



**EAGLE**  
PAN TILT SYSTEMS  
Helping to bring your world  
into focus

**PTE-350**  
Pan Tilt Head  
Installation and Operations Manual  
Version 4  
February 2011



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ITEMS INCLUDED WITH YOUR PTE-350 PAN TILT HEAD:

- 1) EAGLE PTE-350 PAN TILT HEAD
- 2) LARGE HOUSING MOUNTING BRACKET
- 3) 4X 1/4"-20 X 1.25" FLAT HEAD CAP SCREW FOR DISC/BRACKET MOUNTING
- 4) 2X 1/4"-20 X 1.00" SOCKET HEAD CAP SCREW FOR MOUNTING CAMERA TO BRACKET, WITH LOCK AND FLAT WASHERS
- 5) 16 PIN AMP CONNECTOR KIT FOR BASE POWER/DATA INPUT
- 6) 1X WIHA 1/16" x 50 hex tool for adjusting mechanical limit stops

## 1. PRECAUTIONARY STATEMENT



Improper settings and connections may cause damage to the PTE-350 pan tilt head, camera, and the lens being used. Please read all of the following documentation before attempting the installation and configuration of these systems. If any of the instructions are unclear to you, call Eagle tech support, your servicing dealer, or Hitachi before proceeding for clarification. Failure to correctly configure and install these systems may cause damage to the equipment, and will void the warranties. Please make sure before connecting or disconnecting any cables that the power supplies are turned OFF.

## 2. WARRANTY

Hitachi Kokusai Electric America, Ltd. warrants to the original customer that each unit shall be free from malfunction due to defective workmanship or component failure for a period of ONE YEAR from the original date of delivery to the customer. For service under the warranty period, return authorization must be obtained before returning the product. This warranty does not apply to finish or appearance items, to malfunction due to abuse or operation in violation of published operating specifications, or to failures caused by improper connections, modifications, alterations, or other unauthorized repairs. This warranty does not cover labor or shipping costs for removal and/or reinstallation of equipment under warranty. Under no circumstances shall Hitachi Kokusai Electric America, Ltd. or Display Devices, Inc., their owners or employees be liable to you for any special damages, including any lost profits, lost savings, or other incidental or consequential damages, or for any claim by any other party.



### IMPORTANT SAFETY INSTRUCTIONS

1. Read ALL The Instructions! All the safety and operating instructions should be read before the product is operated
2. Retain Instructions. These safety and operating instructions should be retained for future reference.
3. Heed Warnings. All warnings on the product and the operating instructions should be adhered to.
4. Follow Instructions. All operating and use instructions should be followed.
5. Cleaning. Unplug this product from the power supply before cleaning. Do not use liquid cleaners or aerosol cleaners. Use only a damp cloth for cleaning.
6. Attachments. Do not use attachments not recommended by the product manufacturer as they may cause hazards.
7. Water and Moisture. Do not immerse this product under water--for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, wet basement, swimming pool, pond, or simi-

lar areas. It is highly water resistant, but not completely waterproof.

8. Accessories. Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and cause serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturers' instructions, and should use only mounting accessories recommended by the manufacturer.

9. Moving. A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

10. Ventilation. The outer case of the unit functions as a heat sink for the electronics contained inside. Do not block off the product from airflow by placing the product on a bed, sofa, rug, or similar surface. This product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturers' instructions have been adhered to .

11. Power Sources. This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your facility, consult your product dealer or local power company.

12. Grounding or Polarization. This product's power supply is supplied with a three wire grounding type plug; a plug having a third (grounding) pin. This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace the obsolete outlet. Do not defeat the purpose of the grounding plug.

13. Power cord protection. Power supply cords should be routed such that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to the cords at plug, receptacle, and to the point at which they enter the power supply and the product.

14. Lightning. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power line surges.

15. Overloading. Do not overload wall outlets, extension cords, or receptacles as this can result in a risk of fire or electric shock.

16. Object and liquid entry. Never push objects of any kind into this product through openings as they may touch voltage points or short out parts that could result in a fire or electrical shock. Never spill liquid of any kind on the product.

17. Flammable and Explosive substances. Avoid using this product where there are gases and also where there are flammable and explosive substances in the immediate vicinity.

18. Heavy shock or vibration. When carrying this product around, do not subject the product to heavy shock or vibration.

19. Servicing. Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified

service personnel unless instructed by Eagle tech support.

20. Damage requiring service. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions: a--When the power supply cord or plug is damaged. b--if liquid has been spilled, or objects have fallen into the product. c--If the product has been exposed to rain or water. d-- if the product does not operate normally by following the operating instructions. Adjust only those controls which are covered by the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operating range. e-- if the product has been dropped or damaged in any way. f--When the product exhibits a distinct change in performance, this indicates a need for service.

21. Replacement parts. When replacement parts are required, be sure that the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

22. Safety Check. Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

23. Wall or Ceiling mounting. This product should only be mounted to a wall or ceiling using brackets made and/or as specified by the manufacturer.

24. Heat. The product must be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers or direct sunlight) that produce heat.

