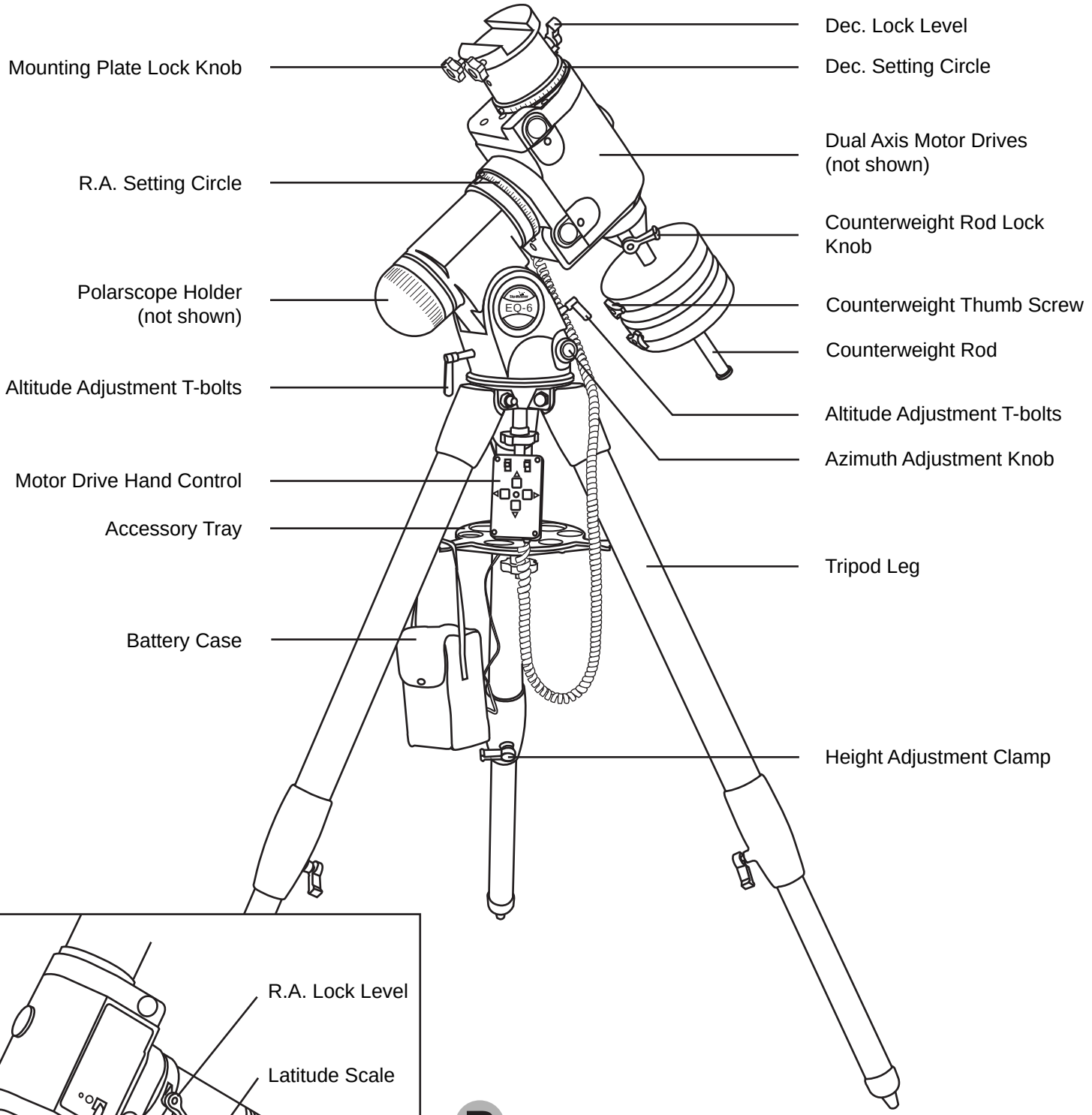
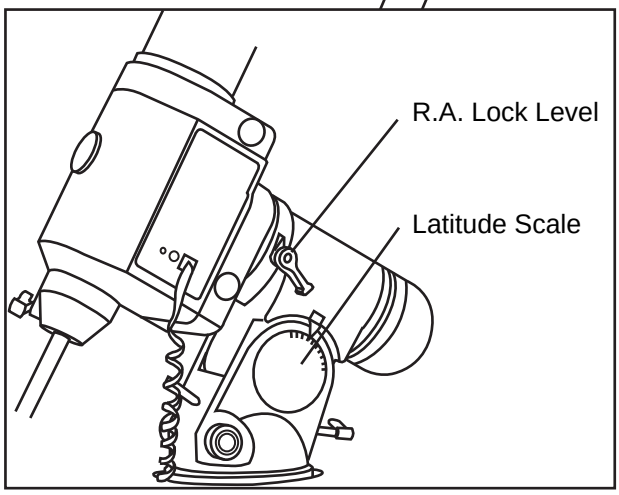
INSTRUCTION MANUAL

