



 A Harman International Company

960L

Automation Package

Owner's Manual Addendum



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DOCUMENTATION CONVENTIONS

This document is an addendum to the 960L Owner's Manual. It contains information about the optional Automation Package available for Software Versions 3.0 and above. Refer to the owner's manual for general safety, installation, and operating instructions.

The following symbols are used in this document:

Note: Calls attention to information that is essential to highlight.

Hint: Calls attention to helpful operating instructions.

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ABOUT THE AUTOMATION PACKAGE

Automation is an optional package available for 960L Software Versions 3.0 and above. It allows program change, parameter change, and mute events to be written and played back synchronized to incoming MIDI time code.

The 960L can store up to 100 automation sessions. Each session consists of:

- Word clock settings
- DSP configuration
- I/O routing
- A unique set of user registers
- Global mix settings
- Global I/O settings
- Program change events
- Parameter change events
- Mute events

When an existing automation session is loaded, the 960L is restored to the state saved with that session. Because each session contains its own unique set of user registers, automation is essentially non-destructive. When a session is closed, user registers are restored to their previous state. Sessions can be run on various 960Ls without affecting the existing state of user registers on each individual machine.

In addition, automation session data is saved independent of its originally written time code frame rate, allowing existing sessions to run at any frame rate without affecting timing accuracy. Sessions will automatically conform to any incoming frame rate and remain real-time accurate.

Automating the 960L allows it to perform a series of functions – all synchronized to MIDI time code and played back exactly as originally recorded. During recording or mixing sessions, the 960L automatically makes previously recorded changes synchronized to incoming MIDI time code.

ENABLING INSTRUCTIONS

Before the Automation Package can be enabled, Software Version 3.0 or above must be installed on the 960L.

To confirm that Software Version 3.0 or above is installed on the 960L:

1. Press the CONTROL button on the LARC2 to enter Control Mode.
2. Press the SYSTEM▼ soft button to access the System Information screen shown in Figure 1 at the top of the next page. The 960L REV field indicates the software version that is installed on the 960L, and the LARC2 REV field indicates the software version that is installed on the LARC2. (Both fields are circled in Figure 1 at the top of the next page.)

If Software Version 3.0 or above is installed, proceed to the instructions that begin on the next page. If not, Software Version 3.0 or above must be installed before the Automation Package can be enabled. Refer to the appropriate software installation instructions for assistance.

Note the following before proceeding to the instructions on the next page:

- Use the front panel standby button whenever the instructions call for the 960L to be powered on or off. Do not use the rear panel power switch.
- The enabling process requires the 12-digit license key that came with the Automation Package. Make sure this key is on hand before beginning.
- The enabling process will take about 5 minutes.

To enable the Automation Package:

1. Press the CONTROL button on the LARC2 to enter Control Mode.

Figure 1: System Information Screen

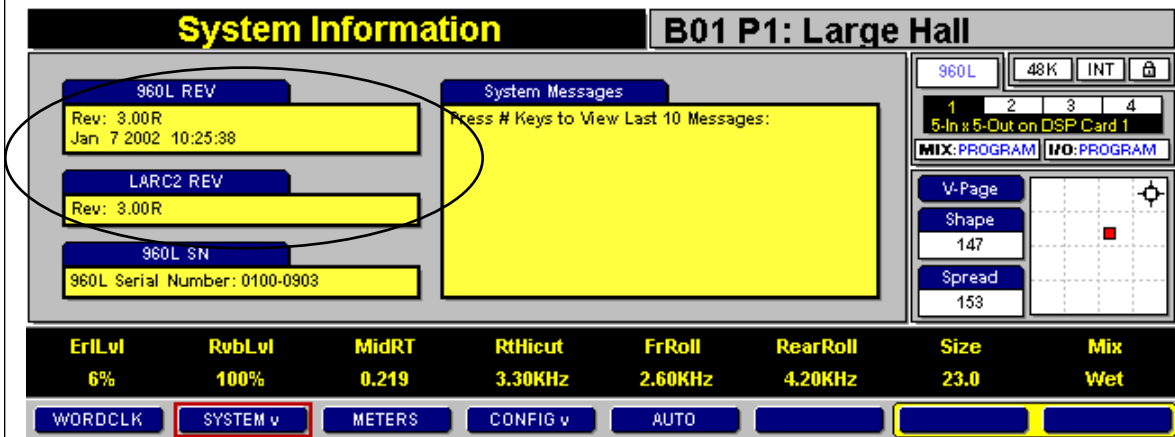
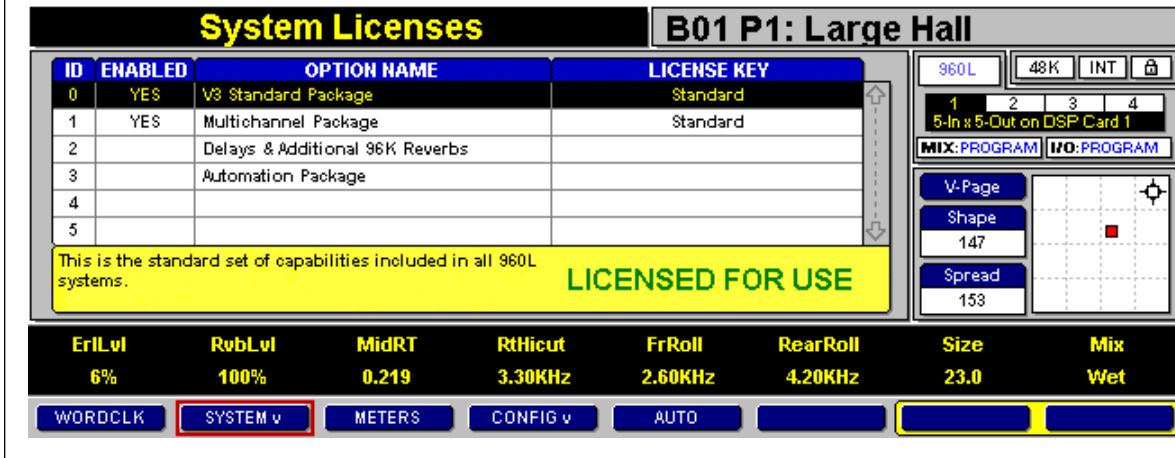
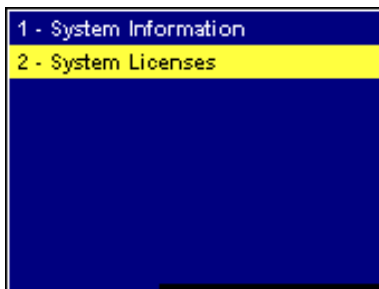


Figure 2: System Licenses Screen



2. Press the SYSTEM v soft button twice in succession to access the SYSTEM v Menu shown in Figure 3 (below).

Figure 3: SYSTEM v Menu



3. Select the System Licenses option to access the System Licenses screen shown in Figure 2 (above).

4. Locate the Automation Package in the Option Name field. If a Yes appears to the left in the Enabled field, the Automation Package has been enabled. Disregard the remaining instructions, and proceed to page 7 to learn more about this package. If a No appears to the left in the Enabled field, proceed to step 5 (page 6).

... Enabling Instructions continues on page 6

Figure 4: License Key Entry Screen

Enabling Instructions *(continued from page 5)*

5. Use the up and down arrow keys on the LARC2 to select the Automation Package. Then, press the ENTER button on the LARC2 to access the License Key Entry screen shown in Figure 4 (above).
 6. Use the numeric keypad on the LARC2 to enter the 12-digit license key that came with the Automation Package. If an incorrect digit is entered, press the – button on the LARC2 to move the cursor back to the appropriate square. Then, enter the correct digit.
 7. When all 12 digits have been entered, use the down arrow key on the LARC2 to select the **save** button located at the bottom of the text editor. Then, press the ENTER button on the LARC2 to enable the Automation Package.
- The following message will display if a valid license key has been entered: "Automation has been Successfully Enabled! When all license keys have been entered, please power cycle the 960L." If this occurs, press the OK soft button that appears at the bottom of the LARC2 display. Then, proceed to step 8.
8. An "Invalid package key" message will display in the top-left corner of the LARC2 display if an invalid license key has been entered. If this occurs, begin again with step 1 (page 5). If the problem persists, contact Lexicon Customer Service at 781-280-0300.
 8. If desired, enter additional license keys at this time. Refer to the documentation enclosed with the license key for specific enabling instructions. If no additional license keys need to be entered, proceed to step 9.
 9. When all license keys have been entered, use the front panel standby button to power cycle the 960L.
 10. When the 960L powers on, follow steps 1 to 4 (page 5) to confirm that the Automation Package has been enabled. If a No appears in the Enabled field for the Automation Package, begin again with step 1 (page 5). If the problem persists, contact Lexicon Customer Service at 781-280-0300.

