Instruction Manual

Telestar 40AZ-T
40mm Altazimuth Refracting Telescope

Meade Instruments Corporation

CAUTION:

ADULT SUPERVISION IS RECOMMENDED. THIS TELESCOPE IS NOT APPROPRIATE FOR CHILDREN BELOW THE AGE OF 3 YEARS.

WARNING:

NEVER USE THE AZ-T TELESCOPE TO LOOK AT THE SUN! LOOKING AT OR NEAR THE SUN WILL CAUSE INSTANT AND IRREVERSIBLE DAMAGE TO YOUR EYE. EYE DAMAGE IS OFTEN PAINLESS, SO THERE IS NO WARNING TO THE OBSERVER THAT DAMAGE HAS OCCURRED UNTIL IT IS TOO LATE. DO NOT POINT THE TELESCOPE OR ITS VIEWFINDER AT OR NEAR THE SUN. DO NOT LOOK THROUGH THE TELESCOPE OR ITS VIEWFINDER AS IT IS MOVING. CHILDREN SHOULD ALWAYS HAVE ADULT SUPERVISION WHILE OBSERVING.

TABLE OF CONTENTS

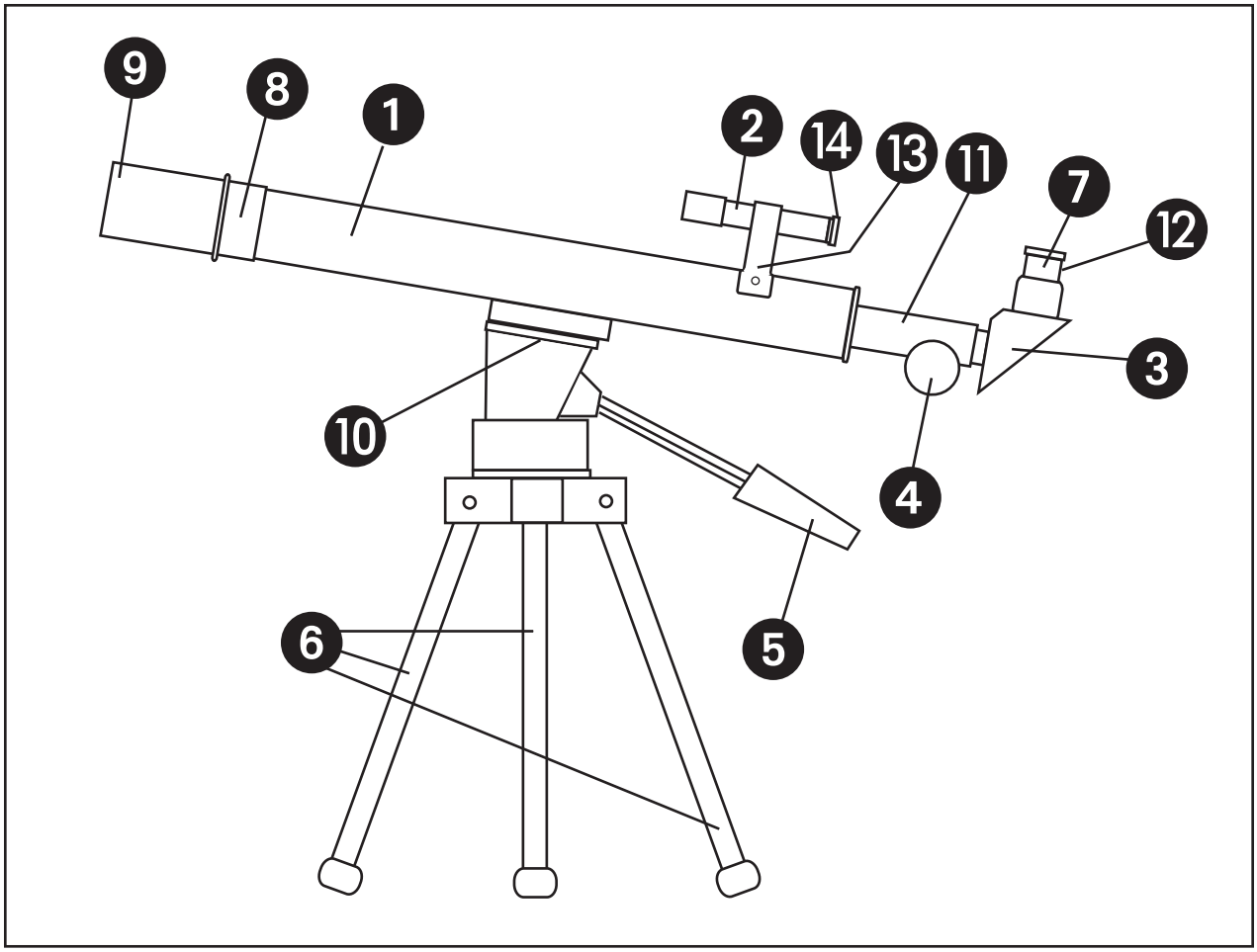

Figure 1: 40AZ-T 40mm Altazimuth Refracting Telescope

1. Optical Tube
2. Viewfinder
3. Diagonal Mirror
4. Focus Knob
5. Altitude Control Handle
6. Tripod
7. Eyepiece
8. Objective Lens
9. Dew Shield
10. Optical Tube Attachment Screw
11. Focus Tube
12. Eyepiece Thumbscrew
13. Viewfinder Bracket
14. Viewfinder Eyepiece Cup

INTRODUCTION

This manual details the set up, operation, specifications, and optional accessories of the Telestar 40AZ-T (40mm) Altazimuth Refracting Telescope. The Telestar 40AZ-T is an easy to operate, refracting telescope designed for both astronomical and terrestrial observing. In order that you may achieve maximum utilization of the instrument, we urge that you to take a few minutes to read all of this manual before making first observations through the telescope. As you read through this manual, the technical terms associated with telescopes will be made clear.

STANDARD EQUIPMENT (Refer to Fig. 1)

- Complete optical tube (objective lens diameter = 40mm; focal length = 600mm)
- 25mm (25X), 6mm (100X) eyepieces (.965" O.D. “Outside Diameter”)
- Diagonal mirror (.965" O.D.)
- 2X viewfinder with bracket
- Table-top Altazimuth mount

INSTALLATION:

