Eklipse

Ekcentrik Mount

INSTRUCTIONS

CONTENT

EKLIPSE EKCENTRIK MOUNT OPERATING INSTRUCTIONS

INTRODUCTION

CONGRATULATIONS ON YOUR PURCHASE OF THE EKLIPSE EKCENTRIK SERIES TELESCOPE MOUNT! THE SERIES OF TELESCOPE MOUNT COME IN EKCENTRIK STANDARD, EKCENTRIK ADVANCED AND EKCENTRIK WEDGE MODELS. ALL OF THE SERIES ARE MADE OF THE HIGHEST QUALITY MATERIALS TO ENSURE STABILITY AND GIVES YOU A LIFETIME PLEASURE OF WITH A MINIMAL AMOUNT OF MAINTENANCE.

NOTE: SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

EKCENTRIK GOTO MOUNT
ALL PARTS

A) EKCENTRIK MOUNT

B) FULLY ADJUSTABLE STAINLESS STEEL TRIPOD.

C) ACCESSORY TRAY.

D) COUNTER WEIGHT ROD ASSEMBLY, WITH THREE COUNTER WEIGHTS.

E) EKSTREAM GOTO KONTROLLER 30

F) AC ADAPTER

G) UPGRADE CABLE

H) CAR LIGHTER CABLE

I) USB TO SERIAL DRIVER SOFTWARE

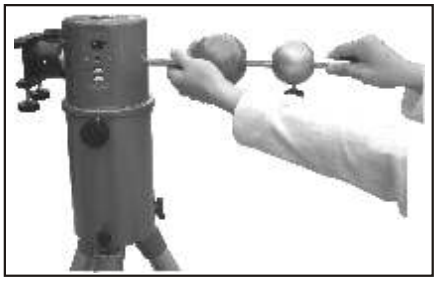
EKCENTRIK GOTO MOUNT ASSEMBLY INSTRUCTIONS

1. REMOVE ALL PARTS FROM BOX AND IDENTIFY THEM.
   - EKCENTRIK MOUNT
   - TRIPOD
   - ACCESSORY TRAY
   - COUNTER WEIGHT
   - EKSTREAM GOTO KONTROLLER 30
   - AC ADAPTER
   - UPGRADE CABLE
   - CAR LIGHTER CABLE
   - DRIVER SOFTWARE

2. SET UP THE TRIPOD BY UNLOCKING TRIPOD LEGS LOCKING KNOB, ADJUST THE TRIPOD TO THE HEIGHT YOU NEED, THEN TIGHTEN THE LOCKING KNOB.

3. REMOVE THE THREE LOCKING KNOBS ON THE ACCESSORY TRAY FIXTURE, PUT THE ACCESSORY TRAY FROM BOTTOM, THEN PUT THE LOCKING KNOBS AND TIGHTEN.

4. THE MOUNT IS COMING WITH A 6″ EXTENSION TUBE. JUST UNSCREW THE EXTENSION TUBE LOCKING KNOB FROM THE TRIPOD HEAD, PUT THE EXTENSION TUBE ON THE TRIPOD HEAD, THEN TIGHTEN THE LOCKING KNOB.

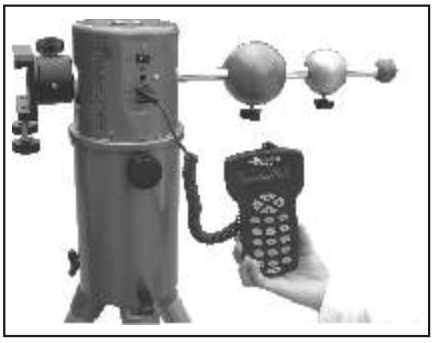


5. PUT THE SPHERICAL COUNTERWEIGHT KIT.

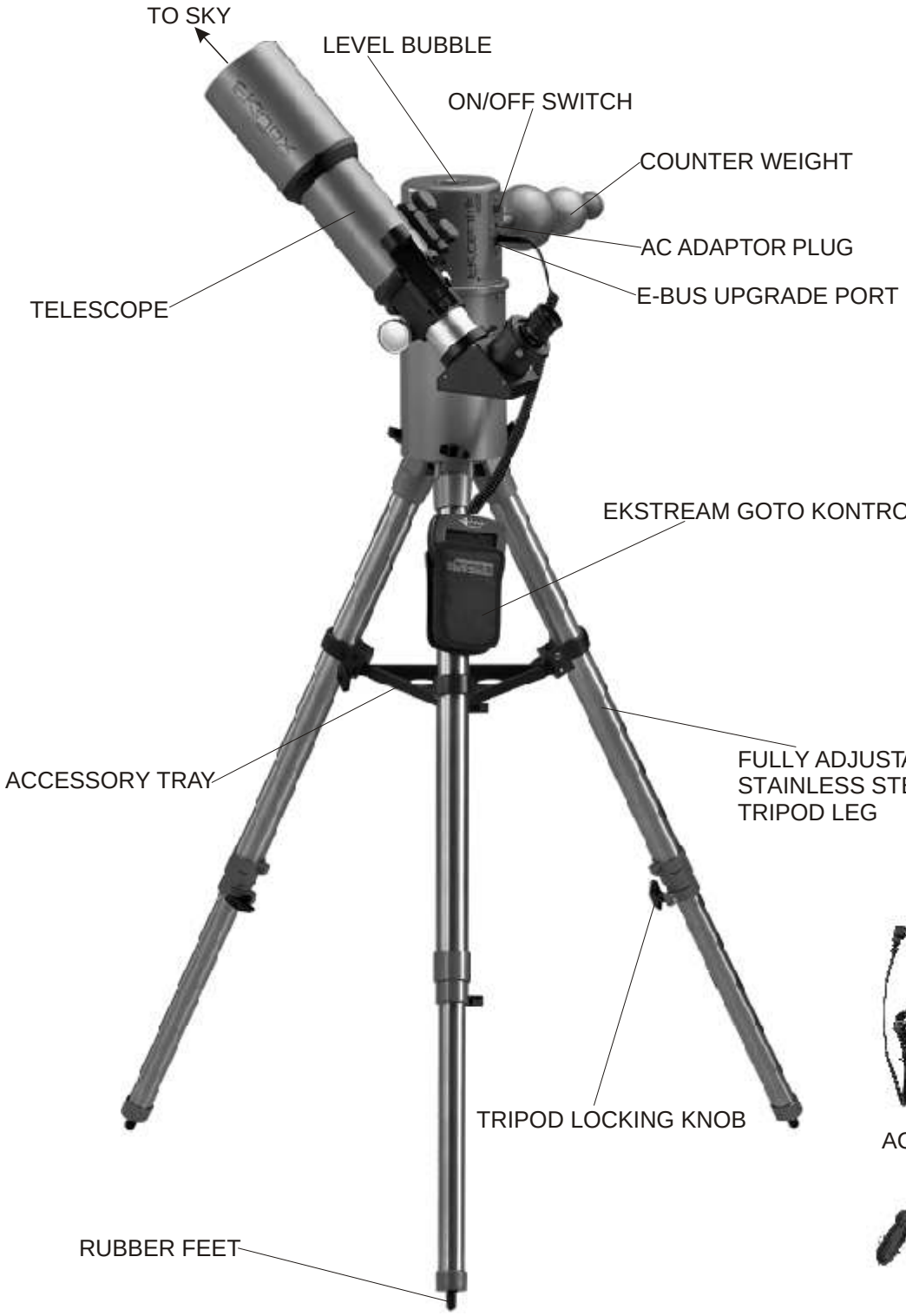
6. THERE IS A LEVEL BUBBLE ON THE TOP. ADJUST THE TRIPOD LEGS TO HAVE THE BUBBLE IN THE CENTER AS PRECISE AS POSSIBLE, TO GET PRECISION GOTO FUNCTION.

7. PLUG THE EKSTREAM GOTO KONTROLLER 30 IN THE HANDBOX PORT, AND THEN PLUG THE POWER LINE IN THE POWER PORT.

8. TURN ON THE POWER. ENJOY THE PLEASURE OF THE UNIQUE EKCENTRIK MOUNT.



FEATURES OF EKCENTRIK MOUNT



AC ADAPTER

CAR LIGHTER CABLE

UPGRADE CABLE

NOTE: THE EKO-SYSTEM, THE ORBITTING PLANETS COUNTERWEIGHT IDEA WAS DESIGNED BY CHRISTIAN LAFLEUR FROM HEMISPHERE CANADA INC. WHO IS WORKING IN PARTNERSHIP WITH KSON OPTICS FOR PRODUCTS DESIGN, IMPROVEMENTS AND INNOVATIONS.

THE TELESCOPE DOES NOT INCLUDE WITH THE MOUNT.

OPERATION MANUAL FOR EKSTREAM KONTROLLER 30

KEY DESCRIPTION:

NAVIGATION KEYS: MOVE THE TELESCOPE TO THE DIRECTION ACCORDING TO THE ARROW IN THE GOTO STATUS. SCROLL UP AND DOWN OR GO FORWARD OR BACKWARD TO SELECT IN THE SET UP STATUS.

MENU: GO INTO THE MENU STATUS WHEN IN THE NAVIGATION STATUS.

STOP: STOP TRAKCING OR FOR TERRESTRIAL OBJECT OBSERVING. RE-PRESS TO START TRACKING AGAIN. SEE MORE DETAILS ON PAGE 16.

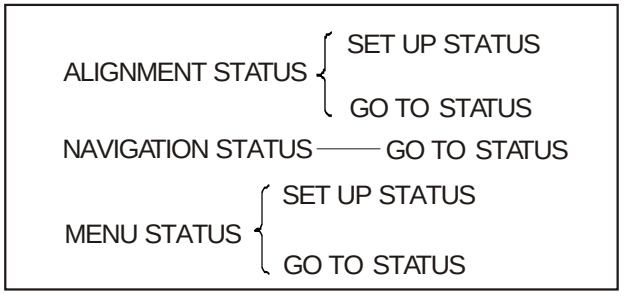
BACK: GO BACK TO PREVIOUS STEP.

NUMBER KEYS: PRESS THE NUMBER 1 (2X), 2 (8X) , 3 (64X) ,4 (SLEW SPEED) TO SELECT THE CORRESPONDING MOTOR SPEED IN THE GOTO STATUS. SELECT THE CORRESPONDING OPTION OR INPUT NUMBERS IN THE SET UP STATUS.

OK: CONFIRM THE SELECTION.

C: WITHDRAW PREVIOUS INPUT OR SAY NO TO THE QUESTION.

STATUS DESCRIPTION:

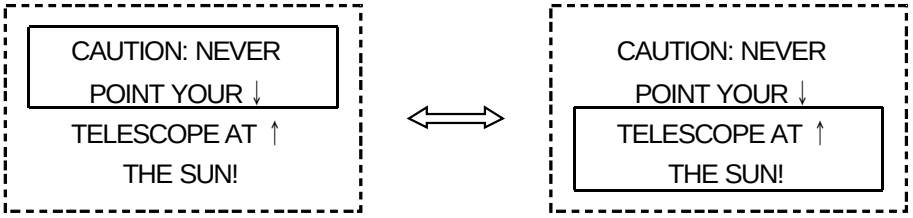


OPERATION PROCESS:

Ⅰ. POWER ON AND DISPLAY THE FOLLOWING FOR 2 SECONDS:

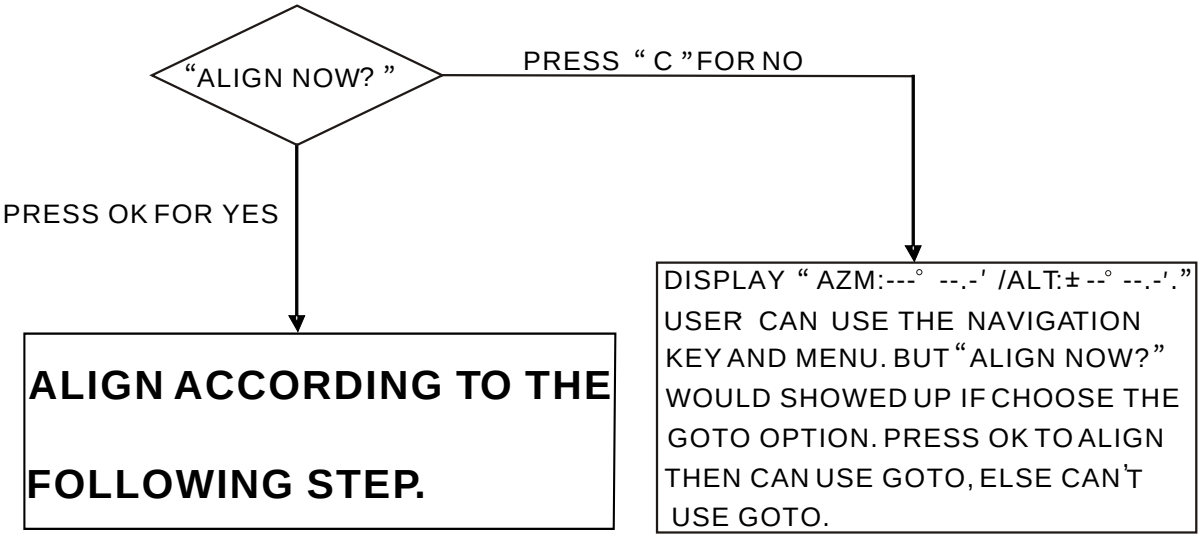
EKLIPSE EKSTREAM
KONTROLLER 30

Ⅱ. WARNING. USER HAS TO SCROLL DOWN TO FINISH READING THEN PRESS OK TO GO INTO THE NEXT STEP.



Ⅲ. ALIGNMENT STATUS:

PRESS **OK**, THE SCREEN DISPLAYS:

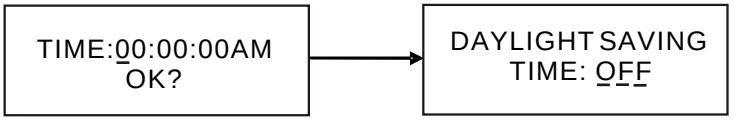


1. CHANGE THE DATE: DISPLAY THE FOLLOWING. (DISPLAY THE INITIALIZED VALUE IF THE FIRST USE OR AFTER A RESET. ELSE IF DISPLAY THE SET UP OF LAST USE.)

DATE: 01M01D2009Y
OK?

THE TEN DIGITS OF THE MONTH IS FLASHING (THE UNDERLINE INDICATES THAT THIS DIGIT IS FLASHING), WHICH MEANS THIS DIGIT CAN BE CHANGED BY PRESSING THE CORRESPONDING NUMBER KEY. AFTER PRESSING THE FLASHING DIGIT IT WILL BE TURNED TO THE NEXT. PRESS◀ OR ▶ KEY CAN CHOOSE THE CHANGEABLE DIGIT. PRESS ***OK*** WHEN FINISH AND GO TO THE NEXT STEP. PRESS ***BACK*** TO GO BACK TO THE "ALIGN NOW?" OPTION.

2. CHANGE THE TIME:



MODIFICATION PRINCIPLE REFERS ABOVE. PRESS ***OK*** WHEN FINISH AND GO TO THE NEXT STEP. PRESS ***BACK*** WILL GO BACK TO THE PREVIOUS STEP.

3. CHANGE THE SITE:

PRESS ***OK*** IF THE CITY INFORMATION IS CORRECT AND GO INTO STEP 4 DIRECTLY. PRESS ***BACK*** WILL GO BACK TO THE PREVIOUS STEP. PRESS ***C*** TO CHANGE THE CITY. DISPLAY THE FOLLOWING.

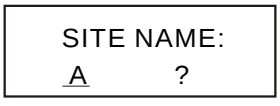
FOR EXAMPLE, CHOOSE 1. US. DISPLAY THE FOLLOWING.

THE CITY NAME SHOW ON **LCD** SCREEN MEANS THIS CITY IS CHOSEN BY PRESSING **OK**. PRESS ▲ OR ▼ TO TURN TO THE PREVIOUS OR NEXT 10 CITY. PRESS ◄ OR ► TO TURN TO THE PREVIOUS OR NEXT THE CITY. PRESS **OK** TO FINISH.

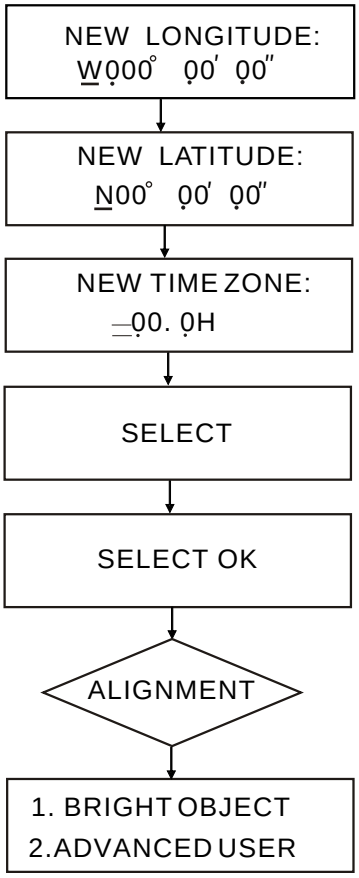
IF CHOOSE 5 TO INPUT A NEW CITY IN STEP ①, DISPLAY THE FOLLOWING.

PRESS 1 TO SELECT THE USER CITY WHICH IS ALREADY STORED. PRESS 2 TO ADD A NEW USER CITY. PRESS 3 TO EDIT A USER CITY ALREADY STORED. PRESS 4 TO DELETE A USER CITY ALREADY STORED.

IF CHOOSE 2 TO ADD A NEW USER CITY IN STEP ②, DISPLAY THE FOLLOWING.



PRESS ▼ TO MAKE THE FLASHING LETTER CHANGE FROM **A** TO **Z** TO **A**. OTHERWISE PRESS ▲. USER ALSO CAN USE THE NUMBER KEYS TO INPUT NUMBERS. PRESS ◄ OR ► TO CHOOSE THE PREVIOUS OR NEXT CHANGEABLE LETTER. THE CITY NAME IS NO MORE THAN 13 LETTERS. INPUT THE OTHER INFORMATION WHEN FINISH.



PRESS ANY NUMBER KEY TO CHANGE **W** OR **E**, "**W**" DENOTES WEST; "**E**" DENOTES EAST

PRESS ANY NUMBER KEY TO CHANGE **N** OR **S**, "**N**" DENOTES NORTH; "**S**" DENOTES SOUTH

PRESS ANY NUMBER KEY TO CHANGE **+** OR **-**

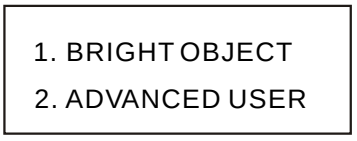
PRESS 1 TO SELECT THE CITY YOU ADDED. -

THE W&E OF THE LONGITUDE, N&S OF THE LATITUDE AND +&- OF THE TIME ZONE CAN BE CHANGED BY PRESSING ANY NUMBER KEY.

IF CHOOSE 1 TO SELECT THE NEW USER CITY IN STEP ②, DISPLAY THE LIST OF THE USER CITY WHICH IS ALREADY STORED.

