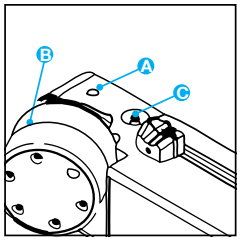
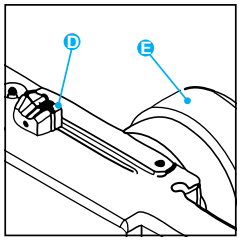
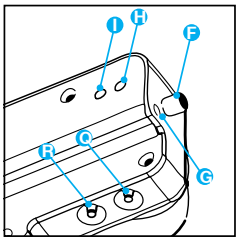
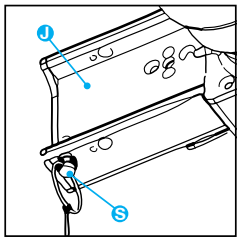
Prototype THC

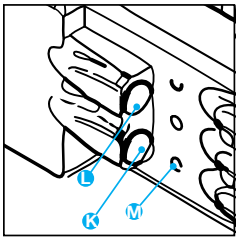
Hand Controller Operations

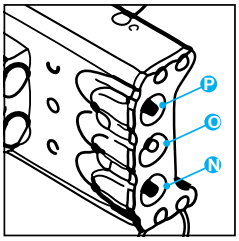












A	**Battery Condition LED**	Indicates Power, regardless if battery or CAN cable
B	**IO Wheel**	Adjusts Inter-Ocular distance when selected
C	**IO Selection Switch**	Switches IO control between Thumb Slide and IO Wheel
D	**IO Thumb Slide**	Adjusts Inter Ocular distance when selected
E	**Convergence Wheel**	Adjusts Convergence distance

F	**Antenna**	Required for all Bluetooth Connections. Removable for shipping
G	**Blue LED**	Bluetooth connection in Wireless mode

H	**IO Limit LED**	Indicates when an IO limit is activated
I	**Convergence Limit LED**	Indicates when a Convergence limit is activated
J	**Battery Receptacle**	Mounts a Sony NP-FM50 7.2 Volt Battery. Spring loaded Halyard ring must be pulled out to allow battery seating
K	**Wired Cable Port**	Communication port uses a 4-pin Lemo connector which connects to the 4-Pin Lemo on the Receiver Box. Hard-wired communication is run through this port.

L	**Auxiliary Port**	Currently not in use… Reserved for future developments
M	**3 LED's**	Correspond to the switches below. Indicate the status of each.
N	**Infinity Button**	Used to set the User Cal Settings when depressed (see instructions below)
O	**Battery/Cable**	Battery power
P	**Initialize Button**	Used to Initialize (set electronic stops) the system, which sets up the mechanics for rig use. (See Initialize Below for instructions)

Q	**IO Limit Switch**	Sets IO limits when pressed (see next page for instructions)
R	**Convergence Limit Switch**	Sets Convergence limits when pressed (see next page for instructions)
S	**Halyard Ring**	Receives a halyard and contains spring loaded pin which locks the battery into position.

Initializing the System

Before using the motor functions of the rig, the system must be initialized in order for the electronics to determine the "ends of travel" limits for each setup. Below is a step-by-step system illustrating how to perform a successful initialization.

Note: Initialization can be performed in either a cabled or Bluetooth capacity. The following sets up the system in a Cabled Situation.

- Step One: Connect one end of the 4-Pin Control Cable to the "Wired" port on the Controller, Connect the other end of Cable to the 4-Pin Port on the Receiver Box.

- Step Two: Connect Powered (12 Volt) two pin Cable to Power port on the Receiver Box.

- Step Three: Watch the "Light Show". All of the LED's on the hand controller will light up (indicating that the Receiver Box has power, also boots up software in hand controller). Once the LED's turn off the system is ready to initialize.

- Step Four: Walk around the rig to ensure that no cables or motors will impede the full travel of the camera. If it is necessary to impede the full travel, False stop blocks will need to be used. False Blocks can be anything that will create a surface parallel to the side support that will block the Dovetail on initialization and create a false electronic stop. Note: this false stop will need to be recreated each time the system needs to be re-initialized

- Step Five: Position IO wheel and thumb slide away from the ends of travel. (This will allow you to view a full travel and then a reposition which is the best way to confirm that the initialization was successful)

- Step Six: Press the Initialize button once. Initialize LED will blink.

- Step Seven: Watch the direct camera dovetail move to the left, then travel fully to the right followed by a repositioning to wherever the current position of the thumb slide or IO wheel.

- Step Eight: Slide the thumb slide or IO wheel (depending on which is activated) to ensure that the system is responsive.

Trouble Shooting the Initialization

As the Initialization is a process by which the motors are looking for a stop position, it is imperative that a full intended initialization is completed to get full intended travel. The following is a list of items that could impede a full initialization:

- Cable Drag
- Motors and Mounts not positioned properly
- Dovetail friction not set correctly
- Hard Stops not set correctly
- Dovetail starting not parallel
- Power interruption
- Mirror Box lens port not sliding smoothly

All of the above issues are correctable and should be resolved before a re-initialization is attempted.

