HSE-100 VTR CONTROL PANEL

Installation and Operation
Version 4.00
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NEW FEATURES FOR VERSION 4.00 SOFTWARE

These are some of the new features or changes included in version 4.00 software. The details of these features are described later in this manual.

1) Number of cues expanded to 99 per vtr.

2) Outpoint registers added to Cues.

3) Greatly improved edit operation.

4) Programmed Freeze operation added.

5) Momentary Shuttle Option added (Menu-selectable)

6) Non-linear Playback modes added (Odetics and Pioneer)

7) Auto VTR Select function added (Menu-selectable)

8) Production Switcher control fully operational

9) GPI Outputs fully operational

10) Monitor Switcher Control fully operational

11) TBC Control fully operational

12) Buzzer on/off switch added to menu

13) Hard Record Lockout option added (Rear Panel Dipswitch, section 5)

13) Many minor improvements and a few bug fixes

Note:

Version 4.00 main software requires version 4.01 or later slave software in the main board U8 location, and also in the Port Expander, if installed.

The displayed checksum for version 4.0 is **8393.**

WARRANTY STATEMENT

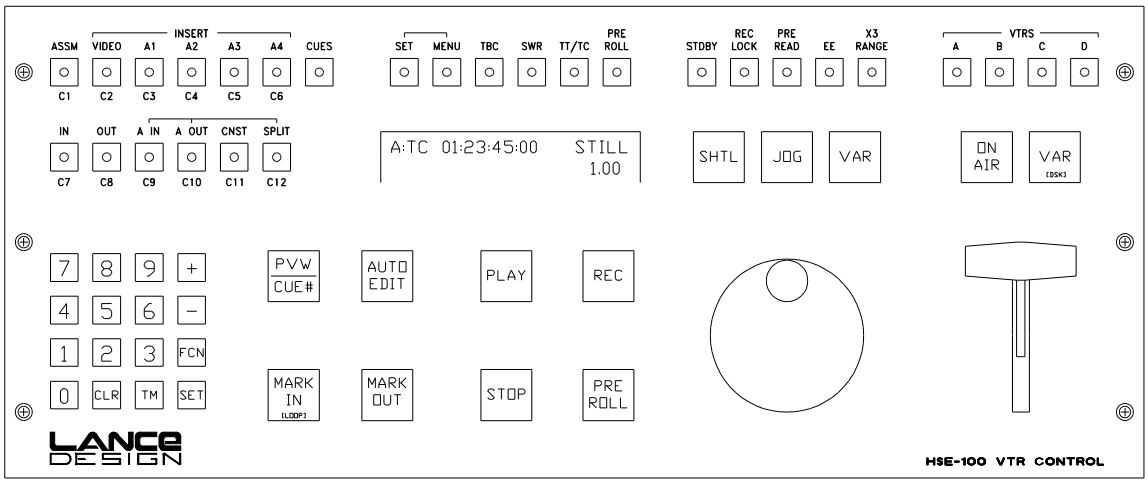
This equipment is warranted to be free of defects in materials and workmanship for a period of two years from date of delivery. Any necessary repairs resulting from defects in materials or in manufacture will be made free of charge provided that the equipment has not been subjected to mechanical or electrical abuse, or modification, as determined by Lance Design, and also that the equipment is returned to Lance Design with prior authorization.

No liability whatsoever is assumed for consequential damages resulting from the use or failure of this equipment. This warranty is in lieu of all other warranties, expressed or implied, including any implied warranty of fitness for purpose.

CAUTION! HAZARDOUS VOLTAGES ARE EXPOSED WHEN THE FRONT PANEL OF THIS UNIT IS REMOVED. DO NOT APPLY POWER WITH THE UNIT DISASSEMBLED.

HSE-100 VTR CONTROL

Front Panel



GENERAL

The HSE-100 controller is designed to be used as a general-purpose transport control panel for vtrs and disk recorders, or any other devices supporting standard Sony P2 (9-pin) protocol. The unit is designed to provide excellent slow-motion control for live use, as well as sophisticated editing functions for pre-production, or other applications.

The editor is a true timeline-based editor, which synchronizes all transports to an internal timeline, resulting in frame-accurate editing, with from 1 to 4 vtrs. The editor also supports unrestricted split edits at both the in and out points, 4-channel audio, and pre-read editing. More editing features are described in the EDITOR section.

Slo-mo operation can be done using either the T-Bar or the Knob to control the replay speed. The Knob allows control from -1X to 3X, or Still to 1X (switchable); the T-Bar always provides control from Still to 1X. The control is high resolution, and selected speed is continuously displayed.

A unique feature of the HSE-100 is that multiple vtrs may be marked, cued, and replayed in sync. If, for example, in a football telecast you wanted to have one vtr iso the quarterback, and another iso the receiver, these vtrs could be cued, put on the air (maybe one in a DVE box over the other), and replayed simultaneously.

Other applications of the unit would be anywhere complete control of vtrs or disk recorders is required, such as graphics workstations, live playback, tape library, etc.

OPERATION

VTR SELECTION

The controller can operate 2 vtrs (or 4 with the optional port expander card) simultaneously, either independently or tied together. Select the machine that you want to control with the vtr selection buttons above the T-Bar. Pressing one by itself switches control to that vtr. Pressing down two or more at once gives you control of multiple vtrs.

When selecting multiple vtrs, the first vtr button pressed will be blinking. This indicates that this is the displayed machine. The status lights in the transport buttons indicate the status of this machine, and the time code (or tape time) will be from this machine. The other selected vtrs will have their buttons lit steadily. This means that they will be controlled, but not displayed.

When multiple vtrs are selected, all of the transport controls (large buttons) as well as the T-Bar and Jog/Shuttle Knob are applied to all vtrs. The smaller buttons apply to the displayed vtr only, even if multiple vtrs are enabled.

TRANSPORT CONTROLS

The transport controls are straight-forward in their operation. There are two VAR buttons, one over the Knob, which selects knob control of variable speed playback, and one over the T-Bar, which selects that device for control. You can use either one anytime you want, or even switch back and forth between them. If you are in variable play (using either control) pressing that VAR button again will put the vtr in pause; pressing it again will revert to the selected variable speed; etc. The '3X RANGE' button above the knob expands the knob variable speed range to -1X to +3X when illuminated.

