tasco®

OWNER'S MANUAL
MANUEL DU PROPRIÉTAIRE
MANUAL DEL USUARIO
MANUALE DELL'UTENTE
BENUTZERHANDBUCH
HANDLEIDING
MANUAL DO UTILIZADOR

46-060675

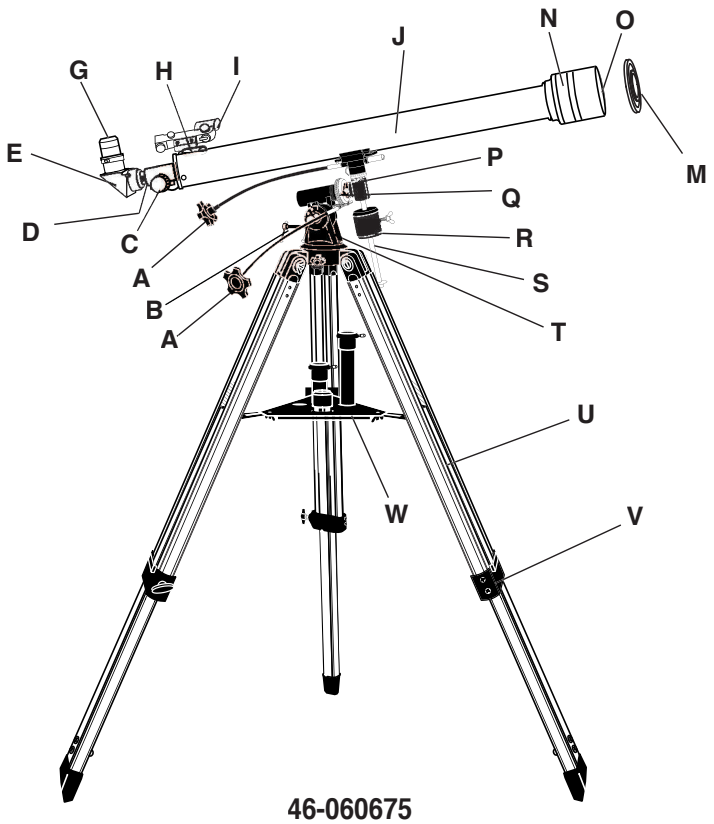
46-114375

46-114500

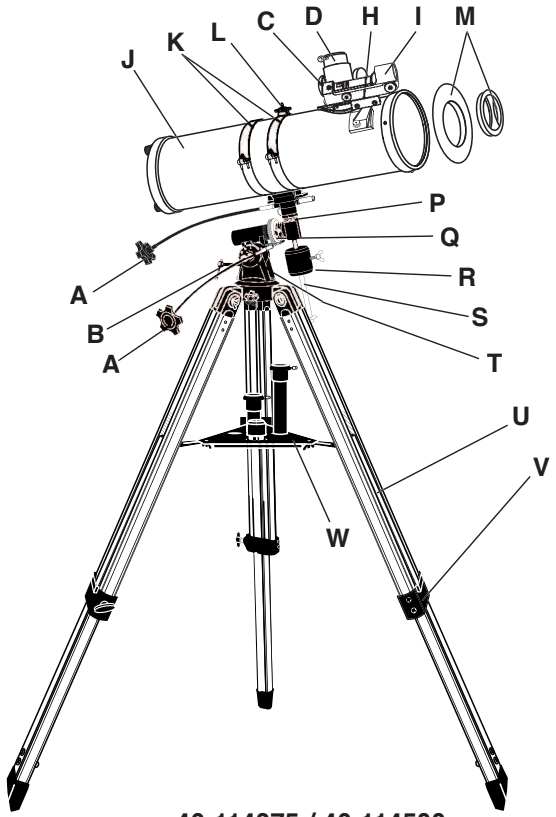
40-060675

40-114675

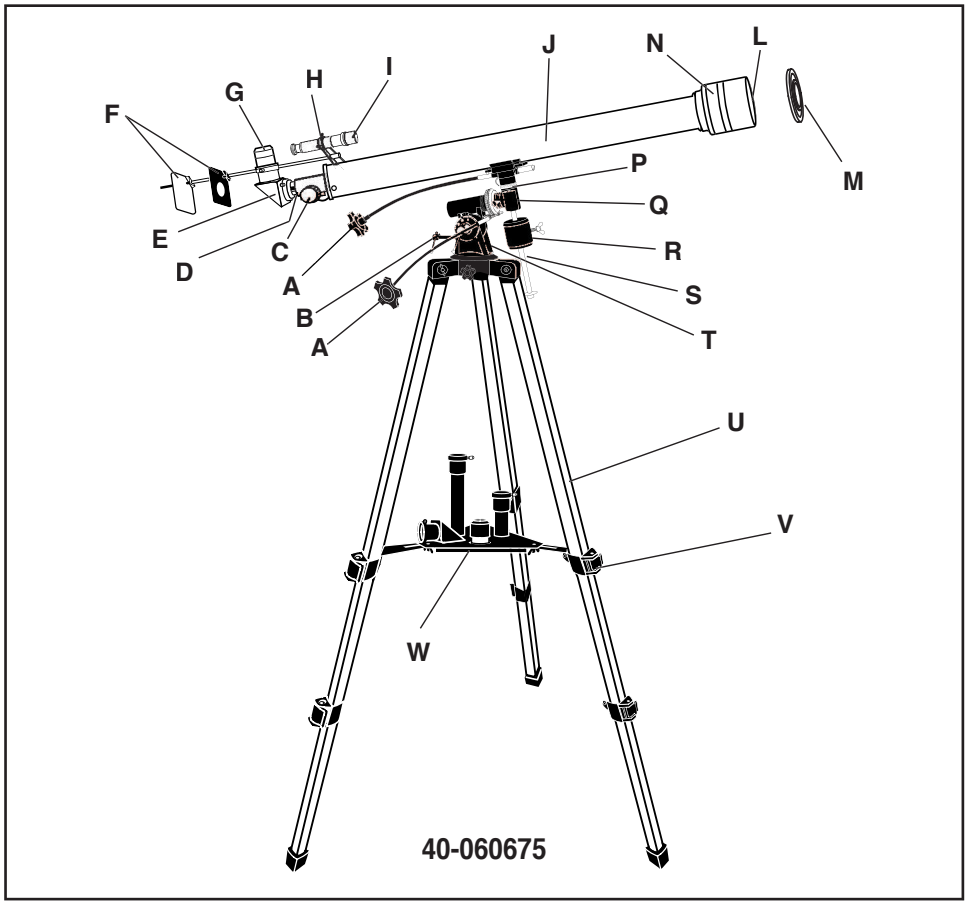
46-060675 / 46-114375 / 46-114500/
40-060675 / 40-114675



