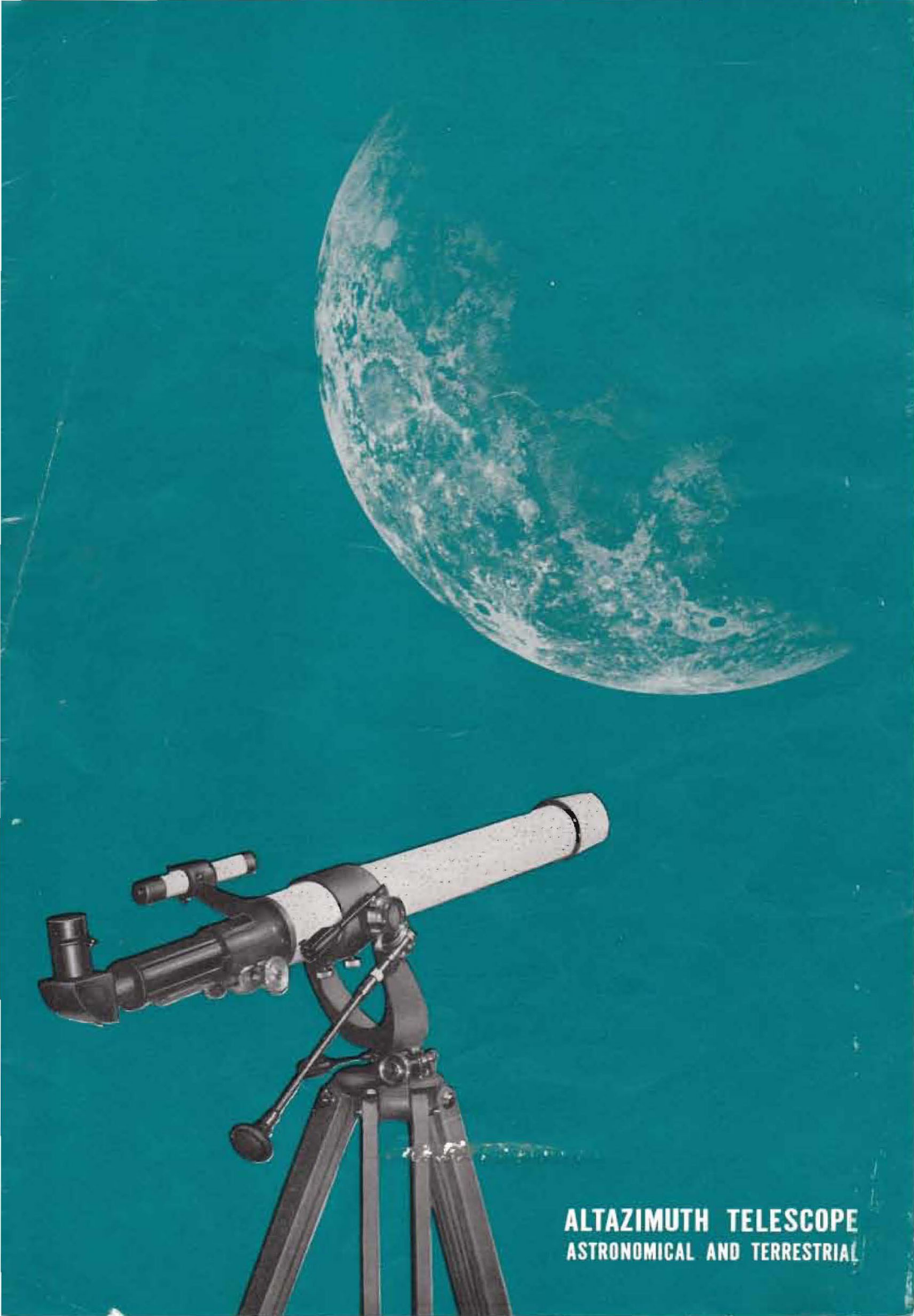


ALTAZIMUTH TELESCOPE

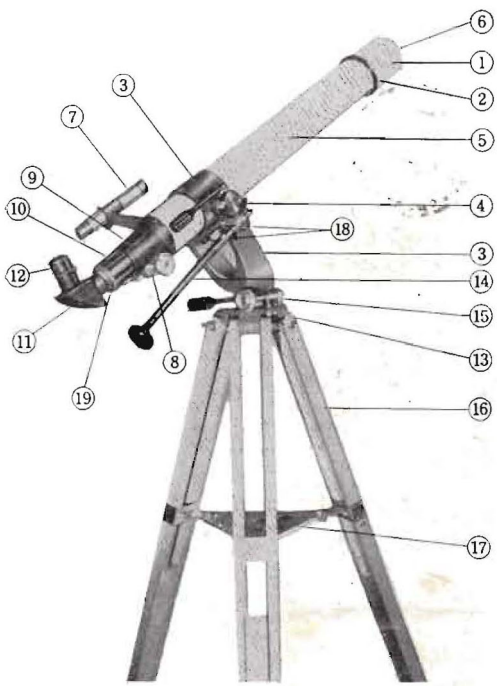
ASTRONOMICAL AND TERRESTRIAL

OPERATING INSTRUCTIONS

Read Carefully Before Attempting Telescope Observations

A telescope is an optical and mechanical instrument of great precision. Handled with respect and care, it will provide many years of excellent service. This booklet is designed to furnish you wtih information on the telescope's construction, on the different accessories available, and to provide an introduction to proper operating techniques.

As with any new instrument, it is necessary for the user to become familiar with its various parts. The diagram which follows indicates the names of the parts of the telescope.



1) Dew cap
2) Objective cell
3) Cellar
4) Elevation adjusting gears
5) Main telescope tube
6) Dust cap
7) Viewfinder telescope—5 power
8) Micro focusing knob
9) Eye end
10) Focusing draw tube
11) Star diagonal prism
12) Eyepiece (ocular)
13) Telescope mount base
14) Altitude "slow motion" control flexible shaft
15) Elevation or azimuth "slow motion" gear
16) Wooden tripod
17) Metal equipment tray
18) (Holds accessories) collar locking screws
19) Focusing tube

SPECIFICATIONS OF TELESCOPE'S OPTICS

OBJECTIVE: Achromatic, Fraunhofer type, hard-coated to increase light transmission.

Clear aperture (mm.)	:	60 mm
Clear aperture (in.)	:	2.4 inches
Focal lengh	:	700 mm or 28 inches
Focal ratio (f/no)	:	11.7
Resolving power	:	2.1 seconds of arc.
Faintest visible stars	:	10.9 magnitude
* Light gathering power with respect to naked eye	:	54 times

