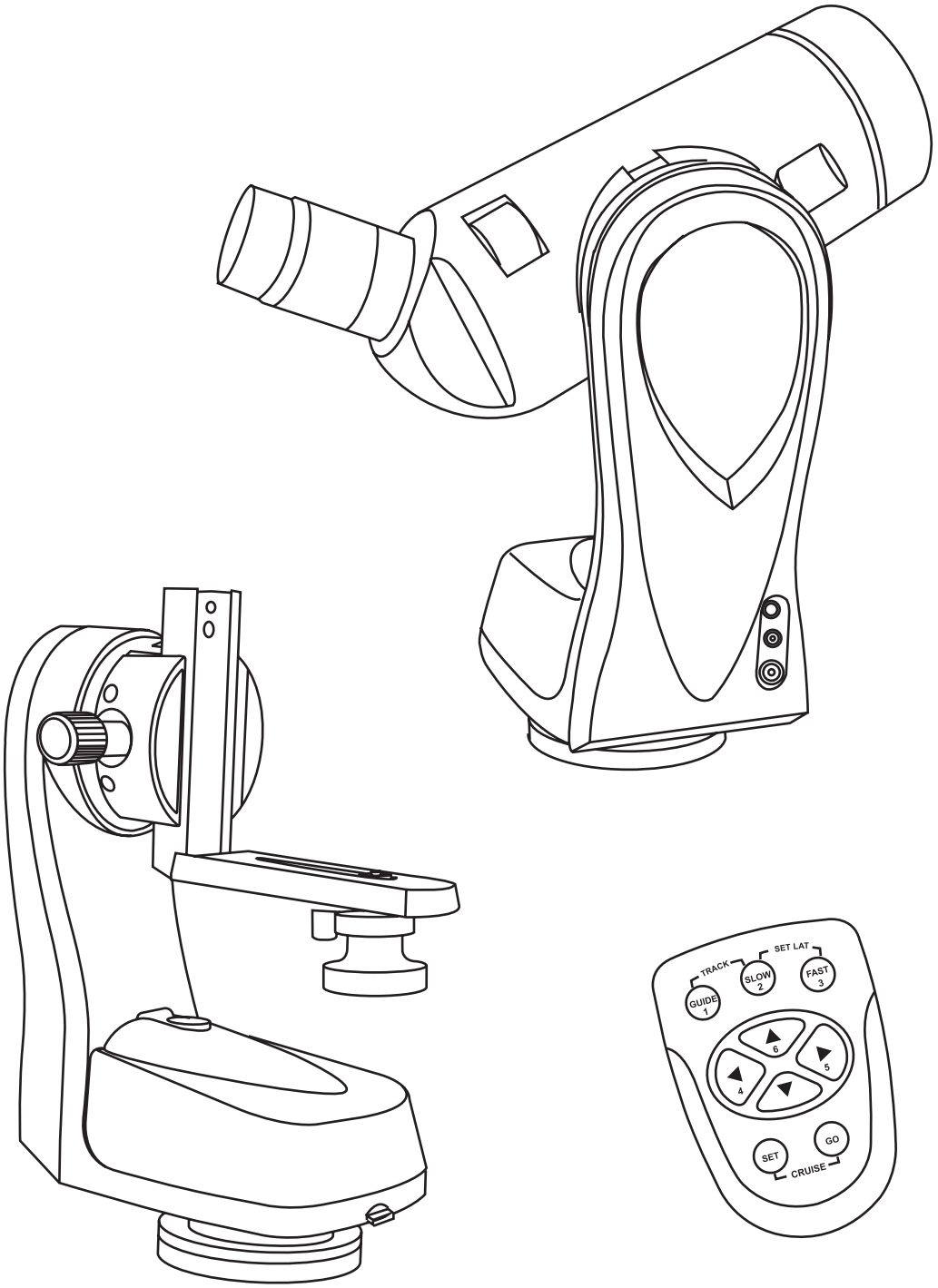
INSTRUCTION MANUAL

MULTI-FUNCTION MOUNT



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Congratulations on your purchase of the Multi-Function Mount. This is a versatile mount which is quite unique in that nothing like this has been offered in the marketplace previously:

- Single Arm Alt-Azimuth Mount
- DC Servo Motor Assembly
- IR Encoder with Optical Wheel
- Hand Control to Command the Motor
- Astronomical Tracking
- Terrestrial Stored Positions to GOTO
- Cruise and Image for Terrestrial Positions
- Lightweight and Portable
- Simple and Easy to Use

— NEVER LOOK AT THE SUN WITH THE NAKED EYE OR WITH A TELESCOPE (UNLESS YOU HAVE THE PROPER SOLAR FILTER). PERMANENT AND IRREVERSIBLE EYE DAMAGE MAY RESULT.

