

800-7400 Stage: Ultra²[®]/Shadow[™]



Stage mechanics and adjustments

The dovetail clamp lever has three positions: forward and locked, 90° for adjustments, and 60° back for mounting or removing the dovetail plate. A safety button must be pushed to move the lever to the unlocked position; the same button holds the lever fully open, making flips to low mode and back a bit easier. Do not force the lever backwards beyond its stop.



Even with a very wide camera, the clamp lever can always be accessed, but the safety release button might require a thin screwdriver.



The stage is easy to adjust. The knob at the right rear controls fore-aft, and the two knobs on the side control side to side movement.



fore-aft adjustment knob

side to side adjustment knob

The motorized stage is position sensing – much like a focus motor system for a lens. One use of this feature is to set the stage to the center of travel, both fore-aft and side to side – great for initial setups.



Pushing the double pole momentary switch on the “nosebox” to the “C” side centers the stage.

Flipping the switch the other way (“L”) sets the stage to a pre-programmed position (more about that later.)



The speed and direction of the motors is set by the switches and thumbwheel pots on the left (port) side of the nosebox. Note that the motor direction switches also have a center-off position, just in case you are in an odd RF environment or you don't want your stage motors to move. Remember this “function” when a stage motor stops working between takes!

The electronics in the stage and nosebox are on “plug and play” circuit boards, easy to upgrade or replace (if there's ever a problem).

The stage connectors



At the rear of the stage, left to right (port side to starboard side):

- Camera power connector. 3 pin Lemo, +28VDC, +14VDC, and ground.
- HDSDI in. This connector has no connection to the distribution amplifiers or DA's. BNC
- HD component video in. 6 pin Lemo
- Standard definition (PAL/NTSC) composite video in. BNC



At the front (nosebox), left to right:

- Power for focus motor receiver/ amplifiers. 3 pin Lemo (+28VDC, +14VDC, and ground)
- Stubby black antenna (no connection, just thought you'd like to know what it was)
- Tally light connector (additional functions possible)



Nosebox starboard side:

- Pot to adjust Tally sensor sensitivity
- Rotary switch to set remote channel (0-8)

Forward, flanking the stage:



- Starboard side: +12VDC (regulated) and video in. 4 pin HRS.



- Port side: +14VDC and video out. 4 pin HRS.

The 800-7400 (Ultra²) stage on these pages is shown with an Ultra². It may look slightly different with another system, such as the ShadowTM.

Note: See page 12 for pin outs and technical descriptions of the connectors.

Smart Motorized Stage

Why the motorized stage is so important for precise operating



This is a crew member's view of the operator adjusting the precise balance of the sled using the wireless transmitter — a 3 second exposure! Really!!

For precise work, the sled must be carefully balanced or trimmed.

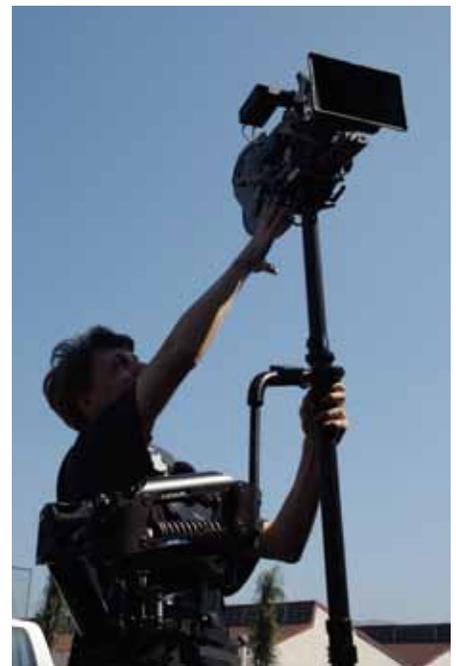
Before operators had the Tiffen's reliable and precise motorized stage, all balancing and trimming had to be done before the shot and therefore the system's balance was fixed. As well as that works, it was, as Garret Brown has often said, a situation akin to that of an airplane pilot landing his plane to adjust the flaps. We can do better.

With the motorized stage, the operator can continuously adjust the sled's balance during the shot — assuring the utmost precision for every moment.

