THE

ULTIMATE SLED

BY

XCS INC.

MANUAL
Rev. 4
10/09

Warranty

Please read before using your equipment

Xtended Camera Support will warranty this product against defects in material and workmanship for a period of one year from the date of invoice. XCS will pay parts and labor charges to repair or replace any manufacturers defect under normal operating conditions. The buyer will be responsible for all shipping charges.

This warranty does not cover, nor will the manufacturer be responsible for, damages caused from abuse, misuse, negligence, accidents, cosmetic damage, or by acts of God. All warranties expressed or written will be voided if this equipment has been damaged by abuse, misuse, negligence, or accident.

Great care in engineering design has been made resulting in no serviceable parts inside this sled and monitor. Care must be taken when using all your equipment. One should protect it from water, dirt, shock, and excessive heat.

If you have any questions on care for any of this equipment, please call XCS and we will be glad to advise you on any maintenance of our equipment.

Proper care should be taken when shipping your equipment to protect it from shock damage. At least 2.0" of a 4 lbs. Ester foam (or equal) should surround your equipment at all times when shipping. Case design is made so that the case will absorb the impact and the case will give up its life, protecting the equipment inside.

Unlike any sled ever designed before, it takes a special and knowledgeable operator to understand the technical hurdles and advancements made with the Ultimate sled. We thank you for choosing it. We understand you have many options for sleds out there, and most of them are less expensive to purchase. However, an informed operator can quickly weed out all the competition, on every design feature, and only our company stands alone.

With proper care, this equipment will provide you with many years of service. Thank you for choosing Xtended Camera Support. We have only the operator in mind for all our designs.

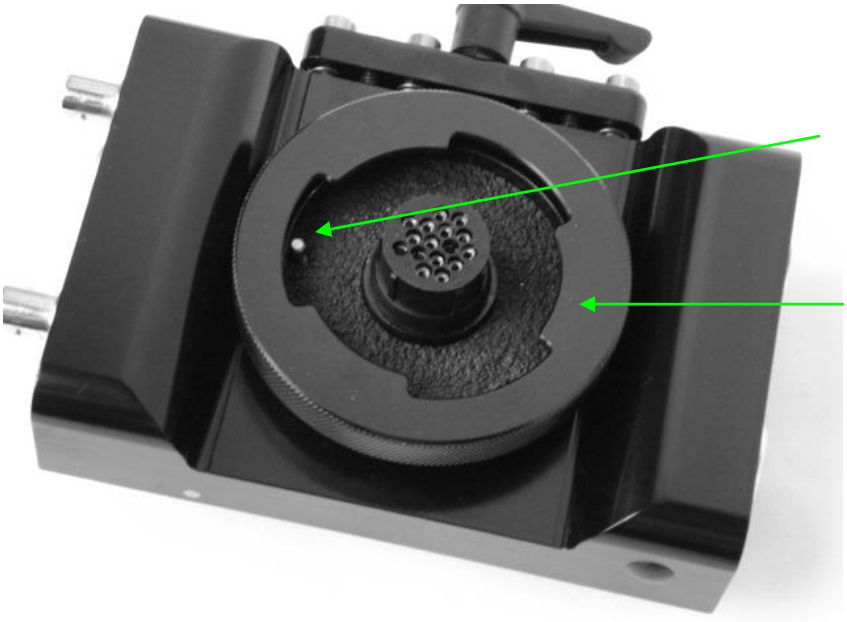
UPPER CAMERA PLATFORM

Camera Dovetail Plate

Allows for attachment of any camera with one plate design.

Upper Camera Platform

Bottom view



Features:
1 –Registration pin for the bayonet mounted post and camera platform.

2 – 16 pin connector.

3 – Bayonet mount locking ring.
Turn to release the camera platform from the center post.

Front view

4 – Three 6-32 TPI tapped holes for lens remote receiver bracket.
WARNING: Screw depth not to exceed .25" into chassis.
5 – Left side BNC composite video input only.
6 – Lemo 0S 304 connector. Delivers 12 & 24 Vdc to lens remote.
7 – Lemo 1S 303 connector. Delivers 12 & 24 Vdc.
8 – Right side BNC HDSDI

Rear view

9 – Lemo 2B 302 connector. Delivers an isolated 12 Vdc, camera power. (Optional wiring here)

10 – Lemo 0B 304 connector. Delivers a true 1v P to P signal video out and 12 Vdc out for a transmitter.

11 – Lemo 2B 303 connector. Isolated 12 & 24 Vdc from the 302 connector. Used for camera power.

Camera left side view

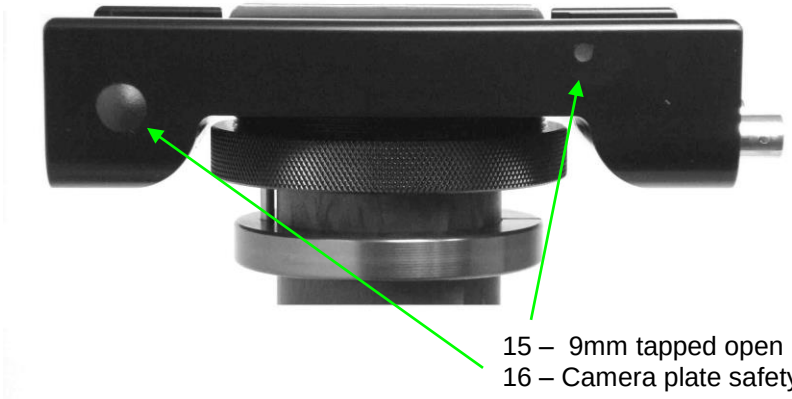
Drop in style quick release upper camera platform. Kipp handle provided.
If you are a tool type person, you can always use a 10-32 SHCS.

12 – Lemo 0B 304 connector. Dedicated video input. 12 Vdc output for video ass't cameras.

13 –10-32 TPI Kipp lockdown handle.

14 – Camera platform locking dovetail clamp.

Camera right side view



15 – 9mm tapped open port for future expansion.
16 – Camera plate safety pin.

GIMBAL
CARBON FIBER POST
SUPPORT ARM

ULTIMATE GIMBAL

Care should be taken so your gimbal will provide you with many years of service and reliability.