1. Unfold the tripod (6, Fig. 1) and place the optical tube (1, Fig. 1) on top of the tripod. Then adjust the attachment screw (10, Fig. 1) to tighten (to a firm feel) the optical tube to the tripod.
2. Attach the viewfinder bracket (13, Fig. 1) to the optical tube (1, Fig. 1) with the eyepiece cup (14, Fig.1) pointing to the back, toward the telescope eyepiece (see diagram). Adjust the viewfinder as you are tightening the bracket so that it points in the same direction the optical tube is pointing.
3. Slide the diagonal mirror (3, Fig. 1) into the tube and tighten the thumbscrews to a firm feel to hold in place.
4. Place an eyepiece (7, Fig. 1) into the diagonal and tighten the thumbscrews to a firm feel to hold in place.

TO ACHIEVE A CLEAR AND SHARP FOCUS:

1. Place the telescope on a stable desk or platform.
2. Do not focus through window glass; this will result in an unclear image. View an object that is at least 50 meters or more distant.
3. Make use of the altitude control handle (5, Fig. 1) and the viewfinder (2, Fig. 1) to help locate an object to view.
4. Look through the eyepiece (7, Fig. 1) and rotate the focus knob (4, Fig. 1). Turn the knob with a slow and gentle motion.
5. Take your time and enjoy.

USING THE TELESCOPE

With the telescope assembled as described above, you are ready to begin observations.

1. First decide on an easy-to-find object. Land objects during the daytime are a good way to become accustomed to the functions and operations of the telescope. At night, try observing the Moon first, if it is visible, or a bright star.
2. To center an object in the main telescope, first use the viewfinder to sight-in the object you wish to observe. When the object is centered in the viewfinder, it should then, also, be somewhere in the main telescope’s field of view. Next, using the 25mm eyepiece, center the object in the main telescope’s field of view, and sharply focus the image by turning the focus knob (4, Fig. 1).