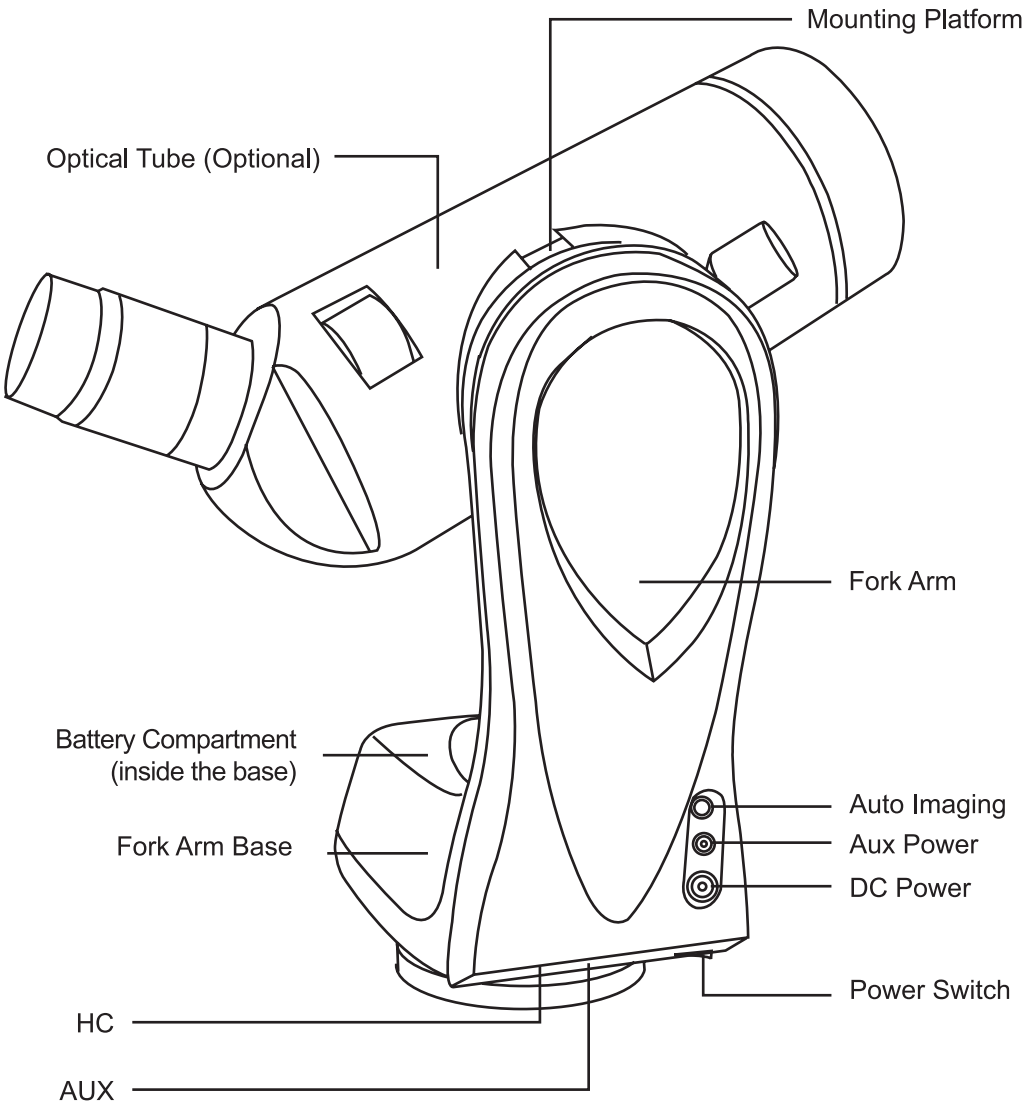
— IF OBSERVING THE SUN (WHILE USING A PROPER SOLAR FILTER) WITH YOUR TELESCOPE, MAKE SURE THAT THE FINDERSCOPE HAS A DUST CAP OVER THE OBJECTIVE END OR REMOVE THE FINDERSCOPE.