4. ALIGNMENT

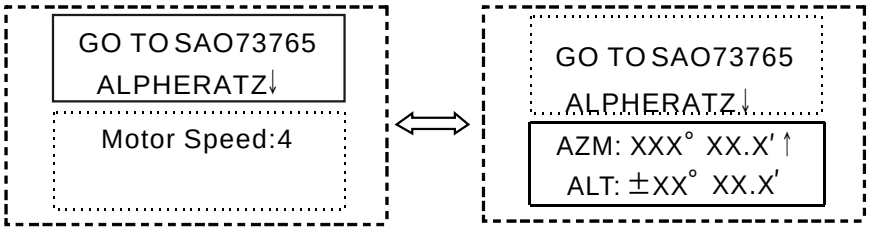
DISPLAY THE FOLLOWING TWO ALIGNMENT METHOD AUTOMATICALLY.



a. IF YOU CHOOSE : ***BRIGHT OBJECT***, THE CONTROLLER WILL DISPLAY SEVERAL OBJECTS WHICH CAN BE SEEN AT THE TIME CHOSEN. THERE ARE 15 OBJECTS INSIDE THAT ARE ENOUGH FOR MOST USERS.

ALIGN ACCORDING TO THE DEFAULT ALIGNMENT STARS IN THE CONTROLLER.

SCREEN DISPLAYS THE ALIGNMENT STARS WHICH CAN BE USED NOW. IT SHOWS THE ALIGNMENT OBJECT CURRENT ALT/AZM COORDINATES. USER CAN ESTIMATE WHERE



THE OBJECT LOCATION IS IN THE SKY. THESE 15 OBJECTS ARE VERY BRIGHT PLANETS OR STARS. SO IT IS VERY EASY TO SEE.

AFTER THE ALIGNMENT OBJECT IS CHOSEN, THE SCREEN SHOWS

PRESS KEYS TO
CENTER IT IN FOV

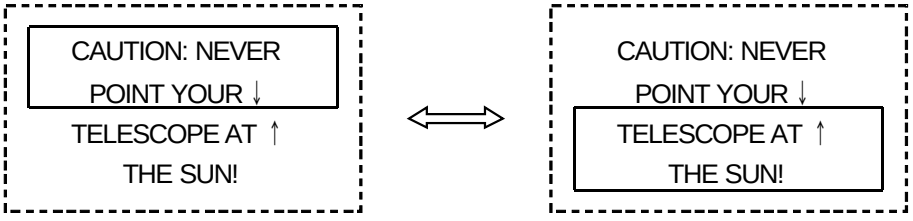
PLEASE PRESS NAVIGATION KEYS TO ADJUST THE ALIGNMENT OBJECT IN THE CENTER OF THE FIELD OF VIEW.

PRESS THE NAVIGATING KEYS TO ADJUST THE DIRECTION OF THE TELESCOPE ACCORDING TO THE DIRECTION OF THE ARROWHEAD. PRESS THE CORRESPONDING NUMBER KEY TO CHANGE THE MOTOR SPEED FROM 1 TO 4. DEFAULT SPEED IS 4 (550X OR 720X BASED ON DIFFERENT MODELS).

PRESS OK WHEN THE ALIGNMENT OBJECT IS IN THE CENTER OF YOUR FIELD OF VIEW. IT WILL DISPLAY ALIGNMENT SUCCESSFULLY.

ALIGNMENT
SUCCESSFULLY

PLEASE NOTE: SUN IS DESIGNATED AS ONE OF ALIGNMENT OBJECT FOR DAYTIME USE. AFTER THE SUN IS CHOSEN, THE SCREEN SHOWS:



WARNING: SUN IS PROHIBITED TO BE USED AS ALIGNMENT OBJECT. IF SUN IS SELECTED, MAKE SURE USER MUST BE ACCOMPANIED AND SUPERVISED BY PROFESSIONALS OR EXPERIENCED AMATEURS. SUN FILTER MUST BE USED WITH THE TELESCOPE.

OK NEEDS TO BE PRESSED TO GO TO NEXT STEP.

b. IF YOU CHOOSE 2. *ADVANCED USER*, THE CONTROLLER ALLOW USER TO USE ANY STARS IN THE SKY AS ALIGNMENT STAR, LIST AS BELOW:

(1) NAMED STAR

(2) SAO

PRESS 1, THE CONTROLLER WILL GO INTO THE NAMED STAR DATABASE. USER CAN CHOOSE FROM THE 240 LISTED STARS BY PRESS THE NAVIGATION KEYS. PRESS ▲ OR ▼ TO TURN TO THE PREVIOUS OR NEXT 10 LIST. PRESS ◄ OR ► TO TURN TO THE PREVIOUS OR NEXT LIST. PRESS OK TO FINISH. IT WILL DISPLAY **OBJECT BELOW HORIZON** IF IT DOES NOT RISE OR ALREADY SET.

PRESS 2, THE CONTROLLER WILL GO INTO THE SAO DATABASE. USER CAN CHOOSE FROM THE 23,543 LISTED STARS BY INPUT THE SAO NUMBER. PRESS ▲ OR ▼ TO TURN TO THE PREVIOUS OR NEXT 10 LIST. PRESS ◄ OR ► TO TURN TO THE PREVIOUS OR NEXT LIST. PRESS OK TO FINISH. IT WILL DISPLAY **OBJECT BELOW HORIZON** IF IT DOES NOT RISE OR ALREADY SET.

PRESS THE NAVIGATING KEYS TO ADJUST THE DIRECTION OF THE TELESCOPE ACCORDING TO THE DIRECTION OF THE ARROWHEAD. PRESS THE CORRESPONDING NUMBER KEY TO CHANGE THE MOTOR SPEED FROM 1 TO 4. DEFAULT SPEED IS 4 (550X OR 720X BASED ON DIFFERENT MODELS).

PRESS OK WHEN THE ALIGNMENT OBJECT IS IN THE CENTER OF YOUR FIELD OF VIEW. IT WILL DISPLAY ALIGNMENT SUCCESSFULLY.

ALIGNMENT SUCCESSFULLY

IN EKCENTRIK MOUNT AND EKSTREAM KONTROLLER SYSTEM, USING ONE-STAR IS ACCURATE ENOUGH FOR ALIGNMENT.

Ⅳ. NAVIGATION STATUS

DISPLAY THE CURRENT AZM/ALT COORDINATES. MOVE THE TELESCOPE BY THE NAVIGATING KEYS. THE AZM/ALT COORDINATION IN THE DISPLAY INTERFACE UPDATING EVERY SECOND.

AZM:XXX° XX.X′ ALT:±XX° XX.X′

THE TELESCOPE WOULD AUTO TRACK AFTER ALIGNMENT IS FINISHED. PRESS **STOP** KEY TO CANCEL TRACKING.

PRESS THE NAVIGATING KEYS TO ADJUST THE DIRECTION OF THE TELESCOPE ACCORDING TO THE DIRECTION OF THE ARROWHEAD. PRESS THE CORRESPONDING NUMBER KEY TO CHANGE THE MOTOR SPEED FROM 1 TO 4.

Ⅴ. MENU STATUS

PRESS MENU KEY TO THE MENU STATUS FROM THE NAVIGATION STATUS.

ALT/AZM MOUNTING

MENU
- 1. GO TO OBJECTS
- 2.SET UP
- 3.SYSTEM

1. GO TO DATABASE

- GO TO OBJECT
  - 1.DATABASE
    - 1. SAO STARS: 23,544
    - 2.NGC: 7,840
    - 3.MESSIER: 110
  - 2.NAMED OBJECTS
    - 0. NAMED STARS 240
    - 1. NAMED NEBULA 62
    - 2. ASTERISMS & OTHERS 59
    - 3. COMMON NON-STELLAR 113
    - 4. NAMED GALAXY 27
    - 5. NAMED CLUSTER 17
    - 6. MIXED DEEP SKY 7
    - 7. CONSTELLATION 88
    - 8. BOBBLE STARS 153
    - 9. VARIABLE STARS 63
  - 3. SOLAR SYSTEM
    - 0. MOON
    - 1. MERCURY
    - 2. VENUS
    - 3. MARS
    - 4. JUPITER
    - 5. SATURN
    - 6. URANUS
    - 7. NEPTUNE
    - 8. PLUTO
    - 9. SUN
  - 4. ENTER RA-DEC: USER MAY INPUT OBJECT RA-DEC WHICH IS NOT LISTED IN THE CONTROLLER
  - 5. WATCH LIST: THERE ARE 15 OBJECTS CAN BE STORED IN THE LIST. USER MAY USE IT TO FIND OBJECT ALREADY OBSERVED
  - 6. LANDOBJECT: IN AZ/ALT MODE, USER CAN STORE LAND OBJECT IF THE MOUNT/TELESCOPE BE ALIGNED CORRECTLY.
    SEE MORE DETAILS ON PAGE 16.

2. SET UP

- SET UP
  - 1.ALIGN
    - 1.BRIGHT OBJECT
    - 2.ADVANCED USER

    OR FOR EQ MODE
    - **1.AUTO ALIGNMENT**
    - **2.ADVANCED USER**
  - 2.DATE
  - 3.TIME
  - 4. SITE
    - 1.USA
    - 2.CANADA
    - 3.EUROPE
    - 4.OCEANIA
    - 5.ASIA
    - 6.CHINA
    - 7.MY SITE
      - 1. SELECT
      - 2. ADD
      - 3.EDIT
      - 4. DELETE
  - 5.DAYLIGHT SAVING TIME
    - ON (WHEN ON IS SELECTED, TIME SET SHOULD BE CHANGED ACCORDINGLY)
    - OFF (DEFAULT IS OFF)
  - 6.BACKLIGNT
    - 1.ADJUST LIGHT
      - LCD LIGHT
      - KEY LIGHT

      PRESS NAVIGATION KEYS TO ADJUST
    - 2.ON
    - 3.AUTO (TURN ON WHEN THERE'S OPERATION, TURN OFF ONE MINUTE LATER)

3.SYSTEM

- **SYSTEM**
  - 1.UPDATE SYSTEM
    - UPDATE HANDSET
    - 1.OK 2.BACK
  - 2.BACKLASH COMPENSATION
    - SET AZ
    - SET ALT
  - 3.INFORMATION — SHOW COMPANY AND MOUNT INFORMATION
  - 4.TRACK SPEED — INPUT 1-2000: USE "C" TO CANCEL CURRENT NUMBER, AND INPUT YOUR DESIRABLE DATA
    * THIS FUNCTION MAY NOT BE USED IN SOME MODELS
  - 5.EQ/AZ CHANGE
    - 1.EQ TO AZ
    - 2.AZ TO EQ

    THIS FUNCTION MAY NOT BE USED FOR SOME MODELS WITHOUT ACCESSORY PARTS
  - 6.DEMO MODE — PRESS BACK TO EXIT DEMO
    * THIS IS ENABLED JUST AFTER ALIGNMENT IS DONE

a. UPDATE SYSTEM

(1) THE DRIVER AND THE GOTO CONTROLLER CAN BE UPDATED VIA INTERNET TO GET THE NEWEST TECHNOLOGY OF THE MOUNT, BETTER SOFTWARE AND POWERFUL DATABASE. THE COMPLETE PACKAGE ALREADY INCLUDES A INTERNET UPDATE CABLE AND SYSTEM DRIVER CD-ROM.

(2) WHEN UPDATE IS NEEDED, USERS NEED TO INSTALL THE DRIVER CD-ROM TO COMPUTER FIRST. THEN DOWNLOAD RELATIVE UPDATED FILES FROM COMPANY OFFICIAL WEBSITE.

INSTALL UPDATE CABLE DRIVER FIRST
INSTALL SYSTEM UPGRADE SOFTWARE

(3)PLUG THE UPDATE CABLE ONE END SHOWING " E-BUS " TO THE " E-BUS UPDATE PORT " ON THE MOUNT, AND ANOTHER END TO COMPUTER USB PORT.

(4)WHEN UPDATING HANDSET, IF THERE IS PROBLEM CONCERNING CONNECTION, THE SCREEN SHOWS:

CONNECTION FAILS

PLEASE CONNECT TO PC CORRECTLY

PLEASE RE-PLUG IN THE CABLE, TURN ON AGAIN.

WHEN EVERYTHING IS OK, IT SHOWS

UPDATE HANDSET 1.OK 2.BACK

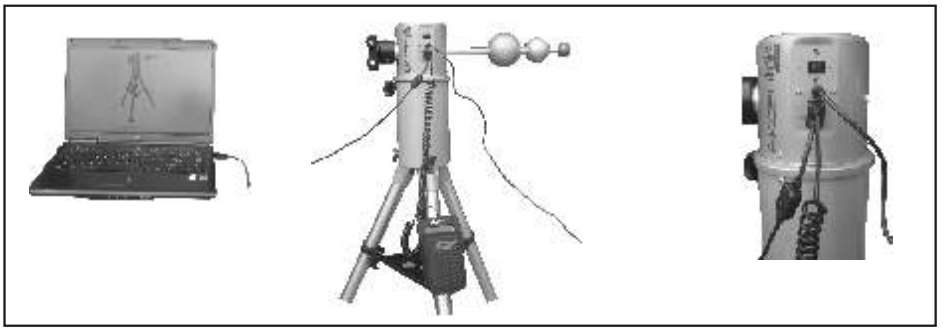
PRESS 1 TO CONTINUE UPDATE CONTROLLER, PRESS 2 BACK TO PREVIOUS SCREEN. WHEN 1 IS PRESSED, T SHOWS

NOW PLUG UPDATE LINE, PRESS: OK

AT THIS TIME, PLEASE PLUG THE UPDATE CABEL TO THE E-BUS PORT, THEN PRESS OK. IT SHOWS AS BELOW.

WHEN UPDATE IS DONE, REMOVE THE UPDATE CABLE, TURN OFF THE POWER, RESTART.

HERE SHOWS THE MOUNT BE CONNECTED TO COMPUTER FOR SYSTEM UPGRADE



THE EKCENTRIK GOTO MOUNT CAN BE UPGRADED TO NEWEST FIRMWARE AND/OR CONTROLLER DATABASE. PLEASE REFER THE FOLLOWING STEPS TO LEARN MORE ABOUT UPGRADE.

Ⅰ .USB TO RS232 DRIVER 1.1 MUST BE INSTALLED TO YOUR COMPUTER FIRST. INSTALL IT FROM THE CD-ROM WHICH COMES WITH THE MOUNT.

Ⅱ . INSTALL SYSTEM UPDATE SOFTWARE ON THE CD-ROM WHICH COMES WITH THE MOUNT.

Ⅲ . PLUG THE CONTROLLER CABLE INTO REMOTE PORT ON THE MOUNT.

Ⅳ .PLUG THE UPGRADE CABLE TO YOUR COMPUTER AND THE MOUNT. MAKE SURE THAT THE END WITH E-BUS SYMBOL TO THE MOUNT E-BUS PORT,THE OTHER END TO USB PORT OF YOUR COMPUTER.

Ⅴ . OPEN THE SYSTEM UPDATE SOFTWARE, SHOWS AS BELOW:

1. SYSTEM WILL GIVE YOU TIPS TO SELECT COM PORT. CHOOSE ONE THAT IS WORKABLE.

2. SELECT THE HARDWARE YOU WANT TO UPGRADE: DRIVER OR HANDSET.

3. LOAD THE PROPER FILE YOU DOWNLOAD FROM OFFICIAL WEBSITE.

4. PRESS TURN ON FROM THE MOUNT.

5. CLICK INSTALL.

WAIT TILL IT SHOWS INSTALL SUCCESSFULLY ON YOUR COMPUTER.

IF COMPUTER SHOWS WRONG INFORMATION, TURN OFF THE MOUNT SWITCH, UNPLUG THE UPGRADE CABLE FROM MOUNT E-BUS PORT. THEN REPLUG IT, TURN ON THE MOUNT AGAIN. CLICK INSTALL

DURING YOUR UPDATING CONTROLLER, IF YOU ENCOUNTER THE LCD SCREEN FLASH WITHOUT ANY CHARACTERS ON THE SCREEN, YOU NEED TO TURN OFF THE MOUNT, UNPLUG THE E-BUS PORT. THEN REPLUG THE UPGRADE CABLE, TURN ON THE MOUNT, AND THEN CLICK INSTALL.

AFTER UPGRADING THE DRIVER AND/OR THE CONTROLLER, THE SYSTEM WILL BE PERFORMING MUCH BETTER. ENJOY THE PLEASURE OF THE UNIQUE EKCENTRIK MOUNT.

(5)DURING UPDATING, THERE IS STATUS BAR SHOWING THE PROGRESS OF THE UPDATING.

a.INFORMATION: IT SHOWS CONTROLLER INFORMATION, AS WELL AS COMPANY AND MOUNT INFORMATION.

b. TRACK SPEED: THIS FUNCTION MAY BE USED IN THE FUTURE AFTER UPDATING NEW SOFTWARE. USER MAY INPUT THE DESIRED SPEED DATA AFTER TRACKING THE OBJECT SOME TIME AND GET THE BETTER TRACKING, ESPECIALLY USEFUL FOR PLANETS, MOON, COMETS.

c. EXCHANGE ALT-AZ / EQ: THIS FUNCTION CAN JUST BE USED FOR MODLES THAT EQ (WEDGE) MAY BE CHANGED TO ALT-AZ MODEL. USER NEEDS TO UPDATE NEW SOFTWARE FOR FUNCTIONS.

d. DEMO: THIS FUCNTON IS ACTIVATED JUST AFTER ALIGNMENT IS DONE. IT IS VERY USEFUL TO DEMOSTRATE THE MOUNT AUTOMATICALLY.

4. HOT KEY:

(1) IN GOTO FUNCTION STATUS, KEY 6 IS FOR PAGE UP, KEY 9 IS FOR PAGE DOWN. THESE TWO KEYS CAN BE USED TO SEE MORE INFORMATION OF THE TARGET ALREADY IN TRACKING.

(2) **SYNC FUNCTION:**IN GOTO FUNCTION STATUS, KEY 0 IS USED FOR **SYNC.**

IN RACKING STATUS, PRESS KEY 0 TO SYNC THE TARGET IF IT IS AWAY THE CENTER OF THE FIELD OF VIEW. THE SCREEN SHOWS:

PRESS OK FOR SYNC

IN THIS STATUS, SYSTEM DEFAULT SPEED IS 3 (64X). USER MAY CHOOSE 1 (2X), OR 2 (8X).

WHEN THE TARGET IS IN THE CENTER OF THE FIELD OF VIEW. PRESS OK TO CONFIRM. THE SCREEN SHOWS.

SYNC SUCCESSFULLY

(3) **SHORTCUT**: PRESS ***C*** ONE SECOND TO GET INTO SHORTCUT OF DATABASE:
IT SHOWS:

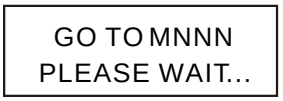
PRESS 1-8 TO DA- TABASE SHORTCUT

A. PRESS 1 FOR SAO
B. PRESS 2 FOR NGC
C. PRESS 3 FOR MESSIERS
D. PRESS 4 NAMED OBJECTS
E. PRESS 5 FOR SOLAR SYSTEM
F. PRESS 6 FOR WATCH LIST
G. PRESS 7 FOR ENTER RA_DEC
H. LAND OBJECT

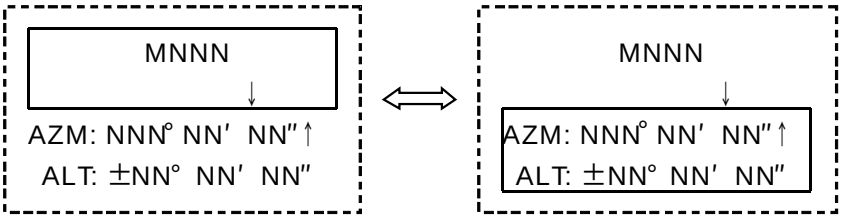
CHOOSE THE CORRESPONDING FUNCTION WITH THE NUMBER KEY.