Pressing the STOP button the first time puts the machine in PAUSE; the second press puts it in true STOP (tension released). Additional presses will toggle between these two modes. The STOP button light will flash in the pause mode, and will be on steadily in the stop mode. (The Pause function of the STOP button is inhibited if the panel is in the edit mode, and the vtr is a recorder. This is because the R-vtr must be in stop mode to see player video through its electronics.)

If the vtr is a cassette machine, the cassette may be EJECTED by holding down the STOP button and pressing the STANDBY button. This will eject the cassette from the currently-displayed machine only.

The large PREROLL button serves a double function. A single press of this button will cue all enabled vtrs to their selected cue times (or edit inpoints in the edit mode) minus their preroll values. A 'double click', or quick double press will park the machine right on the time, without the preroll. This is often referred to as CUE function. Both preroll button lights will flash to indicate when the machine is 'cued' rather than 'prerolled'.

PREROLL

There is a small PREROLL button above the display. When in the CUES mode, pressing this button will display the current preroll time for this vtr (each vtr is independent). The preroll time can be anything from 00:00 to 59:29 (seconds and frames). These times may be entered and manipulated (trimmed, added, subtracted, etc.) just like any other register. To enter the preroll time from the keypad, key in the time (seconds and frames), press SET, and press (small) PREROLL. The small preroll button will be lit when there is a non-zero preroll value entered.

If the panel is in the EDIT MODE, (CUES button not lit), the small PREROLL button displays and allows setting of the EDIT ROLL time. This is common for all vtrs. The minimum valid time for EDIT ROLL is 02:00.

If you want to enter an even-second preroll (or edit roll) from 0 to 12 seconds, there is a FAST PREROLL SET function, which saves some keystrokes. Just hold down the small PREROLL button, and press one of the 12 cue buttons (C1-C12). A preroll value corresponding to the cue number will be entered. If you want preroll set to zero, hold down PREROLL and press CLR, or CUES (or key in zero from the keypad, if you'd like).

SELECTING TAPE TIMER OR TIMECODE

Tape time or timecode is selected on a per-machine basis by the TT/TC button above the display. When time code is selected, the button will be lit, and the display will say "TC" after the vtr letter. When tape timer (timer 1) is selected, the button will be dark, and the display will say "TT". This time selection information is sent to the vtr every second or so, so it will override the selection made at the machine when the machine is in remote.

This choice of tape timer or time code also affects which counter in the machine will be loaded when the SET TIME function (next section) is used.

SET TIME FUNCTION

You can set the tape timer or time code generator from the keypad by entering a time, pressing SET, and pressing TM. If time code display is selected (previous section) the time code generator will be set. If tape timer is selected, it will be set. Note that the time code generator time may not be visible until you put the vtr into record mode. Also the generator mode on the machine must be set to INTERNAL and PRESET (or AUTO).

TRIMS AND OTHER REGISTER ARITHMETIC

All of the time registers (cues, in-points, out-points, constant register, preroll values, etc.) may be transferred, added, and subtracted with abandon. The SET key is similar to an 'enter' key, or an 'equals' key, and must (in general) be pressed to calculate the result of the operation, and prepare the time to be stored in a destination register. Some examples are below.

- To transfer ('copy') registers: Press 'from' register, say C1
  Press SET
  Press 'to' register, say C2

This copies the time value in C1 to C2, leaving C1 unaffected.

- To add a keyed-in time (trim): Press the register button, say C1 again.
  Press the '+' key
  Enter the time value on the keypad
  Press the SET key (this calculates the result)
  Press the C1 key again (saves the result in C1)

- To subtract a keyed-in time: Do the same as above, except use the '-' key

- To add or subtract two registers: Press the first register button
  Press the '+' or '-' key
  Press the second register button
  Press the SET key (calculates the result)

and if you want to store the result: Press the destination register button

- To find a duration (edit mode): Press the buttons corresponding to the two time registers at the same time.

You can also transfer a time from one vtr to another. For example say you wanted to transfer the time in VTR A Cue 1 to VTR B Cue 12.

Select VTR A with the vtr selection buttons
Press C1
Press SET
Select VTR B
Press C12

FAST TRIMS OF TIME REGISTERS

There is a much easier way to do register trims if you only need to change the value by a few frames. Just hold down the button corresponding to the register that you want to trim (edit points, constants, or cue in/out points) and press the '+' or '-' keys on the keypad. The register will be trimmed by 1 frame for each press.

TO CUE TO A SPECIFIC REGISTER (OTHER THAN AN INPOINT)

If you want to cue to an outpoint for example, hold down the 'OUT' register button and press the (big) PREROLL button. This will cue the vtr to the outtime minus the preroll value. If you want to park right on the outtime, do the same thing, but 'double-click' the PREROLL button.

This 'GO-TO' function works on all edit point registers, the constant register, and when in CUES mode, on the CUE IN and OUT points for cues 1-12. This function can not be used on the extended cues (cues 13 through 99) outpoints, since there is no button to hold down. You can of course cue to any of the cue inpoints.

- ***There are two distinct modes in which the panel may be operated. They are CUES mode and EDIT mode. This selection is made by pressing the 'CUES' button in the upper left section of the panel. It lights red to indicate the CUES mode, and is off when the panel is in the edit mode.***

- ***When in CUES mode, the labels below the 12 buttons in the upper left section apply (C1-C12), and the PVW/CUES# button performs the CUE# function. When in the edit mode, the upper labels apply.***

- ***Use the CUES mode for replay or clip playback operation; when you want to store several cue points. Use the EDIT mode for all editing operation.***

CUES MODE OPERATION

SELECTING CUES

When the CUES button is lit, the panel is in the CUES mode, and you have 99 cues available **per vtr.** Cues 1 through 12 may be selected using the dedicated C1 through C12 buttons. Cues 1 through 99 may be selected by pressing the 'CUE #' button (PREVIEW button in edit mode), and then a two-digit number. This is exactly the same as pressing the dedicated buttons for C1 through C12, except that you have access to 99 cues.

If a cue in the range 1-12 is selected, its dedicated button will be flashing. If a cue in the range 13-99 is selected, the 'CUE #' button will be lighted. The currently-selected cue inpoint may be recalled by 'double-clicking' the 'CUE #' button. You can also scroll up and down through the cues by holding down the 'CUE #' button, and pressing the '+' or the '-' key.

