

BAUSCH & LOMB

PROFESSIONAL REFRACTOR MODEL 78-0040

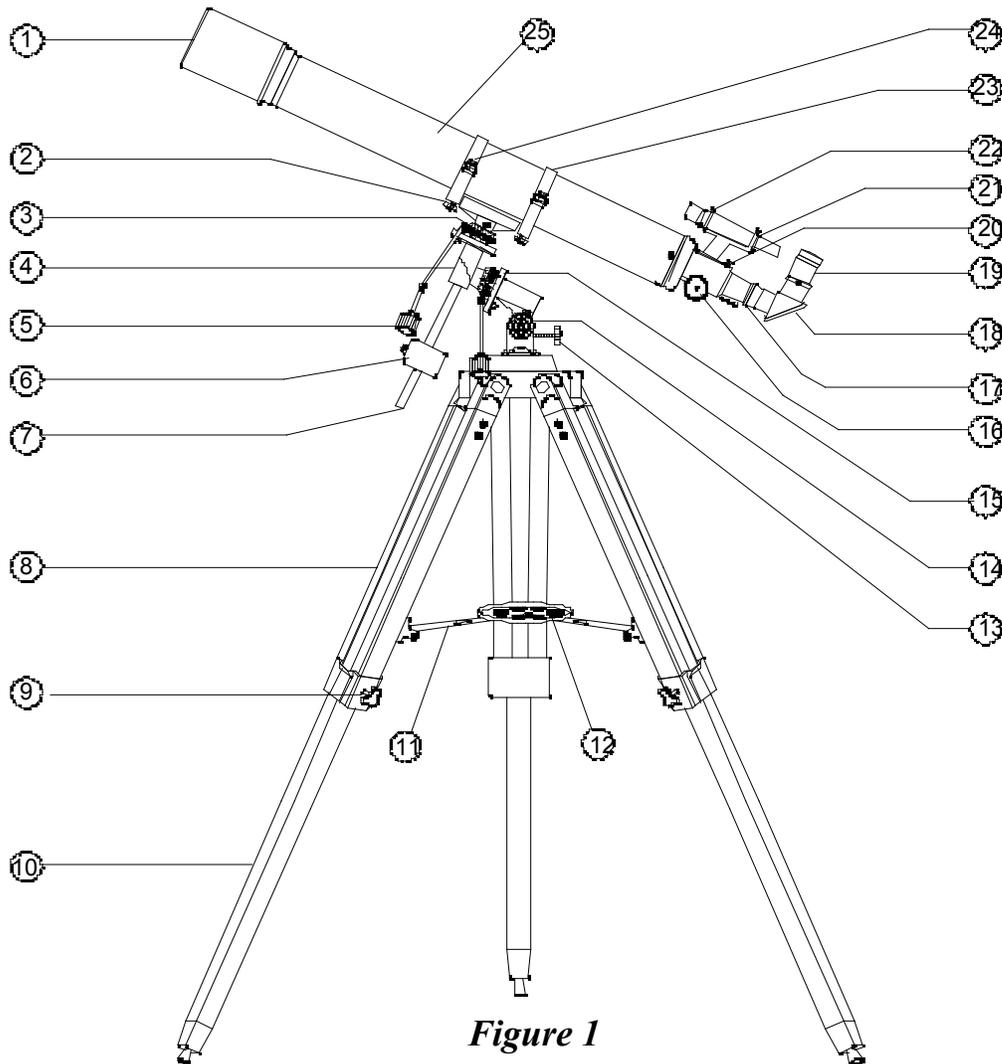


Figure 1

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|---------------------------------|--------------------------------------|
| 1. Objective Lens | 13. Latitude Adjustment Screw |
| 2. Mounting Screws (2) | 14. Latitude Scale |
| 3. Declination Axis | 15. Right Ascension Axis |
| 4. Equatorial Mount | 16. Rack & Pinion Focusing Mechanism |
| 5. Fine Adjustment Cables (2) | 17. Focusing Draw Tube |
| 6. Counterweight | 18. Diagonal Mirror |
| 7. Counterweight Shaft | 19. 1.25" Format Eyepiece |
| 8. Aluminum Tripod Legs | 20. Tension Adjustment |
| 9. Tripod Leg - Lock Screws (3) | 21. 6 x30 Finderscope |
| 10. Tripod Leg Middle Section | 22. Finderscope Adjustment Screws |
| 11. Accessory Tray Supports | 23. Telescope Cradles (2) |
| 12. Accessory Tray | 24. Cradle Lock Screws (2) |
| | 25. Main Telescope Tube |

