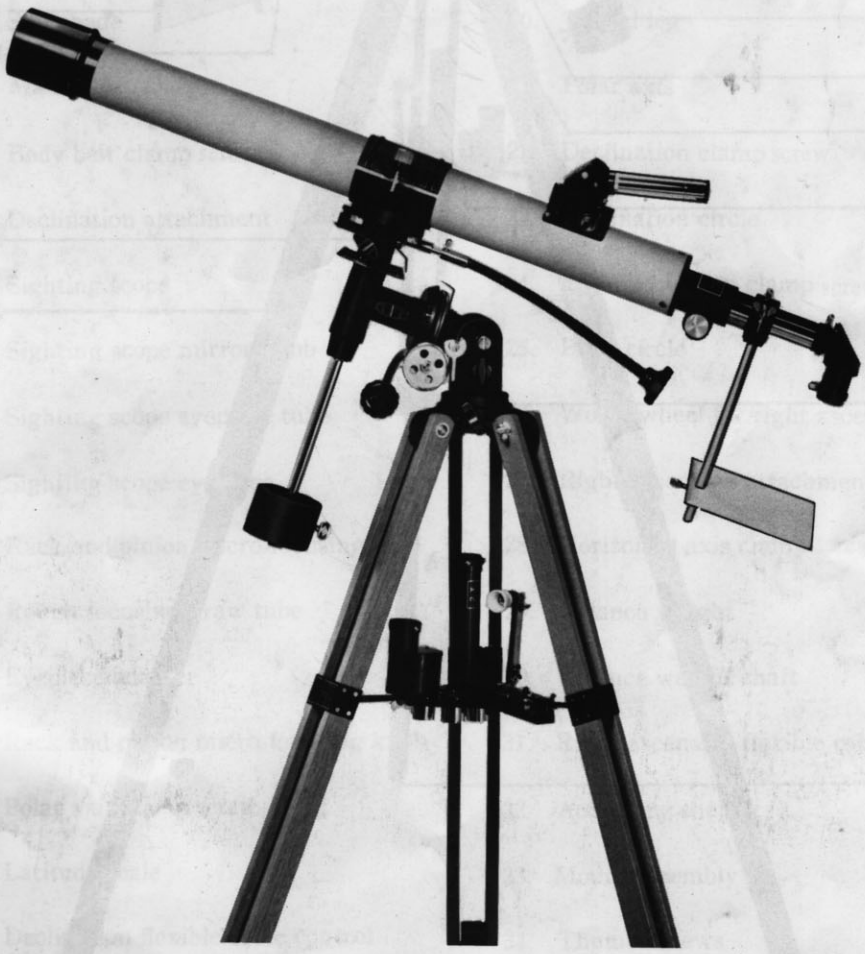
Bushnell MODEL 78-5700

BANNER® ASTRO 454

454 Power 60mm Equatorial Refractor Telescope

D=60mm

F=910mm



D=60MM F=910MM

PARTS DIAGRAM

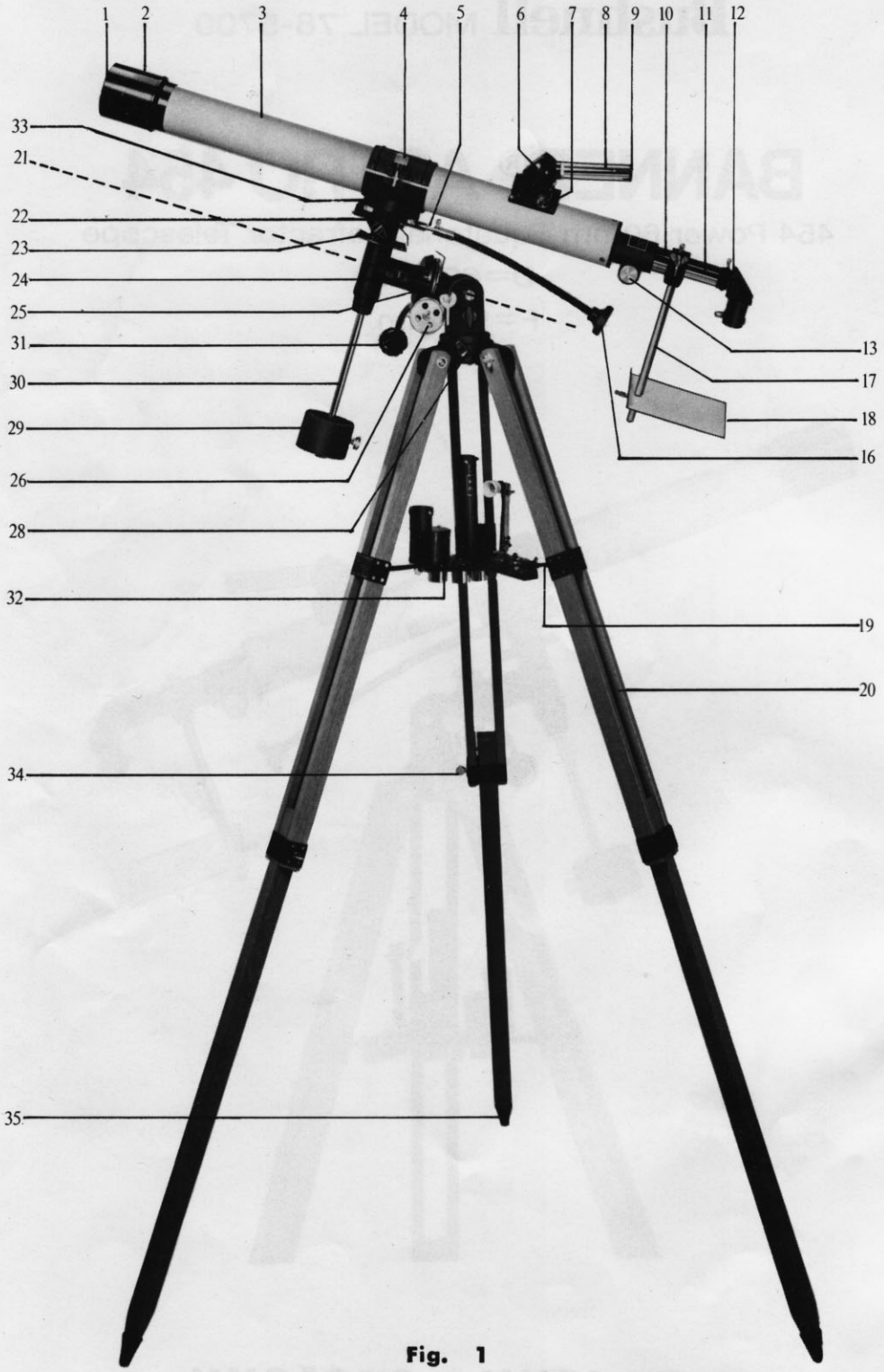
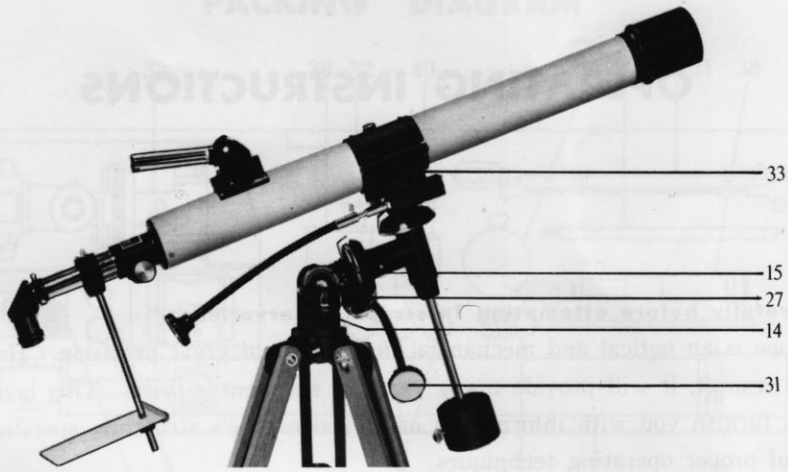


