

# ADDENDUM

16" Advanced Coma-Free™ f/8 LX600™ with StarLock™



**MEADE** INSTRUMENTS

*Innovative products for curious minds*

since 1972

# **WARNING!**

**Due to the weight and size of the 16" LX600-ACF models, please use extreme caution whenever assembling, disassembling, lifting, transporting or storing this product. Two or more persons should always be used whenever performing any of the described tasks. Disregard for the above warning could result in serious injury or death.**

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## **WARNING!**

**Never use a Meade® LX600 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 at or near the Sun. Do not look  
through the telescope or Finder Scope as it  
is moving. Children should always have adult  
supervision while observing.**

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# INTRODUCTION

## The 16" LX600-ACF f/8 Telescope with StarLock

### *Advanced Technology for the Astro Imager and Visual Observer*

Congratulations on receiving your new LX600 telescope! You'll find that this telescope system has all you need to explore the Universe we live in.

Drawing on over 40 years of experience and innovation, Meade Instruments introduces the latest in a long line of advanced astronomical products: the LX600. Using revolutionary new technology, every aspect of this amazing telescope system has been designed to deliver the new standard in astrophotographic and visual performance:

- StarLock™ full-time automatic integrated guider assists with ultra-precise polar alignment, finds and centers targets and then automatically locks onto a field star as faint as 11th magnitude for down to one arcsecond guiding. No separate computer, no guide star selection, no user focus. Just set up your camera and image.
- Fast f/8 Advanced Coma-Free (ACF) optical system on the 16" OTAs. These optics produce wider, flatter fields with no coma for pinpoint stars out to the edge of larger imaging sensors or extreme wide angle eyepieces.
- Internal Crayford-style primary mirror focusing system with a dual speed 7:1 focus control, which eliminates image shift and mirror flop. Precise focus is a snap.
- MAX Mount Tripod provides a stable, yet remarkably transportable platform that supports the telescope.
- Optional MAX-Wedge is made from machined aluminum and stainless steel for more stability. Configures the LX600 telescope in the Polar mode which is essential for long exposure astrophotography

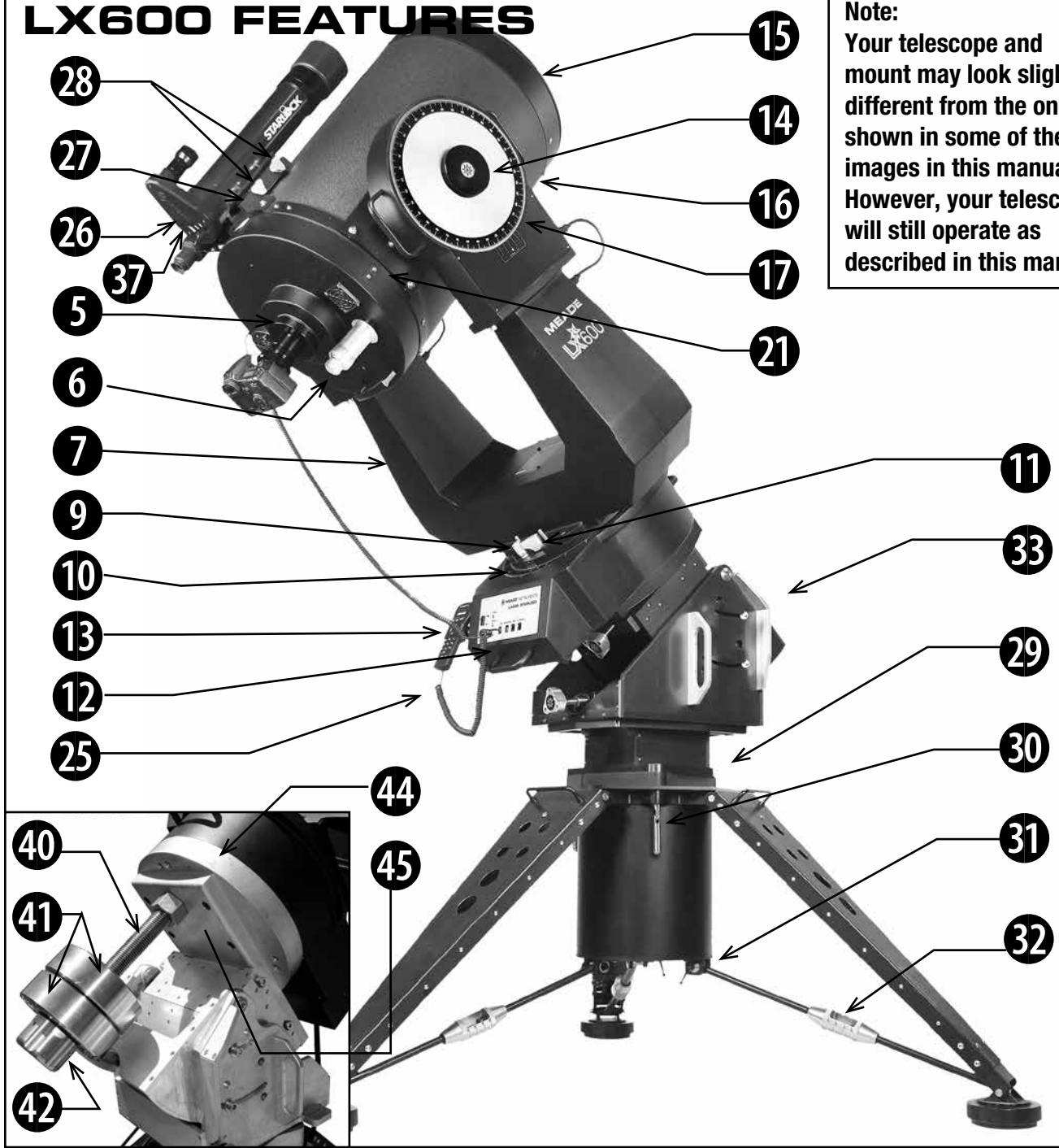
If you are like us, you can't wait to get outside under a dark sky to use your new LX600 telescope. We have provided a Getting Started Guide that will get you up and running in the shortest amount of time possible. After your first experience, please sit down with this manual and read about all the advanced features that are available to you with this telescope system. We are confident that the LX600 will keep you fascinated with the Universe and entertained for many years to come.

Clear Skies,

The People at Meade

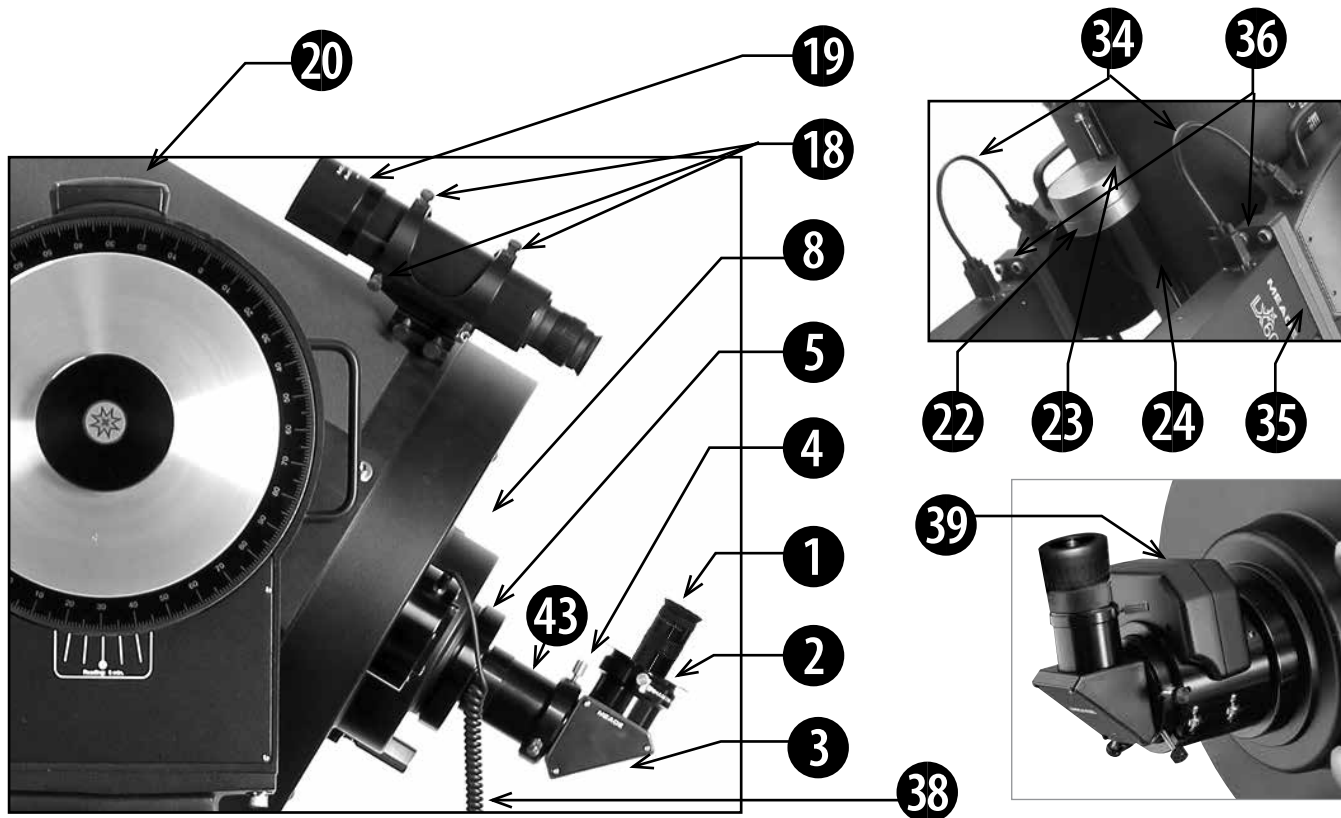
# LX600 FEATURES

**Note:**  
Your telescope and mount may look slightly different from the one shown in some of the images in this manual. However, your telescope will still operate as described in this manual.