** Based on naked eye adapted for night viewing*

EYEPIECES:

Type	Focal Length	Magnification	Magnification with Barlow Lens
Huygenian	5 mm	140 ×	280 ×
Huygenian	20 mm	35 ×	70 ×

ASSEMBLY AND OPERATING INSTRUCTIONS

Open the wood carrying case and note the arrangement of the telescope components. The styrofoam supports in the case are designed to permit transporting the instrument without damage. When replacing the scope in its case, the various parts should always be returned to their proper places.

The telescope can be assembled without difficulty by taking the following steps:

1. Reverse the telescope tube. For compactness in shipping, the tube was put into the holding collar (part 3) in reverse. To correct this, hold the tube in your lap and unscrew the objective cell (part 2). Slide the tube out of the holding collar and turn the collar over so that the locking screws are on the bottom. Then slide the telescope tube back into the collar so that the focusing end is as shown in the illustration. When replacing the objective cell, be careful not to cross-thread the mating parts.

2. Take the tripod legs from the case and adjust them all to the same length by sliding out the center leg and locking it by tightening the wing nut at the lower end.

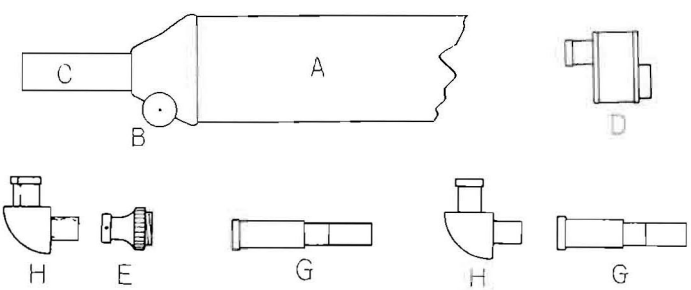
3. The telescope mount is attached to the legs by the long screws and wing bolts located on the upper part of the leg. Pass the bolt through the holes in the legs and through the base of the mount with the hinged part facing inwards. Tighten the wing nuts so that the legs are held firmly and spread the legs for the next step.