Fig. 1



1. Objective end
2. Sun shade
3. Main tube (body)
4. Body belt clamp screw
5. Declination attachment
6. Sighting scope
7. Sighting scope mirror knob
8. Sighting scope eyepiece tube
9. Sighting scope eyepiece
10. Rack and pinion micro-focusing tube
11. Rough focusing draw tube
12. Eyepiece adapter
13. Rack and pinion micro-focusing knob
14. Polar axis clamp screw
15. Latitude scale
16. Declination flexible cable control
17. Shaft for sun projection screen
18. Sun projection screen
19. Accessory shelf bracket
20. Tripod leg
21. Polar axis
22. Declination clamp screw
23. Declination circle
24. Right ascension clamp screw
25. Hour circle
26. Worm wheel for right ascension axis
27. Right ascension attachment
28. Horizontal axis clamp screw
29. Balance weight
30. Balance weight shaft
31. Right ascension flexible cable control
32. Accessory shelf
33. Mount assembly
34. Thumb screws
35. Rubber tips

OPERATING INSTRUCTIONS

Read carefully before attempting Telescope Observations.

A telescope is an optical and mechanical instrument of great precision. Handled with care and respect, it will provide many years of excellent service. This booklet is designed to furnish you with information on this telescope's structure, specifications, and the use of proper operating techniques.

FAMILIARIZING YOURSELF WITH THE TELESCOPE

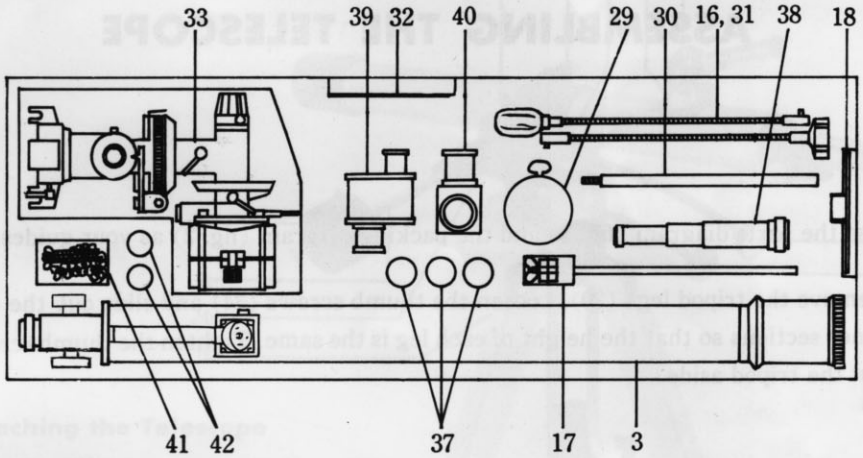
Your telescope has been specially packed in styrofoam to protect it in shipping and carrying. Always re-pack your telescope as indicated by the packing diagram (fig. 2) and you will have no trouble when assembling and disassembling.

WHAT IS A TELESCOPE ?