— NEVER USE YOUR TELESCOPE TO PROJECT AN IMAGE OF THE SUN ONTO ANY SURFACE. INTERNAL HEAT BUILD-UP CAN DAMAGE THE TELESCOPE AND ANY ACCESSORIES ATTACHED TO IT.

— NEVER USE AN EYEPIECE SOLAR FILTER OR A HERSCHEL WEDGE. INTERNAL HEAT BUILD-UP INSIDE THE TELESCOPE CAN CAUSE THESE DEVICES TO CRACK OR BREAK, ALLOWING UNFILTERED SUNLIGHT TO PASS THROUGH TO THE EYE.

— DO NOT LEAVE THE TELESCOPE UNSUPERVISED, EITHER WHEN CHILDREN ARE PRESENT OR ADULTS WHO MAY NOT BE FAMILIAR WITH THE CORRECT OPERATING PROCEDURES OF YOUR TELESCOPE.

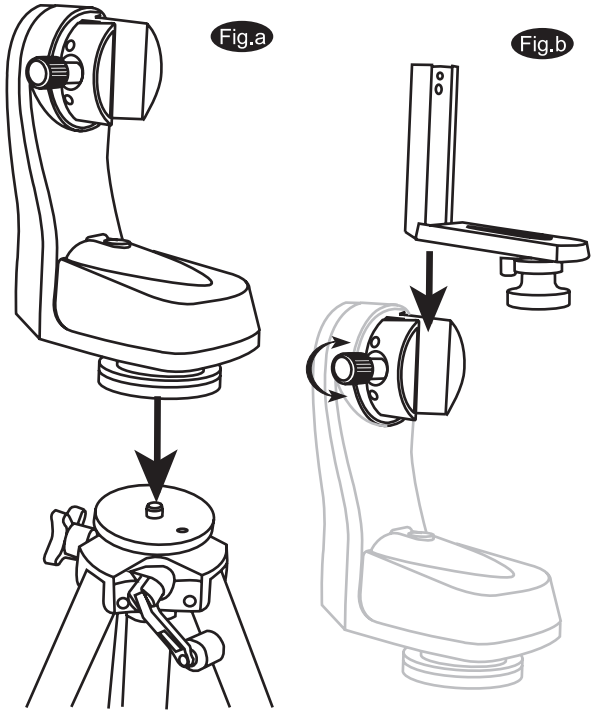
PARTS DIAGRAM



Auto Imaging —	Electronic shutter interface. This controls software action from the mount to devices such as digital spotting scope or Canon EOS digital cameras.
AUX Power —	Power supply socket for other devices. This is for auxiliary power from the mount to devices such as digital spotting scope or digital camera. The output voltage is the same as DC power.
DC Power —	For optional DC 12-volt source to power the mount.
HC —	For connection to the hand control.
AUX —	Not in use.

NEVER PLUG EXTERNAL POWER SUPPLY INTO "AUX POWER" SOCKET. IT MIGHT DAMAGE THE BATTERIES INSIDE THE BATTERY COMPARTMENT OR CAUSE THEM LEAK OR EXPLODE