EQ6 EQUATORIAL MOUNT



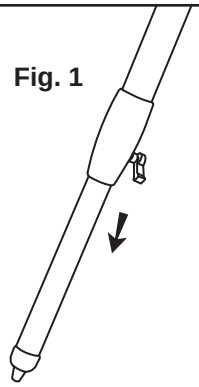


Before you begin

Read the entire instructions carefully before beginning. Your telescope should be assembled during daylight hours. Choose a large, open area to work to allow room for all parts to be unpacked. Never use your telescope to look directly at or near the sun. Permanent eye damage will result. Use a proper solar filter for viewing the sun. Never use your telescope to project sunlight onto another surface, the internal heat build-up will damage the telescope optical elements.

TRIPOD SET UP

Fig. 1



ASSEMBLING TRIPOD LEGS (Fig.1)

1) Slowly loosen the height adjustment clamp and gently pull out the lower section of each tripod leg. Tighten the clamps to hold the legs in place.
2) Pull the tripod legs away from the tripod head to stand the tripod upright.
3) Adjust the height of each tripod leg until the tripod head is properly leveled. Note that the tripod legs may not be at same length when the equatorial mount is level.

Fig. 2.

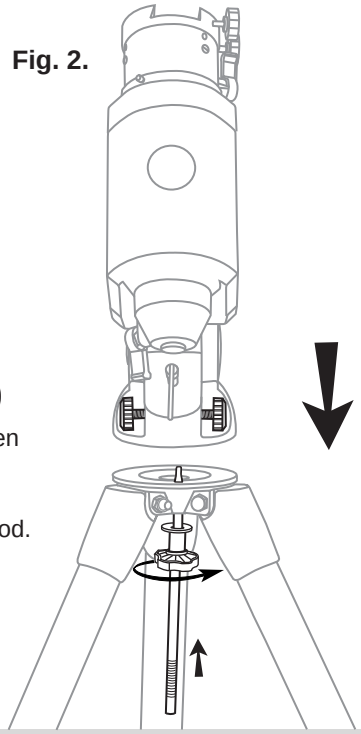
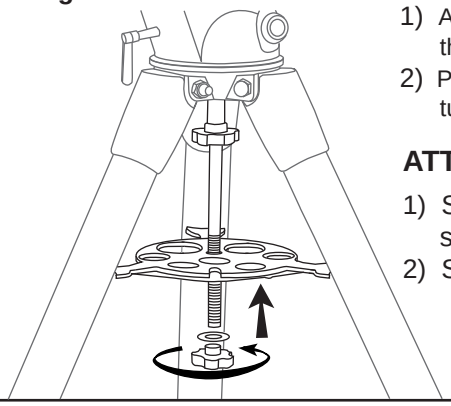


Fig. 3



ATTACHING MOUNT TO TRIPOD LEGS (Fig. 2)

1) Align metal dowel on the tripod head with the gap between the azimuth adjustment knobs underneath the mount.
2) Push the primary locking shaft up against the mount and turn the knurled knob underneath to secure mount to tripod.

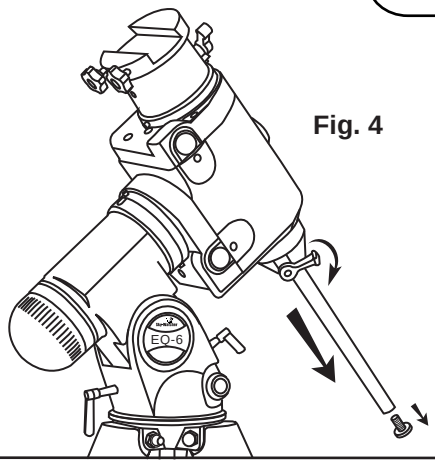
ATTACHING THE ACCESSORY TRAY (Fig. 3)

1) Slide the accessory tray along the primary locking shaft until it pushes against the tripod legs.
2) Secure with the washer and locking knob.