### 3. HARDWARE ASSEMBLY



Before starting installation, make certain that all power supplies to equipment are turned OFF. Attach PTE-350 to optional PT-OB-1 mount or to location of your own choosing. Make sure that wall or bracket is capable of securely handling weights of 150 pounds (68kg). Ensure that the mount is level in both directions.

Use care in handling the PTE-350 as it is heavy; extreme damage or harm may result to the head, attached equipment, and to other personnel if the head is dropped.

Attach the supplied camera mounting cradle to the hub of the pan tilt head. The limit setting rings MUST remain on the left side of the PTE-350 as it was shipped. To mount the housing cradle on the same side as the limit rings, use the longer set of flat head hex bolts included with the accessories. Use the standard 1/4"-20x1.25" flat head hex bolts, passed through the black spacer disc, to attach it to the hub on the right side of the head.

Place the PT-EE-\* housing (not included) onto the housing mounting cradle of the PTE-350. Open the housing latches and raise the cover (it hinges at the front). Using the supplied 1/4"-20 x 1" fasteners and washers, thread them from the underside of the cradle into the bottom of the housing. Tighten the fasteners securely. Connect the umbilical cable conduit harness from the PTE-350 head to the bottom of the PT-EE-\* housing. It will be necessary to push the connectors through the conduit fitting one at a time in order to get them to fit, starting with the largest connector first.

Assemble camera/lens combination. Remove any lens hood from the lens. Attach camera/lens system onto sled inside housing using the supplied 1/4"-20 fasteners. The camera / lens system can be mounted on either top of bottom of the sled depending on the centerline height of the lens needed. Place the sled into the housing onto the adjustable screw mounting points. Do not completely tighten the fasteners until after the next step. Depending on your camera, your system may include a spacer block or shims to raise the camera body above the mounting sled in order to accommodate lens motor design.



Depending on your camera and lens type, your system may need a spacer block or shims to raise the camera body above the mounting bracket in order to accommodate lens motor design. Aluminum spacer blocks are available at no cost from Eagle tech support upon request.

Move the camera/lens assembly to the front of the sled until the lens is very close to the glass window at the front of the housing; this is to reduce stray reflections from the window-lens interface. Make sure to allow room for the lens to zoom and focus; not all lenses have internal focusing and zooming, and will change physical dimensions when focused or zoomed. Tighten the sled mounting screws securely now.

Attach connecting cables (camera power, camera control, lens control, video and/or genlock) from the umbilical conduit leading into the housing to the camera and lens. Normally, teleconferencing type lenses have two cables attached to them; a shorter one, that plugs into the camera body; and a longer one that plugs into the mating connector in the umbilical. Make sure these cables are plugged into the correct locations or the lens will not function.

Make and attach the data/power input cable for the base of the PTE-350 head as detailed on page 21.

Set both the mechanical limit stops and the electronic limits in accordance with section 5-13 below on limit adjustment.

**SPECIAL NOTE:** For remote camera control operation with the Eagle CCB option, the Hitachi camera must be set to 9600 baud and to native remote mode (not RS-232) before mounting it to the bracket in order to be controlled by the PTE-350 head. Consult your camera's owners' manual for instructions on setting up the baud rate and communications type of your particular camera model.



**DO NOT ATTEMPT TO PAN OR TILT THE UNIT BY HAND!** Gear reductions on the motors make this impossible to do, and damage may result if this is attempted. Always use the Eagle controller or the Windows® compatible software to control the movement of the pan tilt systems.

Follow the detailed instructions in Eagle controller manuals and/or the following software control instructions for complete usage of the pan-tilt head.

## 4. FUNCTION DEFINITIONS FOR CONTROL OF PTE-350 when used with EAGLE PT-C55 desktop controller

These are a simple overview of controls; for more complete details, consult the manual included with your particular Eagle controller. Your controller may or may not include all of these listed features.

### CAMERA NUMBER

Selects the camera / head combination to be moved. Select the CAMERA NUMBER button that corresponds to the pan tilt head you wish to control. For example, to control camera 1-4, press the 1-4 key. To select cameras 5-8, press SHIFT, then the 5-8 button you want. Note that the LED of the selected camera will change from RED to GREEN when cameras 5 to 8 are selected.

Select the ALL button if you wish to move ALL camera heads. Please note that for safety reasons when CAMERA ALL is selected, you may not clear travel limits. Travel limits must be cleared individually on a head by head basis.

### SAVE FUNCTION

This is used for saving preset pan tilt and lens positions. To save a preset, you must first be in the POSition mode. Press the POS button to enter POSition mode.



NOTE: if you have a PT50, PT101, PT250, or PTE350 head with TYPE 5 shown on the serial number sticker, you don't have to enter into POS mode to save a preset. You may save a preset anywhere and at any lens setting. Make sure to select TYPE 5 as the lens type when setting up the controller for that head.