- |                                     |                                  |                                     |
|-------------------------------------|----------------------------------|-------------------------------------|
| 1 Eyepiece                          | 10 RA setting circle             | 19 8 x 50 viewfinder                |
| 2 Eyepiece thumbscrew               | 11 RA lock                       | 20 GPS receiver                     |
| 3 2.0" diagonal mirror with UHTC    | 12 Computer Control Panel        | 21 Tube adapters                    |
| 4 Diagonal mirror thumbscrew        | 13 Autostar II holder            | 22 StarLock Counterweight(s)        |
| 5 Rear cell port                    | 14 DEC lock                      | 23 StarLock Counterweight hex screw |
| 6 Two-speed focus knob              | 15 Dust cover                    | 24 StarLock Counterweight rail      |
| 7 Fork arms                         | 16 Optical tube                  | 25 AutoStar II handbook             |
| 8 Primary Mirror Lock (not visible) | 17 DEC setting circle            | 26 StarLock assembly                |
| 9 RA slow-motion control            | 18 Viewfinder collimation screws | 27 StarLock dovetail bracket        |

Figure 1(a): LX600 Key Features (See Pages 6 & 7 for details)



- 28 StarLock retaining bolts
- 29 MAX tripod
- 30 Tripod Lock Lever
- 31 Coarse adjustment lever
- 32 Fine adjustment turnbuckle
- 33 MAX-Wedge
- 34 Fork Arm Jumper Cables
- 35 Fork Arm Connecting Plates
- 36 Connecting Plate Bolts (Although the illustration shows four (4) bolts, final configuration shall be two (2) bolts per fork arm)
- 37 StarLock Cable
- 38 Cooling Fan Cable
- 39 Micro Focuser
- 40 Wedge Counterweight Shaft
- 41 Wedge Counterweights (two)
- 42 Wedge Counterweight Cap
- 43 Dovetail Adapter Plate
- 44 Drivebase Adapter Plate

Figure 1(b): LX600 Key Features - Left View, Control Panel and Micro Focuser

# 16" LX600 FEATURES

The Meade LX600 ACF models are extremely versatile, high-performance telescopes for imaging and visual use. With pushbutton controls, precision GPS alignment, true-level and North electronic sensors, StarLock automatic guiding and ultra-precise pointing, automatic tracking of celestial objects, and a library of 145,000+ objects in the AutoStar II database, the LX600 ACF models offer unmatched state-of-the-art performance.

Observe or image the rings of the planet Saturn from a distance of 800 million miles or focus beyond the Solar System on ancient star clusters, remote galaxies, and stars recently discovered to have planets orbiting about them. Meade LX600 ACF telescopes are capable of growing with your interest and can meet the requirements of the most demanding advanced observer.

**1 Eyepiece:** Place the eyepiece into the 90° diagonal mirror (Pg. 7, Fig. 1b, 1) and tighten in place with the eyepiece thumbscrew (Fig. 1b, 2). The eyepiece magnifies the image collected in the optical tube.

**2 Eyepiece Thumbscrew:** Secures the eyepiece (Fig. 1b, 2) in place. Tighten to a firm feel only.

**3 2" Diagonal Mirror with/UHTC:** Provides a more comfortable right angle viewing position. Includes 1.25" adapter.

**4 Diagonal Mirror Thumbscrew:** Tightens the diagonal mirror in place. Tighten to a firm feel only.

**5 Rear Cell Port:** 2" extension tube threads onto this port.

**6 Two-speed Focus Knob:** 2-speed Crayford-style focusing system moves the telescope's primary mirror in a finely-controlled motion to achieve precise image focus. LX600 telescopes can be focused on objects from a distance of about 100 ft to infinity. Rotate the focus knob clockwise to focus on distant object.

**7 Fork Arms:** This heavy-duty mount holds the optical tube securely in place.

**8 Primary Mirror Lock:** Rotate this knob towards the "Lock" position and adjust the tension to a firm feel; this action serves to lock in the coarse focus and also to prevent mirror flop. Use in conjunction with the optional Zero Image-Shift Microfocuser.

**9 Right Ascension (RA) Slow-Motion Control:** When the mount is not sidereally tracking on the night sky you can make fine adjustments in the Right Ascension, i.e. the horizontal axis, by turning this control with the RA lock in the unlocked position. Set the RA lock to a "partially locked" position to create a comfortable drag for the RA slow-motion control.

**Caution: Do not operate the RA or DEC slow-motion controls with the locks in the fully locked position, as such operation may result in damage to the internal gear system and also cause you to lose alignment.**

**10 Right Ascension (RA) Setting Circle:** See the main LX600 manual, for detailed information.

**11 Right Ascension (RA) Lock:** Controls the manual horizontal

rotation of the telescope. Turning the RA lock counterclockwise unlocks the telescope, enabling it to be freely rotated by hand about the horizontal axis. Turning the RA lock clockwise locks the telescope, prevents the telescope from being rotated manually, and engages the horizontal motor drive for AutoStar II operation.

**12 Computer Control Panel (see Pg. 7, Fig. 1b inset):**

**A. ON/OFF Switch:** Turns the computer control panel and AutoStar II ON or OFF. The red power indicator LED next to the switch illuminates when power is supplied to mount. The LED can be turned off in the Panel Light menu; see **page 15**).

**B. 12vDC Power Connector:** Provides a connection so that the telescope assembly may be powered from a standard 115/240v AC home outlet using the optional Universal Power Adapter (product# 07584) or the optional 12v DC #607 Cigarette Lighter Adapter (product# 07043).

**C. Focus Port:** (An additional focus port is located on the fork arm). Plug the microfocuser into this port. Control the microfocuser through the AutoStar II menus.

**D. Reticle Port:** Plug the optional reticle eyepiece cable into this port. Control the reticle through the AutoStar II menus.

**Note: See the instruction sheets that are included with the micro focuser and the reticle for more details.**

**E. 12vDC Output:** (An additional 12vDC power output is located on the fork arm) Use the 12vDC output to power telescope accessories.

**F. Handbox (HBX) Port:** Plug the AutoStar II coil cord into this port.

**G. RS232 Port:** Provides a connection with a PC and for current and future Meade accessories. Your PC can control your LX600 ACF telescope using the supplied AutoStar Suite software for custom applications. Go to the Meade website ([www.meade.com](http://www.meade.com)) to download the latest serial commands and device pinouts. Meade 507 connecting cable required.

**H. Auxillary Autoguider Port:** If you wish to use an add-on autoguider in place of the integrated StarLock, plug the autoguider cable into this port. See the instruction sheet that came with your autoguider for more information.

**13 Tilttable AutoStar II Holder:** Holds your handbox in a convenient location.

**14 DEC Lock:** Controls the manual vertical movement of the



telescope. Turning the DEC lock counterclockwise unlocks the telescope, enabling it to be freely rotated by hand about the vertical axis. Turning the DEC lock clockwise (to a firm feel only) prevents the telescope from being moved manually, but engages the vertical motor drive for AutoStar II operation.

**Caution: When loosening the DEC lock, be sure to support the optical tube (Fig. 1a, 16). The weight of the tube could cause the tube to swing through the fork arms suddenly.**

**15 Dust Cover:** Gently pry the dust cover from the front lens of the telescope.

**Note: The dust cover should be replaced after each observing session and the power turned off to the telescope. Verify that any dew that might have collected during the observing session has evaporated prior to replacing the dust cover.**

**16 Optical Tube:** The main optical component that gathers the light from distant objects and brings this light to a focus for examination through the eyepiece.

**17 Declination (DEC) Setting Circle:** Please refer to appendix E, Page 57, in the 10", 12" & 14" LX600 manual that is included with your telescope.

**18 Viewfinder Collimation Screws:** Use these six screws to adjust the alignment of the viewfinder.

**19 8 x 50mm Viewfinder:** A low-power, wide-field sighting scope with crosshairs that enables easy centering of objects in the telescope eyepiece.

**20 GPS Receiver:** Receives information transmitted from Global Positioning System satellites and provides the telescope with updated Date, Time, and site information.

**21 Tube Adapters:** The optical and mechanical axes of the LX600 telescope have been carefully aligned at the factory to ensure accurate object pointing. **Do not loosen or remove the optical tube assembly from the tube adapters.** The resulting misalignment of the axes will result in inaccurate pointing of the telescope in the GO TO mode.

**22 StarLock Counterweight(s):** Precisely counter balance the StarLock assembly and optional accessories by moving this weight.

**23 StarLock Counterweight Hex Screws:** Tighten to secure the counterweight in place.

**24 StarLock Counterweight Rail:** Slide the StarLock counterweight along this rail to achieve optimum balance.

**25 AutoStar II Handbox:** The LX600 user interface. Use the Handbox to command the LX600 to automatically slew to any object in the night sky.