To adjust the gimbal up or down the post, simply turn the Kipp handle to loosen and move the gimbal into position, and retighten. You do not have to over tighten a gimbal lock on the carbon fiber post. Snug is generally significant enough and does not need as much force as you might be used to on other posts.

When you need to make small gimbal height adjustments, I have found that turning the gimbal sleeve a little bit like a screw, helps makes small adjustments very easy.

One of the many unique sleeve design features is the symmetrical contours. This gives the operator the same feel when operating in either high or low mode. The symmetrical fork design allows considerably more hand room under the gimbal fork in normal mode. You will never have to worry about pinching your thumb on the fork in low mode.

Precise alignment of all three axis, no tools balance adjustment, complete interchangeability of components has made this gimbal the most popular interchangeable gimbal on the market.

On the standard 115 degree gimbal handle is the 10-32 locking screw which is used for tightening the gimbal handle on to your post in low mode. Under the foam grip is the standard .1875" through hole in this handle. If you like to use a safety pin as well, I would suggest using a soldering pencil to melt the small hole through the foam grip. If you are using the Ergo handle you will not need the locking screw because you do not flip the handle over for low mode work.

Gimbal Cleaning, Care & Sleeve Removal

You will find that you most likely will not be disassembling your gimbal and cleaning it very often. In fact, it may be years before you would need to do it if at all.

Use the gimbal wrench and place on gimbal cover. Hold down as picture shows and turn to remove gimbal dust cover. A light tap with a plastic screwdriver handle may be necessary. It will take about 5 revolutions to remove cap. Hold the gimbal upright when removing cap so not to have the fork and bearing cup fall off the gimbal sleeve. Using the same gimbal wrench, remove the side dust covers on the gimbal fork. This will reveal the two fork bearings. It is not necessary and not recommended to remove the bearings for cleaning.

When removing the fork & bearing cap from sleeve, be careful to slide it off evenly. It is a perfect fit. **DO NOT PRY OR TAP THE FORK OR BEARING TO REMOVE OR DISASSEMBLE FROM SLEEVE**. If the bearing does not remove from sleeve smoothly, put it in the freezer for 20-30 minutes, this will allow the bearing to be removed from the gimbal sleeve.

When cleaning the bearings in the field a pressurized non-lubricated spray contact cleaner works perfectly. You can also use an automotive pressurized can of spray carburetor/brake cleaner. Be advised to wear eye protection when using any pressurized cleaner. I would spray all bearings both sides well one or two times. After that I would spin the bearings and repeat the spraying again to remove any left over dirt. After spraying let the gimbal set and dry, 2-3 minutes. At this time it would be good to clear the gimbal sleeve and dust covers.

Lubricate with the oil of your choice. We use a Castro synthetic bearing lubricant, but any type of lubrication will work. Place a few drops on all the bearings and spin the bearings to work the oil into the cage. This oil will fly out when you spin it, so be forewarned.

Wipe lubricant on the bearing journal on the gimbal sleeve, I use a Q tip for this. Wipe on a small amount of lubricant for easy assembly.

Insert the bearing cup onto the gimbal sleeve and reassemble in reverse order. Once again I would give a light tap on the gimbal wrench to tighten the cap on the sleeve.

We do not and do not recommend using any type of thread locker on these threads.

If you have trouble putting the bearing cup on the journal, again stick it in the freezer for 20-30 minutes and it will slip into position.

Gimbal handle removal, replacement

Before you replace your gimbal handle, take your new handle and inspect the spindle end (tapered end portion that fits into the gimbal fork). Make sure the tapered portion has no dents, scratches, or marring of any kind. If it does, do not use this spindle.

To remove the handle, please follow the instructions below.

1) Remove gimbal from the sled post. With clamping end of the gimbal facing up, insert 9" hex head wrench provided through the gimbal handle sleeve into the hex head screw in the gimbal fork.

2) Remove the screw that holds the fork on the gimbal handle and set it aside. The fork should separate from the spindle cleanly. If the handle is stuck on the spindle, you might re-insert the screw half way and tap the top of the hex head wrench. This will disengage the stainless steel spindle shaft from the fork.

What to do if the spindle is turning while you turn the hex head screw.

If this occurs, press down slightly on the fork with your index and middle finger next to the hex head screw as you turn the wrench. This will put slight pressure on the spindle and hold it while you loosen the screw.

3) Reassemble in reverse order. You do not have to use Loctite on the 10-32 screw that attaches the fork to the handle, but if you decide to, use a non-permanent Loctite (#222) on gimbal fork screw. Do not over tighten this screw. The recommended maximum inch/pounds is 28 on this stainless steel screw.

Other notes:

We use a Heilcoil insert on the threads of the gimbal sleeve to prevent possible damage to the sleeve itself. If you replace the Kipp handle, we recommend not using hardened steel screws. Over a period of time these could damage the thread insert.

If you wish to remove the Kipp handle and use a standard hex head screw, a 10-32 TPI screw size and .625" long should work fine. The gimbal comes with spare screws.

When tightening the gimbal handle onto the fork. ***All 10-32 stainless steel screws should not be tightened more than 31 inch. lbs.*** This is 100% torque on this type of stainless steel screw. Manufacturers recommend 75-80% of maximum torque, which is 23.25 in. lbs.

Bayonet mounted Carbon Fiber Telescoping Post

End view of the mount that contains the 16 pin connector.

Never before has changing center posts been so quick and easy. When connecting or disconnecting the center post, there is never any need to connect or disconnect wires inside the post. The post itself contains a custom designed cable, with 16 conductors.

Our custom coiled cable contains correct wire gauge sizes for power, 75 Ohm video and signal wires. This sled is the first design to have all correct power and video termination on all inputs and outputs.

2" post is custom wound carbon fiber filament to assure maximum post rigidity. This allows the operator to feel solidness like never before. Currently, this post is up to 15X more rigid than current aluminum designs.

To assure maximum integrity in the center post, there are no slots or grooves cut into the inner or outer posts. This allows you to spin the outer post around the inner post. Maximum 360 degrees. One needs to be careful not to spin the tube more than 360 degrees or uncoiling the inner-coiled cable would make telescoping and contracting difficult.

This tube is permanently sealed and there are no serviceable components inside the post. Be extremely cautious not to bend or break the protruding connector pins.