Move the left joystick up, down, left, or right for positioning the head, manually aiming the shot the way you desire. Use the zoom and focus in/out buttons to select the field of view as desired. **YOU MUST ZOOM AND FOCUS TO SET UP YOUR SHOT AFTER ENTERING THE POSITION MODE !!**. (Fujinon and Canon telecon type servo lenses only. If using a C mount, DC drive lens, you don't need to enter POSition mode first. ) If you set up your zoom and focus before entering the POSITION mode, the lens will not report where it is in its' zoom and focus range to the software, and the lens preset will not be stored. Press the SAVE button followed by the PRESET button you wish to call it. For storing presets 11 thru 20, touch SAVE, SHIFT, and the PRESET button number. Note that the LED of the PRESET button will shift to GREEN to show that you are saving a number from 11 to 20. Up to 20 presets may be saved for each individual pan tilt head.

### A.IRIS

This button controls the toggling of Auto Iris being ON or OFF. When the LED is lit, AUTO IRIS is ON. This is only applicable for cameras and lens systems with auto iris functionality. If you switch from one head to another, this LED may stay on even though the Auto Iris function of the second camera may not be on. Cycle the button once to verify the mode.

Check the list in your PT head manual to see if your camera / lens has this feature.

## FUNCTION

Used in combination with the PRESET buttons to select special setup functions of the PTE-350 system. Consult the detailed chart at the end of this manual for all of the FUNCTIONS available.

## POS

As described earlier with SAVE FUNCTION; this button puts the pan tilt head into POSition mode for saving presets. Note that if you have a head with TYPE 5 on the serial number, you don't have to enter this mode to save presets.

## LIMIT

The LIMIT button in conjunction with the CAMERA FUNCTIONS keypad allows the operator to set the travel limits of the PT head. Limits are to prevent the head from traveling in areas not needed, or to prevent the camera / lens from hitting an obstruction. Limits on the Eagle™ PT-250 and 350 systems are set both electronically and mechanically. The heads are shipped with safety limits in place of about 45° each up and down, and 160° each left and right. It is recommended to stay with these limits until you are familiar with the operation of the system. Once familiar with the operation you may change the limits by touching the LIMIT button followed by the MENU button. This will clear all previously set limits.

Please note that if you clear the safety limits, they are erased permanently.

The PT-250 and 350 heads automatically find the UP and LEFT mechanical stops upon power up. For this reason, they do not have electronic limits for UP or LEFT; they are not needed. If you wish to prevent the range of movement of the head to the UP or LEFT regions, simply adjust the LOWER pan adjust ring and the OUTER tilt adjust ring to set different stops.

Press LIMIT followed by the DOWN or RIGHT buttons respectively to set the DOWN and RIGHT limits. Note that you must move the head to those positions before setting the LIMIT, otherwise you will set all of the limits in one place, preventing the head from moving at all! If this happens, simply clear the limits and start over.

## BARS

Pressing this button will toggle the video output of the selected head/camera between normal video output and color bars. Note that the PT head must have the Eagle CCB camera control option for this to work.

## SHUTTER

Pressing this button will toggle through the camera's shutter speeds. Note that the PT head must have the Eagle CCB camera control option for this to work. Check your camera's owners manual for the listing of the shutter speeds selectable.

## AUTO WHITE

The A.WHT button is a toggling function. Press the button by itself to execute the AUTO

WHITE setting of the camera. Press SHIFT then A.WHT to execute the AUTO BLACK setting of the camera.

## SPEED

The SPEED button in combination with some other buttons allow various speed settings to be changed.

The PT heads have three overall speed ranges; to change the range, press SPEED followed by PRESET 1, 2, or 3 for HIGH, MEDIUM, and SLOW speed ranges. The heads are shipped in HIGH range.

You can also adjust the speed of the rocker on your lens by pressing SPEED, then Left Arrow, then PRESET 1, 2, or 3 to set the rocker control to Fast, Medium, or Slow.

Adjust the rotary knob sensitivity by pressing SPEED, Right Arrow, then PRESET 1, 2, or 3 to set the rotary knob control speed to Fast, Medium, or Slow.

## SHIFT

The SHIFT button is used only as a modifier button in conjunction with other buttons to carry out special functions. It has no effect on it's own.

## "PAINTING" COMMANDS--R & B GAIN, R & B BLACK ADJ

The R&B Gain buttons, and their shifted counterparts R&B Black adjust, allow you to "paint" the camera's color output to match desired levels. You should only use these buttons in conjunction with proper test equipment, such as a vectorscope, to keep track of these adjustments. Note that not all cameras have these functions, and may not be adjustable.

## FUNCTION MODES

Select the FUNCTION button then a PRESET button and the following combination of keys to run the shown function. Touch the FUNCTION key again to clear the function operation.

## PRESET 1-- PRESET SPEED CHANGE

This function allows changing preset speeds to different values than were originally chosen. For example, travel to preset 3 was originally set to speed 1(high range). If you now want to change travel speed to this preset to 2 (mid range), recall preset 3, then enter FUNCT, PRESET 1, then PRESET 1, 2 or 3 to change the preset to HIGH, MEDIUM, or LOW speed.

