ES-SloMo

Slow Motion Video Controller

Operations Manual

JLCOOPER ELECTRONICS

ES-SloMo User's Manual, Third Edition
Part Number 932094

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Introduction

The ES-SloMo is a compact controller for News, Sports, Scoreboard and other slow motion editing operations. It makes the operation of professional video recorders quick and easy.

It's a full-featured 4-machine editor and universal Jog/Shuttle remote for most VTRs, DDRs and disk recorders. Its sleek design and low cost make it the perfect addition to edit suites, remote trucks and other studio applications.

ES-SloMo features include professional transport buttons, professional Jog/Shuttle Wheel for convenient picture search operations, a high quality TBar for Slow Motion and shuttle tape operation, an easy to read 2 x 16 VF display for accurate editing, a full size numeric keypad, fast access function keys and an integrated data and power cable to minimize desktop clutter.

Features

- Simultaneous Control of up to 4 VTRs or DDRs via standard 9 pin (P2) protocol
- Simultaneous Control of up to 16 VTRs or DDRs with the addition of the optional Gangway16
- 4 RS-422 serial ports (16 with the optional Gangway16)
- Professional Jog/Shuttle mechanism
- TBar control for slow motion control using Shuttle, Jog or Variable Play commands
- Dynamic slow motion replays directly accessed from integrated TBar mechanism
- User programmable TBar limits
- User programmable TBar behavior:
  Min to Max, -Max to +Max, ±5%, ±10%
- Active or Passive TBar Modes

- High durability transport buttons
- Full size numeric keypad to enter and recall cue locations and time code
- Easy to read 2 line x 16 VF Display
- Assemble, insert, crash and record lockout modes
- Global record lock
- Machine 1 control lockout
- Mark In and Mark Out keys to quickly store cue points
- Capacity to store 1000 cue points or 400 in and out points with varispeed
- Ability to transfer cues to/from another ES-SloMo or computer for backup or editing
- Ability to import/export cues from/to Ash Vale SM-2a
- Programmable cueing modes
- Automatic play All Cues function
- 2 user assignable buttons
- Log operation for QC Applications
- 16 variable replay speeds
- EE/PB switching control
- EJECT function for tape based decks
- Controls most VTRs and hard disk based systems
- Direct support for Doremi Video Servers
- Direct support for Odetics compatible video servers
- 10 foot (3m) detachable control and power cable with recessed connector to minimize footprint
- AC or DC power, 90~240 volts AC, 50/60 Hz or, 9-12 volts DC

Connecting

Connecting the ES-SloMo is straightforward. Connect the large 25 pin D-Sub connector to the rear of the ES-SloMo. Secure the connector the unit by screwing the lock screws into the connector. Connect each deck or video server to the smaller 9 pin D-Sub connectors. Some video servers have more than one connector, which allow simultaneous control of the recorder and player. In these cases, connect each port to its own connector on the ES-SloMo.

Lastly, connect the unit to a source of power. This can be either from the power mains using the provided power supply or directly from 9-12 volts DC. The connector is a 2.1mm coaxial power connector. The center pin is positive. A power switch on the rear panel turns the unit on or off.

Initialization

The ES-SloMo configuration and TBar calibration can be reset by holding the EJECT button while applying power to the unit. After doing so, the display will show:

Then the display will show:

Follow the directions on the display.

This calibrates the TBar for optimum range. These values are stored in nonvolatile memory and should never need to be changed. After performing this, the unit will revert to normal operation.

Timecode Display

When the ES-SloMo displays timecode, it displays more than just the current timecode. The character to the left of the hours field indicates drop frame operation. If the machine returns nondrop frame timecode, the ES-SloMo displays a space as in the pictures below.

Nondrop Timecode display in Cue and Park Mode

Nondrop Timecode display in Cue/Play/Stop and Cue/Play/StopSlo Modes

If the machine returns drop frame timecode, the ES-SloMo displays a period or dot as in the picture below.

Drop Frame Timecode display in Cue and Park Mode

Drop Frame Timecode display in Cue/Play/Stop and Cue/Play/StopSlo Modes

The character between the seconds and frames numbers indicates field 1 or 2. If the machine returns field 1 in the timecode, the ES-SloMo displays a period as in the pictures below.

Timecode display in Cue and Park Mode indicating field 1

Timecode display in Cue/Play/Stop and Cue/Play/StopSlo Modes indicating field 1

If the machine returns field 2 in the timecode, the ES-SloMo displays a colon as in the pictures below.

Timecode display in Cue and Park Mode indicating field 2

Timecode display in Cue/Play/Stop and Cue/Play/StopSlo Modes indicating field 2

Many decks do not return fields so, you may only see one or the other.

Menu

There are a number of user configurable items that should be checked and set for your application.

To go to the menu, press the MENU button. Select the menu item by turning the jog wheel. *If you are in Shuttle Mode, the display will tell you to go to the Jog mode. Press the wheel to go to Jog mode, and press the MENU button again*.

As the Jog wheel is turned, different menu items are displayed on

the top line of the window.

