

MAK90KM-EQ2

Kson®



Instructions

MAK90KM-EQ2 OPERATING INSTRUCTIONS

INTRODUCTION

THIS TELESCOPE HAS BEEN CORRECTED AGAINST CHROMATIC ABERRATION AND PRODUCED TO PRECISE SPECIFICATIONS.

PRIOR TO USING YOUR NEW KSON TELESCOPE, PLEASE READ THE FOLLOWING SETUP AND USAGE INSTRUCTIONS. IT IS IMPORTANT TO PROPERLY ASSEMBLE YOUR TELESCOPE IN ORDER TO ALLOW IT TO FUNCTION PROPERLY.

CONSIDER USING THE TELESCOPE FOR EARTH (TERRESTRIAL) VIEWING BEFORE ATTEMPTING TO VIEW ASTRONOMICAL OBJECTS. THIS WILL FAMILIARIZE YOU WITH HOW POWERFUL EACH EYEPIECE WILL BE, AS WELL AS INTRODUCING YOU TO THE FUNCTIONS OF YOUR ACCESSORY LENSES.

DUE TO THE DIAGONAL MIRROR POSITIONED IN THE FOCUS HOUSING, THE IMAGE YOU SEE WILL ALWAYS BE RIGHT SIDE UP. BUT LEFT AND RIGHT ARE REVERSED.

WE RECOMMEND YOU BEGIN WITH THE LOWEST POWER EYEPIECE, 25MM, WHEN USING YOUR TELESCOPE. AS YOU INCREASE THE POWER TO 10MM, YOUR POWER WILL BE HIGHER, BUT THE IMAGE WILL APPEAR DARKER; THIS IS DUE TO THE BASIC PHYSICAL PROPERTIES OF THE TELESCOPE. THE HIGHER THE POWER YOU USE THE DARKER THE IMAGE WILL APPEAR AND YOUR VIEWING FIELD WILL BE MORE NARROW.

PLEASE BE PATIENT WHEN USING YOUR TELESCOPE. IT IS A VERY SENSITIVE INSTRUMENT THAT IS CAPABLE OF USING HIGH POWERS. HOWEVER, THE MORE POWER YOU USE, THE MORE SENSITIVE THE TELESCOPE BECOMES. AS A RESULT, THE SLIGHTEST MOVEMENT OF THE TELESCOPE COULD CAUSE YOU TO LOSE THE IMAGE YOU HAVE IN YOUR EYEPIECE. PRACTICE WILL ENABLE YOU TO KNOW HOW MUCH MOVEMENT TO EXPECT WITH EACH EYEPIECE AND IT'S CORRESPONDING POWER.

ACCESSORIES

- A. ELECTRONIC RED DOT FINDER:
USED TO LOCATE OBJECTS PRIOR TO
USING MAIN TELESCOPE.
PLEASE NOTE YOU MUST ALIGN THE
FINDER WITH THE MAIN TUBE PRIOR TO
INITIAL ASTRONOMICAL OR TERRESTRIAL USE.



- B. EYEPIECES
25MM EYEPIECE =32X (LEAST POWERFUL - MOST LIGHT)
10MM EYEPIECE =80X (MOST POWERFUL - LEAST LIGHT)



- C. 3X BARLOW:
USED TO INCREASE THE POWER OF ANY GIVEN EYEPIECE BY
300%. EXAMPLE - 25MM EYEPIECE SEPARATELY PROVIDES 36X
POWER, WHEN USED WITH THE 3X BARLOW, YOU NOW HAVE
108X POWER.



- D. DIAGONAL MIRROR



- E. EQ2 EQUATORIAL MOUNT



NOTE: SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

ACCESSORIES

F. COUNTERWEIGHT



G. MICRO-ADJUSTMENT



H. MICRO-ADJUSTMENT



I. 2 x AZIMUTH MICRO-ADJUSTMENT KNOBS



AZIMUTH MICRO-ADJUSTMENT KNOBS

NOTE: SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

MAK90KM-EQ2 ASSEMBLY INSTRUCTIONS

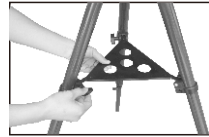
CAUTION: NEVER POINT YOUR TELESCOPE
AT THE SUN. VIEWING THE SUN WITH
THIS TELESCOPE OR EVEN THE UNAIDED
EYE CAN RESULT IN BLINDNESS OR OTHER
SERIOUS EYE DAMAGE.