**26 StarLock Assembly:** Integrated autoguiding unit made up of the StarLock narrowfield OTA and sensor, used for high-precision guiding, and the StarLock widefield OTA and sensor,

used in alignment and ultra-precise pointing.

**27 StarLock Dovetail Adapter:** Attaches StarLock to the optical tube.

**28 StarLock Retaining Bolts:** Secures the StarLock assembly to the dovetail adapter.

**29 MAX-Tripod:** Ultra-stable and collapses for convenient transportation

**30 Tripod lock lever:** Secures the telescope drive base or MAX-Wedge to the tripod.

**31 Coarse Adjustment Lock Lever:** Use this to make major adjustments when leveling the tripod.

**32 Fine Adjustment Turnbuckle:** Twist the turnbuckle to make final, precise leveling adjustments.

**33 MAX-Wedge:** See Appendix A for details.

**34 Fork Arm Jumper Connector:** Allows power and communications from the control panel to reach the Dec assembly.

**35 Fork Arm Connecting Plate:** Connection point between OTA assembly and fork arms. Two (2) locking screws per arm.

**36 Connecting Plate Bolt:** Secures the OTA assembly to the fork arms. Two (2) locking screws per fork arm.

**37 StarLock Cable:** Connects StarLock via dedicated port located on the fork arm.

**38 Cooling Fan Cable:** Provides power to the OTA mirror cooling fan. Plugs into the control panel or fork arm.

**39 Micro Focuser:** Please refer to LX600 10", 12", 14" manual for details.

**40 Wedge Counterweight Shaft:** Threads into the drive base adapter plate.

**41 Wedge Counterweights (two):** Threads on to the wedge counterweight shaft.

**42 Wedge Counterweight Safety Nut:** Caps off the wedge counterweight shaft.

**43 2" Extension Tube:** If the micro-focuser is not used, the 2" extension tube connects the telescope rear cell to standard 2" accessories. Slide the 2" diagonal mirror into the 2" extension tube and secure with its thumbscrew.

**44 Drive base Adapter Plate:** Allows connection between the LX600 16" drive base and Max-Tripod for the Alt-Az configuration. If the Max-Wedge is being used, this adapter plate is further attached to the Dovetail Adapter Plate allowing connection to the Max-Wedge.

**45 Dovetail Adapter Plate:** Only used with the MAX-Wedge in the Polar mode configuration. If using the LX600 16" in Alt-Azimuth mode, the dovetail adapter plate is removed.

# GETTING STARTED

## Parts Listing

Getting the telescope ready for first light requires about 30 minutes. When first opening the shipping box, note carefully the following parts:

- 16" LX600 ACF Optical Tube
- Fork arms
- Drive Base with adapter plate
- MAX Field Tripod
- StarLock unit with cable
- Optional MAX Wedge Assembly
  
- AutoStar II handbox and interface coil cord; handbox holder
- 8 x 50mm viewfinder assembly
- 2" Diagonal Mirror, 2" Extension tube, and 1.25" Eyepiece holder
- Series 4000 26mm Super Plössl eyepiece
- Microfocuser
- OTA Counterweight(s)
- DEC Jumper cables (2)
- 507 Connecting Cable and USB to RS232 Adapter
- Instructional Manual and Software DVD
- 16" LX600 AC Power Adapter
- Set of hex keys and Hardware

## Commercial Shipping

**Caution:** Serious damage to the drive gears may result from shock in handling. During transport or commercial shipping, the R.A. lock (**Fig. 6, Fig. 1a, 11**) and/or the Dec. lock (**Fig. 1a, 14**) must not be engaged. Always release the locks when storing in the case or when crating for commercial shipment. This allows the telescope to give if the case or crate is sharply jarred or dropped.

The optical and mechanical axes of the 16" LX600-ACF telescope have been carefully aligned at the factory to ensure accurate object pointing. Do not loosen or remove the optical tube assembly from the tube adapters (**Fig 1a, 21**). The resulting misalignment of the axes will result in inaccurate slewing of the telescope in the GO TO mode. Do not attempt to turn the focus knob of the optical tube (**Fig. 1a, 6**) until you unlocked the primary mirror lock.

## Components of the 16" LX600

The 16" LX600 features a unique modular design that allows a couple of individuals to assemble, either permanently or transportably, a mount twice the size of any other commercially available mount.

The mount in Alt-Az mode breaks down into a Portable Pier (tripod), Drive Base, fork arm, and Optical Tube Assembly (OTA).

With the addition of the MAX Wedge Assembly, the 16" LX600 becomes a highly stable, precision platform for imaging.

Together all of the components and an assembly fit easily into a station wagon, SUV, minivan or small truck.

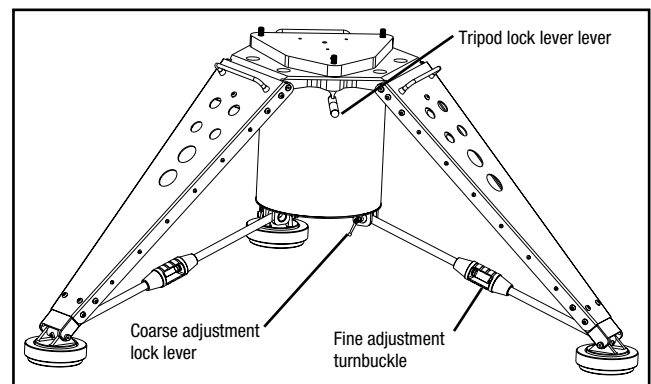


Fig. 2: MAX-Tripod components.

## MAX-Tripod - Using the 16" LX600 in Alt/Az mode

The MAX mount tripod can be transported or permanently installed. It provides a wide stance to assure that it can safely carry the 16" LX600 massive payload in all orientations, but still collapses down to a size that is easy to handle.

## Tripod Assembly

Before you pull legs out of collapsed tripod, notice raised pentagon pattern on top of the tripod (photo). Set the top of the pentagon so it is pointing in the direction of TRUE North as shown below.

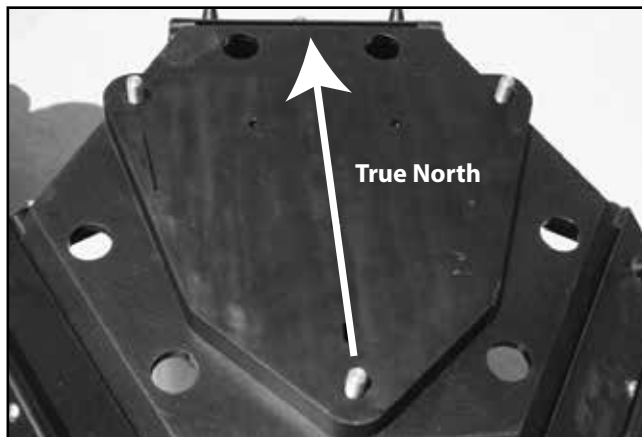


Fig. 3: Orient the tripod.

Set up on a surface of concrete, or if on the ground, a solid surface (such as granite). Verify that the location you chose provides a clear view of the sky. **The fully assembled telescope system is extremely heavy and it is best not to attempt to move it. Moving a fully assembled telescope can result in damage and may result in the collapse of the telescope itself.** Make sure that you have clear access to the sky.



Fig. 4: Tripod legs collapsed.



Fig. 5: Coarse adjustment lock lever.

**CAUTION: AVOID GRASS AND DIRT. THE MAX TRIPOD ASSEMBLY WILL SINK INTO GROUND, NOT REMAIN LEVEL AND TIP OVER, CAUSING SERIOUS INJURY TO THE ASSEMBLY AND OBSERVERS.**



Fig. 6: Tripod legs extended.

Turn the three coarse adjustment leg lock levers to unlock the legs of the tripod. See Figure 5 for a close up of a lock lever.

Extend the legs outward. Note that the legs need not be extended fully. Extend them so that the top of the tripod is coarsely level with the horizon. You should make fine leveling adjustments after the OTA has been mounted and all accessories have been attached.



Fig. 7: Fine adjustment turnbuckle.

## Attaching the 16" Drive Base

- Remove the four pointed bolts that hold the packing material in place. These bolts are used only for shipping purposes and not used in the telescope assembly procedure. See **Fig. 8**.

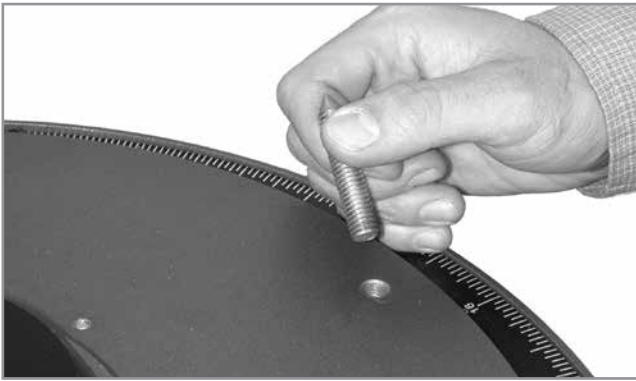


Fig. 8: Remove the pointed bolts from the drive base.

- b. With the tripod orientated as described on the previous page, place the drive base onto the tripod.