There are two types of items accessed this way: Parameters and Commands. Parameters allow the user to modify settings and are stored in nonvolatile memory. Commands allow you to perform certain operations such as a memory dump or clear memory. In the case of parameters, you will see the currently selected and stored value on the bottom line. An arrow of the left side of the display points to the top line, indicating that the menu item is now being selected by the wheel.

Once the desired menu item is shown, a press of the ENTER key will cause the arrow to change to the bottom line of the display.

This indicates that turning the Jog wheel will scroll the possible options for that menu item. Pressing the ENTER key again will return the arrow to the top line, and additional menu items may be scrolled thru. When all options have been set, another push of the MENU button will save them to the nonvolatile memory. If you decide to not save, pressing the CLR/ESC key will exit out of the menu mode without saving.

When commands are reached at the end of the parameters, the arrow symbol no longer appears. The second line will now be an instruction, such as ENTER = Erase. In some cases, additional instructions may appear after the pressing of ENTER. Pressing the CLR/ESC key will exit out of the menu operation.

On the following pages are the list of parameters and commands along with all the possible options. The defaults after initialization are shown in **boldface**.

Parameters

1. ***Time Code Type***
   This is only used by the Step Frame (Frame+1 and Frame-1) functions. This determines how the ES-SloMo behaves at whole second boundaries.
   - 24
   - 25
   - 29.97
   - **30**
   - 29.97 drop
   - 30 drop
   - 60

2. ***Record Enable***
   Allows record and edit functions to be enabled or disabled.
   - **Enabled**
   - Disabled

3. ***TBar Range***
   This sets the speed range of the TBar from bottom to top.
   - **Normal** Scaling Disabled: Still to 10x
     Scaling Enabled: Configurable using TBar Speed Min and Max.
   - ± 5% 95% to 105% of play speed
   - ± 10% 90% to 110% of play speed
   - Bidirectional -1x to +1x play speed

4. ***TBar Mode***
   - **Passive**
     Movement of an Enabled TBar sets the speed, which will be sent upon either pressing the Play button or calling up a Clip or Cue. Actual command sent would be selected by the "TBar Message" below unless set at exactly Play speed, in which case a Play message will be sent.
   - Active
     Movement of the TBar immediately sends an appropriate command to machine when Enable LED is on.

5. ***TBar Speed Min***
   This sets the minimum speed to be sent by the TBar in Normal Mode when the T1 (Scaling) button is active
   - **Still**
   - 1/64x
   - 1/32x
   - 3/64x
   - 1/16x
   - 3/32x
   - 1/8x
   - 3/16x
   - ¼x
   - ⅜x
   - ½x
   - ¾x

6. ***TBar Speed Max***
   This sets the maximum speed to be sent by the TBar in Normal Mode when the T1 (Scaling) button is active
   - 1x
   - 1½x
   - 2x
   - **4x**
   - 8x
   - 10x

7. ***TBar Speed Preset***
   Sets the Preset Speed to be evoked by pressing the Preset Button
   - Still
   - 1/64x
   - 1/32x
   - 3/64x
   - 1/16x
   - 3/32x
   - ⅛ x
   - 3/16x
   - ¼x
   - ⅜x
   - ½x
   - ¾x
   - **Play**
   - 1½x
   - 2x
   - 4x

8. ***TBar Message***
   This sets the type of command sent by unit during TBar operations
   - Jog
   - Variable
   - **Shuttle**

9. ***Stop → TBar***
   This determines if pressing the STOP, PLAY, R-PLAY, REW or FFWD button will disable the TBar and turn off ENABLE LED.
   - No Effect
   - **Turns Off**

10. ***Step Frame***
    This determines what will happen when a Frame+1 or Frame-1 button is pushed.
    - **GoTo Mode**
      This will issue a GoTo to the proper frame. This should be used with most "modern" machines, as it can cause inaccurate locating with older machines such as the BVU-800.

    - SloMo Mode
      This issues a slow shuttle command in the appropriate direction, then a Still command when the desired frame has been reached. This does not work well with disk-based recorders.

    - Step Fwd/Rev
      This sends a `2x 14` or `2x 24` command that is recognized by only very new machines.

11. ***Audio Trk Type***
    This determines how the audio track arming is handled.
    - **Type 1**
      Older decks with two analog tracks.
      A1 = Analog Audio 1 (This is sometimes interpreted as Digital Audio 1 in some decks)
      A2 = Analog Audio 2 (This is sometimes interpreted as Digital Audio 2 in some decks)
      Shift + A1 = Analog Audio 3 (TC in some decks)
      Shift + A2 = Analog Audio 4 (Sync in some decks)

- Type 2
  Sends a 2 byte track arm message with the A1 & A2 bits copied from the D1 & D2 bits. Tally back uses byte 5 of the Status Data message.
  A1 = Analog Audio 1 and Digital Audio 1
  A2 = Analog Audio 2 and Digital Audio 2
  Shift + A1 = Digital Audio 3
  Shift + A2 = Digital Audio 4

- Type 3
  Same as Type 2, except Tally back uses the Edit Preset Sense message.
  A1 = Analog Audio 1 and Digital Audio 1
  A2 = Analog Audio 2 and Digital Audio 2
  Shift + A1 = Digital Audio 3
  Shift + A2 = Digital Audio 4

- Type 4
  Same as Type 2, except the A1 & A2 bits are set to zero.
  A1 = Digital Audio 1
  A2 = Digital Audio 2
  Shift + A1 = Digital Audio 3
  Shift + A2 = Digital Audio 4

12. ***Stop Method***
    Sets Stop behavior.
    - STOP Command
      A Stop command is sent.

