

Talon

Operations Manual

and

Connector Information

General Description

The Talon is a mid-size, two axis remote camera head. It has a wide variety of operating modes: manual operation from joystick, wheels or panbar, motion control style record and playback, "go to mark" preset framing, intervalometer operation and can operate as a slave to Kuper Node motion control. It also is capable of providing motion data for virtual set operation.

Two controllers are available. The Talon Advanced Controller gives the user all input and programming capabilities. The Jibstick remote is a simpler and less expensive controller designed for one-man jib operation.

The Talon's lens interface controls zoom, focus and iris. It provides four varieties of control signals: RS-232 for Fujinon digital lenses or Ravensclaw (TOC) motor drives, RS-422 for Canon digital lenses or Preston motor drives, position or speed based analog and pulse width type RC servos.

The following is an in-depth description of Talon operation, a more complete description of each of its features, followed by an appendix with a complete description of all connector pinouts.

Talon Advanced Controller

I. Startup

- 1) **Front Panel buttons:** - The top row of buttons default to act like a normal record - playback system; record, rewind, stop and play. The top left button, 'Q', is used as a 'Shift' key.
The bottom row includes:
The "Setup" button = '*'
The "Accept" button = '<-'
The "Cancel" button = 'x'
- 2) **Powering up the system** - Power up the Talon. Switch on the "Main Power" rocker switch to power up the Talon Remote controller. It will take a couple of seconds for the two systems to establish communications and synchronize to one another. The controller display will show a spinning line during this process. Once communication is established the controller will display a solid diamond.

- 3) **Motor power** - After communication has been established, motor power may be turned on with the "Motor Power" switch. At this point the controls will move the motors. When the motor power switch is off, the pan and tilt motors can be moved by hand and the axis positions are displayed on the main screen.

- 4) **Initial Calibration/Home Sense** - Before calibrating please insure that the overslung/underslung setting is correct. This will affect the homing position of the tilt axis. If you are recording or playing back Moves or Marks, the Talon should be calibrated once motor power is turned on. The Calibrate process commands the Talon to find its home positions by driving the pan and tilt motors to find their home sensors. To implement this, rotate the "Select" knob until "Goto" is highlighted on the display; and press the "Accept" button. Then rotate the "Select" knob until "Home" is highlighted on the display; and press the "Accept" button. The system will ask "Ready to Calibrate?" and requires a second press of the "Accept" button. This will cause the Talon to drive the pan and tilt motors toward their home sensors. Once found the system will reverse the motors at a slower speed to more precisely locate the home positions.

- 5) **Go to Zero** - The "Go to Zero" command may be used at any time to return the Talon to a recorded zero position. If no zero position has been recorded this defaults to the Home Sense position. To record a zero position, rotate the "Select" knob until "Set" is highlighted on the display; and press the "Accept" button. Then rotate the "Select" knob until "Zero" is highlighted on the display; and press the "Accept" button. This will set the current position as zero for all motors (pan, tilt, zoom and focus).

II. The Main Page



The main page may always be enabled by pressing the “Cancel” button one to three times, depending on which sub-menu you start out from. The upper right portion of the LCD screen shows motor status and current positions for pan, tilt, zoom and focus. A check in the box to the left of the axis name indicates that that motor is enabled to run. If soft limits are enabled for the axis, the box is filled and appears white with a blue check mark. The numbers to the right of the axis names are the motor positions; pan and tilt are shown in degrees, and zoom and focus are shown as an unscaled number from 0 to 1000.

The left portion of the screen contains basic user controls, current take and mark numbers and the connection status icon (a diamond) as explained above. There is an additional smaller “sync” icon shown above just to the left of the connect icon. This is displayed when a sync signal is being received, either video sync through the main BNC connector, or camera sync through the tilt assembly. When external sync is being received, the external frame rate will be displayed here in real time.

Each control function can be highlighted in two different ways. You can rotate the “Select” knob until the desired function shows a box around it. Or you can use the “Que” button as a shift button. Holding the “Que” button down changes the function of the “Record” and “Rewind” buttons to be “+” and “-” buttons respectively. The “+” button will advance to the next selected control, and the “-” button moves to the previous control. This offers a different way to select controls, or change values. Once a control is selected, press “Accept” to activate that control.

(Note: Changing values)

Change a value by turning the Select knob or using the "+ -" keys. If a value is being changed, pressing "Cancel" will cancel the operation, reverting to the old value. New values usually take effect as they are changed; pressing "Accept" only confirms the new value.

Trick: Hold the "Que" button down while turning the Select knob to change values by 10s instead of 1s; hold the "Setup" button down to change values by 100s (useful for Take and Mark numbers). Hold both Que and Setup buttons down to change values by 1000.