To align your upper camera platform and lower electronics housing, simply align the rule markings on the post with the slot on the center post clamp.

There is a safety stop located inside the post preventing the system from pulling apart.

Connecting & disconnecting the center post.

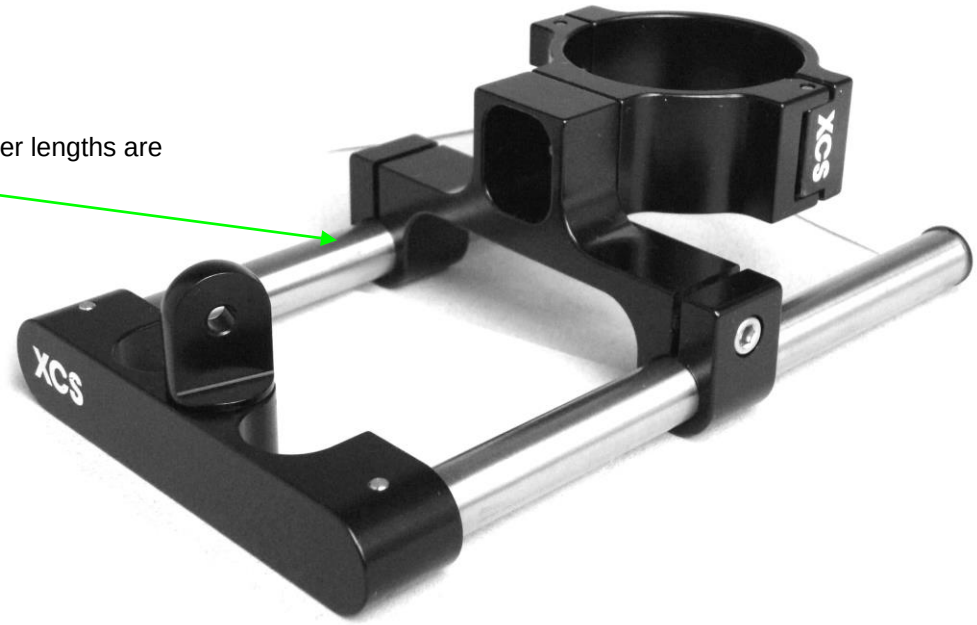
The bayonet mounted design allows for quick positive locking of your center post.

There is a registration pin on the receiving mount, as well as registration keys on your connectors, that assure correct alignment. All that is needed is to slide the docking ring down the post and spin off the bayonet locking ring to release the center post. It truly takes a few seconds.

CAUTION: After removing your center post, be careful not to damage any of the mating pins or plugs by sticking objects into them. Do not reassemble the post if a pin is damaged. This will cause further damage to the mating pin. The design of the system assures that the bayonet mount and alignment slots on the connector engage before any pins make contact. Mating cable connectors are designed to have a few degrees of movement in them. This allows for quick, easy assembly.

DUO ROD MONITOR SUPPORT ARM

5.5” telescoping range, other lengths are available upon request.



The telescoping monitor support arm allows you to spread out your sleds inertial masses for better sled stability. Example a nice long walk and talk down a hallway or road. When you spread out the mass weight in horizontal position, keeping the weight as far from the gimbal as possible, this will help smooth out any sudden but perceptible movements transmitted into the yaw. Or, on those windy days, moving your monitor and batteries out increasing your panning inertia allowing your system to glide along instead of being thrown about by the wind gusts. The two hex head screws on the side of the clamp when loosened allow you to move your monitor in and out.

When flipping your monitor into low mode, operators need only to loosen the Kipp handle on the center post clamp, then flip your monitor over and reattach moving it closer to the gimbal. This will ensure you have a clearer view of the monitor screen.

There is an 8-32 Phillips FHMS located on the inside of the post clamp. If you wish to have the locking clamp rotated to the other side, simply loosen the Phillips head screw, remove the split clamp, flip it 180 degrees and press it on lightly and attach the screw with a bit of nonpermanent Loc-tite.

Once again we use 10-32 TPI Kipp handles on the sled. If you wish to replace the Kipp handles you will need the 10-32TPI screws, different lengths for different applications. A set of these spare screws are provided with the sled.

LOWER ELECTRONICS HOUSING

LOWER ELECTRONICS HOUSING

This view of the lower electronics housing shows the three battery positions. The rear two battery positions starting with the top most plate is, #1 and #2 is on the bottom, both ride on two ½" rails. This rear battery position is adjustable in and out by loosening the two lock screws just in front of the rear battery housing. The 3rd battery position is below the electronics housing itself. These battery positions will correspond with the three individual LCD displays. The LCD display will show the percentage of available capacity left in each of the three batteries, when you are using interactive batteries. There will be a fourth display showing you the total voltage of all the batteries powering the system.

Any battery can be in any position at any time**.**

**Sled wiring options may isolate one battery from the battery management system*.

It is not necessary to use multiple batteries to achieve 24 volts with the ULTIMATE 1 sled. Our custom designed power supply provides you with both 12 and 24 Vdc at all times.

You can choose any battery cell type, chemistry and voltage up to 18volts.

We designed our lower electronic and battery housing as compact and as far away from the gimbals center of balance as possible. This allows you to run a single battery on your 24 Vdc camera, making the ULTIMATE the lightest film production sled built.

Battery Plate Options

We will supply the ULTIMATE sled with your option of either Anton Bauer gold mounts, PAG or *IDX V mount battery plates. If you like you can mix them. Currently, our Battery Management System BMS will display the total battery voltage of all combined batteries into the system and up to 3 individual remaining battery capacities from the Anton Bauer Interactive batteries on the LCD display. It will also display the total voltage of any battery and all types and manufacturers on the sleds display.
*IDX V mount plates have an additional minimal charge for them.

Sled Wiring Options

We give you 3 different sled wiring options. These options are offered because of the introduction of the much higher current draw 12 volt cameras like the Panavision Genesis, F35, when you need two batteries. If you think that you will be running these cameras in the future you might consider option 2 or 3. Remember any option you choose can be changed at anytime.

1) Standard wiring so that all three battery plates deliver power to the battery management system. All batteries are monitored and drawn down equally and displayed on the LCD.