## PRESET 2-- SCENE FILE ASSIGNMENT

Dependent upon the camera being used, i.e., if using capable Hitachi cameras, SCENE files can be stored In the camera controller chip and recalled in conjunction with a specific location preset. This could be useful if the scene has multiple shots to be setup, under different lighting conditions. First, the scene files must be set up and stored using the camera functions / on screen menu system of the camera. Next, decide which position preset you want to link to which scene file. For our example, let's use position preset 3, and link it to scene file 1. Recall preset 3 (by pressing the PRESET 3 button). Once it is done recalling,

then hit FUNCTION, PRESET 2, and PRESET 1, representing scene file 1. This will now link the position preset 3 and the scene file 1 together. In order to make any changes after saving this information, you must either resave or delete the position preset 1.

#### PRESET 3--INVERT DIRECTION

This toggling FUNCTION will invert the left and right, and up and down directions of the PT head. This is useful when the pan/tilt is to be ceiling mounted instead of tripod or wall mounted. It reverses the movement directions of the pan tilt head. This can be set individually on a head by head basis so that if a mix of upright and inverted heads are being used in the same room, they can be configured such that they all move the same direction.

Simply choose the camera number to change, followed by FUNCTION, and PRESET 3. Repeat the command sequence to change it back.

#### PRESET 4--ADDRESS OF PAN TILT HEAD

The head address is set by the factory to 1 when shipped. If a change is required, simply enter FUNCTION, the PRESET 4 button, then PRESET 1 through 8 to readdress the head from number 1 through 8.

Note that the readdressing procedure will only work if you know the number the head is currently set to; if you don't know the number, first select CAMERA, ALL. This will allow you to talk to any head that is correctly wired up.

Also note that this will set the address for all heads on the RS-485 comm line; you must disconnect the power or communication for all the heads except the one you wish to address, otherwise all the powered heads will be set to the same address!

#### PRESET 5--SET LENS TYPE.

This is set by the factory when ordered for your specified lens type; 1 is for Rainbow and other CCTV type lenses, 2 is for Fujinon and Canon telecon lenses. The Fujinon C mount lenses with the -R11 designation are also set to type 2. 5 is for Fujinon and Canon telecon lenses when used on a compatible Eagle head. If your PT head has a TYPE 5 indicated on the serial number label, you should set your lens type to TYPE 5. This will allow instant saving of presets at any position and lens setting.

If you wish to change the lens type after receiving your PT head, press FUNCTION, PRESET 5, then PRESET 1 or 2 to set lens type 1 or 2. If you are changing lens types, you may also need to reconfigure the lens cable inside the PT head. Contact Eagle™ tech support for assistance.

#### PRESET 6--HEAD STATUS CHECK

This is a simple method of checking pan tilt head status remotely. Touch FUNCTION, then PRESET 6. If the head is working correctly, all of the PRESET LED's will flash green. If something is wrong with communications to the head, the LED's will flash RED. If there is no response from the head, the LED's will not flash at all. Also, if the controller is being routed through the PT-MP1 multiplexer, the LED's will not flash either.

## PRESET 7-- SAVING SCENE FILES

The PT-C55 controller is capable of saving SCENE files for use with some Hitachi cameras, in particular, the HV-D30 camera. The HV-D30 is capable of saving up to four different scene files, which are combinations of various lighting and color correction settings. See the Hitachi HV-D30 camera manual for complete details on creating scene files. To save a scene file with the PT-C50 controller, press FUNCTION, PRESET 7, then PRESET 1 through 4 for scene file 1 through 4.

## PRESET 8-- ZOOM/FOCUS CONTROLS

The PT-C55 controllers' zoom and focus controls may be swapped to fit user preference. Normally, the rocker pot is set to zoom, and the rotary knob at the end of the joystick is used to focus. If you would like to swap these, simply touch FUNCTION, 8, 2 to set the rocker to focus and the rotary knob to zoom. To set them back to normal, touch FUNCTION, 8, 1. You can also change the speed/sensitivity of the rocker and rotary knob by following the commands listed under the SPEED function on page 10.

## DAMPING CONTROL

New to the PT-C55 is the ability to control the "damping" effect of the joystick interface with the pan/tilt action of the head being controlled. It does not matter what model head you are using; the damping effect is a characteristic of the joystick output.

To adjust the damping effect press FUNCTION, SHIFT, then PRESET 1 through PRESET 10 to select a level from no damping to full damping, 1 being the least, 10 being the most damped.

## CAMERA FUNCTIONS

The buttons in the top right hand area of the PT-C55 controller allow the adjustment of the on-screen camera setup menus of several Hitachi cameras. To activate the on-screen menu, simply hit the MENU button. You may then scroll up and down through the menus of the cameras. To make a change to a setting, touch the left or right button. Push the MENU button again to turn off the MENU operation.

NOTE: To access the SPECIAL SET menus of the Hitachi cameras, press FUNCTION, then the MENU button. After about 3 seconds the SPECIAL SET menu will appear. This is to access the SPECIAL SET menu screens to allow detailed camera setup functions.

These are a simple overview of controls; for more complete details, consult the manual included with your particular Eagle controller. Your controller may or may not include all of these listed features.

## 5. PAN-TILT OPERATIONS

Be sure to follow all of the installation instructions included with the Eagle pan tilt head be-

fore starting to use this system !!

It is preferred to power up the Eagle controller being used before powering up the PTE-350 head.

It is recommended that for any load over 18 lbs. that only speeds 2 or 3 (medium or slow) should be used, not HIGH speed mode 1.