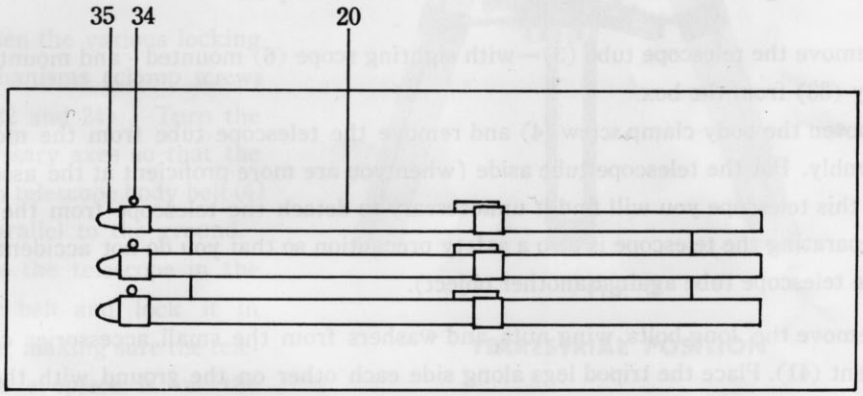
A telescope is an optical system designed to magnify distant objects. The telescope you have purchased is called a REFRACTOR Telescope. It has a large lens (the objective) mounted in front of the tube. The objective controls light rays and directs them to the telescope, where the eyepiece (ocular lens system) magnifies the image that is formed.

This telescope has an equatorial mount. It is extremely versatile because it allows the telescope to move in all directions. Thus, it is possible for your telescope to track a star's movement across the sky in the same path that the star seems to take (called diurnal movement). It has flexible cable controls (16 and 31), which make it possible to move the telescope while you are looking through it.

PACKING DIAGRAM



TOP



BOTTOM

Fig. 2

TOP SECTION

33. Mount assembly
39. Erecting prism
32. Accessory shelf with illuminator
40. Star diagonal prism
29. Balance weight
30. Balance weight shaft
16, 31. Flexible cable controls
38. Barlow lens
18. Sun projection screen
41. Small accessories compartment ··· for nuts and bolts.
42. Sun, Moon filter
37. Eyepieces
17. Shaft for sun projection screen
3. Main tube (body) with sighting scope

BOTTOM SECTION

35. Rubber tips
34. Thumb screws
20. Tripod legs

ASSEMBLING THE TELESCOPE

Use the parts diagram (fig. 1) and the packing diagram (fig. 2) as your guides.

I. Remove the tripod legs (20). Loosen the thumb screws (34) and slide out the wooden inner sections so that the height of each leg is the same. Tighten the thumb screws and put the tripod aside.

II. **Attaching The Mount Assembly (33) To The Tripod**

Remove the telescope tube (3)—with sighting scope (6) mounted – and mount assembly (33) from the box.

Loosen the body clamp screw (4) and remove the telescope tube from the mount assembly. Put the telescope tube aside (when you are more proficient at the assembling of this telescope you will find it unnecessary to detach the telescope from the mount. Separating the telescope is also a safety precaution so that you do not accidentally hit the telescope tube against another object).

Remove the long bolts, wing nuts, and washers from the small accessories compartment (41). Place the tripod legs along side each other on the ground with the screw eyes and accessory shelf brackets (19) facing up. Place the long bolts through the tripod holes, making sure that all bolts are pushed through in the same direction (left to right or right to left). There should be a washer placed on either side of each tripod legs. Attach the wing nuts loosely to the bolts.

Slip one notch of the mount assembly over the bolt you have just placed through the tripod leg ····· with the main part of the mount assembly facing up. Again, make sure that the tripod screw eye and accessory shelf bracket faces up. Tighten the wing nut to secure the mount. Leaving the first leg and mount on the ground, attach the other two legs to the mount. Make sure that the screw eyes and accessory shelf brackets face in.

Stand the tripod up, spreading the legs. Loosen the three wing nuts just enough to seat the mount firmly, then tighten the wing nuts again. Remove the accessory shelf (32) and the small bolts and wing nuts found in the accessory compartment (41). Place the accessory shelf on top of an accessory shelf bracket (19). Push a bolt up through the bracket and shelf and tighten the wing nut. Do the same with the other two brackets.

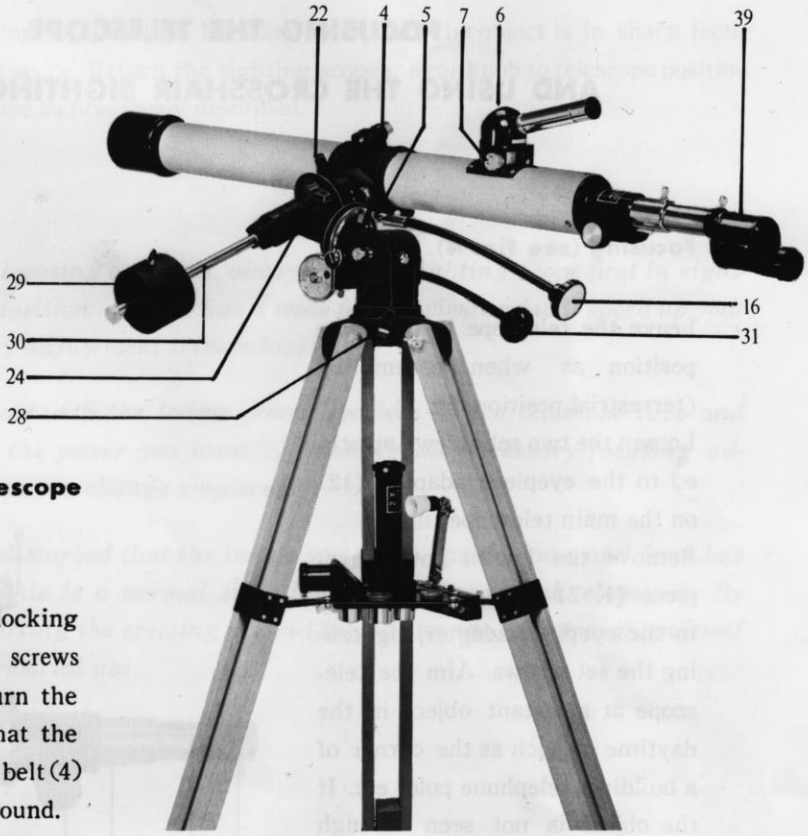


Fig. 3

TERRESTRIAL POSITION

III. Attaching the Telescope (see fig. 3)

Loosen the various locking mechanisms (clamp screws 14, 22 and 24). Turn the necessary axes so that the main telescope body belt (4) is parallel to the ground. Place the telescope in the body belt and lock it in place, making sure the telescope eyepiece is on the same side as the declination attachment (5). Lock all clamp screws (14, 22 and 24).

