

How To Modify A Library Telescope

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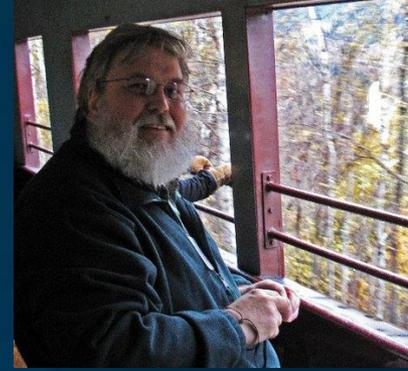
Library Telescope Program

- Library owns a telescope that is loaned out to adult patrons much like a book
 - Orion 4.5" StarBlast Reflector with some modifications





Origin of the Library Telescope Program



- Started by the New Hampshire Astronomical Society in 2008 based on the telescope and modifications proposed by Marc Stowbridge
 - To my knowledge, there are currently over 500 libraries with Library Telescope Programs in 44 states in the U.S.
- Tell us about your Library Telescope Program at:
www.librarytelescope.org/register-your-program

Astronomy Club Project

- The Library Telescope is perfect for an astronomy club project
 - Various skills are needed that can more easily be met at the club level
- A single amateur astronomer could do it as well but having a group to help out certainly makes it easier

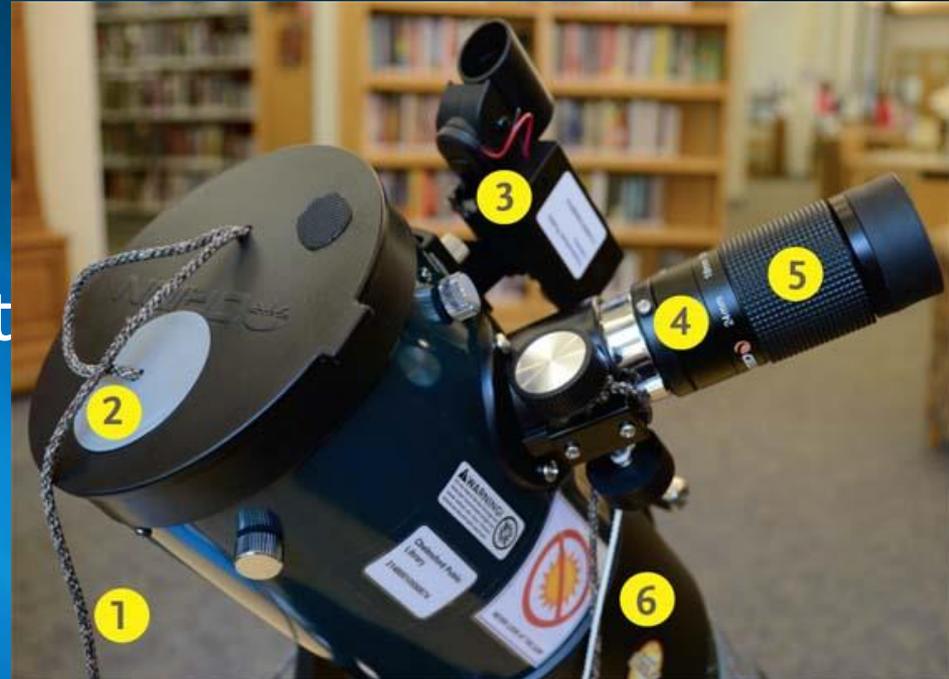


Modified vs. Out of the Box



Modifications

- Attach lens cap & tube cover to the base with string or wire (1)
- Low tech Moon filter - cut hole in the tube cover & affix a plug to it with string or wire (2)
- Affix viewfinder & add AA batteries (3)
- Affix the zoom eyepiece to the focuser & tape the eye guard (4,5)
- Add decals (6)
- Protect the collimation screws