INPUT THE DATABASE NUMBER WHEN USING THE GOTO OPTION. FOR EXAMPLE INPUT THE MESSIER NUMBER.

INPUT THE MESSIER NUMBER. PRESS ***OK*** AND THE TELESCOPE WILL GO TO THE OBJECT.



DISPLAY THE INSTANT COORDINATES OF THE OBJECT WHEN FINISH GOING.

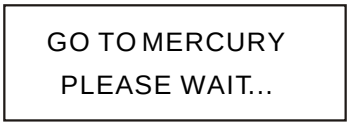


THE COORDINATE WILL BE UPDATED EVERY 10 SECONDS UNTIL ANOTHER OPERATION BE OPERATED. PRESS ***BACK*** WILL GO BACK TO THE PREVIOUS STEP.

THE TELESCOPE WILL AUTO TRACK IN THE GO TO STATUS OF THE MENU STATUS.

PRESS THE NAVIGATING KEYS TO ADJUST THE DIRECTION OF THE TELESCOPE ACCORDING TO THE DIRECTION OF THE ARROWHEAD. PRESS THE CORRESPONDING NUMBER KEY TO CHANGE THE MOTOR SPEED FROM 1 TO 4.

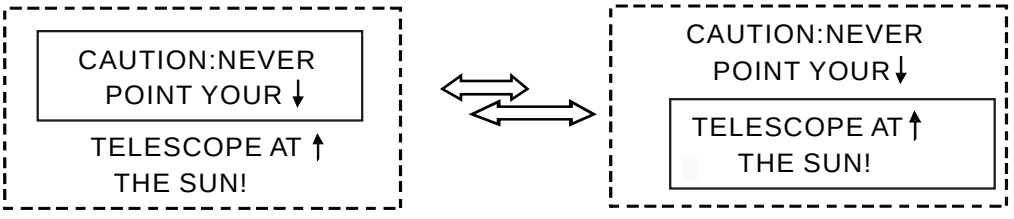
IF CHOOSE THE PLANET, FOR EXAMPLE PRESS 1 TO CHOOSE THE MERCURY, THE TELESCOPE WILL DISPLAY THE FOLLOWING MESSAGE WHEN GOING:



DISPLAY THE CURRENT COORDINATES OF THE MERCURY WHEN THE TELESCOPE STOPS

OPERATION PRINCIPLE REFERS ABOVE.

NOTICE: IF YOU CHOOSE THE MERCURY OR VENUS, THE SCREEN WILL SHOW UP THE FOLLOWING WARNING MESSAGE FOR 2 SECONDS.



IF THE NUMBER INPUT IS OUT OF RANGE OF THE CELESTIAL DATABASE, THE FOLLOWING MESSAGE WILL BE SHOW UP FOR 2 SECONDS. THEN GO BACK TO RE-INPUT THE CELESTIAL NUMBER.

THE SCREEN WILL DISPLAY THE FOLLOWING MESSAGE FOR 2 SECONDS, IF THE OBJECT IS BELOW THE HORIZON. THE TELESCOPE KEEP STILL

OBJECT BELOW HORIZON

5.TRACKING MODE AND LAND MODE

IN TRACKING MODE, PRESS **STOP** THE SYSTEM WILL STOP, AND SHOWS:

LAND MODE

AZM:XXX° XX.X′ ALT:±XX° XX.X′ S

THE **S** HERE MEANS STOP

IN THIS STATUS, USER MAY PRESS NAVIGATION KEYS TO LOCATE LAND OBJECT. WHEN DONE, PRESS OK, IT SHOWS:

INPUT LAND NAME KSON1

INPUT DIGIT DIRECTLY OR USE ▲ AND ▼ TO SELECT LETTER FROM **A** TO **Z** TO **A.** PRESS OK FOR FINISH. THERE ARE 10 SITES CAN BE STORED.

USER CAN ALWAYS USE THESE LAND OBJECTS AS LONG AS THE MOUNT AND TELESCOPE POSITION BE NOT MOVED. IN SHORTCUT, SELECT 8, GET INTO LAND OBJECT.

IN LAND MODE, PRESS **STOP** THE SYSTEM WILL BE BACK TO TRACKING MODE. IT SHOWS:

TRACK MODE

AZM:XXX° XX.X′ ALT:±XX° XX.X′ T

THE **T** HERE MEANS TRACKING

6.PARK YOUR MOUNT (TELESCOPE)

AFTER ALIGNMENT IS FINISHED, USER MAY PRESS KEY "C" FOR 3 SECONDS TO STORE THE CURRENT COORDINATES IN THE SYSTEM AND THE KONTROLLER SHUTS OFF AUTOMATICALLY.

POWER OFF WAIT 10 SECOND

REPRESS KEY "C", OR TURN ON THE POWER, IT SHOWS

GOTO DATSBASE OK OTHERWISE C

USER MAY USE THE MOUNT ANY TIME WITHOUT ALIGNMENT AGAIN, AS LONG AS THE MOUNT (TELESCOPE) KEEP ITS ORIGINAL POSITION.

USER NEEDS TO TURN OFF THE POWER TO SHUT OFF THE MOUNT.

IF THE EKCENTRIK STANDARD MOUNT BE UPGRADED TO WEDGE VERSION, PLEASE READ:

FOR EQ MODE, THE CONTROLLER WILL DISPLAY

1.AUTO ALIGNMENT 2.FOR ADVANCED USER

Ⅰ .**IF USER CHOOSE 1**. AUTO ALIGNMENT METHOD, SELECT THE ALIGNMENT OBJECT (MOON, PLANETS OR STARS), PRESS OK, THEN JUST ROTATE R.A. AXIS BY CONTROLLER, SO THAT THE TELESCOPE IS ON THE TOP OF THE MOUNT; IN THE MEANTIME, THE ARROW MARK ON THE DOVETAIL ADAPTOR NEEDS TO ROUGHLY POINT TO ANOTHER MARK ON THE MOUNT HOUSING, MANUALLY OR BY CONTROLLER. PRESS OK AGAIN, THE TELESCOPE WILL GO TO THE SELECTED TARGET AUTOMATICALLY. THE SELECTED ALIGNMENT TARGET MAY BE NEAR THE FIELD OF VIEW, USE◀ ,▶ ,▲ ,▼ KEY TO HAVE IT CENTERED IN THE FIELD OF VIEW, THEN PRESS OK. ALIGNMENT SUCCESSFULLY.

Ⅱ .**IF USER CHOOSE 2**. ADVANCED USER METHOD FOR ALIGNMENT, SELECT THE ALIGNMENT STAR FROM 1. NAMED STAR OR 2. SAO. PRESS OK, USE◀ , ▶ , ▲ , ▼ KEY TO HAVE IT CENTERED IN THE FIELD OF VIEW, THEN PRESS OK. ALIGNMENT SUCCESSFULLY.

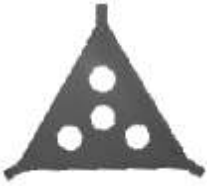
FOR EKCENTRIK ADVANCED GOTO MOUNT

ALL PARTS

A) EKCENTRIK MOUNT

B) FULLY ADJUSTABLE STAINLESS STEEL TRIPOD.

C) ACCESSORY TRAY.



D) COUNTER WEIGHT ROD ASSEMBLY, WITH THREE COUNTER WEIGHTS.

E) EKSTREAM GOTO CONTROLLER 30

F) AC ADAPTER

G) UPGRADE CABLE

H) CAR LIGHTER CABLE

I) USB TO SERIAL DRIVER SOFTWARE

NOTE: SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

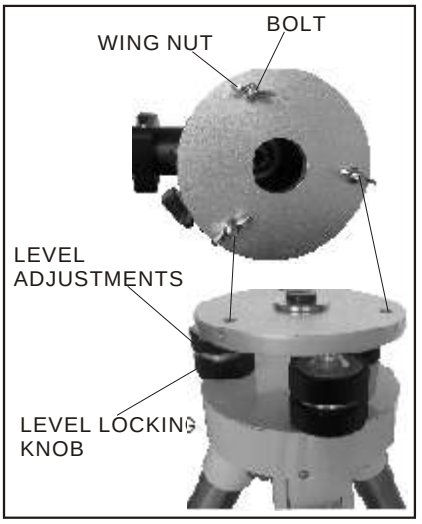
EKCENTRIK ADVANCED GOTO MOUNT ASSEMBLY INSTRUCTIONS

1. REMOVE ALL PARTS FROM BOX AND IDENTIFY THEM.
   - EKCENTRIK ADVANCED GOTO MOUNT
   - TRIPOD
   - ACCESSORY TRAY
   - COUNTER WEIGHT
   - EKSTREAM GOTO CONTROLLER 30
   - AC ADAPTER
   - UPGRADE CABLE
   - CAR LIGHTER CABLE
   - DRIVER SOFTWARE

2. SET UP THE TRIPOD BY UNLOCKING TRIPOD LEGS LOCKING KNOB, ADJUST THE TRIPOD TO THE HEIGHT YOU NEED, THEN TIGHTEN THE LOCKING KNOB.

3. REMOVE THE THREE LOCKING KNOBS ON THE ACCESSORY TRAY FIXTURE, PUT THE ACCESSORY TRAY FROM BOTTOM, THEN PUT THE LOCKING KNOBS AND TIGHTEN.

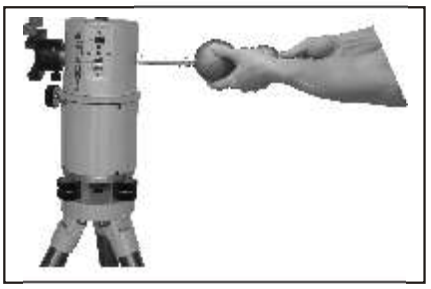
4. THERE IS A THREE-LEVEL-POINT ADJUSTMENTS SYSTEM COMING WITH THE TRIPOD, ON TOP. BELOW THE TOP PLATE, IS THE SYSTEM.



5. THE MOUNT IS COMING WITH A 4.8″ EXTENSION TUBE. THERE IS ANOTHER PLATE BELOW THE EXTENSION TUBE, WHERE LOCATES THE THREE BOLTS AND WING NUTS. REMOVE THE THREE WING NUTS, PLACE THE BOLTS TO THE HOLES ON THE THREE-LEVEL-POINT TOP PLATE, PUT ON THE WING NUTS AND TIGHTEN. ASSEMBLY IS NOW FINISHED.

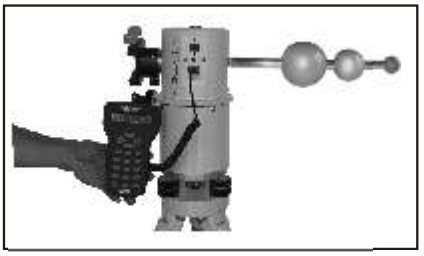
6. ADJUST THE THREE-LEVEL-POINT, MAKE SURE THAT THE LEVEL BUBBLE ON THE TOP OF THE MOUNT IS IN THE CENTRE, THE MORE PRECISE THE BETTER.

7. PUT THE SPHERICAL COUNTERWEIGHT.

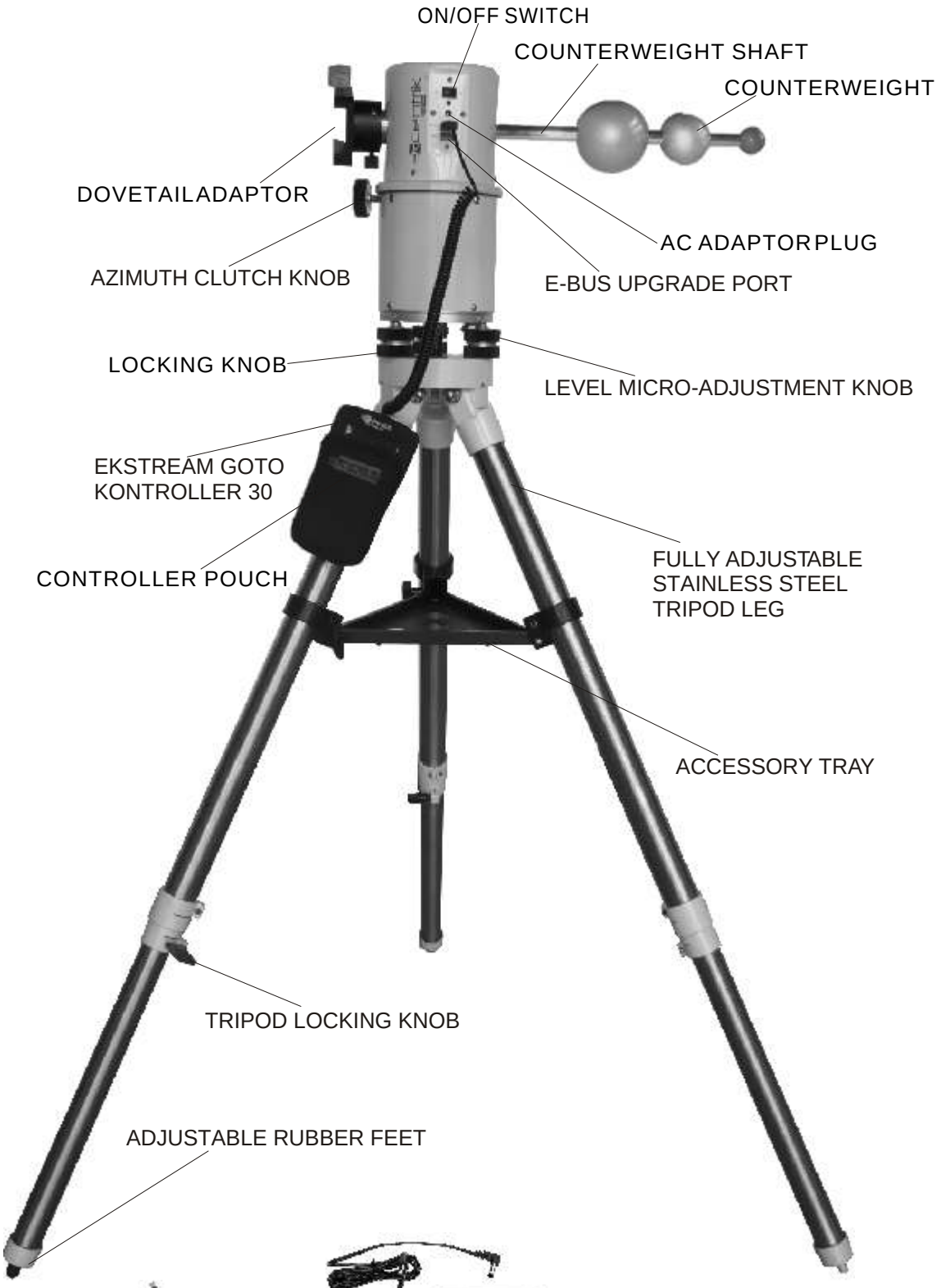


8. PLUG THE EKSTREAM GOTO KONTROLLER 30 IN THE HANDBOX PORT, AND THEN PLUG THE POWER LINE IN THE POWER PORT.

9. TURN ON THE POWER. ENJOY THE PLEASURE OF THE UNIQUE EKCENTRIK MOUNT.



FEATURES OF EKCENTRIK ADVANCED MOUNT



CAR LIGHTER CABLE

AC ADAPTER

UPGRADE CABLE

FOR EKCENTRIK WEDGE MOUNT

ALL PART

A) EKCENTRIK MOUNT

B) EKCENTRIK WEDGE

C) FULLY ADJUSTABLE STAINLESS STEEL TRIPOD.

D) ACCESSORY TRAY.

E) COUNTER WEIGHT ROD ASSEMBLY, WITH THREE COUNTER WEIGHTS.

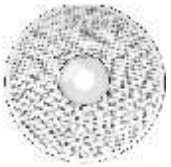
F) EKSTREAM GOTO CONTROLLER 30

G) AC ADAPTER

H) UPGRADE CABLE

I) CAR LIGHTER CABLE

J) USB TO SERIAL DRIVER SOFTWARE

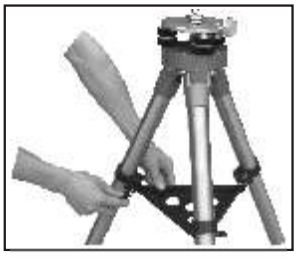


NOTE: SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

EKCENTRIK WEDGE GOTO MOUNT ASSEMBLY INSTRUCTIONS

1. REMOVE ALL PARTS FROM BOX AND IDENTIFY THEM.
   - EKCENTRIK MOUNT
   - EKCENTRIK WEDGE
   - TRIPOD
   - ACCESSORY TRAY
   - COUNTER WEIGHT
   - EKSTREAM GOTO CONTROLLER 30
   - AC ADAPTER
   - UPGRADE CABLE
   - CAR LIGHTER CABLE
   - DRIVER SOFTWARE

2. SET UP THE TRIPOD BY UNLOCKING TRIPOD LEGS LOCKING KNOB, ADJUST THE TRIPOD TO THE HEIGHT YOU NEED, THEN TIGHTEN THE LOCKING KNOB.



3. REMOVE THE THREE LOCKING KNOBS ON THE ACCESSORY TRAY FIXTURE, PUT THE ACCESSORY TRAY FROM BOTTOM, THEN PUT THE LOCKING KNOBS AND TIGHTEN.

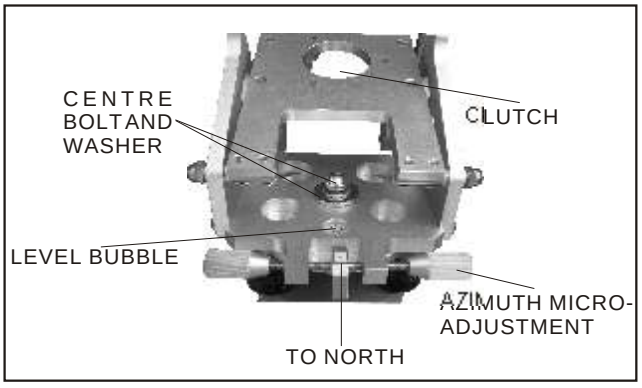
4. THERE IS A THREE-LEVEL-POINT ADJUSTMENT SYSTEM COMING WITH THE TRIPOD, ON TOP. BELOW THE TOP PLATE, IS THE SYSTEM.

5. THERE IS CENTER BOLT AND WASHER ON THE TOP OF THE THREE-LEVEL-POINT ADJUSTMENTS SYSTEM. REMOVE IT AND PUT THE WEDGE ON THE TOP OF THIS SYSTEM. THEN THREAD THE CENTER BOLT, NOT TOO LOOSE AND NOT TOO TIGHT. BE SURE THAT YOU LEAVE ENOUGH SPACE BETWEEN THE AZIMUTH MICRO-ADJUSTMENT, SO THE NORTH CAN BE PLACED IN BETWEEN. PLACE THE TRIPOD FACING THE NORTH, SEE THE MARK.