The system offers another shortcut when selecting Takes and Marks. The Take or Mark number can be any number up to 2000. This might create a delay while selecting a take, looking for the right number. If you hold down the "Stop" button while turning the "Select" knob, the number will advance to the next non-empty Take or Mark. So for example, if you only have Take number 3 and number 1281 recorded and you are on Take 3, holding the "Stop" button while turning the "Select" knob will advance directly to Take 1281.

Main Page Controls:

Note: Each screen or menu will remember the latest control that is selected and return to that control when the screen is re-selected, even after power is re-started.

- 1) **Take** - This control shows the selected Take number. (See section V. below.) Press "Accept" when this control is highlighted to change the take number. As the number is changed with the select knob, the duration of the selected Take is shown in seconds under the take number, as well as the number of seconds remaining in memory for new recordings.

Take	1	✓	pan	-1.4
Mark	1	✓	tilt	2.1
Go to		✓	zoom	265.7
Set	Enl	✓	focus	289.7
Spd:	100	♦	Take:	1
Sync:	♦ ♦			9.3 seconds
				seconds left: 4341

- 2) **Mark** - Marks are pre-recorded positions for pan, tilt, zoom and focus. This control shows the selected Mark number. You can select up to 2000 pre-recorded positions. As this number is changed, the motor positions for the selected mark will show on the screen. After selecting a new take or mark, press "Accept" to keep the new number, or "Cancel" to revert to the old value.

Take	1	✓	pan	-1.4
Mark	1	✓	tilt	2.1
		✓	zoom	265.7
		✓	focus	289.7
Go to				
Set	Enl		Mark P:	-1.4
Spd:	100		num T:	2.1
			Z:	265.7
Sync:	◊ ◊		1 F:	289.7

Modifying Mark Number Trick:

Sometimes you need to quickly change mark numbers. Using the combination button presses described below allows the mark number to be changed quickly. When the selection control is on Goto, and the sub-menu is highlighting "Mark", a double press of the "Accept" button allows very rapid "GoTo Mark" operation without the need to use the select knob.

Method: From the main screen, hold the "Que" button down while pressing the "Go" button. The mark number will advance to the next mark. Hold the "Que" button down while pressing the "Stop" button will change the mark number to the previous mark.

3) Goto - This control activates the Goto menu.

Take	1	✓	pan	-1.4
Mark	1	✓	tilt	2.1
		✓	zoom	265.7
		✓	focus	289.7
Go to				
Set	Enl		Go to:	
Spd:	100		Mark Zero Home	
Sync:	◊ ◊		Start End	

Mark: Moves all motors to the active mark.

Zero: Moves all motors to their zero position.

Home: Calibrates the pan/tilt axes.

Start: Moves all motors to the beginning of the active take.

End: Moves all motors to the end of the active take.

Note: All inputs are de-activated during all moves: goto's, rewinds and takes.

4) Set - This control activates the Set menu.

Take	1	✓	pan	-1.4
Mark	1	✓	tilt	2.1
		✓	zoom	265.7
		✓	focus	289.7
Go to				
<input type="checkbox"/> Set	End		Set:	Soft Limits
Spd:	100		Mark	Zero
Sync:	♦ ♦		Start	End

Mark: Sets the current position of all motors in internal memory. Assigns the mark number on the screen to refer to this position.

Zero: Sets the current position of all motors to be zero. Motor positions may be set to zero individually in the Set: Soft Limits screen.

Start: Resets the beginning positions of the active take to be the current position.

End: Resets the end positions of the active take to be the current position.

Soft Limits:



Press "Accept" to enter the Soft Limit menu. Then select the desired motor with and select knob (or +/- keys). Press "Accept" to enter the menu for that motor.

The first control will show whether position limits are "Enabled" or "Disabled". If they are enabled, that motor will not go beyond the limit, and it will slow down shortly before the limit to avoid stopping suddenly.

The second control, "Set zero", will set the selected motor's current position to be "0.00".

The third control, "Set limit", allows setting the positional limits for the selected axis. The soft limits should be disabled (as explained above) before using this control, but it is not necessary. The usual technique for setting two limits for an axis is to first enter the Soft Limit menu. Disable the Limits. Move the selected motor to one limit point. Press "Accept" on the "Set limit" control. Move the motor to the other limit point and select "Set limit". Now Enable the limits and they will be set.

If "Set limit" is selected again, the closest limit will be replaced.

The "Reference" control shows either "sensor" or "zero". When "sensor" is selected, soft limit positions will remain in the same location even when a new zero is set for pan or tilt. If "zero" is selected, the soft limit positions for pan and tilt will be reset if a new zero is set in a new position. The reason for the "zero" setting is in some cases the head will need to be powered up and soft limits quickly enabled without going through the head calibration process. All that needs to be done is to re-zero the head in some known location, and the soft limits will be in a known position.