MOUNT AND TELESCOPE ASSEMBLY



TRIPOD SET UP

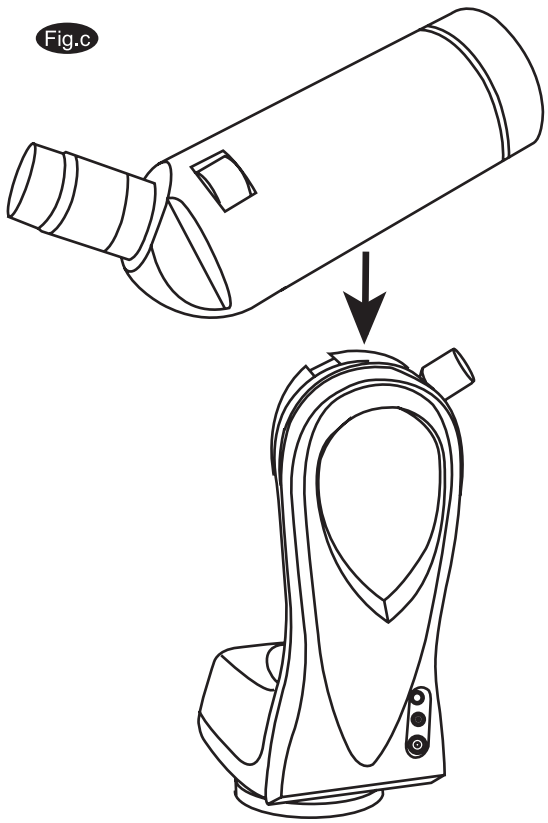
1. Remove the tripod from the box and spread the legs apart until fully extended.
2. Adjust the desired height of the tripod before attaching the fork arm and your optical tube. Minor adjustments can be made later. Loosen the locking mechanisms on each leg and slide the legs to the desired height and then retighten them.

MOUNT SET UP

1. Next you will attach your Multi-function mount to the tripod. Locate the 3/8" threaded bolt in the top of the tripod platform. Then, find the mating 3/8" threaded hole underneath the Fork Arm Base. Thread the 3/8" bolt of the tripod platform into the 3/8" threaded hole in the fork arm base until it is good and tight (Fig.a).
2. Locate the 1/4x20 Mounting Platform. Slide it down the slot on the Fork Arm as in dicated in Fig.b. Secure by tightening the thumb screws.

ATTACHING THE TELESCOPE TUBE TO THE MOUNT

1. If you are using the telescope for tracking astronomical objects, attach the optical tube to the Mounting Platform so that the Fork Arm is located on the right hand side (Fig.c). If the telescope is installed incorrectly you will not be able to use the latitude scale on the top of the Fork Arm. Thread the 1/4x20 Mounting Screw into the 1/4x20 tripod adapter of the optical tube and make sure it is tight. Do not overtighten the screw.



Telescopes with a dovetail bar attached can be installed directly onto the Multi-function mount without using the Mounting Platform.

ATTACHING A CAMERA TO THE MOUNT

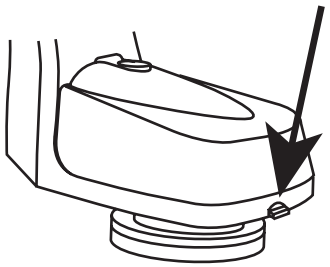
1. For general terrestrial use, the camera can be secured on the Mounting Platform any way you wish. Thread the 1/4x20 Mounting Screw into the camera and make sure it is tight. Do not overtighten the screw.

Do NOT overtighten the 1/4x20 Mounting Screw or it may cause damage to the screw.

You must be careful not to use an optical tube that is too heavy or too big as the motor assembly will not be able to operate properly and you may damage the mount.

Powering the Multi-Function Mount

Fig.d

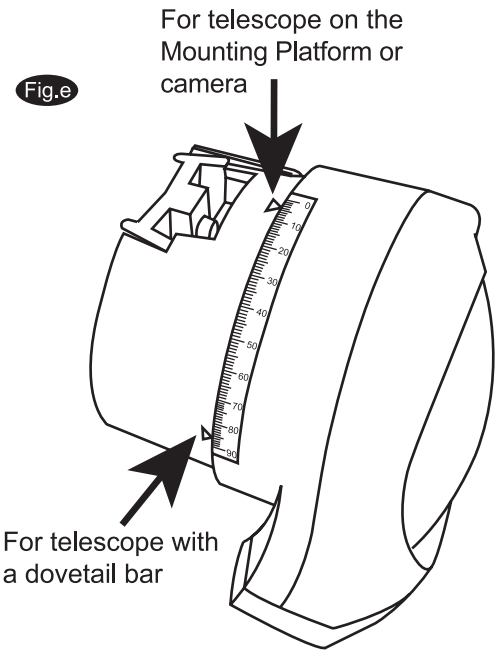


The Multi-Function Mount power requirement is 12-Volts DC Nominal. The maximum voltage should not exceed 16-volts and the minimum is 8-volts. The battery compartment holds eight (8) AA alkaline batteries (user supplied). Open the battery compartment by pressing down on the lever located in the front of the fork arm base (Fig.d). Remove the battery holders inside to install or replace batteries.