    - STILL Command
      A Shuttle=0 (Still) command is sent.

    - **2nd push STOP** or **STILL, STOP**
      The first push will cause a Still command to be sent. The second push will cause a Stop to be sent.

13. ***FFwd and Rew***

Sets Fast Forward and Rewind behavior.

- **Latched**
  After release of the key, the controlled unit will remain in selected operation until some other button is pressed.

- Momentary
  Upon release, either a Stop or Still will be sent, depending on the Stop Method selected above.

14. ***Trk Data Tally***

Allows disabling of this tally, which, under unusual circumstances, might disrupt normal track select operations. If this is disabled, the ES-SloMo will not "know" of any track operation done on the controlled unit itself.

- **Disabled**
- Enabled

15. ***W1 Button Send,***
W2 Button Send

Sets the command sent when the W1 and W2 buttons are pressed.

- **Off** (no command sent)
- Preroll
- Preview
- Review
- Autoedit
- Sync Play
- Toggle Clip Enable
  see "Editing the Cue List" below
- Change SloMo
  see "Editing the Cue List" below
- Full EE On
- Full EE Off
- Select EE On
- ½x Play
- ½x Rev Play

16. ***Show Shut Spd***
Enables or disables display of the Shuttle speed in the display window.
    - Disabled
    - **Enabled**

17. ***Log Operation***
Enables or disables Log Operation.
(See Log Operation in appendix)
    - **Disabled**
    - Enabled

18. ***Cue Operation***
This determines how cues are stored and played back and the definition of a cue.
    - **Cue and Park**
      Cues are only defined a start time. When a cue is recalled, a CueUp message is sent to unit and no further action is taken. Cue start times are captured using the Store Cue button. This mode allows 1000 cues.

    - Cue/Ply/Stop
      Cues are stored as start and stop times. When a cue is recalled, a CueUp message is sent. When the unit reports that it is cued, a Play command is issued. When the play time agrees with the stop time, a Stop command is issued. Cues are captured using the Mark In/Out keys, along with the ENTER key. This mode allows 400 cues composed of start and stop times.

    - CuePlyStopSlo
      Intended primarily for Sports. Like the operation above, except that when the cue is captured, the present setting of the TBAR is saved as a SloMo setting. This may be done without the TBAR actually affecting the speed of playback at the time the capture takes place. When a cue is recalled, this SloMo speed setting will be

used instead of the Play command (unless the current setting of the TBAR is at Play speed, in which case, a normal Play command is issued). This mode allows 400 cues composed of start and stop times with a speed value.

19. ***Preroll Time***
    Sets the amount of preroll applied to all Goto or locate operations including Cue operations.
    - **0 seconds**
    - 15 frames
    - 1 second
    - 2 seconds
    - 3 seconds
    - 4 seconds
    - 5 seconds
    - 6 seconds
    - 7 seconds
    - 8 seconds
    - 9 seconds

20. ***Cue Delay Time***
    Sets the amount of delay between cues when in Play All Cues operation.
    - **0 seconds**
    - 1 second
    - 2 seconds
    - 3 seconds
    - 4 seconds
    - 5 seconds
    - 6 seconds
    - 7 seconds
    - 8 seconds
    - 9 seconds

21. ***Mach 1 Control***

Enables or disables the machine on port 1. This is intended for units that have the ability to simultaneously record and playback. This feature allows the operator to start the recorder at the beginning of an event and then locking out the controls to prevent the accidental stopping of the record process.

- Disabled
- **Enabled**

22. ***Gangway Oper.*** *(v1.23 or later firmware)*

Enables or disables control of an optional JLCooper Electronics Gangway16 RS-422 router. Enabling this option repurposes the 1, 2, 3 & 4 buttons and LEDs below the T-Bar for remote control of the Gangway16. See the section on Gangway Operation.

Commands

23. ***Ply All Clips***

This allows the automatic playback of valid and enabled cues, starting with the currently selected one. When a blank cue is reached, the operation ends. A blank cue is defined as a cue with a stop time = 00:00:00:00, which is the internal condition of erased cues. ***You must be in Cue/Play/Stop or CuePlyStp Slo modes for this operation to take place!*** After each cue is played, the controlled unit will stop for a period set by the Cue Delay Time, and then proceed to the next cue.

- ENTER
  When the ENTER key is pressed to initiate this command, a message appears prompting the operator to place the destination deck into record mode.
  Press ENTER again to begin the playout of clips.

- W1 or W2
  By selecting the W1 or W2 button to be "Tog Clip Enable", it is possible.

- CLR/ESC
  Pressing the CLR/ESC button at any time aborts the operation.

24. ***Ply Odet Clips***

This the same as Play All Cues, except that it uses the Odetics protocol to accomplish the playback. All other description of Play All Cues is valid.