   The 25mm eyepiece included as standard equipment is the best eyepiece to use for the initial finding and centering of an object. The low power 25mm eyepiece presents a bright, wide field of view, ideal for terrestrial and general astronomical observing of star fields, clusters of stars, nebulae, and galaxies. For lunar and planetary viewing, switch to a higher power eyepiece such as the 6mm–conditions permitting. If the image starts to become fuzzy as magnification is increased—back down to a lower power—the atmosphere is not steady enough to support higher powers.
3. If you are observing an astronomical object (the Moon, a planet, star, etc.), you will immediately notice that the object is in a rather slow but continuous motion through the telescopic field of view. This motion is caused by the rotation of the Earth on its axis which results in an apparent motion of the object in the telescope’s field of view; *i.e.* although the Moon, planets and stars are, for practical purposes, fixed in

their positions during any 2 or 3 hour observing session, the platform on which the telescope is sitting (the Earth) rotates once every 24 hours underneath these fixed objects. To keep astronomical objects centered in the field, simply move the telescope on one or both of its axes (vertical and/or horizontal), using the altitude control handle (5, Fig. 1) as appropriate. At higher powers, astronomical objects will seem to move through the field more rapidly.

4. Avoid touching the eyepiece while observing through the telescope. Vibrations resulting from such contact will cause the image to move. Likewise, avoid observing sites where vibrations may resonate the tripod. Viewing from the upper floors of a building may also introduce image movement.
5. Allow a few minutes for your eyes to become "dark adapted" prior to attempting any serious observations. Use a red-filtered flashlight to protect your night vision when reading star maps, or inspecting components of the telescope.
6. Avoid setting up the telescope inside a room and observing through an open window (or worse yet, a closed window pane). Images viewed in such a manner may appear blurred or distorted due to temperature differences between inside and outside air. Also, it is a good idea to allow your telescope a chance to reach the ambient (surrounding) outside temperature before starting an observing session.
7. We repeat the warning stated at the outset of this manual:

NEVER POINT THE TELESCOPE DIRECTLY AT OR NEAR THE SUN AT ANY TIME! OBSERVING THE SUN, EVEN FOR THE SMALLEST FRACTION OF A SECOND, WILL RESULT IN INSTANT AND IRREVERSIBLE EYE DAMAGE, AS WELL AS PHYSICAL DAMAGE TO THE TELESCOPE ITSELF.

8. Certain atmospheric conditions can distort an observed image. Planets, in particular, viewed while low on the horizon, often exhibit lack of sharpness—the same object, when observed higher in the sky, will appear to be much better resolved with far greater contrast. Also, turbulent air in the upper atmosphere can cause the images to "shimmer" in the eyepiece—reduce power until the image steadies. Keep in mind that a bright, clearly resolved, but smaller image will show far more interesting detail than a larger, dimmer, fuzzy image.
9. The 40AZ-T may be used for a lifetime of rewarding astronomical and terrestrial observing, but basic to your enjoyment of the telescope is a good understanding of the instrument. Read the above instructions carefully until you understand all of the telescope's parts and functions. One or two observing sessions will serve to clarify these points forever in your mind.
10. The number of fascinating objects visible through your 40AZ-T is limited only by your own motivation. Astronomical software, or a good star atlas (check out your local library, bookstore or the Internet) will assist you in locating many interesting celestial objects. These objects include:

- **Jupiter** and its four major moons, visible around the planet, changing position each night. Also cloud belts across the surface of Jupiter.
- **Saturn** and its famous ring system.
- **The Moon:** A veritable treasury of craters, mountain ranges and fault lines. The Moon is best observed during its crescent or half phase when Sunlight strikes the Moon's surface at an angle. It casts shadows and adds a sense of depth to the view. No shadows are seen during a full Moon, causing the overly bright Moon to appear flat and rather uninteresting through the telescope.
- **Deep-Space:** Nebulae, galaxies, multiple star systems, star clusters. These objects are best viewed at a dark site, away from city and other lights.
- **Terrestrial objects:** Your telescope may also be used for high resolution land viewing. In this case, note that the diagonal mirror results in an image which is reversed left-for-right, but which is correctly oriented up-and-down. Terrestrial observations should almost always be made using a low power eyepiece (50x or less) for bright, sharp images. Land objects will not normally accept higher powers well because the telescope is being pointed through the thickest part of the Earth's atmosphere, unlike astronomical observations made by pointing the telescope up and through a thinner atmosphere.

CALCULATING POWER

The power, or magnification, at which a telescope is operating is determined by two factors: the optical, or focal length of the telescope's main (objective) lens and the focal length of the eyepiece being used.

The focal length of the Telestar 40AZ-T's objective lens is 600mm. To compute power, divide the focal length of the eyepiece into the focal length of the objective lens. The resulting quotient is the magnifying power of the telescope when used with the eyepiece in question. For example, the 25mm eyepiece yields with the Telestar 40AZ-T, a power of:

Power = 600mm ÷ 25mm = 24X

Similarly, if the 6mm eyepiece is used:

Power = 600mm ÷ 6mm = 100X.

A few words about power. While the theoretical power or magnification of a telescope is virtually limitless, there are, however, practical limits imposed by the Earth's atmosphere as to what can be seen well at a given power. The most useful higher magnification with any 40mm diameter telescope is in the range of 24 to 100 power.

The general rule regarding power: Only use as much magnification as supports a steady, well-defined image. The stability of the air varies and is one reason why having various eyepieces is highly desirable. Higher powers are no guaranty of better images; in fact, the opposite is often true. Also, keep in mind, that land viewing and wide-field, deep-space observation are, generally, low power applications of your telescope.

MAINTENANCE

The AZ-T telescope should be stored in a dry and dust-free place. It should not be stored in direct sunlight. When not in use, keep the lens covered so that it stays clean. Avoid cleaning the lens. A little dust on the the lens hardly affects image quality and should not be considered reason to clean the lens.

SPECIFICATIONS

Objective (main) lens focal length	600mm
Objective lens diameter	40mm, 2-element achromat
Viewfinder	2x
Mounting type	Altazimuth
Eyepieces	25mm, 6mm
Power	24X, 100X

Limited Warranty

Every Telestar telescope, spotting scope, and telescope accessory is warranted by Meade Instruments Corporation ("Meade") to be free of defects in materials and workmanship for a period of ONE YEAR from the date of original purchase in the U.S.A. Meade will repair or replace a product, or part thereof, found by Meade to be defective, provided the defective part is returned to Meade, freight-prepaid, with proof of purchase. **This warranty applies to the original purchaser only and is non-transferable. Meade products purchased outside North America are not included in this warranty, but are covered under separate warranties issued by Meade international distributors.**

RGA Number Required: Prior to the return of any product or part, a Return Goods Authorization (RGA) number **must** be obtained from Meade by writing, or by calling (949) 451-1450. Each returned part or product must include a written statement detailing the nature of the claimed defect, as well as the owner's name, address, and phone number.

This warranty is not valid in cases where the product has been abused or mishandled, where unauthorized repairs have been attempted or performed, or where depreciation of the product is due to normal wear-and-tear. Meade specifically disclaims special, indirect, or consequential damages or lost profit which may result from a breach of this warranty. Any implied warranties which cannot be disclaimed are hereby limited to a term of one year from the date of original retail purchase.

This warranty gives you specific rights. You may have other rights which vary from state to state.

Meade reserves the right to change product specifications or to discontinue products without notice.

This warranty supersedes all previous Meade product warranties.

Meade Instruments Corporation
6001 OAK CANYON, IRVINE, CALIFORNIA 92618-5200 U.S.A4
(949) 451-1450 ■ *www.meade.com*

70040 4/04