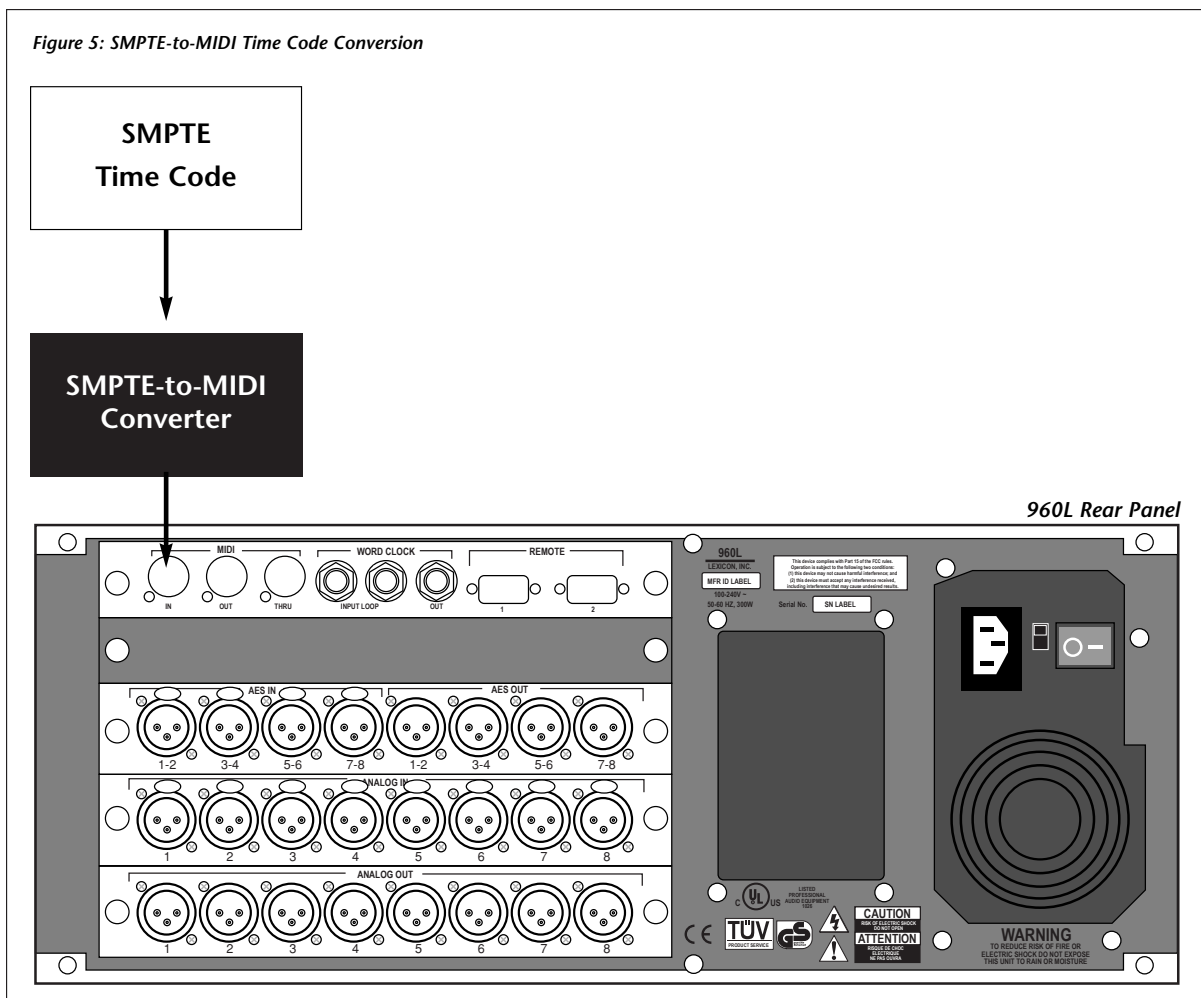
GETTING TIME CODE INTO THE 960L

To take advantage of automation, MIDI time code must be received on the MIDI IN connector located on the 960L rear panel. Because the 960L operates as a slave only, it does not generate its own time code. Instead, MIDI time code must be generated externally. In systems that have the ability to generate MIDI time code, connect the time code source directly to the 960L MIDI IN connector.

SMPT-TO-MIDI TIME CODE CONVERSION

Depending on the system, a SMPTE-to-MIDI converter may be necessary for operation. If the system is based on linear SMPTE time code, a SMPTE-to-MIDI converter must be used as shown in Figure 5 (below). Refer to the converter owner's manual for specific installation and operating instructions.

Lexicon does not recommend a specific SMPTE-to-MIDI converter, as any converter should work. Converters that were used in product development include the Midiman Syncman, Digidesign SMPTE Slave Driver and Universal Slave Driver, the Mark of the Unicorn MIDI Timepiece AV, and Opcode Studio 4.



CONTROL MODE CONTROLS

Figure 7 shown on page 9 provides a general map of Control Mode controls. It is similar to the Control Mode portion of the map that appears in the 960L Owner's Manual, except that automation controls have been added.

CONTROL

Represents the CONTROL button on the LARC2. Press to enter Control Mode.

WORDCLK

Represents soft buttons that appear on the soft row at the bottom of the LARC2 display.

48K INT

Represents screen option soft buttons that can be accessed by pressing the >>OPTIONS soft button on the soft row at the bottom of the LARC2 display.

- 1 - System Information
- 2 - System Licenses

Represents menu options that can be accessed by pressing the associated soft button.



Appears on all soft buttons that access menu options when pressed.

SCREEN OPTIONS

Rectangles with rounded corners and dashed outlines represent screen options. When screen options are available for the current screen, the >>OPTIONS soft button appears on the soft row at the bottom of the LARC2 display. Press this button once to open the screen options soft row. Press this button again to close the screen options soft row and open the previously displayed soft row.

When the screen options soft row is open, the arrows on the >>OPTIONS soft button point to the left (<<OPTIONS). When the screen options soft row is closed, the arrows on the >>OPTIONS soft button point to the right.

AUTOMATION TRANSPORT CONTROLS

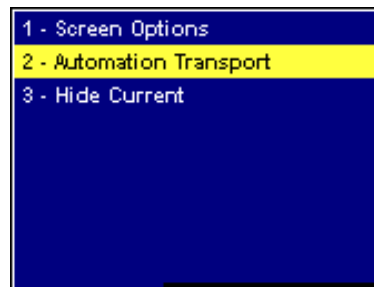
When automation is running, the Automation Transport Controls (Figure 20, page 24) are available on all screens. When no screen options are available for the current screen, the >>AUTO soft button appears on the soft row at the bottom of the LARC2 display. Press this button once to open the Automation Transport Controls. Press this button again to close the Automation Transport Controls and open the previously displayed soft row.

When the Automation Transport Controls are open, the arrows on the >>AUTO soft button point to the left (<<AUTO). When the Automation Transport Controls are closed, the arrows on the >>AUTO soft button point to the right.

OPTIONS MENU

The Options Menu shown in Figure 6 (below) is available when both screen options and Automation Transport Controls are available for the current screen. To access the Options Menu, press the >>OPTIONS or >>AUTO soft button twice in succession.