1. REMOVE ALL PARTS FROM BOX AND IDENTIFY THEM.
TELESCOPE W/MOUNT ATTACHED
TRIPOD (PREASSEMBLED)
EQ2 EQUATORIAL MOUNT
ELECTRONIC RED DOT FINDER
EYEPieces (25MM & 10MM)
COUNTERWEIGHT
TWO MICRO-ADJUSTMENTS
ACCESSORY TRAY

2. ADJUST TRIPOD TO PROPER HEIGHT BY LOOSENING,
ADJUSTING AND TIGHTENING THE LOCKING KNOBS.



3. ATTACH ACCESSORY TRAY.



4. LOOSEN MOUNTING KNOB ON THE EQUATORIAL
MOUNT (UNDERNEATH)
5. PLACE THE EQUATORIAL MOUNT ONTO THE TOP
OF THE TRIPOD.
6. TIGHTEN LOCKING KNOB (UNDERNEATH THE TRIPOD TOP)
SECURELY.



7. ATTACH THE COUNTERWEIGHT TO THE
EQUATORIAL MOUNT.



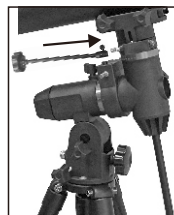
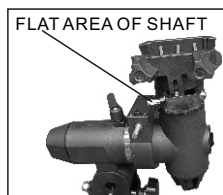
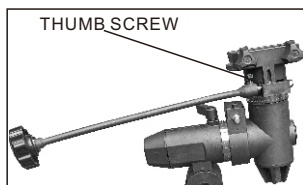
8. ATTACH THE TELESCOPE TO THE EQUATORIAL MOUNT.



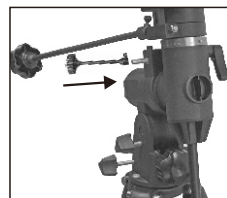
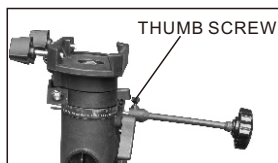
9. ALIGN THE BOTTOM OF RED DOT FINDER TO THE DOVETAIL OF THE FINDER BASE, THEN TIGHTEN THE SCREW.



10. ATTACH MICRO-ADJUSTMENT TO EQUATORIAL MOUNT. **TIGHTEN THE THUMB SCREW. MAKE SURE THE THUMB SCREW MATCHES THE FLAT AREA OF SHAFT.**



11. ATTACH MICRO-ADJUSTMENT TO EQUATORIAL MOUNT. **TIGHTEN THE THUMB SCREW. MAKE SURE THE THUMB SCREW MATCHES THE FLAT AREA OF SHAFT.**