Remove the balance weight shaft (30) and balance weight (29). Screw the balance weight shaft (30) into the female receptacle located at the base of the declination shaft. Note that the position of this weight can be changed by slipping it back and forth. making it possible to balance the telescope. Fasten the weight with the set screw. Fasten the declination (16) and right ascencion (31) flexible cable controls to the yoke mount at 5 and 27.

Your telescope is now ready for use.

FOCUSING THE TELESCOPE

AND USING THE CROSSHAIR SIGHTING SCOPE

I. Focusing (see fig. 4)

Leave the telescope in the same position as when assembling (terrestrial position, fig. 3).

Loosen the two set screws attached to the eyepiece adapter (12) on the main telescope tube.

Remove the lowest power eyepiece (K 21 mm) and attach it to the eyepiece adapter, tightening the set screws. Aim the telescope at a distant object in the daytime . . . such as the corner of a building, telephone pole, etc. If the object is not seen through your telescope, turn the sighting scope mirror knob (7) to the eyepiece end . . . telescope position.

Turn the focusing knob (13) so that the focusing tube (10) is about one half way out. Pull out the rough focusing draw tube (11) so that the object is in rough focus. Rack the focusing knob (13) back and forth until the object is in sharp focus.

Center the image in the eyepiece.

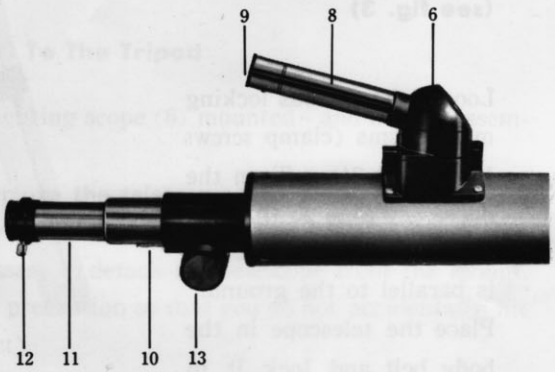


fig. 4

II. Using the Sighting Scope (see fig. 4)

The crosshair sighting scope (6) is used very simply. This instrument is designed to make it possible to locate an object quickly. By centering the image in the sighting scope's crosshair, you will automatically set the main telescope tube to view the same image. Turn the sighting scope mirror knob (7) to the objective end . . . sighting scope position.

Move the sighting scope eyepiece (9) back and forth until the object is in sharp focus through the sighting scope. Return the sighting scope mirror knob to telescope position and focus the telescope as previously described.

Note 1 : Whenever locating an object, always use the sighting scope first in sighting scope position . . . as it has a wide field of view and will speed up your preliminary adjustment tremendously.

Note 2 : Always start with the lowest power eyepiece in the telescope tube and work up to the power you want . . . making the necessary focusing adjustments as you change eyepieces.

Note 3 : Do not be disturbed that the image you see is upside down and from left to right. This is a normal situation with astronomical telescopes. By simply inserting the erecting prism (39), the image will straighten itself out for terrestrial use.

Eye Pieces and Magnification

This telescope is supplied with three different eyepieces (K21mm, H12mm, and SR4mm). The power of each particular eyepiece is directly related to the focal length of the objective lens in the telescope...which is 910mm (millimeters).

The formula is as follows:

$$\frac{\text{Focal length of objective lens}}{\text{Focal length of eyepiece}} = \text{Magnification}$$

As an example, your SR4mm eyepiece will show a magnification of:

$$\frac{910\text{mm}}{4\text{mm}} = 227\text{X Magnification}$$

Using the same formula, the other eyepieces will give:

H12mm...76X Magnification
K21mm...43X Magnification

The Barlow lens (38···described in the accessory section) will double the magnification of each of these eyepieces.

USING YOUR TELESCOPE ASTRONOMICALLY

Before learning the technical details of this telescope, you will find that you can now enjoy observing the stars, the planets, the moon and the sun with your present knowledge. Loosen the declination axis clamp screw (22), the right ascension clamp screw (24), and the polar axis clamp screw (14).

Re-adjust your telescope so that it is in the position as shown in fig. 1. Loosen the horizontal clamp screw (28) so that you can swing the telescope in a circle. Attach the star diagonal prism (40) and your lowest power eyepiece (K). See the accessories section for details of the star diagonal prism.

THE MOON AND THE STARS

If you are viewing at night, you will get the most fun out of looking at the moon and its surface. Aim the sighting scope so that the moon is in the center of the crosshairs. Tighten all clamp screws. The main telescope is now directly aimed at the moon. Focus the telescope as described previously. With your hands on the two flexible cable controls (16, 31) you will find that you can move the telescope in any direction as you study the moon's surface. Try this with the moon filter (42) screwed into the eyepiece and without the moon filter screwed in. The design of the two cable controls is such that the telescope can be swung a limited distance before the clamps must be loosened for further movement. Do not try to force the movement of the telescope past the automatic stops on the controls. To go past a stop position, loosen the necessary clamp screw and shift the telescope manually before re-tightening the clamp. The balance weight should be adjusted up or down depending upon the position the telescope is in. You will find that if the balance weight is correctly adjusted, the telescope will move on any axis (with the appropriate clamp screw loosened) with the slightest touch of the finger.