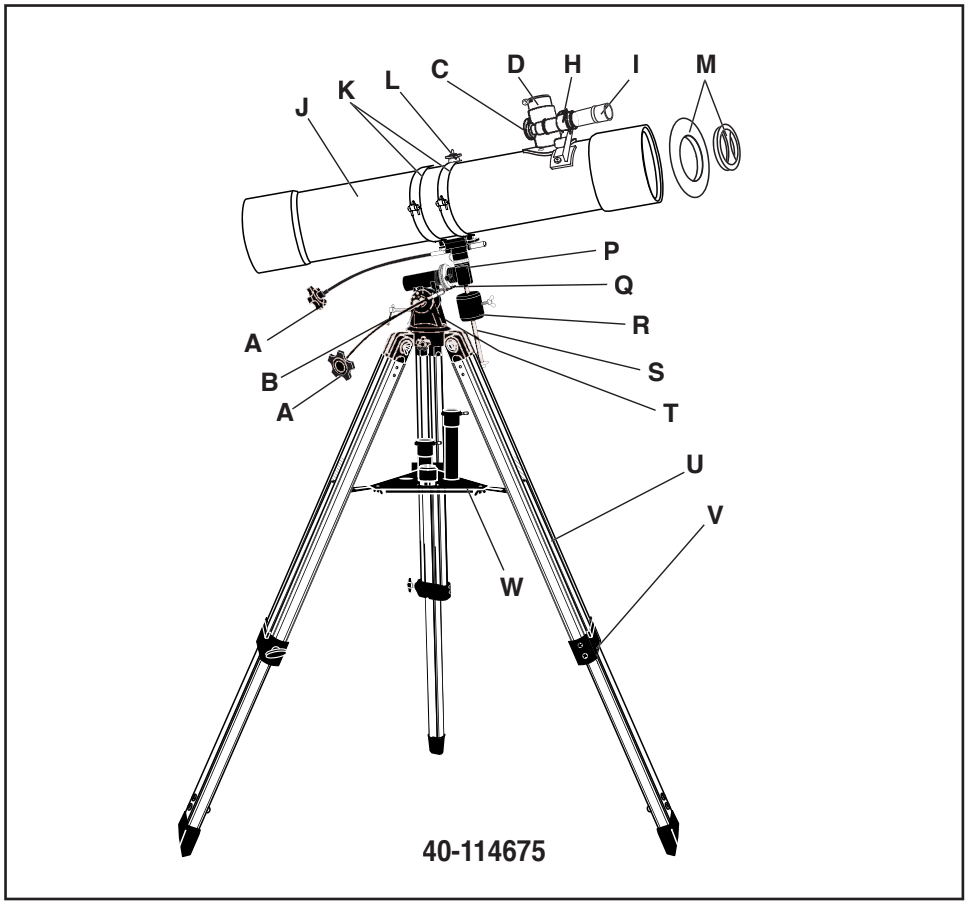
46-060675



46-114375 / 46-114500



40-060675



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