ENTERING TIME VALUES INTO CUE REGISTERS

Each cue number (1-99) has an inpoint and an outpoint. You can **enter the current vtr time** (MARK) by pressing the MARK IN and MARK OUT buttons. If there is no inpoint stored for the selected cue, the MARK IN button will be dark. If no outpoint, the MARK OUT button will be dark.

Since the cue registers have an inpoint and an outpoint, the also have a **duration.** This may be calculated and displayed by pressing the 'TM' button on the keypad.

(The reason that there is an outpoint associated with the cue registers is to allow the definition of segments or 'clips', which may then be entered into a sequence or playlist, and if controlling certain disk recorders, played back without editing. Even if you're not using them for this function, the outpoints may still be useful to keep track of segment outtimes, calculating segment times, or any other use you might have. They do not affect operation except in the sequence play mode.)

You can **enter IN times from the keypad** by doing the following:

	a)	Key in the time on the keypad (you don't need to enter leading zeros)
	b)	Press the 'SET' key in the keypad
	c)	Press either a dedicated cue button (cues 01-12)
OR	c)	Press the 'CUE #' button, then a two-digit number (cues 01-99)
OR	c)	Double-click the 'CUE #' button. This will enter the time into the current cue register (the most-recently selected).

You can **enter OUT times from the keypad** by doing exactly the same as above, except press the 'FCN' key between steps (b) and (c).

RECALLING CUE REGISTERS

You can recall the inpoint time of a cue by doing any one of four things:

a) Press the dedicated cue button (cues 01-12)
b) Press the 'CUE #' button, then a two-digit number (cues 01-99)
c) Double-Click on the 'CUE #' button (to recall the currently-selected cue)
d) Scroll to the cue number by holding down the 'CUE #' button, and using the '+' or '-' keys

You can recall the outpoint time of a cue by doing any of these three things:

a) Press the 'FCN' key, then press the dedicated cue button (cues 01-12)
b) Press the 'FCN' key, then press the 'CUE #' button, then a two-digit number (cues 01-99)
c) Press the 'FCN' key, then double-click the 'CUE #' button. (recalls currently-selected cue outtime)

COPYING FROM ONE CUE TO ANOTHER

a) Recall the time that you want to copy as described in the Recalling Cue Registers section.
b) Press the 'SET' key in the keypad
c) Press either a dedicated cue button (cues 01-12)
OR c) Press the 'CUE #' button, then a two-digit number (cues 01-99)

In and out times must be copied separately.

CLEARING CUE REGISTERS

Cue registers may be cleared either one at a time, as the group 01-12, or as the group 01-99. If you clear a cue by itself, the in and out times are cleared separately. If you clear a group of cues, the in and out times are both cleared at the same time.

To clear an individual cue IN point:

a) Press 'CLR'
b) Press 'SET'
c) Press either a dedicated cue button (cues 01-12)
OR c) Press the 'CUE #' button, then a two-digit number (cues 01-99)
OR c) Double-click the 'CUE #' button (to clear the currently-selected cue)

To clear the corresponding OUT point, press the 'FCN' key between steps (b) and (c) above.

(continued)
To clear the group of cues 01-12 (IN and OUT points):

a) Press ‘CLR’
b) Press ‘SET’
c) Press ‘CUES’ button (next to C6 in the top row)

To clear the group of cues 01-99 (IN and OUT points):

a) Press ‘CLR’
b) Press ‘SET’
c) Hold down ‘CUE #’ button, and press ‘CUES’ button, as above.

(This is deliberately awkward, to hopefully prevent clearing all 198 registers by mistake)

Note that if ‘Archived Cues’ is turned on in the menu, cues 01-06 will not be cleared as part of either group, but they may still be cleared individually.

PARKING THE VTR AT A CUE POINT

When the PREROLL button is pressed, the vtr will cue to the inpoint of the cue, minus any preroll time. If the PREROLL button is double-clicked, the vtr will park right on the cue inpoint, ignoring any preroll time.

CUES AUTO-STEP OPERATION

There is an AUTO STEP option in the menu (see menu operation section). When this is enabled, the selected cue will advance each time the MARK IN button is pressed. This rotation includes only cues 01-12. Cues 13-99 are not included.

ARCHIVED (or saved) CUES

If menu item 03, “Archived Cues” is set for “None”, the auto-step will rotate through all 12 cues. If Archived Cues is set for “1-6”, then cues 1-6 will be left out of the rotation; auto-step will include only 7-12. Cues 1-6 may then be used as saved cues.

MOMENTARY SHUTTLE BUTTON OPTION

Starting with version 3.0 software, there is a menu item (Item 06, Momentary Shuttle On/Off) which affects the operation of the shuttle button only when the panel is in the CUES mode. If this item is ON, and the panel is in the cues mode, the vtr will stay in shuttle only as long as the button is held down. When the button is released, the vtr will be placed in the JOG mode. This may be useful for rapid recueing of replays.

END OF RECORDING PROTECTION

There is an end-of-recording ("EOR") protection feature, which must be enabled in the menu (Item 01) each time the HSE is powered up. If enabled, this prevents the vtr from going past the end of the last recording only in the VAR and JOG forward modes. Normal Play will not be affected.

If the EOR is on, and active, you will get an "EOR IN XX:XX" prompt in the display. This shows you how much tape time remains until the end of the last recording. As the vtr approaches the end of the recording, you will get warning beeps at 45, 30 and 15 frames out, and the vtr will go into pause just before the end of the recording.

Two important notes regarding this feature:
The EOR feature is not reliable in playback speeds greater than 1X.
The EOR feature operates only on the currently-displayed vtr.

PROGRAMMED FREEZE

You can use the EOR feature to stop a variable-speed playback on any desired frame, by entering a time value into the 'last frame' register. Normally this frame stores the last frame of a recording, but you can enter any time you want into it by:

a) Keying in a time on the keypad
b) Pressing 'SET'
c) Pressing 'STOP'

Or if you want to mark a time from the tape (more likely), use the MARK OUT register to grab the time:

a) Park the tape where you want to freeze
b) Press 'MARK OUT'
c) Press 'SET'
d) Press 'STOP'

The display will say 'Freeze Point Set'. Now the operation will be just like it is with the EOR feature normally. When you roll the machine (prior to the programmed point) in VARIABLE or JOG, the display will count you down to the freeze, and put the vtr in STILL at that time.