2) Any one battery plate is direct wired to the upper camera platform's auxiliary camera power connector, Lemo 2B 302. This will deliver direct power from the battery and not be connected to the battery management system. This will allow you to run all cameras at all times.

3) All battery plates are direct wired to the upper camera platform's auxiliary camera power connector, Lemo 2B 302. This will deliver direct power from the battery; *it will be* connected to the battery management system and monitored normally. *This will not allow you to run the ARRI 3 cameras at high-speed only* (past 60 fps) because of the common ground. Pan/ Arri's are not affected because they are 24VDC power inputs and can be run up to 120 fps without issue. All batteries will be monitored normally by the battery management system. All other cameras can be run at all times on the sled like option 1.

Pushbuttons left to right:

MAIN PWR: Turns your system on and off.

STDBY: Puts your sled into low power consumption mode.

ZERO: Always active, reZERO's your Programmable Digital Level at any angle with a press of the button.

LEVEL: *(Optional)* Allows you to enter the User programmable settings of your level and crosshair. (See digital level chapter for details)

SLED : Allows you to enter the User programmable settings for the Battery Management System, Sled controls, Uno frameliner control and Recorder power.

SELECT: Scrolls through your programmable menu pages.

ADJ: Scrolls through and selects your settings for that programmable page.

Releasing the post from the Lower Electronics Housing (LEH)
To remove the post from the LEH you simply turn the knurled locking ring. The mount on the housing is designed to turn +/-5 degrees, connector in the post as well is designed to turn. Registration pin on housing, alignment slots on connectors will assures correct alignment of post and connector.

LOWER ELECTRONICS HOUSING FRONT PANEL CONECTORS

Three Lemo connectors, left to right.

1B 308: feeds power, tach, video and tally light information to the TB-6 Smart Monitor.

0B 304: feeds 12 Vdc out, and video signal out only. For transmitter, 1A maximum.

2B 303: 12 & 24 Vdc out.

BNC: HDSDI

LOWER ELECTRONICS PROGRAMMABLE FUNCTION AND USER PROGRAMMABLE CONTROLS
The following is a description of the programmable functions that are available on the ULTIMATE sled. First, a brief summary on how to enter each menu, each programmable page and how to select the setting for that page.
Second later in this section there will be a list of definitions of each of the programmable pages and it will tell you exactly what each of those page functions are.
The following brief descriptions will cover the standard features which include the Battery Management System, LCD Display, and Uno functions and setup. It will also cover the optional Programmable Digital Level, Crosshair.

What the Battery Management System (BMS) allows you to do is to simply run your sled on one, two or three batteries. It will deliver the correct voltages to the appropriate plugs, monitor and display total voltage of the incoming batteries, and when using interactive batteries, will display percentage of remaining capacity of each battery plugged in. We have designed all our own software for this function, which is completely different and far more useful and trusting than a display on the battery.

First, you will need to power up your system, so you will need a battery and a video signal present to access the full menu of programmable settings.

When you press the power button, up will pop the yellow power light, the LCD display will say XCS ULTIMATE and our web page. This will take about three to four seconds and will disappear. The battery displays will then appear.

You are now ready to enter one of the programming menus.

MENU pages.

You have five different main menus to choose from. Within those five main menus you have submenus. These submenus are your user selectable pages for programming.

5 main menus are as follows:

1) LEVEL*, optional*
2) CROSSHAIR, *option comes with level software*.
3) SLED
4) UNO FRAMELINER
5) DECK

To enter the five main menus you have two pushbuttons, **LEVEL or SLED.** The Programmable Digital Level Plus is an option, so if it is not built in you will not have the level functions.

The **LEVEL** pushbutton allows you to enter the optional **PDL** and **+HAIR** (crosshair) menus. The **SELECT up/ down** buttons allow you to enter those submenu pages, while the **ADJUST up/ down** pushbuttons allow you to select your settings for that page.

Editing is a simple three step process:

1. Choose your **MENU**
2. Use the **SELECT** button to find your programmable page.
3. Use the **ADJ** buttons to program your settings.

The **SLED MENU** button allows you to enter all the other sled menus. The **SELECT** buttons allow you to enter those sub menus which include the LCD visual display, BMS, record deck power supply, and the Uno. Once again the **ADJUST** up/ down pushbuttons allow you to select your settings for that page.

All programmed settings on the ULTIMATE sled are always saved in nonvolatile memory. This means that whenever you turn your sled off, pull off the batteries, pack it away for a month and bring it out and power back up, it will remember all the previous settings.

When editing any of the pages, your LCD display will prompt you of all your current settings for that page and display your options for that page when you use the up and down **ADJ** buttons to scroll through your options. Also, if your TB-6 is turned on and a video signal is present, the same information will appear on screen.

You can edit any of the **SLED** functions with no video signal present.

You cannot edit any of the **LEVEL** functions without a video signal present.

Example – You want to turn on the backlight OFF, on your LCD display.

*Go to the **MENU** buttons, press the sled button once.*

The LCD display will display SLED LIGHT ON. Use the ADJ up or down key, press once and this will turn the SLED LIGHT OFF.

*To exit that menu page, you have two options. You can choose another page to edit simply by pressing the **SELECT** keys, or you can let the microprocessor **time out**.*

TIMING OUT. Timing out is a term used to tell you that a pushbutton that was active (operational) is no longer active, “Timed out”. In our design you have 4 seconds to press a button, then it will automatically turn off if no buttons are pressed. Once you enter an edit mode by pressing one of the two **MENU** buttons, **LEVEL** or **SLED**, the **SELECT** and **ADJ** keys are automatically activated. The reason we do this is to prevent you from accidentally changing any of your settings.

The following buttons are always active when a battery power is present. **POWER**, **STANDBY** and **ZERO**.