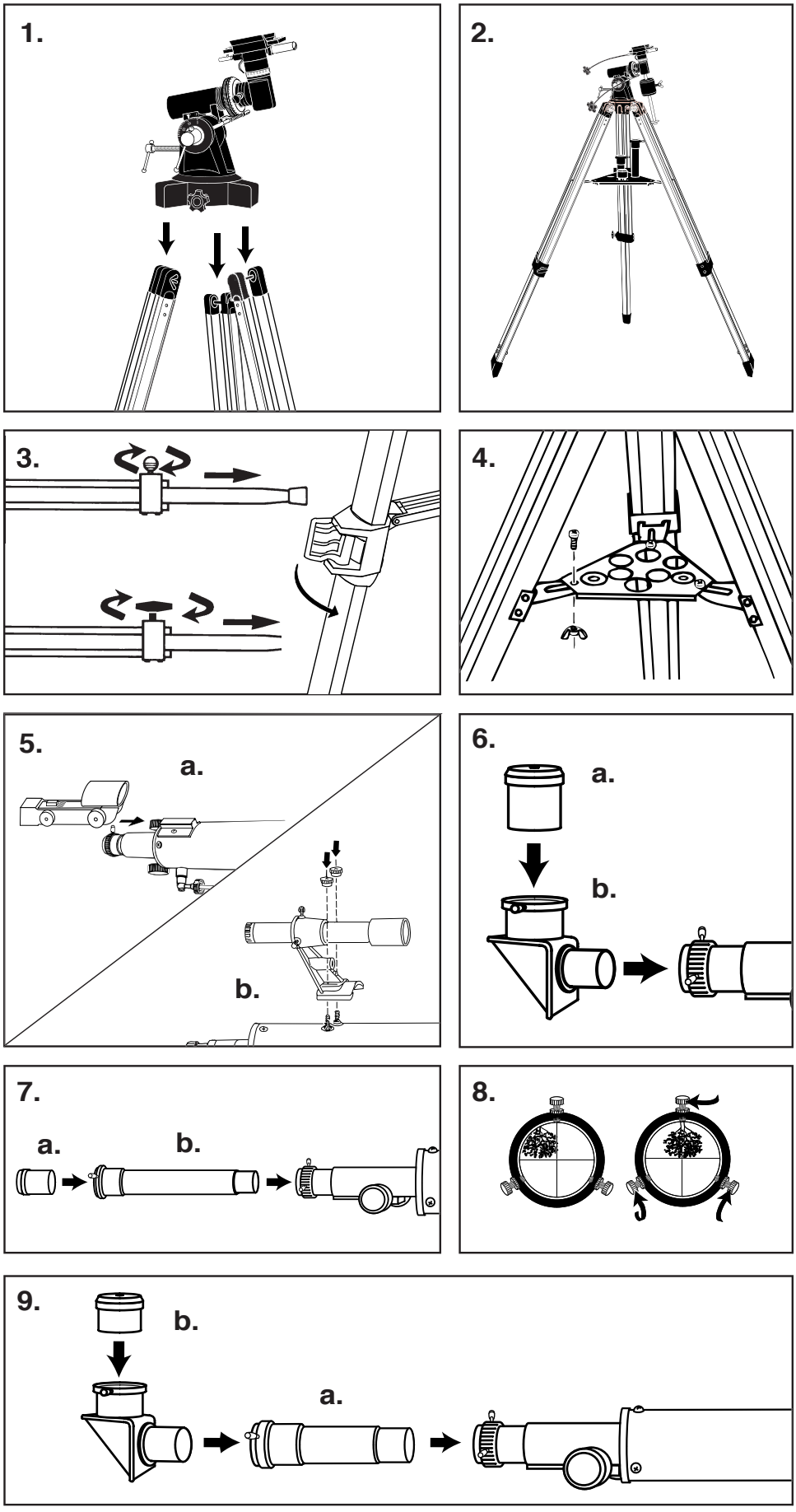
1.
2.
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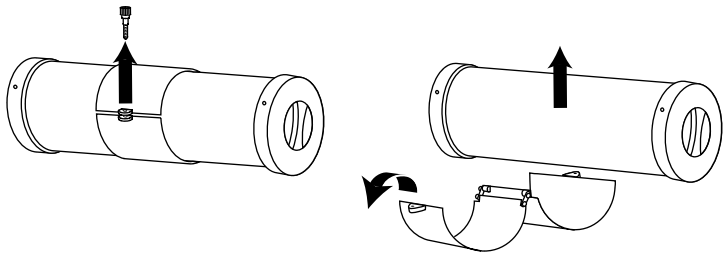