FOR ASTRONOMICAL USE

Setting up the Multi-Function Mount

Fig.e

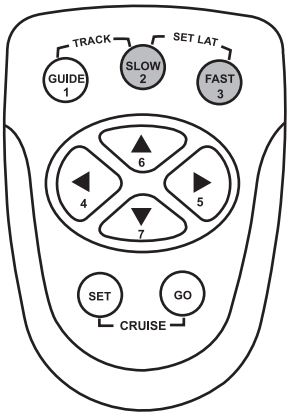


Plug the cable (connector) from the Hand Control into the telephone type jack at the side of the arm..

1. You will find a latitude scale with two index pointers near the top of the fork arm. If you are using a camera or a telescope mounted on the Mounting Platform, use the pointer on top as reference. If your telescope is mounted directly on a dovetail bar, use the lower point as reference. Manually adjust the telescope tube until the latitude scale reads 0 (Fig.e).
2. Next, the telescope must be pointing North from the location you are using.
3. After the above is accomplished, the Multi-Function Mount is now properly setup in the "Home" position.
4. Turn on the power.

Setting the local latitude

Fig.f



Setting the local latitude enhances the tracking accuracy for astronomial objects. It requires that you know the latitude of the observing site. To set the latitude for the Northern Hemisphere, use the directional buttons to adjust the telescope tube until the latitude scale reads 0. Turn off the power and turn it back on again. Now use the hand control to move the telescope tube until the latitude scale reads your local latitude. Press the "Fast" and "Slow" buttons simultaneously to store the local latitude into the system (Fig.f).

For Southern Hemisphere, use the direction buttons to adjust the telescope tube until the latitude scale reads your local latitude. Turn off the power and turn it back on again. Now use the directional buttons to move the telescope tube until the latitude scale reads 0. Press "Fast" and "Slow" buttons simultaneously to store the local latitude into the system (Fig.f).

Setting the local latitude only needs to be done once. The information will be stored in the hand control even when the power is turned off.

Use the same ▲ or ▼ key to end adjusting scale reading to 0 degree and setting your local latitude. This will help eliminate the influence of mechanical backlash. For example, if ▲ key is the last key that you used to set the scale to 0 degree, you should also use ▲ key as the last key for setting the scale reading to your local latitude.

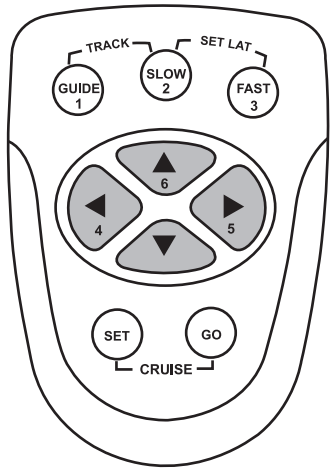
Hand Control Operation

The basic movements of the telescope mount are directional movement, slewing, and tracking. The tracking rate is sidereal rate.

When a command is successfully entered, all the LEDs will light up. The LEDs will not go off until all key buttons are released. If there is any type of communication error between the hand control and the motor Assembly, all the LEDs will flash.

THE DIRECTIONAL KEYS (Fig.g) allow for the movement direction that you want the telescope to go. If two opposite buttons are pressed at the same time, only the button first pressed will respond. AZ (azimuth) and ALT (altitude) axis can be adjusted at the same time.

Fig.g

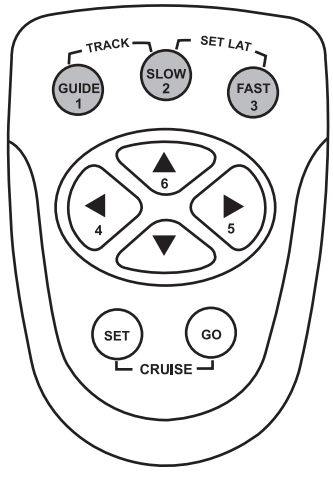


THE SLEWING SPEED (Fig.h) can be set from the three available options by pressing the correspondent key on the hand control:

Guide (defult) – slow speed used for centering objects in the eyepiece.
Slow – medium speed used for finding and moving objects in the finderscope.
Fast – fast speed used for quick movement in the sky.