Note: Loosen the azimuth adjustment knobs if mount does not fit into tripod head completely. Retighten knobs to secure.

MOUNT ASSEMBLY

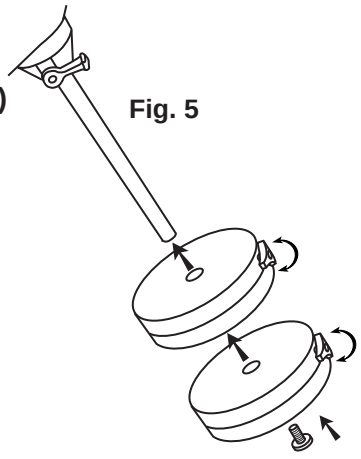
Fig. 4



INSTALLING COUNTERWEIGHTS (Fig. 4, 5)

1) Loosen the counterweight rod lock knob and gently pull out the counterweight rod. Re-tighten the lock knob to secure the counterweight rod in place.
2) Unscrew the threaded cap from the end of the counterweight rod.
3) Locate counterweights and slide them halfway along the counterweight rod. Tighten counterweight thumb screws to secure.
5) Replace cap on the end of counterweight rod.

Fig. 5

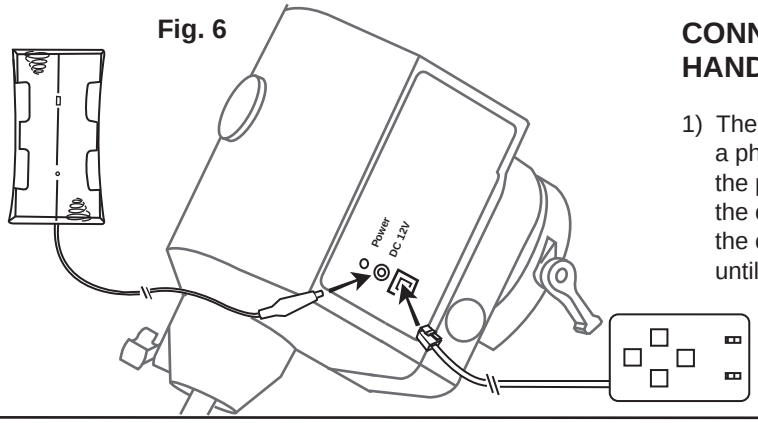


HAND CONTROL INSTRALLATION

POWERING THE EQ6 MOTORS (Fig. 6)

1) Insert four "D" cell batteries into the battery case.
2) Plug the DC power cord from battery case into the DC 12V outlet on the side of the mount.

Fig. 6



CONNECTING THE HAND CONTROL (Fig. 6)

1) The EQ6 hand control has a phone type connector. Plug the phone jack connector into the outlet on the mount. Push the connector into the outlet until it clicks into place.

Balancing the telescope

Telescope should be balanced before each observing session. Balancing reduces stress on telescope mount and allows precise control of micro-adjustment. A balanced telescope is specially critical when doing astrophotography.

The telescope should be balanced after all accessories (eyepiece, camera, etc.) have been attached. Before balancing your telescope, make sure that your tripod is balanced and on a stable surface. For photography, point the telescope in the direction you will be taking photos before performing the balancing steps.

R.A. Balancing

1) Slowly unlock the R.A. and Dec thumb screws. Rotate the telescope until both the optical tube and counterweight rod is horizontal to the ground, and the telescope tube is to the side of the mount (Fig.a).
2) Tighten the Dec. thumb screw.
3) Move counterweights along the counterweight rod until telescope is balanced and remains stationary when released.
4) Tighten thumb screws to hold counterweights in their new position.

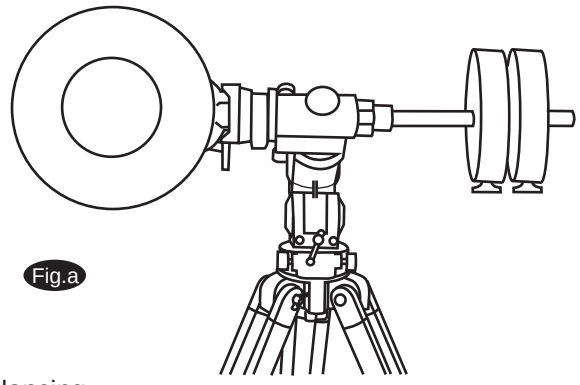


Fig.a

Dec. Balancing

The R.A. axis should be balanced before proceeding with Dec. balancing.