25. ***Xmit Cue List***

Pressing the ENTER key causes all non zero cue location data to be sent over port #4 to either another ES-SloMo unit or a computer. When attaching to another ES-SloMo unit, a special RS-422A crossover cable is necessary. When attaching to a computer, as RS-422A port or RS-422A to RS-232 converter is necessary.

When the ES-SloMo is in Cue and Park mode, the data format conforms to the Ash Vale SM-2a protocol. When the ES-SloMo is in Cue/Ply/Stop or CuePlyStopSloMo mode, the data format is unique to the ES-SloMo.

Both formats are detailed in the appendix.

26. ***Rcv Cue Dump***

Pressing the ENTER key causes the ES-SloMo to prepare itself for reception of a Cue Dump from another ES-SloMo or from a computer. Reception is via port #4. The Es-SloMo will automatically detect which format is being sent to it. Pressing the CLR/ESC button aborts this operation.

When sending data from a computer, a 25 mS delay must be inserted between each cue to allow the unit to write to nonvolatile memory. The ES-SloMo performs this when it sends data.

27. ***Erase All Cues***

In Cue and Park mode, pressing the ENTER key will set all 1000 cue locations to 00:00:00:00, which is considered an erased location.

In Cue/Ply/Stop mode, pressing the ENTER key will set all 400 start and stop times to 00:00:00:00, which is considered an erased location.

In CuePlyStopSlo mode, pressing the ENTER key will set all 400 start and stop times to 00:00:00:00 and set the speed to 00 00, which is considered an erased location.

28. ***Init for Sports***

Pressing the ENTER key will set up parameters for typical sports slow motion operation.

- Frame rate and type = 30 drop
- Record Enabled
- TBar = Normal range
- TBar = Passive
- Min TBar = Still
- Max TBar = Play Speed
- TBar Preset = Play Speed
- TBar sends Shuttle
- Stop/FF/Rew have no effect on TBar Enable
- Step Frame = GoTo
- Type 2 Audio track handling
- Stop button sends Stop
- Latched FF and Rew
- Enabled Track Tally
- W1 toggles Clip Enable
- W2 writes new SloMo speed on current Clip
- Display Shuttle Speed Off
- Log Function Off
- Cue operation = Cue/Play/Stop with SloMo
- Preroll = 0 sec
- Clip Delay = 0 sec.
- Mach 1 Control = Enabled

29. ***Init for Coords***

Pressing the ENTER key will set up parameters for another typical sports slow motion operation.

- Frame rate and type = 30 drop
- Record Enabled
- TBar = Normal range
- TBar = Passive
- Min TBar = Still
- Max TBar = Play Speed
- TBar Preset = Play Speed
- TBar sends Shuttle
- Stop/FF/Rew have no effect on TBar Enable
- Step Frame = GoTo
- Type 2 Audio track handling
- Stop button sends Stop
- Monentary FF and Rew
- Enabled Track Tally
- W1 Off
- W2 Off
- Display Shuttle Speed Off
- Log Function Off
- Cue operation = Cue and Park
- Preroll = 15 frames
- Clip Delay = 0 sec.
- Mach 1 Control = Enabled

Cue Operations

There is nonvolatile storage on the ES-SloMo for 1000 cues or 400 clips. These are numbered 000 – 999 or 000 - 399. The various operations involving cues are as follows:

Basic Cue Operations

To Goto a Predefined Cue #

1. Enter the 1,2 or 3 digit number: the time will show on line #2 of the display, while the entry is shown on line #1.

2. Press Enter. A locate command will be issued, and the top line will revert to showing current time.

   Note: If Preroll is enabled, that will be applied to time.

3. The next action will depend upon the Cue Operation mode that the unit is configured for.

   - If in Cue and Stop mode, the controller does nothing.
   - If in Cue/Ply/Stop mode, the controller will send a Play command when Mark In point is reached (minus any Preroll), and will send a Stop command when the Mark Out point is reached.
   - If in CuePlyStopSlo mode, the controller will send a Variable Play command when Mark In point is reached (minus any Preroll), and will send a Stop command when the Mark Out point is reached.

4. Pressing the CLR/ESC button will exit the cue entering process, but will allow the entered cue to remain "pending" for possible Cue/Ply/Stop time capture operation.

Next Cue

Pressing this will bring up the next higher cue from the last entered or used. The time stored in this Cue location will be displayed on the second line. Multiple presses of this will scroll thru the Cues.

- Pressing Enter will cause the currently displayed Cue to be sent.

- Pressing the Clr/Esc button will exit back to normal operation without sending the Cue.

Last Cue

This operates the same as above, except that the Cue number is decremented with each push.

Current Cue

Pressing the ENTER key will replay the most recently selected cue. This may be done repeatedly.

"Cue and Park" Specific Operations

To Manually Enter a Goto Time

1. Press ManTime button. The display will show:

2. Start pressing numbers: they will scroll from right to left across screen. At any time, a first press of the CLR/ESC button will clear whatever entry is being made to all zeros. A second push of the button will exit the operation.

3. When the desired time is displayed, press Enter. The GoTo command will be issued and the top line will revert to showing current time.

Note: If Preroll enabled, that will be applied to time.

To store Current Time to a Cue #

1. Press StoreCue. If no manual entry of time has been made, the Current Time will transfer to bottom line and

   will appear on top line.