At this point, try the more powerful eyepieces in your observation of the details of the moon. After looking at the moon, you will probably want to look at some of the more well known constellations (like the big dipper). The stars will appear like flickering dots of light. This is the case with even the more powerful telescopes.

Your daily paper will probably tell you the location of the planets and the times that they are in your area on any particular day. See if you can find one of these planets. Try Venus first, as it is the brightest object in the heavens (discounting the moon and sun) at most times of the year. The planets will tend to appear like flat discs through your telescope and you will probably be quite surprised by the rapidity with which they move across the sky. If you aim your telescope at a planet and walk away for five or ten minutes, you are likely to find that the planet has moved out of the telescope's field when you get back.

A SIMPLE WAY TO AIM AT THE SUN

NEVER LOOK DIRECTLY AT THE SUN THROUGH THE TELESCOPE OR FINDERSCOPE AS SEVERE EYE DAMAGE CAN RESULT.

Always cap or cover the finderscope when using the telescope on the sun. To aim the telescope, remove the star diagonal prism from the draw tube of the telescope. Next, face the telescope toward the sun. The main shadow of the telescope will get smaller and smaller and then become a ring when the tube is aimed directly at the sun.

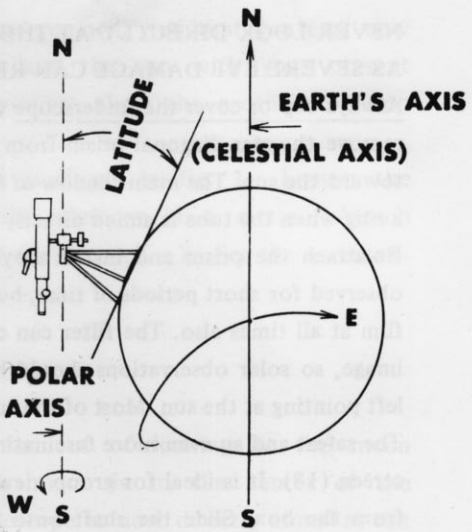
Re-attach the prism and install a eyepiece with the sun-filter installed. The sun can now be observed for short periods of time, but it is best to use dark glasses or a piece of dark developed film at all times also. The filter can crack from the great heat build up from the intense solar image, so solar observations should be limited to brief looks and the telescope should not be left pointing at the sun. Most of the sun's activities take place at the edge of the sun.

The safest and an even more fascinating way of observing the sun is by use of the sun projection screen (18). It is ideal for group viewing. Remove the shaft (17) and the sun projection screen from the box. Slide the shaft onto the screen with the white side of the screen facing up. Tighten the set screw. Turn the focusing knob (13) so that it is far enough out for the split ring attachment to fit on focusing tube. Attach, then tighten the wing nut. See figure 1. Follow the aiming instructions of the previous paragraph (but without using the sun filter). When you attach the prism, it should face down (as in figure 1). Focus the telescope so that the sun's image is sharply projected on the screen. By moving the screen higher up the shaft, you will get a smaller, but much sharper image. Using the flexible cable controls, circle the telescope around the sun, noting the irregular edges as the flames leap into the heavens. Dark spots on the sun's surface are the sun spots you have heard so much about.

USING THE TELESCOPE TERRESTRIALLY (See Fig. 3)

Since the image seen through the telescope is upside down and left to right, it is essential that the erecting prism (39) be attached to the eyepiece adaptor before using this telescope for terrestrial (or land) viewing. See the accessory section for the use of the erecting prism. Loosen the polar axis clamp screw (14). Set the polar axis at right angles to the tripod (straight up). Loosen the declination clamp screw (22). Adjust the telescope so that it is parallel to the ground (fig. 3). Tighten the clamp screws. Aim the telescope with the sighting scope in the same way as you do for astronomical viewing. To move the telescope from left to right, loosen the horizontal clamp (28). To move the telescope up and down, loosen the declination clamp screw (22). For small movements, use the flexible cable controls (16, 31). Attach the image erecting prism (39) and lowest power eyepiece (K21). See the accessories section for details of the image erecting prism.

USING THE SETTING CIRCLES TO LOCATE STARS

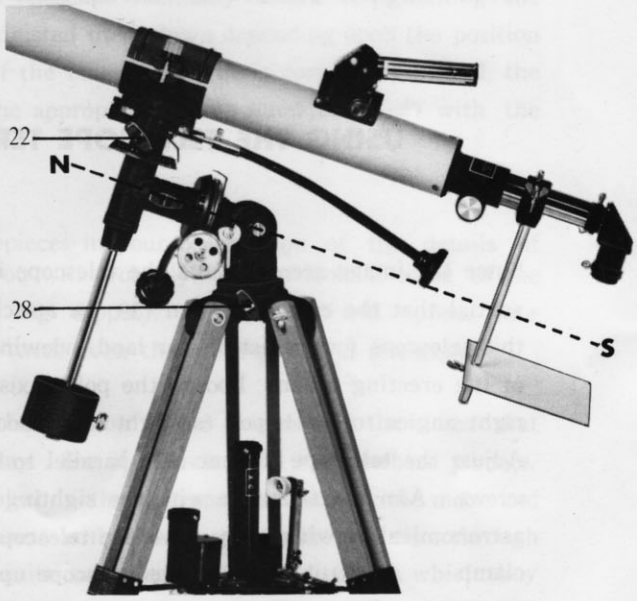


POLAR AXIS AND EARTH'S AXIS

Fig. 5

Since this equatorial telescope is designed to move in any direction, it can be set to track the apparent movements of celestial bodies across the sky. This is referred to as diurnal movement. This diurnal movement of celestial bodies is in the direction opposite to that of the earth's rotation and is around the earth's axis or celestial axis (fig. 5). By simply aiming the telescope polar axis (21) at celestial North, you will automatically place the telescope in parallel with the earth's axis and thus be able to locate stars in the sky based on information in star charts and star atlases. In simple language you aim your telescope dead center in the celestial sphere.....that point in the sky that is like the hub of a wheel and does not appear to move. The angle of declination is simply 90° minus the angle away from this hub. Celestial North is 90°. If you were at the North Pole, you would point your telescope straight up to aim at celestial North. To compensate for your position on the round earth, the polar axis (21) is set in one of two simple ways. (see fig. 6.)

