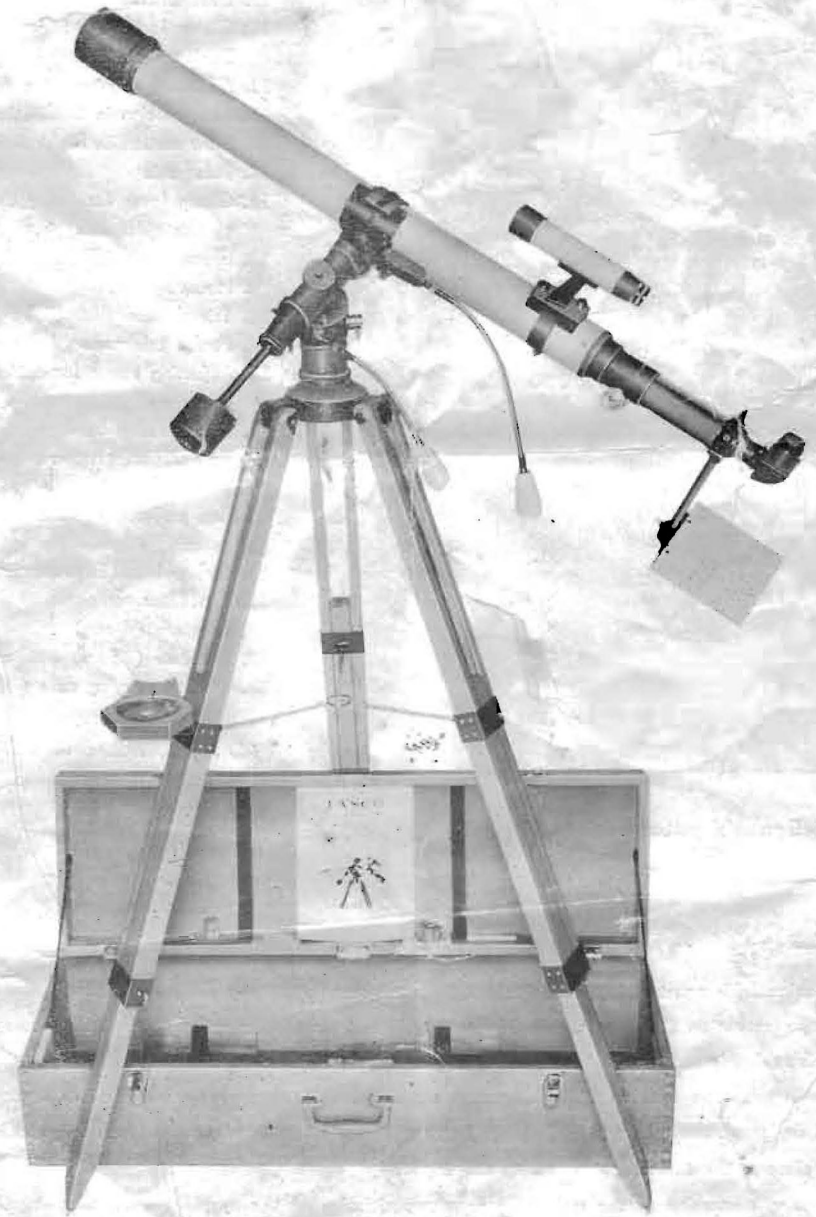
TASCO

228 POWER

ASTRONOMICAL AND TERRESTRIAL TELESCOPE

INSTRUCTION



NAMES OF THE PARTS

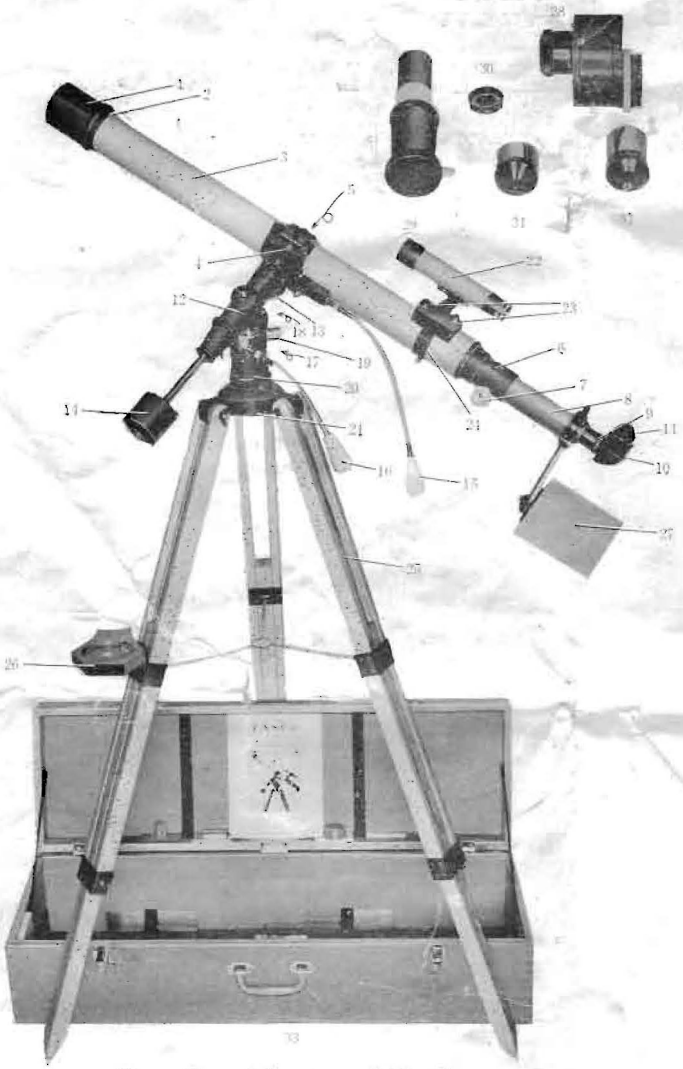


Fig. 1 - Equatorial posture of the telescope

1. Dew cap (Lens hood)
2. Objective cell
3. Telescope tube
4. Telescope tube trunion sleeves
5. Clamp lever for fixing telescope tube
6. Eye end
7. Micro focusing knob with pinion
8. Focusing draw-tube with rack
9. Eyepiece adapter
10. Star diagonal prism
11. Eyepiece (12.5 mm)
12. Declination axis
13. Clamp for fixing telescope to the Declination axis
14. Adjusting counter-poise (Balance weight)
15. Slow motion in Declination
16. Slow motion in Right Ascension
17. Polar axis
18. Clamp lever for fixing the telescope to the polar axis
19. Clamp lever for fixing the inclination
20. Mounting pillar
21. Tripod head
22. Finder telescope
23. Adjusting screw for optical axis of finder telescope
24. Finder fixing band
25. Two-section wooden tripod
26. Accessories tray
27. Sun projection screen
28. Erecting prism
29. Barlow lens (Extension tube)
30. Sun filter
31. Eyepiece (6 mm)
32. Eyepiece (25mm)
33. wooden carrying case

POWERS AVAILABNE WITH EACH EYEPIECE

Eyepiece	Power	Power with Ext. Tube (29)
6 mm(31)	152X	228X
12.5 mm(10)	73X	109X
25 mm(32)	36X	55X

FEATURES

1. Unique alt-azimuth & equatorial combination mount contributes to the versatility and ease of operation
   The telescope moves on three axis, the Horizontal, Polar, and Declination. Since the Polar axis is supported by the Horizontal axis and can be fixed at any angle from vertical to horizontal, the telescope can be used as both an alt-azimuth telescope for terrestrial observation and equatorial telescope for astronomical observation.
2. The special design of the telescope permits its quick and easy assemblage and disassemblage, and it can be separated into three pieces, the telescope, mounting and tripod.
3. The free moving mechanism of the main tube permits positioning of the eyepiece and finder at will.
4. New designed optical parts and constructions are superior and precise.