ASSEMBLY INSTRUCTIONS

I. TELESCOPE ASSEMBLY

1. Remove all components from the carton.

2. Set-Up Tripod, Mount and Accessory Tray

- Locate (pre-assembled) *Equatorial Mount* (4) and *Tripod legs* (8). Spread *Tripod Legs* until *Accessory Tray Supports* (11) are fully extended. Beginning with one tripod leg, loosen *Tripod Leg-Lock Screws* (9) releasing the *Tripod Leg Middle Section* (10). Extend the *Tripod Leg Middle Section*. Tighten the *Tripod Leg Lock Screws* so that the middle section is securely in place. Repeat for remaining legs.
- Locate *Accessory Tray* (12). Remove knob located beneath the *Accessory Tray*. Position the *Accessory Tray* over the circular bracket located at the junction of the *Accessory Tray Supports*. Secure the *Accessory Tray* to the *Supports* using the knob

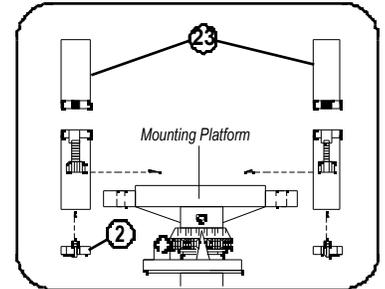


Figure 2.

1. Attach Finderscope

Locate *Main Telescope Tube* (25) and *Finderscope* (21). Loosen *Finderscope Adjustment Screws* (22) and position the Finderscope inside the finderscope bracket. Secure the *Finderscope* in place by fastening the finderscope adjustment Screws “finger-tight only”.

1. Attach Telescope Cradle and Main Tube

Locate *Telescope Cradles* (23). Remove *Mounting Screws* (2) and position *Cradles* under mounting platform as shown (fig 2). Now open *Cradle* by unscrewing *Cradle Lock Screws* (22.) (fig. 3.) Position *Main Telescope Tube* (23) into *Cradles*. Tightly secure *Main Telescope Tube* in place using *Cradle Lock Screws*.

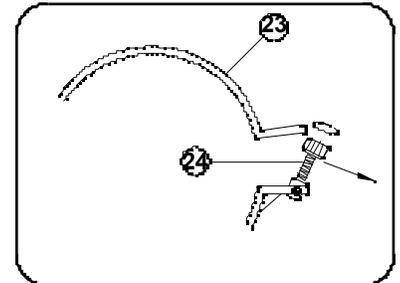


Figure 3

2. Attach Control Cables, Counterweight and Ocular

- Locate *Fine Adjustment Cables* (5). Attach *Cables* to the silver posts just under the *Right Ascension Axis* (15) and the *Declination Axis* (3). Secure cables “finger-tight” using set screw located on the end of each *Fine Adjustment Cable*.
- Locate *Counterweight* (6) and *Counterweight Shaft* (7). Slide *Counterweight* onto the *Counterweight Shaft* and tighten thumb screw to secure. Thread *Counterweight Shaft* into the hole on the bottom of the declination column of the mount. Make sure that the shaft is securely locked into the mount.
- Balance telescope. See instructions in “Tips For Using Your Telescope” section.
- Locate *1.25” Format Eyepiece* (19) and *Diagonal Mirror* (18). Carefully place *Eyepiece* into *Diagonal Mirror* as shown (fig 4.). Next, insert *Eyepiece* and *Diagonal Mirror* into *Focusing Draw Tube* (17).