Lens Cap & Tube Cover



Moon Filter

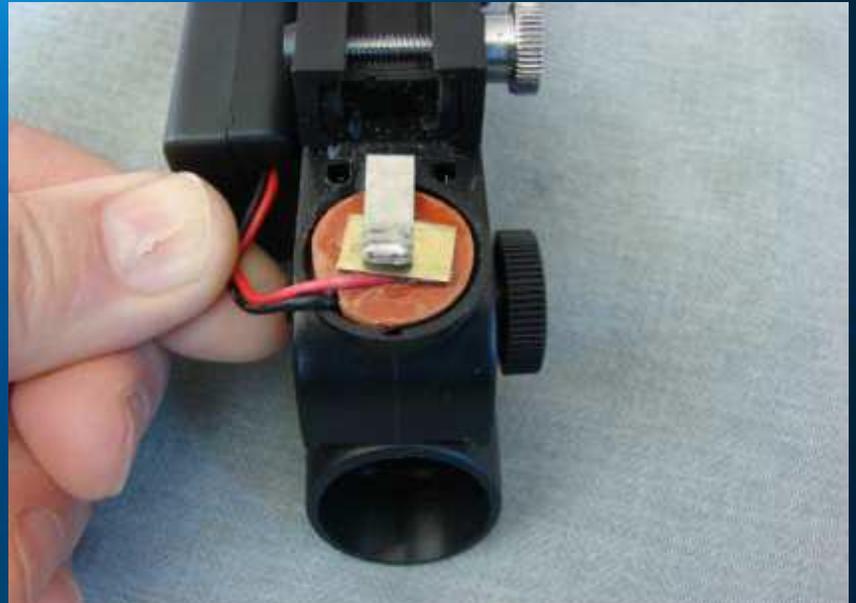
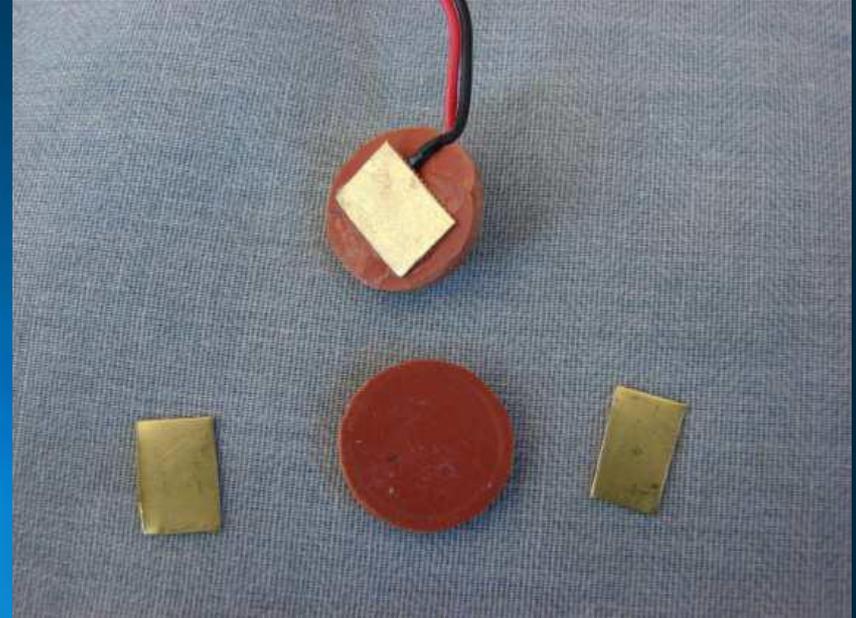
- Full Moon can be very bright which can be uncomfortable
 - Very low-tech answer to the problem



View Finder



View Finder – Change Batteries





View Finder New Model



Zoom Eyepiece



Decals

EYEPIECE MAGNIFICATION CHART		
TELESCOPE SPECIFICATIONS	F/ 3.9	450MM
EYEPIECE	POWER	FIELD OF VIEW DEG.
8	56x	.55
12	38x	1.23
18	25x	2.05
24	19x	2.46

Library Telescope Program



Quick Start Resources:

- How to use the telescope
- Introduction to astronomy
- Educator resources
- Sky Map/Other resources
- More about the program