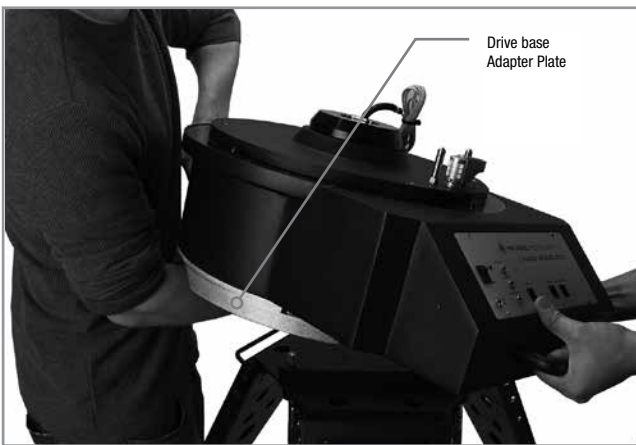


Fig. 9: Attach the drive base to the tripod.

- c. Position the 16" drive base with drivebase adapter plate (Fig 1, #44) onto the field tripod, with the power panel facing South. Secure the drive base using the three attachment bolts. Thread these bolts up through the underside of the tripod head into the drive base. Firmly tighten these bolts. See Fig. 2.
- d. Note the DB-15 connector at the center of the base.



Fig. 10: Secure the drive base to the tripod by tightening the lever.

## Attaching the Fork

- a. Place the single-piece fork onto the top of the drive base. One side of the base of the fork has a cutout to allow clearance for the R.A. lock and R.A. slow-motion control (Fig. 13), which are located on top of the drive base.
- b. Bolt the fork to the drive base using the four 3/8"-16 x 3/4" long socket cap screws (Fig. 13). Using the supplied hex key, tighten to a firm feel only.

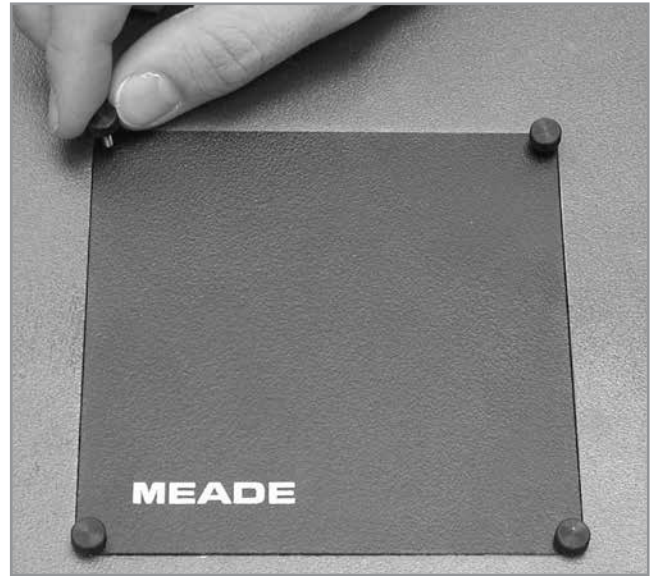


Fig. 11: Remove the four thumbscrews from the plate.

- c. Unscrew and remove the four thumbscrews from the rectangular plate (Fig. 11) in the center of the fork arms. Remove the plate. Note the DB-15 plug under the fork plate.

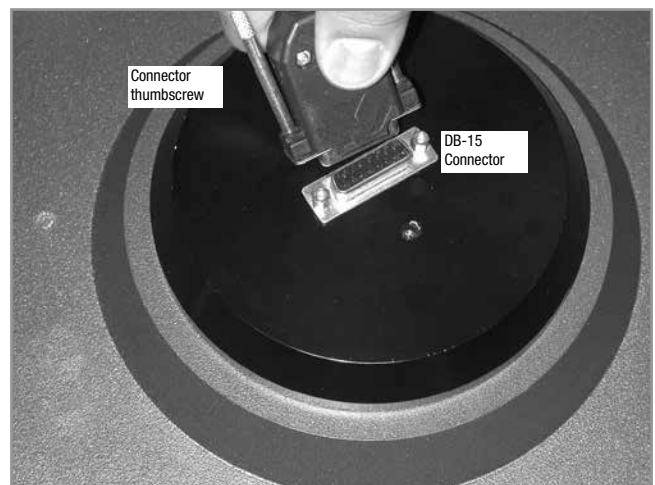


Fig. 12: View beneath plate (fork base not shown for clarity sake): Attach the DB-15 connector underneath the plate.

- d. Connect the DB-15 plug pre-installed in the fork arm, to the DB-15 connector underneath the plate. Tighten the two thumbscrews onto the connector to a firm feel. See **Fig. 12**.

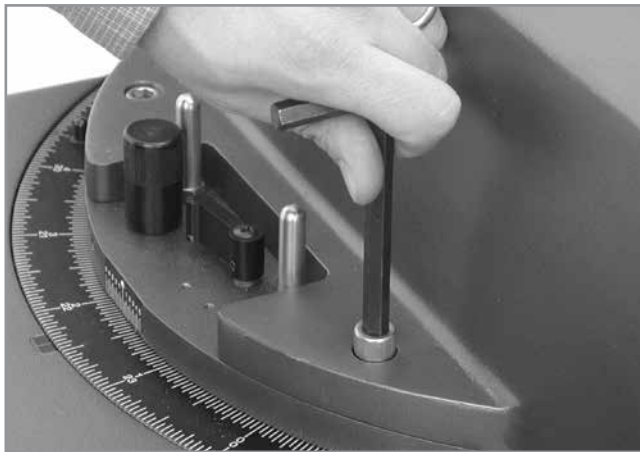


Fig. 13: Attach the fork arm to the drive base.

## Mounting the Optical Tube Assembly (OTA)

This step requires two people who can lift up to 70 pounds each. The optical tube assembly (OTA) weighs about 125 lbs. and it must be positioned accurately in order to mount to the fork.



Fig. 14: Position the holes over the shoulder bolts. When they are in place, slide the OTA back so that the shoulder bolts lock into the slots.

- Located on the two top surfaces of the fork are two shoulder bolts. These two bolts function as locating pins for the OTA. On the inside edge of the Dec. castings are two matching holes (with slots). Before trying to mount the OTA, be sure to locate these two bolts and holes. Notice that the bolts and holes are located on one side of the castings, requiring the OTA to be mounted one way only.
- Tighten the Dec. lock (**Fig. 1, 14**) to a firm feel only. With you on



Fig. 15: Tighten the fork arm assembly using the provided hex key.

one side of the OTA and your assistant on the other side, grasp the two handles on each side and lift the OTA onto the top of the fork. Position the holes over the shoulder bolts. When they are in place, slide the OTA back so that the shoulder bolts lock into the slots (**Fig. 14**).

- Lock the OTA in place using the four 3/8"-16 x 1 1/4" bolts and 3/8" washers. Thread up the four bolts into the bottom of the Dec. castings, two on each side. Using the supplied hex key, tighten to a firm feel only (**Fig. 15**).

## Attaching the Power and Data Cords

Several power and data cords are supplied with the 16" LX600-ACF. These should all be attached before powering up the telescope.

- Confirm that the power switch (**Pg. 7, Fig. 1b, A**) on the power



Fig. 16: Plug in the DB-9 connectors to provide power from the Dec. motor to the fork arms.

panel is in the OFF position. Connect the power adapter to the 12vDC connector (**Fig. 1b, B**).

- b. Two short cords (8" long) with DB-9 connectors are supplied to provide power to the Dec. system, the GPS, and the level sensor. Plug into the two DB-9 connectors located at the top of the sides of the fork and the Dec. casting (**Fig. 16**).
- c. Connect the AutoStar II handbox to the HBX connector (**Fig. 1b, F**) on the control panel.
- d. Connect the supplied coil cord from the fan to the 12vDC output jack (**Fig. 1b, E**) on the fork arm.

## Attaching Accessories

Please refer to the LX600 10", 12" and 14" manual for detailed mounting instructions.

## Leveling the Telescope

Once you have completely assembled the 16" LX600 telescope, and mounted all the accessories, it is advised that you take the time to more precisely level the telescope base. using the fine adjustment turnbuckles. Now adjust the three turnbuckles to level the base.



Fig. 17: Fine adjustment turnbuckle.



Fig. 18: Level Tripod.

