Nightrider I
Equatorial Platform
Operator's Guide

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INTRODUCTION

The Nightrider Equatorial Platforms represent the finest design for astronomical tracking available at any price. You will find lasting value in the design, construction and reliability of the product. The following information will help you understand the setup, operation and maintenance of the Nightrider I.

The equatorial platform (also know as an equatorial table) is designed to give a Dobsonian-type scope the ability to track the stars as an equatorially mounted scope.

Unpacking

The equatorial platform comes in two parts, the top and the base. These parts are kept separate during shipping to prevent scratching and damage. When transporting the platform, we recommend that you use the original box and packaging material to protect your investment.

Before doing anything else, look for any obvious shipping damage and verify that all components are present. Here is a list of what you should find in the box:

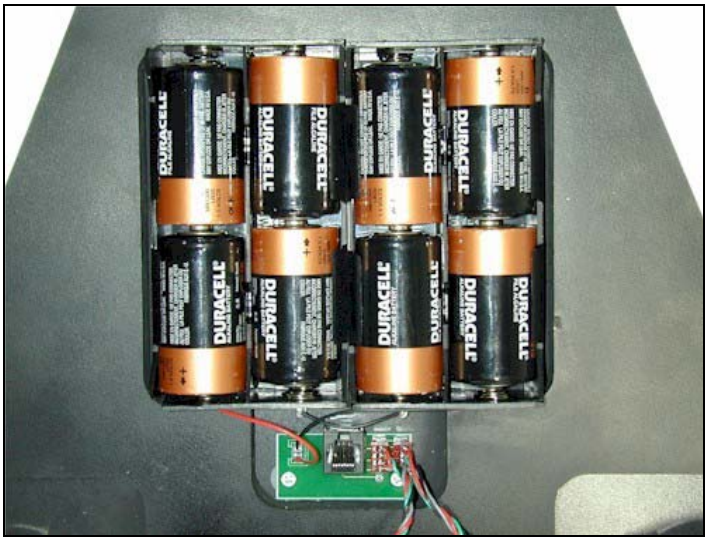
- Equatorial Platform Base
- Equatorial Platform Top
- Hand Control with Cable
- Self-adhesive Abrasive Pads (4)
- This Instruction Manual

Base (left) and Top (right) of the Nightrider I

Hand Control, Cable and Abrasive Pads

Battery Installation

Insert 8 fresh alkaline D batteries, with the correct polarity, into the battery holder. The electronics will operate from 9-12 volts DC. The motors will run quietest when operated from a 9V source. Installing D alkaline cells will yield about 100 hours of operation. General-purpose carbon cells are also OK, but expect fewer hours of operation from them.



Battery Compartment in Base

Powering Up and Down

To turn the unit on, simply connect the hand control cable. One end is inserted into the hand control and the other end into the modular jack in the base of the platform (next to the battery compartment). There is no need to turn a switch on or off. Turning the unit off is accomplished by unplugging one end of the hand control cable.

Care and Maintenance

Always keep the unit shaded or covered. The platform is made from Melamine particle board and leaving it exposed to direct sunlight or high humidity can cause the assembly to warp, swell or become too hot.

Very little maintenance should be required of your platform. When bring it into a warm house from a very cold observing session, condensation will occur unless you cover the unit with a towel. You are discouraged from letting the unit get wet, although heavy dew should be no problem. The electronics are coated to protect against this type of moisture. Exposure to rain and/or immersion is not recommended. Do not lubricate the drive rollers. Friction is necessary for proper operation.

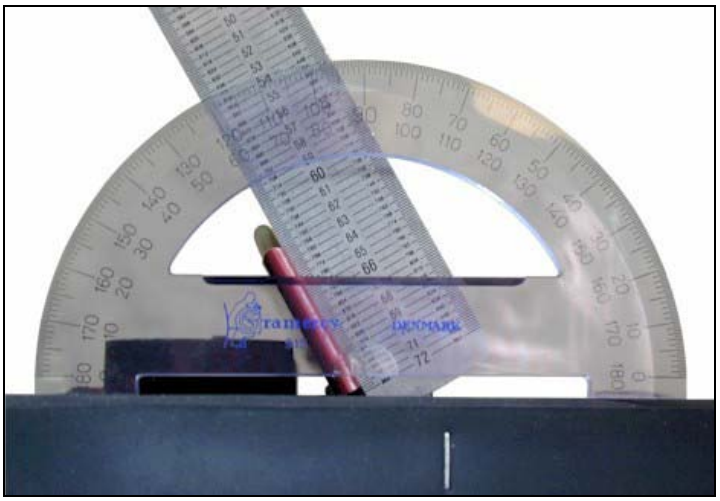
OPERATION

It is necessary to position the drive plate to the correct latitude setting for your location. You only need to do this once, unless your observing location varies by more than 300 miles north and south. You can adjust latitude settings from 0° to 50°.