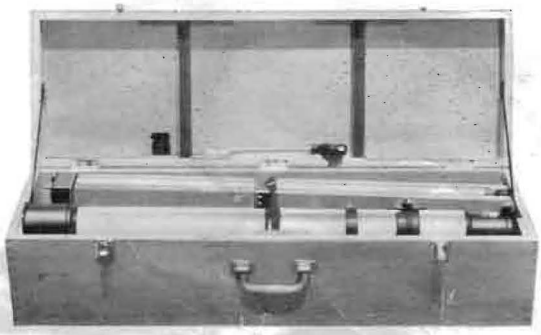


Fig. 2 - Telescope packed in the carrying case.

ASSEMBLING

1. As shown in Fig. 1, the tube and tripod legs are tied with a tape in the carrying or packed position. When removing the telescope from the case, raise and pull out the eye-end section first.
2. Untie the tape as shown in Fig. 3.
3. Let the tripod legs down. Lift up the main tube by the mount section and the legs of the tripod will fall naturally into the position shown partially in Fig. 3.
4. The main tube slides freely. To balance the main tube, slide it a little toward the eye-end. Tighten the wing nuts on the tripod lightly. The legs of the tripod should not be spread apart too much.
5. Remove the balance weight from the Declination body and screw it in as shown in Fig. 4.
6. Fix the flexible shafts to the slow motion's worm for Declination and Right Ascension. as shown in Fig. 5.
7. Fix the finder on the main tube with the band as shown Fig. 6.
8. When footing is instable, secure the legs of the tripod with the tape.



Fig. -3 Folding down the tripod legs, preparatory to setting the Telescope.

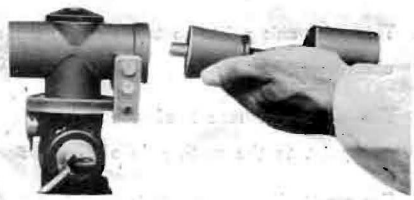


Fig. 4- Screwing the balance weight.

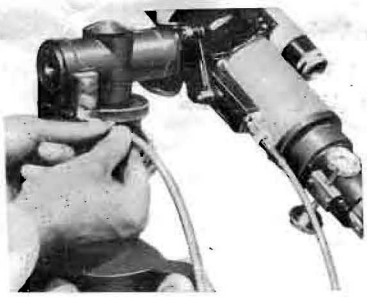


Fig. 5- Fixing the flexible Shaft.

DISASSEMBLING

1. Disassembling procedure is the exact reverse of setting up. All accessories are firstly removed. Then the balance weight is unscrewed, removed and fixed to the Declination body. But finder fixing band is left on the telescope.
2. The main tube, pointing straight up is pulled up as far as the eye end approaches to the tripod head and rotated to a position right by the pillar crevice, then, fold up the tripod legs one by one as shown in Fig. 3.



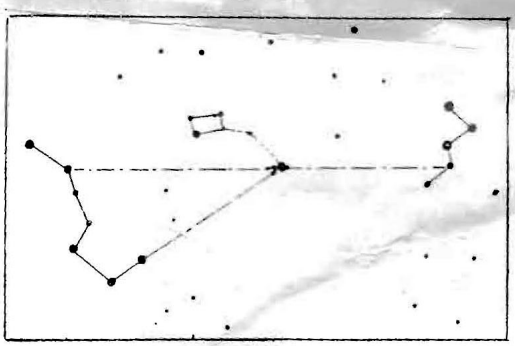
Fig. 6—Fitting the finder.

