large rubber washer. If the washer is 1/16 inch thick, cut two disks. The end result should have the same thickness as the battery that it is replacing.

5. Size a 1/2 x 1/4 x 0.016 inch brass strip. These strips can be



found at hobby shops.

6. Trim the wires on the battery box to a suitable length.

7. Solder the brass strips to the wires.

8. Use superglue to fasten the strips to the 3/4 inch diameter rubber disks.

9. Put the rubber disk with the contacts in place with the red lead on top of the pad, under the battery clip. This configuration should have the same thickness, 1/8 inch, as the button battery that it is replacing.

10. Replace the button battery cover.

11. Place a white dot on the finder's on-off switch to indicate the off position. Place a white line on the EZ

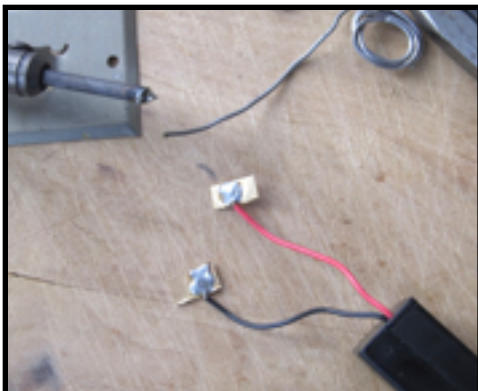
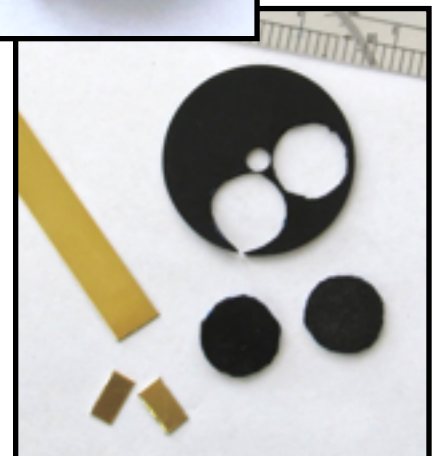
Finder body that aligns with the white dot.

12. Secure the battery holder to the EZ finder by either using double sided tape or 2-part adhesive (activator and bonder) formulated for most plastics. Make sure

the AA battery box placement doesn't interfere with the optical sight tube. Make sure the AA battery



Notch





compartment's retaining screw is on the outside, away from the EZ finder.