Setting up Hand Controller for Wireless Use

The hand controller is capable of completely wireless operation with a few simple set-up steps. This set-up requires the use of a control cable to set the MAC address between the Hand Controller and the intended Receiver Box. Note that all Hand Controllers can be re-assigned to another Receiver Box by following the steps listed below. Once connections are made that one Controller will only "Speak" to that specific receiver box, eliminating any possibility of cross talk between closely functioning units.

Note: The receiver box and hand controller must be linked first in order to use it in handheld mode. If they are not linked, please refer to "Initializing the System; Steps One thru Three".

- Step One: Mount a charged NP-FM50 Battery into the battery receptacle. Lock into position with the spring loaded pin in the Halyard mount

- Step Two: Switch the Battery/Cable switch to the Battery position.

- Step Three: Watch the "Light Show", specifically watching the Blue light on the top of the Hand Controller. When light goes out, remove the cable and wait for it to "re-light" indicating that a Bluetooth connection has been made.

- Step Four: Initialize the system as indicated above beginning with Step Four.

Setting IO and Convergence Limits

In order to perform small IO or Convergence shifts over a relatively long period of time it may be preferable to reset the thumb slide or wheel limits to give a broader move on the hand controller relative to a smaller move on the rig. This can be done quickly and easily by following this set-up procedure:

- Step One: Position the Horizontal camera to one end of the desired move (either IO or Convergence).
- Step Two: Locate the switch on the back of the controller that corresponds to the LED Indicators on the right side of the Controller.
- Step Three: Press and hold in appropriate switch, notice the corresponding LED begin to Flash
- Step Four: Using the IO or Convergence control adjust the Horizontal camera to the other end of the desired move (while holding in the switch).
- Step Five: Once the end is reached, release the switch and watch for the camera to reposition to the new slide or wheel position. Once released, IO or Convergence LED will light.
- Step Six: Move the slide or wheel through the intended move and re-scale the slide or wheel appropriately.

Note: To disable limits, press IO or Convergence button again. LED light(s) will turn off.

Resetting Sensor Calibration

If the controller ever exhibits unusual activity it is possible that the Controller needs to have its sensor stops re-defined.

Note: Camera divergence is not an indication of the need to reset Sensor Calibration. (See Rig Trouble Shooting)

This activity could include but is not limited to:

- Quick camera resets counter to a desired move
- Range limits inside of initialized limits
- Erratic camera movements

This occurrence should rarely happen in the field but is easily rectified by the following steps:

- Step One: Position IO thumb slide to one end of the slide. Position the IO wheel to one end of the rotation. Position the Convergence Wheel to one end of the rotation
- Step Two: Connect 4-Pin Control Cable to Receiver Box.
- Step Three: Push and hold the Initialize button.
- Step Four: Plug in 12v power to receiver box.
- Step Five: Push and Hold IO limit button on the back of Controller, slide Thumb Slide to the other end of slide then release IO limit button.
- Step Six: Push and hold IO select button then turn IO wheel to other end of rotation and release.
- Step Seven: Push and Hold Convergence limit button on back of Controller, turn convergence wheel to other end and release.
- Step Nine: Recycle hand controller power.

Setting User Cal Settings In Side-By-Side

In side-by-side mode it is necessary to reset the User Cal settings in order to track convergence due to the fact that the cameras are no longer beginning from a "0" position. This reset will require the use of a chart but is achieved quickly using the following steps:

- Step One: Initialize the system as described above allowing you to move the cameras with the Hand Controller
- Step Two: Hold in the Infinity (User Cal) button for about two seconds. The light will begin blinking. Now you can use the IO controls to move the camera in a parallel move and the convergence wheel will be just an angular control.
- Step Three: Using the convergence wheel, adjust the convergence to where both cameras are converged on an object about a mile away. When it is in this position, the cameras are essentially parallel. At this point refrain from touching the Convergence control
- Step Four: Using only the IO control adjust the cameras so that they are nine inches apart. Use a chart positioned approx. 9ft. off the cameras to do this.
- Step Five: Once the cameras are in this position, hold in the Infinity (User Cal) button for two seconds. The LED will begin to flash more rapidly and you will hear the User Cal engage causing the camera to move a little bit.

Now the User Cal is set and active. You will be able to track convergence in Side-by-side mode…. Once convergence is set on a plane it will not change when you move the IO.

Note: Once the setup phase is complete you can toggle it on and off by using the User Cal button. If desired the User Cal settings can be cleared by pressing the User Cal button and holding for 10 Seconds.

Changing Direction of the I/O Wheel or Slider

If desired, it is possible to change the direction of the Interocular wheel or Thumb slide in relation to its effect on the rig. This is done using the sensor calibration button.

- Step One: Power up the controller with the initialize button pressed. LED's will flash quickly for a couple of seconds.
- Step Two: Push the slider to the top of its slide
- Step Three: Hold in the Interocular limit button and slide the slider to the bottom of its slide.
- Step Four: Release the Interocular limit button.
- Step Five: Cycle power on the controller and reinitialize.

Note: Steps are exactly the same to change the Interocular wheel direction