*Example – Under the **LEVEL** menu, there are two options.*

1) ***PDL***
2) ***+HAIR** (crosshair).*

*To enter the **PDL** options, simply press the **LEVEL** button once.*
*Your **LCD** and your on screen text will display the first selectable page, **LEVEL**, and your programmable setting option which are **On** or **Off.** Turn it **ON***
*To further select editable pages for the **PDL**, use your **SELECT** down button to scroll through your programmable pages using the **ADJ** pushbuttons to set you preferences.*
*To enter the **+HAIR** selectable pages, you would have to press the **LEVEL** menu button twice. Once again, your first selectable page **+HAIR** and your programmable setting option will be **On** or **Off**. Turn **ON.***
*To further select editable pages for the **+HAIR menu**, use your **SELECT** up/down button to scroll through your programmable pages using the **ADJ** pushbuttons to set your preferences.*

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ENTERING THE SLED MENU

Press the **SLED** button once.	Brings up the sled's control package. This includes the Backlight, Battery Management System, Serial # and Brightness.
Press the **SLED** button twice.	Brings up the **UNO**.frameliner
Press the **SLED** button three times.	Brings up the record **DECK** options

**You should always leave the Deck powered up either at 4.5 or 7.2 Vdc.*

The **SLED** menus can be edited at any time with or without video signal present.

USER SELECTABLE PAGES & PROGRAMMABLE SETTINGS

If you press the **SLED** menu pushbutton one, two or three times these will be your following options:
Pressing the SLED menu button once brings up the following submenu under the SELECT pushbuttons.

SELECTable pages (**SELECT** keys)	**Programmable settings** (**ADJ** keys)
SLED LIGHT	**ON / OFF**
SLED BATT %	**ON / OFF**
SLED BATT	**12 / 13.2 / 14.4 VDC**
SLED LO BATT	**9.1 – 15.0 (User Adjustable)**
SLED BRITE	**LO / MED / HI / MAX**
(also sets the frameline intensity on the UNO for transmitters)	
InACT	**OFF/5 / 10 / 15 MINUTES**
ULTIMATE SLED SERIAL NUMBER #0000	

PRESSING THE SELD BUTTON TWICE

UNO (single digital frameline for the transmitter only, w/black border control on/off) When the **UNO** menu is selected and turned on, all other visual displays on your TB-6 will temporarily be turned off. The DUO inside the TB-6 will remain on. This will enable you to easily program the settings on your **UNO**. When you are finished editing the framelines, and you exit the **UNO** page, your previous TB-6 frameline settings on the monitor will return. These **UNO** frame lines will be seen only at video village.

SELECTable pages (**SELECT** keys)	Programmable settings (**ADJ** keys)
POWER	**ON / OFF**
LEFT (moves left frame line)	move with the **ADJ** keys
RIGHT (moves right frame line)	move with the **ADJ** keys
UPPER (moves top frame line)	move with the **ADJ** keys
LOWER (moves bottom frame line)	move with the **ADJ** keys
BORDER	**ON / OFF**

PRESSING THE SELD BUTTON THREE TIMES

DECK (recorder)

SELECTable pages (**SELECT** keys)	Programmable settings (**ADJ** keys)
POWER	**ON / OFF**
VDC	**4.5 / 7.2 VDC**
STANDBY	**ON / OFF**

PROGRAMMABLE DIGITAL LEVEL (PDL) MENU (optional)

+HAIR MENU (available only with the PDL)

If you press the **LEVEL** menu once or twice, these will be your following options. Remember, the **ZERO** button is always active. This means you can re**ZERO** your level at any time. Simply press and hold the button in, and on the screen of your **TB-6** you will see a message that says **ZERO WAIT**. In two seconds the message will say **ZERO SET**. This setting is now stored into nonvolatile memory. We offer you four visual displays under the style page for the **PDL**. Two vertical and two horizontal. When using the vertical style level, your +HAIR function is automatically inactive. You can only use the +HAIR with the two horizontal displays.

SELECTable pages (**SELECT** keys)	Programmable settings (**ADJ** keys)
LEVEL	**ON / OFF**
MOVE	**UP / DOWN**
SWEEP	**L TO R / R TO L**
ZERO	**HMODE / LMODE / OTHER**
RANGE	**+/- 1,2,4,8,16 DEGREES**
REACT	**SNAIL / SLOW / MID / FAST / HYPER**
STYLE	**1 / 2 / 3 / 4**
SIZE	**SMALL / MED / LARGE / XL**
BRITE	**LO / MID / HIGH / MAX**
BLACK	**HALF / FULL / OFF**
TILT	**ON / OFF**

+HAIR (crosshair)

SELECTable pages (**SELECT** keys)	Programmable settings (**ADJ** keys)
POWER	**ON / OFF**
MOVE	**L R** (LEFT TO RIGHT)
MOVE	**U P** (UP OR DOWN)
SIZE	**SMALL / MED / LARGE / XL**
LOOK	**WHITE / BLACK / ZEBRA**

ULTIMATE SLED MENU PAGES AND DEFINITIONS OF EACH USER PROGRAMMABLE SETTING

SLED, UNO, RECORDER, LEVEL Menu's

Most of the programmable page titles are self explanatory by title. But here is a list of what options each page offers.

SLED LIGHT – Turns on and off the back light on the LCD screen.

SLED BATT % - ON/OFF – Turns on and off the visual display of your three individual battery percent remaining displays.

SLED BATT 12 / 13.2 / 14.4 – Tells the microprocessor what voltage battery you are using.

SLED LoBATT – The programmable range is **10.5-15.0 Vdc**. This setting triggers your low battery threshold, programmable in 0.1 Vdc increments. Factory standard setting is 13.7 Vdc. ***This is very important to note:*** Because different battery chemistries, cell sizes, voltages, and battery age drop out at different low battery thresholds. NO single preset battery indicator will work for all batteries. This is one reason why we developed the **BATTERY MANAGEMENT SYSTEM**. You now have complete control to program into the microprocessor the battery voltage and at what voltage you would like your **LO** battery indicators to turn on at. The microprocessor in the BMS also very precisely measures the percent of your batteries remaining capacity. This will allow each individual operator a comfort zone on when to change out their batteries. The BMS will greatly increase the longevity of your batteries, and running time on your sled before you change out batteries.

SLED BRITE – LO / MED / HI / MAX – This is the brightness setting for your on screen text, Programmable Digital Level indicator and crosshair appearance on the TB-6. It also controls the frameline intensity on the UNO frameliner for your transmitters display.