Setting the Latitude

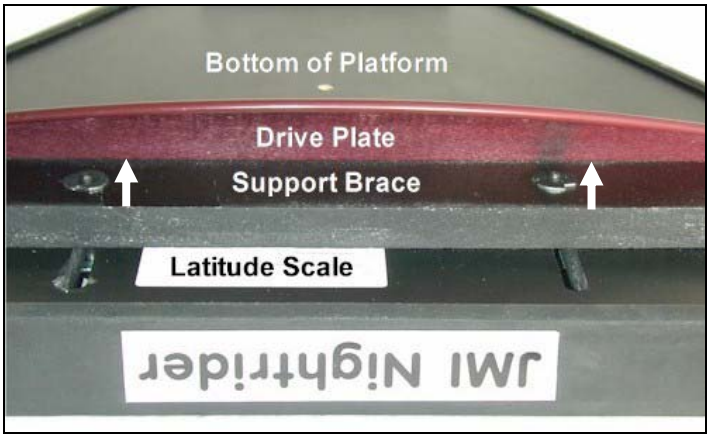
There are two ways to set the latitude position of the drive plate. The first is to use the latitude scale positioned under the support brace (see the picture at the bottom of the page). The other method requires a protractor and straight edge. To use the protractor method, align the protractor center with the bottom of the drive plate and place the straight edge on the plate as shown.

Use the *compliment* of your latitude as the angle to set the drive plate. The complimentary angle is 90º minus your latitude. For example, the compliment of 50º latitude is 90 – 50 or 40º. The compliment of 25º latitude is 90 – 25 or 65º.



Proper Position for a 30° Latitude Setting

Use the straight edge to extend the plane of the drive plate to get a latitude reading. Loosen the brace and adjust the plate to the correct setting. Measure and set the same angle at BOTH ends of the support brace.



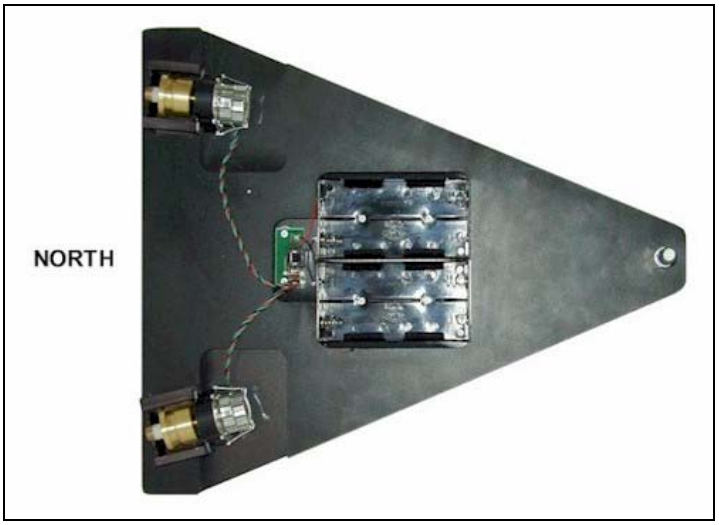
No Gap between Support Brace and Drive Plate

Place the brace flush against the drive plate and tighten. Make sure the support is flush and there is no gap between the plate and support. The support brace should touch the plate along its entire length. A gap may result in unstable and inaccurate tracking results.

Positioning the Platform

Always transport the unit in two pieces. This will prevent side-to-side movements, which could cause minor nicks in the precision assemblies

To use the platform, select a hard, level patch of ground or grass and place the base so the front motors face north, in the direction of Polaris (for use at northern latitudes), or south (for southern latitudes). For visual use, approximate alignment is quite sufficient.



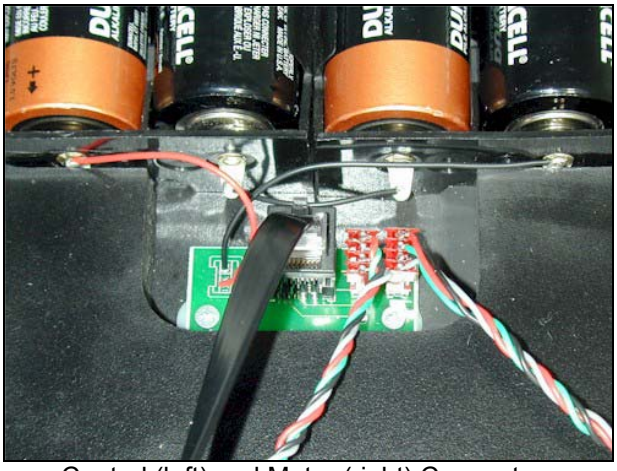
Align the Base with the Motors Facing the Celestial Pole

Align the drive wheels with the plane of the drive plate by slightly rotating the motor brackets (clockwise or counter-clockwise while looking down on the motors).

Rotate Brackets to Match Drive Wheels with Plate

Adjusting for Your Hemisphere

The polarity of the stepper motor connections must be reversed to change hemispheres. To do this, simply remove the red connector (for each motor) from the printed circuit board (next to the battery compartment), turn the connector 180º and reconnect it.