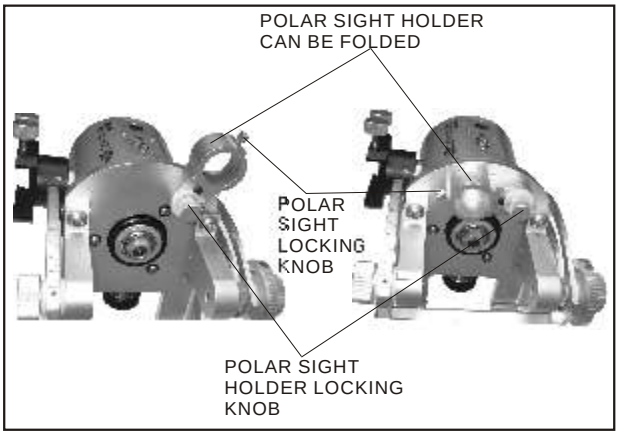
THIS CENTER BOLT AND WASHER COMES WITH TRIPOD

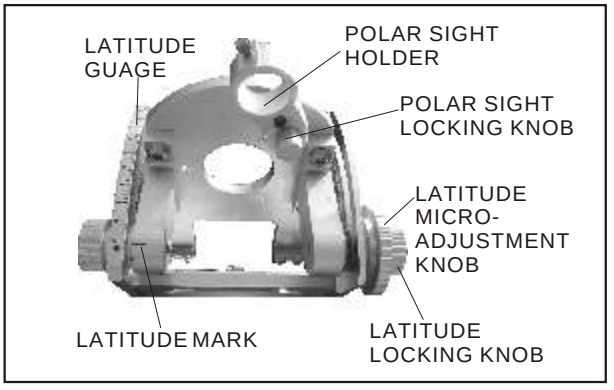
UNTHREADED IT WITH WASHER

PLACE THE WEDGE ON AND THREAD THE CENTER BOLT

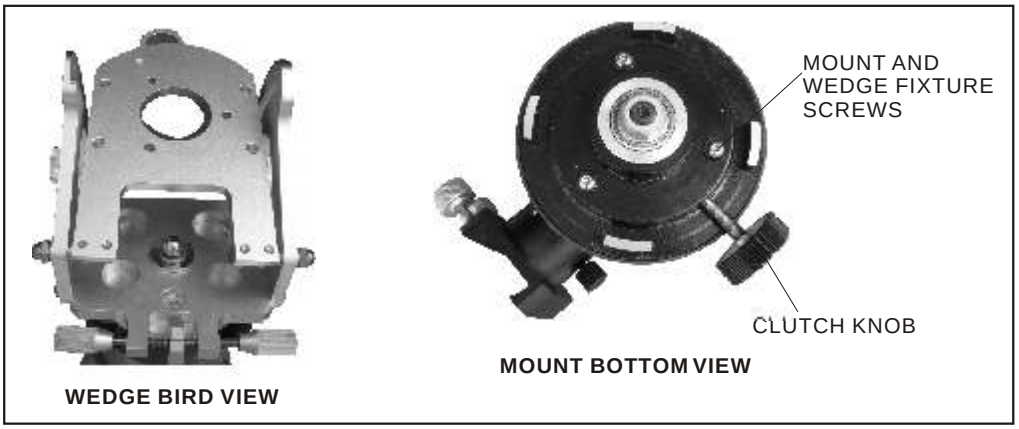


6. UNLOCK THE LATITUDE LOCKING KNOB, ROTATE THE LATITUDE MICRO-ADJUSTMENT KNOB TO GET THE LATITUDE LOCALLY, THEN TIGHTEN.





7. THERE ARE THREE MOUNT & WEDGE FIXTURE SCREWS ON THE BOTTOM OF THE MOUNT. REMOVE THE THREE SCREWS (ALLEN WRENCH IS INCLUDED IN A WHITE BOX), PUT THE MOUNT ON THE WEDGE. MAKE SURE THE CLUTCH KNOB FACES TO THE NORTH MARK, SO THE MOUNT CAN BE SIT DOWN STEADY ON THE WEDGE PLATE. TIGHTEN THE THREE SCREWS.



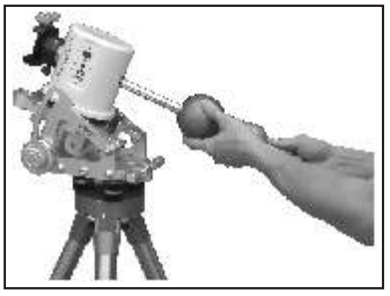
8. ADJUST THE THREE-LEVEL-POINT ADJUSTMENT SYSTEM, MAKE SURE THE BUBBLE IS IN THE CENTRE.

9. PLACE THE POLAR SIGHT INTO THE HOLDER. TIGHTEN THE SCREW, MAKE SURE THE POLAR SIGHT IS FIXED SECURELY. THEN TIGHTEN THE KNOB, SO THE HOLDER CONTACTS THE WEDGE PLATE TIGHTLY.

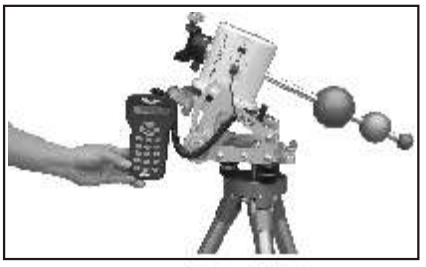
10. THERE IS A PAIR OF MARKS ON THE MOUNT. THEY ARE USED FOR AUTO ALIGNMENT. AFTER YOU HAVE POSITIONED POLARIS PRECISELY, AND CHOOSE AUTO ALIGNMENT METHOD ON THE EKSTREAM 30 GOTO CONTROLLER, JUST ROTATE R.A. AXIS BY CONTROLLER, SO THE TELESCOPE IS ON THE TOP OF THE MOUNT; IN THE MEANTIME, THE ARROW MARK ON THE DOVETAIL ADAPTOR NEEDS TO ROUGHLY POINT TO ANOTHER MARK ON THE MOUNT HOUSING, MANUALLY OR BY CONTROLLER. THE RESULT IS THE TELESCOPE IS POINTING TO THE EAST. SEE PICTURE AS REFERENCE. MORE DETAILS ARE INCLUDED IN THE CONTROLLER INSTRUCTIONS.

11. IF YOU USE ADVANCED USER METHOD FOR ALIGNMENT, THERE IS NO NEED TO MATCH THE MARK.

12. PUT THE SPHERICAL COUNTERWEIGHTS.

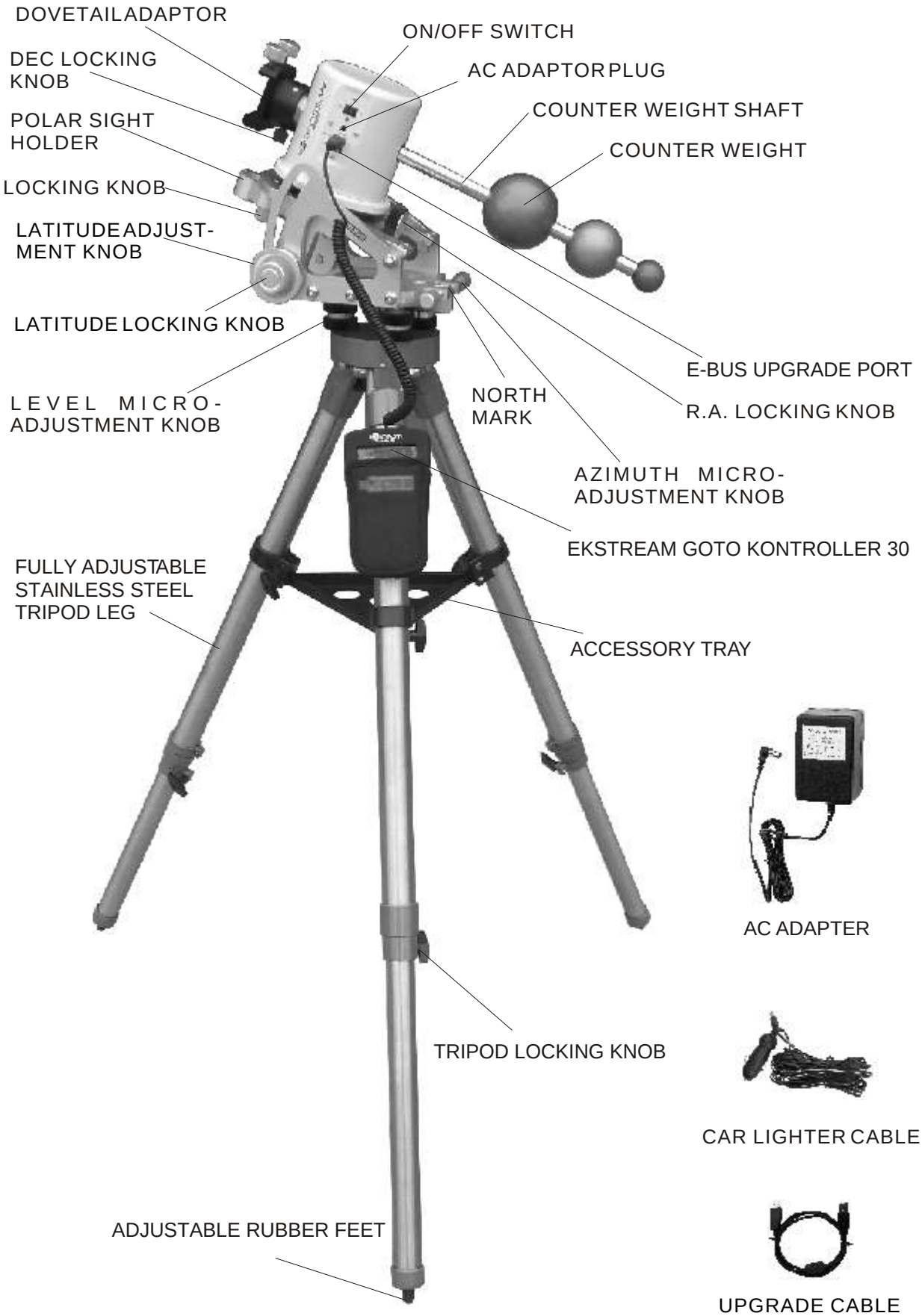


13. PLUG THE EKSTREAM GOTO KONTROLLER 30 IN THE HANDBOX PORT, AND THEN PLUG THE POWER LINE IN THE POWER PORT.



14. TURN ON THE POWER. ENJOY THE PLEASURE OF THE UNIQUE EKCENTRIK MOUNT.

FEATURES OF EKCENTRIK WEDGE MOUNT

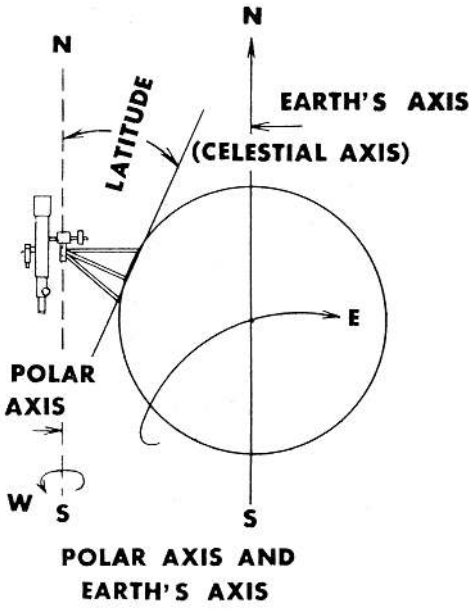


AC ADAPTER

CAR LIGHTER CABLE

UPGRADE CABLE

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 LONG FOCAL LENGTH EYEPIECE WHICH GIVES YOU THE WIDEST FIELD OF VIEW AND BRIGHTEST IMAGE. WHEN OBSERVING THE MOON AND PLANETS START OUT WITH THE LONG FOCAL LENGTH EYEPIECE. WHEN YOU WANT TO GET A LARGER IMAGE, CENTER THE OBJECT IN THE EYEPIECE, AND CAREFULLY TAKE THE LONG FOCAL LENGTH OUT AND REPLACE IT WITH THE SHORTER FOCAL LENGTH. WHEN USING THE BARLOW, IT MUST BE PLACED INTO THE FOCUSER BEFORE THE EYEPIECE . THE BARLOW WILL MAGNIFY THE POWER YOUR EYEPIECE PRODUCT.

OPERATION IN SOUTHERN HEMISPHERE MAY BE DIFFERENT

EKLIPSE ONE YEAR WARRANTY

EKLIPSE WARRANTS ITS TELESCOPE OR MOUNT TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR ONE YEAR.

EKLIPSE WILL REPAIR OR REPLACE SUCH PRODUCT OR PART THERE OF WHICH UPON INSPECTION BY EKLIPSE , IS FOUND TO BE DEFECTIVE IN MATERIALS OR WORKMANSHIP. AS A CONDITION TO BE OBLIGATION OF EKLIPSE TO REPAIR OR REPLACE SUCH PRODUCT, THE PRODUCT MUST BE RETURNED TO EKLIPSE TOGETHER WITH PROOF-OF PURCHASE SATISFACTORY TO EKLIPSE. ALL RETURNS MUST BE ACCOMPANIED BY A WRITTEN STATEMENT SETTING FORTH THE NAME, ADDRESS, AND DAYTIME TELEPHONE NUMBER AND EMAIL OF THE OWNER, TOGETHER WITH A BRIEF DESCRIPTION OF ANY CLAIMED DEFECTS PARTS OR PRODUCT FOR WHICH REPLACEMENT IS MADE SHALL BECOME THE PROPERTY OF EKLIPSE. THE CUSTOMER SHALL BE RESPONSIBLE FOR ALL COSTS OF TRANSPORTATION AND INSURANCE, BOTH TO AND FROM THE FACTORY OF EKLIPSE AND SHALL BE REQUIRED TO PREPAY SUCH COSTS.

EKLIPSE SHALL USE REASONABLE EFFORTS TO REPAIR OR REPLACE ANY TELESCOPE OR MOUNT COVERED BY THIS WARRANTY WITHIN THIRTY DAYS OF RECEIPT. IN THE EVENT REPAIR OR REPLACEMENT SHALL REQUIRE MORE THAN THIRTY DAYS. EKLIPSE SHALL NOTIFY THE CUSTOMER ACCORDINGLY. EKLIPSE RESERVES THE RIGHT TO REPLACE ANY PRODUCT WHICH HAS BEEN DISCONTINUED FROM ITS PRODUCT LINE WITH A NEW PRODUCT OF COMPARABLE VALUE AND FUNCTION.

THIS WARRANTY SHALL BE VOID AND OF NO FORCE OF EFFECT IN THE EVENT A COVERED PRODUCT HAS BEEN MODIFIED IN DESIGN OR FUNCTION, OR SUBJECT TO ABUSE, MISUSE, MISHANDLING OR UNAUTHORIZED REPAIR. FURTHER, PRODUCT MALFUNCTION OR DETERIORATION DUE TO NORMAL WEAR IS NOT COVERED BY THIS WARRANTY.

THIS WARRANTY SUPERSEDES ALL OTHER PRODUCT WARRANTIES.

IF WARRANTY PROBLEMS ARISE, OR IF YOU NEED ASSISTANCE IN USING YOUR TELESCOPE OR MOUNT CONTACT:

EKLIPSE CANADA PHONE: 1-418-580-2435
www.eklipse.biz
support@eklipse.biz
EKLIPSE CHINA PHONE:86-757-8368-9911
www.eklipse.com.cn
support@eklipse.com.cn

EKLIPSE RESERVES THE RIGHT TO MODIFY OR DISCONTINUE, WITHOUT PRIOR NOTICE TO YOU, ANY MODEL OR STYLE TELESCOPE OR MOUNT. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM PROVINCE TO PROVINCE. SOME PROVINCES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS AND EXCLUSIONS MAY NOT APPLY TO YOU.

EKLIPSE DISCLAIMS ANY WARRANTIES, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR USE, EXCEPT AS EXPRESSLY SET FORTH HEREIN.

THE SOLE OBLIGATION OF EKLIPSE UNDER THIS LIMITED WARRANTY SHALL BE TO REPAIR OR REPLACE THE COVERED PRODUCT, IN ACCORDANCE WITH THE TERMS SET FORTH HEREIN. EKLIPSE EXPRESSLY DISCLAIMS ANY LOST PROFITS, GENERAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM BREACH OF ANY WARRANTY, OR ARISING OUT OF THE USE OR INABILITY TO USE ANY EKLIPSE PRODUCT. ANY WARRANTIES WHICH ARE IMPLIED AND WHICH CAN NOT BE DISCLAIMED SHALL BE LIMITED IN DURATION TO A TERM OF ONE YEARS FROM THE DATE OF ORIGINAL RETAIL PURCHASE.

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support@eklipse.biz
EKLIPSE CHINA PHONE:86-757-8368-9911
www.eklipse.com.cn
support@eklipse.com.cn