2. Enter a 1, 2 or 3 digit number.

3. Press Enter. Current time will be stored, and display will revert. No Goto will be sent.

To store a manually entered time to a Cue #

1. Press ManTime button. The display will show:

2. Start pressing numbers: they will scroll from right to left across the screen.

3. When desired time entered, press StoreCue. The display will show:

4. Enter a 1, 2 or 3 digit number.

5. Press Enter. The entered time will be stored, and the display will revert. No Goto will be sent.

To copy a time from one Cue to another

1. Enter a 1 or 2 digit Cue number. The associated time will be shown on the second line.

2. Press StoreCue. The display will show:

3. Enter a 1, 2 or 3 digit number.

4. Press Enter. The entered time will be stored, and the display will revert. No Goto will be sent.

"Cue/Ply/Stop" and "CuePlyStp Slo" Specific Operations

Saving a Cue with Start and Stop times

1. Insure that in either Cue/Ply/Stop or CuePlyStp Slo mode.

2. Select a starting Cue number by entering the number on the keypad, then pressing CLR/ESC. The number will show as the leftmost three digits on the top line.

3. At desired Start point, press Mark In. An asterisk appears to the right of the cue number. This may take place with unit playing at any speed or stopped.

4. At desired Stop point, press Mark Out. Again, this may take place with unit playing at any speed or stopped. The Store Cue LED will light, and the current time will freeze on the display.

5. If planning to have the automatic SloMo speed captured, you can at this point move the TBar to a desired speed, which will be displayed on the second line. If the ENABLE LED is off, this may be done without affecting the playback that may be going on.

6. Press the ENTER key. The Start and Stop times, along with the SloMo speed will be saved to the currently displayed storage location, then the Cue number will auto-increment.

7. Repeat steps 3 thru 6. Each time, the Cue number will increment to the next.

Playing back a Cue/Ply/Stop or CuePlyStp Slo Cue

1. Make sure in correct mode.

2. Enter the desired Cue number on the numeric keypad.

3. Press ENTER

4. Controlled unit will be directed to cue to the Start time minus any preroll time. Once there, either a Play or a SloMo command will be issued. The exact command sent is the one set in the TBar Message Menu item. When the unit has reached the prestored Stop point, a Stop command is issued.

Editing the Cue List

It is possible to step thru the list of Cues and Enable or Disable them individually for inclusion in the "Play all Clips" playback.

1. Set the W1 or W2 button for Toggle Clip Enable.

2. As you step thru the clips using the Next, Last, or numerical input, the selected W1 or W2 button's LED will light if a clip is enabled. Pressing the button toggles the condition.

   It is possible to change the SloMo speed that a CuePlyStp Slo Clip plays back. This will take effect on individual recalls of a Clip or on the Play all Clips" operation.

3. Program the W1 or W2 button for "Change SloMo" operations.

4. With the TBar Enabled, recall a Clip.

5. Move the TBar to a desired speed (optional at this point).

6. Recall a clip. While playing, you may move the TBar to desired speed.

7. When set to desired speed, press the W1 or W2 button programmed in step 3 above. The new speed will now be written to the current clip.

TBar Operation

The TBar may be set via "TBar Range" to Normal, ±5%, ±10%, or bidirectional operation.

Normal

There are three main aspects of the "Normal" speed operation of the TBar, as follows:

Full Range Operation

Press the ENABLE button. As soon as the TBar is moved, a speed command (depending on message choice made in the Menu) will be sent. The range of operation is from Still (all the way toward the operator) to 10x normal play speed.
A subsequent press of the ENABLE button will turn the TBar off. Depending on selection within the Menu, the pressing of any "transport" button (REW, R-PLAY, STOP, PLAY, FFWD) may be made to turn the TBar off.

Scaled Range Operation

Press the T1 button. The TBar will be enabled. The Minimum speed of the T Bar will now be the value set in the Menu Item TBar Speed Min. The Maximum speed will now be the value set in the Menu Item TBar Speed Max.

Preset Operation

It might be desired to be able to always start T Bar operation at a know speed different from the Max or Min value. When the PRESET button is pushed, a speed value equal to the speed set in the Menu Item "TBar Speed Preset" will be immediately sent. That speed will be shown on the second line of the display. Unless the TBar happens to be sitting at the Preset speed, the PRESET LED will blink indicating that the T Bar needs to be moved to the "null" point (the point where the T Bar position is the same as the Preset).

On the far right of the display, an up or down arrow will show which direction the T Bar needs to be moved. When the TBar is moved past the Preset point, the LED will turn off, and the arrow will disappear. The T Bar is now "Live".

When the ENABLE LED is off, movement of the T Bar will display (for about 1/2 second) the speed that would be sent were the T Bar enabled. This includes any min/max scaling if the T1 LED is lit. By this means, the operator can go to an exact speed position at any time without causing the controlled machine to move.

±5% Play Range

With this range, the Preset and Range buttons do nothing. The range of the TBar is from about 95% of normal play speed to about 105%.

±10% Play Range

With this range, the Preset and Range buttons do nothing. The range of the TBar is from about 90% of normal play speed to about 110%.

Bidirectional

With this range, the Preset and Range buttons do nothing. The range of the TBar is from 100% reverse play speed to 100% forward play speed.