Control (left) and Motor (right) Connectors

Placing a Telescope on the Platform

With the ground board attached, place your telescope's ground board and rocker box on top of the platform so the center rocker box pin is centered between the front drive rollers and the rear Teflon pad of the base. You can experiment with placement of the telescope a bit forward or back for greatest stability. Moving forward increases friction of the drive rollers, but may make the reset operation more difficult. Next, place your optical tube assembly carefully into position. Use smooth, gentile movements to re-position your telescope. Once you are certain of the best position, you can apply the abrasive pads to the platform to mark the location and keep the scope from sliding on the platform.

To reset the platform, gently push the top half fully towards the west (east in the southern hemisphere) thus moving the scope to the east (west in the southern hemisphere). The platform will then provide about sixty minutes of tracking. You can reset it at any time, but remember after a reset, you will need to re-center your observing object.

Installation and Removal WARNING

Be certain when installing or removing your scope to first properly align the top and base of the platform to create a level platform surface. Next, place or remove the scope either in pieces or as a unit. Remember, the platform is only held together by gravity, just as your telescope is.

Because the drive plate is on a hinge (to allow for universal latitude adjustment), you will have to be careful when you re-point your telescope to avoid the hinge folding. This is best accomplished by slow, deliberate movements when pointing the telescope. Always return the platform to a level position when placing or removing your telescope.

Adjusting the Speed

You can adjust the speed with the hand control. Insert the ends of the hand control cable into the hand control and the base to turn the platform tracking on. Use the following procedures to vary the speeds for tracking or slewing:

- **Forward Slewing** (16x normal tracking speed)
  Press RA+.

- **Reverse Slewing** (16x normal tracking speed in reverse)
  Press RA–.

- **Slowly Increase Tracking Speed**
  First press and hold RA+ then quickly and simultaneously press RA–. Hold down both keys until you reach the desired speed.

- **Slowly Decrease Tracking Speed**
  First press and hold RA– then quickly and simultaneously press RA+. Hold down both keys until you reach the desired speed.

During normal tracking, the LED will flash. During the above procedures for slewing and speed adjustments, the LED will change from flashing to steady.

Note: The Dec+ and Dec– buttons are not supported on the Nightrider I.

TROUBLESHOOTING

If you are having problems getting the platform to function properly, first make sure both motors and the hand control are plugged in and fresh batteries are installed. Next, refer to the Troubleshooting Guide (below) to find possible causes.

Troubleshooting Guide

Symptom	Possible Cause(s)
No motion is detected even though the LED is on.	• Low battery (use alkaline batteries for best performance) Make sure the LED is flashing. A steady LED indicates high-speed slew mode. Low batteries will not operate the motors in slew mode. • The two motors may have different connector polarities. (See the section titled *Adjusting for Your Hemisphere*, for changing connector polarity.)
The unit is tracking the wrong direction.	• Make sure that the motor end is facing the celestial pole. • Check the motor connector polarity. (See the section titled *Adjusting for Your Hemisphere*.)

APPENDIX A
Nightrider I Specifications

Platform Size	24" x 24" x 24" (triangle)
Weight Capacity	90 pounds
Scope Capacity	13" aperture
Latitude Range	±0º to 50º
Platform Height	7½ inches
Construction	Melamine particle board and Aluminum
Total Weight	25 pounds (shipping weight 30 pounds)
Hand Control	Single axis with forward and reverse slewing, adjustable tracking speed, built-in chart-illuminator LED
Tracking Time	40-60 minutes
Power	9-12v DC 100mA, accepts 8 size D batteries
Battery Life	80 to 100 hours (with Alkaline batteries)

APPENDIX B
Precision Alignment Using the Star Drift Method

This method requires observing a star under high power, preferably with a center reticule eyepiece. If no such eyepiece is available, you can use the defocused star image very close to the eyepiece field of view to observe any drift. Here is one of many methods:

- Place the platform as close as possible to level and polar aligned. The closer this initial alignment is, the faster you will complete the task. Note the axis of travel during fast/slow slew in the eyepiece. This is the RA direction, which is not terribly important if there is drift. Perpendicular to that axis you will notice the drift that you need to eliminate.

- Pick a star near the celestial equator and in the east. Make sure you are far enough above the horizon to avoid atmospheric distortion (approx. 15º). By raising/lowering the elevation of one end of the platform (not the scope), you should minimize the drift over several minutes.

- Pick a star near the celestial equator and close to the meridian. Reduce the drift by rotating the platform base (not the scope) ever so slightly. Adjust until the error is minimized over several minutes.

- Repeat this sequence until satisfied.

This same method applies to CCD imaging, except you are watching the pixel drift.

For more information on polar alignment, go to our Document Library at www.jmitelescopes.com and find document number 8, *Polar Alignment is Easy ... Really!*

Good luck with your imaging!