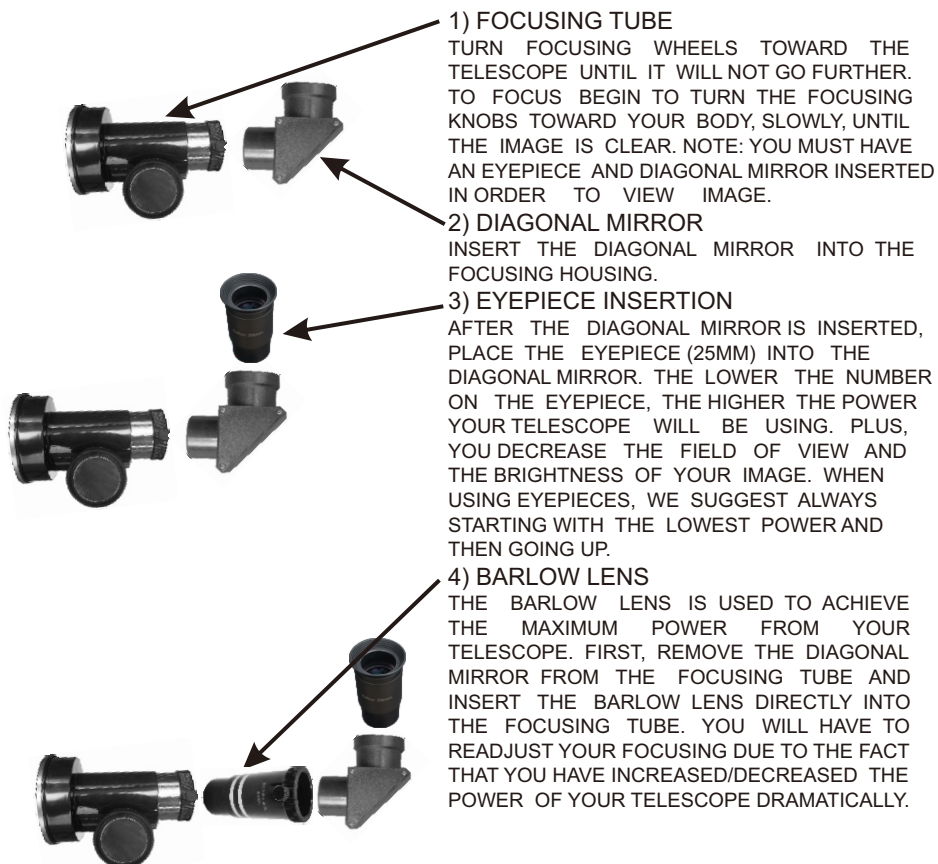


FEATURES OF MAK90KM-EQ2



HOW TO USE EYEPIECES & ACCESSORIES

PLEASE CONSIDER USING YOUR ACCESSORIES IN THE FOLLOWING ORDER. BY DOING THIS YOU WILL BETTER UNDERSTAND THE IMPACT EACH INDIVIDUAL ACCESSORY HAS ON THE FUNCTION OF YOUR TELESCOPE.



ELECTRONIC RED DOT FINDER MOUNTING & ALIGNMENT

TO MOUNT:

- 1) REMOVE ELECTRONIC RED DOT FINDER FROM BOX.
- 2) LOOSEN THUMB SCREWS ON SIDE OF FINDER AND SLIDE FINDER ONTO DOVETAIL MOUNT LOCATED AT TOP OF MAIN TELESCOPE TUBE.
- 3) TIGHTEN THUMB SCREWS.

TO CHECK ALIGNMENT WITH MAIN TELESCOPE:(IMPORTANT!)

- 1) THE ELECTRONIC RED DOT FINDER IS NOT PRE-SET AT FACTORY. THE FOLLOWING WILL ALLOW YOU TO ADJUST THE ALIGNMENT.
- 2) DURING THE DAY LIGHT HOURS, AIM THE MAIN TELESCOPE AT AN OBJECT AT LEAST 1/4 MILE OR MORE IN THE DISTANCE AND BRING IT INTO FOCUS.(VERY IMPORTANT)
- 3) ONCE YOU HAVE CENTERED THE REFERENCE ITEM IN THE MAIN TUBE, TIGHTEN ALL KNOBS AND ADJUSTMENTS TO PREVENT ANY MOVEMENT.
- 4) REMOVE CIRCULAR BATTERY SAVER LOCATED BENEATH FRONT OF FINDER (BE SURE. TO SAVE AND REPLACE THE BATTERY SAVER WHEN NOT IN USE.)
- 5) TURN FINDER ON BY SLIDING ON/OFF SWITCH FORWARD. ON/OFF SWITCH IS LOCATED ON THE RIGHT SIDE OF THE FINDER.
- 6) LOOK THROUGH THE FINDER AND LOCATE THE RED DOT.



