

Ø 1.1323"

Finder Scope – Assembly Procedure

Refer to the exploded view and bill of materials in the Finder Scope drawing packet during assembly.

WATCH THE VIDEO!



<https://youtu.be/ApWWkFle36>

- 1) Press the **THREADED INSERT (ITEM 2)** into the **TUBE (ITEM 1)** using a lever-actuated "arbor press". The short reduced diameter section on the **THREADED INSERT** is a lead-in to aid in alignment and should face inward. This step was not shown in the video because it had already been completed, but it is simple to do.

Tools used: Arbor press

- 2) Put on disposable nitrile gloves. Clean the eyepiece lens (**17.5MM DIA X 22MM FL ACHROMATIC DOUBLET; ITEM 15**) with optical tissue and lens cleaning fluid. The lens has two sides – a flat side and a convex side. Install the lens into the **FOCUSER (ITEM 4)** with the flat side facing inward. (00:31)

Tools used: Disposable nitrile gloves, optical tissue, lens cleaning fluid

- 3) Place the **15.5MM ID X 17.5MM OD X 1MM THICK BUNA-N O-RING (ITEM 13)** on top of the eyepiece lens in the **FOCUSER**. (02:55)

Tools used: Tweezers

- 4) Thread the **EYEPIECE RETAINER (ITEM 5)** into the **FOCUSER**. Do not tighten excessively. (03:17)

- 5) Clean the objective lens (**32MM DIA X 130MM FL ACHROMATIC DOUBLET; ITEM 14**) with optical tissue and lens cleaning fluid. The two elements of the lens are not cemented. The convex surface and concave surface are correctly oriented when circular rings (or "interference fringes") are visible between the two lens elements. Install the lens into the **TUBE** once again with the flat side facing inward. (04:03)

Tools used: Disposable nitrile gloves, optical tissue, lens cleaning fluid

- 6) Place the **28MM ID X 32MM OD X 2MM THICK BUNA-N O-RING (ITEM 12)** on top of the objective lens in the **TUBE**. (06:53)

Tools used: Tweezers

- 7) Thread the **OBJECTIVE RETAINER (ITEM 6)** into the **TUBE**. Do not tighten excessively. (07:06)

- 8) Lightly apply cyanoacrylate adhesive (Super Glue) to the counterbore surface of the **CARRIER (Item 11A)**. Use tweezers to lay the **CROSSHAIR (Item 11B)** into the counterbore of the **CARRIER** on top of the adhesive. Press down firmly with a cylindrical weight to flatten the **CROSSHAIR**. Wait 30 seconds before removing the weight to provide time for the adhesive to cure. (07:49)

Tools used: Cyanoacrylate adhesive, tweezers, cylindrical weight

- 9) Thread the **CROSSHAIR AND CARRIER SUBASSEMBLY (ITEM 11)** into the **FOCUSER**. Position the **CROSSHAIR** so that it is in sharp focus when viewed through the eyepiece lens. (09:17)

Tools used: 6" ruler or other flathead driver

- 10) Install the **FOCUSER** into the **THREADED INSERT** in the **TUBE**. (10:52)

- 11) Mount the **SHIELD (ITEM 3)** onto the **TUBE** using the three **#6-32 X 5/16IN LONG X 100 PHILLIPS FLAT HEAD SCREWS (ITEM 16)**. (11:11)

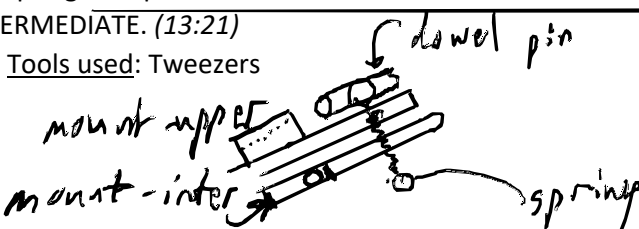
Tools used: #2 Phillips screwdriver

- 12) Assemble the **MOUNT-UPPER (ITEM 9)** onto the **TUBE** using the **1/4-20 X 1/2IN LONG SOCKET HEAD CAP SCREW (ITEM 18)**. (12:24)