- 5) **Enable** - Each axis may be separately enabled or disabled. Enabled axes are shown with a check mark on the left side of the motor display. Disabled axes are shown as an "X". A motor in neutral (no power to motor) is shown as an "O" in the motor status boxes.



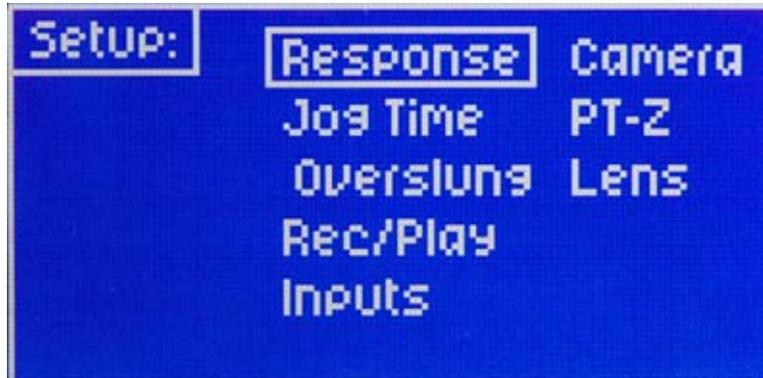
Press "Setup" on the Enable control to enter the Enable menu. Then select the desired motor with the select knob (or +/- keys). The left side of the motor display will show the selected motor's enable status. Toggle between enabled and disabled by pressing the "Accept" button. Place the motor in neutral by holding down the "Setup" button, then pressing the "Accept" button.

A reverse background on the motor enable boxes shows that soft limits are enabled (see "Set: Soft Limits").

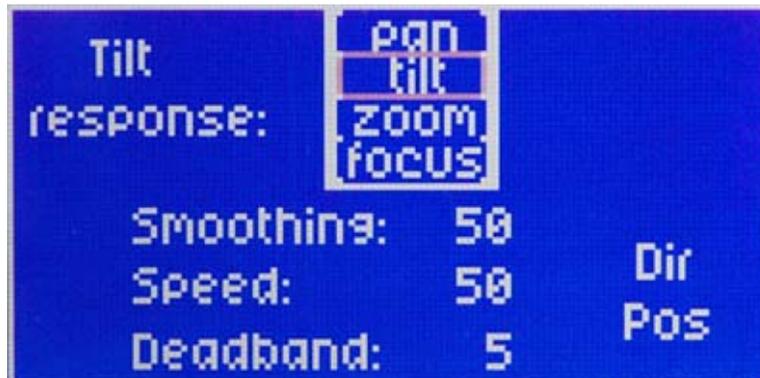
- 6) **Spd (Speed)** - This control allows the operator to quickly change the response for pan and tilt at the same time or separately. The first time this mode is entered, the Setup knob will change the speed value shown on the main page. This value (1-100) is a master setting that limits both pan and tilt speeds. Pressing "Enter" one more time changes the system mode so that the Setup knob now changes the Tilt speed, and the Focus knob changes the Pan speed. These speeds are the same as the speed selected in the Response page for pan and tilt. Pressing "Enter" once again (or Cancel) returns the system to normal operation.

III. Standard System Setup

System setup is accomplished using the Setup Controls: "Setup", "Accept" and "Cancel" buttons and the "Select" knob. There are two setup screens. Press the "Setup" button once to enable the first setup menu. Pushing the "Setup" button a second time will bring up the second Setup menu.



- 1) **Response** - This control sets up motor response. This includes speed (sensitivity), smoothing and direction. After selecting the "response" control, select the desired motor with the select knob.



The smoothing control smoothes all input controls for the selected motor. "1" is no smoothing, 100 is maximum smoothing. The more smoothing is applied for a motor, that motor will lag further behind the input controller, and will have a smoother motion.

The speed setting controls how fast the motor moves in response to all inputs. "1" is very slow motion, "100" is very fast motion.

The deadband setting is used for the joystick inputs. The larger the deadband setting, the larger the distance in the middle of the joystick travel where there will be no response.

The direction control changes the direction each motor moves for a given input. "In" changes the direction of the controller for that axis (joystick or encoder), "Out" changes the numerical sign on the display for that axis, also the numerical sign for the streaming data output.

