ES-450
9-Pin Machine Controller

Users Manual

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Description

The ES-450 is a self-contained machine controller for professional and semi-professional VTRs, audio decks and computer based editing systems that support the industry standard Sony 9-pin protocol. This is also known as Sony "P2" or RS-422 protocol.

ES-450 features include:

- Timecode display
- Genuine Sony Jog/Shuttle wheel
- Transport control
- Frame Bump forward and reverse
- Seven Locate points
- Remote Track arming
- Direct timecode entry
- Support for 24/25/29.97/30 frames per second
- Support for Drop and non-Drop timecode

Setting up the ES-450

The ES-450 can operate in either of two modes: as a stand-alone master controller for VTRs and decks that respond to the Sony 9-pin protocol or, as a slave device meant to be attached to a host that directly supports the ES-450. See your system documentation for details. As shipped from the factory, the ES-450 is normally configured as a master controller.

Controlling a machine

As a master controller, the ES-450 requires little in the way of setup to use it with a VTR or audio deck.

1. Connect the 9-pin D-sub connector from the rear of the ES-450 to your machine or computer.
2. Connect the supplied power supply to the end of the cable attached to the ES-450

Your machine must be set for remote operation. Please consult your Operators Manual for details.

Using with a Host Computer

Using the ES-450 with a host computer requires the unit to be changed to slave mode. To do so, you will need the following tools: a 5/64" Allen wrench, a 3/16" hex driver, and a small flat-blade screwdriver.

1. Remove the four Allen screws from the front.
2. Carefully remove the front panel from the bottom chassis.
3. On the small circuit board, remove the 8-pin IC, which is inserted into U3 "To Mach." socket, and move it to the "To Host" socket. Make sure orientation is preserved.
4. Remove the jumper JB1.
   (In case the unit might be changed back in the future, you can re-plug in the jumper to only on pin of JB1.)
5. Reassemble the front panel to the bottom chassis.

Controls

The ES-450 was laid out in an ergonomic manner. It was designed to be used by left- and right-handed operators. With the operators hand resting on the Jog/Shuttle Wheel, the most commonly used transport buttons are in easy reach.

Jog/Shuttle Wheel

The Jog/Shuttle Wheel has two modes. The mode can be changed by simply pressing the wheel.

In the Shuttle Mode, the wheel has a detent in the center and at the two extreme positions. In the center position, The ES-450 places the machine into SHUTTLE STILL or PAUSE mode. As the wheel is turned clockwise, the machine will start shuttling forward. Conversely, as the wheel turned counterclockwise, the machine will start shuttling in the reverse direction. The two arrow LEDs indicate the direction the tape is moving. When both arrow LEDs are illuminated, the machine is in SHUTTLE STILL or PAUSE mode. Below are typical shuttle speeds from the center detent to the extreme ends of rotation:

STILL 1/8x 1/4x 1/2x 1x 2x 3x 4x 5x 6x 10x 13x 16x

In the Jog Mode, the wheel turns freely without any detents or stops. Turning the wheel clockwise moves the tape forward. While turning the wheel counterclockwise moves the tape in the reverse direction. The two arrow LEDs indicate the direction the tape is moving. When the Jog wheel is not being turned, both arrow LEDs will be off indicating that the machine is in JOG STILL or PAUSE mode.

Transport Controls

The Transport Controls are positioned above the Jog/Shuttle Wheel. These functions include: Stop, Play, Reverse Play, Fast

Forward and Rewind. Additionally, there is an Eject button in the upper left hand corner of the front panel.

Typically, pressing the Stop button places the machine into STILL or PAUSE mode so the operator can view the image on tape. Pressing Fast Forward and Rewind place the machine into shuttle forward and reverse respectively. These functions may be implemented differently in your machine or editing software.

Track Arming

Above the Transport Controls are the Track Arming buttons, which select tracks to be overwritten when the machine is placed in Record. Pressing the ASM button will place the machine in to Assemble mode where the video and audio tracks are written. To insert new material over existing material, the Insert mode is used. To initiate Insert mode, press the INS button and any tracks you wish to record.

LEDs above the Track Arming buttons indicate the tracks that are armed or being recorded on.

Record is initiated by pressing REC/SHIFT and F-PLAY.

Editing Controls

Located around the Jog/Shuttle Wheel are the Editing Controls.

At the top center just above the Jog/Shuttle Wheel is the SHUTTLE SELECT button. The SHUTTLE SELECT button allows the machine to return to a shuttle operation after it has been interrupted by a STOP, FRAME+1, FRAME-1 or GOTO command. The direction arrows indicate the direction of the pending shuttle. In Jog Mode, this button has no effect.

On either side of the SHUTTLE SELECT button are the FRAME+1 and FRAME-1 buttons. Pressing either of these buttons will move the tape forward or backwards one frame. This

is performed by using the timecode sent to the ES-450 by the machine. The ES-450 sends a locate that is incremented or decremented by one frame.

> Note:
> *If the machine does not use the timecode it sends out of the remote connector as the locate reference, the machine will locate to the wrong point. An example of this would be a machine that sends VITC timecode to the remote, but uses LTC to locate.*

MARK IN and MARK OUT send Mark In and Mark Out commands to the machine. These are used to set points used in Preview and Autoedit operations.