1) Set up the telescope at night. Loosen the declination axis clamp screw (22) and turn the telescope around until the arrow points at 90° on the declination scale. Tighten the declination axis clamp screw. The telescope is now in parallel with the polar axis.
2) Loosen the horizontal screw (28) and turn the telescope until the objective end (1) faces due North. This can be done by an approximate sighting on the Pole Star (Polaris) or by the use of a compass to find magnetic north. True North is then found by directing the telescope at the Pole Star, as magnetic North is slightly away from true North.



POLAR AXIS ADJUSTMENT

Fig. 6

3) Look up the latitude of your area in any geographical atlas. Loosen the polar axis screw (14) and set the latitude scale (15) to the correct latitude for your area. Aim the sighting scope at the Pole Star. You will probably notice that Polaris (the Pole Star) is not dead center in the crosshair sighting scope. This is probably because your telescope is not absolutely level with the ground. Loosen the horizontal axis screw again and turn the telescope so that it is directly aimed at the Pole Star. Clamp both screws tight. Polaris is 1° off the North celestial pole. Therefore, the sighting of stars will have to be slightly adjusted as you locate them in the heavens.

TO LOCATE ANY STAR IN THE HEAVENS QUICKLY

With the telescope set as described in the previous section, look up the declination of any star in the chart that comes with this telescope. For instance, the bright star Vega is located plus 38° 44 minutes declination. Loosen the declination clamp (22). Swing the telescope around the declination axis to 38° and lock it in there. This sets the telescope to make a circle around the pole star with an angle of approximately 52° from Polaris (90°−38°). The sky is divided like a big 24 hour clock, with minutes and seconds. You will notice on the chart that the Big Dipper (Ursa Major) is located from approximately 11 hours through 13 hours 45 minutes. Since Vega is located at 18 hours 35 minutes, by the simple process of swinging the telescope along the right ascension axis a bit past 1/4 turn to the right from the two pointer stars (at around 11 hours) of the Big Dipper, you will be near the constellation Lyra and the bright star Vega. (Note: these two pointer stars aim almost directly at Polaris, making it rather easy to locate the center of the celestial sphere).

After locating the pointer stars of the Big Dipper, loosen the right ascension clamp screw (24). Swing the telescope around so that the barrel of the telescope is on a line with the two pointer stars of the Big Dipper (and, of course, Polaris). Your telescope is now aimed at an approximate right ascension of 11 hours. Clamp the right ascension screw. Turn the hour circle (25) so that the pointer is on 11 hours. You have now set the telescope so that it is coordinated with and celestial clock for your location, at this particular moment. Turn the knurled knob on the right ascension attachment (27) so that the telescope moves approximately one quarter turn to the right, until the pointer is a bit past 18 hours 30 minutes on the hour circle. Look through the sighting scope.

The bright star close to the center of the crosshairs is Vega. Using the declination (16) and right ascension (31) flexible cable controls as you look through the sighting scope, make your final adjustments so that Vega is centered in the crosshairs. Now focus, using the main telescope. If the mount hits against itself, loosen the declination clamp, swivel the telescope to clear the mount, and reset the declination pointer. The division of the sky into a 24 hour clock is, of course, based on the earth's rotation.....which divides the day into 24 hours.

Each star is located at a right ascension of from 0 to 24 hours – (just like in a 24 hour clock). Each star is also located so many degrees from a flat, imaginary plane at the North Pole. It is called the angle of declination. Due celestial North would be straight up from the North Pole, or 90°.

It is essential to always start out with the lowest power eyepiece when locating a star. Once the star is found, the more powerful eyepieces with smaller fields of view may be used to greater advantage.

ACCESSORIES AND THEIR USES

Sighting Scope (6)

The 10× sighting scope (described previously) is mounted on the main telescope tube and is designed to quickly locate an image . . . as it covers a rather wide field of view.

By centering the image in the sighting scope crosshair, the observer will automatically set the main telescope tube to view the same image.



SIGHTING SCOPE

Barlow Lens (38)

This lens will automatically double the power of any telescope. The lens is inserted in the eyepiece adapter of the telescope and the eyepiece is then inserted on the far side of the lens. Because the power of the telescope is doubled, the field of view is sharply reduced. The relative brightness of the telescope is also reduced.



BARLOW LENS

Star Diagonal Prism (40)

This prism is essential for viewing celestial objects. The observer can work in comfort without straining his neck, as the prism puts the eyepiece at a right angle to the telescope tube and makes it possible for the observer to stand or sit while observing the heavens. This prism bends the light rays at right angles to accomplish this purpose. It is attached in the same way as the Barlow lens.