InACT – 5 / 10 / 15 / OFF – This allows you to program into your sled a time **5, 10** or **15** minutes of sled inactivity to automatically turn itself off. When your sled sits idle, a sensor notices no movement and will power down your sled saving battery power. To turn your system back on, simply press the **POWER** button on the sled. If the **InACT** is in the **OFF** position, you will simply have to manually turn your sled off by pressing the **POWER** button. You can have your sled set to turn off at a specified time setting and still turn your sled off manually.

SER# - This is your sled serial number. We put this into the firmware and it cannot be removed and your sled still function. If your sled gets stolen, we will be able to track it when it appears on the market. Another nice feature we have added.

UNO – This is another nice development in our sled design. This is a completely positionable, digital white frameliner and border controller that is designed to work with your video transmitter only. The frame lines and border control will not be seen on your TB-6 monitor except for initial setup. The **UNO** is a kin to this but it only works with the video transmitter. So let's say on your TB-6 monitor the **DUO** is set up to show you, the operator, full academy and 1:85. You can show the director 1:85 only and black box out the rest of the image. You have a choice of white frame lines if the **BORDER** control is **OFF**, or a completely black **BORDER** if the **BORDER** controller is in the on position.
Since this image like all our designs is digitally controlled, it will not drift.

UNO – PWR ON / OFF – Turns the power on or off to the **UNO** display.

UNO – LEFT – Moves the left frame line.

UNO – RIGHT – Moves the right frame line.

UNO – UPPER – Moves the top frame line.

UNO – BOTTOM – Moves the lower frame line.

BORDER – ON / OFF – Turns on the black box outside the set frame lines in the **ON** position. Turns off the black border and allows video image to pass, viewing only the white programmable frame lines.

DECK POWER – ON / OFF – Turns on or off the internal power supply feeding power to your on board deck.

DECK VDC – Choose a supply voltage of **4.5** or **7.2 Vdc** out for powering your on board recorder.

DECK STANDBY – ON / OFF – Choose the ON position and when you put your sled in the STANDBY mode, you will not be able to power up your on board recorder for playback. In the OFF position, you will be able to do video recorder playback in this position in the STANDBY mode. But the system will put the rest of the sled except the TB-6 in low power mode.

PDL's PUSHBUTTON CONTROLS & SETTINGS

6 Pushbuttons control: Level menu, Select, ADJ buttons, Zero

Level: Enters the Level menu pages.

ZERO: The ZEROing process requires the ZERO pushbutton to be pressed and held in for about 2 seconds. This is a safety feature to prevent accidental resetting. By pressing the ZERO button, immediately a message will appear on screen saying ZERO WAIT, after 2 seconds of being depressed, the message will say ZERO SET, the bubble will align to the center tick mark. If the button is released before the ZERO SET message appears, nothing will happen. The ZEROing button is functional at all times.

SELECT: The SELECT pushbuttons scrolls through a list of user menu pages. With each press of the button, your on screen text will display the current selected menu page. Example: line may read – RANGE, TILT, MOVE, REACT.

ADJust: ADJ pushbuttons allow you to control the setting available on the SELECTed page when the visual text is on screen.

PDL's MENU PAGES & USER PROGRAMMABLE SETTINGS

LEVEL: ON / OFF. Pressing the ADJ button turns the level on/off.

RANGE: +/- 1,2,4,8,16 degrees. Each press of the ADJ button scrolls you to the next setting up to +/- 16 degrees. It does not roll over to +/- 1. You must use the DOWN button.

BRITE: LO / MID / HI / MAX. Each press of the ADJ button sets the next higher or lower setting of video brightness. The four settings LO / MED / HIGH / MAX, correspond approximately to 50 / 100 / 150 / 200 percent of the current white level. This is here to boost the levels of visual intensity through the border intensity control on the DUO DIGITAL FRAMELINER.

SIZE: SMALL / MED / LARGE / XL. Using the ADJ buttons allows you to adjust the levels visual size.

MOVE: ADJ. When in a horizontal level display, allows you to move the level over the entire video field. When in a vertical level display, allows you to move the level left and right over the entire field.

ZERO: **HMODE, LMODE, OTHER**. These are three levels of programmable memory. Every time you press the reZEROing button, your level setting has been stored on one of your selected levels of memory – HMODE, LMODE, or OTHER. You choose which memory level you wish to store your level setting on. If you wish to store a level setting on a specific memory level, use the up and down push buttons to bring up the memory level you wish to save it in HMODE, LMODE, or OTHER. A text box will appear on your monitor screen displaying which of the three modes you are in. To bring back a stored level setting, simply use the up or down buttons to bring up the memory level you previously saved. The level will automatically bring up that stored setting. You do not have to press the reZEROing button.

SWEEP: L ____ R / R ____ L. Toggling the ADJ buttons results in the reversal of the on screen levels bubble orientation between left & right, and right & left.

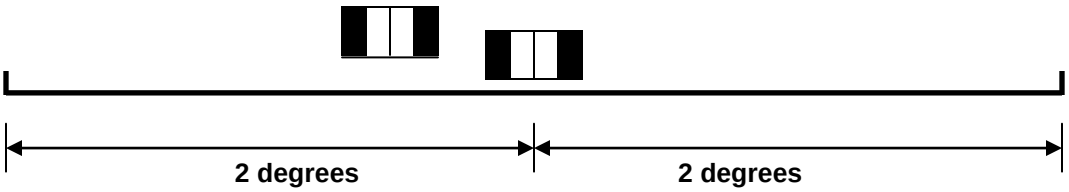
REACT: SNAIL / SLOW / MID / FAST / HYPER. Using the ADJ buttons you can adjust the bubble levels rate of response time to off axis movements. 1/125, 1/90,/1/60,/ 1/30, 1/15 of a second Using this dampening control in conjunction with the RANGE control, you will be able to find a nice physical & visual response of the level for yourself.

STYLE: 1 / 2 / 3 / 4. Use the ADJ buttons to choose between four different visual display styles. Two horizontal, and two vertical displays. On the horizontal displays, you will notice one center point (middle point or ZEROed) and tick marks at the end of the visual display. These tic marks represent the +/- RANGE setting of the level. The bubble will travel beyond these marks, up to +/- 90 degrees. But the tic marks represent your programmed RANGE setting +/- 1, 2, 4, 8, 16 degrees. This non linear scaling will produce far great accuracy and sensitivity in the critical range.