1) Release the R.A. thumb screw and rotate R.A. axis so that the counterweight rod is in horizontal position. Tighten the R.A. thumb screw.
2) Unlock the Dec. thumb screw and rotate telescope tube until it is paralleled to the ground.
3) Slowly release the telescope and determine which direction the telescope rotates. Loosen telescope tube clamps and slide telescope tube forward or backward in the clamps to balance dec. axis.
4) Once telescope no longer rotates from its parallel starting position, re-tighten tube clamps and the Dec. thumb screw. Reset altitude axis to your local latitude.

Operating the EQ6 mount

The EQ6 mount has controls for both conventional altitude (up-down) and azimuthal (left-right) directions of motion. Use the altitude adjustment T-bolts for altitude adjustments. These allow fine-adjustment for setting the mount to your local latitude. The azimuthal axis is changed by the two azimuth adjustment knobs located near the tripod head. These allow fine-adjustment of azimuth for polar aligning (Fig.b).

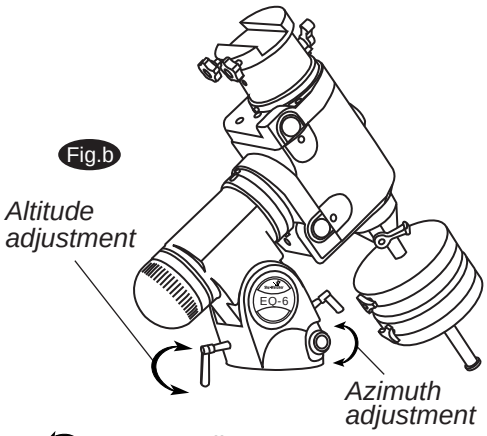


Fig.b

In addition, this mount has direction controls for polar aligned astronomical observing. These directions use right ascension (east/west) and declination (north/south) axis. There are two options to move the telescope in these directions: For large and quick movement, loosen the R.A. lock level under the R.A. shaft or the Dec. lock level near the top of the mount (Fig.c). For fine adjustments, use the motor drive hand control (see "Using the Hand Control).

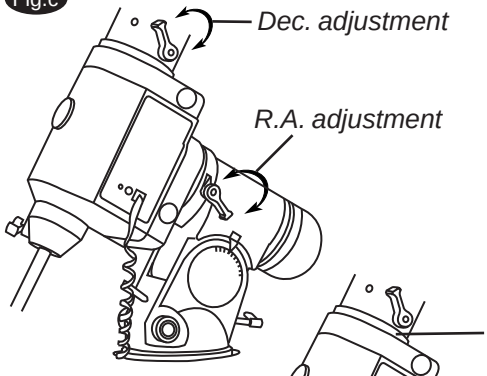


Fig.c

There are three numerical scales on this mount. The lower scale is used for polar alignment of the telescope to your local latitude. The R.A. (right ascension) scale is measures hour angle and is adjustable to your local meridian. The declination scale is located near the top of the mount (Fig.d).

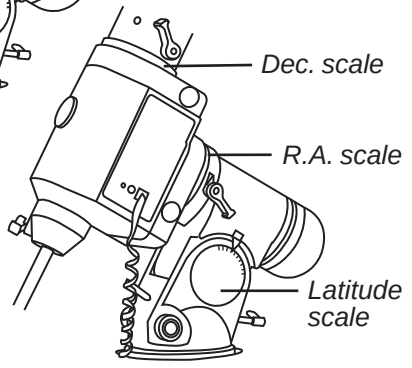
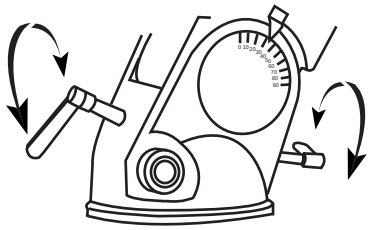


Fig.d

Polar Alignment

In order for your telescope to track objects in the sky you have to align your mount. This means tilting the head over so that it points to the sky's North (or South) pole. For people in the Northern Hemisphere this is rather easy as there is a bright star very near the spot Polaris. For casual observing, rough polar alignment is adequate. Make sure your equatorial mount is level and the finderscope is aligned before beginning.