First, select the address of the head you wish to control. Since multiple heads may be on a single RS-485 line, you must choose the correct one to control. Select CAMERA, then the number of the head to be controlled. Head addresses can be changed as described in your controller manual.

If this is the first time use of the system, the limits of pan tilt movement must be set now to limits of your choosing. If you like the factory limits of 45° up and down, and 90° left and right, ***you may skip this step.***

Begin by clearing all electronic movement limits. See your specific controller manual for details on this operation. This function will eliminate all electronic limits that have been set at the factory to prevent excess travel.

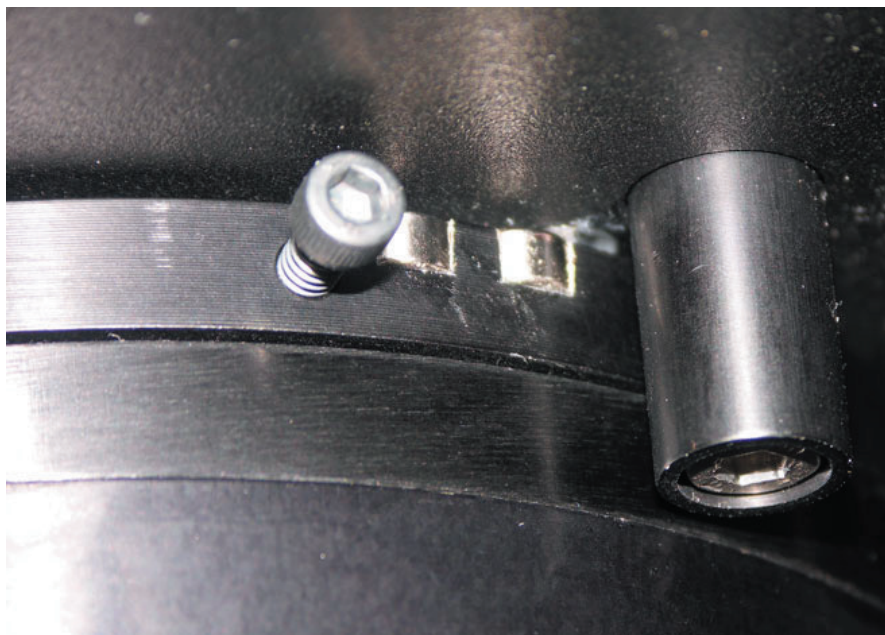
NOTE: This clearing is PERMANENT; when power is removed and then restored, the previous limits will be gone. This will erase any limits previously set by the factory during testing. Never use the PTE-350 head without having limits set to prevent damage to the PT head and/or camera/lens if control is lost!

Next, reset the home position stops (mechanical stops) as desired. Use the included 1/16" Wiha hex driver to loosen the 3 set screws on the mechanical stop ring (pan axis or tilt axis) you wish to adjust. The tilt UP home position is controlled by the OUTER ring; the pan LEFT home position is controlled by the LOWER pan ring.

Use the functions of your controller for right and down electronic limit setting. Remember, that the pan tilt head has a range of pan of 355° (left or right 180°), and a tilt range of 180° (up or down 90°); it cannot turn more than a full circle. The mechanical end travel stops built into the head to prevent traveling more than these amounts. Make sure when cabling the system that enough cable slack is included to prevent damage to the pan-tilt connectors and camera and lens connectors. The motors in the head are very strong, and will easily rip a connector out of its' socket. Once the travel limits are set, normal usage of the pan tilt system may begin.