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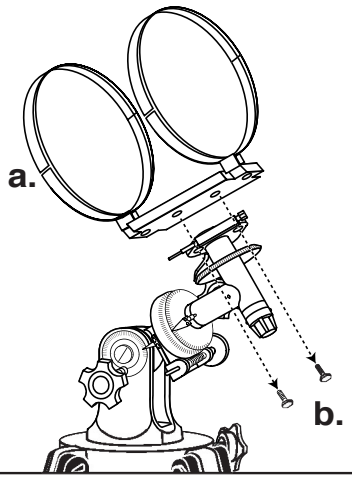

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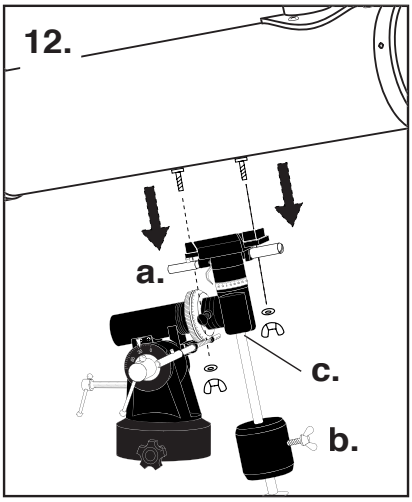

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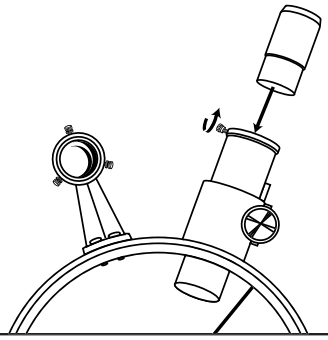

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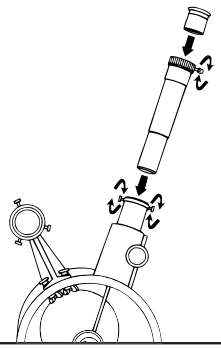

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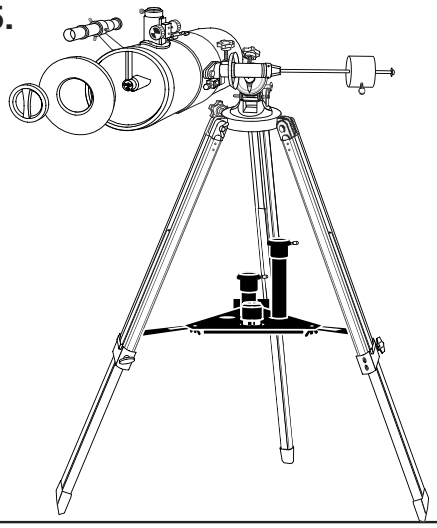

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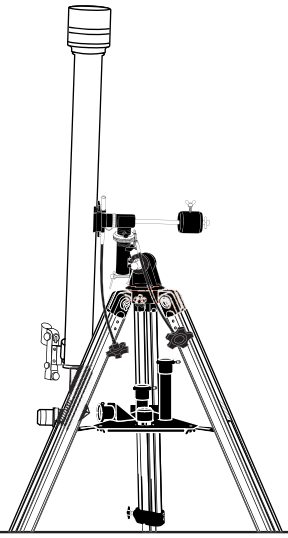