Note - "Maximum Speed"

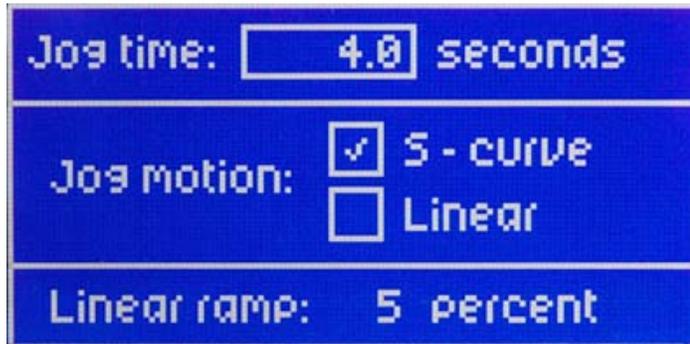
There is one hidden menu item in the system, located here. This is because once set, it is not needed. It sets a maximum speed limit for each axis. The system has the capability of demanding more speed from the motors than they are able to provide, for instance when a pan-bar is moved very quickly. The top speed changes depending on motor type, but mostly on voltage applied to the motor (24 to 36 volts).

If the motor cannot move fast enough for the command, it will move as fast as it can and then stop suddenly instead of smoothly at the end position. To prevent this sudden stop, you can limit the commanded speed from the system to a motor.

waitingForMessage

To activate the Maximum Speed menu item, from the main screen, press the System button. Then hold down the Que button while entering the Response page. The "max speed" setting should be increased and tested until the motor stops suddenly, then decreased until the motor runs smoothly for all input speeds.

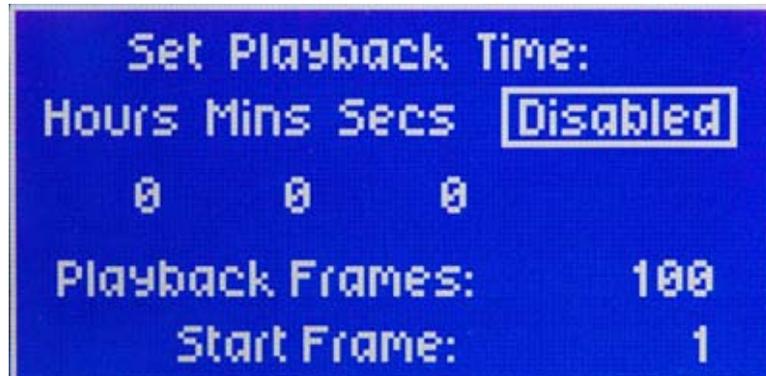
- 2) **Jog Time** - This control allows the user to modify how many seconds the motors take while moving to a Mark or going to Zero. You can also select the kind of motion the motors use while moving. The default setting is "S - curve". This means that the axes will move in a very smooth motion, starting out and ending slowly with the fastest motion in the middle of the move. You can also select "Linear" motion. This will move the motors at a constant speed. When Linear motion is selected, you must also select what portion of the move is taken to accelerate to the constant speed, from 1 to 50 percent.



- 3) **Over / UnderSlung** - This control shows the active configuration of the Talon head, i.e. whether the Aerohead is mounted above or below its base. Changing this will reset the home position for the tilt axis. It must be set to "Overslung" if the Aerohead is pylon mounted. If set to "Underslung" tilt will calibrate 180 degrees out. Be sure to test homing before mounting a camera, this could cause serious problems if the camera is too large to be able to continuously rotate in tilt. Pan direction is also reversed.



- 4) **Rec/Play** - The Bloop delay menu has a setting for a time delay after the sync (Bloop) light flashes before a move is activated. Otherwise, the bloop light will flash on the first frame of every move being recorded or played back.



The "Playback Time" selection has controls to enable the intervalometer mode and set the total move time and the number of frames to be taken. These are universal settings that will apply to any take that is selected and played from the main screen. The intervalometer mode allows any move to be played back at a slower rate than the recorded rate. Playback time must be greater than the original recorded time. Activate the intervalometer mode by toggling the "Disabled" menu item to "Enabled".

Set the Hours, Minutes and Seconds to any value, and this will be the time that the move takes to play. If you wish, you can trigger camera frames during the move playback. Simply set the number of camera frames that you want to be triggered during the move. At every frame transition, a trigger pulse will be output from the "Cam Run Relay" pins, available on either the 16 or the 12 pin connector near the camera on the camera tilt assembly.

If "Start Frame" is set to something other than "1" then the move will begin at that camera frame. For instance setting "Start Frame" to "50" in the above screen will cause the move to begin half-way through the take.

There are two other options on this page. "PB ratio" mode lets you play back a recorded move at any speed you like. The only restriction is that the playback speed must be slower than the recorded speed. Set the

“Rec FPS” (record frames per second) to any value, and the “Play FPS” to any other value that is less than the record FPS, and the move will play back at the new speed. If you set the “Rec FPS” to 24.0, and the “Play FPS” to 12.0, the move will play back at half speed. It will also play back at half speed if you set the “Rec FPS” to 6.0, and the “Play FPS” to 3.0.

Remember that to make setting these values easier, you can hold the “Q” (shift) button to make the numbers move more quickly, or hold down both the “Q” and the blue Setup buttons at the same time to quickly change values.