Edit Preset (Track Arming)

The ES-SloMo includes buttons dedicated to adjusting the Edit Preset status of a target machine. The main modes are:

Crash Recording

Insure that neither the INS nor ASM LEDs are on. Holding down the Shift button, then pushing the PLAY button will place the machine(s) in the Crash Record mode.

Assemble Recording

Toggle the ASM button so that it is on. Holding down the Rec/Shift button, then pushing the PLAY button will place the machine(s) in the Assemble Record (Edit) mode.

Insert Recording

Toggle the Ins button so that it is on. In addition, press the desired tracks so that they are on. Immediately available are the Video, A1 and A2 tracks. When the Rec/Shift is pushed, the A1 and A2 buttons/LEDs become the D3 and D4 toggles. Holding down the Rec/Shift button, then pushing the PLAY button will place the machine(s) into the Insert Record (Edit) mode. *If no Video or Audio track is enabled, only the Play command will be sent.*

To exit any of the modes while the deck in motion, simply press the Stop button.

The exact command sent will depend on the `Aud Trk Type` menu item.

Machine Control

Any combination of four machines may be controlled by the ES-SloMo. The four buttons labeled "Machine Control" indicate and modify the machines that will receive commands. Pressing a single button will switch both the output of the ES-SloMo and the tally back to it to the selected machine. If more than one button are held down, all units will receive commands from the ES-SloMo. In this case, the first one pushed will become the machine used for Tally operations (current time code, transport control LEDs, and Edit Presets.) In a multi-machine operation, the selection of tally machine made during the output select process may be overridden by holding down the Rec/Shift button, then selecting a machine. As soon as the Rec/Shift button is held, the current tally machine will be displayed.

Upon power-up, the unit will always start with machine #1 selected unless the menu item *Mach 1 Control* is set to Disabled. In that case, the ES-SloMo will start up with machine #2 selected.

Gangway16 Operation

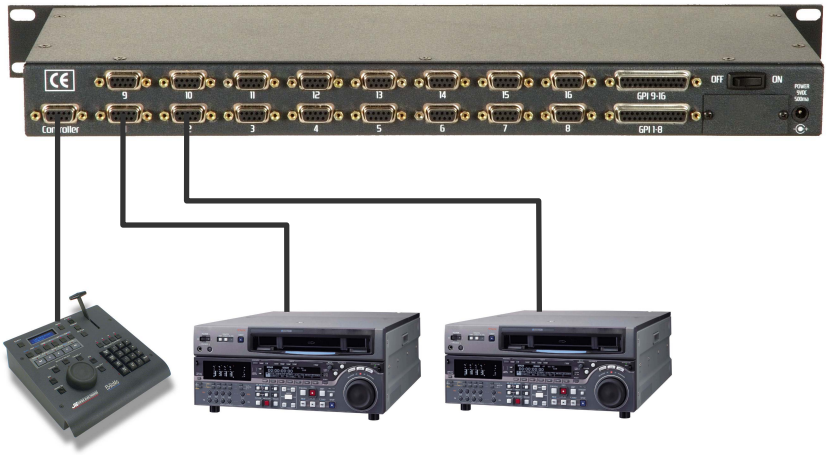
When Gangway16 Operation is enabled in the menu, the ES-SloMo is able to remotely control the Gangway16. The ES-SloMo must have version 1.23 or later firmware to control the Gangway16. The Gangway16 requires version 1.01 firmware or later to be controlled by the ES-SloMo.

Firmware upgrades are available for purchase from the JLCooper Electronics Service Department. You can contact the Service Department by dialing (310) 322-9990 in North America or +1-310-322-9990 outside North America. The Service Department is also available by email at: service@jlcooper.com.

Setup

To use the Gangway16 with the ES-SloMo:

1. Connect port 1 of the ES-SloMo to the rear panel controller port of the Gangway16 as shown below.



2. Enable Gangway Operation in the ES-SloMo menu as shown below.

    - To go to the menu, press the MENU button. Select the menu item by turning the jog wheel. If you are in Shuttle Mode, the display will tell you to go to the Jog mode. Press the wheel to go to Jog mode, and press the MENU button again.

    - As the Jog wheel is turned, different menu items are displayed on the top line of the window.

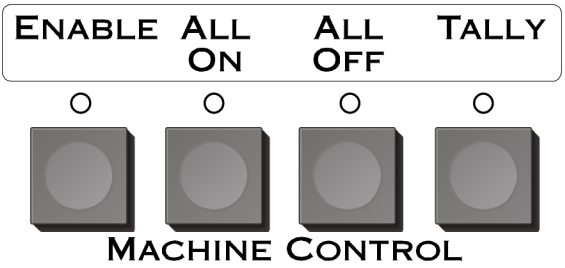
    - Scroll to the menu item for `Gangway Oper.`

    - When the menu item `Gangway Oper.` is selected, press the ENTER button to move the cursor to the bottom line.

    - Turn the Jog wheel so that the value is set to `Enabled`.
    - Press MENU to exit the menu.