4. The triangular accessory is fastened to the tripod legs by the short screws and wing nuts provided. Put the bent edges of the tray downwards. The two holes or the slotted hole on the hinged support permits adjusting the spread of the legs.

5. The 5-power viewfinder telescope (part 7) attached piggy back to the main telescope is to help in locating objects to observe. To align it to the main telescope, proceed as follows: Screw the prism erecting unit (part D) to the focusing tube and insert the 20MM eyepiece. Find the cross-arm of a telephone pole at least ½ mile away and center it in the field of view focusing until it is very clear. Then carefully adjust the three centering screws of the finder scope mount until the crosshair in the finder is also centered on the telephone pole. A corner of a building, flagpole, or anything else can be used to align the finder, but the object should be at least ½ mile away.

6. Place the various accessories in the tray, using the holes provided.

DESCRIPTION OF ACCESSORIES



A—Telescope barrel
B—Focusing wheel
C—Retractable focusing tube (threaded inside)
D—Erecting prism
E—Adapter sleeve
G—Barlow lens (doubles power of existing system
H—Diagonal prism

OPERATING INSTRUCTIONS

To determine the power (magnification) of the telescope, divide the focal length of the objcetive lens (700mm) by the focal length of the eyepiece used. Thus, $\frac{700mm}{20mm}$ equals $35\times$

The Barlow lens (part G) magnifies twice, so that the $35\times$ then becomes $70\times$.

So much for the telescope arithmetic; now to the actual using of the various parts.

The telescope can be used in three ways:

1. For terrestrial (on the earth) viewing, use the erecting prism (part D). The prisms in this unit make the object being observed just as the eye sees it when looking firectly at it. The image is erect and correct from left to right. Any of the eyepieces can be used with it, but you cannot use either the diagonal prism (part H) or the Barlow lens with it. It can also be used for astronomy, but it is not as convenient as the diagonal prism.

2. To use the diagonal prism (also called 90 degree eyepiece, Or star diagonal) the adapter (part E) is screwed into the focusing tube and the eyepiece placed in it. The diagonal erects the image, but leaves it reversed, as when looking into a mirror.

3. For astronomy, the eyepiece can be used directly with the adapter (part E), first, then the eyepiece is put into it. The power is then doubled. The diagonal prism can be used with the Barlow lens; the focusing tube is then brought out until the object is again in focus.

The Sun Filter *must* be used when looking at the sun, or the observer's eye can be severely and permanently damaged by the intense concentrated rays. The filtr is scrwed into the threaded forward part of the eyepiece. The sun can also be viewed by putting the eyepiece (without filter) into the diagonal prism and turning the prism so that it points downwards. Hold a sheet of white paper or cardboard about 5″ away from the eyepiece and focus until the image of the sun is at its sharpest. You will see a large projected image and any sunspots will be clearly seen.

CARE OF THE TELESCOPE

You may see what appears to be scratches on the wood legs of the tripod or carrying case, but these are merely abrasion marks in the finish. Wiping the surfaace with any furniture polish or oil will make them disappear and keep the surface looking shiny and new.

Wash the white tube of the telescope occasionally with a damp cloth and soap.

Disassembling the objective lens should be done with great caution. The objective consists of 2 lenses sepaarated by 3 metal shims. The air space thus created acts like a third lens. It is necessary that the shims be left in place. The crown element (positive outward bulging lens) should face towards the object (away from you). The negative portion of the lenses has very sharp edges, and can be easily chipped if not placed squarely into the objective cell.

Clean all lenses with soft paper tissue or an old handkerchief *moistened* with Windex; then wipe immediately with a dry portion of the tissue. Cotton tipped sticks, such as "Q" tips can be used to clean very small eyepiece lenses, but any lint left should be removed.