The last option on this page allows stop-motion animation. When you select this option, make sure to select the number of frames that you want the move to shoot. Then when the move is run, the system will wait for a trigger input, then move to the next frame. The trigger input can be either a press of the green “Run” switch, or a switch input using the trigger pins on the “Bloop” connector on the back of the console.

When a frame trigger is received, the system will calculate the positions for the next frame, then move to those positions, then trigger a camera frame from the connector near the camera that you can use if desired.

“Bloop Delay” allows a delay time to be inserted after the move trigger, and before the recorded move starts running. This allows a “Bloop light” to be hand held in view of the camera at the start of the move. When the move playback is triggered, the bloop light will light for one frame, and the system will wait the pre-determined amount of time before starting the move. This allows time for the bloop light to be removed from the camera frame so that it is not in the shot while the move is running.

Sync:

Please refer to the “Camera Sync” section below for some more information about camera sync.

The “Sync” menu item must read “Sync On” to enable external camera sync signals. New menu items appear when Sync is enabled. These are “Cam phase”, and an option to enable “Virtual sync”.

The Cam phase setting allows you to shift the playback so that it happens from 1 to 99 percent of the recorded camera frame. The default setting of 7.5% works in most settings.

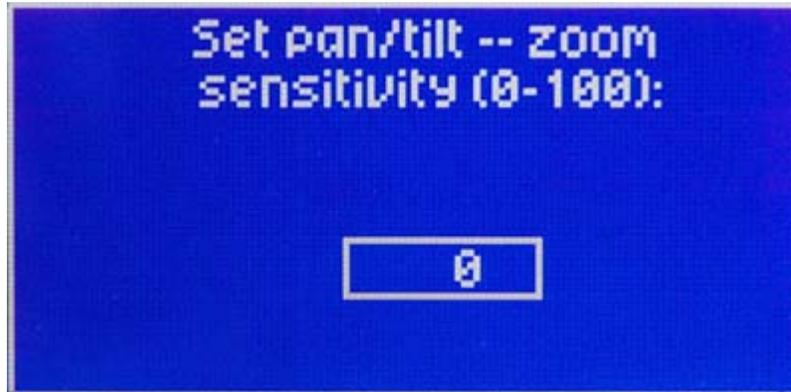
“Virtual sync” allows recording and playback of a move at different “virtual” frame rates, even if there is no incoming camera sync pulse. When this item is enabled, any move can be recorded or played back as if there were an incoming camera pulse. You only need to specify the frame rate (from 1.0 to 60.0 frames per second) at which the system will generate virtual sync pulses. So, for instance, you can record a move with incoming camera sync pulses at 24 FPS, and play back that move at any frame rate you like using virtual sync. When this option is enabled, the system will ignore any actual sync pulses coming in from a camera. Or, you can record using virtual sync, and play back with actual sync pulses.

- 5) **Inputs** - This menu selects which control inputs are active for motor and lens control. There are three selection rows on the screen, one row for each type of input: Front panel, wheels/panbar, or hand-held lens controller (TOC). For each axis (Pan (P), Tilt(T), Zoom(Z) and Focus(F)), check the box in the appropriate row to activate that input.



- 6) **Camera** - The Camera menu is not active yet.

- 7) PT-Z - Pan / Tilt sensitivity relative to zoom position can be modified here. A value of zero means that the zoom position has no effect on pan and tilt sensitivity. As this value is increased, zooming in will decrease pan / tilt joystick sensitivity, meaning that pan and tilt will move more slowly for a longer zoom position. This helps maintain smooth control for long zooms.



- 8) Lens

Current Lens:	Default			Current Lens:	Preston		
Zoom:	2.50	5.00	7.50	Zoom:	2.50	xxx	7.50
Focus:	2.50	xxx	7.50	Focus:	2.50	xxx	7.50

This page allows selection of four lens types: Generic, Fujinon, Canon or Preston. Select the appropriate lens for your configuration. This setting will be stored in the tilt board in the Talon head so that the appropriate digital link will be active to communicate with selected digital lens system. This lens page also allows setup of the analog zoom and focus voltage for any lens with analog inputs. A different analog setup is saved for each lens type. Three values are shown for zoom and three for focus. The first value is the minimum analog voltage. The last value is the maximum analog voltage. If the center value is numerically between the first and last values it is interpreted as the center resting value and that the axis runs in velocity mode (Zoom.) If the center value is outside the first and last value (xxx) it is ignored and the axis will be in position mode.