Figure 6: Options Menu



... OPTIONS MENU continues on page 10

Figure 7: Control Mode Controls

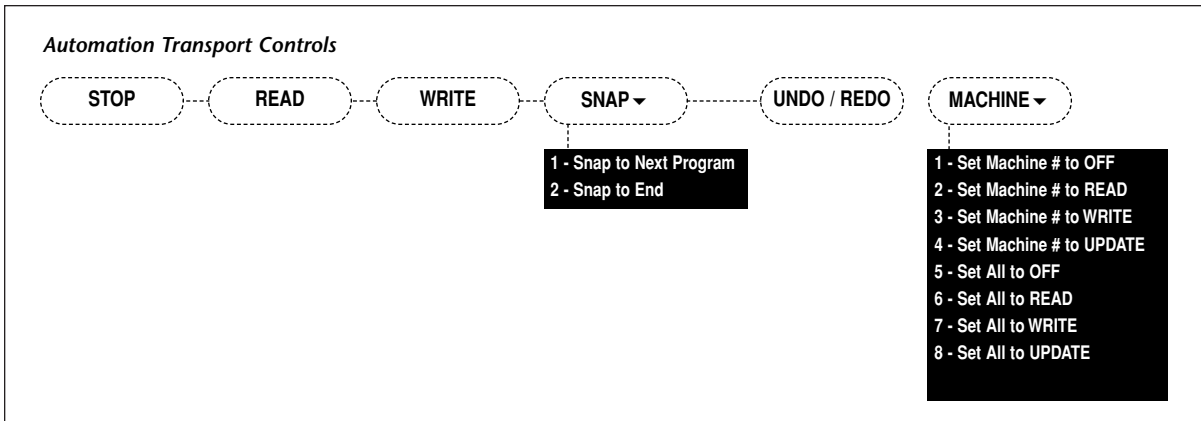
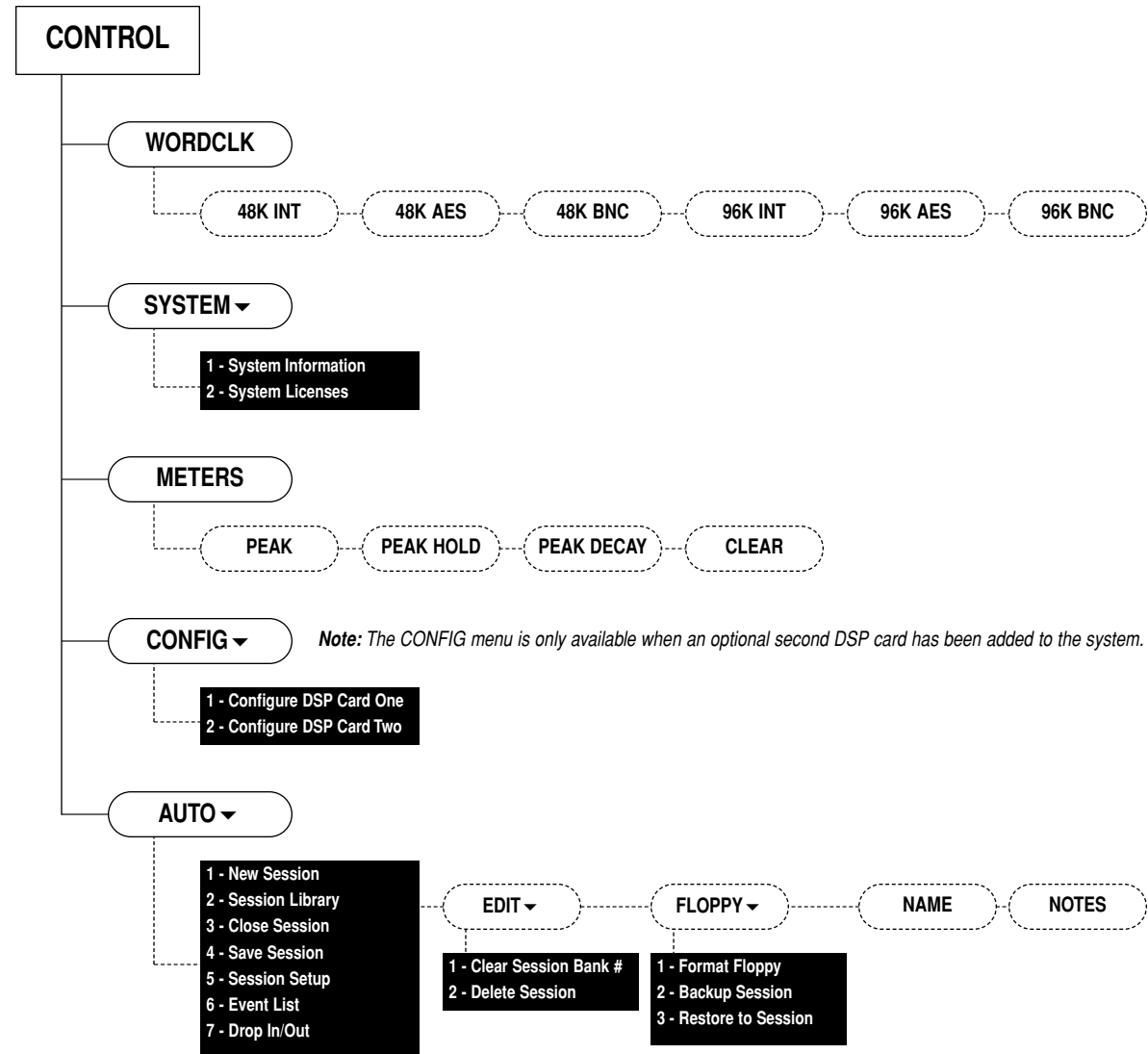


Figure 8: Control Mode Soft Row



Options Menu *(continued from page 8)*

Screen Options

Selecting Screen Options opens the screen options soft row and closes the Automation Transport Controls.

Automation Transport

Selecting Automation Transport opens the Automation Transport Controls and closes the screen options soft row.

Hide Current

Selecting Hide Current hides the currently displayed soft row, as if the >>OPTIONS or >>AUTO soft button had been pressed.

AUTOMATION MENU

To access the Automation Menu:

1. Press the CONTROL button on the LARC2 to enter Control Mode, which provides access to automation. The soft row shown in Figure 8 (above) will display.

2. Press the AUTO v soft button to enter Automation Mode. The automation screen that was last selected will display. When automation is accessed for the first time, the Automation Session Library screen shown in Figure 10 (page 11) will display.
3. Press the AUTO v soft button again to access the Automation Menu shown in Figure 9 (below).

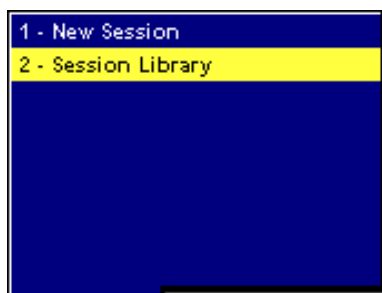
The Automation Menu will display in one of two forms. Menu A will display when automation is not running, and Menu B will display when automation is running. Automation Menu options are described throughout this document.

NEW SESSION

Selecting the New Session option creates a new automation session using the existing state of the 960L. Current word clock settings, DSP configuration, I/O routing, global mix settings, and global I/O settings become part of the new session.

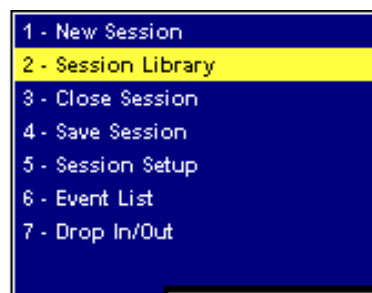
Figure 9: Automation Menu

A



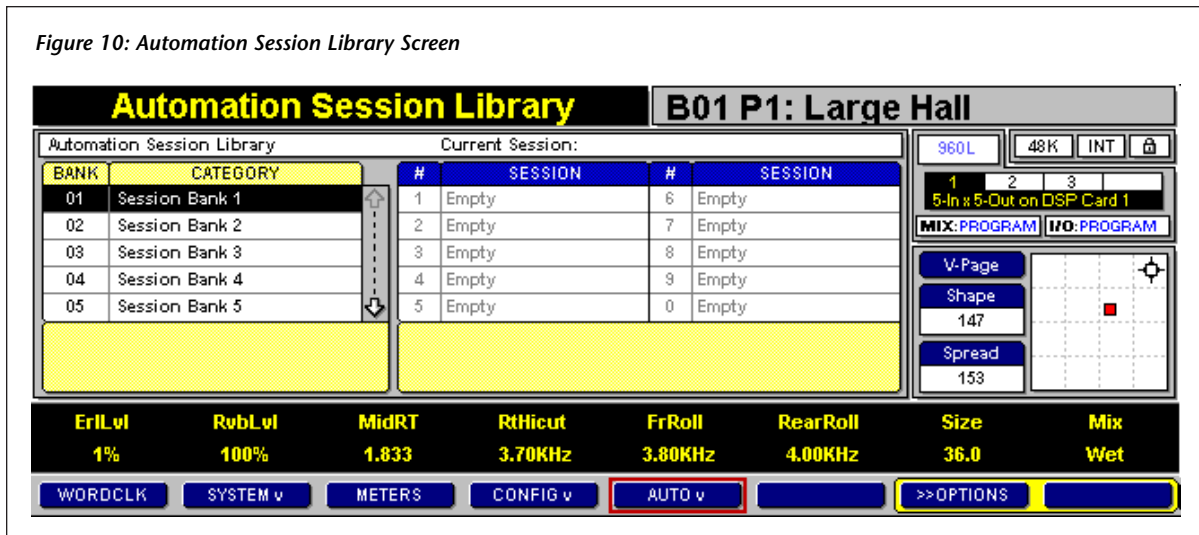
The Automation Menu will display as shown above when automation is not running.

B



The Automation Menu will display as shown above when automation is running.