CLEARING THE EOR REGISTER

If the EOR function is enabled, the 'last frame' register may be cleared (preventing EOR operation until another recording is made) by holding down STOP and pressing CLR. The display will prompt "EOR Register Clear".

Remember that menu item 01, 'EOR Stop' must be enabled each time the panel is powered up for both of the above features to operate.

SUPER SLO-MO MODE

Menu item 04 selects the Super Slo-mo Mode. If this is on, the range of the variable play controls (Knob and T-Bar) will be reduced to 33% of what they normally are, for use with super slo-mo (90-frame) vtrs. The resolution is increased so that the controls have the same travel as in normal mode.

AUTO VTR SELECTION

This feature is provided to allow enabled vtr status (the VTR buttons above the T-bar) to be stored with the cue time data, so that when a cue is recalled, it automatically selects a slave vtr, if the cue was saved with the slave(s) enabled.

The purpose of this feature is to automatically play back multiple channels of video from two (or more) transports (for example key and fill video), without having to manually select the same cue number on each transport, and then manually enable the vtr ports.

Here's how to use it:

a) The feature must first be turned on in the menu. Since this is a rarely-used feature which could cause problems if it were enabled without the operator's knowledge, it is turned off each time the controller is powered up. This way, it should always be off unless the operator specifically turns it on. It must be enabled during both the save and recall operations.

b) Mark or enter the intime for each vtr, using the same cue # (say cue # 1) for each required vtr (you can use up to 4).

c) Hold down the button for the primary vtr, and press the vtr buttons for the secondary vtr(s). (In other words, enable all required machines, with the primary one being the displayed vtr)

d) Re-save the cue (in our example, cue # 1) by copying it to itself;
Press C1
Press 'SET'
Press C1

This re-saves Cue #1, this time including the vtr enable information for all machines.

When this cue is recalled the next time, it will do two things:

a) It will set the vtr enable buttons to the state they were in when the cue was saved (all required vtrs enabled).

b) It will recall the same cue # for all enabled vtrs. In our example it would select Cue #1 for all enabled vtrs.

When the PREROLL button is pressed, all vtrs will go to their respective cue #1's, and when PLAY is pressed, they will all roll in sync. (This feature is primarily designed for use with the Tektronix Profile, and the sync roll has not been verified using other transports.)

An astrisk next to the cue number indicates that more than one vtr has been enabled. An underscore '_' indicates that no auto vtr select data is present for the recalled cue.

NON-LINEAR PLAY OPERATION

Version 4.0 also supports non-linear (or 'clip') playback operation with some disk recorders. Two protocol types are supported, as selected by menu item 43, 'Disk Protocol'. The two options are 'Odectics' which is the more popular, and 'Pioneer', which is supported by the Pioneer Laser Disk, and a couple of digital disk recorders (specifically the Drastic Technologies VVCR, and the ASC Virtual Recorder). The disk manufacturers change their supported control protocols from time to time, but this is correct so far as I know.

SEQUENCE ENTRY MODE

There are three sequence storage registers available per vtr. These sequences are built in the 'sequence entry mode'. This is accessible by pressing the function key, then pressing either the 1, 2, or 3 key (this accesses sequence 1, 2, or 3 respectively). The controller must be in the 'CUES' mode of operation, and segments defined for each cue involved (using the "MARK IN' and 'MARK OUT' buttons or the keypad).

Once in the sequence entry mode, pressing a cue button (C1 - C12), or 'CUE #' and a two-digit number (C01-C99) enters that segment into the play list. Pressing the 'CLR' button removes the current item, and closes up the list. Use the '+' and '-' keys to scroll through the sequence. As you scroll to each item in the sequence, the disk recorder will be cued to the first frame of that item (clip). To insert an item in the list, scroll to the point in the list, and enter a cue number. The new item will be inserted after the current item, and the list pushed down.

The left side of the display will say something like S107. This indicated that you're looking at Sequence number 1, Item number 07.

LOOPING

When in this sequence entry mode, pressing the "MARK IN' button will enter the indicator 'LP' into the sequence. This item will cause the sequence to loop back to the first item in the sequence.

CUEING AND PLAYING A SEQUENCE

Once a sequence is entered, pressing the "PREROLL' button will cue the sequence and calculate the total running time. Pressing "PLAY' will start the sequence playing.

One press of the "STOP' button will stop the sequence, and return you to the sequence entry mode. Pressing "STOP' when in the sequence entry mode will cancel the non-linear play operation altogether, and return the panel to normal operation.

EDIT MODE OPERATION (CUES button not lit)

If the panel is in the edit mode, the 12 buttons in the upper left of the panel assume the functions described by the labels above the buttons. The top row selects the edit type, and enables the desired channels. The bottom row selects the in and out point registers and turns on the split edit function if desired. The CNST (constant) button on the bottom row is simply a scratchpad register which you may use to hold any desired time for later use.

Also, when in the edit mode, both the MARK IN and MARK OUT buttons are lighted. These are used to mark video in and video out points. If SPLIT is turned on (you must have selected INSERT VIDEO and at least one AUDIO channel before you can turn SPLIT on), and either A IN or A OUT is pressed, these buttons begin to flash. This indicates that the MARK buttons now mark the AUDIO in and out times instead of video. This mode may be cleared with the CLR button, or by pressing IN or OUT.

If the registers are empty, the MARK buttons are not lit. If registers contain a time value, MARK buttons are lit.

TO PERFORM AN EDIT

- Select the desired record machine with the VTR Select buttons. Select the edit mode and channels desired (Assemble, Insert V, A1, etc.), and enter an in point. Enter an out-point if desired. If no out-point is entered, the edit will be open-ended. The duration may be checked by pressing down the IN and OUT buttons at the same time.

- If desired select a second (or third, or fourth) vtr as a player. For a player, do not turn on any of the edit modes (assemble or insert); just set an inpoint. All edit durations are determined by the recorder, so player outpoints are ignored.