Gangway16 Controls

When Gangway Operation is enabled in the menu, the Machine Control buttons and LEDs are repurposed to control the Gangway16. In this case, the functions of the buttons and LEDs are as follows:



Labeling

Since the default labeling of these four buttons is for the Machine Control function, a plastic decal (shown below) is supplied with the unit that allows the labeling of the buttons with the Gangway functions. If desired, this decal can be applied the ES-SloMo above the four Machine Control as shown above to clarify the operation of these buttons and LEDs.

Enable

Pressing this button enters the Gangway16 configuration mode. In this mode, the Enable LED will illuminate and the VFD will show the Gangway16 routing.

All On

When this button is pressed, the Gangway is configured to enable all 16 ports.

All Off

When this button is pressed, the Gangway is configured to disable all 16 ports.

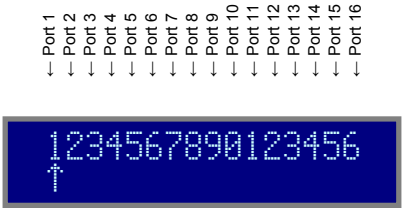
Tally

Pressing this button allows you to select the port, which provides Tally information (timecode, status) to the ES-SloMo. In this mode, the Tally LED will illuminate and the VFD will show the Gangway16 Tally routing.

Controlling the Gangway16

To control the Gangway16, simply press the Enable button. The Enable LED will illuminate and the display will show similar to the screen shot below.

The top line indicates the ports of the Gangway16, 1 = Port 1, 2 = Port 2 and so on. Starting with 0, only the last digit is shown due to space constraints. In this case, 0 = Port 10, 1 = Port 11 and so on.



The bottom line indicates which ports are enabled. The presence of an arrow pointing up indicates that a port is enabled for output. While the absence of an arrow indicates the port is not enabled for output.

To enable or disable a port on the Gangway, make sure that the Enabled LED is illuminated then, key in the two digit entry on the numeric keypad for the port. For example, to toggle the state of Port 6, press 0, 6. The display will be similar to the screen shot below. In addition, the Gangway16 will illuminate buttons 1 and 6.

This indicates that Ports 1 and 6 are enabled for output that is, commands from the ES-SloMo will be sent to decks connected to Ports 1 & 6.

Similarly, to disable Port 1 in the above example, press 0, 1. The display will show similar to the screen shot below and the Gangway will now only illuminate button6.

To enable Port 12 in the above example, press 1, 2. The display will show similar to the screen shot below.

To enable all the ports on the Gangway16 for output, press the All On button. The display will show:

To disable all the ports on the Gangway16 for output, press the All Off button. The display will show:

To receive data (such as Timecode or Status) back from the deck, a port for Tally operation must be selected. This can be done by pressing the Tally button. Pressing Tally will illuminate the Tally LED and cause the display to show the following:

The down pointing arrow will indicate the port that is configured as the Tally port or the port that the ES-SloMo listens to for Timecode and Status responses.

As with the Enable function, to enable a port on the Gangway for Tally, make sure that the Tally LED is illuminated then, key in the 2 digit entry on the numeric keypad for the port. For example, to select Port 9 for Tally, press 0, 9. The display will be similar to the screen shot below.

To remove the Gangway16 configuration pages, simply press the Enable button. This will cause the display to revert to normal operation.

Appendix

Log Operation

When doing QC work with films or tapes, an operator must look for flaws, and log the type of flaw and time code, often by hand.

The ES-SloMo includes a mode to help automate this task. When in this mode (accessed thru the Menu Item "Log Operation",) Machine #4's output is used to send a special command upon the operator's pushing of one of the buttons immediately below the display. This command will be in the form:

```
74h bb ff mm ss hh cs
```

Where:

bb is button # from 0 to 5. This is intended to be an indication of the type of flaw found by the operator and is entirely definable by the user.

ff mm ss hh is the timecode as returned from the machine immediately preceding the button press. It is in BCD format.

cs is checksum of all the bytes in the packet preceding it. The checksum is truncated to the least significant 8 bits.

The data transmission from the ES-SloMo follows the standard P2 specification. EIA RS-422A at 38400 bits/sec, 8 data bits, 1 stop bit and odd parity. The user will need to (usually) provide a RS-422 to RS-232 or USB converter, and will need to provide a simple application that receives this data and presents it in a useful format. JLCooper may provide this software at some point in the future, depending on demand. Contact the factory for details.

For details on how to connect your ES-SloMo to a computer, refer to the pinout section.

Clip Transfer Protocol

The ES-SloMo can transfer cue information in one of two protocols:

- Ash Vale SM-2a
- ES-SloMo

The SM-2a protocol is:

The port settings are:
38400 bits/sec, no parity, 8 data bits, 1 stop bit.

The data format is

```
0Dh 0Ah <Cue#> 20h <Time>
              :
0Dh 0Ah <Cue#> 20h <Time>
0Dh 0Ah @
```

The ES-SloMo protocol is:

The port settings are:
38400 bits/sec, no parity, 8 data bits, 1 stop bit.

The data format is

```
0Dh 0Dh 0Ah <Cue#> 20h <StartTime> 20h <EndTime>
20h <n1> <n0>
              :
0Dh 0Dh 0Ah <Cue#> 20h <StartTime> 20h <EndTime>
20h <n1> <n0>

0Dh 0Dh 0Ah @
```

Cue# is a three digit ASCII value (000 to 999 or 000 to 399) that specifies the cue location.