Figure 10: Automation Session Library Screen



Most settings cannot be changed once the automation session begins. Word clock source and I/O routing remain adjustable during the session. Word clock rate can also be changed within the selected single or double-speed family (i.e. the setting can be changed between 44.1 and 48kHz or between 88.2 and 96kHz, but not between 44.1/48kHz and 88.2/96kHz).

When a new automation session is created, the Automation Session Setup screen shown in Figure 16 (page 17) will display. See page 16 for more information.

To create a new automation session:

1. Make sure the 960L is in the desired state. Remember, most configuration settings cannot be changed once the session begins.
2. Follow the instructions in the previous column to access the Automation Menu.
3. Select the New Session option.

SESSION LIBRARY

Selecting the Session Library option accesses the Automation Session Library screen shown in Figure 10 (above). This screen can be used to:

- Open an existing automation session
- Clear session banks
- Delete automation sessions
- Format disks
- Archive automation sessions to disk
- Restore automation sessions stored on disk
- Name session banks
- Enter session bank notes

Automation sessions are organized into 10 banks. Each bank contains 10 sessions, for a total of 100 sessions.

To access the Automation Session Library screen:

1. Follow the instructions on page 10 to access the Automation Menu.
2. Select the Session Library option.

Automation Session Library Screen Controls

The Automation Session Library screen features a BANK/CATEGORY control that can be used to select session banks, and a SESSION control that can be used to select individual automation sessions within the selected bank.

To use the BANK/CATEGORY control:

1. Use the left and right arrow keys on the LARC2 to select the BANK/CATEGORY control on the LARC2 display.
2. Use the up and down arrow keys on the LARC2 to select the desired session bank. (The bank number can also be entered directly using the numeric keypad on the LARC2.)

To use the SESSION control:

1. Use the left and right arrow keys on the LARC2 to select the SESSION control on the LARC2 display.
2. Use the up and down arrow keys on the LARC2 to select the desired automation session. (The session number can also be entered directly using the numeric keypad on the LARC2.)

Loading an Existing Automation Session

To load an existing automation session:

1. Follow the instructions on page 11 to access the Automation Session Library screen.

2. Follow the instructions in the previous column to use the BANK/CATEGORY and SESSION controls to select the automation session to be loaded. The name of the currently selected session will flash.
3. When the desired session is selected, press the ENTER button on the LARC2 to load the session.

Note:

When the automation session number is entered directly, it is not necessary to press the ENTER button on the LARC2 to load the session. It will automatically load when its number is entered.

Automation Session Library Screen Options

Most Automation Session Library screen functions can be accessed from the screen options soft row shown in Figures 11 and 12 (below). Press the >>OPTIONS soft button on the soft row at the bottom of the LARC2 display to open the screen options soft row. Press the >>OPTIONS soft button again to close the screen options soft row and open the previously displayed soft row.

When the screen options soft row is open, the arrows on the >>OPTIONS soft button point to the left (<<OPTIONS). When the screen options soft row is closed, the arrows on the >>OPTIONS soft button point to the right.

Figure 11: Automation Session Library Screen Options Soft Row (with SESSION Control Selected)



The screen options soft row displays as shown in Figure 11 when the SESSION control is selected on the LARC2 display.

Figure 12: Automation Session Library Screen Options Soft Row (with BANK/CATEGORY Control Selected)



The screen options soft row displays as shown in Figure 12 when the BANK/CATEGORY control is selected on the LARC2 display.

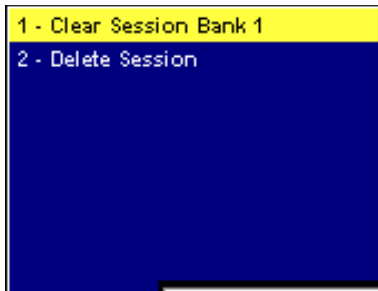
The screen options soft row displays as shown in Figure 11 when the SESSION control is selected. It displays as shown in Figure 12 when the BANK/CATEGORY control is selected. (Figures 11 and 12 are shown at the bottom of page 12.)

When automation is running, the Automation Transport Controls shown in Figure 20 (page 24) are also available. See page 8 for more information about toggling between the screen options soft row and the Automation Transport Controls.

EDIT▼

Pressing the EDIT▼ soft button accesses the EDIT▼ menu shown in Figure 13 (below). This menu can be used to clear session banks and delete automation sessions.

Figure 13: EDIT▼ Menu



Clear Session Bank

Clears the currently selected session bank. When a session bank is cleared, all automation sessions contained in that bank are deleted.

To clear a session bank:

1. Follow the instructions on page 11 to access the Automation Session Library screen.
2. Press the >>OPTIONS soft button.
3. Follow the instructions on page 12 to use the BANK/CATEGORY control to select the session bank to be cleared.
4. Press the EDIT▼ soft button.
5. Select the Clear Session Bank # option.

Delete Session

Deletes the currently selected automation session.

To delete an automation session:

1. Follow the instructions on page 11 to access the Automation Session Library screen.
2. Press the >>OPTIONS soft button.
3. Follow the instructions on page 12 to use the BANK/CATEGORY and SESSION controls to select the automation session to be deleted.
4. Press the EDIT▼ soft button.
5. Select the Delete Session option.

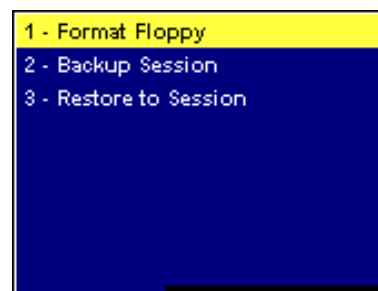
Note:

Deleted automation sessions cannot be recovered.

FLOPPY▼

Pressing the FLOPPY▼ soft button accesses the FLOPPY▼ menu shown in Figure 14 (below). This menu can be used to format disks, store automation sessions on disk, and restore automation sessions stored on disk.

Figure 14: FLOPPY▼ Menu



Format Floppy

Formats the disk inserted in the 960L disk drive. Automation sessions cannot be stored on unformatted disks.

... FLOPPY▼ continues on page 14

FLOPPY ▼ (continued from page 13)**To format a disk:**

1. Follow the instructions on page 11 to access the Automation Session Library screen.
2. Press the >>OPTIONS soft button.
3. Insert a disk in the 960L disk drive.
4. Press the FLOPPY ▼ soft button.
5. Select the Format Floppy option.

Backup Session

Stores the selected automation session on the disk inserted in the 960L disk drive.

To store an automation session on disk:

1. Follow the instructions on page 11 to access the Automation Session Library screen.
2. Press the >>OPTIONS soft button.
3. Follow the instructions on page 12 to use the BANK/CATEGORY and SESSION controls to select the automation session to be stored.
4. Insert a disk in the 960L disk drive.
5. Press the FLOPPY ▼ soft button.
6. Select the Backup Session option.

Restore to Session

Restores the automation session stored on the disk inserted in the 960L disk drive to the selected session bank location.

To restore an automation session stored on a disk:

1. Follow the instructions on page 11 to access the Automation Session Library screen.
2. Press the >>OPTIONS soft button.
3. Follow the instructions on page 12 to use the BANK/CATEGORY and SESSION controls to select the session bank location in which to restore the automation session.

4. Insert the disk containing the desired automation session in the 960L disk drive.
5. Press the FLOPPY ▼ soft button.
6. Select the Restore to Session option.

NAME

Pressing the NAME soft button accesses the text editor shown in Figure 15 on the next page. The text editor can be used to modify the name of the currently selected session bank.

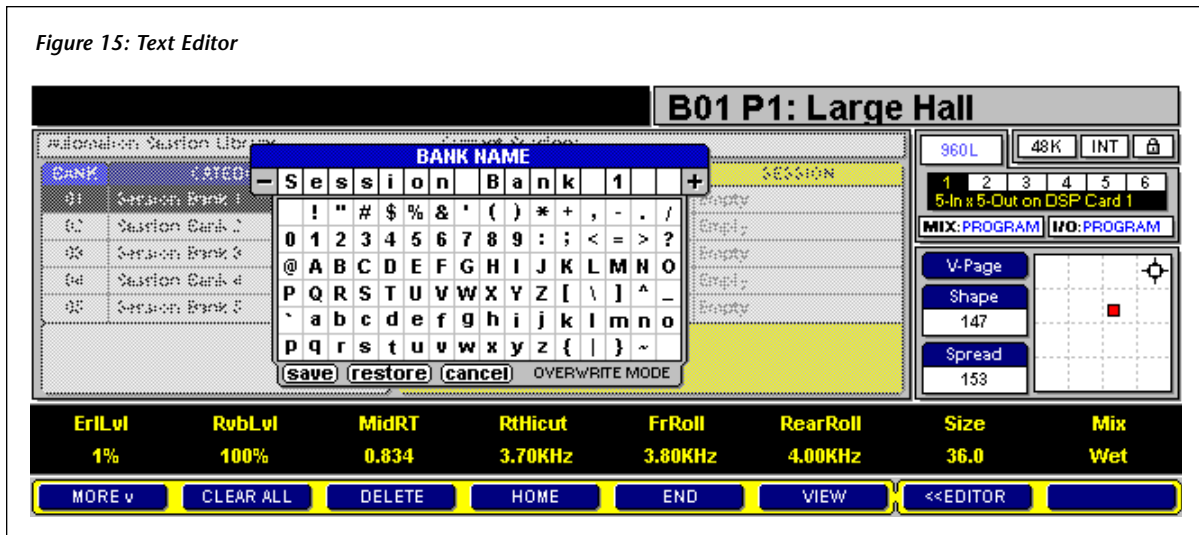
Note:

The NAME soft button is only available when the BANK/CATEGORY control is selected on the LARC2 display

To modify a session bank name:

1. Follow the instructions on page 11 to access the Automation Session Library screen.
2. Press the >>OPTIONS soft button.
3. Follow the instructions on page 12 to use the BANK/CATEGORY control to select the session bank to be named or renamed.
4. Press the NAME soft button.
5. Enter the new session bank name using one of the following methods:
 - Type the name on the external keyboard attached to the LARC2.
 - Use the arrow keys or the joystick on the LARC2 to select the desired character on the text editor, then press the ENTER button on the LARC2 to enter that character. Repeat this process until the entire name has been entered.
6. Save the new session bank name using one of the following methods:
 - Locate the Enter button on the external keyboard attached to the LARC2, then press it twice.
 - Use the arrow keys on the LARC2 to select the **save** button at the bottom of the text editor, then press the ENTER button on the LARC2.

Figure 15: Text Editor

**Note:**

Use the Automation Session Setup screen shown in Figure 16 (page 17) to modify individual automation session names.

NOTES

Pressing the NOTES soft button accesses a text editor similar to that shown in Figure 15 (above). The text editor can be used to enter notes about the currently selected session bank.

Note:

The NOTES soft button is only available when the BANK/CATEGORY control is selected on the LARC2 display.

To enter notes about a session bank:

1. Follow the instructions on page 11 to access the Automation Session Library screen.
2. Press the >>OPTIONS soft button.
3. Follow the instructions on page 12 to use the BANK/CATEGORY control to select the session bank for which to enter notes.
4. Press the NOTES soft button.

5. Enter the new session bank notes using one of the following methods:

- Type the notes on the external keyboard attached to the LARC2.
- Use the arrow keys or the joystick on the LARC2 to select the desired character on the text editor, then press the ENTER button on the LARC2 to enter that character. Repeat this process until all notes have been entered.

6. Save the new session bank notes using one of the following methods:

- Locate the Enter button on the external keyboard attached to the LARC2, then press it twice.
- Use the arrow keys on the LARC2 to select the **save** button at the bottom of the text editor, then press the ENTER button on the LARC2.

Note:

Use the Automation Session Setup screen shown in Figure 16 (page 17) to enter individual automation session notes.

CLOSE SESSION

Selecting the Close Session option closes the currently running automation session. A prompt will appear on the LARC2 display if the session has not been saved since the last modification. When a session is closed, the Automation Session Library screen shown in Figure 10 (page 11) will display.

To close the currently running automation session:

1. Follow the instructions on page 10 to access the Automation Menu.
2. Select the Close Session option.

SAVE SESSION

Selecting the Save Session option accesses the Automation Session Library screen shown in Figure 10 (page 11), which can be used to save the currently running automation session. The Automation Session Library screen displays with a default session bank location flashing.

The default session bank location is selected as follows:

- If the currently running automation session has been previously saved, the default location will be the session bank location that was last used.
- If the currently running automation session was created by loading an existing session, the default location will be the session bank location of the originally loaded session.
- If the currently running automation session was created with the New Session option on the Automation Menu shown in Figure 9 (page 10), the default location will be the first available session bank location.

To save the currently running automation session:

1. Follow the instructions on page 10 to access the Automation Menu.
2. Select the Save Session option.

SESSION SETUP

Selecting the Session Setup option accesses the Automation Session Setup screen shown in Figure 16 at the top of the next page. This screen can be used to:

- Name automation sessions
- Enter automation session notes
- Set session offset time
- Set incoming frame rate
- Set SMPTE-to-MIDI converter flywheel offset
- Activate and deactivate the Action Display (Timecode Display)

To access the Automation Session Setup screen:

1. Follow the instructions on page 10 to access the Automation Menu.
2. Select the Session Setup option.

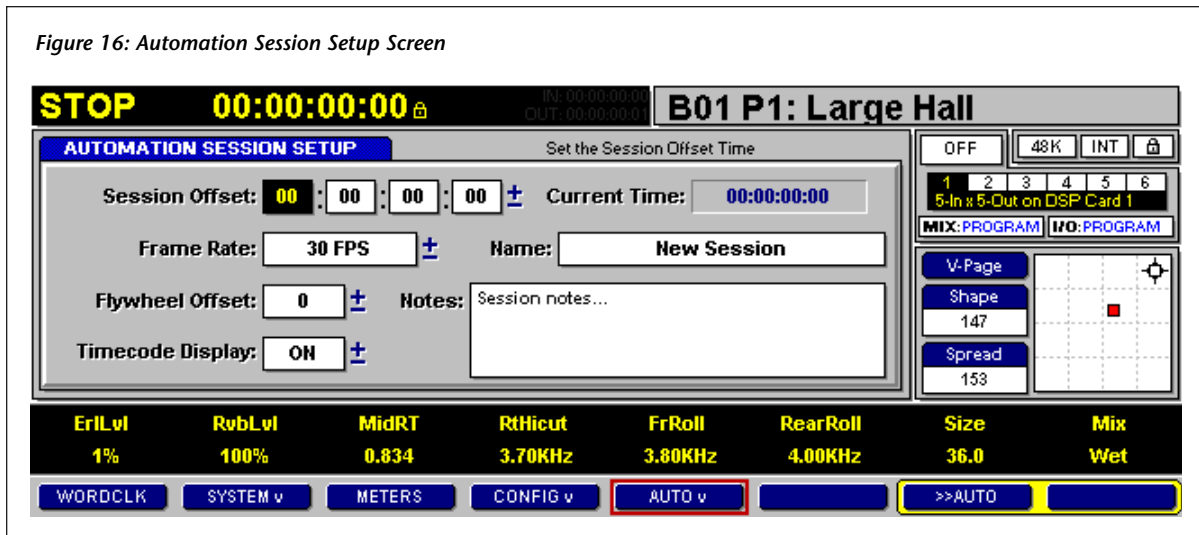
Session Offset

Session Offset can be described as the time at which the 960L begins counting frames. All time code is displayed using a 24-hour clock.

For example:

- Session Offset is set to 00:00:00:00 and the first moves occur at 1:00:00:00. Those moves are stored at an offset of 1 hour inside the automation session.
- Session Offset is set to 12:00:00:00 and the first moves occur at 13:00:00:00. Those moves are also stored at an offset of 1 hour inside the automation session.
- Session Offset is set to 12:00:00:00 and the first moves occur at 1:00:00:00. Those moves occur at an offset of 13 hours inside the automation session (wrapping through midnight).
- Session Offset is set to 00:00:00:00 and the first moves occur at 1:00:00:00. Then, Session Offset is changed to 12:00:00:00. Now, those moves will occur at 13:00:00:00.

Figure 16: Automation Session Setup Screen



In most cases, the Session Offset field can be safely set to 00:00:00:00. However, it is recommended to adjust the setting when:

- The first time code is 00:00:00:00. Most facilities adapt to a convention by which automation sessions begin at 1:00:00:00 or some other non-zero time. This allows ample time for preroll (1 hour if Session Offset is set to 00:00:00:00), and avoids preroll that passes through midnight. When the first time code is 00:00:00:00, it is recommended to set Session Offset to a slightly earlier time, such as 23:00:00:00. The 960L will roll through midnight, and the moves will occur at 00:00:00:00.
- The time code of a work print changes from day-to-day. In this circumstance, adjusting Session Offset keeps the moves synchronized with the work print. But if the work print has been substantially recut, it will probably be necessary to redo the mix.

Maximum Automation Session Length

The maximum length of an automation session is 23 hours and 59 minutes. No moves can be recorded during the one-minute period preceding the Session Offset field setting.

If time code passes through this period while moves are played back, the 960L will not resume playing moves when time code exits this period. This is considered "playing through the end of the session."

Frame Rate

The Frame Rate field sets the frame rate for the currently running automation session. This field must be set to match the master SMPTE frame rate for automation to lock to incoming time code.