The actual slewing speeds are different depending on whether tracking is "on" or "off". See the chart below for details. (1x = Sidereal rate)

Fig.h

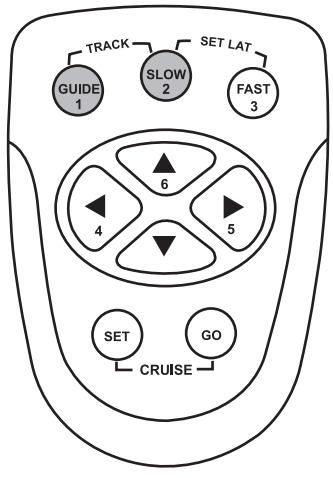


Slewing Speeds	Guide	Slow	Fast
Tracking "on"	1x	4x	8x
Tracking "on"	32x	64x	800x

In standby mode, the LED will respectively indicate the current slewing speed.

To activate the **TRACKING FUNCTION**, you must first find the astronomical object you are seeking. The preferred method of finding objects is called "star-hopping" and there is much written on this method. Remember, you must used the Hand Control unit to move the telescope as you cannot move it manually. When you are ready to track (when the object is in the center of the field of view), press the "Guide" and "Slow" buttons in combination and tracking will be activated (Fig.i). When you want to cancel "tracking" and slew in higher speed, press the same button combination. Note that when tracking is activated, one of the "Guide", "Slow" or "Fast" buttons will flash.

Fig.i



When centering objects in the eyepiece for astronomical objects, use the Slow (4x) and Fast (8x) speeds with tracking option turned on. For general slewing to get to objects quickly, make sure the tracking is "off".

FOR TERRESTRIAL (LAND) USAGE

Setting up the Multi-Function Mount

The Multi-Function Mount does not require setup for terrestrial use. The mount can start from any position. However, if the telescope or camera is positioned in one spot and the Cruise function is utilized, setting a Reference Point to start and end a viewing session will save a lot of time for you -– you will not need to reset the 6 Cruising positions before every viewing session. The Reference Point is defined as the point to which the optical tube is pointing when the power switch is turned on. (See below for information on the Cruise function.)

Make sure to turn off "Tracking" when using the Auto-tracking mount for terrestrial use.

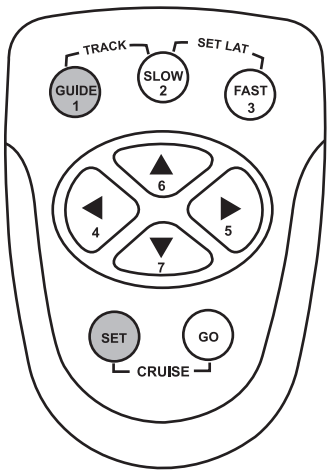
Hand control operation

The Multi-Function Mount can be set to automatically CRUISE between up to 6 stored positions, or GOTO any stored position.

STORING POSITIONS

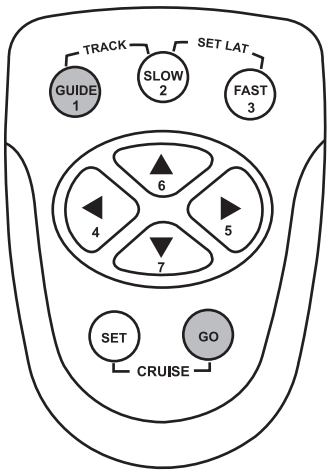
You can store up to 6 positions. After slewing to a desired position using the directional keys, press "SET" and one of the 6 numeric keys (Fig.j). The location of each selected position will be stored in the system memory of the hand control until the data is overwrite by the user.

Fig.j



To ensure the best accuracy of your position choices, it is important that before the actual setting you do the final direction adjustments using the ▲ and ▶ keys.