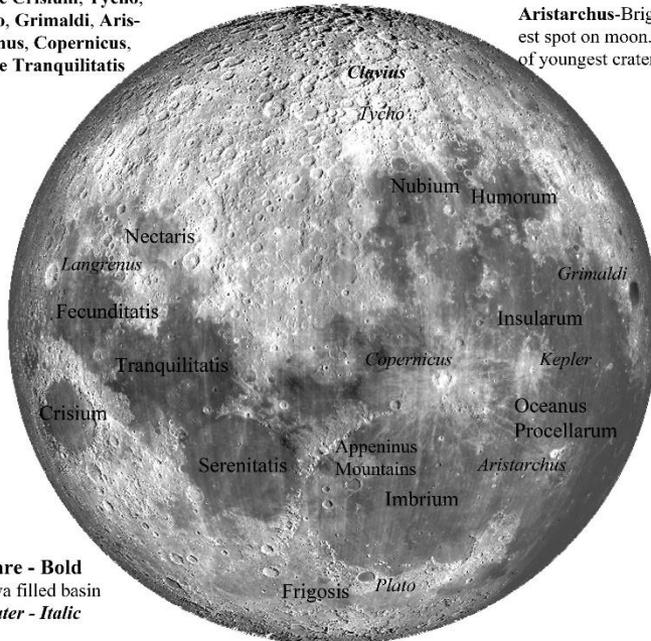
www.librarytelescope.org/get-started

2018-04-LT04

Orientation Features:
Mare Crisium, Tycho, Plato, Grimaldi, Aristarchus, Copernicus, Mare Tranquilitatis

Mare Tranquilitatis - Site of 1st Lunar landing

Tycho - Young white crater - origin of many rays
Aristarchus - Brightest spot on moon. One of youngest craters