# AUTOSTAR II MENU TREE

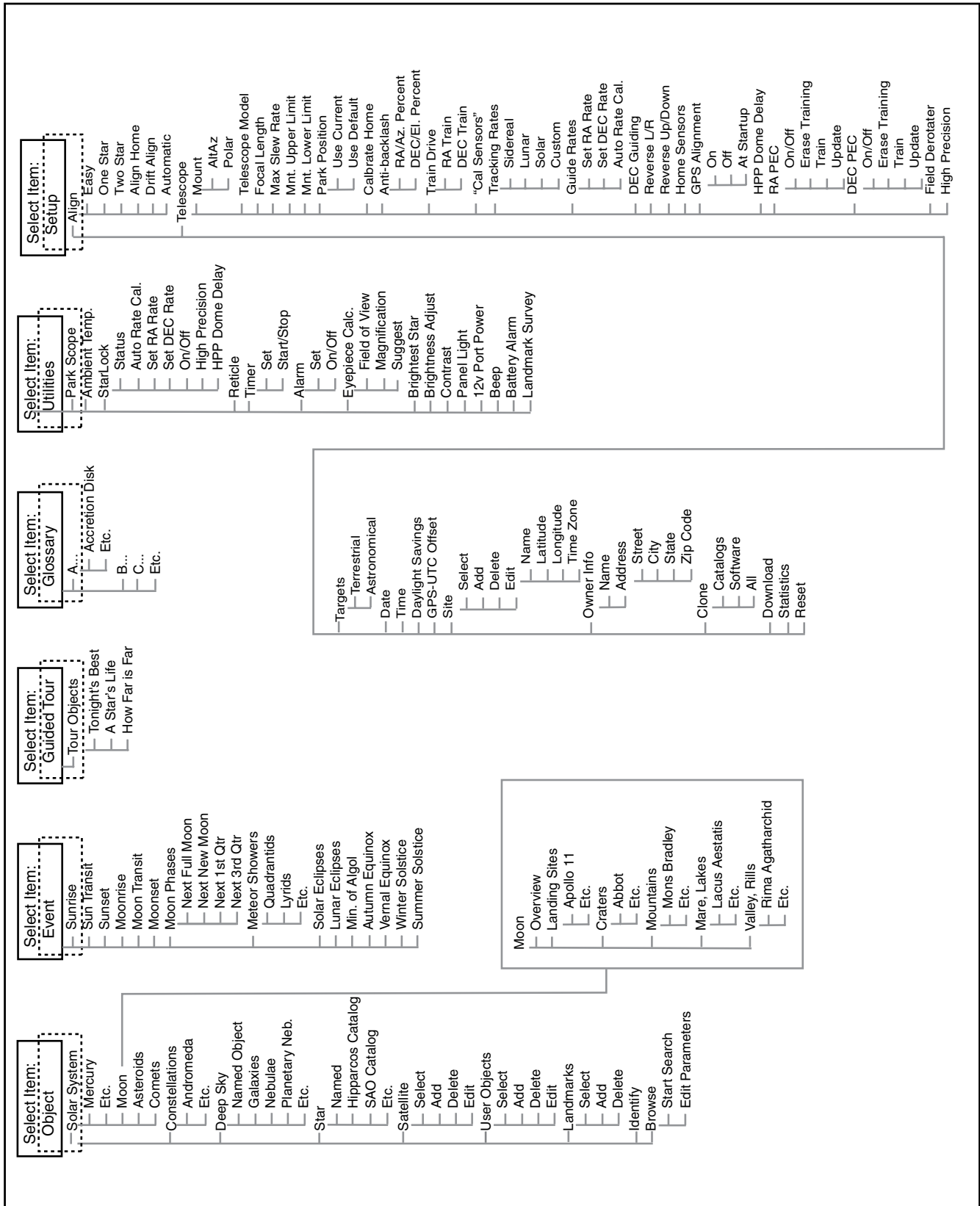


Figure 19: The AutoStar II Menu Tree

# SPECIFICATIONS

## AutoStar II System Specifications

Processors .....	10 processors arranged in a Distributed Intelligent Network Architecture to facilitate parallel task management (U.S. Patent 6,304,376)
Flash Memory .....	3.5MB, reloadable
Database.....	145,000 objects

## AutoStar II Handbox Specifications

Keypad.....	20 key alphanumeric
Display.....	2 line, 16 character LCD
Backlight.....	Red LED
Utility Light.....	Yes
Coil Cord .....	24"
Length .....	6.56" (16.6cm)
Width (LCD end).....	3.19" (80cm)
Width (Connector end).....	2.25" (57cm)
Depth.....	0.81" (21cm)
AutoStar II net weight.....	1.12 lbs (0.51kg)

## StarLock Specifications

Wide-field camera.....	25mm x 26mm f/1.04 optic with 1/2 inch format CMOS sensor gives field of 14.72 x 11.78 degrees.
Narrow-field camera .....	80mm x 400mm f/5 optic with 1/2 inch format CMOS sensor gives field of 57.2 x 45.8 arcminutes (2.68 arcseconds/pixel)
High-precision pointing .....	+/- 1 arc minute
High-precision guiding.....	+/- 1 arc second RMS (with good seeing. 1-4 second correction update rate depending on star magnitude. Faintest guide star 11th mag.)
High-precision alignment.....	Semi-automatic drift align procedure for ultra-precise polar alignment
Weight .....	2.7 pounds

## 16" f/8 LX600 ACF Specifications

Optical design .....	Advanced Coma-Free
Clear aperture.....	406.4mm (16")
Focal length .....	3251mm
Focal ratio (photographic speed) .....	f/8
Resolving power.....	0.29 arc sec
Coatings .....	Meade Ultra-High Transmission Coatings (UHTC)
Mounting.....	Cast-aluminum, double-tine forks
Gears .....	11"-dia. worm gears, both axes
Periodic Error Correction .....	Both axes
Alignment .....	Altazimuth or equatorial with optional wedge or pier
Slew Speeds .....	1x sidereal to 8°/sec in 9 increments
Power .....	12v power supply
Tripod.....	MAX field tripod
Accessories.....	8 x 50mm viewfinder 2.0" diagonal mirror, with 1.25" adapter Series 4000 26mm Super Plössl eyepiece 4-speed zero image-shift microfocuser 12v AC adapter #507 Connection Cable USB to RS232 Adapter Software DVD 16-channel GPS receiver
Net telescope weight.....	318 lbs.
Net tripod weight.....	81 lbs.



# APPENDIX A: USING THE 16" LX600 IN POLAR MODE WITH MAX-WEDGE

## Polar Mode with the MAX-Wedge

MAX's Wedge assembly can be configured to cover three latitude ranges without the need of disassembly. Together, the three ranges allow the mount to operate most anywhere on the planet.

## Parts Listing

The following parts are included with the MAX-Wedge:

- MAX-Wedge
- Counterweight shaft
- Counterweights (two)
- Counterweight shaft safety cap
- MAX-wedge dovetail adapter plate
- MAX-wedge Addendum (assembly manual)
- Hex keys and hardware

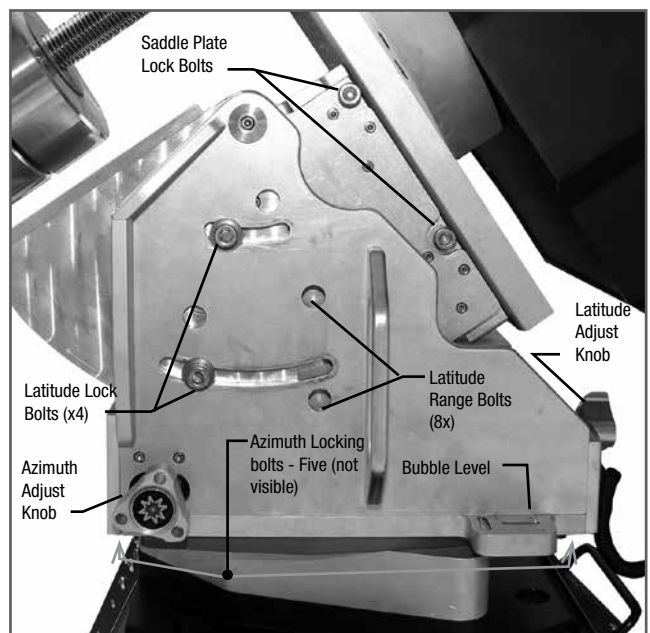
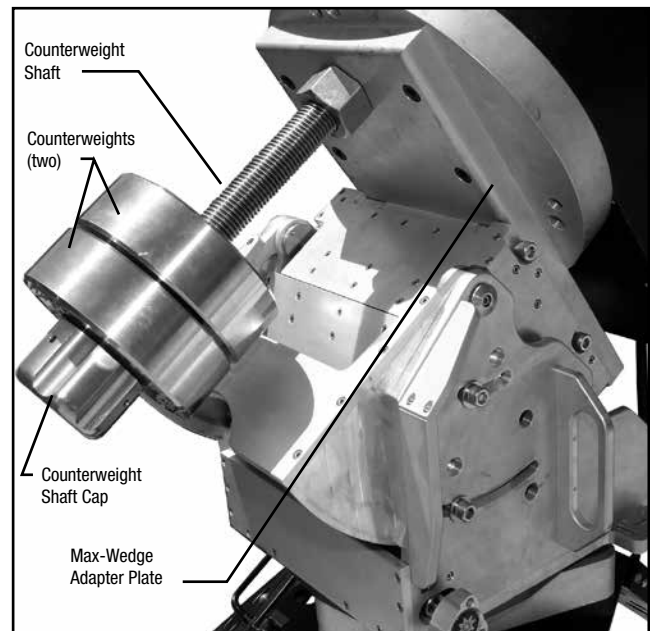
## Set-up sequence

Below is an outline of the steps involved when setting-up your 16" LX600 in polar mode:

1. Orient and set-up the MAX Tripod
2. Attach the MAX-Wedge to the MAX-Tripod
3. Attach the 16" drive base to the MAX-Wedge
4. Attach the fork arm assembly to the drive base
5. Attach counterweight shaft and counterweights to the MAX-Wedge
6. Attach the OTA to the fork arm assembly
7. Attach StarLock, StarLock cable, finderscope, diagonal, microfocuser and eyepiece, AutoStar handbox and handbox holder
8. Balance OTA counterweight

## MAX-Wedge

Illustration below identifies key features and controls for the MAX-wedge.



## Choosing a location

It is important that when you begin the process of setting up your 16" LX600 to thoughtfully choose your location. The fully assembled telescope system is extremely heavy and it is best not to attempt to move it. Moving a fully assembled telescope can result in damage and may result in the collapse of the telescope itself. Makes sure that you have clear access to the sky. The wedge mounted telescope has considerable overhang, so it is advisable to have a clearance of at least five (5) feet in all directions.