DATABASE FOR NAMED OBJECTS

APPENDIX A
BRIGHT NAMED STAR: 240

Common Name	Bayer	SAO	HD	GC	GSC	Mag	R.A.	Dec
Acamar	Theta Eridani	216113	18622	3584	7563:1016	3.4	02h 58m 16s	-40° 18' 16"
Achernar	Alfa Eridani	232481	10144	1979	8478:1395	0.4	01h 37m 42s	-57° 14' 12"
Achird	Eta Cassiopeiae	21732	4614	962	3663:2669	3.6	00h 49m 06s	+57° 48' 56"
Acrux	Alfa Crucis	251904	108248	16952	8979:3464	1.2	12h 26m 36s	-63° 05' 56"
Acubens	Alfa Cancri	98267	76756	12406	814:3029	4.3	08h 58m 28s	+11° 51' 28"
Adhafera	Zeta Leonis	81265	89025	14107	1969:1261	3.4	10h 16m 40s	+23° 25' 00"
Adhara	Epsilon Canis Majoris	172676	52089	9188	6535:3619	1.6	06h 58m 37s	-28° 58' 18"
Ain	Epsilon Tauri	93954	28305	5430	1273:1104	3.5	04h 28m 36s	+19° 10' 46"
Al Anz	Epsilon Aurigae	39955	31964	6123	2907:1275	2.9	05h 01m 58s	+43° 49' 22"
Al Baldah	Pi Sagittarii	187756	178524	26386	6295:282	2.9	19h 09m 45s	-21° 01' 24"
Al Giedi	Alfa Capricorni	163427	192947	28200	5749:2530	3.6	20h 18m 02s	-12° 32' 40"
Al Nair	Alfa Gruis	230992	209952	30942	8438:1959	1.7	22h 08m 13s	-46° 57' 38"
Al Risha	Alfa Piscium	110291	12446	2452	40:1338	4.1	02h 02m 03s	+02° 45' 50"
Alaraph	Beta Virginis	119076	102870	16215	273:928	3.6	11h 50m 42s	+01° 45' 53"
Albali	Epsilon Aquarii	144810	198001	28978	5760:1997	3.8	20h 47m 40s	-09° 29' 44"
Albireo	Beta Cygni	87301	183912	26953	2133:2964	3.4	19h 30m 42s	+27° 57' 36"
Alchibah	Alfa Corvi	180505	105452	16586	6672:995	4	12h 08m 23s	-24° 43' 44"
Alcor	80 Ursae Majoris	28751	116842	18155	3850:1384	4	13h 25m 11s	+54° 59' 16"
Alcyone	Eta Tauri nelle Pleiadi	76199	23630	4541	1800:2202	2.8	03h 47m 28s	+24° 06' 18"
Aldebaran	Alfa Tauri	94027	29139	5605	1266:1416	0.9	04h 35m 53s	+16° 30' 32"
Alderamin	Alfa Cephei	19302	203280	29848	4252:1870	2.5	21h 18m 34s	+62° 35' 08"
Aldibah	Zeta Draconis	17365	155763	23182	4210:1048	3.2	17h 08m 46s	+65° 42' 54"
Alfirk	Beta Cephei	10057	205021	30118	4465:2643	3.3	21h 28m 40s	+70° 33' 38"
Algenib	Gamma Pegasi	91781	886	238	1179:1775	2.9	00h 13m 13s	+15° 11' 02"
Algieba	Gamma Leonis	81298	89484	14177	1423:1349	2.4	10h 19m 58s	+19° 50' 30"
Algol	Beta Persei	38592	19356	3733	2851:2168	2.1	03h 08m 10s	+40° 57' 20"
Algorab	Delta Corvi	157323	108767	17029	6103:2395	3.1	12h 29m 52s	-16° 30' 56"
Alhena	Gamma Geminorum	95912	47105	8633	1329:1746	1.9	06h 37m 41s	+16° 23' 56"
Alioth	Epsilon Ursae Majoris	28553	112185	17518	3845:1190	1.7	12h 54m 01s	+55° 57' 36"
Alkaid	Eta Ursae Majoris	44752	120315	18643	3467:1257	1.9	13h 47m 31s	+49° 18' 46"
Alkalurops	Mu Boötis	64686	137391	20724	2570:1521	4.3	15h 24m 28s	+37° 22' 36"
Alkes	Alfa Crateris	156375	95272	15106	6079:1901	4.1	10h 59m 46s	-18° 17' 56"
Almach	Gamma Andromedae	37734	12533	2477	2837:2311	2.3	02h 03m 52s	+42° 19' 46"
Alnasl	Gamma Sagittarii	209696	165135	24632	7391:2710	3.1	18h 05m 48s	-30° 25' 26"
Alnath	Beta Tauri	77168	35497	6681	1859:1470	1.6	05h 26m 18s	+28° 36' 28"
Alnilam	Epsilon Orionis	132346	37128	6960	4766:2450	1.8	05h 36m 12s	-01° 12' 06"
Alnitak	Zeta Orionis	132444	37742	7089	4771:1188	2	05h 40m 46s	-01° 56' 34"
Alniyat	Sigma Scorpii	184336	147165	21982	6798:540	3	16h 21m 11s	-25° 35' 33"
Alphard	Alfa Hydrae	136871	81797	13044	5460:1592	2	09h 27m 34s	-08° 39' 32"
Alphecca	Alfa Coronae Borealis	83893	139006	20947	2029:1690	2.2	15h 34m 40s	+26° 42' 52"
Alpheratz	Alfa Andromedae	73765	358	127	1735:3180	2.1	00h 08m 22s	+29° 05' 26"
Alsaphi	Sigma Draconis	18396	185144	27050	4448:2483	4.7	19h 32m 22s	+69° 39' 38"
Alshain	Beta Aquilae	125235	188512	27587	493:3355	3.9	19h 55m 18s	+06° 24' 25"
Altair	Alfa Aquilae	125122	187642	27470	1058:3413	0.8	19h 50m 46s	+08° 52' 04"
Altais	Delta Draconis	18222	180711	26520	4444:2239	3.2	19h 12m 32s	+67° 39' 42"
Altarf	Beta Cancri	116569	69267	11254	794:1622	3.5	08h 16m 30s	+09° 11' 08"
Alterf	Lambda Leonis	80885	82308	13143	1959:1582	4.3	09h 31m 42s	+22° 58' 04"
Aludra	Eta Canis Majoris	173651	58350	9886	6550:4525	2.4	07h 24m 06s	-29° 18' 10"

Alula Australis	Xi Ursae Majoris	62484	98230	15537	-	3.8	11h 18m 11s	+31° 31' 49"
Alula Borealis	Nu Ursae Majoris	62486	98262	15547	2520:2631	3.5	11h 18m 28s	+33° 05' 38"
Alya	Theta Serpentis	124068	175638	25991	457:687	4.5	18h 56m 12s	+04° 12' 14"
Alzirr	Xi Geminorum	96074	48737	8823	754:2356	3.3	06h 45m 16s	+12° 53' 44"
Ancha	Theta Aquarii	145991	211391	31152	5803:1996	4.3	22h 16m 49s	-07° 46' 58"
Angetenar	Tau Eridani	168460	20720	3979	5878:1292	3.7	03h 19m 30s	-21° 45' 28"
Ankaa	Alfa Phoenicis	215093	2261	519	7527:1031	2.4	00h 26m 16s	-42° 18' 20"
Antares	Alfa Scorpii	184415	148478	22157	6803:2158	1.1	16h 29m 22s	-26° 25' 54"
Arcturus	Alfa Boötis	100944	124897	19242	1472:1437	0.2	14h 15m 40s	+19° 10' 58"
Arkab	Beta 1 Sagittarii	229646	181454	26703	7943:2105	4.3	19h 22m 37s	-44° 27' 32"
Arneb	Alfa Leporis	150547	36673	6875	5920:1685	2.6	05h 32m 43s	-17° 49' 18"
Arrakis	Mu Draconis	30239	154905	23092	3890:1396	5.6	17h 05m 19s	+54° 28' 10"
Ascella	Zeta Sagittarii	187600	176687	26161	6885:2837	2.7	19h 02m 35s	-29° 52' 46"
Asellus Australis	Delta Cancri	98087	74442	12022	1396:2758	9.9	08h 44m 40s	+18° 09' 14"
Asellus Borealis	Gamma Cancri	80378	74198	11982	1399:2905	4.7	08h 43m 16s	+21° 28' 08"
Aspidiske	Iota Carinae	236808	80404	12831	8595:3312	2.3	09h 17m 04s	-59° 16' 28"
Asterope	21 Tauri nelle Pleiadi	76159	23432	4502	1803:1584	5.8	03h 45m 54s	+24° 33' 16"
Atik	Zeta Persei	56799	24398	4688	2361:2820	2.8	03h 54m 07s	+31° 53' 02"
Atlas	27 Tauri nelle Pleiadi	76228	23850	4586	1800:2203	3.6	03h 49m 10s	+24° 03' 10"
Atria	Alfa Trianguli Australis	253700	150798	22558	9275:3641	1.9	16h 48m 40s	-69° 01' 40"
Auva	Delta Virginis	119674	112300	17543	294:1032	3.7	12h 55m 36s	+03° 23' 52"
Avior	Epsilon Carinae	235932	71129	11463	8579:2692	2.2	08h 22m 30s	-59° 30' 32"
Azha	Eta Eridani	130197	18322	3539	5287:1076	4	02h 56m 25s	-08° 53' 52"
Baham	Theta Pegasi	127340	210418	31013	565:1999	3.7	22h 10m 12s	+06° 11' 52"
Baten Kaitos	Zeta Ceti	148059	11353	2249	5278:2437	3.9	01h 51m 28s	-10° 20' 06"
Beid	Omicron Eridani	131019	26574	5056	4732:1970	4	04h 11m 52s	-06° 50' 16"
Bellatrix	Gamma Orionis	112740	35468	6668	113:1856	1.7	05h 25m 07s	+06° 20' 59"
Betelgeuse	Alfa Orionis	113271	39801	7451	129:1873	0.4	05h 55m 10s	+07° 24' 25"
Botein	Delta Arietis	93328	19787	3805	1228:2019	4.5	03h 11m 37s	+19° 43' 36"
Canopus	Alfa Carinae	234480	45348	8302	8534:2277	-0.6	06h 23m 57s	-52° 41' 44"
Capella	Alfa Aurigae	40186	34029	6427	3358:3141	0.1	05h 16m 40s	+45° 59' 52"
Caph	Beta Cassiopeiae	21133	432	147	3664:1985	2.4	00h 09m 10s	+59° 08' 58"
Castor	Alfa Geminorum	60198	60178	10120	2457:2407	1.9	07h 34m 36s	+31° 53' 20"
Celaeno	16 Tauri nelle Pleiadi	76126	23288	4475	1799:1440	5.4	03h 44m 48s	+24° 17' 20"
Celbalrai	Beta Ophiuchi	122671	161096	24048	423:1724	2.8	17h 43m 28s	+04° 34' 00"
Chara	Beta Canum Venaticorum	44230	109358	17127	3020:2548	4.3	12h 33m 45s	+41° 21' 28"
Chort	Theta Leonis	99512	97633	15441	1437:2847	3.3	11h 14m 13s	+15° 25' 44"
Cor Caroli	Alfa Canum Venaticorum	63257	112413	17557	3021:2645	2.9	12h 56m 01s	+38° 19' 04"
Cujam	Omicron Herculis	102153	148112	22090	971:1433	4.6	16h 25m 23s	+14° 01' 58"
Cursa	Beta Eridani	131794	33111	6274	4759:1671	2.9	05h 07m 51s	-05° 05' 08"
Dabih	Beta Capricorni	163481	193495	28295	5753:2281	3	20h 21m 00s	-14° 46' 50"
Deneb	Alfa Cygni	49941	197345	28846	3574:3347	1.2	20h 41m 25s	+45° 16' 48"
Deneb Algiedi	Delta Capricorni	164644	207098	30491	6363:1044	3	21h 47m 01s	-16° 07' 36"
Denebola	Beta Leonis	99809	102647	16189	870:988	2.1	11h 49m 04s	+14° 34' 18"
Diphda	Beta Ceti	147420	4128	865	5847:2333	2	00h 43m 34s	-17° 59' 12"
Dschubba	Delta Scorpii	184014	143275	21489	6779:2194	2.5	16h 00m 19s	-22° 37' 18"
Dubhe	Alfa Ursae Majoris	15384	95689	15185	4146:1274	2	11h 03m 43s	+61° 45' 02"
Dziban	Psi Draconis	8890	162003	24089	4436:1425	4.6	17h 41m 55s	+72° 08' 56"
Edasich	Iota Draconis	29520	137759	20747	3875:1620	3.5	15h 24m 55s	+58° 57' 56"
Electra	17 Tauri nelle Pleiadi	76131	23302	4477	1799:1441	3.7	03h 44m 52s	+24° 06' 46"
Eltanin	Gamma Draconis	30653	164058	24432	3523:1684	2.4	17h 56m 34s	+51° 29' 20"

Enif	Epsilon Pegasi	127029	206778	30431	1125:2186	2.5	21h 44m 10s	+09° 52' 30"
Er Rai	Gamma Cephei	10818	222404	32875	4606:3584	3.4	23h 39m 20s	+77° 37' 58"
Erakis	Mu Cephei	33693	206936	30440	3979:1616	4.2	21h 43m 30s	+58° 46' 48"
Fomalhaut	Alfa Piscis Austrini	191524	216956	32000	6977:1267	1.2	22h 57m 39s	-29° 37' 18"
Gacrux	Gamma Crucis	240019	108903	17052	8654:3422	1.6	12h 31m 10s	-57° 06' 46"
Giausar	Lambda Draconis	15532	100029	15799	4392:1805	3.8	11h 31m 24s	+69° 19' 50"
Gienah Gurab	Gamma Corvi	157176	106625	16740	6098:1754	2.8	12h 15m 47s	-17° 32' 30"
Gomeisa	Beta Canis Minoris	115456	58715	9947	764:2774	3.1	07h 27m 08s	+08° 17' 20"
Graffias	Beta Scorpii	159682	144217	21609	6208:1623	2.6	16h 05m 25s	-19° 48' 16"
Grumium	Xi Draconis	30631	163588	24364	3910:1710	3.7	17h 53m 31s	+56° 52' 22"
Hadar	Beta Centauri	252582	122451	18971	9005:3919	0.6	14h 03m 47s	-60° 22' 22"
Haedus	Eta Aurigae	40026	32630	6226	2899:2237	3.2	05h 06m 30s	+41° 14' 04"
Hamal	Alfa Arietis	75151	12929	2538	1758:2416	2	02h 07m 10s	+23° 27' 46"
Heze	Zeta Virginis	139420	118098	18351	4966:1366	3.4	13h 34m 41s	-00° 35' 45"
Homam	Zeta Pegasi	108103	214923	31664	1155:2187	3.6	22h 41m 28s	+10° 49' 50"
Izar	Epsilon Boötis	83500	129988	19856	2019:1251	2.7	14h 44m 58s	+27° 04' 26"
Jabbah	Nu Scorpii	159764	145502	21773	6209:1537	4.1	16h 11m 58s	-19° 27' 38"
Kaffaljidhma	Gamma Ceti	110707	16970	3276	50:1721	3.6	02h 43m 17s	+03° 14' 08"
Kaus Australis	Epsilon Sagittarii	210091	169022	25100	7401:3471	2	18h 24m 10s	-34° 23' 04"
Kaus Borealis	Lambda Sagittarii	186841	169916	25180	6861:3180	2.8	18h 27m 58s	-25° 25' 18"
Kaus Media	Delta Sagittarii	186681	168454	25024	6856:2170	2.7	18h 21m 00s	-29° 49' 40"
Keid	Omicron Eridani	131063	26965	5138	5312:2325	4.4	04h 15m 16s	-07° 39' 10"
Kitel Phard	Alfa Equulei	126662	202447	29735	536:2354	3.9	21h 15m 47s	+05° 14' 52"
Kochab	Beta Ursae Minoris	8102	131873	20029	4416:1799	2.2	14h 50m 42s	+74° 09' 20"
Kornephoros	Beta Herculis	84411	148856	22193	1518:1442	2.8	16h 30m 12s	+21° 29' 20"
Kraz	Beta Corvi	180915	109379	17133	6683:1116	2.8	12h 34m 22s	-23° 23' 48"
Kurah	Xi Cephei	19827	209790	30877	4271:2621	4.4	22h 03m 46s	+64° 37' 40"
Lesath	Upsilon Scorpii	208896	158408	23693	7387:1249	2.7	17h 30m 45s	-37° 17' 44"
Maasym	Kappa Herculis	101951	145001	21696	1508:1273	5	16h 08m 04s	+17° 02' 48"
Maia	20 Tauri nelle Pleiadi	76155	23408	4500	1799:1439	3.9	03h 45m 49s	+24° 22' 04"
Marfik	Lambda Ophiuchi	121658	148857	22203	386:2062	3.9	16h 30m 54s	+01° 59' 02"
Markab	Alfa Pegasi	108378	218045	32149	1711:2475	2.5	23h 04m 46s	+15° 12' 18"
Matar	Eta Pegasi	90734	215182	31706	2736:1823	3.1	22h 42m 58s	+30° 13' 14"
Mebsuta	Epsilon Geminorum	78682	48329	8786	1897:1639	3.1	06h 43m 55s	+25° 07' 50"
Megrez	Delta Ursae Majoris	28315	106591	16736	3837:1070	3.4	12h 15m 25s	+57° 01' 58"
Meissa	Lambda Orionis	112921	36861	6915	705:2400	3.5	05h 35m 07s	+09° 56' 02"
Mekbuda	Zeta Geminorum	79031	52973	9313	1353:1550	3.9	07h 04m 06s	+20° 34' 12"
Menkalinan	Beta Aurigae	40750	40183	7543	2924:2742	1.9	05h 59m 31s	+44° 56' 52"
Menkar	Alfa Ceti	110920	18884	3643	58:1618	2.5	03h 02m 16s	+04° 05' 22"
Menkent	Theta Centauri	205188	123139	19033	7293:2215	2.3	14h 06m 40s	-36° 22' 10"
Menkib	Xi Persei	56856	24912	4779	2369:2273	4	03h 58m 58s	+35° 47' 26"
Merak	Beta Ursae Majoris	27876	95418	15145	3827:1079	2.4	11h 01m 49s	+56° 22' 58"
Merope	23 Tauri nelle Pleiadi	76172	23480	4512	1800:2204	4.1	03h 46m 19s	+23° 56' 52"
Mesartim	Gamma Arietis	92681	11503	2291	1209:1835	4.8	01h 53m 31s	+19° 17' 38"
Miaplacidus	Beta Carinae	250495	80007	12764	9200:2603	1.8	09h 13m 12s	-69° 43' 01"
Mimosa	Beta Crucis	240259	111123	17374	8659:3107	1.5	12h 47m 41s	-59° 41' 20"
Mintaka	Delta Orionis	132220	36486	6847	4766:2445	2.5	05h 31m 58s	-00° 17' 55"
Mira	Omicron Ceti	129825	14386	2796	4693:1144	8.7	02h 19m 19s	-02° 58' 40"
Mirach	Beta Andromedae	54471	6860	1400	2286:1329	2.1	01h 09m 43s	+35° 37' 14"
Mirfak	Alfa Persei	38787	20902	4041	3320:2808	1.8	03h 24m 18s	+49° 51' 38"
Mizar	Zeta Ursae Majoris	28737	116656	18133	3850:1385	2.4	13h 23m 55s	+54° 55' 29"
Mothallah	Alfa Trianguli	74996	11443	2272	1763:3028	3.4	01h 53m 04s	+29° 34' 44"
Mufrid	Eta Boötis	100766	121370	18805	1470:1157	2.8	13h 54m 40s	+18° 23' 52"