- Now engage all desired vtrs by pressing down the vtr select buttons at the same time. The first one you press will be the displayed vtr (IT DOESN'T HAVE TO BE THE RECORDER, but it may be confusing if it isn't!). Once all desired machines have been selected, press PVW to preview the edit, or AUTO EDIT to do the recording. Note that the record vtr's editor is only turned on when required, and turned off when the edit is completed, so you don't have to worry about turning off the editor for playback.

- The machines roll, synchronize, and perform the edit (or preview), postroll, and stop.

- If any machines are not able to synchronize, the edit will abort and an error message will be displayed. The cause for this will most probably be a color framing error with the record machine. This is usually evident by rapid, repeated attempts to synchronize during the preroll. Try changing the MANUAL COLOR FRAME in the menu (Item 14), or select COLOR FRAME AUTO (Menu Item 13), and let the editor swap it for you. If you don't want to worry about color framing, and are willing to sacrifice a couple of frames of accuracy, select EDIT ACCURACY = 2 FRAMES (Menu Item 12).

- Another thing to try if a vtr fails to synchronize is to lengthen the EDIT PREROLL. There is a learning process within the servos, however, so give it a couple of tries first.

OTHER EDIT MODE NOTES

- Once an AUTO EDIT (or PREVIEW) has been started, another vtr which is not involved in the edit may be selected and operated manually. This might be useful if you're editing together highlights, and want to run a slo-mo playback manually. Set up the edit on the record machine, press AUTO EDIT, then select the player with the vtr buttons, and operate it as you normally would. It will not interfere with the edit.

- Another unusual feature is that you can mark new in and out points while an auto edit is in progress, without affecting the current edit. This allows you to mark the next edit while the current edit is happening.

MORE ON COLOR FRAMING

Dealing with color framing is a necessary evil with this type of editor, but I've tried to make it as painless as possible. For those interested, here's what happens on a more technical level:

When an edit is initiated, the HSE-100 puts all players in 2-field capstan lock, and puts the recorder in 4-field or 2-field, depending on Menu Item 15. This should generally be set to 4F. The editor then checks the R-VTR inpoint for even or odd status, and compares that to an arbitrary color frame reference (the field counter) within the HSE-100. The edit timeline (to which all vtrs are sync'ed) is started when there is coincidence. *(If editing machine-to-machine with DVW-series digital betas using the serial digital interconnect, you may want to select 2-field lock on the recorder. Otherwise you'll be forced to manually maintain even-even or odd-odd pairing with the player).*

If this color frame phase agrees with the R-vtr's internal color framer (which is looking at off-tape video), then all is well and the edit proceeds. if they don't agree, then the two servos battle it out, and the edit aborts. If AUTO COLOR FRAME is turned on in the editor, it will then flip the phase of the internal color frame reference and prompt you to try the edit again. The servos should now agree and the edit should be successful.

This abort-flip-retry sequence should happen only once, or at most once per record tape (if the tape's timecode to video relationship is consistent). It may also happen when the editor or the sync generator is powered down, since the editor's field counter starts arbitrarily at power up.

If you don't want to deal with all of this, select EDIT ACCURACY = 2 FRAMES in the menu. This allows the vtr's color framer to take precedence, and the edit should never abort (at least for this reason).

If you are using the tape timer on the record machine, the 2-frame accuracy is forced, since it isn't possible to color frame reliably based on tape timer numbers, which slip.

USING THE MENU

- To enter the menu mode, just press MENU
- To select the desired item, either turn the Knob, or use the '+' and '-' keys
- To change the setting, press the SET MENU key (above the display)

If there are only two choices the SET MENU key will toggle between them; If there is a range of values (e.g. Trans Rate) hold down the SET MENU button, and turn the knob.

- To exit the menu mode, press MENU again

MENU ITEMS

01 EOR STOP (ENABLED or DISABLED)
Enables the automatic end of recording protection

02 CUE AUTO-STEP (ON or OFF)
If on, cues advance before each MARK; if off, they don't

03 ARCHIVED CUES (NONE or 1-6)
If set to 1-6, cues 1-6 will not be cleared by CLEAR ALL, and will not be in auto-step rotation

04 SUPER SLO-MO MODE (ON or OFF)
When on, variable speeds are scaled by 33% for 90 frame/sec recorders

05 TAPE TIMER MODE (12 or 24 HOURS)
Controls tape timer display and arithmetic modes

06 MOMENTARY SHUTTLE (ON or OFF)
Enables momentary operation of the shuttle button (in CUES mode only)

07 PANEL BUZZER (ON or OFF)
Enables the buzzer for such things as Mark In, Register Sets, Etc. The buzzer is always enabled for error or fault alarms.

08 AUTO VTR SELECT (ON or OFF)
Enables auto vtr selection for multi-channel playback (see AUTO VTR section)
This is reset to OFF each time the HSE-100 is powered up, and should be off for most operational situations.

11 EDIT ACCURACY (0 FRAMES or 2 FRAMES)
This is the time line accuracy demanded of the vtrs in an auto edit. If 0 frames is selected, then color framing must be considered. If 2 frames is selected, then the HSE-100 will attempt to sync the machines, but once synchronization has been reached, the HSE-100 will release control to the vtr's color framer, resulting in a possible +/- 1 frame error at the in and out points.

MENU ITEMS (CONTINUED)

12 PREREAD CANCEL (ENABLED or DISABLED)
If this item is enabled, the controller will automatically turn off Preread (if it was on) after the completion of an auto edit.

13 COLOR FRAME (AUTO or MANUAL)
If AUTO is selected, and the record machine fails to synchronize during an auto edit in a manner which indicates that the problem may be color frame phase, the HSE-100 color frame will automatically be swapped, and a “Retry” prompt displayed. If MANUAL is selected, no change will be made to the internal color frame reference, only a sync error message will be displayed.

14 MANUAL COLOR FRAME (A or B)
Indication of the HSE-100’s internal color frame phase. This is an arbitrary indicator, and does not have an absolute relationship with reference video.

15 R-VTR CAP LOCK (2F or 4F)
Determines capstan lock mode of recorder in an auto edit.

21 GPI 1 (Off, In Time, Constant)
Selects the trigger for the GPI 1 output as follows:
Off - No Trigger
In Time - Triggered at current (displayed) vtr video in time.
Constant - Triggered at time of Constant register for current vtr.