Mare - Bold
 Lava filled basin
Crater - Italic

Copernicus - Spectacular crater with layering and rays

Grimaldi and Plato - Walled lava filled craters

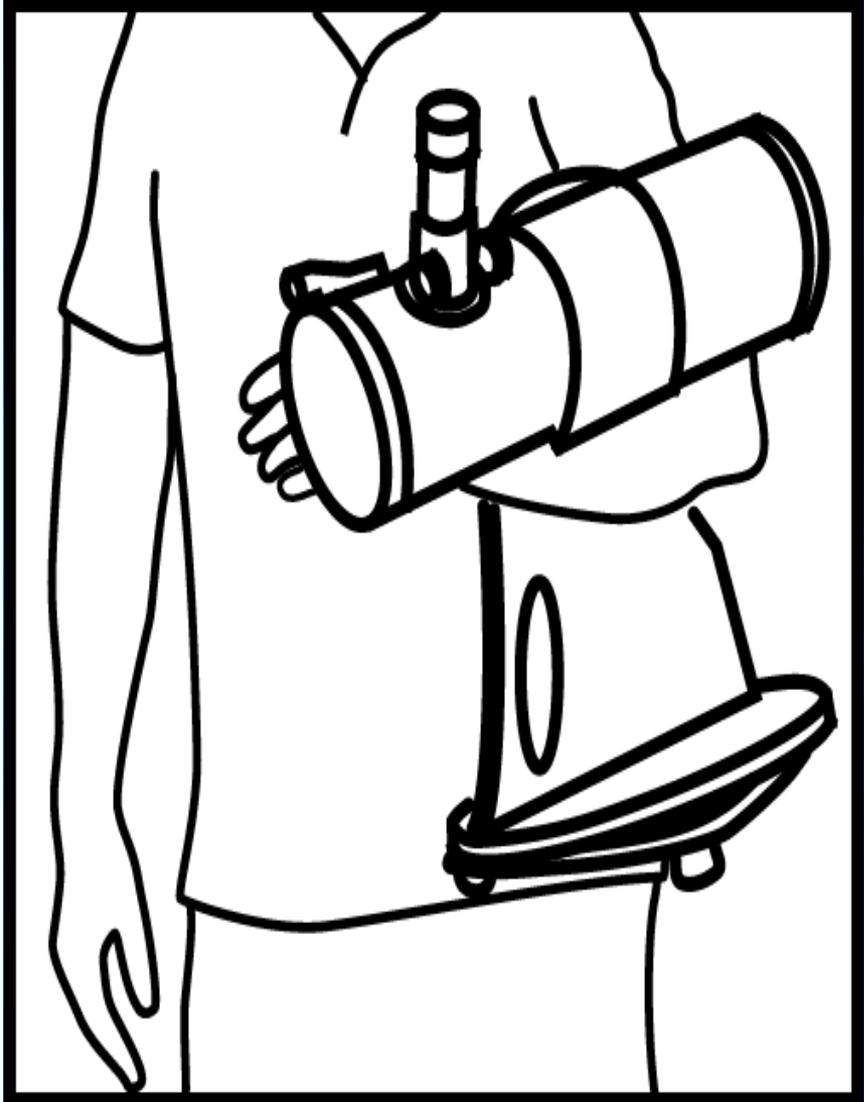
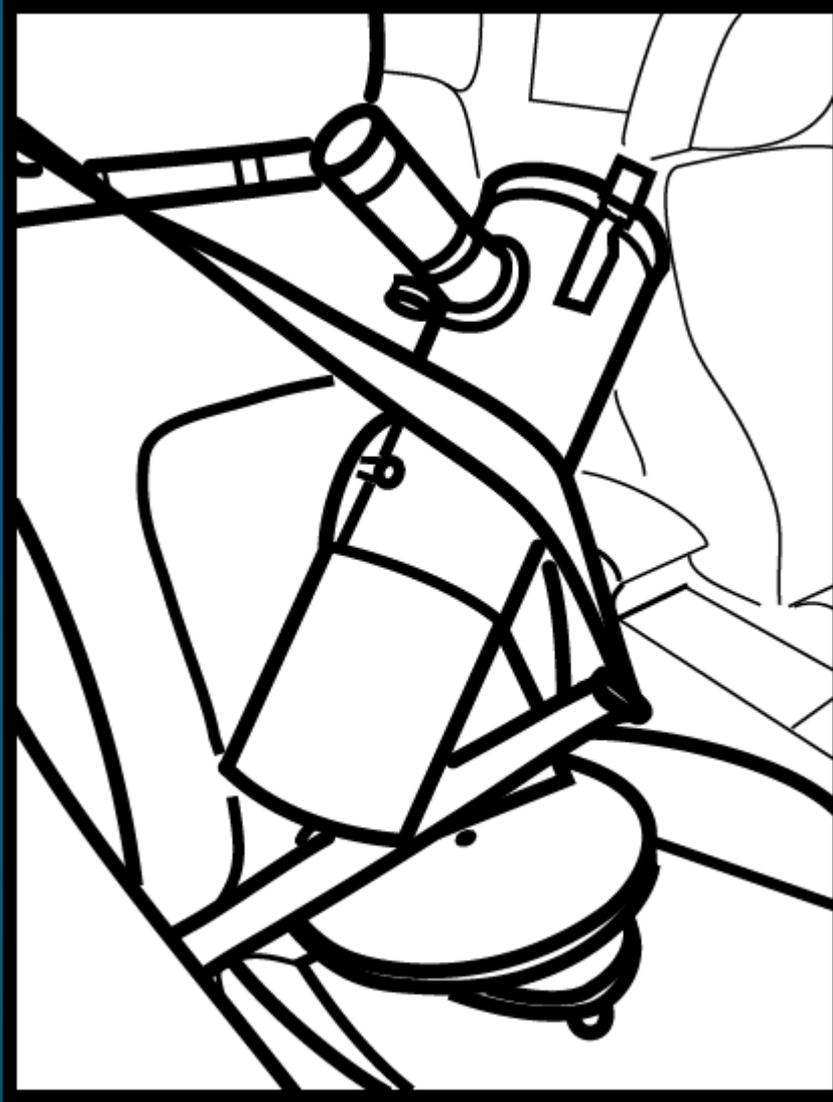


Collimation Screws

- Cover the screws
- OR replace the screws with non-standard screws
- OR leave screws exposed with instructions not to touch them



Moving the Library Telescope



Does your library have a Library Telescope?