There is a new value on this page (not shown in the above diagram) which controls the power setting for the "TOC" lens control. This setting

shows up on the last column on the lens page. You can input a value from 0 to 99, however we do not recommend setting this value below about 25. This value only affects operation during automatic lens calibration. It should be adjusted to a higher value (up to about 70) if you have a lens with a very stiff zoom, focus or iris ring, because it takes more power for the motor to move the ring. During auto calibration, the TOC system moves the motor in both directions until it encounters resistance, which it assumes is the end of motion for the lens ring. If the lens ring is stiff, the motor will stop too soon, and will not reach the actual limits of the lens ring motion.

IV. Advanced System Setup

To enter the Advanced System Setup press the "Setup" button while the system is in the first "Setup" screen. This will enable the setup of the more advanced and less often used functions.



- 1) **Contrast** - Adjusts the contrast setting of the LCD screen for better viewing.
- 2) **Head setup** - Use this page to select one-way or two-way communication for the remote system. One-way operation is useful for long distance operations, either fiber-optic based or wireless. If one-way is selected, the system will assume the head is doing what is requested because it will not expect any positional feedback from the head. Two-way communication is default and used for normal operation.

Note - one-way soft limit enable

When one-way communication is enabled, there is an added feature available. Holding "Que" and pressing "Record" while on the main page will toggle both pan and tilt soft limit enables. This allows an operator to quickly move a camera outside limits for unexpected camera shots.

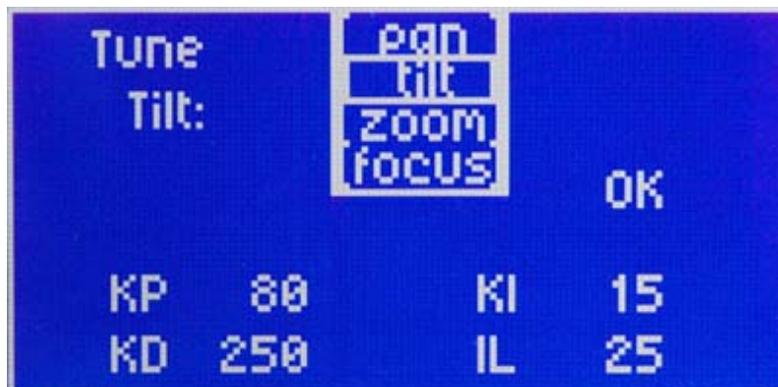
There is an option here for wired or wireless operation, select the appropriate mode for your system.

There are three head types available: Standard (S), High Speed (HS) and Ultra Speed (HSX). Each version has different gearing from the motor to the pan or tilt axis. Selecting the proper head type here will

only affect the degree value shown on the main page so that, for instance, rotating the pan axis one full turn will show 360 degrees on the main page.

- 3) **Stabilize** - Reserved for future developments. This control will set up pan/tilt stabilization.
- 4) **Telescope** - The system has been developed as a telescope mount, responding to most telescope control systems. Available as a specialized option.
- 5) **Encoders** - Reserved for future developments. This control will allow setup for external encoder feedback.
- 6) **Tuning** - These settings control the values used in the servo motor tuning calculations. Changing these can cause severe motor operation problems and should only be changed by knowledgeable engineers. If these are changed and severe problems occur please restore the values to the default values of:

Pan and Tilt: KP = 80, KI = 15, D = 250, IL = 25



- 7) **Version** - The current software version will show on this screen, as well as the software version of the Talon head, if two-way communication is enabled.

V. Record/Playback

This is a mini motion control system which will record and playback moves as originally performed. There is more than 1 hour of move recording capability in the system. This can be a few or up to 2000 takes.

- 1) **Record a Move** - Select the desired take number. Press the "Record" button and perform your move. When complete push the "Stop" button.
- 2) **Play back a Move** - Select the desired take number. Press the "Rewind" button to move to the beginning of the take. Press "Go" to run the move. If the motors aren't at the beginning of the Take, pressing "Go" will first position the motors to the start of the Take, then press "Go" again to start playing the move.
- 3) **Delete a Move** - Select the desired take. Hold the "Stop" button and hit "Record" to delete the take.
- 4) **Record a "Goto Mark" move**- Select the desired take. Select the desired Mark number. Press "Record" to start recording. Hold the "Que" button and press "Go". The axes will move to the desired Mark and record the motion.

VII. Additional information

Press the "Stop" button any time the motors are moving to execute an emergency stop.

If the "Cancel" button is held when power is turned on, various sections of memory will be erased depending on which other buttons are being held. Cancel and

Stop - resets all motor parameters

Record - Erases all Takes

Go - Erases all Marks

The system will ask for confirmation. Press the "Accept" to confirm.

Important!

There might be times when from unexpected circumstances (i.e. lightning strikes), the memory in the system might get corrupted. If you need to reset the system to a known state, just hold down the "Cancel" and "Stop" buttons while powering up the system as described above. This should also always be done after upgrading the system software in the field.