- 7) IF THE OBJECT IN THE ELECTRONIC RED DOT FINDER IS NOT THE OBJECT YOU SEE THROUGH THE MAIN TELESCOPE TUBE, ADJUSTMENT IS REQUIRED.
- 8) TO MOVE THE RED DOT UP AND DOWN, SIMPLY TURN THE ELEVATION SCREW LOCATED ON THE REAR BOTTOM OF THE FINDER TO HEIGHT REQUIRED.
- 9) TO MOVE THE RED DOT LEFT AND RIGHT, SIMPLY TURN THE WINDAGE SCREW LOCATED AT THE FRONT LEFT SIDE OF THE FINDER TO THE PROPER POSITION.
- 10) THESE ADJUSTMENTS WILL ALLOW YOU TO POSITION THE RED DOT ON THE SAME OBJECT CENTERED IN THE MAIN TELESCOPE.



USING THE BARLOW LENS

AS STATED EARLIER IN THE INSTRUCTIONS, THE BARLOW LENS INCREASES THE POWER OF THE EYEPIECES BY 3 TIMES.

TO USE SIMPLY INSERT THE BARLOW LENS INTO THE MAIN FOCUSING TUBE AND THEN PUT THE DESIRED EYEPIECE INTO THE RECEIVING END OF THE BARLOW LENS

PLEASE REMEMBER, THE HIGHER THE POWER YOU USE THE DARKER THE IMAGE WILL APPEAR.

POWER CHART

EYEPIECE	POWER	POWER WITH 3X BARLOW
25MM	36X	108X
10MM	90X	270X

GETTING THE MOST FROM YOUR TELESCOPE

TAKE THE TIME TO BECOME FAMILIAR WITH YOUR NEW TELESCOPE. LEARN THE NAMES OF THE VARIOUS PARTS, WHERE THEY ARE LOCATED AND THEIR FUNCTION. IT IS BEST TO PERFORM THESE FUNCTIONS DURING THE DAY TIME.

WHEN SETTING UP FOR A VIEWING SESSION, PLACE THE TELESCOPE IN AN AREA SHELTERED FROM THE WIND IF POSSIBLE. THE BEST NIGHT TIME VIEWING WILL BE AWAY FROM CITY LIGHT AND WHEN THE ATMOSPHERE IS "STEADY".

WITH A LITTLE PRACTICE YOU WILL LEARN TO JUDGE WHEN VIEWING CONDITIONS ARE GOOD. LOOK FOR THE NIGHTS WHEN THE STARS SHINE BRIGHTLY WITH LITTLE OR NO TWINKLING.

USE LOW POWER TO TAKE ADVANTAGE OF THE WIDER FIELD OF VIEW AND BRIGHTER IMAGE. RESERVE YOUR HIGHER POWERS FOR THOSE NIGHTS WHEN VIEWING CONDITIONS ALLOW FOR DETAILED OBSERVATIONS.

MOVING THE TELESCOPE MANUALLY

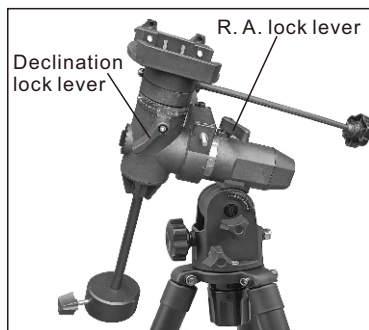
IN ORDER TO PROPERLY BALANCE YOUR TELESCOPE, YOU WILL NEED TO MOVE YOUR TELESCOPE MANUALLY AT VARIOUS PORTIONS OF THE SKY TO OBSERVE DIFFERENT OBJECTS. TO MAKE ROUGH ADJUSTMENTS, LOOSEN THE R.A. AND DEC CLUTCH KNOBS SLIGHTLY AND MOVE THE TELESCOPE IN THE DESIRED DIRECTION.