Library Telescope Program

where Library patrons can borrow
an easy-to-use quality telescope as they would a book!

The telescope, an Orion 4.5 inch StarBlast Reflector,
is a quality instrument that is...

- ★ user friendly
- ★ very portable and light weight
- ★ fitted with a sturdy mount
- ★ equipped with quality optics and zoom eyepiece
- ★ easy to use
- ★ has easy to understand user instructions

Check it out, take it home!

- ★ Must be 18 or older to check it out like a book
- ★ easy to carry
- ★ secure on a car's seat using a seat belt
- ★ set on a sturdy table



Special Zoom Eyepiece

- ★ magnifications between 19 and 56 power
- ★ change magnification by rotating the barrel

Powerful enough to see

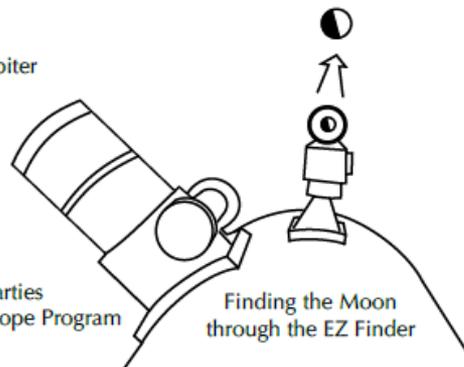
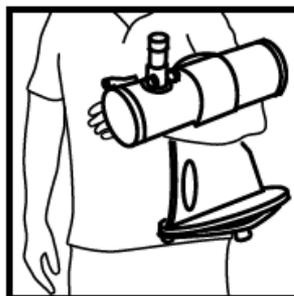
- ★ craters on the Moon
- ★ the crescent of Venus
- ★ the four Galilean moons of Jupiter
- ★ the rings of Saturn
- ★ star clusters and nebulae

Your local amateur astronomy club
would love to help you
with this program at your library!

- ★ Great for library astronomy presentations and star parties
- ★ Over 500 libraries in 44 states have a Library Telescope Program
- ★ Instruction for Library staff

For more information visit:
www.librarytelescope.org or
[www.Facebook.com/LibraryTelescope](https://www.facebook.com/LibraryTelescope)

or contact: _____



ASTRONOMICAL LEAGUE

www.astroleague.org/outreach

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Library Telescope Modification Tips



Ron Thompson

Preparing Telescope

Unpack Telescope

Remove Telescope, with bag, from foam.. Return foam and bag to box.

Plastic bag will be reused to transport, with foam, in original shipping box.

Save the Round Cardboard for base when drilling rear cell, front cover and eyepiece cap.



Preparing Telescope

Lay Telescope on its' side and glue rubber feet to base if needed

Tighten Base, if necessary, to allow smooth rotation

If grinding, separate base and re-seat the lifted staple (s)



Preparing Telescope

Open clam shell, remove Optical Tube and remove paper. Replace Optical Tube with opening facing Hand-Hold

Loosen two Accessory Bar screws

Lift to remove Accessory Bar and tighten screws



Rear Cell

Unscrew Three Screws Holding Cell

Carefully Remove Cell With Mirror



Rear Cell (Mirror)

Remove three screws to free rear cell. Remove Cell from OTA. Remove adjusting hardware used for collimating . Place mirror assembly face down on a clean rag...screws facing up. (Use existing screws) Ensure existing screws are tight on the cell. (remove springs, turn snugly, CCW, with needle-nose pliers, replace springs)