Camera Sync

The system recognizes and locks to two kinds of camera sync. The BNC connector on the back of the Remote accepts video signals: NTSC, PAL, or Analog HD. The system will gen-lock to the video signal and provide synced data to virtual sets.

When video sync is detected, the system will time the sync mark and assume that it is the nearest evenly divided factor of 120: 120, 60, 40, 30, 24, 20, 15 and 12. The Talon system interrupt will automatically lock to the sync input. This will synchronize the virtual set data stream or any played back move.

The Talon Tilt assembly also accepts shutter pulse signals from any film camera. When recording a Take, the system records these (1 per frame) pulses along with the motion data. When playing back this move, if there are shutter signals present, the move will play back exactly synced to these new pulses. This way, the axis (and camera) positions will be the same every camera frame as when they were recorded. This is extremely important when shooting repeat passes on film or video. There is no need to tell the system what frame rate to expect, it will lock to any frame rate from 1 to 60 FPS.

Both kinds of camera sync (including “virtual” sync, described above), if present, will activate the camera sync icon which will show up on the main screen display. The display on the LCD will show a smaller diamond just to the left of the main sync icon, and the incoming frame rate will also be displayed.

Talon Jibstick

The Jibstick system utilizes a small, simplified joystick controller to replace the Talon Remote. This system is designed for use with one-man jib systems. To initialize operation connect the Jibstick to the control input of the Talon remote head and the focus controller to the appropriate connector on the Jibstick. Applying power to the remote head will supply power to the Jibstick through the control cable. The green LED on the Jibstick will flash for a few seconds indicating that it is establishing communications with the remote head. Once communications is established the LED will stay on solid. The Jibstick includes knob controls for smoothing and speed. Slide switches control pan and tilt directions. The speed and smoothing controls affect both the Pan and Tilt axes.

The Jibstick also incorporates a DB9 connector for connection to an RS-232 port of a PC type computer. This is for future enhancements that will give the

Jibstick the ability to set-up system variables, tune motor servo parameters, import and export move files and in general give it many of the capabilities of the full function Remote.

Lens Control System



The Talon lens control system is incorporated into a small circuit board located in the tilt box. A single 16 pin LEMO connector brings all lens controls to the outside. These controls include:

1. RS-232 communications for Fujinon Digital lenses and the Ravensclaw TOC control system
2. RS-422 communications for Canon Digital lenses and for Preston lens control systems
3. Two axes of analog control
4. Two axes of pulse width RC Servo control
5. 24 volt head power for external lens controls

Once the system is powered up the microprocessor in the lens control system will alternate sending communication requests between the RS-232 and RS-422 ports. Once it has received an answer from whichever lens systems is attached it will lock onto and issue commands to control that system.

Information about the type and voltage range of the analog systems is stored in the tilt circuit board. These parameters may be set up using the full function controller and will be automatically stored in the tilt board. If the Jibstick system is used it will use those saved parameters.

Appendix

Power Supply Connectors

1) Power Connector - XLR4F

Pin	Function	Wire Color
1	Camera Neg.	Black
2	Talon Neg.	White
3	Talon Pos.	Red
4	Camera Pos.	Green

2) Camera Power Connector

Pin	Function	Destination
1	Camera Neg.	Loop to Power Connector
2	N.C.	
3	N.C.	
4	Camera Pos.	Loop to Power Connector

3) Battery pack adaptor

Pin Battery side	Function	Destination Talon side
1	12 & 24 V. neg	1 & 2
3	24 V. pos	3
4	12 V. pos	4

Talon Base Connectors

1) Control Connector - LEMO EGG1B307CLL

Pin	Function	Wire Color (Cable)	
1	Common	Brown	
2	RS-422 TXD	Red	
3	RS-422 TXD!	Orange	
4	RS-422 RXD	Yellow	
5	RS-422 RXD!	Green	
6	24 VDC +	Blue	Power to Remote or Jibstick
7	24 VDC -	Violet	Power to Remote or Jibstick

2) Kuper Node Connector - LEMO EGG1B306CLL

Pin	Function	DB9
1	Common	1
2	N.C.	
3	RS-422 RXD (Kuper)	8
4	RS-422 RXD! (Kuper)	9
5	RS-422 TXD (Kuper)	5
6	RS-422 TXD! (Kuper)	6

3) Camera Control Input Connector - EGG2B310CLL

Pin	Function
1	Common
2	12 VDC out
3	Run Switch
4	Remote Enl
5	Remote Clock
6	Remote Direction
7	Clock out
8	Sync out
9	N.C.
10	N.C.