## Tripod Assembly

Before you pull the legs out of collapsed tripod, note the raised pentagon pattern on top of the tripod (Fig. 20). Set the top of the pentagon so that it is pointing in the direction of True North.

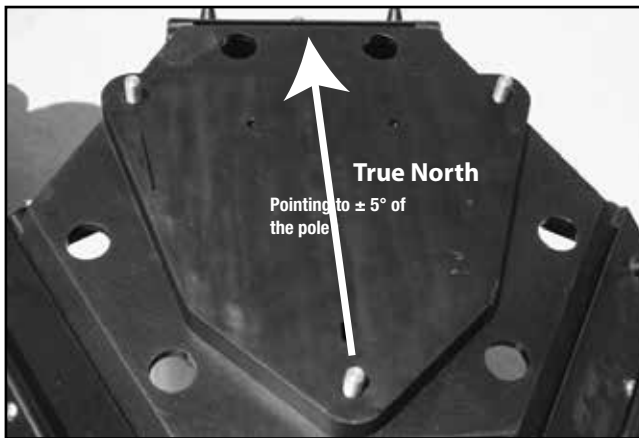


Fig. 20: Orient the tripod.

Set up on a surface of concrete, or if on the ground, a solid surface (such as granite).



Fig. 21: Tripod legs extended.

**CAUTION: AVOID GRASS AND DIRT. THE MAX TRIPOD ASSEMBLY WILL SINK INTO GROUND, NOT REMAIN**

## LEVEL AND TIP OVER, CAUSING SERIOUS INJURY TO THE ASSEMBLY AND OBSERVERS.

Turn the three coarse adjustment leg lock levers to unlock the legs of the tripod. See Photo 5 for a close up of a lock lever.

Extend the legs outward. Note that the legs need not be extended fully. Extend them so that the base of the tripod is coarsely level with the horizon. You should make fine leveling adjustments after the OTA has been mounted and all



Fig. 22: Lift and place the MAX-Wedge on to the fully extended tripod.

accessories have been attached.

## MAX-Wedge Assembly and Adjusting Latitude Position

Using two people, firmly grasp the MAX-Wedge. lift and place the Wedge on the tripod. Use the 3 tripod lock levers on

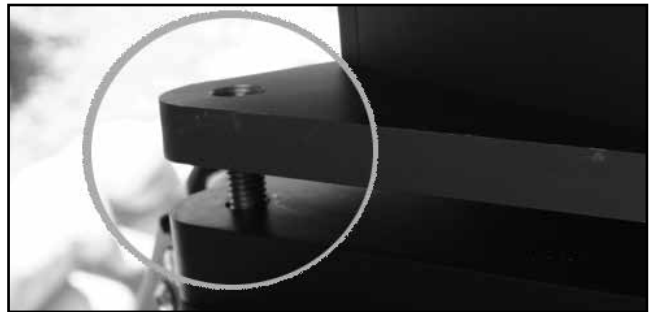


Fig. 23: Locking pins.

the base as a guide. Note that these pins are spring loaded and are self-locating.

**CAUTION: THE MAX-WEDGE REQUIRES TWO PEOPLE TO LIFT THE ASSEMBLY**



Fig. 24: Tripod lock levers.

Tighten (rotate) the tripod lock knobs below the Wedge to a "tight" feel by first loosely tightening all three knobs, then further tightening all three securely.

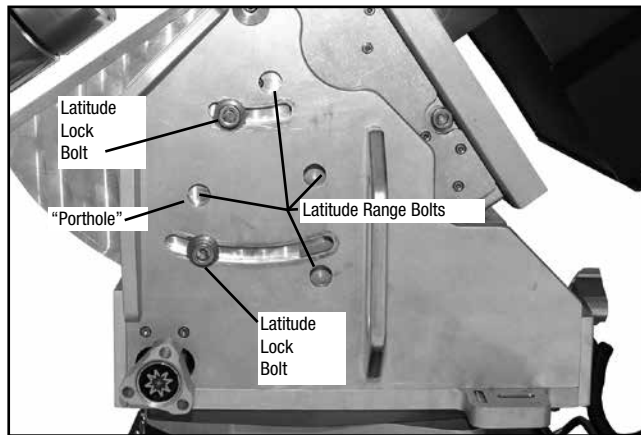


Fig. 25: Latitude adjustment.

## Setting the Wedge Latitude Range

The telescope comes set for mid-range latitudes (30° to 60°).

**If you need to set for low range or high range**, loosen all four latitude lock screws (2 on each side) remove the 4 latitude bolts from each side of the wedge (8 total) using a supplied hex

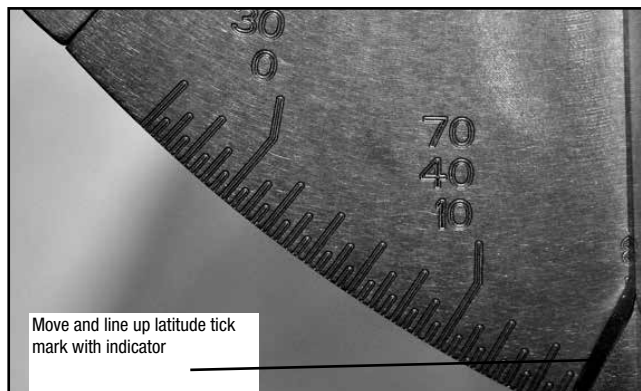


Fig. 26: Latitude scale and indicator.

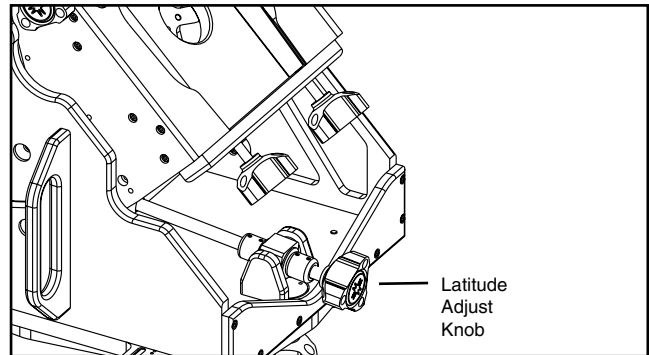


Fig. 27: MAX-Wedge latitude adjustment knob.

wrench (see photo above). The wedge will now swing freely. Swing the wedge so that the bolt portholes match up with another set of bolt holes on the underneath plate (there are three sets of bolt holes, one for each latitude range).

Move the wedge until it lines up your latitude tick mark with the indicator on the latitude scale.

Replace and tighten the latitude bolts. Note: If you are setting for low-range latitude, you will need to replace only three bolts on each side. There isn't a fourth hole on either side. Relock latitude locks screws.

Fine tune the latitude adjustment using the Latitude Adjustment knobs. See appendix B, if you need help reading the latitude scale.

- **Is your telescope pointing North?**
- **Is your telescope level?**
- **Make sure you are pointing Toward True North and are level before proceeding.**

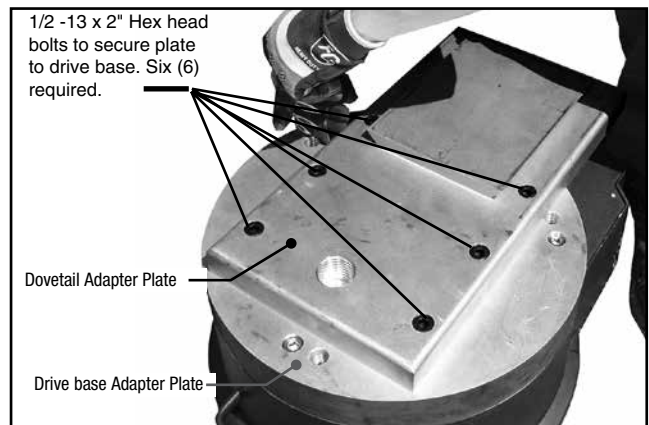


Fig. 28: Attach the MAX-Wedge adapter plate. **Note:** Drive base is shown in upside down position.

## MAX-Wedge Adapter Plate

In order to secure the 16" drive base to the MAX-Wedge, two adapter plates are used. The drive base adapter plate (Fig 1, 44) connects directly to the drive base using three 1/2-13 x 5/8" socket cap screws.

Next, the dovetail adapter plate(Fig 1, 45) attaches to the drive base adapter plate using six 1/2-13 x 2" socket cap screws. The dovetail plate adapter plate then slides into the MAX-Wedge from the top. In order to secure the 16" drive base to the MAX-Wedge, two adapter plates are used. The drive base adapter plate(Fig 1, 44) connects directly to the drive base using three 1/2-13 x 5/8" socket cap screws.

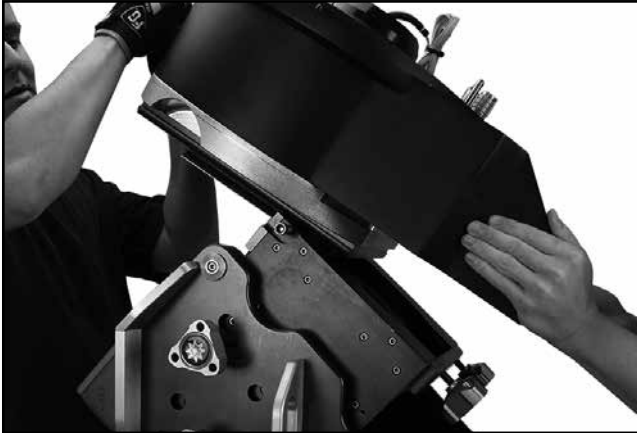


Fig. 30: Lift base, slide adapter into receiver and guide.