A. Flexible Control Cable
B. Polar Axis Micro Adjustment Lever
C. Focus Knob
D. Focus Tube
E. Diagonal
F. Sun Projection Screen
G. Eyepiece
H. Finderscope Bracket
I. Finderscope
J. Telescope Main Body
K. Cradle
L. Camera Set Screw
M. Dust Caps (remove before viewing)
N. Sun Shade
O. Objective Lens (not shown)
P. Declination Axis Scale
Q. Hour Axis Scale
R. Counterweight
S. Counterweight Shaft
T. Polar Axis Locking Lever
U. Tripod Leg
V. Tripod Leg Adjusting Screw / Clamp
W. Accessory Tray

A. Câble de contrôle flexible
B. Levier pour le réglage précis de l'axe polaire
C. Bouton de focalisation
D. Tube de focalisation
E. Diagonale
F. Ecran de projection du soleil
G. Oculaire
H. Support du télescope chercheur
I. Télescope chercheur
J. Corps principal du télescope
K. Monture
L. Vis de réglage caméra
M. Coiffes de protection (à enlever avant l'observation)
N. Pare-soleil
O. Lentille de l'objectif (pas sur le dessin)
P. Echelle de déclinaison de l'axe
Q. Echelle horaire
R. Contrepoids
S. Tige du contrepoids
T. Levier de verrouillage de l'axe polaire
U. Pied du trépied
V. Vis de réglage pour le pied
W. Plateau pour accessoires

A. Cable de mando flexible
B. Manivela para el Ajuste del Eje Polar
C. Botón de Enfoque
D. Tubo de Enfoque
E. Diagonal
F. Pantalla protectora contra el sol
G. Mirilla
H. Abrazadera del Telescópico Buscador
I. Telescópico Buscador
J. Cuerpo Principal del Telescópico Buscador
K. Armazón portador
L. Tornillo de Ajuste para la Cámara
M. Protecciones contra el Polvo (quitar antes de mirar)
N. Protección contra el Sol
O. Lentilla de Objetivo (no se muestra)
P. Escala Eje de Declinación
Q. Escala Eje de la Hora
R. Contrapeso
S. Arbol del Contrapeso
T. Manivela para el Bloqueo del Eje Polar
U. Pata del Trípode
V. Tornillo de Ajuste de la Pata del Trípode
W. Bandeja para los Accesorios

A. Cavo di controllo flessibile
B. Leva di microregolazione asse polare
C. Manopola fuoco
D. Tubo di messa a fuoco
E. Diagonale
F. Schermo di proiezione solare
G. Oculare
H. Supporto cercatore
I. Cercatore
J. Corpo principale telescopio
K. Culla
L. Vite settaggio camera
M. Coperture antipolvere (toglierle prima di operare)
N. Protezione solare
O. Lenti obiettivo (non visibili)
P. Scala asse declinazione
Q. Scala asse oraria
R. Contrappeso
S. Asta contrappeso
T. Leva fermo asse polare
U. Gamba treppiedi
V. Vite regolazione gambe treppiedi
W. Scatola porta accessori

A. Biegsames Steuerkabel
B. Polaraxe-Mikroeinstellhebel
C. Fokussierknopf
D. Fokussiertubus
E. Diagonalspiegel
F. Sonnenprojektionsschirm
G. Okular
H. Sucherklammer
I. Sucher
J. Teleskopkörper
K. Wiege
L. Camera-Stellschraube
M. Staubkappen (vor dem Betrachten entfernen)
N. Sonnenblende
O. Objektivlinse (nicht gezeigt)
P. Skala der Deklinationsachse
Q. Skala der Stundenachse
R. Gegengewicht
S. Schaft des Gegengewichts
T. Polarachsen-Sperrhebel
U. Stativbein
V. Stativbein-Einstellschraube
W. Zusatztablett

A. Flexibele controlekabel
B. Microafstelhendel van de poolas
C. Scherpteregelaar
D. Scherpstellingbuis
E. Diagonaal
F. Zonneprojectiescherm
G. Oogstuk
H. Klem van de zoeklens
I. Zoeklens
J. Telescoopbuis
K. Wieg
L. Bevestigingsschroef van de camera
M. Stofkapjes (verwijderen voor het kijken)
N. Zonneklep
O. Objectieve lens (niet op de tekening)
P. Schaalaanduiding declinatie
Q. Schaalaanduiding uur
R. Tegengewicht
S. Staaf van het tegengewicht
T. Grendelstaaf van de poolas
U. Driepoot
V. Afstelschroef van de driepoot
W. Accessoirebakje