Murzim	Beta Canis Majoris	151428	44743	8223	5938:2918	2	06h 22m 40s	-17° 57' 20"
Muscida	Omicron Ursae Majoris	14573	71369	11593	4127:2431	3.3	08h 30m 16s	+60° 43' 04"
Nair al Saif	Iota Orionis	132323	37043	6937	4778:1401	2.8	05h 35m 25s	-05° 54' 36"
Naos	Zeta Puppis	198752	66811	10947	7663:4093	2.3	08h 03m 34s	-40° 00' 10"
Nashira	Gamma Capricorni	164560	206088	30320	6362:1078	3.8	21h 40m 04s	-16° 39' 42"
Navi	Epsilon Cassiopeiae	12031	11415	2289	4036:2834	3.4	01h 54m 24s	+63° 40' 12"
Nekkar	Beta Boötis	45337	133208	20226	3047:1258	3.6	15h 01m 57s	+40° 23' 26"
Nihal	Beta Leporis	170457	36079	6762	5928:1657	3	05h 28m 14s	-20° 45' 32"
Nunki	Sigma Sagittarii	187448	175191	25941	6868:1829	2	18h 55m 15s	-26° 17' 47"
Nusakan	Beta Coronae Borealis	83831	137909	20795	2032:1605	3.7	15h 27m 49s	+29° 06' 20"
Peacock	Alfa Pavonis	246574	193924	28374	8785:1898	1.9	20h 25m 39s	-56° 44' 04"
Phact	Alfa Columbae	196059	37795	7078	7064:1357	2.7	05h 39m 38s	-34° 04' 26"
Phad	Gamma Ursae Majoris	28179	103287	16268	3833:1034	2.5	11h 53m 49s	+53° 41' 42"
Pherkad	Gamma Ursae Minoris	8220	137422	20692	4414:2314	3.1	15h 20m 43s	+71° 50' 02"
Pleione	28 Tauri nelle Pleiadi	76229	23862	4587	1800:2200	5.1	03h 49m 10s	+24° 08' 12"
Polaris	Alfa Ursae Minoris	308	8890	2243	4628:237	2.1	02h 31m 48s	+89° 15' 50"
Pollux	Beta Geminorum	79666	62509	10438	1920:2199	1.2	07h 45m 17s	+28° 01' 32"
Porrima	Gamma Virginis	138917	110379	17270	4949:1120	2.9	12h 41m 40s	-01° 26' 56"
Praecipua	Alfa Leonis Minoris	62297	94264	14961	2521:2271	3.9	10h 53m 17s	+34° 12' 54"
Procyon	Alfa Canis Minoris	115756	61421	10277	187:2184	0.4	07h 39m 18s	+05° 13' 29"
Propus	Eta Geminorum	78135	42995	7969	1877:1716	3.5	06h 14m 52s	+22° 30' 24"
Proxima	Alfa Centauri C	-	-	-	9010:4949	11	14h 29m 47s	-62° 40' 55"
Rana	Delta Eridani	130686	23249	4450	5303:1320	3.5	03h 43m 14s	-09° 45' 46"
Ras Algethi	Alfa Herculis	102681	156015	23278	990:2133	5.4	17h 14m 39s	+14° 23' 24"
Ras Alhague	Alfa Ophiuchi	102932	159561	23837	1000:2508	2.1	17h 34m 55s	+12° 33' 36"
Ras Elased Australis	Epsilon Leonis	81004	84441	13443	1960:1550	3	09h 45m 50s	+23° 46' 26"
Ras Elased Borealis	Mu Leonis	81064	85503	13590	1964:1473	3.9	09h 52m 46s	+26° 00' 24"
Rastaban	Beta Draconis	30429	159181	23741	3521:1800	2.8	17h 30m 25s	+52° 18' 02"
Regor	Gamma Velorum	219504	68273	11105	8140:6533	1.8	08h 09m 31s	-47° 20' 12"
Regulus	Alfa Leonis	98967	87901	13926	833:1381	1.4	10h 08m 22s	+11° 58' 00"
Rigel	Beta Orionis	131907	34085	6410	5331:1752	0.3	05h 14m 31s	-08° 12' 06"
Rigil Kentaurus	Alfa Centauri	252838	128620	-	9007:5849	0	14h 39m 36s	-60° 50' 06"
Rotanev	Beta Delphini	106316	196524	28709	1100:1720	4.1	20h 37m 32s	+14° 35' 42"
Ruchbah	Delta Cassiopeiae	22268	8538	1715	4031:3289	2.8	01h 25m 47s	+60° 14' 04"
Rukbat	Alfa Sagittarii	229659	181869	26737	7935:2139	4.1	19h 23m 52s	-40° 36' 56"
Sabik	Eta Ophiuchi	160332	155125	23158	6232:1333	2.6	17h 10m 22s	-15° 43' 28"
Sadachbia	Gamma Aquarii	146044	212061	31257	5226:1606	4	22h 21m 39s	-01° 23' 12"
Sadalbari	Mu Pegasi	90816	216131	31851	2225:1821	3.5	22h 49m 58s	+24° 36' 06"
Sadalmelik	Alfa Aquarii	145862	209750	30896	5224:1806	3.2	22h 05m 46s	-00° 19' 11"
Sadalsuud	Beta Aquarii	145457	204867	30137	5216:1725	3.1	21h 31m 34s	-05° 34' 14"
Sadr	Gamma Cygni	49528	194093	28338	3156:2223	2.3	20h 22m 13s	+40° 15' 24"
Saiph	Kappa Orionis	132542	38771	7264	5351:760	2.1	05h 47m 45s	-09° 40' 10"
Sargas	Theta Scorpii	228201	159532	23857	7892:7679	1.9	17h 37m 19s	-42° 59' 52"
Sarin	Delta Herculis	84951	156164	23294	2065:1930	3.2	17h 15m 01s	+24° 50' 20"
Scheat	Beta Pegasi	90981	217906	32135	2243:1831	2.6	23h 03m 46s	+28° 04' 58"
Shaula	Lambda Scorpii	208954	158926	23769	7388:1093	1.6	17h 33m 35s	-37° 06' 14"
Shedir	Alfa Cassiopeiae	21609	3712	792	3663:2668	2.2	00h 40m 30s	+56° 32' 12"
Sheliak	Beta Lyrae	67451	174638	25847	2642:2929	3.2	18h 50m 04s	+33° 21' 46"
Sheratan	Beta Arietis	75012	11636	2309	1212:1935	2.7	01h 54m 37s	+20° 48' 28"
Sirius	Alfa Canis Majoris	151881	48915	8833	5949:2777	-1.4	06h 45m 08s	-16° 42' 56"
Skat	Delta Aquarii	165375	216627	31943	6387:1382	3.5	22h 54m 39s	-15° 49' 14"
Spica	Alfa Virginis	157923	116658	18144	5547:1518	1	13h 25m 10s	-11° 09' 38"
Sualocin	Alfa Delphini	106357	196524	28709	1100:1720	3.9	20h 37m 32s	+14° 35' 42"

Subra	Omicron Leonis	98709	83808	13366	821:2130	3.5	09h 41m 08s	+09° 53' 30"
Suhail	Lambda Velorum	220878	78647	12623	7689:2617	2.2	09h 07m 58s	-43° 25' 58"
Sulafat	Gamma Lyrae	67663	176437	26086	2643:3346	3.3	18h 58m 57s	+32° 41' 20"
Syrma	Iota Virginis	139824	124850	19244	4982:1645	4	14h 16m 00s	-06° 00' 02"
Talitha Australis	Kappa Ursae Majoris	42661	77327	12503	3424:1626	4.2	09h 03m 37s	+47° 09' 24"
Talitha Borealis	Iota Ursae Majoris	42630	76644	12407	3420:2149	3.1	08h 59m 12s	+48° 02' 30"
Tania Australis	Mu Ursae Majoris	43310	89758	14232	3004:1418	3.1	10h 22m 19s	+41° 29' 56"
Tania Borealis	Lambda Ursae Majoris	43268	89021	14113	3007:1286	3.5	10h 17m 06s	+42° 54' 50"
Tarazed	Gamma Aquilae	105223	186791	27354	1061:2577	2.8	19h 46m 16s	+10° 36' 46"
Taygete	19 Tauri nelle Pleiadi	76140	23338	4486	1803:1585	4.3	03h 45m 11s	+24° 28' 00"
Tejat	Mu Geminorum	78297	44478	8208	1878:1429	2.9	06h 22m 58s	+22° 30' 50"
Thuban	Alfa Draconis	16273	123299	19019	4174:1262	3.6	14h 04m 22s	+64° 22' 32"
Tsih	Gamma Cassiopeiae	11482	5394	1117	4017:2319	2.8	00h 56m 42s	+60° 43' 00"
Tyl	Epsilon Draconis	9540	188119	27471	4449:2652	4	19h 48m 10s	+70° 16' 04"
Unukalhai	Alfa Serpentis	121157	140573	21158	363:1135	2.8	15h 44m 16s	+06° 25' 32"
Vega	Alfa Lyrae	67174	172167	25466	3105:2070	0.1	18h 36m 55s	+38° 47' 02"
Vindemiatrix	Epsilon Virginis	100384	113226	17687	886:1326	2.8	13h 02m 10s	+10° 57' 32"
Wasat	Delta Geminorum	79294	56986	9755	1359:2672	3.5	07h 20m 05s	+21° 58' 54"
Wezen	Delta Canis Majoris	173047	54605	9443	6532:5001	2	07h 08m 22s	-26° 23' 34"
Wezn	Beta Columbae	196240	39425	7364	7069:1482	3.2	05h 50m 58s	-35° 46' 04"
Yed Posterior	Epsilon Ophiuchi	141086	146791	21920	5042:999	3.3	16h 18m 17s	-04° 41' 34"
Yed Prior	Delta Ophiuchi	141052	146051	21838	5037:1068	3	16h 14m 20s	-03° 41' 38"
Yildun	Delta Ursae Minoris	2937	166205	24236	4655:1053	4.4	17h 32m 12s	+86° 35' 08"
Zaurak	Gamma Eridani	149283	25025	4778	5311:1285	3.2	03h 58m 01s	-13° 30' 32"
Zosma	Delta Leonis	81727	97603	15438	1439:2479	2.6	11h 14m 06s	+20° 31' 26"
Zuben El Arkab	Gamma Librae	159370	138905	20949	5608:1381	4	15h 35m 31s	-14° 47' 23"
Zuben El Genubi	Alfa Librae	158840	130841	19975	6155:1210	2.9	14h 50m 52s	-16° 02' 30"
Zuben El Shamali	Beta Librae	140430	135742	20539	5585:1014	2.7	15h 16m 58s	-09° 22' 58"

APPENDIX B

NAMED NEBULA: 62

Name	No.	Name	No.
Baxendell's Nebula	NGC 7088	Horsehead Nebula	IC 434
Blinking Planetary	NGC 6826	Hour Glass Nebula	NGC 6523
Blue Planetary	NGC 3918	Hubble's Variable Nebula	NGC 2261
Blue Snowball	NGC 7662	Keyhole Nebula	NGC 3372
Bode's Nebula	NGC 3031	Lace-work Nebula	NGC 6960
Box Nebula	NGC 6309	Lagoon Nebula	NGC 6523
Bubble Nebula	NGC 7635	Little Dumbbell	NGC 650
Bug Nebula	NGC 6302	Little Gem	NGC 6818
California Nebula	NGC 1499	Little Ghost	NGC 6369
Cirrus Nebula	NGC 6960	Maia Nebula	NGC 1432
Cirrus Nebula NW Part	NGC 6979	Merope Nebula	NGC 1435
Clown Face Nebula	NGC 2392	Network Nebula	NGC 6992
Cocoon Nebula	IC 5146	North American Nebula	NGC 7000
Coddington Nebula	IC 2574	Omega Nebula	NGC 6618
Cone Nebula	NGC 2264	Orion Nebula	NGC 1976
Crab Nebula	NGC 1952	Owl Nebula	NGC 3587
Crescent Nebula	NGC 6888	Pelican Nebula	IC 570
Dumbbell Nebula	NGC 6853	Pinwheel Nebula	NGC 4254
Eagle Nebula	NGC 6611	Ring Nebula in Lyra	NGC 6720
Eight-burst Planetary	NGC 3132	Rosette Nebula	NGC 2244
Eskimo Nebula	NGC 2392	Saturn Nebula	NGC 7009
Eta Carinae	NGC 3372	Seagull Nebula	NGC 2032
Filamentary Nebula	NGC 6960	Star Queen Nebula	NGC 6611
Flame Nebula	NGC 2024	Struve's Lost Nebula	NGC 1554
Flaming Star	IC 45	Swan Nebula	NGC 6618
Ghost of Jupiter	NGC 3242	Tarantula Nebula	NGC 2070
Great Nebula in Andromeda	NGC 224	Tempel's Nebula	NGC 1435
Great Nebula in Orion	NGC 1976	Thor's Helmet	NGC 2359
Gum 1 Nebula	IC 2177	Trifid Nebula	NGC 6514
Helix Nebula	NGC 7293	Veil Nebula	NGC 6960
Hind's Variable Nebula	NGC 1555	Witch Head Nebula	IC 2118

APPENDIX C

ASTERISMS & OTHERS: 59

Name	RA(h)	DEC(Deg)
Brocchi's Cluster	19.423332	20.183332
Campbell's Nebula	19.579351	30.510555
Kappa Crucis	12.894422	-60.358723
Leo I	10.140944	12.3075
Leo II	11.224777	22.153334
Mayalls' Object	11.065056	40.850018
Pazmino's Cluster	3.278413	60.049889
Perseus A	3.330148	41.512604
Piazzi's Flying	21.115162	38.746029
Pointer Star 1	11.030833	56.3825
Pointer Star 2	11.062222	61.751111
The Big Bear	11.315833	53.566111
The Big Dipper	12.6125	56.5825
The Broken Engagement Ring	10.844167	56.114722
The Cat's Eye Nebula	17.976435	66.631775
The Circlet	23.528333	3.923333
The Coal Sack Nebula	12.830622	-63.049362
The Coathanger	19.438333	20.132222
The Crimson Star	4.993408	-14.806111
The Dolphin's Diamonds	21.117222	16.276389
The Draco Dwarf	17.336798	57.915379
The Egg Nebula	21.038507	36.693222
The False Cross	8.906111	-57.618056
The Garnet Star	21.725105	58.780193
The Great Square of Pegasus	23.641667	21.585278
The Gum Nebula	8.501716	-44.055553
The Horseshoe	21.130556	47.231944
The Hyades	4.451389	16.932778
The Jaws	12.64	-11.521111
The Keystone	16.916111	35.269167
The Kite	14.703333	29.362778
The Large Magellanic Cloud (LMC)	5.350463	9-68.455391
The Little Bear	15.301944	78.215278
The Little Dipper	15.698611	81.252778
The Little Queen	18.590556	72.380278
The Medusa Nebula	7.483425	13.246111
The Mini-Coathanger	16.480278	80.2875
The North Pole	5	90
The North Star	2.531667	89.264167
The Northern Cross	20.098333	36.069167
The Pegasus I Cluster	23.337408	8.206111
The Pegasus II Cluster	23.641239	27.031111
The Pleiades	3.782778	24.110833
The Plough	12.6125	56.5825
The Red-Necked Emu	20.234722	36.499444

The Running Chicken	11.61003	-63.03347
The Scout Double	19.512222	27.9625
The Seven Sisters	3.782778	24.110833
The Sickle	10.090278	19.308056
The Small Magellanic Cloud (SMC)	0.877201	-72.800385
The South Pole	5	-90
The Southern Cross	12.496389	-60.118333
The Stargate	12.595833	-12.028056
The Summer Triangle	19.6875	28.951944
The Teapot	18.607778	-29.449444
The Trapezium	5.587883	-5.387361
The Winter Triangle	6.748333	-1.432222
Wild's Triplet	11.776518	-3.859444
Zwicky's Triplet	16.824261	45.456745

APPENDIX D

COMMON NON-STELLAR: 113

Name	Path	No	Name	Path	No
Andromeda Galaxy	NGC	224	Lace-work Nebula	NGC	6960
Antennae	NGC	4038	Lagoon Nebula	NGC	6523
Barnard's Galaxy	NGC	6822	Little Dumbbell	NGC	650
Baxendell's Nebula	NGC	7088	Little Gem	NGC	6818
Bear Paw Galaxy	NGC	2537	Little Ghost	NGC	6369
Beehive Cluster	NGC	2632	Little Star Cloud	NGC	6603
Black-eye Galaxy	NGC	4826	Lost Galaxy	NGC	4526
Blinking Planetary	NGC	6826	Maia Nebula	NGC	1432
Blue Planetary	NGC	3918	Merope Nebula	NGC	1435
Blue Snowball	NGC	7662	Miniature Spiral	NGC	3928
Bode's Nebula	NGC	3031	Network Nebula	NGC	6992
Box Nebula	NGC	6309	North American Nebula	NGC	7000
Bubble Nebula	NGC	7635	Omega Centauri	NGC	5139
Bug Nebula	NGC	6302	Omega Nebula	NGC	6618
Butterfly Cluster	NGC	6405	Orion Nebula	NGC	1976
California Nebula	NGC	1499	Owl Nebula	NGC	3587
Christmas Tree Cluster	NGC	2264	Papillon	IC	78
Cirrus Nebula	NGC	6960	Pelican Nebula	IC	570
Cirrus Nebula NW Part	NGC	6979	Pinwheel Galaxy	NGC	598
Clown Face Nebula	NGC	2392	Pinwheel Nebula	NGC	4254
Cocoon Nebula	IC	5146	Polarissima Australis	NGC	2573
Coddington Nebula	IC	2574	Polarissima Borealis	NGC	3172
Cone Nebula	NGC	2264	Praesepe	NGC	2632
Copeland's Septet	NGC	3745	Ring Nebula in Lyra	NGC	6720
Crab Nebula	NGC	1952	Ring-Tail Galaxy	NGC	4038
Crescent Nebula	NGC	6888	Rosette Nebula	NGC	2244
Deer Lick Group	NGC	7331	Saturn Nebula	NGC	7009
Double Cluster in Perseus	NGC	869	Sculptor Galaxy	NGC	253
Dumbbell Nebula	NGC	6853	Seagull Nebula	NGC	2032
Eagle Nebula	NGC	6611	Seyfert's Sextet	NGC	6027
Eight-burst Planetary	NGC	3132	Siamese Twins	NGC	4567
Eskimo Nebula	NGC	2392	Sombrero Galaxy	NGC	4594
ET Cluster	NGC	457	Spider Galaxy	NGC	5829
Eta Carinae	NGC	3372	Spindle Galaxy	NGC	3115
Filamentary Nebula	NGC	6960	Star Queen Nebula	NGC	6611
Flame Nebula	NGC	2024	Stephan's Quintet	NGC	7317
Flaming Star	IC	45	Struve's Lost Nebula	NGC	1554
Foxhead	NGC	6819	Sunflower Galaxy	NGC	5055
Ghost of Jupiter	NGC	3242	Swan Nebula	NGC	6618
Great Cluster in Hercules	NGC	6205	Tarantula Nebula	NGC	2070
Great Nebula in Andromeda	NGC	224	Tempel's Nebula	NGC	1435
Great Nebula in Orion	NGC	1976	The Box	NGC	4169
Gum 1 Nebula	IC	2177	The Comma	NGC	4039
Helix Galaxy	NGC	2685	The Eyes	NGC	4438
Helix Nebula	NGC	7293	The Fath	NGC	708

Hercules Globular Cluster	NGC	6205	The Mice	NGC	4676
Hind's Variable Nebula	NGC	1555	The Nonet	NGC	4438
Hole-in-a-Cluster	NGC	6811	The Wall	NGC	6205
Horsehead Nebula	IC	434	Thor's Helmet	NGC	2359
Hour Glass Nebula	NGC	6523	Triangulum Galaxy	NGC	598
Hubble's Variable Nebula	NGC	2261	Trifid Nebula	NGC	6514
Integral Sign	NGC	3697	Tucanae (47)	NGC	104
Intergalactic Wanderer	NGC	2419	Veil Nebula	NGC	6960
Jewel Box	NGC	4755	Whirlpool Galaxy	NGC	5194
Keenan System	NGC	5216	Wild Duck Cluster	NGC	6705
Kemble's Cascade	NGC	1502	Witch Head Nebula	IC	2118
Keyhole Nebula	NGC	3372			