Next, the dovetail adapter plate(Fig 1, 45) attaches to the drive base adapter plate using six 1/2-13 x 2" socket cap screws. The dovetail plate adapter plate then slides into the MAX-Wedge from the top.



Fig. 31: Tighten the locking bolts.

Note the following:

- a. The adapter plate is secured using six (6) 1/2-13 x 2" hex-head bolts.
- b. Orient the plate as shown in figure 28.
- c. Once all six (6) 1/2-13 x 2" hex-head bolts have been threaded in the drive base you may proceed to tighten the bolts.

## Mount the LX600 Drive Base to the MAX-Wedge

Using two people, firmly grasp the 16" LX600 Telescope Drive base, lift and place the wedge adapter dovetail in the wedge receiver.

Secure the drive base by tightening the two hex head bolt as shown in illustration 31.

## Attach the Fork Arm to the Drive Base

Using two people, place the fork arm on the drive base and secure using the four(4) 3/8-16 X 3/4" socket head cap screws.



Fig. 32: Lift base, slide adapter into receiver and guide.

## Attach Counterweight Shaft, Counterweights and safety nut

Thread in the counterweight shaft into the base of the the dovetail adapter plate. Tighten to a firm feel.

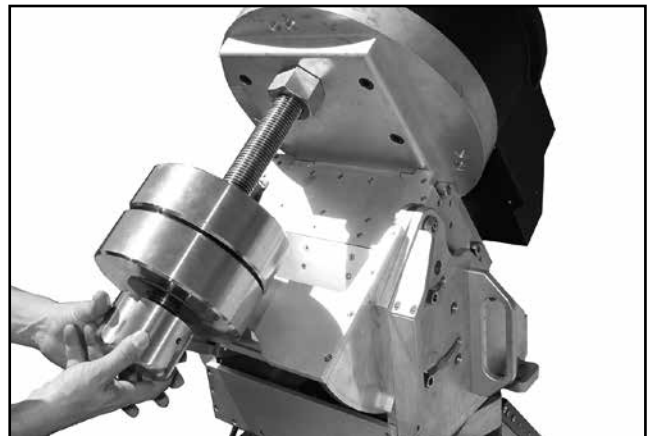


Fig. 33: Attach counterweight shaft, two counterweights and safety nut.

Next, thread on the two counterweights. Make sure that your feet are not in the fall line, especially when you are removing the weight, as they are heavy and can injure a foot if dropped on to it.

Complete the step by threading on the counterweight retaining nut.

Once you have secured the MAX-Wedge counterweight system, you can proceed to mount the OTA and accessories.

## Mounting the Optical Tube Assembly (OTA)

This step requires at least two (2) people which that can lift up to 70 pounds each. It is highly suggested that when possible, the help of a third person be used to spot and guide the OTA arms in to place.

Installing the 16" OTA on the MAX-Wedge requires greater care and is more challenging than assembly in the polar Mode. The optical tube assembly (OTA) weighs about 125 lbs. and it must be positioned accurately in order to mount to the fork. Note that when installing the OTA in the polar mode, the OTA is initially hung on two (2) shoulder bolts. These bolts will safely support the weight of the OTA assembly; care is need in the lifting the OTA on to the two shoulder bolts.

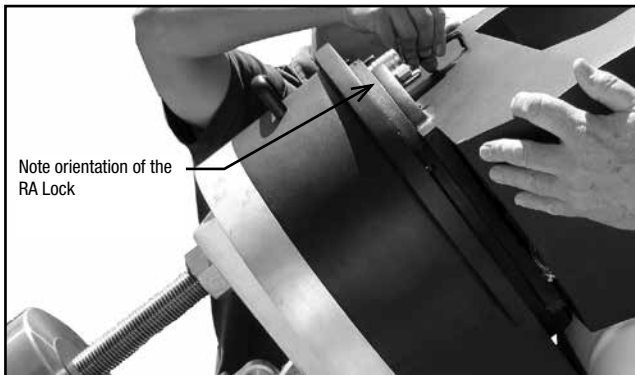


Fig. 34: RA Lock Pointing Away from the control panel

- a. Orientate the fork arms so that the RA lock is pointing away from the control panel. Rotate the RA lock into the "locked" position so that it will not move when you mounting the OTA. In this orientation the receiving slots will pointing upward to easily accept the hanger screw as it slips down
- b. Located on the two top surfaces of the fork are two shoulder bolts. These two bolts function as locating pins for the OTA. On the inside edge of the Dec. castings are two matching holes (with slots). Before trying to mount the OTA, take time to locate these two bolts and holes. Notice that the bolts and holes are located on one side of the castings, requiring the OTA to be mounted one way only.
- c. Before attempting to mount the OTA, take time to verify that the shoulder bolts have sufficient extension. When the OTA is mounted on to the fork arm, it will hang from these shoulder bolts. If the bolt is tightened down too far, they will not slide into slots. If necessary, back these bolts out so there is sufficient clearance for the bolt to slide into the slot.

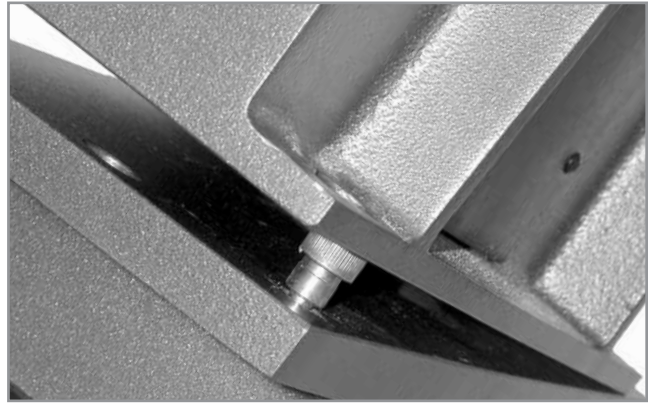


Fig. 35: Position the holes over the shoulder bolts. When they are in place, slide the OTA back so that the shoulder bolts lock into the slots.

- d. Tighten the Dec. lock (Fig. 1, 14) to a firm feel only. With you on one side of the OTA and your assistant on the other side, grasp the two handles on each side and lift the OTA onto the top of the fork. Position the holes over the shoulder bolts. When they are in place, slide the OTA back so that the shoulder bolts lock into the slots (Fig. 35).



Fig. 36: Tighten the fork arm assembly using the provided hex key.

- e. Lock the OTA in place using the four 3/8"-16 x 1 1/4" bolts and 3/8" washers. Thread up the four bolts into the bottom of the Dec. castings, two on each side. Using the supplied hex key, tighten to a firm feel only (Fig. 36).

## Attaching the Power and Data Cords

Several power and data cords are supplied with the 16" LX600-ACF. These should all be attached before powering up the telescope.



Fig. 37: Plug in the DB-9 connectors to provide power from the Dec. motor to the fork arms.

- a. Confirm that the power switch (**Pg. 7, Fig. 1b, A**) on the power panel is in the OFF position. Connect the power adapter to the 12vDC connector (**Fig. 1b, B**).
- b. Two short cords (8" long) with DB-9 connectors are supplied to provide power to the Dec. system, the GPS, and the level sensor. Plug into the two DB-9 connectors located at the top of the sides of the fork and the Dec. casting (**Fig. 37**).
- c. Connect the AutoStar II handbox to the HBX connector (**Fig. 1b, F**) on the control panel.
- d. Connect the supplied coil cord from the fan to the 12vDC output jack (**Fig. 1b, E**) on the fork arm.

## Attaching Accessories

Please refer to the LX600 10", 12" and 14" manual for detailed mounting instructions.

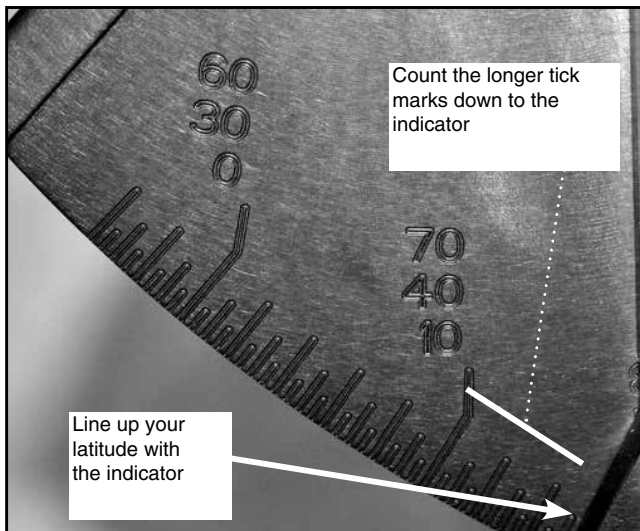
## Removing the Optical Tube Assembly (OTA) from the MAX-Wedge

Removal is basically the reverse of the assembly process with the following important caveat. It is essential that you unlock the RA, rotate the telescope so that the RA Lock/RA slow-motion control is facing upward, or away from the control panel and then lock the RA. In this position the OTA will safely rest on the hanger bolts, and will not fall away when with eight (8) retaining screws are removed. Failure to orient the OTA in this position prior to disassembly can result in damage to the telescope and/or personal injury.