A. Cabo de comando flexível
B. Micro alavanca de ajuste do eixo polar
C. Botão rotativo de focagem
D. Tubo de focagem
E. Espelho diagonal
F. Écran de projecção do sol
G. Ocular
H. Suporte do dispositivo Finderscope
I. Dispositivo Finderscope
J. Corpo principal do telescópio
K. Armação
L. Parafuso de fixação para máquina fotográfica
M. Tampas de protecção do pó (retire antes de efectuar observações)
N. Parasol
O. Lentes da objectiva (não ilustradas)
P. Escala do eixo de inclinação
Q. Escala do eixo horário
R. Contrapeso
S. Eixo do contrapeso
T. Alavanca de fixação do eixo polar
U. Perna do tripé
V. Parafuso de ajuste das pernas do tripé
W. Tabuleiro de acessórios

TELESCOPE ASSEMBLY INSTRUCTIONS

1. Remove the three tripod legs (U) from the box. To attach tripod legs to tripod head (N) align the holes of the tripod legs with those of the equatorial mount. Secure each leg by inserting a large (3") bolt with washer into the hole and secure with a wing nut and washer. Tighten bolts (Fig. 1).

NOTE: When attaching tripod legs to tripod head, be sure that hinge flange on each leg faces inward. The tripod accessory tray (W) will attach to these flanges.

2. Stand tripod and spread legs. Loosen the adjusting lock on each leg. Grab the equatorial mount and lift. Extend the tripod legs to the desired height (at equal lengths). In addition, tighten each leg's adjusting locks to hold them in position (Fig. 2).

3. Using the small machine screws and wing nuts provided, attach the accessory tray to each of the flanges on the tripod legs (Fig. 4).

NOTE: Flanges fit under accessory tray when attached.

4. Remove telescope main body (J), counterweight (R), counterweight rod (S), and the two flexible control cables (A) from the box. Carefully rest the telescope main body tube in the cradle (Fig. 11) Be sure the cradle is positioned at the center of the telescope main body tube for proper balancing. Tighten the cradle locking knobs (Fig. 11a). Attach the control cables to the declination (P) and hour axis (Q) cable studs. Loosen counterweight clamping screw (Fig. 12b). Slide weight into rod. Thread counterweight rod into the threaded hole located below the declination axis (Fig. 12c).

5. Models 46-060675, 46-114375, 40-060675: Remove telescope main body (J), counterweight (R), counterweight rod (S), and the two flexible control cables (A) from the box. Remove the knurled nuts from the telescope mounting studs. Seat telescope main body in "V" block and secure with the nuts. Attach the control cables to the declination (P) and hour axis (Q) cable studs. Loosen counterweight clamping screw. Slide weight into rod. Thread counterweight rod into threaded hole located below the declination axis.

6. Models 40-060675, 40-114675: Remove the finderscope with finderscope bracket (H) attached from the box. Remove the two knurled thumbscrews from the telescope main body. Position the finderscope bracket on the telescope main body so that the holes in the base of the bracket line up with the exposed holes in the telescope main body. Replace the two knurled thumbscrews and tighten securely (Fig. 4b).

7. Models 46-060675, 46-114375, 46-114500: Remove the StarPointer finderscope with finderscope bracket (H) attached from the box (only on models 46-060675, 46-114375 and 46-114500). Remove the two knurled thumbscrews from the telescope main body. Position the finderscope bracket on the telescope main body so that the holes in the base of the bracket line up with the exposed holes in the telescope main body. Replace the two knurled thumbscrews and tighten securely (Fig. 4a).

8. Insert diagonal (E) into the focus tube (Fig. 5a). Secure by tightening small retaining screw.

NOTE: Diagonal is only to be used in combination with the eyepieces (oculars). Never use the diagonal and Barlow at the same time.

9. Insert eyepiece (G) into diagonal (Fig. 5b). Secure by tightening small retaining screw.

10. Insert Barlow (Fig. 7) into the focus tube. Secure by tightening small retaining screw. Insert eyepiece into open end of Barlow and secure (Fig. 6).

NOTE: In all astronomical telescopes, the image appears upside down. With the use of the diagonal in refractor models, the image appears erect but with a left to right inversion (mirror like). To use the telescope for terrestrial view and to correct the mirrored image, remove the diagonal and replace with the erecting eyepiece. We recommend the use of the low magnification eyepiece when the telescope is used for terrestrial viewing.
Refractor telescopes can be used for terrestrial viewing by using an erecting eyepiece. Reflectors are used mainly for astronomical purposes.

The telescope is now fully assembled and ready for use.

CAUTION! Viewing the sun can cause permanent eye damage. Do not view the sun with this telescope or even with the naked eye.