Automation session data is saved independent of its originally written time code frame rate. This allows existing sessions to run at any frame rate without affecting timing accuracy. Sessions automatically conform to any incoming frame rate and remain real-time accurate – as long as the Frame Rate setting matches the incoming SMPTE frame rate.

If the Frame Rate setting does not match the incoming SMPTE frame rate, the automation session will not play. The lock shown next to the SMPTE time code on the Action Display shown in Figure 17 (page 18) will flash red to indicate the discrepancy. (The lock will appear solid yellow when the Frame Rate setting matches the incoming SMPTE frame rate.)

Figure 17: Action Display (with Timecode Display field set to ON)



Flywheel Offset

The Flywheel Offset field compensates for a feature found in SMPTE-to-MIDI converters called "Jam Synch" or "Flywheel." This feature allows converters to recover from most normally encountered dropouts in incoming time code. When a dropout is encountered, most converters automatically fill in the missing frames to compensate for the dropout.

The number of frames a SMPTE-to-MIDI converter will flywheel varies from converter to converter. For example, if a converter flywheels for six frames, the converter can handle dropouts of six frames or less. If a dropout occurs for more than six frames, the converter responds as if incoming time code has stopped.

Because of flywheel, SMPTE-to-MIDI converters cannot recognize the difference between stopped time code and dropouts until the number of flywheel frames has been exceeded. When incoming time code stops on a particular frame, the converter outputs MIDI time code until the number of flywheel frames has been reached. This causes the incoming frame and the 960L frame to be off by the number of converter flywheel frames.

Flywheel Offset should be set to ensure that the frame displayed on the LARC2 matches the frame at which incoming time code stopped. The field setting is global. It applies to all automation sessions until adjusted.

To set the Flywheel Offset field:

1. Follow the instructions on page 16 to access the Automation Session Setup screen.

2. Set the Frame Rate field to match the incoming SMPTE frame rate as described in the Frame Rate section (page 17).
3. Start the incoming time code source. The SMPTE time on the Action Display should update. The Action Display is shown in Figure 17 (above).
4. Stop the incoming time code source, noting the time at which time code was stopped. If the SMPTE-to-MIDI converter flywheels, the SMPTE time on the Action Display will read several frames ahead of the master.
5. Set the Flywheel Offset field to compensate for this discrepancy. For example, if the SMPTE time on the Action Display is six frames ahead of the master, set the Flywheel Offset field to -6 frames. This value will be added to the SMPTE time when time code stops, compensating for SMPTE-to-MIDI converter flywheel.
6. Start the incoming time code source again and allow it to run for several seconds.
7. Stop the incoming time code source. The SMPTE time on the Action Display should match the master. If not, begin again with step 1.

Timecode Display

The Timecode Display field controls the Action Display shown in Figure 17 (above). When set to ON, the current Master Automation Status, SMPTE time, and drop in/out times are shown on the Action Display. When set to OFF, the Action Display operates as if no automation session is running. This feature is useful when two LARC2s are connected to a single 960L; the Timecode Display field can be set to OFF on one LARC2.

Current Time

The Current Time field indicates the current SMPTE time. This time is only updated when incoming time code stops.

Name

The Name field indicates the name of the currently running automation session. It can be used to modify the session name.

To modify an automation session name:

1. Follow the instructions on page 16 to access the Automation Session Setup screen.
2. Use the arrow keys on the LARC2 to select the Name field.
3. Press the ENTER button on the LARC2 to access a text editor similar to that shown in Figure 15 (page 15).
4. Enter the new automation session name using one of the following methods:
 - Type the name on the external keyboard attached to the LARC2.
 - Use the arrow keys or the joystick on the LARC2 to select the desired character on the text editor, then press the ENTER button on the LARC2 to enter that character. Repeat this process until the entire name has been entered.
5. Save the new automation session name using one of the following methods:
 - Locate the Enter button on the external keyboard attached to the LARC2, then press it twice.
 - Use the arrow keys on the LARC2 to select the **save** button at the bottom of the text editor, then press the ENTER button on the LARC2.

Note:

Use the Automation Session Library screen shown in Figure 10 (page 11) to modify session bank names.

Notes

The Notes field contains notes about the currently running automation session. It can be used to enter notes about the session, which are useful to identify the session in the future.

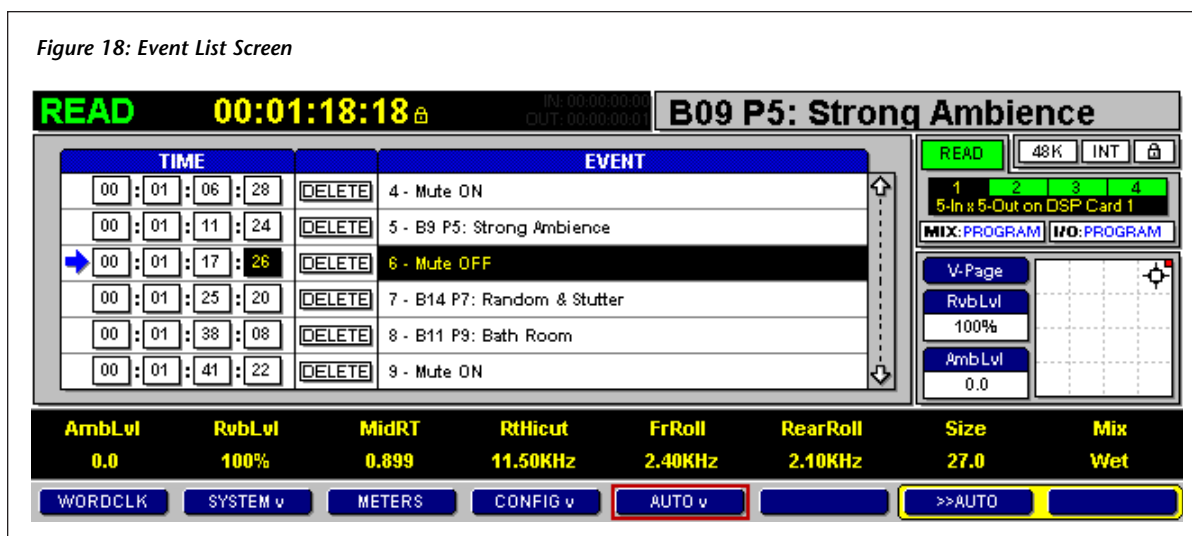
To enter notes about an automation session:

1. Follow the instructions on page 16 to access the Automation Session Setup screen.
2. Use the arrow keys on the LARC2 to select the NOTES field.
3. Press the ENTER button on the LARC2 to access a text editor similar to that shown in Figure 15 (page 15).
4. Enter the new automation session notes using one of the following methods:
 - Type the notes on the external keyboard attached to the LARC2.
 - Use the arrow keys or the joystick on the LARC2 to select the desired character on the text editor, then press the ENTER button on the LARC2 to enter that character. Repeat this process until all notes have been entered.
5. Save the new automation session notes using one of the following methods:
 - Locate the Enter button on the external keyboard attached to the LARC2, then press it twice.
 - Use the arrow keys on the LARC2 to select the **save** button at the bottom of the text editor, then press the ENTER button on the LARC2.

Note:

Use the Automation Session Library screen shown in Figure 10 (page 11) to enter session bank notes.

Figure 18: Event List Screen



EVENT LIST

Selecting the Event List option accesses the Event List screen shown in Figure 18 (above). This screen can be used to modify program change and mute event times. Parameter change events are not displayed on this screen.

To access the Event List screen:

1. Follow the instructions on page 10 to access the Automation Menu.
2. Select the Event List option.

Modifying Event Times

To modify an event time:

1. Follow the instructions above to access the Event List screen.
2. Use the up and down arrow keys on the LARC2 to select the event to be modified.
3. Use the left and right arrow keys on the LARC2 to select the TIME field to be modified – from left to right: hours, minutes, seconds, or frames.
4. Use the + and – keys on the LARC2 to increase or decrease the selected time field, or enter the time directly using the numeric keypad on the LARC2.

Editing Rules & Restrictions

The Event List screen can be used to delete unwanted program and mute events, as well as to make small adjustments to program and mute event positions to match events on-screen or in music. It is also possible to make large adjustments. However, it is important to understand the consequences.