Even for conventional, pre-shot balancing, it is much quicker and more accurate to maintain your posture and grip as you push a button to tweak the sled's balance, than it is to reach up, twist a knob, and wait for you and the sled to settle to a new attitude. The easier it is to tweak the sled's balance, the more likely it is that the operator under real-life production pressures can (and will) actually take the time to precisely balance his sled.

Some situations where the motorized stage really helps:

- Anytime you want to trim precisely and quickly, with no change in posture or grip. Includes trimming on the fly, in the middle of a shot, or holding an opening frame perfectly still.
- In long mode (and sometimes in standard low mode), it is often difficult or impossible for the operator to reach the stage to manually adjust the sled's balance.
- While shooting from a vehicle, it can be dangerous to let the sled go with one hand to adjust the sled's balance.



Removing the remote

Whenever you want to hand the remote off to your assistant (or charge the remote's battery), unscrew the knurled ring.



The remote is held in place by two sets of pins. The forward set of pins slips into two small holes, and the rear set of pins are captured in a groove in the knurled ring.



When returning the remote to the handle, insert the pins carefully and do not force anything.

If you want, you can remove the pins and just Velcro the remote to the handle. A half-moon™ filler plate is supplied with gimbal so that if the remote is removed, the filler can take its place.



Charging the remote

If the transmitter's battery is low, the LED will blink continuously after any button is depressed. To charge the remote, remove it from the gimbal handle. Plug the supplied cable into the remote and the other end into any one of the three 4-pin HRS connectors on the sled.



Leave the sled on as you charge the battery. It takes about 5 hours to charge a completely discharged remote battery. When the battery is charging, the green LED will be on. When the lithium-ion battery is fully charged, the green light goes off.

If plugging in a fully charged transmitter, the LED will remain lit for approximately ten minutes until the charge circuit determines the battery is actually full.

Battery life can vary depending on how often the transmitter is used and the storage and operating conditions.

Changing the frequency

To avoid interference with other systems, 1 of 8 channels can be selected via the rotary switch on starboard side of nose box.



The remote and the receiver must be on the same channel. Simultaneously holding down the top 2 go-to buttons for 6 seconds will enter the remote into a channel change mode. The number of LED blinks will correspond to channel selected.

Change channels by pressing the fore or aft remote buttons (channel up or down). After the proper channel is selected, the programming mode will time out after 9 seconds and re-flash the selected channel number. Channel 0 corresponds to 8 flashes.

(For operation outside of the USA) To select between US and UK frequency operation, there are two jumpers that must be changed. One jumper is inside the nosebox, the other is inside the remote. They must match for the system to work. The jumpers are set at the factory at the time of shipping. (902 – 928MHz US and 868 to 870MHz UK)

The green "PWR" LED on nose box comes on when the CPU is operational.

Smart Motorized Stage

Ergonomics



regular

The remote control is ergonomically designed, and it rotates to any angle for your comfort, whether you operate normally or goofy-footed.



goofy



Low mode: Typically, the remote is upside down in low mode. You can also orient the remote for better low mode operation.

To angle the remote, loosen the small set screw in the curved handle of the gimbal.



Orient the remote by screwing the curved handle in or out. If the handle is too far in, you can't easily remove the remote via the black knurled ring, and you might have to back the handle off one full turn. Loosening the setscrew a lot further and unscrewing the handle is also how you access the "tilt" bearings and shaft for cleaning.



For goofy foot operators, the remote can be inserted upside down keeping the go-to buttons on the "thumb side." You might, however, prefer accessing the go-to buttons with your index finger: i.e., orient the remote as you wish.



“Go-to” Buttons and the Smart Motorized Stage

On the remote control, there are three “go-to” buttons on one side in addition to the four original “trim” buttons (as well as two other “spare” buttons).



The go-to buttons move the stage to specific marks, defined by the operator. One position is usually the nominal balance, and the other two are programmed for some other part of the shot. During the shot, the operator (or an assistant holding the removable remote) pushes a go-to button to move the stage precisely to a new trim setting. Pushing the “home” button at any time returns the stage to the nominal trim. No more counting revolutions or so many seconds; the stage moves exactly where you want it to — and back.

In addition to big tilts and Dutch angles, you might set a button to “post perfectly vertical and in dynamic balance,” and use another button for the nominal trim for the shot at hand. Or set the three buttons to roughly account for the side to side movement of film in some magazines.