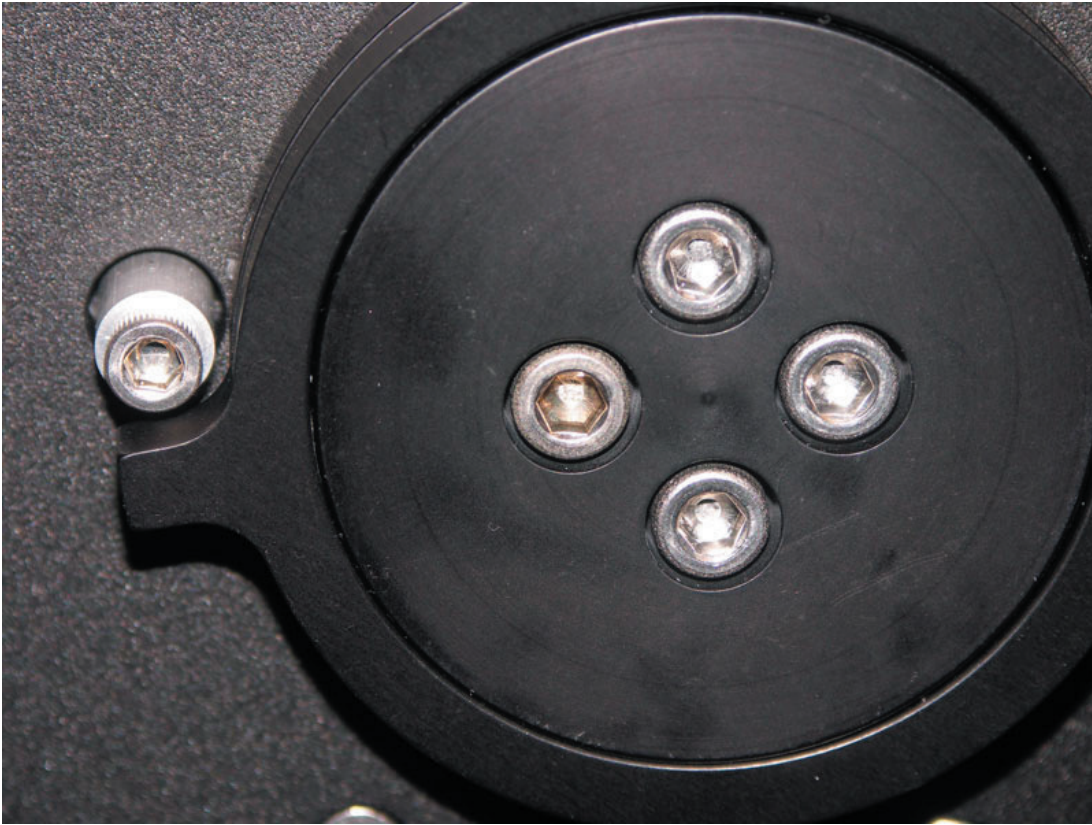
The PTE-350 head always finds HOME position end stops (UP and LEFT) for pan and tilt upon power up by automatically moving UP and to the LEFT. When you adjust the limit stop rings, you are adjusting the maximum travel positions. If there is an obstruction to the left or above the head, set the OUTER tilt and LOWER pan rings to prevent the head from running into that obstacle. The head finds these stops upon power up, so it is not required nor possible to set electronic limits using the controller to either the UP or LEFT positions.

Use the INNER tilt and UPPER pan rings to prevent the head from running into obstacles below or to the right of the head. These rings also contain magnets that are detected by a sensor in the body of the pan tilt head to AUTOMATICALLY prevent the head from running into the LOWER or RIGHT end stops. There are LOWER and RIGHT electronic limits that may be set from your controller. Those limits should be set BEFORE the position of the magnets. See the commands specific to your controller for setting those two limits.



Pan limit setup.VIEW IS FROM REAR OF HEAD. Hard stop shown approaching pan right limit socket head screw. Loosen 2 ring set screws and the socket head screw and move lower stop ring to right to allow more movement to left. Move lower stop ring to left to allow less movement to left.

Table of limit ring actions		
TILT AXIS	INNER RING	OUTER RING
	Sets DOWN travel limit	Sets Home (UP) position/travel limit
PAN AXIS	LOWER RING	UPPER RING
	Sets LEFT travel limit	Sets Home (RIGHT) position/travel limit



Tilt limit Home position setup. Loosen the 3 set screws ( 2 on ring and 1 inside machined tab) and move inner limit ring tab to control tilt down position. Move outer limit ring to control tilt up stop.

## 6. RS-485 COMMUNICATIONS SETUP

Communications for the PTE-350 heads are transmitted via the RS-485 standard, a common multidrop network configuration. Three wires are required for RS-485 communications, two for signal and one for ground. The input for the RS-485 to the pan tilt head is contained within the Phoenix™ connector at the base of the pan tilt head. Using the appropriate gauge shielded twisted pair cable, maximum communication length without a repeater is 4,000 feet.

Inside each of our pan tilt heads and in our PT controller is a 120 ohm terminating resistor. The two units at the ends of the communication line should have the terminating resistor in place; all other units on the line must have the resistor disconnected. The resistor is connected in series to a switch for easy configuration; this switch can be found inside the rear access cover of the PTE-350 pan-tilt head. It is located on the bottom of the main logic board. (see photo next page) With the switch to the right, the resistor is terminated; move the switch to the left to unterminate the head. Heads are shipped with the switch unterminated. If using a controller other than the Eagle PT series pan tilt controller, such as an AMX or Crestron control system, termination should be provided at the controller end.

### SETTING THE ADDRESS OF THE PTE-350 PAN TILT HEAD

All Eagle™ PTE-350 pan tilt heads require a separate address for controlling them by serial communication. Each pan tilt on the RS-485 line has a specific logical address. This address may be set by software control from one of the Eagle™ controllers or software packages, or set mechanically via the dip switches located under the removable top access panel on the PT-101 head. To access the address setting switches, remove the four hex head screws securing the rear cover (one each on right and left sides, one each top and bottom). With the cover removed, you will see the main logic board for the PTE-350. A blue bank of eight white switches can be found near the lower center of the board. The convention for the switches is this: down is OFF(or zero), up is ON. With all switches down/off, the head's address is set by remote control from an Eagle™ controller.

NOTE: These are binary address switches. With only switch number 1 in the up position, the head's address is 1. With only switch number 2 up, the address is 2. With only switch number 3 up, the address is 4. With only switch number 4 up, the address is 8. With only switch number 5 up, the address is 16. With only switch number 6 up, the address is 32. With only switch number 7 up, the address is 64. The switches may be configured in any manner to arrive at a desired address up to 127 (all switches up= $1+2+4+8+16+32+64=127$ )

For example, to set address number 3, switches 1 and 2 should be up. For address 6,

switches 2 and 3 should be up (2+4=6).