The PREVIEW button sends a Preview command to the machine. This allows the operator to preview an edit. Typically, this command causes the machine to perform the following actions:

1. Locate to the Mark In point minus the pre roll
2. Enter Play mode
3. Switch to input monitor at the Mark In point
4. Revert to tape monitor at the Mark Out point
5. Stop the tape at the Mark Out point plus the post roll

The AUTOEDIT button sends an Auto Edit command. This allows the operator to perform an edit with frame accuracy. Typically, this command causes the machine to perform the following actions:

1. Locate to the Mark In point minus the preroll
2. Enter Record Ready mode
3. Switch to Record mode at the Mark In point
4. Revert to Record Ready mode at the Mark Out point
5. Stop the tape at the Mark Out point plus the postroll

Timecode Window

The Timecode Window displays the timecode that the machine sends via the 9-pin interface. This is usually the longitudinal timecode of the media. Some machines will send timecode derived from VITC, a dedicated timecode track or the control track. The timecode is displayed in hours:minutes:seconds:frames format. Drop frame timecode is indicated by a small dot or period between "LTC" and the hours field.

`LTC 01:25:36:12`

Non-Drop frame timecode

`LTC.01:25:36:12`

Drop frame timecode

Locate Functions

The ES-450 can store up to seven locate points internally. These locate points are stored as long as the unit is powered.

The locate buttons are secondary functions of the Editing Controls. The locate buttons are identified below:

Mark In	Locate 1
Preview	Locate 2
Frame-1	Locate 3
Shuttle Select	Locate 4
Frame+1	Locate 5
Autoedit	Locate 6
Mark Out	Locate 7

Locate points are set by pressing and holding REC/SHIFT then the desired locate button. Locate points are recalled by pressing GOTO then the desired locate button. Locate points are stored in memory as long as the unit is powered.

Direct Numeric Entry

The ES-450 can also command the machine to locate to arbitrary timecode position. This is initiated by pressing the GOTO button. The display will show:

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GoTo    :   :   :
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Using the Transport and Track Arming Buttons, key in the desired timecode then press ENTER. The machine will immediately go to the entered timecode.

Technical Reference

Electrical Interface

The ES-450 uses the EIA RS-422A protocol over a 9 pin D-Sub connector. The pinout is listed in the table below:

1	Ground
2	Receive A
3	Transmit B
4	Ground (Transmit)
5	not used
6	Ground (Receive)
7	Receive B
8	Transmit A
9	Ground

The ES-450 sends data at 38.4 kbits/sec. The data format is 1 start bit, 8 data bits, 1 stop bit and 1 parity bit. The parity is odd. That is, the sum of the data bits and the parity bit is an odd number.

$$D7 + D6 + D5 + D4 + D3 + D2 + D1 + D0 + P = 1$$

Troubleshooting

If for some reason the ES-450 does not give you the expected results, take a moment to do some investigating. The most important concept is that you have your ES-450 connected properly as outlined in *Setting up the ES-450*. Take a minute to double check this setup.

Double check with the manufacturer of the deck you are controlling to see if an external controller is supported. As long as your cable connections are setup properly, everything should be working.

Make sure your machine is set to "Remote" and not "Local" control. This will insure that your ES-450 is communicating with your machine.

Care and Service

If properly cared for, your ES-450 should provide years of troublefree performance. Avoid dropping the ES-450 or banging hard on the controls.

Clean with a soft, damp cloth. Do not allow liquids to get inside the unit.

There are no user-serviceable parts in the ES-450. Please refer to the JLCooper Electronics Limited Factory Warranty for detailed warranty and service information.

JLCooper Electronics Limited Factory Warranty

JLCooper Electronics ("JLCooper") warrants this product to be free of defects in materials or workmanship for a period of 12 months from the date of purchase. This warranty is non-transferable and the benefits apply to the original owner. Proof of purchase in the form of an itemized sales receipt is required for warranty coverage. To receive service under this warranty, customers in the United States should contact the JLCooper factory at (310) 322-9990 and talk to a service technician. If necessary, a Return Authorization number may be issued. For our customers outside the United States, it is recommended that you first contact your Dealer or Distributor, since they may offer their own service or support policy. If local support is not obtainable, please send a FAX to JLCooper's Service Department at +1 310 335 0110 with a detailed description of the service required. Upon issuance of return authorization, the product should be properly packed and shipped to: Service Department, JLCooper Electronics, 142 Arena Street, El Segundo, CA 90245. Please include the following: copy of the sales receipt, your name and address (no P.O. Boxes, please), a brief description of the problem, and any other related items discussed with the service department and considered necessary to evaluate the product or effect a repair. The return authorization number must be clearly written on the outside of the package. JLCooper will at its option, without charge for parts or labor, either repair or replace the defective part(s). Shipping costs are not covered by this warranty. JLCooper's normal repair turn around time at the factory is approximately 15 business days from receipt of product to shipping. Your actual turn around time will include return shipping. Actual turn around time will vary depending upon many factors including the repeatability of the customer's reported complaint, the availability of parts required for repair, the availability of related products needed to evaluate the product if necessary. Priority services are available at additional cost. These should be discussed with the service technician at the time the return authorization is issued.This warranty provides only the benefits specified and does not cover defects or repairs needed as result of acts beyond the control of JLCooper including but not limited to: abuse, damage by accident/negligence, modification, alteration, improper use, unauthorized servicing, tampering, or failure to operate in accordance with the procedures outlined in the owner's manual; nor for natural or man-made events such as, but not limited to flooding, lightning, tornadoes, earthquake, fire, civil unrest, war, etc.

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