STAR DIAGONAL PRISM

Image Erecting Prism (39)

The image seen through the telescope always appears left to right and upside down when using an eyepiece alone. The reason for this is that every time light passes through a lens, some of it is lost in its travels through the telescope. This decreases the amount of brightness that reaches the eye. To get maximum light.....an essential in observing celestial objects.....the number of lenses is deliberately reduced to a minimum. That the image is left to right and upside down will not disturb you while observing the stars, the moon, the sun, etc. The image erecting prism will straighten out the image when the telescope is used to view terrestrial objects. This image erecting prism is added to the telescope in the same way as the Barlow Lens.

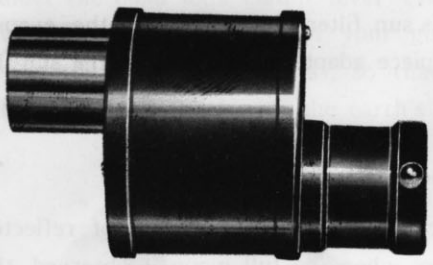
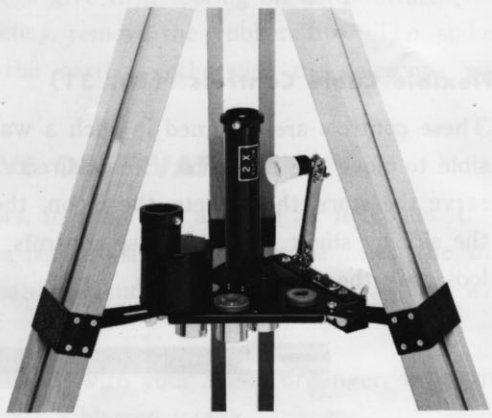


IMAGE ERECTING PRISM

Accessory Shelf with Illuminator (32)

The telescope is most efficient astronomically in total darkness. Since, under these conditions, it is difficult to locate and identify accessories, we have added a small illuminator to the accessory shelf to make it easy to find the necessary accessories. This illuminator uses two "AA" penlight batteries. The accessory shelf is designed to hold all your accessories.



ACCESSORY SHELF WITH ILLUMINATOR

Sun Filter (42)

The sun filter is essential when viewing the sun directly with the telescope.
UNDER NO CIRCUMSTANCES SHOULD THE OBSERVER LOOK DIRECTLY AT THE SUN WITHOUT THE FILTER IN PLACE AS DIRECT OBSERVATION OF THE SUN IS DANGEROUS TO THE NAKED EYE.



This sun filter is screwed into the eyepiece before the eyepiece is inserted into the eyepiece adapter. Sighting on the sun has been explained already.

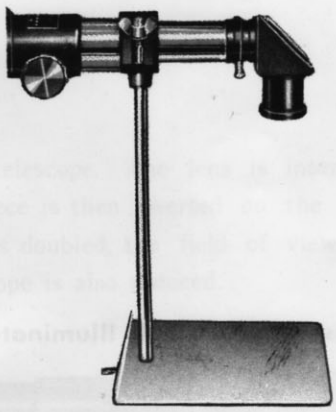
Moon Filter (42)

Because there is a great deal of reflected glare when the full moon is observed, the addition of the moon filter will remove this glare and make it possible to sharpen surface details. At other times, this filter is unnecessary and a sharper image can be obtained without it. The moon filter is screwed into the eyepiece in the same way that the sunfilter is added.



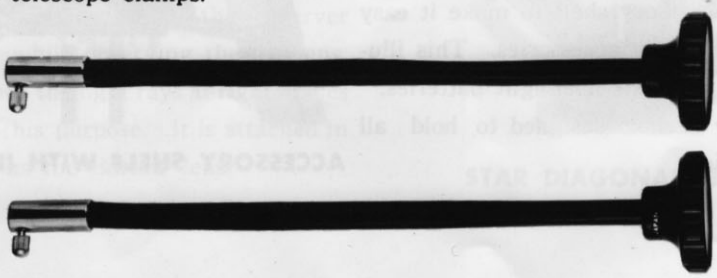
Sun Projection Screen (17, 18)

The use of this screen is one of the best ways to view the sun. The screen fastens to the telescope tube and the suns image is projected through the telescope directly onto the screen. It is ideal for group viewing.



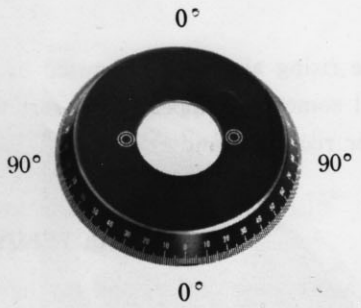
Flexible Cable Controls (16, 31)

These controls are designed in such a way that even with all clamps tight, it is possible to move the telescope in any direction by using these cables. Thus, you may observe the stars, the planets, the moon, the sun in their apparent movements across the sky by slight turns of these controls and without the necessity of tightening and loosening the telescope clamps.



Declination Circle (23)

This declination circle is mounted on the shaft of the declination axis. It is a metal disk which is graduated in degrees. Its purpose, in coordination with the hour circle, is to help you quickly locate a sky object by relating it to a well known and easily located star.



Latitude Scale (15)

This scale is mounted along the polar axis under the polar axis clamp lever (14). It is a metal disk graduated in degrees of latitude. Set at the latitude of your geographical area, it helps aim the telescope quickly at the Pole Star (Polaris), so that the telescope is pointed directly at celestial North and is in parallel with the earth's axis.

Hour Circle (25)

The hour circle is mounted on the shaft of the polar axis, above the worm wheel for the right ascension axis (22). It is a metal disc graduated from 0 to 24 hours. It can be turned around the polar axis by hand. Its purpose, in coordination with the declination circle, is to locate a sky object by relating it to a well known and easily located star.