Note that if the address is changed with the unit powered up, the unit power must be cycled off and back on for the address to be set in memory.

Addresses can also be easily set and changed remotely using an Eagle™ PT controller. However, in the event that multiple heads are used on a single RS-485 line, the hardware method of address setting is preferred, as this provides a method of setting the address in the head so that they cannot be changed by accident from the PT controller. To set the address by remote control from a PT controller or software, follow this procedure. The address is set by the factory to 1 when shipped. If a change is required, follow the procedure for your particular model of Eagle™ controller:

PT-C55 controller: Enter FUNCT, PRESET 4, then select PRESET 1 through 8 to set addresses from 1 through 8. Note that the PT-C55 controller is limited to control of 8 PT heads.

PT-C controller: simply enter FUNCTION, the 11 button; the LCD display will read ADDRESS. Then push the number you wish to set the head to.

PT-TSC2 touchscreen controller: From the main page, touch the FUNCTION button. Then touch the SET PT ADDRESS button. On the numeric keypad that pops up, touch the number you wish the head to become, followed by the ENTER button.

Note that the remote addressing procedure will only work if you know the number the head is currently set to; if you don't know the number, first select CAMERA, ALL. This will allow you to talk to any head that is correctly wired up and powered.

Also note that remote addressing will set the number for all heads on the RS-485 comm line that are not set by internal address switches; you must disconnect the power or communication for all the heads except the one you wish to address, otherwise all the powered and connected heads will be set to the same address. Conversely, if the address is set by the internal dip switches, you cannot override it from the controller.

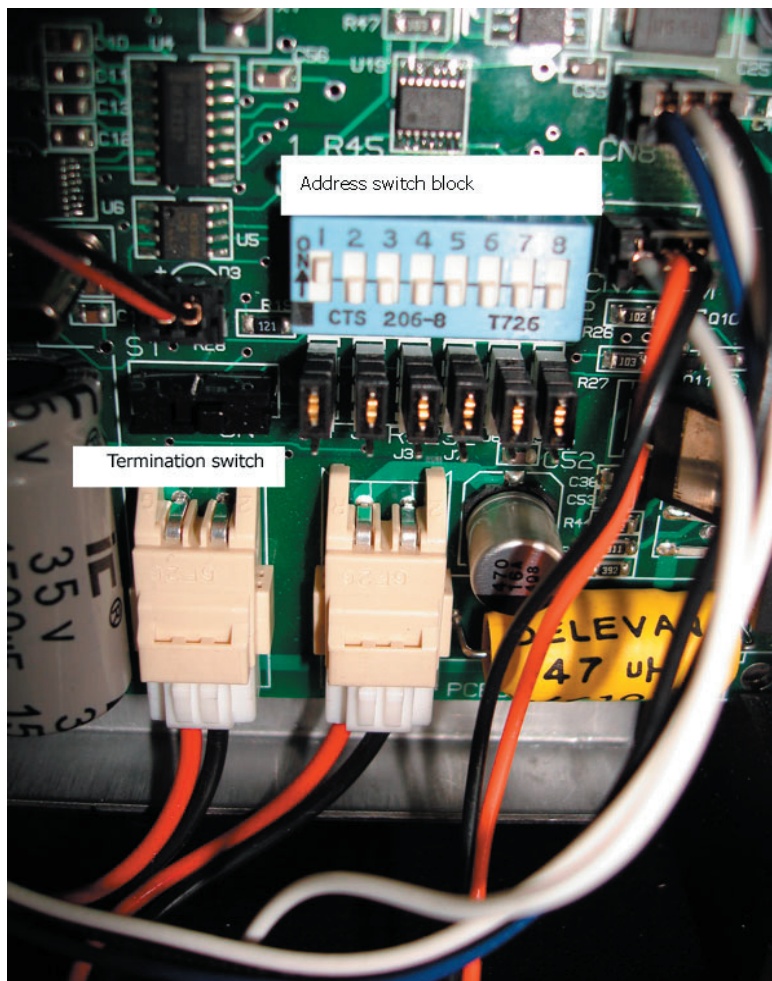


Photo showing close up of control board with address switch block, RS-485 termination switch, and comm mode jumpers

### RS-232 SERIAL OPERATION (OPTIONAL CONFIGURATION)

The PTE-350 pan tilt head is capable of direct RS-232 operation right out of the box. No adapters are needed. Under the rear cover access panel you will find six black repositionable jumpers. The PTE-350 is shipped in standard RS-485 mode; with all of the jumpers UP.

Switch the three left most jumpers (J1, J2, J3) to the lower position, and the head is now configured for RS-232 mode. The same control codes used for RS-485 apply for moving the head using Eagle™ software or when writing your own software. These control codes are available off of the Eagle website, <http://www.eaglepantilt.com>. Please be aware that the maximum reliable distance for RS-232 control is only about 50 to 75 feet, and that only one PTE-350 head may be hooked up per serial port as is standard with RS-232 communications. The three right jumpers (J7, J6, J5) are to switch the camera control method to RS-232 from the normal TTL mode. Do not move these jumpers unless advised to by Eagle

tech support.