APPENDIX D

COMMON NON-STELLAR: 113

Name	Path	No	Name	Path	No
Andromeda Galaxy	NGC	224	Lace-work Nebula	NGC	6960
Antennae	NGC	4038	Lagoon Nebula	NGC	6523
Barnard's Galaxy	NGC	6822	Little Dumbbell	NGC	650
Baxendell's Nebula	NGC	7088	Little Gem	NGC	6818
Bear Paw Galaxy	NGC	2537	Little Ghost	NGC	6369
Beehive Cluster	NGC	2632	Little Star Cloud	NGC	6603
Black-eye Galaxy	NGC	4826	Lost Galaxy	NGC	4526
Blinking Planetary	NGC	6826	Maia Nebula	NGC	1432
Blue Planetary	NGC	3918	Merope Nebula	NGC	1435
Blue Snowball	NGC	7662	Miniature Spiral	NGC	3928
Bode's Nebula	NGC	3031	Network Nebula	NGC	6992
Box Nebula	NGC	6309	North American Nebula	NGC	7000
Bubble Nebula	NGC	7635	Omega Centauri	NGC	5139
Bug Nebula	NGC	6302	Omega Nebula	NGC	6618
Butterfly Cluster	NGC	6405	Orion Nebula	NGC	1976
California Nebula	NGC	1499	Owl Nebula	NGC	3587
Christmas Tree Cluster	NGC	2264	Papillon	IC	78
Cirrus Nebula	NGC	6960	Pelican Nebula	IC	570
Cirrus Nebula NW Part	NGC	6979	Pinwheel Galaxy	NGC	598
Clown Face Nebula	NGC	2392	Pinwheel Nebula	NGC	4254
Cocoon Nebula	IC	5146	Polarissima Australis	NGC	2573
Coddington Nebula	IC	2574	Polarissima Borealis	NGC	3172
Cone Nebula	NGC	2264	Praesepe	NGC	2632
Copeland's Septet	NGC	3745	Ring Nebula in Lyra	NGC	6720
Crab Nebula	NGC	1952	Ring-Tail Galaxy	NGC	4038
Crescent Nebula	NGC	6888	Rosette Nebula	NGC	2244
Deer Lick Group	NGC	7331	Saturn Nebula	NGC	7009
Double Cluster in Perseus	NGC	869	Sculptor Galaxy	NGC	253
Dumbbell Nebula	NGC	6853	Seagull Nebula	NGC	2032
Eagle Nebula	NGC	6611	Seyfert's Sextet	NGC	6027
Eight-burst Planetary	NGC	3132	Siamese Twins	NGC	4567
Eskimo Nebula	NGC	2392	Sombrero Galaxy	NGC	4594
ET Cluster	NGC	457	Spider Galaxy	NGC	5829
Eta Carinae	NGC	3372	Spindle Galaxy	NGC	3115
Filamentary Nebula	NGC	6960	Star Queen Nebula	NGC	6611
Flame Nebula	NGC	2024	Stephan's Quintet	NGC	7317
Flaming Star	IC	45	Struve's Lost Nebula	NGC	1554
Foxhead	NGC	6819	Sunflower Galaxy	NGC	5055
Ghost of Jupiter	NGC	3242	Swan Nebula	NGC	6618
Great Cluster in Hercules	NGC	6205	Tarantula Nebula	NGC	2070
Great Nebula in Andromeda	NGC	224	Tempel's Nebula	NGC	1435
Great Nebula in Orion	NGC	1976	The Box	NGC	4169
Gum 1 Nebula	IC	2177	The Comma	NGC	4039
Helix Galaxy	NGC	2685	The Eyes	NGC	4438
Helix Nebula	NGC	7293	The Fath	NGC	708

Hercules Globular Cluster	NGC	6205	The Mice	NGC	4676
Hind's Variable Nebula	NGC	1555	The Nonet	NGC	4438
Hole-in-a-Cluster	NGC	6811	The Wall	NGC	6205
Horsehead Nebula	IC	434	Thor's Helmet	NGC	2359
Hour Glass Nebula	NGC	6523	Triangulum Galaxy	NGC	598
Hubble's Variable Nebula	NGC	2261	Trifid Nebula	NGC	6514
Integral Sign	NGC	3697	Tucanae (47)	NGC	104
Intergalactic Wanderer	NGC	2419	Veil Nebula	NGC	6960
Jewel Box	NGC	4755	Whirlpool Galaxy	NGC	5194
Keenan System	NGC	5216	Wild Duck Cluster	NGC	6705
Kemble's Cascade	NGC	1502	Witch Head Nebula	IC	2118
Keyhole Nebula	NGC	3372			

APPENDIX E

NAMED GALAXY: 27

Name	Path	No
Andromeda Galaxy	NGC	224
Antennae	NGC	4038
Barnard's Galaxy	NGC	6822
Bear Paw Galaxy	NGC	2537
Black-eye Galaxy	NGC	4826
Copeland's Septet	NGC	3745
Deer Lick Group	NGC	7331
Helix Galaxy	NGC	2685
Integral Sign	NGC	3697
Keenan System	NGC	5216
Lost Galaxy	NGC	4526
Miniature Spiral	NGC	3928
Papillon	IC	78
Pinwheel Galaxy	NGC	598
Polarissima Australis	NGC	2573
Polarissima Borealis	NGC	3172
Ring-Tail Galaxy	NGC	4038
Sculptor Galaxy	NGC	253
Seyfert's Sextet	NGC	6027
Siamese Twins	NGC	4567
Sombrero Galaxy	NGC	4594
Spider Galaxy	NGC	5829
Spindle Galaxy	NGC	3115
Stephan's Quintet	NGC	7317
Sunflower Galaxy	NGC	5055
Triangulum Galaxy	NGC	598
Whirlpool Galaxy	NGC	5194

APPENDIX F

NAMED CLUSTER: 17

Name	Path	No
Beehive Cluster	NGC	2632
Butterfly Cluster	NGC	6405
Christmas Tree Cluster	NGC	2264
Double Cluster in Perseus	NGC	869
ET Cluster	NGC	457
Foxhead	NGC	6819
Great Cluster in Hercules	NGC	6205
Hercules Globular Cluster	NGC	6205
Hole-in-a-Cluster	NGC	6811
Intergalactic Wanderer	NGC	2419
Jewel Box	NGC	4755
Kemble's Cascade	NGC	1502
Little Star Cloud	NGC	6603
Omega Centauri	NGC	5139
Praesepe	NGC	2632
Tucanae (47)	NGC	104
Wild Duck Cluster	NGC	6705

APPENDIX G

MIXED DEEP SKY: 7

Name	Path	No
The Box	NGC	4169
The Comma	NGC	4039
The Eyes	NGC	4438
The Fath	NGC	708
The Mice	NGC	4676
The Nonet	NGC	4438
The Wall	NGC	6205

APPENDIX H

CONSTELLATION: 88

Constellation	**Ab.**	**RA**	**DEC**
Andromeda	(And)	0 h 40 m	+38°
Antlia	(Ant)	10 h 00 m	-35°
Apus	(Aps)	16 h 00 m	-76°
Aquarius	(Aqr)	22 h 20 m	-13°
Aquila	(Aql)	19 h 30 m	+2°
Ara	(Ara)	17 h 10 m	-55°
Aries	(Ari)	2 h 30 m	+20°
Auriga	(Aur)	6 h 00 m	+42°
Bootes	(Boo)	14 h 35 m	+30°
Caelum	(Cae)	4 h 50 m	-38°
Camelopardalis	(Cam)	5 h 40 m	+70°
Cancer	(Cnc)	8 h 30 m	+20°
CanesVenatici	(CVn)	13 h 00 m	+40°
CanisMajor	(CMa)	6 h 40 m	-24°
CanisMinor	(CMi)	7 h 30 m	+6°
Capricornus	(Cap)	20 h 50 m	-20°
Carina	(Car)	8 h 40 m	-62°
Cassiopeia	(Cas)	1 h 00 m	+60°
Centaurus	(Cen)	13 h 20 m	-47°
Cepheus	(Cep)	22 h 00 m	+70°
Cetus	(Cet)	1 h 45 m	-12°
Chamaeleon	(Cha)	10 h 40 m	-78°
Circinus	(Cir)	14 h 50 m	-63°
Columba	(Col)	5 h 40 m	-34°
ComaBerenices	(Com)	12 h 40 m	+23°
CoronaAustrilis	(CrA)	18 h 30 m	-41°
CoronaBorealis	(CrB)	15 h 40 m	+30°
Corvus	(Crv)	12 h 20 m	-18°
Crater	(Crt)	11 h 20 m	-15°
Crux	(Cru)	12 h 20 m	-60°
Cygnus	(Cyg)	20 h 30 m	+43°
Delphinus	(Del)	20 h 35 m	+12°
Dorado	(Dor)	5 h 00 m	-60°
Draco	(Dra)	17 h 00 m	+60°
Equuleus	(Equ)	21 h 10 m	+6°
Eridanus	(Eri)	3 h 50 m	-30°
Fornax	(For)	2 h 25 m	-33°
Gemini	(Gem)	7 h 00 m	+22°
Grus	(Gru)	22 h 20 m	-47°
Hercules	(Her)	17 h 10 m	+27°
Horologium	(Hor)	3 h 20 m	-52°
Hydra	(Hya)	10 h 30 m	-20°
Hydrus	(Hyi)	2 h 40 m	-72°
Indus	(Ind)	21 h 20 m	-58°
Lacerta	(Lac)	22 h 25 m	+43°
Leo	(Leo)	10 h 30 m	+15°
LeoMinor	(LMi)	10 h 20 m	+33°
Lepus	(Lep)	5 h 25 m	-20°
Libra	(Lib)	15 h 10 m	-14°
Lupus	(Lup)	15 h 00 m	-40°

Lynx	(Lyn)	7 h 50 m	+45°
Lyra	(Lyr)	18 h 45 m	+36°
Mensa	(Men)	5 h 40 m	-77°
Microseopium	(Mic)	20 h 50 m	-37°
Monoceros	(Mon)	7 h 00 m	0°
Musca	(Mus)	12 h 30 m	-70°
Norma	(Nor)	16 h 00 m	-50°
Octans	(Oct)	21 h 00 m	-87°
Ophiuchus	(Oph)	17 h 10 m	-4°
Orion	(Ori)	5 h 20 m	+3°
Pavo	(Pav)	19 h 10 m	-65°
Pegasus	(Peg)	22 h 30 m	+17°
Perseus	(Per)	3 h 20 m	+42°
Phoenix	(Phe)	1 h 00 m	-48°
Pictor	(Pic)	5 h 30 m	-52°
Pisces	(Psc)	0 h 20 m	+10°
PiscisAustrinus	(PsA)	22 h 00 m	-32°
Puppis	(Pup)	9 h 35 m	-47°
Pyxis	(Pyx)	9 h 07 m	-27°
Reticulum	(Ret)	3 h 50 m	-63°
Sagitta	(Sge)	19 h 40 m	+18°
Sagittarius	(Sgr)	19 h 00 m	-25°
Scorpius	(Sco)	16 h 20 m	-26°
Sculptor	(Scl)	0 h 30 m	-35°
Scutum	(Sct)	18 h 30 m	-10°
Serpens	(Ser)	15 h 35 m	+8°
Sextans	(Sex)	10 h 10 m	-1°
Taurus	(Tau)	4 h 30 m	+18°
Telescopium	(Tel)	19 h 00 m	-52°
Triangulum	(Tri)	2 h 00 m	+32°
TriangulumAustral e	(TrA)	15 h 40 m	-65°
Tucana	(Tuc)	23 h 45 m	-68°
UrsaMajor	(UMa)	11 h 00 m	+58°
UrsaMinor	(UMi)	15 h 40 m	+78°
Vela	(Vel)	9 h 35 m	-47°
Virgo	(Vir)	13 h 20 m	-2°
Volans	(Vol)	7 h 40 m	-69°
Vulpecula	(Vul)	20 h 10 m	+25°

APPENDIX I
DOUBLE STARS: 153

Name	Path	No	R.A.		DEC
			h	m	°
gam Ari	GSC	1209:1835	1	53.5	19.29
lam Ari	SAO	75051	1	57.9	23.6
32 Eri	SAO	130806	3	54.3	-2.95
39 Eri	GSC	5315:2291	4	14.4	-10.26
omi2 Eri	GSC	5312:2325	4	15.3	-7.65
88 Tau	SAO	94026	4	35.7	10.16
tau Tau	SAO	76721	4	42.2	22.96
kap Lep	SAO	150239	5	13.2	-12.94
bet Ori	SAO	131907	5	14.5	-8.2
23 Ori	SAO	112697	5	22.8	3.55
118 Tau	SAO	77200	5	29.3	25.15
del Ori	SAO	132220	5	32	-0.3
lam Ori	SAO	112921	5	35.1	9.56
the Ori	SAO	132321	5	35.3	-5.23
sig Ori	SAO	132406	5	38.7	-2.6
gam Lep	SAO	170759	5	44.5	-22.45
zet CMa	SAO	196698	6	20.3	-30.06
eps Mon	SAO	113810	6	23.8	4.59
bet Mon	GSC	4797:1882	6	28.8	-7.03
38 Gem	SAO	96265	6	54.6	13.18
eps CMa	SAO	172676	6	58.6	-28.97
zet Gem	SAO	79031	7	4.1	20.57
145 CMa	SAO	173349	7	16.6	-23.32
eta CMa	SAO	173651	7	24.1	-29.3
eta Pup	SAO	174020	7	34.3	-23.47
alp Gem	SAO	60198	7	34.6	31.89
kap Pup	SAO	174199	7	38.8	-26.8
2 Pup	SAO	153363	7	45.5	-14.69
xi Pup	SAO	174601	7	49.3	-24.86
19 Pup	SAO	153942	8	11.3	-12.93
phi2 Cnc	SAO	80187	8	26.8	26.94
iot Cnc	SAO	80416	8	46.7	28.76
eps Hya	SAO	117112	8	46.8	6.42
b1 Car	SAO	236436	8	57	-59.23
27 Hya	SAO	136768	9	20.5	-9.56
ome Leo	SAO	117717	9	28.5	9.06
tau1 Hya	SAO	136895	9	29.1	-2.77
ups Car	SAO	250695	9	47.1	-65.07
gam Leo	SAO	81298	10	20	19.84

I Car	SAO	256710	10	24.4	-74.02
mu Car	SAO	238574	10	53.3	-58.86
54 Leo	SAO	81584	10	55.6	24.75
xi UMa	SAO	62484	11	18.2	31.53
iot Leo	SAO	99587	11	23.9	10.53
omi Cen	SAO	239145	11	31.8	-59.48
N Hya	SAO	179967	11	32.3	-29.26
2 Com	GSC	1444:2569	12	4.3	21.46
del Cen	SAO	239689	12	8.3	-50.71
alp Cru	SAO	251904	12	26.6	-63.1
17 Com	SAO	82330	12	28.9	25.91
gam Cru	SAO	240019	12	31.2	-57.11
24 Com	SAO	100160	12	35.1	18.38
gam Cen	SAO	223603	12	41.5	-48.96
gam Vir	GSC	4949:1120	12	41.7	-1.45
32 Com	SAO	100309	12	52.3	17.09
35 Com	SAO	82550	12	53.6	21.24
mu Cru	SAO	240366	12	54.6	-57.18
alp CVn	SAO	63257	12	56	38.32
78 UMa	SAO	28601	13	0.07	56.37
17 CVn	SAO	63380	13	10.1	38.5
J Cen	SAO	252284	13	22.6	-60.99
zet UMa	SAO	28738	13	23.9	54.93
25 CVn	SAO	63648	13	37.5	36.29
the Cen	GSC	8667:2226	13	41.7	-54.56
alp Cen	GSC	9007:5849	14	39.6	-60.83
54 Hya	SAO	182855	14	46	-25.44
17 Dra	SAO	30013	16	36.2	52.91
mu Dra	SAO	30239	17	5.3	54.47
nu Dra	SAO	30447	17	32.2	55.18
26 Dra	SAO	17546	17	35	61.87
psi Dra	SAO	8890	17	41.9	72.15
39 Dra	SAO	30949	18	23.9	58.8
eps Dra	SAO	9540	19	48.2	70.27
del Her	SAO	84951	17	15	24.84
kap Her	SAO	101951	16	8.1	17.05
alp Her	SAO	102681	17	14.6	14.39
95 Her	SAO	85647	18	1.5	21.6
100 Her	SAO	85753	18	7.8	26.1
eps Lyr	SAO	67315	18	44.4	39.64
zet Lyr	SAO	67321	18	44.8	37.64
bet Lyr	SAO	67451	18	50.1	33.36
bet Cyg	SAO	87301	19	30.7	27.96

16 Cyg	SAO	31898	19	41.8	50.52
del Cyg	SAO	48796	19	45	45.13
psi Cyg	GSC	3570:2427	19	55.6	52.44
31 Cyg	SAO	49337	20	13.6	46.74
29 Cyg	SAO	69678	20	14.6	36.8
ome2 Cyg	SAO	49741	20	31.2	49.22
lam Cyg	SAO	70505	20	47.4	36.49
61 Cyg	GSC	3168:2800	21	6.9	38.75
79 Cyg	SAO	71643	21	43.5	38.29
mu Cyg	SAO	89939	21	44.1	28.74
16 Vul	SAO	88098	20	2	24.94
15 Sge	SAO	105635	20	4.1	17.08
15 Aql	SAO	142996	19	0.5	-4.03
pi Aql	SAO	105282	19	48.7	11.82
57 Aql	SAO	143898	19	54.6	-8.23
rho Oph	SAO	184381	16	25.6	-23.44
lam Oph	SAO	121658	16	30.9	1.98
36 Oph	GSC	6820:326	17	15.3	-26.6
	SAO	185238	17	18	-24.29
61 Oph	SAO	122690	17	44.6	2.58
tau Oph	SAO	142050	18	3.1	-8.18
70 Oph	GSC	434:5213	18	5.5	2.5
del Ser	SAO	101623	15	34.8	10.54
59 Ser	SAO	123497	18	27.2	0.2
the Ser	SAO	124068	18	56.2	4.2
bet Sco	SAO	159682	16	5.4	-19.8
nu Sco	SAO	159764	16	12	-19.46
alp Sco	SAO	184415	16	29.4	-26.43
chi CrA	SAO	210294	18	33.4	-38.72
gam CrA	GSC	7422:1737	19	16.4	-37.06
8 Lac	SAO	72509	22	35.9	39.63
bet Cap	SAO	163481	20	21	-14.78
eps Cap	SAO	163614	20	28.9	-17.82
omi Cap	SAO	163626	20	29.9	-18.58
Bet Cep	SAO	10057	21	28.7	70.56
xi Cep	SAO	19827	22	3.8	64.63
del Cep	SAO	34508	22	29.2	58.42
pi Cep	SAO	10629	23	7.9	75.39
omi Cep	SAO	20554	23	18.6	68.11
12 Aqr	SAO	145064	21	4.1	-5.82
41 Aqr	GSC	6384:1570	22	14.3	-21.07
zet Aqr	SAO	146107	22	28.8	-0.02
94 Aqr	SAO	165625	23	19.1	-13.46

101 Aqr	SAO	191988	23	33.3	-20.91
104 Aqr	SAO	165836	23	41.8	-17.81
107 Aqr	SAO	165868	23	46	-18.68
37 Peg	SAO	127551	22	30	4.43
35 Psc	SAO	109087	0	15	8.82
65 Psc	SAO	74296	0	49.9	27.71
psi Psc	SAO	74482	1	5.7	21.47
zet Psc	SAO	109739	1	13.7	7.58
alp Psc	SAO	110291	2	2	2.76
37 Cet	SAO	129193	1	14.4	-7.92
chi Cet	SAO	148036	1	49.6	-10.69
66 Cet	SAO	129752	2	12.8	-2.39
gam Cet	SAO	110707	2	43.3	3.24
kap Scl	SAO	166083	0	4.3	-27.99
lam Cas	SAO	21489	0	31.8	54.52
eta Cas	SAO	21732	0	49.1	57.82
phi Cas	SAO	22191	1	20.1	58.23
iot Cas	GSC	4058:1504	2	29.1	67.4
AR Cas	SAO	35478	23	30	58.55
4 Cas	SAO	20614	23	24.8	62.28
sig Cas	GSC	0:00	23	59	55.76
eps Per	SAO	56840	3	57.9	40.01
57 Per	SAO	39604	4	33.4	43.05
56 And	SAO	55107	1	56	37.26
nu And	SAO	37734	2	3.9	42.33
59 And	SAO	55330	2	10.9	39.04
iot Tri	SAO	55347	2	12.4	30.3
15 Tri	GSC	2332:2197	2	35.8	34.7