For program event editing:

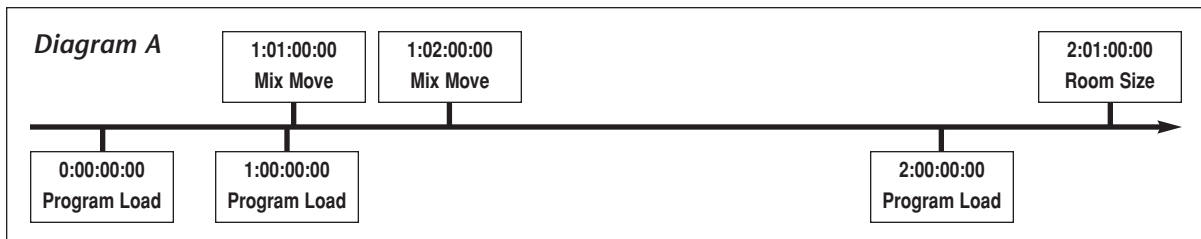
- Each automation session must have at least one program event for each machine. This event begins at time 00:00:00:00 (relative to Session Offset) and defines the default state of the machine.
- Any program event can be deleted or moved, except the last remaining program event.
- If the first program event on the list is deleted, the earliest remaining event will move to time 00:00:00:00.
- Program events can only be moved to the spaces between the preceding and following events. Program events cannot be moved ahead of the preceding program event, or behind the following program event.
- When a program event is deleted, all parameters associated with that program are also deleted.

- When a program event is moved, the 960L attempts to maintain all parameters at their same time codes. (In other words, parameters are not moved.)
 - While it is possible to move program loads one frame apart, it is not practical. It may take a few seconds for the new program to begin passing audio.
- For mute event editing:**
- Each automation session must have at least one mute event for each machine. This events begins at time 00:00:00:00 (relative to Session Offset) and defines the default state of the machine.
 - Any mute event can be deleted or moved, except the last remaining mute event.
 - If the first mute event on the list is deleted, the earliest remaining event will move to time 00:00:00:00.
 - Mute events can only be moved to the spaces between the preceding and following events. Mute events cannot be moved before the preceding mute event, or after the following mute event.
 - Deleting mute events sometimes results in a mute on following another mute on, or a mute off following another mute off. When this occurs, the second mute event is deleted because it is redundant.
 - Deleting or moving mute events has no effect on parameters.

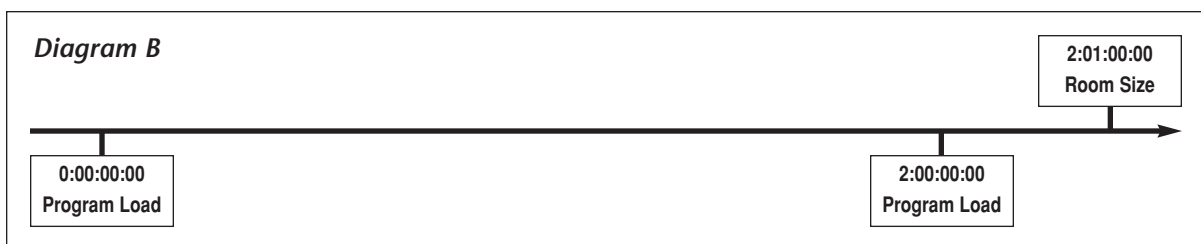
The Relationship Between Program Load Events & Parameter Change Events

The diagrams that begin below illustrate the relationship between program load events and parameters. All diagrams illustrate the same automation session (with slight modifications) along a timeline that passes from left to right.

- **Diagram A** illustrates a simple automation session that includes three program loads, with some parameter change events.



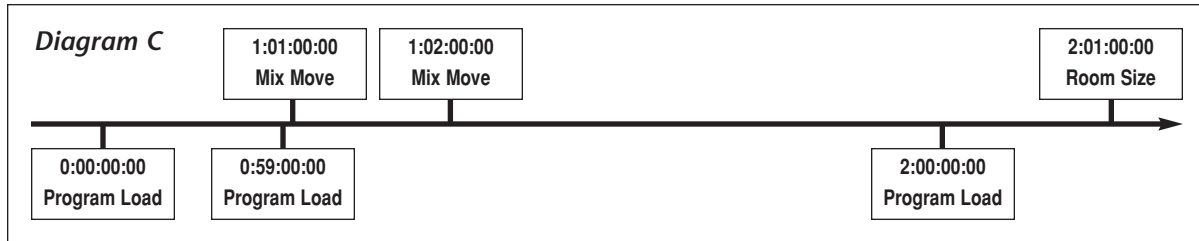
- In **Diagram B**, the second program load has been deleted. Consequently, the parameters related to that program have also been deleted. All other moves remain in place.



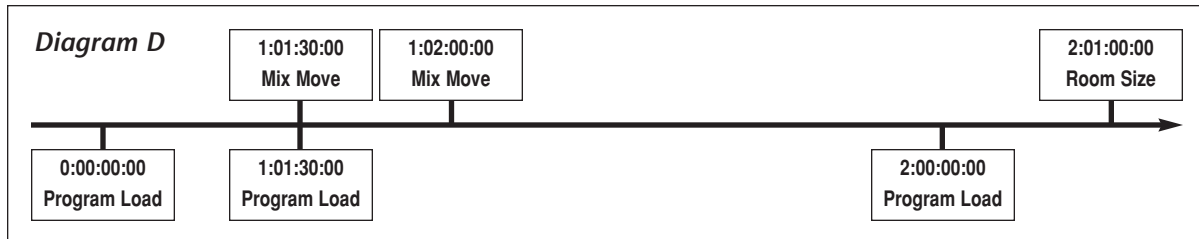
... The Relationship Between Program Load Events & Parameters continues on page 22

The Relationship Between Program Load Events & Parameters (continued from page 21)

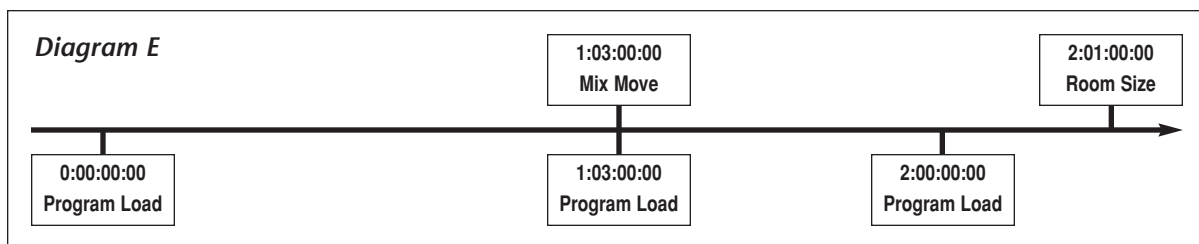
- In **Diagram C**, the second program in Diagram A has been moved to an earlier time (one minute earlier). Parameter moves remain in place.



- In **Diagram D**, the second program in Diagram A has been moved to a later time, past the position of the first mix move. The first mix move slips to the same time as the second program load so it will not be lost.



- In **Diagram E**, the second program in Diagram A load is moved past the position of the second mix move. The second mix move slips to the same time so it will not be lost. The first mix move is deleted because it is redundant.



- In **Diagram F**, the first program load in Diagram A (at time 00:00:00:00) has been deleted. The second program load moves to time 00:00:00:00, but its parameter change events remain in the same place.

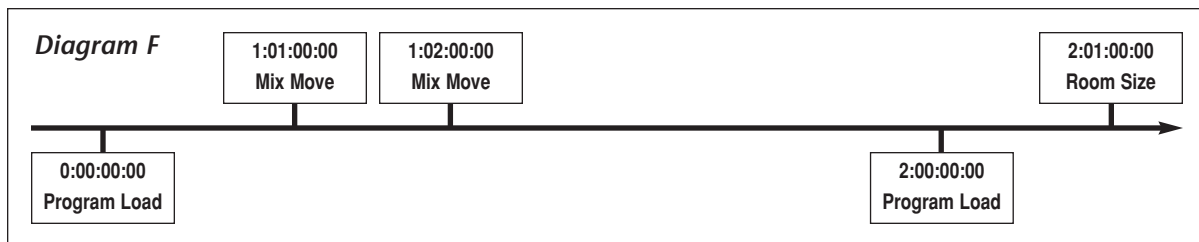
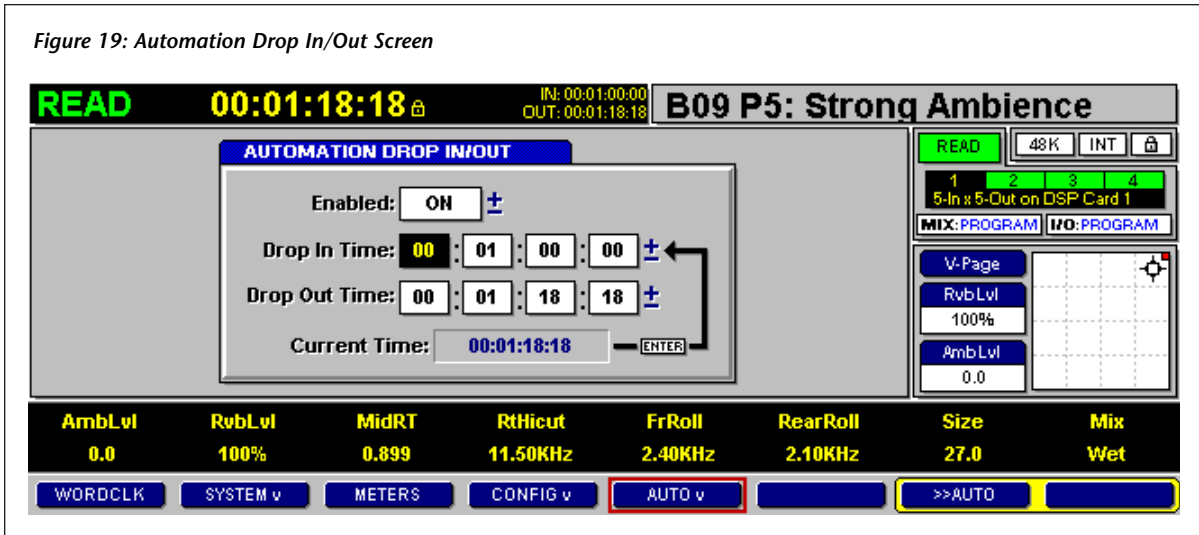