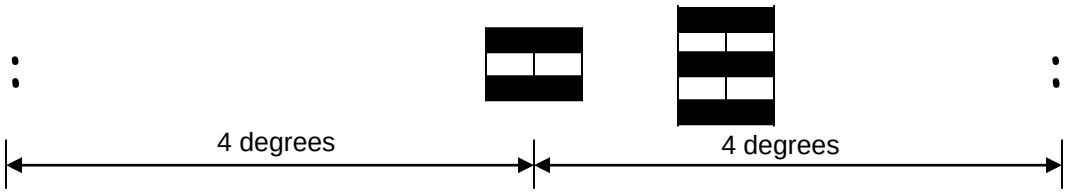
Example:

Visual STYLE 1

You have programmed the RANGE to be set at +/-2 degrees.



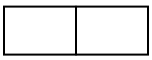
Visual STYLE 2

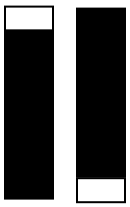


Visual STYLE 3 & 4

STYLE 4 is in the vertical mode.
Range setting at +/-4 degrees.

The vertical level indicator has no tic marks. You cannot BLACK boxed or TILT the indicator. It produces its own black box as it stretches out to visually show you're off level. If you are perfectly level, the indicator will look like a white rectangular box. If you go off level, it will stretch into a black rectangular box with white indicators going in opposite directions.

Level: 

Off level: 

BLACK: OFF / HALF / FULL. The BLACK box function turns on / off a black background behind the level. It can be set to HALF, which is just the bubble height and length of the indicator or FULL, which is the bubble, grid & length of the indicator across the screen. This allows an extremely high degree of viewability with a low level of (BRITE) intensity.

TILT: ON / OFF. When ON, a tilted bubble gives a definitive indication of the sled deviation from true vertical. This may be helpful in the operator response time representing the orientation of the sled position and their need to tilt back in the other direction to bring it back to level.

+HAIR – This is the programmable crosshair that is displayed on your TB-6 screen only. It will not be transmitted.

+HAIR – PWR ON / OFF – Turns on or off the visual display of your crosshair.
Remember, the **+HAIR** function is automatically turned off if you use either of the vertical PDL displays.

MOVE – L / R – Allows you to move the crosshair left and right.

MOVE – U / D – Allows you to move the crosshair up and down.

MOVE – SMALL / MED / LARGE / XL – Changes the visual size of your crosshair.

MOVE – LOOK BLACK / WHITE / ZEBRA – Changes the look of the crosshair from a black to a white or combination of both.

OTHER LCD DISPLAY MESSAGES:
STANDBY – Blinks **STANDBY** and **NO VIDEO** message when you have put your sled into low power consumption mode. A touch of the standby button on the sled will bring everything back up.
LO BATT – This will appear when your batteries have depleted past their programmable low voltage threshold setting.
NO VIDEO – this will appear when the sled does not receive a video signal. It also will appear when you put your sled in the standby mode.
FAIL MEMORY TEST – This will appear if there has been a powering up issue. Power down your system, remove batteries, press the power button once or twice, put the batteries back on, re-power your system.
MEMORY ERROR TRY POWER OR RESET – If your LCD displays this information, re-power your system, remove your batteries and re-power your system, or re-power your system doing a factory reset.

LOWER ELECTRONICS HOUSING AMBER L.E.D.'s

MAIN PWR – This lets you know that your system is powered up.
LO – Low battery Indicator blinks when your battery drops .01 Vdc below your programmable battery threshold.
STANDBY – Turns on when you put your sled into low power (sleep) mode. You may notice your sled's three yellow LED's blinking very faintly every few seconds. This is normal. It is your microprocessor scanning and watching for any kind of programming changes.

MONITOR SCREEN DISPLAYS GENERATED BY THE L.E.H.

The lower electronics housing generates an on-screen low battery indicator when your battery voltage drops below your preset battery threshold. It will appear in the lower left hand corner of your monitor screen. Visually, the indicator will be a small white box that looks like a battery with a plus sign in the center. It will blink about every two seconds and remain on screen until you change out your battery. Periodically you may see the low battery indicator pop on and off screen when you start up a motion picture camera. This is indicating that your battery is dropping below your low battery threshold and as your camera gets up to speed it goes back to normal operation and your battery does not have to work as hard. Typically, a Nicad will drop about .1 to .2 of a volt. A Hytron will drop between .6 and .8 of a volt on camera start up. Lithium .2-.4 volts. This voltage drop will vary between cameras.

RESETTING THE ELECTRONICS BACK TO FACTORY STANDARDS:

A video source is required to reset your electronics back to factory presets.
With battery installed, and system turned off, press and hold the **STANDBY** button down.
While holding the **STANDBY** button down, turn on the main power. Continue to hold the **STANDBY** button down for approximately 15 seconds. At first, the LCD display will display:

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When the reset is finished, the backlight will flash on and the battery voltages will appear. You may now remove your finger from the **STANDBY** button.

LCD DISPLAY

The LCD display is capable of reproducing 2 lines of 16 characters each. This is why we have abbreviated some of the page names.
.The SLED & LEVEL menu information will be reproduced on the TB-6 Smart Monitor and on the LCD.
In non-edit mode, the LCD will display the status of the Battery Management System.
This mode tells the user the total voltage into the system on the top left hand side. It does not matter what voltage or battery type is used. This simply tells you the total voltage into the system of 1, 2, or 3 batteries.

If you are using interactive batteries, the next three readouts are of the individual batteries on your sled.

If you are not using interactive batteries, then you probably would like to turn off the three individual battery readouts so you are not looking at three sets of zero's. This will not affect the total voltage readout. This total voltage reading will remain on screen.
To turn off the individual readouts go to the
MENU press
SLED press
SELECT to bring up the **SLED BATT %** press
ADJ to toggle **ON** or **OFF**

MAINTENANCE OVER TIME

It's inevitable that over time you will have to do a bit of adjustment or replace a screw or Kipp handle. The following information may be useful.