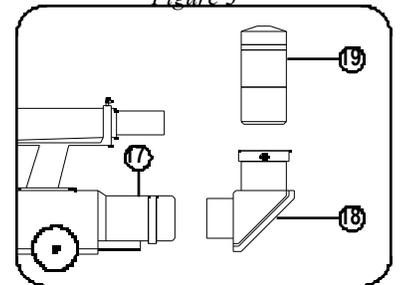


Figure 4

II. STANDARD EQUIPMENT

- Complete Main Telescope Body
- Full Length Aluminum Tripod
- Kellner 25mm (40x) eyepiece with 1.25” outside diameter
- Diagonal Mirror
- 6 x 30mm Finderscope with bracket
- Equatorial Mount with Counterweight and flexible adjustment cables
- Accessory Tray
- Axis Locking Tool (Use to adjust the Declination and Right Ascension Axes)

III. UNDERSTANDING THE EQUATORIAL MOUNT

The equatorial mount is designed to move in any direction. It can be set to allow manual controls to track the movements of celestial bodies across the sky. This is referred to as diurnal movement; movement of celestial bodies in the direction opposite to that of the earth's rotation and is around the earth's axis.

By aligning the telescope's polar axis at celestial North, you will place the telescope in parallel with the earth's axis and thus be able to locate stars in the sky based on star atlas information. To compensate for your position on earth, the polar axis is set in one of three ways:

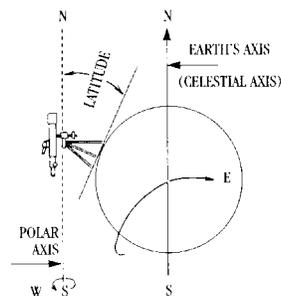
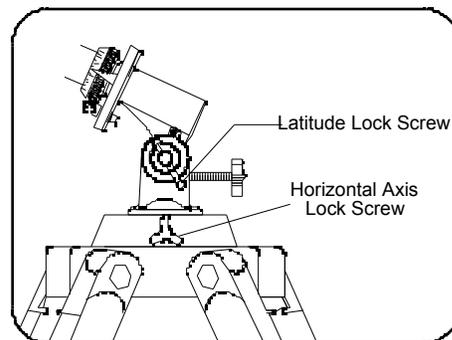


Fig. 1
POLAR AXIS AND EARTH'S AXIS

- Set up the telescope at night. Loosen the declination axis lock screw (use adjustment tool provided) and rotate the telescope around the declination axis until the arrow on the declination scale points to 90 degrees. Tighten the declination axis lock screw. The telescope is now roughly in parallel with the polar axis.
- Loosen the horizontal axis lock screw and turn the telescope until the objective end faces due north. This can be done by approximating the location of the pole star (Polaris or North Star) or by the use of a compass. True North is then found by directing the telescope at Polaris, as magnetic North is slightly away from true North.
- Look up the latitude of your area in any geographical atlas. Loosen the latitude lock screw and set the latitude scale to the correct latitude for your area. Aim the Finderscope at Polaris. You will probably notice that Polaris is not dead center in the finderscope's field of view. This is probably because your telescope is not absolutely level with the ground. Loosen the horizontal axis lock screw again and turn the telescope so that it is directly aimed at Polaris. Tighten both the horizontal axis lock screw and the Latitude Lock Screw. Polaris is 1 degree of the North celestial pole. Therefore, the sighting of stars will have to be slightly adjusted as you locate them in the heavens.



IV. TIPS FOR USING YOUR TELESCOPE

Focusing the Telescope

- Aim the main telescope tube at a well-defined target, at least 200 yards away (e.g. a telephone pole or building). Fully extend the focusing tube by turning the *rack and pinion focusing mechanism* (16).
- While looking through the *Eyepiece Lens* (19), slowly retract focusing tube by turning the *rack and pinion focusing mechanism* until object comes into focus. **(Note: The image will be upside down and reversed. This is a normal occurrence in astronomical telescopes.)**

Aligning the Finderscope

- Locate an object at least 200 yards away. Tighten the *Latitude Lock Screw* (fig 5.) so that telescope's aim is not disturbed.
- Looking through the *Finderscope* (21), adjust the *Finderscope Adjustment Screws* (22) until the crosshairs of the *Finderscope* are precisely centered on the same object already centered in the field of view of the *Main Telescope Tube*. **(Note: image in finderscope will be upside down and reversed.)**
- Objects located using the finderscope will also be centered in the main telescope's view.