`Time, StartTime` and `EndTime` are 11 digit ASCII values that specifies timecode values in the following format:

`hh:mm:ss:ff`

n_1 and n_0 define play speed for the clip in CuePlyStop Slo mode. The actual play speed is can be determined by the following equation.

$$TapeSpeed = 10^{\left(\frac{n_1}{32}-2\right)} + \frac{n_0}{256} \times \left(10^{\left(\frac{n_1+1}{32}-2\right)} - 10^{\left(\frac{n_1}{32}-2\right)} \right)$$

These are the same values sent from the ES-SloMo to a machine and are defined on page 17 of the Sony document *Protocol of Remote (9-pin) Connector 2nd Edition*.

The '@' character terminates the sending of cue data.

When sending data from a computer, a 30 mS delay must be inserted between each cue to allow the unit to write to nonvolatile memory. The ES-SloMo performs this when it sends data.

For details on how to connect two ES-SloMo controllers together or to connect your ES-SloMo to a computer, refer to the pinout section.

Pinout

ES-SloMo to Deck

The table below details the pinout of the cable included with the ES-SloMo.

ES-SloMo Function	Machine 1	Machine 2	Machine 3	Machine 4	Ports 1,2,3,4
Ground	21	11	16	6	1
Receive A	22	25	17	20	2
Transmit B	10	12	5	7	3
Receive B	9	13	4	8	7
Transmit A	23	24	18	19	8

Note: Some decks do not use pin 1 for ground so you may have to connect pin 1 at each end of the ES-SloMo cable to pins 4 and 6 on your deck.

The data transmission from the ES-SloMo follows the standard P2 specification. EIA RS-422A at 38400 bits/sec, 8 data bits, 1 stop bit and odd parity.

ES-SloMo to ES-SloMo / ES-SloMo to Computer

To connect two ES-SloMo controllers together, an RS-422A crossover adapter or cable will be needed. An adapter is available from JLCooper Electronics by ordering p/n 620026. An RS-422A crossover cable can be made by using the following pinout:

1,4,6&9	1,4,6&9
2	8
3	7
7	3
8	2

Note: pins 1, 4, 6 and 9 are grounds and are connected together at each end.

Power

The ES-SloMo requires a 9-12 volt DC power supply capable of delivering 500 milliamps or more. This can be either from the power mains using the provided power supply or directly from 9-12 volts DC. The connector is a 2.1mm coaxial power connector. The center pin is positive. A power switch on the rear panel turns the unit on or off.

The unit comes with a power supply appropriate for the country in which the unit was sold. If you need a power supply specific to your location, please contact your local distributor or JLCooper Electronics.

Warning: Using a power supply other than the unit specified could result in damage to the ES-SloMo and/or other equipment, which is not covered by the JLCooper Factory Warranty.

Location	JLC P/N
North America	PSDC117
Europe (except UK)	PSDC230
Japan	PSDC117

JLCooper Approved Power Supplies

Troubleshooting

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

A common problem is forgetting to turn the power switch on or turning the unit on after the software application has launched.

In addition, the JLCooper website (www.jlcooper.com) will contain up to date information on drivers, applications and troubleshooting.

If all else fails, you can contact the JLCooper Service Department at: service@jlcooper.com.

Care and Service

If properly cared for, your ES-SloMo should provide years of troublefree performance. While the ES-SloMo is built in a rugged metal enclosure, please avoid dropping the ES-SloMo.

Clean with a soft, damp cloth. Do not allow liquids, dust or other foreign matter to get inside the unit.

There are no user-serviceable parts in the ES-SloMo. Please refer to the JLCooper Electronics Limited Factory Warranty on the following page 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 only 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 packed in the original shipping materials and shipped prepaid and insured 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) or unit. Shipping costs, duties, customs, brokerage and other fees to and from JLCooper are not covered by this warranty. JLCooper's normal repair turn around time at the factory is approximately 10 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 representative at the time the return authorization is issued. This warranty provides only the benefits specified and does not cover damage, defects or repairs needed as result of acts beyond the control of JLCooper including but not limited to: abuse, damage by accident or negligence, damage from using incorrect power supply, modification, alteration, improper or abnormal use, unauthorized servicing, tampering, ingress of foreign matter 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, terrorism, etc.

THE DURATION OF ANY OTHER WARRANTIES, WHETHER IMPLIED OR EXPRESS, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN. JLCOOPER HEREBY EXCLUDES INCIDENTAL AND CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO: LOSS OF TIME, INCONVENIENCE, DELAY IN PERFORMANCE OF THIS WARRANTY, THE LOSS OF USE OF THE PRODUCT OR COMMERCIAL LOSS, AND FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY APPLICABLE TO THIS PRODUCT. JLCOOPER SHALL NOT BE LIABLE FOR DAMAGES OR LOSS RESULTING FROM THE NEGLIGENT OR INTENTIONAL ACTS OF THE SHIPPER OR HIS CONTRACT AFFILIATES. THIS WARRANTY SHALL BE GOVERENED BY THE LAWS OF THE STATE OF CALIFORNIA.