22 GPI 2 (Off, In Time, Constant)
Same as above for GPI 2.

23 AUTO-TRANS (Off, In Time, Constant)
Same as above for production switcher auto-transition (when SWR button is lit)

24 SWR TRANS RATE (00-99)
Transition rate for production switcher auto-transitions. Set by holding down MENU SET button and turning jog knob.

25 SWR TYPE (GVG 300 or GVG 3K/4K)
Selects the type of production switcher controlled via the UTIL RS-422 port. See section on SWR CONTROL in this manual.

26 SWR BANK (F/F or M/E 1)
Selects which bank of the production switcher will be controlled.

27 SWR X-POINT CONTROL (On/Off)
Enables of disables automatic control of production switcher crosspoints. If this is set to OFF, swr transitions and DSK functions may still be controlled, but crosspoint control will be inhibited.

MENU ITEMS (CONTINUED)

28 MONITOR SWR (ENABLED or DISABLED)
Enables control of a Grass Valley 'Performer' 10X1 monitor switcher via the 'AUX' port.

31-34 SWR XPTS (00-48)
Allows assignment of switcher crosspoint (input) numbers to each vtr selection button on the HSE-100. Change by holding down MENU SET key and turning knob.

35-38 MON SWR XPTS (00-10)
Allow assignment of crosspoint numbers for each vtr for the external GVG Performer monitor switcher.

39 PROGRAM MON XPT (00-10)
Allows assignment of the Program input to the external monitor switcher. This feature is available for future implementation of an external preview capability.

41 UTIL PORT (PROD SWR or EDL COMPUTER)
Selects function of UTIL RS-422 port on rear panel. EDL COMPUTER is not yet implemented; must be set to PROD SWR for switcher control to work.

42 AUX PORT (MON SWR or EDL COMPUTER)
Same as above for the AUX port (contained within the D-15 'AUX/GPI' connector.) Must be set to MON SWR for that function to work.

43 DISK PROTOCOL (ODETICS or PIONEER)
Selects which extended protocol is used for the Non-linear (sequence) play mode.

50 VTR TYPE DISPLAY (display only - cannot be changed)
This displays what type of machine the HSE-100 thinks it's connected to.
If the vtr is not recognized (or not responding) the type display will be UNKNOWN, and the parameters will default to those for a Sony BVW-75.

FAULT AND ERROR MESSAGES

There are several fault, error, and warning messages which may appear on the display of the controller. In some cases these indicate a condition which will prevent the requested operation from taking place. In other cases they are just warnings for the operator of a non-standard condition.

NOT INSTALLED - This is displayed if VTR C or D is selected and the optional port expander card has not been installed.

NOT RESPONDING - The displayed VTR is not communicating with the controller. Check cables, connections, etc.

IN LOCAL - The displayed VTR is communicating, but does not have remote control enabled.

TAPE OUT - The displayed VTR is not threaded (loaded).

VTR FAULT - The displayed VTR is reporting an internal problem; check the VTR's fault display.

NO SERVO REF - The VTR is reporting that it is missing its reference (black) signal.

TAPE TROUBLE - The VTR is reporting that it has a transport or tape problem, such as tension, tape slack, etc. Check the VTR's fault display.

NO EXT REFERENCE - The reference signal is missing from the controller. This will appear when an auto function (EDIT or PREVIEW) is attempted without reference video connected to the controller.

R-VTR RECORD LOCK - The VTR assigned as the edit recorder has a record lockout set, either at the controller, or at the machine.

NO VIDEO INPOINT - THE R-VTR in the edit has no video inpoint marked.

NO AUDIO INPOINT - The R-VTR in a split edit has no audio inpoint.

NO MARK - One of the VTRs is missing a required inpoint or cue mark

ILLEGAL SPLIT DURATION- The Audio Inpoint is later than the Video Outpoint, or vice-versa. In a split edit, the video and audio must overlap.

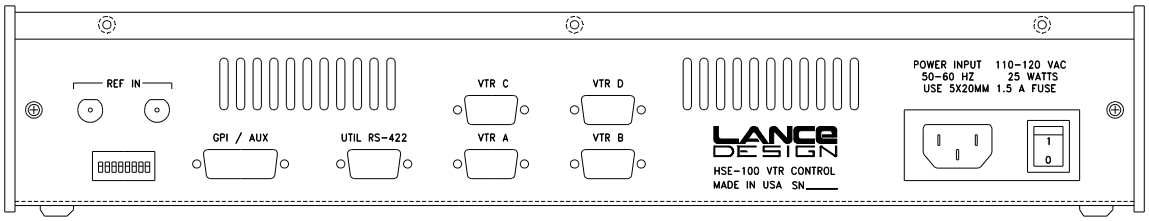
(continued)

FAULT AND ERROR MESSAGES (continued)

NEGATIVE DURATION -	Indicates that the outpoint is before the inpoint. This is a warning only; the edit will proceed but will be open-ended.
SYNC ERROR -	One of the VTRs involved in the edit or preview was unable to synchronize to the timeline during the preroll. This could be due to the color framing not being correct; to the preroll not being long enough, or to a VTR fault.
CF SWAPPED - RETRY	The attempted edit was aborted because the record VTR would not synchronize during preroll. The controller then changed the phase of the internal controller CF reference, and is prompting you to re-try the edit. This will only happen if Menu Item 13 (Color Frame) is set to AUTO.
NO RESPONSE -	One of the VTRs involved in an auto function (edit or preview) is not communicating with the controller.
NOT READY -	One of the VTR's involved in the edit is not in remote, or has no tape loaded.
NO CUE SET -	Displayed when the panel is in CUES mode, and PREROLL is pressed, if the selected cue register is empty.
PANEL IN CUES MODE -	Displayed if PREVIEW or AUTO EDIT is pressed and the panel is in CUES mode. Panel must be in edit mode (CUES button not lit) to perform these functions.
MULTIPLE RECORDERS -	Displayed when more than one of the VTRs enabled has its editor turned on (assemble or insert buttons lit). Only one recorder is allowed at a time.
CODE TYPE MISMATCH -	If a calculation or other operation is attempted in which there is a combination of drop-frame and non-drop-frame timecode, this error message is displayed.
NO ITEMS IN LIST -	If in non-linear play mode, this message is displayed if you attempt to cue a sequence which is empty (contains no clips)
ITEM XX NOT VALID -	If in non-linear play mode, this message is displayed if you attempt to cue a sequence which contains an item (clip) which is missing an in or out point, or is neg. duration.