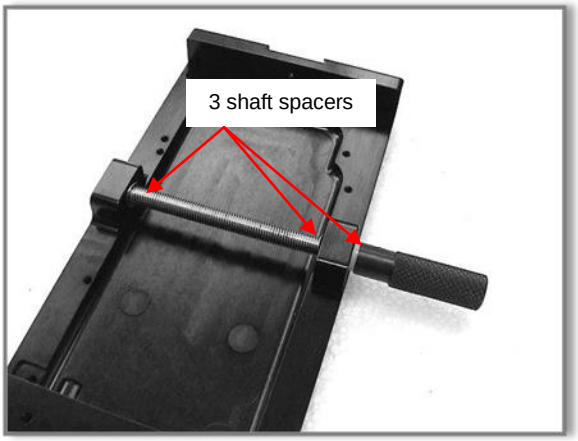
ADJUSTING THE DOVETAIL CLAMP

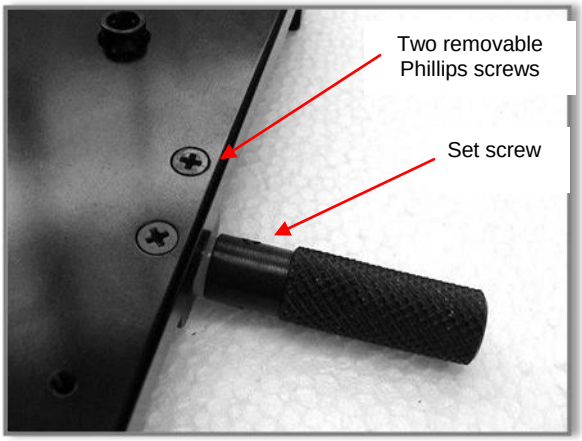
If you find that your camera plate is sliding or the clamp is hanging up on the four shoulder bolts, the clamp's two brass tipped set screws are out of adjustment and need to be reset.

Locate the two set screws on the side of the dovetail clamp, back them out 2 turns.

- With a dovetail plate in the platform, snug up the clamp using the Kipp handle. Do not over tighten it as if you are clamping it down, just snug so it takes a bit of end pressure to slide the camera plate in the camera platform.
- Flip the UCP over (leaving the camera dovetail plate snug) and turn the two set screws in equally.
- Snug up both brass tipped set screws. I measure the distance of the gap with a caliper and keep it close. You might want to put a thread locker on these set screws to keep them from moving.
- Tighten up the Kipp handle with normal finger pressure and make sure that the camera plate does not slide. If it does slide, loosen the Kipp handle again back out the set screws a very small amount - 1/10th of a turn at a time each set screw, remeasure the gap, tighten the Kipp handle. Repeat if necessary. I set the gap +/- 0.001" measured at each set screw when manufactured.

Swapping/ replacing the inching Knobs side to side





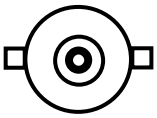
The first photo is a cutaway of the LEH and shows you how the shaft sits. It does screw through a plastic nut in the center (not pictured) of the upper half of the LEH. This means you will have to turn out the drive shaft and turn it back in.
There are three spacers on the drive shaft. One on the inside end of the drive shaft, and one under the knurled inching knob.

- Remove the LEH from the post.
- .050” hex head wrench removes the set screw on the knurled knob, spin the knob off the shaft.
- Remove the two Phillips head screws on the bottom as shown.
- Spin out the drive shaft, flip it around and spin it back in.
- When you have the drive shaft almost all the way in, place spacer on shaft end, insert it into end cap.
- Add spacer on other shaft end and add the removable end cap.
- Screw in two Phillips head screws.

The Fore and Aft knob is very simple.

- Loosen the set screw, spin out the inching knob.
- Remove the plastic cap on opposite side and place the knob on the shaft, tighten set screws.
- Replace plastic cover on open hole.

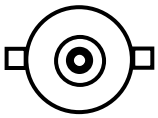
Upper Camera Platform /Lower electronics housing connectors.



Composite Video
In only

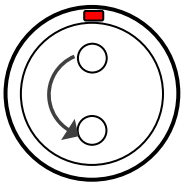
0S 304
1-14 Vdc+
2-Ground
3-Ground
4-24 Vdc+

1S 303
1-28 Vdc+
2-Ground
3-14 Vdc+

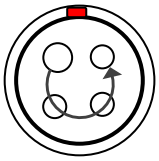


HDSDI Video
loop through

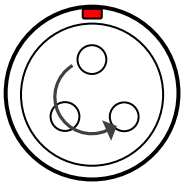
Camera platform rear



2B 302
1-14 Vdc+
2-Ground

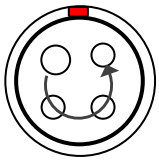


0B 304
1-Ground
2-14Vdc+
3-Video signal
4-Video gnd.



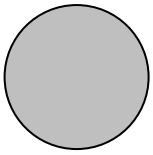
2B 303
1-28 Vdc+
2-Ground
3-14Vdc+

Camera platform left side view



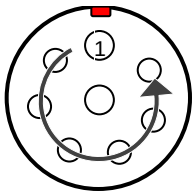
0B 304
1-Ground
2-14 Vdc+
3-Video signal
4-Video gnd

Camera platform right side

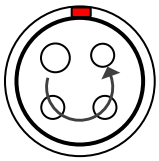


9mm tapped
plugged hole for
0B Lemo

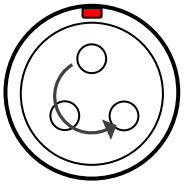
Lower electronics housing front view



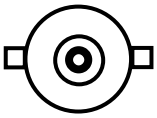
1B 308
1-Power gnd.
2-14 Vdc+
3-Video signal
4-Video gnd.
5,6,7 not connected
8-Video out from
recorder deck.



0B 304
1-Ground
2-14Vdc+
3-Video
signal
4-Video gnd



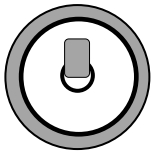
2B 303
1-28 Vdc+
2-Ground
3-14Vdc+

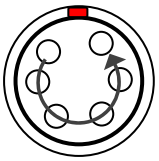


HDSDI loop
through

Lower electronics rear view

Toggle switch
Records composite video
Playback on pin 8 of the
monitor connector





0B 306
1-Power gnd
2-Selectable Vdc+
3-Video signal to monitor
4-Video gnd. to monitor
5-Video signal record deck
6-Video gnd record deck

THE

ULTIMATE SLED

BY

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