APPENDIX J

VARIABLE STARS: 63

Name	Path	No	Name	Path	No
GCVS BU Tau	SAO	76229	GCVS chi Cyg	SAO	68943
GCVS lam Tau	SAO	93719	GCVS P Cyg	SAO	69773
GCVS R Lep	SAO	150058	GCVS W Cyg	SAO	51079
GCVS RX Lep	SAO	150206	GCVS T Vul	SAO	89216
GCVS mu Lep	SAO	150237	GCVS R Aql	SAO	124266
GCVS alp Ori	SAO	113271	GCVS eta Aql	SAO	125159
GCVS eta Gem	SAO	78135	GCVS chi Oph	SAO	159918
GCVS T Mon	SAO	113845	GCVS R Ser	SAO	101771
GCVS omi CMa	SAO	172542	GCVS d Ser	SAO	123497
GCVS zet Gem	SAO	79031	GCVS R Sct	SAO	142620
GCVS EW CMa	SAO	173264	GCVS alp Sco	SAO	184415
GCVS ome CMa	SAO	173282	GCVS mu Sco	SAO	208102
GCVS UW CMa	SAO	173444	GCVS RR Sco	SAO	208221
GCVS X Cnc	SAO	98230	GCVS eps CrA	SAO	210781
GCVS RS Cnc	SAO	61306	GCVS del Cap	SAO	164644
NSV 04093	SAO	14573	GCVS T Cep	SAO	19229
GCVS R Car	SAO	250614	GCVS del Cep	SAO	34508
GCVS I Car	SAO	250683	GCVS mu Cep	SAO	33693
GCVS R Leo	SAO	98769	GCVS R Aqr	SAO	165849
GCVS U Hya	SAO	156110	GCVS bet Peg	SAO	90981
GCVS VY UMa	SAO	15274	GCVS TX Psc	SAO	128374
GCVS omi Cen	SAO	239146	GCVS TV Psc	SAO	91910
NSV 05568	SAO	251862	GCVS T Cet	SAO	166210
GCVS Y CVn	SAO	44317	GCVS omi Cet	GSC	4693:1144
GCVS R Hya	SAO	181695	GCVS gam Cas	SAO	11482
GCVS mu Cen	SAO	224471	GCVS SU Cas	SAO	12472
GCVS R Cen	SAO	241580	GCVS rho Cas	SAO	35879
GCVS g Her	SAO	46108	GCVS rho Per	SAO	56138
GCVS alp Her	SAO	102681	GCVS bet Per	SAO	38592
GCVS u Her	GSC	2596:1318	GCVS lam And	SAO	53204
GCVS bet Lyr	SAO	67451	GCVS R Tri	GSC	2332:1426
GCVS R Lyr	SAO	47919			

WORLDWIDE CITIES

1.USA

NAME OF CITY	LONGITUDE			LATITUDE			TIME ZONE
	+/−	DEGREE	MINUTES	+/−	DEGREE	MINUTES	
Akron, OH	-	81	31	+	41	5	-5
Albany, NY	−	73	45	+	42	39	-5
Albuquerque, NM	−	106	39	+	35	5	-7
Allentown, PA	−	75	28	+	40	36	-5
Altoona, PA	−	78	24	+	40	31	-5
Amarillo, TX	−	101	50	+	35	12	-6
Asheville, NC	−	82	33	+	35	36	-5
Atlanta, GA	−	84	24	+	33	45	-5
Augusta, ME	−	69	48	+	44	19	-5
Austin, TX	−	97	45	+	30	16	-6
Baltimore, MD	−	76	37	+	39	17	-5
Bangor, ME	−	68	46	+	44	48	-5
Baton Rouge, LA	−	91	11	+	30	27	-6
Berkeley, CA	−	122	17	+	37	52	-8
Billings, MT	−	108	30	+	45	47	-7
Binghamton, NY	−	75	55	+	42	6	-5
Birmingham, AL	−	86	49	+	33	31	-6
Bismarck, ND	−	100	47	+	46	48	-6
Boise, ID	−	116	12	+	43	37	-7
Boston, MA	−	71	3	+	42	21	-5
Bridgeport, CT	−	73	11	+	41	11	-5
Brownsville, TX	−	97	30	+	25	54	-6
Buffalo, NY	−	78	52	+	42	53	-5
Butte, MT	−	112	32	+	46	0	-7
Camden, NJ	−	75	7	+	39	57	-5
Cedar Rapids, IA	−	91	40	+	41	58	-6
Charleston, SC	−	79	56	+	32	47	-5
Charleston, WV	−	81	38	+	38	21	-5
Charlotte, NC	−	80	51	+	35	13	-5
Chattanooga, TN	−	85	19	+	35	3	-5
Cheyenne, WY	−	104	49	+	41	8	-7
Chicago, IL	−	87	38	+	41	52	-6
Cincinnati, OH	−	84	31	+	39	6	-5
Cleveland, OH	−	81	42	+	41	30	-5
Colorado Springs, CO	−	104	49	+	38	50	-7
Columbia, MO	−	92	20	+	38	57	-6
Columbus, OH	−	83	0	+	39	58	-5
Concord, NH	−	71	32	+	43	12	-5
Dallas, TX	−	96	48	+	32	47	-6
Daytona Beach, FL	−	81	1	+	29	13	-5
Denver, CO	−	104	59	+	39	45	-7
Des Moines, IA	−	93	37	+	41	35	-6
Detroit, MI	−	83	3	+	42	20	-5
Durham, NC	−	78	55	+	36	0	-5
El Paso, TX	−	106	29	+	31	46	-7
Erie, PA	−	80	11	+	42	5	-5
Eugene, OR	−	123	5	+	44	3	-8
Evansville, IN	−	87	34	+	37	58	-5

Fargo, ND	—	96	47	+	46	52	-6
Fort Wayne, IN	—	85	8	+	41	4	-5
Fort Worth, TX	—	97	20	+	32	45	-6
Fresno, CA	—	119	47	+	36	44	-8
Galveston, TX	—	94	48	+	29	18	-6
Grand Rapids, MI	—	85	40	+	42	58	-5
Greenville, SC	—	82	24	+	34	51	-5
Gulfport, MS	—	89	5	+	30	22	-6
Harrisburg, PA	—	76	53	+	40	16	-5
Helena, MT	—	112	2	+	46	36	-7
Houston, TX	—	95	22	+	29	45	-6
Indianapolis, IN	—	86	10	+	39	46	-5
Jackson, MS	—	90	11	+	32	18	-6
Jacksonville, FL	—	81	40	+	30	20	-5
Jersey City, NJ	—	74	4	+	40	44	-5
Johnstown, PA	—	78	55	+	40	20	-5
Kansas City, KS	—	94	38	+	39	7	-6
Knoxville, TN	—	83	55	+	35	58	-5
Lansing, MI	—	84	33	+	42	44	-5
Laredo, TX	—	99	30	+	27	30	-6
Las Vegas, NV	—	115	9	+	36	10	-8
Lexington, KY	—	84	30	+	38	3	-5
Lincoln, NE	—	96	42	+	40	49	-6
Little Rock, AR	—	92	17	+	34	45	-6
Los Angeles, CA	—	118	14	+	34	3	-8
Louisville, KY	—	85	46	+	38	15	-5
Lubbock, TX	—	101	51	+	33	35	-6
Madison, WI	—	89	23	+	43	4	-6
Memphis, TN	—	90	3	+	35	9	-6
Miami, FL	—	80	12	+	25	47	-5
Minneapolis, MN	—	93	16	+	44	59	-6
Mobile, AL	—	88	3	+	30	42	-6
Montgomery, AL	—	86	19	+	32	23	-6
Montpelier, VT	—	72	34	+	44	16	-5
Nashville, TN	—	86	47	+	36	10	-6
New Haven, CT	—	72	55	+	41	18	-5
New Orleans, LA	—	90	4	+	29	57	-6
New York, NY	—	74	0	+	40	45	-5
Newark, NJ	—	74	10	+	40	44	-5
Norfolk, VA	—	76	17	+	36	51	-5
Ogden, UT	—	111	58	+	41	14	-7
Oklahoma City, OK	—	97	31	+	35	28	-6
Omaha, NE	—	95	56	+	41	16	-6
Pensacola, FL	—	87	13	+	30	25	-6
Peoria, IL	—	89	36	+	40	42	-6
Philadelphia, PA	—	75	9	+	39	57	-5
Phoenix, AZ	—	112	4	+	33	27	-7
Pittsburgh, PA	—	80	0	+	40	26	-5
Portland, ME	—	70	15	+	43	40	-5
Portland, OR	—	122	41	+	45	31	-8
Portsmouth, VA	—	76	21	+	36	51	-5
Providence, RI	—	71	25	+	41	50	-5
Raleigh, NC	—	78	38	+	35	47	-5

Reno, NV	—	119	49	+	39	31	-8
Richmond, VA	—	77	26	+	37	32	-5
Roanoke, VA	—	79	57	+	37	16	-5
Rockford, IL	—	89	6	+	42	17	-6
Sacramento, CA	—	121	30	+	38	35	-8
Salt Lake City, UT	—	111	53	+	40	45	-7
San Antonio, TX	—	98	29	+	29	26	-6
San Diego, CA	—	117	9	+	32	43	-8
San Francisco, CA	—	122	25	+	37	47	-8
Santa Barbara, CA	—	119	42	+	34	25	-8
Santa Fe, NM	—	105	56	+	35	41	-7
Savannah, GA	—	81	6	+	32	5	-5
Schenectady, NY	—	73	57	+	42	49	-5
Seattle, WA	—	122	20	+	47	37	-8
Shreveport, LA	—	93	45	+	32	31	-6
Sioux City, IA	—	96	24	+	42	30	-6
Sioux Falls, SD	—	96	44	+	43	33	-6
South Bend, IN	—	86	15	+	41	41	-5
Spokane, WA	—	117	26	+	47	40	-8
Springfield, IL	—	89	39	+	39	48	-6
Springfield, MA	—	72	36	+	42	6	-5
Springfield, MO	—	93	18	+	37	13	-6
St. Joseph, MO	—	94	51	+	39	46	-6
St. Louis, MO	—	90	12	+	38	38	-6
St. Paul, MN	—	93	6	+	44	57	-6
Syracuse, NY	—	76	9	+	43	3	-5
Topeka, KS	—	95	40	+	39	3	-6
Tucson, AZ	—	110	58	+	32	13	-8
Tulsa, OK	—	96	0	+	36	9	-6
Utica, NY	—	75	14	+	43	6	-5
Washington, D.C.	—	77	1	+	38	54	-5
Wichita Falls, TX	—	97	20	+	37	41	-6
Wichita, KS	—	98	29	+	33	55	-6
Wilmington, DE	—	75	33	+	39	45	-5
Winston Salem, NC	—	80	15	+	36	6	-5

2.CANADA

NAME OF CITY	Longitude			Latitude			Time Zone
	+/—	Degrees	Minutes	+/—	Degrees	Minutes	
Quebec, CanadA	—	73	33	+	52	56	-5
Winnipeg, Canada	—	97	9	+	49	53	-6
Victoria, Canada	—	123	22	+	48	25	-7
Vancouver, Canada	—	123	7	+	49	17	-8
Calgary, Canada	—	114	5	+	51	3	-7
Edmonton, Canada	—	113	28	+	53	33	-7
Regina, Canada	—	104	39	+	50	25	-6
Toronto, Canada	—	79	23	+	43	39	-5
Ottawa, Canada	—	75	42	+	45	25	-5
Montreal, Canada	—	73	35	+	45	30	-5
Saint John's, Canada	—	52	43	+	47	33	-4

3.EUROPE

NAME OF CITY	Longitude			Latitude			Time Zone
	+/−	Degrees	Minutes	+/−	Degrees	Minutes	
Aberdeen, Scotland	−	2	6	+	57	8	0
Adana, Turkey	+	35	19	+	37	0	2
Amsterdam, Netherlands	+	4	54	+	52	23	1
Andorra la Vella, Andorra	+	1	30	+	42	30	1
Ankara, Turkey	+	32	52	+	39	56	2
Athens, Greece	+	23	43	+	37	58	2
Barcelona, Spain	+	2	11	+	41	23	1
Berlin, Germany	+	13	22	+	52	33	1
Berne, Switzerland	+	7	28	+	46	57	1
Birmingham, England	−	1	53	+	52	29	0
Bonn, Germany	+	7	6	+	50	44	1
Bradford, England	−	1	45	+	53	48	0
Bristol, England	−	2	35	+	51	27	0
Brussels, Belgium	+	4	20	+	50	50	1
Budapest, Hungary	+	19	5	+	47	30	1
Bursa, Turkey	+	29	4	+	40	12	2
Copenhagen, Denmark	+	12	35	+	55	40	1
Donetsk, Ukraine	+	37	48	+	48	0	3
Edinburg, Scotland	−	3	12	+	55	57	0
Glasgow, Scotland	−	4	16	+	55	51	0
Hamburg, Germany	+	10	0	+	53	33	1
Istanbul, Turkey	+	28	58	+	41	1	2
Izmir, Turkey	+	27	10	+	38	25	2
Kharkiv, Ukraine	+	36	15	+	50	0	1
Kiev, Ukraine	+	30	31	+	50	26	3
Leeds, England	−	1	35	+	53	50	0
Lisbon, Portugal	−	9	8	+	38	43	0
Liverpool, England	−	3	0	+	53	23	0
London, United Kingdom	−	0	5	+	51	31	0
Luxembourg, Luxembourg	+	6	7	+	49	36	1
Lyons, France	+	4	51	+	45	45	1
Madrid, Spain	−	3	41	+	40	24	1
Marseilles, France	+	5	24	+	43	18	1
Milan, Italy	+	9	12	+	45	28	1
Minsk, Belarus	+	27	34	+	53	54	3
Monaco, Monaco	+	7	25	+	43	44	1
Moscow, Russia	+	37	35	+	55	45	3
Munich, Germany	+	11	35	+	48	9	1
Naples, Italy	+	14	15	+	40	50	1
Odessa, Ukraine	+	30	44	+	46	28	3
Oxford, England	−	1	15	+	51	45	0
Paris, France	+	2	20	+	48	52	1
Plymouth, England	−	4	6	+	50	23	0
Prague, Czech Republic	+	14	27	+	50	4	1
Rome, Italy	+	12	29	+	41	54	1
Rotterdam, Netherlands	+	4	29	+	51	55	1
San Marino, San Marino	+	12	28	+	43	55	1
Sheffield, England	−	1	30	+	53	23	0
Southampton, England	−	1	23	+	50	54	0
Stockholm, Sweden	+	18	3	+	59	20	1

Thessalonica, Greece	+	22	58	+	40	38	2
Turin, Italy	+	7	40	+	45	3	1
Vaduz, Liechtenstein	+	9	32	+	47	8	1
Vienna, Austria	+	16	22	+	48	12	1
Warsaw, Poland	+	21	0	+	52	15	1
York, England	−	1	5	+	53	57	0

4.OCEANIA

NAME OF CITY	Longitude			Latitude			Time Zone
	+/−	Degrees	Minutes	+/−	Degrees	Minutes	
Adelaide, Australia	+	138	36	−	34	56	+9.5
Brisbane, Australia	+	153	1	−	27	30	+10
Canberra, Australia	+	149	10	−	35	20	+10
Geelong, Australia	+	144	26	−	38	10	+10
Gold Coast, Australia	+	153	22	−	27	59	+10
Hobart, Australia	+	147	20	−	42	55	+10
Melbourne, Australia	+	145	0	−	37	50	+10
Sydney, Australia	+	151	12	−	33	53	+10
Wollongong, Australia	+	137	57	−	17	13	+10
Auckland, New Zealand	+	174	45	−	36	51	+12
Christchurch, New Zealand	+	172	36	−	43	35	+12
Dunedin, New Zealand	+	170	30	−	45	52	+12
Hamilton, New Zealand	+	175	18	−	37	46	+12
Wellington, New Zealand	+	174	51	−	41	28	+12

5.ASIA

NAME OF CITY	Longitude			Latitude			Time Zone
	+/−	Degrees	Minutes	+/−	Degrees	Minutes	
Fukuoka, Japan	+	130	21	+	33	39	+9
Hiroshima, Japan	+	132	27	+	34	23	+9
Kawasaki, Japan	+	139	41	+	35	32	+9
Kitakyushu, Japan	+	130	49	+	33	52	+9
Kobe, Japan	+	135	12	+	34	40	+9
Kyoto, Japan	+	135	45	+	35	2	+9
Nagasaki, Japan	+	129	55	+	32	48	+9
Nagoya, Japan	+	136	53	+	35	8	+9
Osaka, Japan	+	135	30	+	34	40	+9
Sapporo, Japan	+	141	21	+	43	3	+9
Tokyo, Japan	+	139	46	+	35	42	+9
Yokohama, Japan	+	141	15	+	41	4	+9
Daegu, South Korea	+	128	36	+	35	52	+9
Inchon, South Korea	+	126	38	+	37	30	+9
Kwangju, South Korea	+	126	52	+	35	7	+9
Pusan, South Korea	+	129	3	+	35	6	+9
Seoul, South Korea	+	127	0	+	37	34	+9
Taejon, South Korea	+	127	26	+	36	20	+9
Singapore, Singapore	+	103	51	+	1	17	+7
Ipoh, Malaysia	+	101	2	+	4	36	+8
Kuala Lumpur, Malaysia	+	101	42	+	3	1	+8

5. CHINA

NAME OF CITY	Longitude			Latitude			Time Zone
	+/−	Degrees	Minutes	+/−	Degrees	Minutes	
Guangzhou, China	+	113	15	+	23	7	+8
Beijing, China	+	116	24	+	39	56	+8
Shanghai, China	+	121	28	+	31	14	+8
Tianjin, China	+	117	12	+	39	8	+8
Chongqing, China	+	106	35	+	29	30	+8
Hongkong, China	+	114	9	+	22	17	+8
Chengdu, China	+	104	6	+	30	37	+8
Nanjing, China	+	118	47	+	32	3	+8
Harbin, China	+	126	41	+	45	45	+8
Shenyang, China	+	123	26	+	41	50	+8
Wuhan, China	+	114	15	+	36	45	+8
Xian, China	+	108	54	+	34	16	+8
Hohhot, China	+	111	48	+	40	49	+8
Shijiazhuang, China	+	114	28	+	38	2	+8
Changchun, China	+	125	19	+	43	52	+8
Hefei, China	+	117	18	+	31	51	+8
Jinan, China	+	117	0	+	36	38	+8
Hangzhou, China	+	120	9	+	30	14	+8
Nanchang, China	+	115	52	+	28	41	+8
Fuzhou, China	+	119	18	+	26	5	+8
Changsha, China	+	113	0	+	28	11	+8
Zhengzhou, China	+	113	42	+	34	48	+8
Nanning, China	+	108	20	+	22	48	+8
Guiyang, China	+	106	42	+	26	35	+8
Kunming, China	+	102	41	+	25	0	+8
Lanzhou, China	+	103	49	+	36	3	+8
Yinchuan, China	+	106	16	+	38	20	+8
Xining, China	+	101	45	+	36	38	+8
Urumchi, China	+	87	36	+	43	48	+8
Lhasa, China	+	91	10	+	29	40	+8
Haikou, China	+	110	20	+	20	2	+8
Taiyuan, China	+	112	34	+	37	52	+8
Kaohsiung, Taiwan, China	+	120	17	+	22	38	+8
Keelung, Taiwan, China	+	121	44	+	25	8	+8
Taichung, Taiwan, China	+	120	40	+	24	9	+8
Tainan, Taiwan, China	+	120	14	+	23	1	+8
Taipei, Taiwan, China	+	121	30	+	25	3	+8