Programming is a snap. It’s just like programming the stations on a car radio. Move the stage to the desired position, either manually or using the traditional

trim buttons. Then hold one of the go-to buttons down for three seconds. The green LED will flash twice, and it’s set. You can even program any button on the fly, during the shot, if you have the mental reserves...

Each go-to button simultaneously programs the fore-aft and the side to side position of the stage. Trimming fore-aft may slightly alter your side to side balance, or you may want to program in a severe Dutch angle. You can even program two or three buttons for the same trim if you like, so you don’t have to think about which button to push!

The positions are stored in non-volatile memory, so changing batteries or turning off the sled power does not erase your presets.



The center go-to button on remote shares the same preset as the “L” position on the switch on the nose box. The “L” position is programmed exactly like the center go-to button on the remote, and the red mode LED on the nosebox will flash to confirm programming.

The “C” button can be programmed the same way as the “L” button. It might be useful to reprogram the “center” position if you were working with a camera and the nominal balance was shifted significantly side to side. Then everytime you changed lenses or started the day you would not have far to go to rebalance side to side.

Holding one of the go-to buttons down for more than six seconds will clear all programming for that button and make it non-operational. The green LED will flash 3 times. It’s a good idea to clear out all 3 buttons at the beginning of the day.

Tilt Head

The Tilt Head

The integral, low profile head is designed to alter the lens angle plus or minus 20 degrees from horizontal with only a minor shift of the camera's c.g.

The most important use of the tilt head is in normal operating. Instead of trimming even two or three degrees for a shot by altering the sled's balance, use the tilt head to preserve a perfectly vertical post and keep your sled in dynamic balance.



Trim for headroom

Without the tilt head, much of the benefit of getting the sled into dynamic balance is wasted when one alters the trim of the rig as much as a few degrees. For example, operators routinely trim their sleds for headroom. This action puts the rig out of both static and dynamic balance.



First, the operator determines the proper length of sled, optimal monitor viewing position, inertia, and lens height. Then the operator adjusts the camera to the nominal tilt angle for the shot.



Setting the tilt

The operator sets the tilt by releasing the two clamps and manually repositioning the camera to the proper angle.



Note: Don't grab the stage by the nosebox to adjust tilt. Be sure to loosen the arc clamps fully and grab the camera or dovetail plate. Don't force anything; it should move fairly easily.

The post remains vertical and the rig stays in (or close to) dynamic balance. Only minor static rebalancing is normally required, but exactly how much depends on the camera, accessories, sled length, monitor position, etc. In all cases, bringing the sled back into static balance by moving the camera will return the sled to dynamic balance as well.

The Tilt Head — General

Operating

Even if the sled is slightly out of perfect dynamic balance, it's a whole lot easier to hold the post vertical than at any other angle, especially when panning and accelerating - which we tend to do a lot when operating. The tilt head keeps the post vertical in many situations, making it easier to operate and keep things level.

Another benefit of the tilt head: a whole new class of whip pans is now possible. All whip pans are done in dynamic balance with the post vertical. Previously this meant that the lens was always horizontal. With the tilt head, the lens can be angled up or down as much as twenty degrees and the operator can still make extremely precise fast pans. Using the tilt head will increase the precision of any pan with a lens angled up or down – fast or slow.

Long mode pans with the lens looking down - say at a crowd - used to be exceedingly difficult or impossible, due to the large spatial translations of the battery, monitor, and camera. But the tilt head leaves the post vertical and therefore eliminates this spatial translation, and makes these pans routine.

Low mode and very low mode pans are also much easier and more precise.



Maintaining Lens Height — Long Modes

As the operator tilts the sled, the precious super-high (or super-low) lens height gained with an extended telescoping post quickly disappears. The more one tilts, the more rapidly the lens height is lost.

Example 1:
Without a tilt head.



Example 1: Same shot,
with a tilt head.
Note that the post is
vertical, the lens is
higher, and the monitor
is in a much better
viewing condition.



Example 2:
Without a tilt head. The
monitor is in a really
awkward position now;
it even degrades the
operator's form.



Example 2: Same shot,
with a tilt head.
Again, the lens height
is greater with the tilt
head.



Other Applications

One of the more unusual applications of the tilt head is to angle the sled and its components relative to the desired position of the lens. Moving the sled relative to the lens might avoid casting shadows into the shot, seeing one's own feet, or prevent the sled from hitting something on the set.