3. When tying the legs of the tripod and the main tube, the accessories tray is placed at the point of the middle bands of the folded legs and the balance weight rod is put into it's hole. Then tie the telescope and tripod together by the tape.
4. To remove the telescope only, unscrew the fixing screw of the main tube trunion sleeve.
5. To remove or turn the mounting from the tripod head, unscrew or loosen the clamp lever which is placed behind the tripod head.

TELESCOPE AS AN EQUATORIAL

1. Generally speaking, the daily and nightly movements of heavenly bodies in the sky are regular and unvarying. (This is because the celestial sphere turns on its axis of the north (south) pole of the heavens a motion identical with the rotation of the earth on its axis.) Accordingly the movements of the heavenly bodies can be followed by letting the telescope rotate arround the axis which is parallel to the earth's axis. This parallel axis is called the polar axis.
2. The polar axis points to true north, the angle of inclination being equal to the degree of latitude at the point of observation.
3. The equatorial mount of the telescope is built so that, as shown in Fig. 1, the polar axis of the telescope may point to the north pole of the heavens.
4. For practical purposes, it is sufficient to point the polar axis of the telescope to the North Star. Once this is done, the polar axis is secured at the place of observation and unless the telescope is moved, it is properly oriented.

Note :-A sketch of the area around North pole showing the Big Dipper (Ursa Major), the Small Dipper (Ursa Minor) and Cassiopeia.



ACCESSORIES

ASTRONOMICAL EYEPIECES



Fig. 7 – Inserting the eyepiece into the adapter

1. As shown in Fig. 7, the astronomical eyepiece is inserted into the adapter simply by being pushed in and clamp with a screw. To focus, turn the focusing slow-motion knobs.
2. The engraved "HM" on the eyepiece stands for "Huyghenian Mittenzwey", a type of ocular which is an improved model of the Huyghenian. The engraved number shows the focal length of the eyepiece in millimeter.
3. The magnifying power of the telescope can be obtaind by dividing the focal length of the objective lens by the focal length of the eyepiece.
4. Observers who wear other than astigmatic glasses should, if possible, remove them in observation.
5. The tube of the astronomical eyepiece has the international standard diameter of 24.5mm.



Fig. 8– Assembling the diagonal prism and eyepiece

DIAGONAL PRISM

1. The diagonal (right angle) prism is also known as the zenith prism. It permits greater ease in astronomical observation.
2. The diagonal prism is inserted as shown in Fig. 8. When the diagonal prism is inserted, the drawtube must be pushed into the depth of approximately 60mm to allow the diagonal prism's additional focal length.

SUN-GLASS

1. The sun-glass intercepting the heat and glare of the sun's rays, permits safe solar observation.
2. It is inserted as shown in Fig. 9.



Fig. 9 –Inserting the sun glass



Fig. 12 - Alt-azimuth posture of the telescope

THE TERRESTRIAL OBSERVATION

1. To observe the terrestrial objects, use the erecting prism and eyepiece.
2. In this case, it is easier to use the telescope in an alt-azimuth position as shown in Fig. 12.

HINTS ON TERRESTRIAL OBSERVING

1. Always remember that under conditions of haze or fog, you will not be able to see much more clearly thru the telescope, than you can see with your naked eye.
2. Always rememder that glare prevents good observation, when observing directly toward the sun.
3. Always remember that uprising air-currents sometimes distort objects being viewed if the window or the lens of the telescope are exposed directly to the sun. Heated air-currents often cause this also when observing on rooftops. In order to offset this condition, when it occurs, it is suggested that you use as low a magnification as possible.

★ OPTICAL EFFECT

OBJECTIVE (Fraunhofer type, achromat, hard coated)						Magnifications	
Lens aperture.	Clear aperture	Focal length	Light collecting Power for naked eye	Resolving power with respect to the double stars	Faintest discernible star	Astro.	Terr.
62.5mm	60mm	910mm	73.5×	2.0″	10.7m	228 × 152 × 109 × 73 × 55 × 36 ×	Same as Astro.