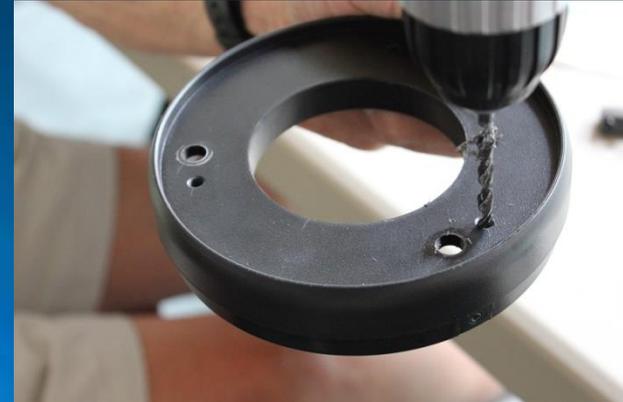
Use new hardware (3 washers and 3 locknuts, 5mm threads). Align screws in smaller holes, (drill out to 15/64") attach washer and locknuts onto protruding threads and tighten flush with locknuts (ensure free movement)

Reinstall cell. Set OTA aside for Collimating

Rear Cell Assembly



1. Place mirror side down screws up



2. Drill out small holes to 15/64



3. Install washers and locknuts



4. Reinstall mirror cell

Zoom Eyepiece (EP)

Unscrew eyecup and apply a spot of Loctite 425 on threads and contact gel on rubber eyecup

EP is unscrewed from the 1.25" barrel. Put a drop of Loctite 425 on threads and reassemble

Use glue sparingly on EP; set aside to cure



Focuser

Rotate focuser outward and unscrew Eyepiece Ring from Focuser

Apply Loctite 425 to threads and screw Ring back onto focuser tube

Remove thumbscrews on Eyepiece Ring and replace with new Hex Head screws



Hex head screws



Focuser and Eyepiece

Mount the Zoom Eyepiece in the focuser and tighten the two hex head screws

Do not over-tighten.

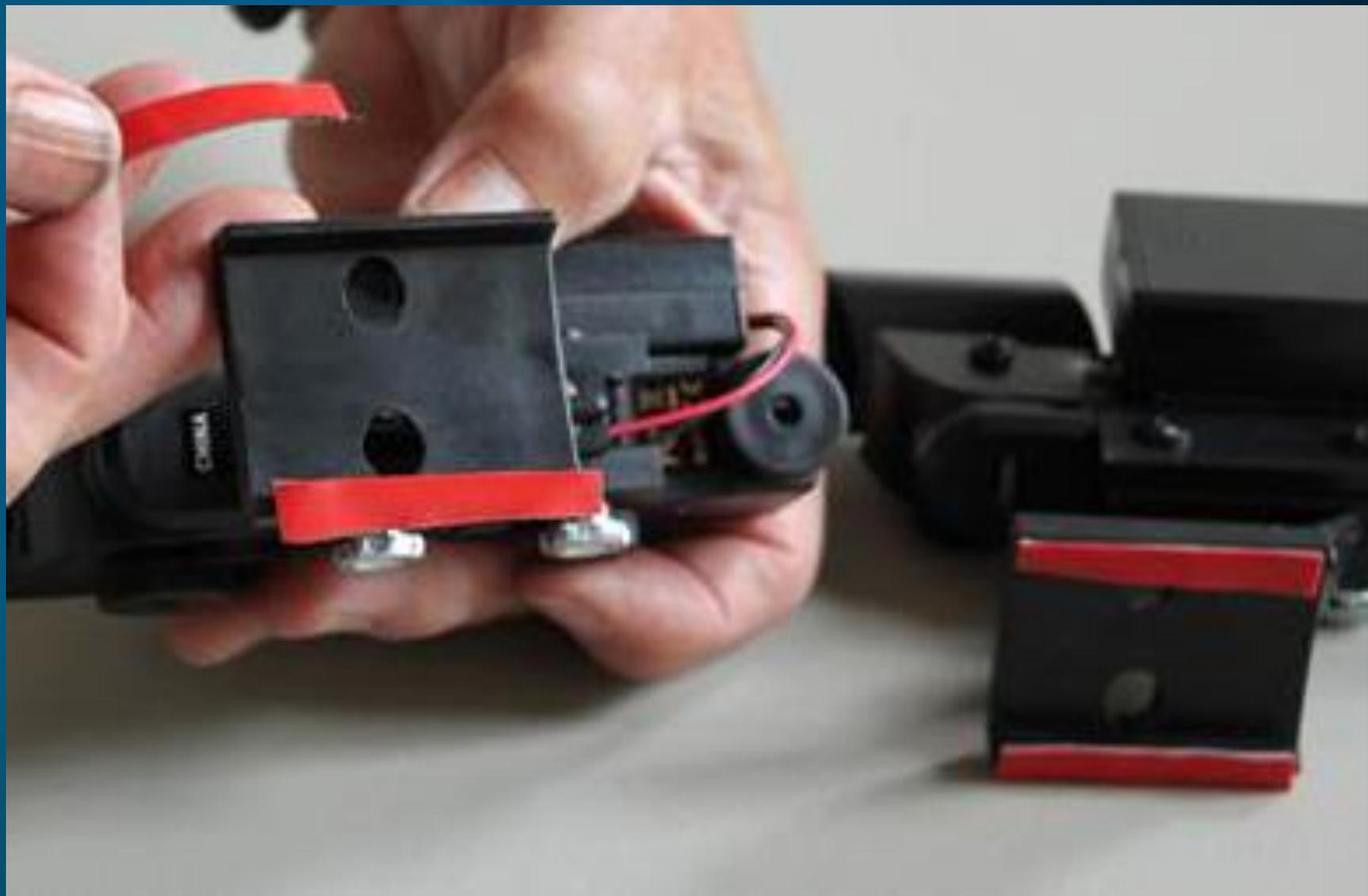
Rotate Zoom Eyepiece, stop to stop and check for ease of movement