## ENERGIZING THE SYSTEM

Power up the Eagle™ pan tilt controller before powering up the PTE-350 pan tilt head. When this is done, you may now power up the power supply for the PTE-350 head(s). The head will automatically travel to its “home” position against the up and left stops. During this travel period, remote control is not possible. This head must home itself whenever power is applied. If the head does not go to the home position, it will not function; please call for service.

The PTE-350 head will now recall PRESET 1 immediately after finding the home position. This allows you to choose an opening shot that you want the head to recall when powering up. Simply memorize a preset 1 position and the head will recall that position upon power up. We have set PRESET 1 at the factory to be straight ahead and level, with a medium wide shot.

## LED COMM STATUS

(LED is located inside the head, but valuable for troubleshooting) The LED provides important visual feedback to the status of the head; if the head has been activated and is being talked to by a controller, the LED is on solid, with some slight flickering. If the head is attached to the RS-485 line and hearing a command being sent to another head, it will flicker.

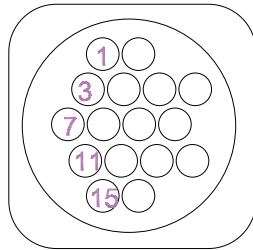
If the LED comes on solid immediately, with no flickering at all, it probably means the RS-485 wiring is incorrect. Usually the ground and one of the data lines have been swapped. Check the wiring and try again.

## LENS TYPE

This is set by the factory when ordered for your specified lens type; 1 is for Rainbow and other CCTV type lenses, 2 is for Fujinon and Canon telecon lenses. The Fujinon C mount lenses with the -R11 designation are also set to type 2. 5 is for Fujinon and Canon telecon lenses when used on a compatible Eagle head. If your PT head has a TYPE 5 indicated on the serial number label, you should set your lens type to TYPE 5. This will allow instant saving of presets at any position and lens setting.

## 7. PTE-350 WIRING CONNECTIONS

Follow the table and diagram below to build up the input cable to the base of the PTE-350 pan tilt. The AMP 16 pin connector, solderable sockets, and backshell with heat shrinkable adhesive seal are included with the head. Make sure to build up and insert the sockets correctly; if the data and power connections are miswired, damage may result to the control board of the head, rendering it unusable. Once you have built up the connection and have tested it you should then use a heat gun to shrink the backshell connector. This connector



PIN 1	24VDC POSITIVE
PIN 2	24VDC POSITIVE
PIN 3	RS-485 LINE 2
PIN 4	RS-485 LINE 1
PIN 5	RS-485 GROUND
PIN 6	OPEN
PIN 7	VIDEO COAX CENTER
PIN 8	VIDEO COAX SHIELD
PIN 9	GENLOCK COAX CTR
PIN 10	GENLOCK COAX SHLD
PIN 11	OPEN
PIN 12	OPEN
PIN 13	WASHER COMMON
PIN 14	WASHER TRIGGER
PIN 15	24VDC GROUND
PIN 16	24VDC GROUND

Recommended wire gauge for power connection to PTE-350 (four conductors required for power)

Distance in feet	AWG
up to 200	18
201-500	16
501-1000	12

## 8. SPECIFICATIONS

### GENERAL

All 6061 aluminum; polyester-based, UV resistant textured grey powder coated to prevent corrosion. All fasteners are type 18-8 stainless steel or black oxide treated.

TEMPERATURE RANGE: 0°F TO +120°F (-18°C TO +49°C)

WEIGHT: 23 lbs. (without housing and camera)

### MECHANICAL

DRIVE SYSTEM: variable speed DC stepper/servo motors direct coupled to worm gear final drive; worm drive adjustable for backlash minimization

PAN RANGE: 355° HORIZONTAL (-180° to +180° ) -NOT CONTINUOUS ROTATION

SPEED: variable from 0° up to approx. 30° per second, with load correctly balanced

TILT RANGE: +90° TO -90° VERTICAL-NOT CONTINUOUS ROTATION

SPEED: variable from 0° up to approx. 30° per second, with load correctly balanced

MAX. LOAD: approximately 50 pounds (22.7 kilos), including camera, lens, and housing. Max load is dependent upon load balance and centering.

### ELECTRICAL

INPUT VOLTAGE: 24vdc from recommended Eagle™ PT-PS-2, 3, or 4 power supplies

CURRENT REQUIREMENTS: starting, 600ma pan or tilt;

running, up to 2500ma, pan and tilt with camera and lens

CABLE REQUIREMENTS:

3 conductor, 22 gauge for RS-485 control system

2 or 4 conductor, 18 gauge for pan tilt head power

Note that these are minimum gauge size requirements; check the tables in the manual for the gauge size needed for your distance/application.

## VERSION CHANGES

VERSION 2: ADDED CHANGES TO LIMIT SETTING; TILT LIMIT PHOTO

VERSION 3: CHANGED WIRING TABLE TO CORRECT DATA WIRING MISTAKE  
ADDED LENS CONFIGURATION INFO AND TABLE

VERSION 4: CORRECTED LIMIT RING TABLE ERROR