4) Peripheral Connector - EGG1B308CLL

Pin	Function
1	Common
2	#1 RS-232 RXD
3	#1 RS-232 TXD
4	+5 VDC
5	24 VDC -
6	#2 RS-232 RXD
7	#2 RS-232 TXD
8	24 VDC +

Tilt Connectors



1) Camera Power - LEMO EGG2B302CLL

Pin	Function
1	Camera Power +
2	Camera Power -

2) Sync & Bloop - Fischer D103A056-130

Pin	Function
1	Common
2	+5 VDC
3	Camera Sync In
5	Bloop Out #1
6	Bloop Out #2

2) Camera Control - LEMO EGG2B312CLL

Pin	Function
1	Common
2	Camera Enable
3	Cam Run - Push/Pull 12 volts
4	Cam Run - Relay pin 1
5	Cam Run pulse - 5 VDC
6	Cam Clock out - 5 VDC
7	Cam Clock out - 12 VDC
8	Cam sync or running return
9	RS-232 TXD
10	RS-232 RXD
11	Cam Run - Relay pin 2
12	+12 Volts out at 1 Watt

3) Lens Control - Tilt Board Version #2 LEMO EGG2B316CLL (Final Version)

Pin	Function	Lens Connection
1	RS-232 RXD	Fuji Digital
2	RS-232 TXD	Fuji Digital
3	+5 VDC - Iso	Fuji Digital
4	Common - Iso	Fuji Digital
5	RS-422 RXD	Canon Digital
6	RS-422 RXD!	Canon Digital
7	RS-422 TXD	Canon Digital
8	RS-422 TXD!	Canon Digital
9	Common	
10	+5 VDC	
11	Analog #1	Focus
12	Analog #2	Zoom
13	Cam Run - Relay pin 1	
14	Cam Run - Relay pin 2	
15	24 VDC +	
16	24 VDC -	

Lens Connection Table

Lens Control, 16 pin LEMO FGG2B316CLAD

	Fujinon Digital HR10A-10P-10P	Fujinon Analog HR10A-10P-12P	Fujinon Telecon HR10A-10J-12P	Canon Digital HR25-9P-20P	Canon Analog HR25-9P-20P
1 RS-232 RXD	3				
2 RS-232 TXD	2				
3 Iso Vcc	4				
4 IsoCom & IsoCom3	5			19 & 20 - Green	
5 RS-422 RXD				17 - Orange	
6 RS-422 RXD!				18 - Yellow	
7 RS-422 TXD				15 - Brown	
8 RS-422 TXD!				16 - Red	
9 Common		2	3		20
10 Vcc (5 volts)					
11 Analog #1 out		7 (If zoom)	9 (Zoom)		2
12 Analog #2 out		7 (If focus)	8 (focus)		3
13 RC Servo Out 1					
14 RC Servo Out 2					
15 Head power + out					
16 Head power - out					

Tie pins 1 & 2 to 7
for position control

Full Function Remote Connectors

1) Auxiliary power input

1	Center 18 to 36 volts input
2	Common

2) Talon Control - LEMO EGG1B307CLL

Pin	Function	Wire Color (Cable)
1	Common	Brown
2	RS-422 RXD	Red
3	RS-422 RXD!	Orange
4	RS-422 TXD	Yellow
5	RS-422 TXD!	Green

6	24 VDC +	Blue	Power from Talon
7	24 VDC -	Violet	Power from Talon

2) Peripheral Connector - EGG1B308CLL

Pin	Function
1	Common
2	#1 RS-232 RXD
3	#1 RS-232 TXD
4	+5 VDC
5	24 VDC -
6	#2 RS-232 RXD
7	#2 RS-232 TXD
8	24 VDC +

3) Lens Control and Panbar Disable - EGG1B305CLL

1	Common
2	Motor disable
3	Zoom analog signal
4	Focus analog signal
5	+5 VDC

4) Wheels and Panbar Encoder Input - EGG1B306CLL

1	Common
2	+5 VDC
3	Pan encoder signal "A"
4	Pan encoder signal "B"
5	Tilt encoder signal "A"
6	Tilt encoder signal "B"

5) Sync & Bloop - Fischer D103A056-130

1	Common - Isolated
2	+5 VDC - Isolated
3	Emergency Stop In
4	Trigger In
5	Bloop out #1
6	Trigger out - not used

6) Video Sync

1	BNC signal
2	Isolated common

Jibstick Connectors

1) Talon Control - LEMO EGG1B307CLL

Pin	Function	Wire Color (Cable)	
1	Common	Brown	
2	RS-422 RXD	Red	
3	RS-422 RXD!	Orange	
4	RS-422 TXD	Yellow	
5	RS-422 TXD!	Green	
6	24 VDC +	Blue	Power from Talon
7	24 VDC -	Violet	Power from Talon

2) Focus Input - Fischer D103A054-130

1	Common
2	+5 VDC
3	Focus analog signal
4	Zoom analog signal (unused)
5	Common