EZ Finder II (Red Dot LED)



EZ Finder II



EZ Finder II

Check the Alt/AZ adjustment screws and center them through their range of motion.
(you can tell)

Mounting and Alignment of EZ Finder. (1) Center a distant object in the EP and Zoom-in to 8mm, maintain object in center. (2) Remove the red paper from the tape on the rails. (3) Switch on the Red LED, using the on/off switch.

(4) With object still centered, place the EZ Finder mount, over the screws on the OTA and onto the tube while keeping the red dot as close to the centered object as possible, centered vertically, and press it down onto the tube.

(5) Thread the holding nuts onto the screws and tighten them on the mount, to the tube. Keep alignment as close as possible, by checking alignment as you tighten the nuts onto the base and holding the finder in position. (It helps to have three hands :<))

(6) Check for centered object in EP and adjust Alt/AZ controls to “place” red dot on object that is centered in the EP. (should be minimal)

Camera Bag and Accessories





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The Library Telescope Modification Tips



Ron Thompson

Webinar Resources

Available at www.LibraryTelescope.org/Tips

- Today's presentation:
 - PDF of full presentation
 - PDF of Cornerstones of Science Presentation with "notes"
 - Recording of today's presentation on YouTube **
- Link to Astronomical League Website
 - Find an Astronomy Club
 - Library Telescope Program Description
 - Sky & Telescope Article
- Links on LibraryTelescope.org:
 - Library Telescope Program Flyer
 - Register Your Own Program
 - YouTube Videos on the Library Telescope Program
 - Facebook Page (also see [Facebook.com/librarytelescope](https://www.facebook.com/librarytelescope)) **

QUESTIONS

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** See social media links at top right of LibraryTelescope.org

QUESTIONS

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Bolts

Bolt Depot.com
fastener shopping made easy

Order Confirmation

We at Bolt Depot thank you for your order!

Bolt Depot Order Number: **1076750**

Placed: 2/19/2019

Shipping

Shipping method:

Ship to:



Your Order

Product#	Description	Quantity	Unit Price	Subtotal
4515	Metric flat washers, Stainless steel 18-8 (A-2), 5mm	2 bags of 100	\$1.77	\$3.54
7219	Metric socket button head, Stainless steel 18-8 (A-2), 3mm x 0.5mm x 8mm	2 bags of 100	\$3.10	\$6.20
4794	Metric hex lock nuts nylon insert, Stainless steel 18-8 (A-2), 5mm x 0.8mm	2 bags of 100	\$4.19	\$8.38

Summary

Subtotal: \$18.12

Tax: \$0.00

Shipping: \$6.80

Total: **\$24.92**