After some of the above messages a VTR designation will be displayed. This is the offending machine. If there are several problems, the first one encountered will be indicated. Once it is fixed, the next one will be displayed, etc.

INSTALLATION AND CONNECTIONS



HSE-100 REAR PANEL

VTR CONNECTIONS

Connect the 9-pin port(s) desired to the vtr's remote connectors using a standard pin-to-pin RS-422 cable, with male D-9 connectors on each end. This cable can be of almost any length (up to 1000 feet).

With the basic HSE-100 unit, ports A and B are supported. With the optional port expander (HSE-PX), the additional ports C and D are supported.

If the port exists, but there is no response from the vtr, the display will say "Not Responding". If the port expander is not installed, the display will say "Not Installed" for ports C and D.

REFERENCE BLACK

For basic slo-mo control, reference black is not usually required, although it is recommended, since it determines when in the frame commands are sent to the vtr, and some machines are a little picky about that.

For editing functions, reference black (or bars, etc.) must be connected and be synchronous to the vtr's reference (at least within a line or so).

UTIL RS-422 PORT

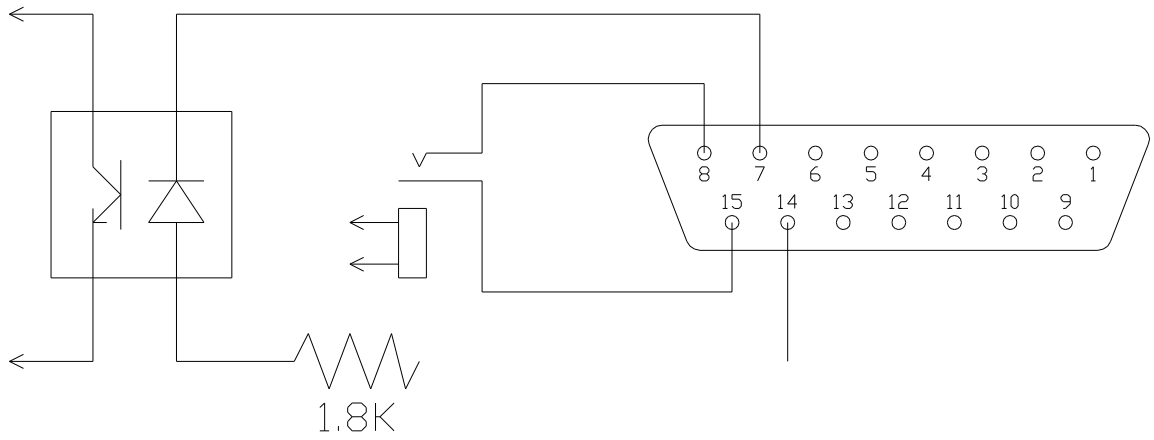
The utility RS-422 port can currently be used to control a Grass Valley Production switcher. See section on PRODUCTION SWITCHER CONTROL in this manual.

GPI/AUX CONNECTOR

The 15-pin AUX/GPI connector provides opto-isolated inputs for a tally voltage, which, when applied, lights the ON LINE button on the panel. In addition, this button closes a pair of dry relay contacts which may be used for a TAKE ME light, or an intercom mike switch, or ???. This connector also contains the GPI outputs, and the AUX RS-422 port. Connections are shown on the following page.

TALLY and ON-LINE SWITCH CONNECTION WIRING (AUX/GPI CONNECTOR)

The internal wiring for the tally and ON-LINE switch contacts are shown below.



• The tally voltage (+5 to +24vdc) should be applied to pin 14, with pin 7 as the return. This input drives an opto-isolator diode, and *is polarity-sensitive*.

• The ON-LINE button on the panel closes the relay contacts wired to pins 8 and 15. These are dry, isolated contacts which may be used for any desired purpose. The contacts are rated at 200 Volts, 0.5 Amps, non-inductive.

GPI CONNECTIONS

The GPI outputs are TTL-level (Really CMOS, 0 vdc low, +5 vdc high) gate outputs. They are NOT open collector, but actively pulled high. The GPI's are normally high, and pulse low for 5 frames when triggered.

Pinout for the GPI/AUX Connector is:

Pin 1 - +5 volts via 10-ohm resistor (limit current to 50 ma)
Pin 2 - Aux RS-422 RX (Inverting) Input
Pin 3 - Aux RS-422 TX (Non-Inverting) Output
Pin 4 - GPI Input (Not currently supported)
Pin 5 - GPI 1 Output
Pin 6 - GPI 2 Output
Pin 7 - Tally Opto-Iso Input (- polarity)
Pin 8 - On-Line Button Relay Output
Pin 9 - Aux RS-422 RX (Non-Inverting) Input
Pin 10 - Aux RS-422 TX (Inverting) Output
Pin 11 - Ground
Pin 12 - Ground
Pin 13 - Ground
Pin 14 - Tally Opto-Iso Input (+ polarity)
Pin 15 - On-Line Button Relay Output

UTIL RS-422 PORT

The UTIL-RS-422 port is configured as a SMPTE "Controlling Device" using RS-422 signals at 38.4K Baud, ODD Parity, 1 Stop Bit. This port is intended to control a production switcher through the switcher's 'editor' port, or similar serial port.

CONNECTING THE PRODUCTION SWITCHER

The only switchers currently controlled are GVG 300, and GVG 3000/4000 models. The 300's must be equipped with a serial interface adapter (SIA). This interface is standard in the 3000/4000's.

Connect the UTIL RS-422 Port of the controller to the EDITOR port of the 3000/4000, or an unused serial port of the 300 SIA using a standard pin-to-pin 9-pin cable. The switcher protocol must be set to 38.4K, Odd Parity, and 1 Stop bit. These are the normal editor interface settings. Enable editor control at the switcher by pressing the EDITOR control enable button. Enable switcher control at the HSE-100 by pressing the SWR button. Make sure the crosspoints and swr type are set in the HSE-100's menus.