BALANCING YOUR TELESCOPE

Precise controls were built into your equatorial mount to hold the telescope steady. When viewing at high magnifications, even a slight breeze vibrating the body can impair your ability to see detail. So to stack the cards on your side as much as possible against the limitations of nature, it is important to balance your telescope (Fig. 15 and 16).

1. Level tripod by adjusting legs.
2. Loosen polar axis clamp and adjust polar axis to correspond to your observing latitude. If you do not know your latitude, consult a map or atlas. Retighten clamp screw.
3. Loosen declination clamp screw and rotate telescope about the declination axis so that "90^{O}" on the declination scale is aligned with the fixed pointer. Retighten clamp screw.
4. Loosen hour axis clamp, rotate scope until the counter weight rod is in a horizontal position. Do not tighten clamp screws.
5. If telescope is balanced, it will remain in place.
6. If telescope is out of balance, loosen counter weight thumb screw and slide weight along rod until telescope remains in place. Tighten weight and hour axis screws.

TO USE THE FINDERSCOPE

The finderscope is a small low-powered and wide field of view telescope mounted alongside the main telescope and is used to search for the target and aim the main telescope at it (I). Before you can use the finderscope, you'll need to line it up with the telescope. This is a simple procedure once you know how and have practiced a little bit.

1. Install the lowest power eyepiece (20mm) into the eyepiece tube. Pick out an easily recognized, unmoving object no closer than a thousand yards away. The higher the object is from the horizon, the easier it will be to position the telescope. Aim your telescope toward your object until its image is centered in the eyepiece. Lock all the knobs on the equatorial mount so the telescope will not move.
2. Look through the finderscope. If the object you lined up in the telescope is not visible, loosen the adjustment screws and move the finderscope around until you see it. Once it gets within range, tighten the adjustment screws while centering the object in the scope. You'll note that the image will shift toward the screw you are tightening (Fig. 8).
3. Adjust screws to center object on the finderscope cross hairs. Recheck your telescope to make certain it is still on target. If it moved, realign it and adjust your finderscope. If it hasn't, you're all set. Your finderscope is now operational.

TO USE THE STARPOINTER

1. The StarPointer is the quickest and easiest way to point your telescope exactly at a desired object in the sky. It's like having a laser pointer that you can shine directly into the night sky. The star pointer is a zero magnification pointing tool that uses a coated glass window to superimpose the image of a small red dot into the night sky. Like all finderscopes, the StarPointer must be properly aligned with the main telescope before it can be used.
2. To turn on the StarPointer, rotate the variable brightness control clockwise until you hear a "click." To increase the brightness level of the red dot, continue rotating the control knob about 180^{O} until it stops.
3. Locate a bright star or planet and center it in a low power eyepiece in the main telescope. If the StarPointer is perfectly aligned, you will see the red LED dot overlap the alignment star. If the StarPointer is not aligned, take notice of where the red dot is relative to the bright star.

   Without moving the main telescope, turn the StarPointer's azimuth and altitude alignment controls until the red dot is directly over the alignment star.

   If the LED dot is brighter than the alignment star, it may make it difficult to see the star. Turn the variable brightness control counterclockwise, until the red dot is the same brightness as the alignment star. This will make it easier to get an accurate alignment. The StarPointer is now ready to be used. Remember to always turn the power off after you have found an object. This will extend the life of both the battery and the LED.

FINDING OBJECTS

1. Look through the StarPointer finderscope and pan the telescope until the object appears in the field of view. Once it's in the field, tighten the altitude and azimuth locks.
2. To center the object with the red dot in the StarPointer, use the fine adjustment ring on the altitude slow motion rod assembly.

FOCUSING

1. Once you have found an object in the telescope, turn the focus knob until the image is sharp.
2. To focus on an object that is nearer than your current target, turn the focus knob toward the eyepiece (i.e., so that the focus tube moves away from the front of the telescope). For more distant objects, turn the focus knob in the opposite direction.
3. To achieve a truly sharp focus, never look through glass windows or across objects that produce heat waves, such as asphalt parking lots.

IMAGE ORIENTATION

1. When observing with a diagonal, the image will be right side up but reversed from left to right.
2. When observing straight through, with the eyepiece inserted directly into the telescope, the image will be inverted. Also, the image in the finderscope will be inverted.

MAGNIFICATION

The magnification (or power) of a telescope varies depending upon the focal length of the eyepiece being used and the focal length of the telescope.