BOTH THE R.A. AND DEC AXIS HAVE LOCK LEVERS TO CLUTCH DOWN EACH AXIS OF THE TELESCOPE. TO LOOSEN THE CLUTCHES ON THE TELESCOPE, ROTATE THE LOCK LEVERS COUNTERCLOCKWISE.

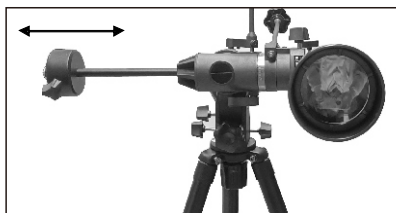
BALANCING THE MOUNT IN R.A.

TO ELIMINATE UNDUE STRESS ON THE MOUNT, THE TELESCOPE SHOULD BE PROPERLY BALANCED AROUND THE POLAR AXIS. PROPER BALANCING IS CRUCIAL FOR ACCURATE TRACKING. TO BALANCE THE MOUNT:

1. VERIFY THAT THE TELESCOPE IS SECURELY ATTACHED TO THE TELESCOPE MOUNTING PLATFORM.
2. LOOSEN THE R.A. LOCK LEVER AND POSITION THE TELESCOPE OFF TO ONE SIDE OF THE MOUNT. THE COUNTER WEIGHT BAR WILL EXTEND HORIZONTALLY ON THE OPPOSITE SIDE OF THE MOUNT.
3. RELEASE THE TELESCOPE— GRADUALLY —TO SEE WHICH WAY THE TELESCOPE “ROLLS.”
4. LOOSEN THE SET SCREWS ON THE SIDE OF THE COUNTER WEIGHT SO IT CAN BE MOVED THE LENGTH OF THE COUNTER WEIGHT BAR.
5. MOVE THE COUNTER WEIGHT TO A POINT WHERE IT BALANCES THE TELESCOPE (I.E., THE TELESCOPE REMAINS STATIONARY WHEN THE R.A. CLUTCH KNOBS ARE LOOSE).
6. TIGHTEN THE SCREW ON THE COUNTER WEIGHT TO HOLD IT IN PLACE.



WHILE THE ABOVE INSTRUCTIONS DESCRIBE A PERFECT BALANCE ARRANGEMENT, THERE SHOULD BE A SLIGHT IMBALANCE TO ENSURE THE BEST POSSIBLE TRACKING. WHEN THE SCOPE IS ON THE WEST SIDE OF THE MOUNT THE COUNTER WEIGHT SHOULD BE SLIGHTLY IMBALANCED TO THE COUNTER WEIGHT BAR SIDE. AND WHEN THE TUBE IS ON THE EAST SIDE OF THE MOUNT THERE SHOULD BE A SLIGHT IMBALANCE TOWARD THE TELESCOPE SIDE. THIS IS DONE SO THAT THE WORM GEAR IS PUSHING AGAINST A SLIGHT LOAD. THE AMOUNT OF THE IMBALANCE IS VERY SLIGHT. WHEN TAKING ASTROPHOTOGRAPHS, THIS BALANCE PROCESS CAN BE DONE FOR THE SPECIFIC AREA AT WHICH THE TELESCOPE IS POINTING TO FURTHER OPTIMIZE TRACKING ACCURACY.



BALANCING THE MOUNT IN DEC

ALTHOUGH THE TELESCOPE DOES NOT TRACK IN DECLINATION, THE TELESCOPE SHOULD ALSO BE BALANCED IN THIS AXIS TO PREVENT ANY SUDDEN MOTIONS WHEN THE DEC LOCK LEVER IS LOOSE. TO BALANCE THE TELESCOPE IN DEC:

1. LOOSEN THE R.A. CLUTCH LOCK LEVER AND ROTATE THE TELESCOPE SO THAT IT IS ON ONE SIDE OF THE MOUNT (I.E., AS DESCRIBED IN THE PREVIOUS SECTION ON "BALANCING THE MOUNT IN R.A.")
2. TIGHTEN THE R.A. LOCK LEVER TO HOLD THE TELESCOPE IN PLACE.
3. LOOSEN THE DEC CLUTCH LOCK LEVER AND ROTATE THE TELESCOPE UNTIL THE TUBE IS PARALLEL TO THE GROUND.
4. RELEASE THE TUBE – **GRADUALLY**– TO SEE WHICH WAY IT ROTATES AROUND THE DECLINATION AXIS. **DO NOT LET GO OF THE TELESCOPE TUBE COMPLETELY!**
5. SLIGHTLY LOOSEN THE KNOBS THAT HOLDS THE TELESCOPE TO THE MOUNTING PLATFORM AND SLIDE THE TELESCOPE EITHER FORWARD OR BACKWARD UNTIL IT REMAINS STATIONARY WHEN THE DEC CLUTCH IS LOOSE. DO NOT LET GO OF THE TELESCOPE TUBE WHILE THE KNOB ON THE MOUNTING PLATFORM IS LOOSE. IT MAY BE NECESSARY TO ROTATE THE TELESCOPE SO THAT THE COUNTER WEIGHT BAR IS POINTING DOWN BEFORE LOOSENING THE MOUNTING PLATFORM SCREW.
6. TIGHTEN THE KNOBS ON THE TELESCOPE MOUNTING PLATFORM TO HOLD THE TELESCOPE IN PLACE.

LIKE R.A. BALANCE, THESE ARE GENERAL BALANCE INSTRUCTIONS AND WILL REDUCE UNDUE STRESS ON THE MOUNT. WHEN TAKING ASTROPHOTOGRAPHS, THIS BALANCE PROCESS SHOULD BE DONE FOR THE SPECIFIC AREA AT WHICH THE TELESCOPE IS POINTING.

ADJUSTING THE MOUNT

IN ORDER FOR THE TELESCOPE TO TRACK ACCURATELY, THE TELESCOPE'S AXIS OF ROTATION MUST BE PARALLEL TO THE EARTH'S AXIS OF ROTATION, A PROCESS KNOWN AS POLAR ALIGNMENT. POLAR ALIGNMENT IS ACHIEVED NOT BY MOVING THE TELESCOPE IN R.A. OR DEC, BUT BY ADJUSTING THE MOUNT VERTICALLY, WHICH IS CALLED ALTITUDE, AND HORIZONTALLY, WHICH IS CALLED AZIMUTH. THIS SECTION SIMPLY COVERS THE CORRECT MOVEMENT OF THE TELESCOPE DURING THE POLAR ALIGNMENT PROCESS. THE ACTUAL PROCESS OF POLAR ALIGNMENT, THAT IS MAKING THE TELESCOPE'S AXIS OF ROTATION PARALLEL TO THE EARTH'S, IS DESCRIBED LATER IN THIS MANUAL IN THE SECTION ON "POLAR ALIGNMENT."

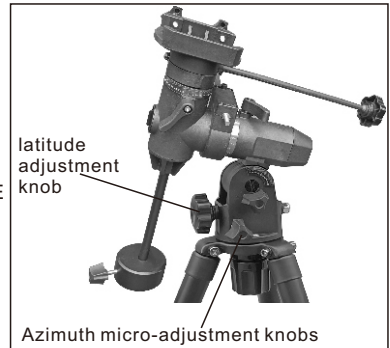
ADJUSTING THE MOUNT IN ALTITUDE

TO INCREASE THE LATITUDE OF THE POLAR AXIS, ROTATE LATITUDE ADJUSTMENT KNOB CLOCKWISE.

TO DECREASE THE LATITUDE OF THE POLAR AXIS, ROTATE LATITUDE ADJUSTMENT KNOB COUNTERCLOCKWISE.