Tools used: 3/16" Allen wrench

- 13) Push the **.022IN WIRE X .18IN OD X .75IN LONG EXTENSION SPRING (ITEM 25)** through the counterbored hole in the **MOUNT – UPPER**. Push a **1/8IN OD X 5/16IN LONG STEEL DOWEL PIN (ITEM 26)** through the hook on the **TUBE-side** of the spring. Pull the spring through the counterbored hole in the **MOUNT- INTERMEDIATE (ITEM 8)** using tweezers and grip firmly by hand. Push another pin through the hook on this side of the spring. Release the spring. The pins should now sit inside the counterbores on both the **MOUNT – UPPER** and **MOUNT – INTERMEDIATE**. (13:21)

Tools used: Tweezers



Attach screws to upper mount first

- 14) Assemble the **FLEXURE (ITEM 10)** onto the **MOUNT - UPPER** and **MOUNT - INTERMEDIATE** using the eight **#6-32 X 1/4IN LONG BUTTON HEAD CAP SCREWS (ITEM 17)**. Some of the threaded holes may need to be "chased" by hand with a tap to clean them up if they were bead blasted. (14:52)

Tools used: 5/64" Allen wrench, tap in pin vise

- 15) Cut four strips of the 1/2" wide X .005" thick Teflon/PTFE tape and apply them to the top of the **MOUNT - LOWER (ITEM 7)** and the bottom of the **MOUNT - INTERMEDIATE** as shown on the drawings. Trim flush with the edges of the parts using a sharp razor blade. (17:09)

Tools used: 1/2" wide X .005" thick Teflon/PTFE tape, scissors, razor blade

- 16) Install the **1/4-20 X 5/8IN LONG BUTTON HEAD CAP SCREW (ITEM 19)** into the **R4A-2RS BALL BEARING (ITEM 20)** and then into the **.25IN ID X .335IN OD X .05IN THICK STEEL WASHER (ITEM 21)**. Then assemble onto **MOUNT - LOWER**. (20:57)

Tools used: 5/32" Allen wrench

- 17) Push the ball bearing on the **MOUNT - LOWER** into the large hole in the **MOUNT - INTERMEDIATE**. Use the **#6-32 X 1/2IN LONG SOCKET HEAD CAP SCREW (ITEM 22)** to clamp the **MOUNT - INTERMEDIATE** on the ball bearing. (21:37)

Tools used: 7/64" Allen wrench

- 18) Compress the **.022IN WIRE X .18IN OD X .63IN LONG COMPRESSION SPRING (ITEM 24)** using tweezers and push in between the **MOUNT - INTERMEDIATE** and **MOUNT - LOWER**. The spring should sit inside the #7 ($\phi .201$ ") hole in the **MOUNT - LOWER** and push against the protrusion on the **MOUNT - INTERMEDIATE**. (22:31)

Tools used: Tweezers

- 19) Press the two **1/4-20 X 3/4IN LONG SOCKET HEAD CAP SCREWS (ITEM 23A)** into the two **BLACK PLASTIC SCREW-HEAD MOUNT KNOBS (ITEM 23B)**. This step was not shown in the video because it had already been completed, but it is simple to do. Use an arbor press. Then install the thumbscrews into the 1/4-20 threaded holes in the **MOUNT - INTERMEDIATE** and **MOUNT - LOWER**. (23:03)

Tools used: Arbor press

lower mount should be centered

5] Press lens through threaded portion of tube

7] Look for moving interference rings as you do your "small wobble/grank"

9] Crosshairs side is first; crosshair assembly is threaded on non-knurled side of focuser
↳ screw driver slots facing out
↳ assembly should be "depthed" to ~ 1 inch (a bit less)

14 Flexure should be squared with the sides
of the mounts

Install screws out \rightarrow in : $\begin{matrix} 1 & 3 & 4 & 2 \\ 0 & 0 & 0 & 0 \end{matrix}$

(achromatic
doublet)

objective
lens

eyepiece
lens

go w/

objective
retainer

eyepiece
retainer

objective \downarrow

$$\text{mag} = \frac{170}{22} \approx 6 \times \text{magnification}$$

eyepiece \uparrow