Fig.e



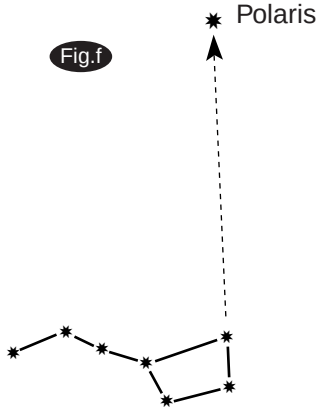
Setting the latitude

Look up your latitude on a map, road maps are good for this purpose. Now look at the side of your mount head, there you will see a scale running from 0-90 degrees. At the base of the head, just above the legs, are two screws opposite each other under the hinge. All you have to do is loosen one side and tighten the other until your latitude is shown by the indicator pointer (Fig.e).

Finding Polaris

Which one is Polaris? The easiest way to find it is to look for the Big Dipper. Draw an imaginary line along the two end stars in the bowl of the Big Dipper. The first star you come to along this line is Polaris (Fig.f).

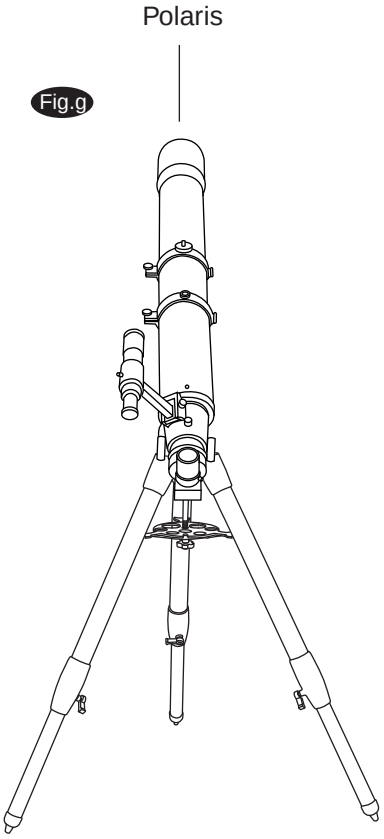
Fig.f



Aligning Your Telescope to Polaris

Unlock the Dec. lock level and rotate the telescope tube until the pointer on the setting circle reads 90°. Retighten the Dec. lock level. Move the tripod so that the telescope faces north and the R.A. axis points roughly at Polaris. Use the two azimuth adjustment knobs to make fine adjustments in azimuth if needed (Fig.g). For more accurate alignment, look through the finderscope and centre the Polaris on the crosshairs.

Fig.g



Along the R.A. axis shaft, the farther away from the back of the shaft that you are the more accurate you will be. Even though the true celestial pole may be up to twice the moon's diameter away (Polaris circles the pole once a day) you won't find this a problem unless you are doing long exposure photography. After a while you will notice your target drifting slowly North or South depending on the direction of the pole relative to Polaris. Turn the power of the hand control on to keep the target in the center of the view (see "Using the Hand Control"). After your telescope is polar aligned, no further adjustments in the azimuth and latitude of the mount should be made in the observing session, nor should you move the tripod. Only movements in R.A. and DEC axis should be made in order to keep the polar alignment of your telescope.

The polar alignment above is adequate for casual observing. More precise alignment using Polar Axis Finderscope is required for long exposure astrophotography.