***Never Look Directly At The Sun With Your Telescope
Permanent Damage To Your Eyes May Occur***

Balancing the Telescope

- Arrange the telescope so that the telescope body is horizontal to the floor (latitude of 0°). Loosen the *Right Ascension Lock* [*Locks right ascension axis* (15)]. The telescope should now turn freely about the

polar axis. Rotate the telescope about the polar axis so that the *Counterweight Shaft (7)* is parallel to the ground (horizontal).

- Loosen the *Counterweight Lock Screw (located on the counterweight)*, and slide the *Counterweight (6)* along the shaft until the telescope remains stationary without drifting rotationally about the polar axis. Tighten *the Counterweight Lock Screw*, locking the *Counterweight* into position.
- Now balance the telescope about the *Declination Axis (3)*. Loosen the declination lock screw and the *Cradle Lock Screws* so that the telescope can slide freely inside the *Cradles*. Slide the telescope up or down inside the rings until the telescope remains stationary without drifting rotationally about the *Declination Axis*. Tighten *Cradle Lock Screws*. The telescope is now balanced.

ANSWERS TO COMMONLY ASKED QUESTIONS

1. The image I see in the telescope is upside down and reversed from right to left ?	<ul style="list-style-type: none"> • An upside-down and reversed image is a common characteristic of all refractor telescopes. Since telescopes are used for astronomical viewing orientation is not important. An erecting lens can be purchased separately that will allow you to see a “natural” image. The image in the finderscope will also be upside down and reversed.
2. How do I determine the power my telescope ?	<ul style="list-style-type: none"> • The power of your telescope can be determine by dividing the focal length of the objective lens by the focal length of the eyepiece. The eyepiece focal length is the number printed on the eyepiece. (For example: $1000 \div 25 = 40X$)
3. What can I see with my telescope ?	<ul style="list-style-type: none"> • Telescopes with power ranging from 25X to 50X can be used to view Star Clusters and Nebulae. 90X to 120X telescope can view galaxies. Most planets can be seen at 150X and higher.
4. What do the numbers on the eyepiece mean ?	<ul style="list-style-type: none"> • The numbers on the eyepiece represents the “focal Length” of the eyepiece.

TROUBLESHOOTING GUIDE

If after you have set-up your new telescope you are unable to see an objects, use this Quick Reference guide to help you to understand the cause of the problem and quickly determine a remedy

1. I've completed the set-up yet I cannot see anything	<ul style="list-style-type: none"> • Check to see if objective lens cover has been removed. • Try to view an object that is 200 or more yards away. • If there is more than one eyepiece included with the telescope, use the lowest power (highest number) eyepiece to begin viewing. • Use the <i>focusing mechanism (16)</i> to bring the object you are trying to view into focus
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Telescope LIFETIME LIMITED WARRANTY

Your telescope is warranted to be free of defects in materials and workmanship for the lifetime of the original owner. The Lifetime Limited Warranty is an expression of our confidence in the materials and mechanical workmanship of our products and is your assurance of a lifetime of dependable service.

If your telescope contains electrical components the electronic components are warranted to be free of defects in materials and workmanship for one year after the date of purchase.

In the event of a defect under this warranty, we will, at our option, repair or replace the product, provided that you return the product postage prepaid. This warranty does not cover damages caused by misuse or improper handling, installation or maintenance of the product.

Any return made under this warranty must be accompanied by the items listed below:

- 1) A check in the amount of \$15.00 to cover the cost of handling
- 2) Name and address for product return
- 3) An explanation of the defect
- 4) Product should be well packed in a sturdy outside shipping carton to prevent damage in transit and return postage prepaid to the address listed below:

IN U.S.A. Send To:

Bushnell * 8500 Marshall Drive * Lenexa, Kansas 66214

IN CANADA Send To:

Bushnell * 25A East Pearce Street, Unit 1 * Richmond Hill, Ontario L4B 2M9

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