## APPENDIX B: How to Read the Latitude Scale

The Latitude scale has three sets of measurements, one for each latitude range: 0 to 30°, 30° to 60° and 60 to 90°. Note that there are five extra degrees beyond both 0 and 90°. This allows you to add for latitudes just slightly below 0 and just slightly above 90 degrees. For instructions as to how to set up the wedge for your latitude range, see page 8, latitude adjustment.

A short tick marks on the scale represents one-half degree, a long tick marks represents one degree. Line up your latitude with the indicator line at the edge of scale.



In the example above, lets say you have chosen the latitude range of 30 to 60 degrees. This is the middle set of numbers (30, 40, 50 and 60). Count the number of longer tick marks from 40 down to the indicator. Always count from the set of numbers closest to the indicator. As there are four longer ticks down to the indicator, the scale reads 44 degrees. If you had chosen the 0 to 30 degree range, the scale reads 14 degrees. Additionally, if you chosen the 60 to 90 degree range, the scale reads 74 degrees.







# APPENDIX C: MAGNETIC DECLINATION

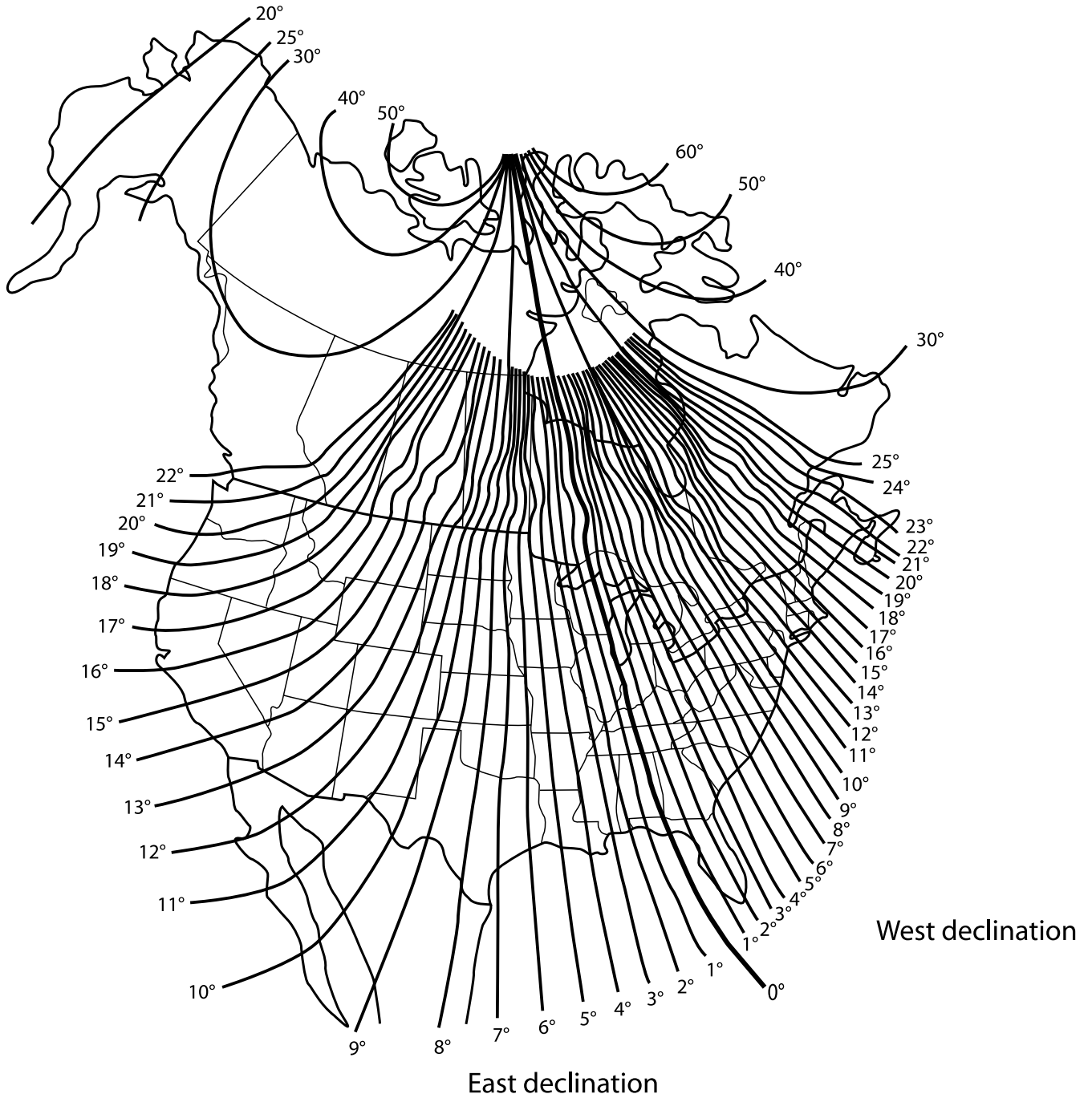


Figure 34. Magnetic declination map of North America.

# APPENDIX D: LATITUDE CHART

## Latitude Chart for Major Cities of the World

To aid in the polar alignment procedure latitudes of major cities around the world are listed below. To determine the latitude of an observing site not listed on the chart, locate the city closest to your site. Then follow the procedure below:

Northern hemisphere observers (N): If the site is over 70 miles

(110 km) North of the listed city, add one degree for every 70 miles. If the site is over 70 miles South of the listed city, subtract one degree per 70 miles.

Southern Hemisphere observers (S): If the site is over 70 miles (110 km) North of the listed city, subtract one degree for every 70 miles. If the site is over 70 miles South of the listed city, add one degree per 70 miles.

<b>NORTH AMERICA</b>			<b>EUROPE (continued)</b>		
City	State/Prov./Country	Latitude	City	Country	Latitude
Albuquerque	New Mexico	35° N	Oslo	Norway	60° N
Anchorage	Alaska	61° N	Paris	France	49° N
Atlanta	Georgia	34° N	Rome	Italy	42° N
Boston	Massachusetts	42° N	Stockholm	Sweden	59° N
Calgary	Alberta	51° N	Vienna	Austria	48° N
Chicago	Illinois	42° N	Warsaw	Poland	52° N
Cleveland	Ohio	41° N	<b>SOUTH AMERICA</b>		
Dallas	Texas	33° N	City	Country	Latitude
Denver	Colorado	40° N	Bogotá	Colombia	4° N
Detroit	Michigan	42° N	São Paulo	Brazil	23° S
Honolulu	Hawaii	21° N	Buenos Aires	Argentina	35° S
Jackson	Mississippi	32° N	Montevideo	Uruguay	35° S
Kansas City	Missouri	39° N	Santiago	Chile	34° S
Kenosha	Wisconsin	45° N	Caracas	Venezuela	10° N
Las Vegas	Nevada	36° N	<b>ASIA</b>		
Little Rock	Arkansas	35° N	City	Country	Latitude
Los Angeles	California	34° N	Beijing	China	40° N
Mexico City	Mexico	19° N	Hong Kong	China	23° N
Miami	Florida	26° N	Seoul	South Korea	37° N
Minneapolis	Minnesota	45° N	Taipei	Taiwan	25° N
Nashville	Tennessee	36° N	Tokyo	Japan	36° N
New Orleans	Louisiana	30° N	Sapporo	Japan	43° N
New York	New York	41° N	Bombay	India	19° N
Oklahoma City	Oklahoma	35° N	Calcutta	India	22° N
Ottawa	Ontario	45° N	Hanoi	Vietnam	21° N
Philadelphia	Pennsylvania	40° N	Jedda	Saudi Arabia	21° N
Phoenix	Arizona	33° N	<b>AFRICA</b>		
Portland	Oregon	46° N	City	Country	Latitude
Salt Lake City	Utah	41° N	Cairo	Egypt	30° N
San Antonio	Texas	29° N	Cape Town	South Africa	34° S
San Diego	California	33° N	Rabat	Morocco	34° N
San Francisco	California	38° N	Tunis	Tunisia	37° N
Seattle	Washington	47° N	Windhoek	Namibia	23° S
Washington	District of Columbia	39° N	<b>AUSTRALIA AND OCEANIA</b>		
<b>EUROPE</b>			City	State/Country	Latitude
City	Country	Latitude	Adelaide	South Australia	35° S
Amsterdam	Netherlands	52° N	Brisbane	Queensland	27° S
Athens	Greece	38° N	Canberra	New South Wales	35° S
Bern	Switzerland	47° N	Alice Springs	Northern Territory	24° S
Copenhagen	Denmark	56° N	Hobart	Tasmania	43° S
Dublin	Ireland	53° N	Perth	Western Australia	32° S
Frankfurt	Germany	50° N	Sydney	New South Wales	34° S
Glasgow	Scotland	56° N	Melbourne	Victoria	38° S
Helsinki	Finland	60° N	Auckland	New Zealand	37° S
Lisbon	Portugal	39° N			
London	England	51° N			
Madrid	Spain	40° N			

# MEADE LIMITED WARRANTY

Every Meade telescope, spotting scope, and telescope accessory is warranted by Meade Instruments Corp. ("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. and Canada. 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 calling (800) 626-3233. 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.

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27 Hubble  
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