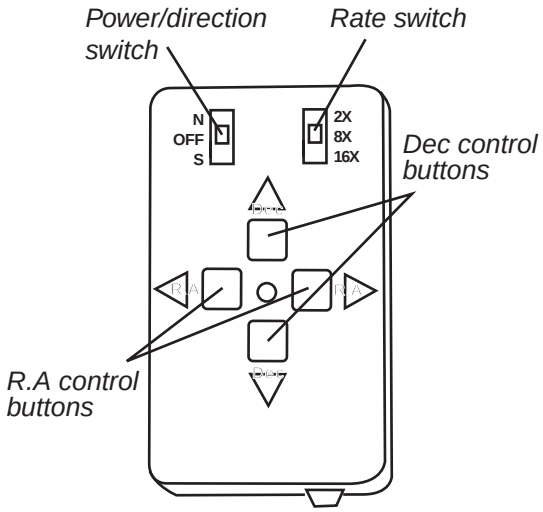
Using the Hand Control

The N/Off/S switch acts as a power switch as well as controlling direction of the motors. The "N" position allows R.A. motor to track for Northern Hemisphere observing and the "S" position is suitable for the Southern Hemisphere (Fig.h). When the EQ6 Hand Control is turned on and all buttons are depressed, the R.A. motor will rotate at the proper speed to compensate for the earth's rotation. The Dec. axis does not automatically rotate. When the mount is correctly polar aligned, you only need to turn the R.A. slow-motion to follow or track objects as they move through the field. The Dec. control is not needed for tracking.

The four push buttons control the direction the up-down buttons control the Dec. motor while the left-right buttons change the R.A. axis.

The rate switch allows changes to the speed rate of the motors from high speed slew rate (16X) to slow micro-adjustment (2X) and the speed in between (8X). When the rate switch is set on "2X", pressing the right R.A. button will rotate the telescope forward at twice the tracking speed or approximately ½º per minute. The left R.A. button stops all motion and allows stars to drift by at their normal rotation rate of approx. ¼º per minute. The "8X" settings allows forward at 8 times the tracking rate and the reverse button moves the telescope backwards at 7 times the tracking rate. The "16X" setting allows forward at 16 times the tracking rate and the reverse button moves the telescope backwards at 15 times the tracking rate.

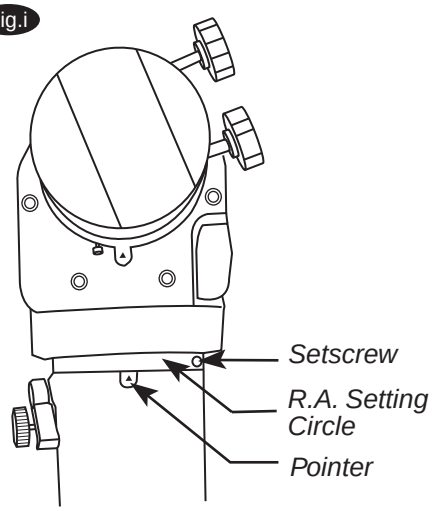
Fig.h



Setting Circles

The quickest way to find objects is to learn the Constellations and use the finderscope, but if the object is too faint you may want to use setting circles on an equatorial mount. Setting circles enable you to locate celestial objects whose celestial co-ordinates have been determined from star charts. Your telescope must be Polar aligned and the R.A. setting circle must be calibrated before using the setting circles.

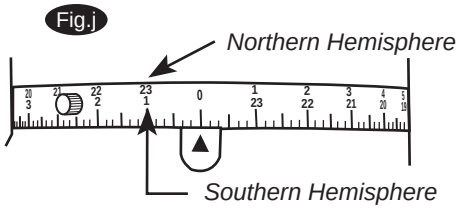
Fig.i



Reading the R.A. setting circle

The telescope's R.A. setting circle is scaled in hours, from 0 through 24, with small lines in between representing 10 minute increments. The upper set of numbers apply to viewing in the Northern Hemisphere, while the numbers below them apply to viewing in the Southern Hemisphere (Fig.i, j).

Fig.j



Setting (calibrating) the R.A. Setting CIrcle

In order to set your Right Ascension circle you must first find a star in your field of view with known coordinates. A good one would be the 0.0 magnitude star Vega in the Constellation Lyra. From a star chart we know the R.A. coordinate of Vega is 18h 36m. Loosen the R.A. and Dec. lock levels on the mount. Centre Vega in the telescope's field of view by rotating the telescope in R.A. and Dec. axes. Retighten the lock levels to lock the telescope in place. Now rotate the R.A. setting circle until it reads 18h36m.

Finding Objects Using the Setting CIrcles

Example: Finding the faint planetary nebula M57; "The Ring"
From a star chart, we know the coordinates of the Rings are Dec. 33º and R.A. 18h52m. Set 33º on your DEC circle, 18h52m on your R.A. circle and the Ring Nebula should be in the field of view. Use low power until the object is found, then centre it in the field for high power examination.

Sometimes it is convenient to find an object with the DEC coordinate only. We could have found the Ring by setting 33º on the DEC circle, then traversing through Lyra in R.A. until it appeared in the field of view.