DIAGNOSTICS

There are some diagnostic routines in the software which may be invoked by turning on dipswitch #1, and then powering the unit up. This will first display the version message, then run the diagnostics.

NOVRAM INITIALIZE

You can initialize all of the time registers and menu items to a default condition by setting dipswitch #2 on (all others off) and powering the unit up. The unit will display the version message, then initialize the NOVRAM, then jump to the diagnostic tests.

End the diagnostics by turning dipswitch sections 1 and 2 both off. When the unit gets to LAMP TEST (last diagnostic) it will return to normal operation.

CHECKSUM

The checksum for the main EPROM will be displayed during the diagnostic routines. This is a test of both general CPU operation, and EPROM integrity.

The correct checksum for Version 4.00 software is **8393**

TBC CONTROL WITH THE HSE-100 VTR CONTROLLER

The HSE-100 VTR Controller can control VTR TBC or output video processor levels and timing. This is possible only for vtrs or disk recorders which allow these levels to be controlled via the standard RS-422 machine control port, via the standard Sony protocol.

Machines which allow this include:	Panasonic	AJ-D350
		AJ-D351
		AJ-D360
		AJ-D580
	Sony	DVR-10
		DVR-18
		DVR-20
		DVR-28
		DVW-500
	Drastic Technologies	VVCR Disk

I'm sure there are others, but these are the ones I know about.

To access this control, just select the vtr that you want to adjust, and press the 'TBC' button above the display window. Select the parameter that you want by using the '+' and '-' keys on the keypad.

If there is no number displayed after the parameter label, then the vtr does not support this control protocol.

Levels are adjusted with the jog knob, and may be set to UNITY by pressing the "CLR' (clear) button on the keypad. This sets only the selected parameter to unity.

This level adjustment data is stored in the vtr, not in the panel, so that there is no need to re-set levels if machine assignments are changed.

HARD RECORD LOCKOUT

If the controller is being used as a playback station, and it is desired that all record operation be inhibited, section 5 of the dipswitch on the rear panel may be turned on (up position). This forces a hard record lockout for all vtrs. The red 'REC LOCK' indicator will light on the panel.

This locks only the HSE-100 panel. It is still possible to put the machine in record from its front panel, for example.

CONTROL OF PRODUCTION SWITCHERS AND MONITOR SWITCHERS

Version 4.0 software supports control of an external production switcher. This allows an editor in the tape room to access dissolves, wipes, keys and other effects on either the program bank or M/E 1 of the production switcher. Control can be either manual or automatic, or a combination of both.

IMPORTANT NOTE: If switcher control is turned on (button above the display), the T-Bar speed control will be disabled, and the normal speed display will indicate [SWR] instead of the usual T-Bar speed display. This is a potential trap if you're not aware of it.

PRODUCTION SWITCHER OPERATION

First make sure the proper swr type is selected (menu item 25) and the bank you want to control is selected (menu item 26).

The HSE-100 can control the production switcher in several ways.

1) It will control crosspoint (source) selection when vtrs are selected for an edit.

2) It will control auto-transitions (with selectable rate) when the T-bar is moved.

3) It will automatically trigger an auto-transition at either the vtr's in time, or at any timecode contained in the constant register.

4) It will mix in and out the DSK (or Key 1/ Title Key when M/E 1 is controlled).

CROSPOINT CONTROL

Assign the proper crosspoints in the menu of the HSE-100. Select menu mode and scroll to ITEM 31, VT A Swr Xpt. Hold down the menu set button, and turn the jog knob to select the proper switcher crosspoint number for VT A. This is the switcher inpoint that will be associated with that vtr. Do the same for the other vtr's. If you are using less than 4 vtrs, you can assign other sources to the unused buttons (still store, black, etc.)

The HSE-100 controls the crosspoints in the following way: It assumes that when you select the vtrs for an edit you are going to do it in a specific sequence. That sequence is:

R-VTR, FROM SOURCE, TO SOURCE

It selects no crosspoint for the R-VTR, sets the FROM source on the A (or program) bus, and sets the TO source on the B (or preset) bus. This sets up the switcher to do the intended transition.

For example, if you are recording on vtr A, and want to dissolve from B to C, you would set all your edit points, and then press the vtr selection buttons in that order, A,B,C.

This would set B vtr on the program bus of the swr, and set C vtr on the preset bus. If you now pull the T-bar, it will auto-transition the switcher between those sources.

EXCEPT IN PREREAD

There is an exception to the above. If the recorder is in preread, the controller assumes that you want to dissolve from the recorder to another source. In this case it will take the RECORDER on the program bus, and the source on the preset bus.

CONTROLLING AUTO-TRANSITIONS WITH THE T-BAR

Once the crosspoints have been selected, an auto-transition may be triggered manually by moving the T-bar off its stop (it doesn't matter which one, top or bottom). This will send an auto-trans command to the switcher, at the rate selected by menu item 24.

This can be done at any time, and as many times as required.

The transition performed depends on the settings of the switcher. If the swr is set to do a wipe, the controller will not alter these settings, except for transition rate.

CONTROLLING THE AUTO-TRANSITIONS AUTOMATICALLY

The HSE-100 can also trigger the auto-transitions automatically. In the menu, item 23 selects the trigger. If it is OFF, control is only manual (T-bar). If you select IN POINT, the auto-trans will be triggered at the displayed vtr's video inpoint. If you select CONSTANT the trigger will be whatever time is displayed in the CNST register.

If you're using the auto-trans trigger, one other thing happens. The HSE-100 will reset the switcher crosspoints to their original TO-FROM configuration at the start of any preview or edit, regardless of where they were. This allows you to repeatedly preview a dissolve without having to manually reset the switcher each time.

CONTROLLING THE KEYER (DSK OR TITLE/KEY1)

The controller can also mix in and out a key, which could be a Chyron, DVE, etc. The HSE-100 does NOT select the key source, it only controls the MIX button, so you'll have to set up the key manually at the switcher.

The control is the VAR button above the T-bar. It will light when the key is inserted. This control is only manual, it just gives you a way to punch keys in and out.

If you are controlling the FF MIX bank, the DSK keyer will be controlled. If you're controlling M/E 1, either the TITLE key (300), or KEY 1 (3000/4000) will be controlled.