LATITUDE SCALE



HOUR CIRCLE

Tripod (20) (see fig. 1)

This hardwood tripod is designed for maximum comfort. By loosening and tightening the thumb screws (19), you may raise or lower the tripod to the position you want. The rubber tips (31) on the tripod legs give firm footing on hard surfaces.
If you work on soft surfaces (earth, grass, etc.), remove the rubber tips. The spikes you will see are to be firmly pushed into the earth.....otherwise the telescope will slowly sink down, shifting position.

HINTS FOR EFFECTIVE OBSERVATION

When the telescope is first brought out doors, into the air, and the air is colder than the indoor temperature, allow a few minutes before using the telescope.....as the difference in temperature will cause a condensation of moisture on the lenses. This will disappear in 15–20 minutes.

If you accidentally perspire or touch the eyepiece with your eyelid or finger, wipe the eyepiece gently with a lintless cloth to prevent a blurred image.

It takes close to 30 minutes for our pupils to dilate (widen) and adjust to darkness. You will be able to see much dimmer objects after 1/2 hour of telescope use at night.

The rising air currents caused by the sun shining directly on objects you are observing will sometimes appear to distort the image. This is also often the case when observing over roof tops and tree tops.

MAINTENANCE OF THE TELESCOPE

As a precision optical and mechanical instrument, the telescope must be handled with utmost care. When not in use, store it in the case. Lenses must be cleaned as carefully and as rarely as possible to avoid its accuracy and performance being affected. Optical elements must never be taken out of their mount by an inexperienced person. When it becomes necessary to clean the lenses, a soft camel's hair brush (obtainable in an art supply store) should be used to brush off dust. Never rub the optical surface without first dusting it thoroughly, as a tiny particle of dirt can scratch the lens surface.

When a lens needs further cleaning beyond brushing, use a clean cotton cloth with a few drops of ether or grain alcohol on it. Wipe the lenses very gently.

SPECIFICATIONS

OPTICAL EFFECT

Objective lens	: Achromatic, crown-flint two-ply glass, hard-coated
Lens clear aperture	: 60 mm
Focal length	: 910 mm
Resolving power	: 1.93″
Visual magnitude	: 11.0″
Magnification	: 43X 76X 227X (w/eyepiece only) 86X 152X 454X (w/barlow lens)

Eyepiece	Magnification	Magnification W/Barlow Lens	Exit pupil Aperture	Brightness	Visual Field	
					Actual	Apparent
K21mm	43	86	1.40	1.96	56'9"	40°
H12mm	76	152	0.79	0.62	24'0"	30°
SR4mm	227	454	0.26	0.07	7'48"	30°

ACCESSORIES :

The following accessories are provided with this telescope.

Eyepiece (K21mm, H12mm, SR4mm)	3 pcs.	Moon Filter	1 pc.
		Sun projection screen	1 pc.
Star Diagonal prism	1 pc.	Sighting scope	1 pc.
Erecting prism	1 pc.	Accessory tray	1 pc.
Barlow lens	1 pc.		
Sun Filter	1 pc.		



STERNKARTE

Diese Sternkarte zeigt die auffallendsten Sterne an der nördlichen Himmelssphäre. Sie ist für die Breite 40 Grad nördlich ausgelegt.
Sternkarte gegen Norden halten und drehen, bis der laufende Monat in der Mitte liegt.

Erklärung der Symbole:

- Sterne heller als 1. Grössenordnung
- Sterne 1. Grösse
- Sterne 2. Grösse
- Sterne 3. Grösse
- Sterne 4. Grösse
- Nebel
- Sternhaufen
- M Messier Nummer
- NGC Neuer Katalog

STAR CHART

This star chart illustrates the most conspicuous stars located in the Northern Celestial Sphere and is arranged specifically for latitude 40 degrees north. Hold this chart towards the north and turn it around until the current month is in the centre.

Explanation of symbols:

- Stars brighter than 1st magnitude
- 1st magnitude stars
- 2nd magnitude stars
- 3rd magnitude stars
- 4th magnitude stars
- Nebulae
- Star clusters
- M Messier number
- NGC New General Catalogue

CARTE D'ETOILES

Cette carte montre les étoiles les plus importantes sur la sphère céleste du nord. Elle est conçue spécialement pour le 40ème degré de latitude nord. Tenez la carte vers le nord et tournez-la jusqu'à ce que le mois actuel soit au centre.

Explication des symboles:

- Etoiles plus claires que 1ère magnitude
- Etoiles de la 1ère magnitude
- Etoiles de la 2ème magnitude
- Etoiles de la 3ème magnitude
- Etoiles de la 4ème magnitude
- Nébuleuse
- Nuée stellaire
- M Numéro Messier
- NGC Nouveau catalogue général

STERRENKAART

Deze sterrenkaart toont de meest opvallende sterren aan de noordelijke hemelssfeer. Zij is voor de breedte 40 graden noordelijk uitgelegd. Sterrenkaart naar het noorden houden en draaien, totdat de lopende maand in het midden ligt.

Verklaring van de symbolen:

- Sterren helderder als 1e grootte-orde
- Sterren 1e grootte
- Sterren 2e grootte
- Sterren 3e grootte
- Sterren 4e grootte
- Mist
- Sterrengroep
- M Messiernummer
- NGC Nieuwe kataloog

CARTA ASTRONOMICA

Questa carta astronomica mostra le stelle più importanti sulla sfera celeste nordica ed è impostata specificatamente su una latitudine di 40° nord. Tenere la carta volta verso il nord e girarla fino a che il mese corrente viene a trovarsi al centro.

Spiegazione dei simboli

- Stelle più luminose di quelle di 1a grandezza
- Stelle di 1a grandezza
- Stelle di 2a grandezza
- Stelle di 3a grandezza
- Stelle di 4a grandezza
- Nebbia
- Costellazione
- M Numero Messier
- NGC Nuovo Catalogo Generale