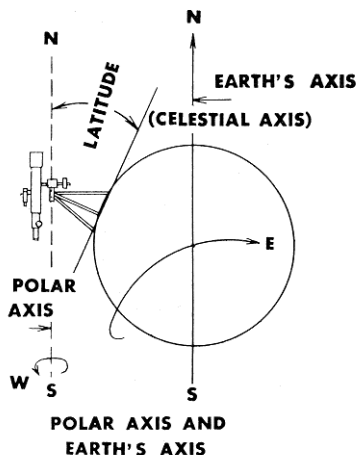
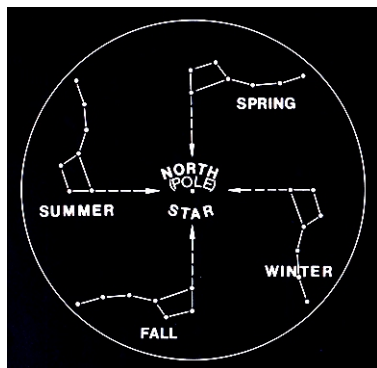
THE LATITUDE ADJUSTMENT ON THE EQUATORIAL MOUNT HAS A RANGE FROM APPROXIMATELY 0° GOING UP TO ABOUT 68° .

IT IS BEST TO ALWAYS MAKE FINAL ADJUSTMENTS IN ALTITUDE BY MOVING THE MOUNT AGAINST GRAVITY (I.E. USING THE LATITUDE ADJUSTMENT KNOB TO RAISE THE MOUNT). THERE IS ONLY ONE KNOB NEEDED TO RAISE THE MOUNT TO THE DESIRED LATITUDE.



KEEP IN MIND THAT ADJUSTING THE MOUNT IS DONE DURING THE POLAR ALIGNMENT PROCESS ONLY. ONCE POLAR ALIGNED, THE MOUNT MUST NOT BE MOVED. POINTING THE TELESCOPE IS DONE BY MOVING THE MOUNT IN RIGHT ASCENSION AND DECLINATION, AS DESCRIBED EARLIER IN THIS MANUAL.

POLAR ALIGNMENT



TAKE THE TELESCOPE OUTSIDE AROUND 30 MINUTES BEFORE YOU ARE READY TO OBSERVE. THIS WILL LET THE TELESCOPE COOL DOWN TO THE AMBIENT TEMPERATURE. THIS WILL ALLOW THE TELESCOPE TO PERFORM AT IT'S BEST.

ONCE IT'S DARK YOU ARE READY TO DO A POLAR ALIGNMENT. LOCATE THE STAR POLARIS, AND POINT THE TELESCOPE'S R.A. AXIS TOWARD THE STAR POLARIS. TO DO A POLAR ALIGNMENT, THE R.A. & DEC. AXES MUST BE LOCKED DOWN AND MUST NOT MOVE. TO GET POLARIS IN THE EYEPIECE YOU MUST MOVE THE MOUNT IN AZIMUTH AND LATITUDE TO CENTER POLARIS IN THE EYEPIECE. ONCE THIS IS DONE, LOCK THE AZIMUTH & LATITUDE LOCK KNOBS, AND YOU ARE READY TO OBSERVE. NOW, TO MOVE THE TELESCOPE TO AN OBJECT (MOON, JUPITER, SATURN ETC.) YOU MUST ONLY MOVE THE TELESCOPE IN THE R.A. & DEC. AXES AFTER THE POLAR ALIGNMENT HAS BEEN COMPLETED. LOOSEN THE R.A. & DEC. AXES AND MOVE THE TELESCOPE TO AN OBJECT BY LOOKING THROUGH THE FINDER (WHICH HAS ALREADY BEEN ALIGNED), AND PLACE THE RED DOT ON THE OBJECT. START OBSERVING BY USING THE 25MM EYEPIECE WHICH GIVES YOU THE WIDEST FIELD OF VIEW AND BRIGHTEST IMAGE. WHEN OBSERVING THE MOON AND PLANETS START OUT WITH THE 25MM EYEPIECE. WHEN YOU WANT TO GET A LARGER IMAGE, CENTER THE OBJECT IN THE EYEPIECE, AND CAREFULLY TAKE THE 25MM OUT AND REPLACE IT WITH THE 10MM. WHEN USING THE BARLOW, IT MUST BE PLACED INTO THE FOCUSER BEFORE THE EYEPIECE.

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