Fig.k



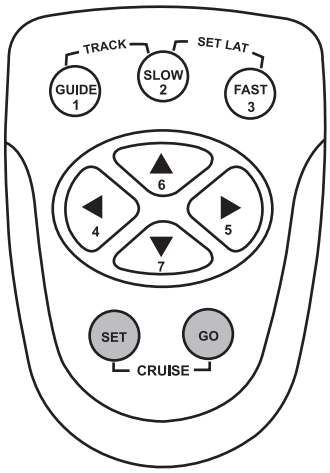
"GOTO" A STORED POSITION

Once the stored positions are set you can GOTO them. Press "GO" and then the corresponding numeric key for the position desired (Fig.k). The mount will automatically slew to the stored position. Once the GOTO function is activated, both "GO" and the corresponding numeric key will light up.

CRUISE AND SHOT

The "Cruise and Shot" mode is usable if you want the mount to stop for several seconds at each stored position during slewing. To activate the "Cruise and Shot" function, press "SET" and "GO" keys in combination (Fig.l). The mount will cruise sequentially among the stored positions. When the mount arrives at a position, the camera (customer supplied) will be triggered. The mount will stay in each position for 5 seconds and then move on to the next position. After one cycle, the mount will stop at the last position for 3 minutes and the cruising cycle will start over again. You can bypass the waiting period of 3 minutes by pressing the "fast" key and the cycle will then start right away.

Fig.l



In the cruise mode, the "SET" and "GO" keys will remain lit throughout the cycle and the numeric key the mount is moving to will flash.

CRUISE AND RECORD

The "Cruise and Record" function is for when using a camcorder. Hold the "GO" key and press the ▼ key to activate the "Cruise and Record" function (Fig.m). The mount will cruise among all the stored positions one by one without a stop at each position. There is not waiting at the end of each cruise cycle.

ERASE A STORED POSITION

If you want to permanently erase a set position, return the mount to the Reference Position. Turn the power off and then turn it back on again. Hold down the "SET" button and press the numeric key corresponding to the position you want to erase. This is to override the previous stored information with 0. During cruising the mount will recognize this and bypass this position and go to the next position instead.

The mount allows a total of 6 stored positions. If there is a vacant one available, it is recommended that you store the Reference Position for quick access in the future.

To stop the mount during "GOTO" or "Cruise" functions, press the ▶ and ▼ keys simultaneously (Fig.n). After a command has been implemented, all keys have to be released before the mount accepts the next command. During the "GOTO" and "Cruise", the mount only reacts to the stop key combination.

Fig.m

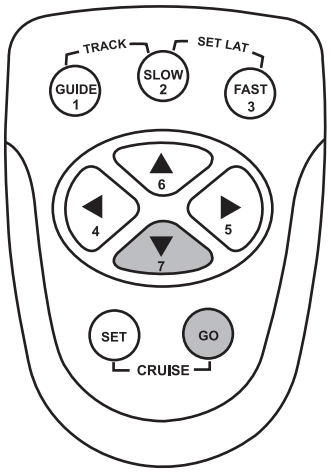
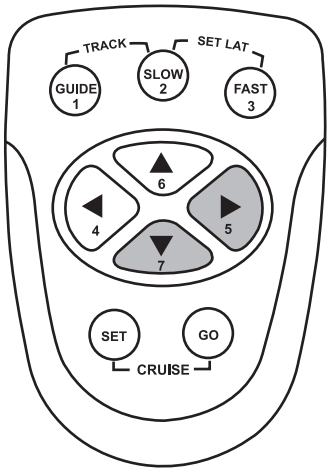


Fig.n



CAUTION!

NEVER USE YOUR TELESCOPE TO LOOK DIRECTLY AT THE SUN. PERMANENT EYE DAMAGE WILL RESULT. USE A PROPER SOLAR FILTER FIRMLY MOUNTED ON THE FRONT OF THE TELESCOPE FOR VIEWING THE SUN. WHEN OBSERVING THE SUN, PLACE A DUST CAP OVER YOUR FINDERSCOPE OR REMOVE IT TO PROTECT YOU FROM ACCIDENTAL EXPOSURE. NEVER USE AN EYEPIECE-TYPE SOLAR FILTER AND NEVER USE YOUR TELESCOPE TO PROJECT SUNLIGHT ONTO ANOTHER SURFACE, THE INTERNAL HEAT BUILD-UP WILL DAMAGE THE TELESCOPE OPTICAL ELEMENTS.