To calculate magnification, use the following formula, in which FL = focal length:

$$\text{Magnification} = \frac{\text{FL (telescope) in mm}}{\text{FL (eyepiece) in mm}}$$

SOLAR OBSERVATION

CAUTION! Viewing the sun can cause permanent eye damage. Do not view the sun with this product or even with the naked eye. Never leave a telescope unattended during the daytime; a child could look at the sun with it and suffer permanent damage to vision.

PREPARING THE TELESCOPE FOR PROJECTING THE SUN ON A SCREEN

CAUTION! Cover the objective lens so no one can look through it.

1. Insert the projection screen rod by sliding it through the opening in the finderscope bracket with the washer end of rod toward the objective. (The washer acts as a stop, preventing the sun screen assembly from slipping completely through the finderscope bracket.)
2. If the diagonal is in place, remove it. It will not be used for solar observation.
3. Select the lowest power eyepiece (the one with the highest numerical designation in millimeters) and insert it, without the diagonal, into the focus tube.
4. Select the black plate of the sun projection assembly. Slip it onto the rod, position it near the eyepiece so that the hole is centered with the lens of the eyepiece and lock it in place. This plate shades the white projection screen which will be put in place in a later step. The telescope is now ready to observe the sun.

OBSERVING THE SUN

1. Point the telescope in the general direction of the sun without looking through it or the finderscope. Looking at the shadow of the telescope on the ground will help in aiming it.
2. Hold the white plate a few inches behind the finderscope eyepiece and move the telescope gently until you see the sun projected on the white plate. You will see a round “picture” of the sky with the sun somewhere in the “picture”. Move the telescope, using the flexible control cables until the sun is centered in this projected image of the sky.
3. Next, slip the white plate into place on the sun projection assembly rod. Position it directly in line with the telescope’s eyepiece and lock it in place.
4. Use the flexible control cables to make any small corrections necessary to center the sun’s image on the white screen.
5. Focus the sun’s image on the white screen using the focus knob.
6. The projected image will show sunspots, the “rice-grain” structure of the solar disk, and that the sun is brighter at the center of the disk than at the edge.

THE MOON FILTER

A moon filter has been included with your telescope for removing glare and increasing contrast when viewing the moon. To attach it to the telescope eyepiece, screw the filter onto the threaded end of the eyepiece.

CAUTION! The moon filter should only be used to view the moon. It is not intended for viewing the sun. Viewing the sun through this telescope (with or without the filter), or even with the naked eye, can cause permanent eye damage.

TECHNICAL SPECIFICATIONS

	46-060675	46-114375	46-114500
Objective Diameter:	60mm (2.36")	N/A	N/A
Mirror Diameter:	N/A	114mm (4.5")	114mm (4.5")
Focal Length:	900mm	500mm	1000mm
Eye Lenses:	K25mm (Low Power) K10mm (Medium Power) SR4mm (High Power)	MA20mm (Low Power) MA10mm (Medium Power) SR4mm (High Power)	MA20mm (Low Power) MA10mm (Medium Power) SR4mm (High Power)
Barlow:	3X	3X	2X
Erecting Eyepiece:	1.5X	N/A	N/A
Maximum Magnification:	675X	375X	500X
Accessories:	Diagonal mirror, Moonfilter	Moonfilter	Moonfilter

	40-060675	40-114675
Objective Diameter:	60mm (2.36")	N/A
Mirror Diameter:	N/A	114mm (4.5")
Focal Length:	900mm	900mm
Eye Lenses:	H25mm (Low Power) H12.5mm (Medium Power) SR4mm (High Power)	H20mm (Low Power) H12.5mm (Medium Power) SR4mm (High Power)
Barlow:	3X	3X
Erecting Eyepiece:	1.5X	N/A
Maximum Magnification:	675X	675X
Accessories:	Diagonal mirror, Moonfilter	Moonfilter

EYE LENS CHART & THEORETICAL POWER LIMITS

	46-060675	46-114375	46-114500	40-060675	40-114675
SR4mm Eye Lens Power:	225X	125X	250X	225X	225X
H12.5mm Eye Lens Power:	N/A	N/A	N/A	72X	72X
H25mm Eye Lens Power:	N/A	N/A	N/A	36X	N/A
K10mm Eye Lens Power:	90X	N/A	N/A	N/A	N/A
K25mm Eye Lens Power:	36X	N/A	N/A	N/A	N/A
MA20mm Eye Lens Power:	N/A	25X	50X	N/A	N/A
MA10mm Eye Lens Power:	N/A	50X	100X	N/A	N/A
H20mm Eye Lens Power:	N/A	N/A	N/A	N/A	45X