Figure 19: Automation Drop In/Out Screen



DROP IN/OUT

Selecting the Drop In/Out option accesses the Automation Drop In/Out screen shown in Figure 19 (above). This screen can be used to enable or disable the automated Drop In/Out feature. It can also be used to set automated SMPTE punch in and out times, which allows the 960L to perform automated, time code-synchronized punch in and out while time code is running.

To access the Automation Drop In/Out screen:

1. Follow the instructions on page 10 to access the Automation Menu.
2. Select the Drop In/Out option.

Enabled

The Enabled field enables or disables the automated Drop In/Out feature. When set to ON, drop in and out times are shown on the Action Display shown in Figure 17 (page 18). Master WRITE Status is automatically selected when the Drop In time is reached, and Master READ Status is automatically selected when the Drop Out time is reached. (See the Master Automation Status section that begins on page 24 for more information.)

To enable automated Drop In/Out:

1. Follow the instructions in the previous column to access the Automation Drop In/Out screen.
2. Use the up and down arrow keys on the LARC2 to select the Enabled field.
3. Set the Enabled Field to ON. (Use the + and – keys or the ENTER button on the LARC2 to toggle the setting ON and OFF.)
4. Use the arrow keys on the LARC2 to select the Drop In Time field, then use the numeric keypad on the LARC2 to enter the desired drop in time.
5. Use the arrow keys on the LARC2 to select the Drop Out Time field, then use the numeric keypad on the LARC2 to enter the desired drop out time.
6. Select the Master Automation Status (see pages 24 and 25).
7. Select Machine WRITE Status (see pages 25 and 26). The Machine Status Display shown in Figure 21 (page 25) will read "DROP IN".
8. Start the incoming time code source. Master WRITE Status will automatically be selected at the set drop in time, and Master READ Status will automatically be selected at the set drop out time.

... Drop In/Out continues on page 24

Figure 20: Automation Transport Controls



Drop In/Out (continued from page 23)

Snapping Drop In/Out Times

To "snap" Drop In and Drop Out times:

1. Follow the instructions on page 23 to access the Automation Drop In/Out screen.
2. Use the up and down arrow keys on the LARC2 to select the Enabled field.
3. Set the Enabled Field to ON. (Use the + and – keys or the ENTER button on the LARC2 to toggle the setting ON and OFF.)
4. Use the arrow keys on the LARC2 to select the Drop In Time field.
5. Start the incoming time code source, and allow it to run until the desired drop in time is reached.
6. Press the ENTER button on the LARC2 to snap the current time to the Drop In Time field.
7. Use the arrow keys on the LARC2 to select the Drop Out Time field.
8. Start the incoming time code source, and allow it to run until the desired drop out time is reached.
9. Press the ENTER button on the LARC2 to snap the current time to the Drop Out Time field.

Hint:

The + and – keys on the LARC2 can be used to increase and decrease Drop In and Out Time field settings in small increments.

AUTOMATION TRANSPORT CONTROLS

The Automation Transport Controls shown in Figure 20 (above) display whenever automation is running. These controls can be used to select a Master Automation Status and Machine Automation Status, which combine to determine what happens when time code is running.

When automation is running, the Automation Transport Controls are available on all screens. Press the >>AUTO soft button on the soft row at the bottom of the LARC2 display to open these controls. Press the >>AUTO soft button again to close the Automation Transport Controls and open the previously displayed soft row.

For some screens, a screen options soft row is also available. See page 8 for more information about toggling between the screen options soft row and the Automation Transport Controls.

MASTER AUTOMATION STATUS

STOP, READ, & WRITE

Pressing the STOP, READ, and WRITE soft buttons selects the corresponding Master Automation Status, which is applied when the soft button is pressed. The current Master Automation Status appears on the Action Display shown in Figure 17 (page 18).

Master STOP Status

Pressing the STOP soft button selects Master STOP Status. When selected, no automation session data is written or read for the machine during the automation session. The machine can be controlled manually with the LARC2.

Master READ Status

Pressing the READ soft button selects Master READ Status. When selected, automation session data reads synchronized to incoming time code, provided Machine READ or Machine WRITE Status is selected. No automation session data is read for machines for which Machine OFF Status is selected.

Master WRITE Status

Pressing the WRITE soft button selects Master WRITE Status. When selected, automatable changes are written into automation session data overwriting any previously written data, provided Machine WRITE Status is selected. Machines for which a different Machine Automation Status is selected will be set to their associated Machine Automation Status.

MACHINE AUTOMATION STATUS

Four Machine Automation Status settings are available: OFF, READ, WRITE, or UPDATE Status. The Machine Automation Status for each machine is independent, allowing one machine to be used at a time or all machines to be used at once.

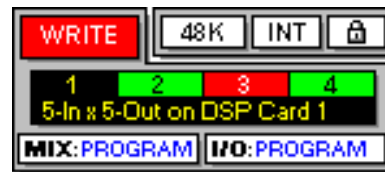
Automation session data is written on a per-machine basis, where each machine has its own set of data within the automation session. The data on one machine does not affect the data on other machines. For example, if eight machines are used during a session, eight tracks of automation session data will be produced – one for each machine.

The Machine Status Display shown in Figure 21 at the top of the next column indicates the Machine Automation Status of the current machine, as well as other machines in the automation session.

Machine OFF Status

When selected, no automation session data is written or read for the machine during the automation session. The machine can be controlled manually with the LARC2.

Figure 21: Machine Status Display



The status of the current machine is shown in the box in the top-right corner of the display. Here, Machine 1 is set to Machine WRITE Status. The color of boxes 2, 3, and 4 indicates the Machine Automation Status of other machines. Green indicates Machine READ Status, red indicates Machine WRITE Status, dark red indicates Machine UPDATE Status, and white indicates Machine OFF Status.

Machine READ Status

When selected, automation session data is read, provided Master READ or Master WRITE Status is selected. Moves made with the LARC2 are ignored.

Machine WRITE Status

When selected, automation session data is written when Master WRITE Status is selected. Automation session data is read when Master READ Status is selected.

Machine UPDATE Status

When selected, new automation session data is written and previously written automation session data is read for the machine.

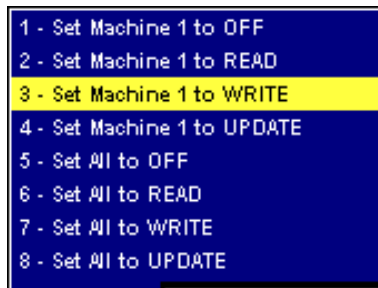
MACHINE ▼

Pressing the MACHINE ▼ soft button accesses the MACHINE ▼ Menu shown in Figure 22 at the top of the next page. This menu can be used to select the Machine Automation Status for the current machine, or to select the same Machine Automation Status for all machines in the automation session.

... MACHINE ▼ continues on page 26

MACHINE▼ (continued from page 25)

Figure 22: MACHINE▼ Menu

**Set Machine # to OFF**

Selects Machine OFF Status for the current machine. When selected, no automation session data is read or written for the machine during the automation session.

Set Machine # to READ

Selects Machine READ Status for the current machine. When selected, automation session data is read, provided Master READ or Master WRITE Status is selected.

Set Machine # to WRITE

Selects Machine WRITE Status for the current machine. When selected, automation session data is written when Master WRITE Status is selected. Automation session data is read when Master READ Status is selected.

Set Machine # to UPDATE

Selects Machine UPDATE Status for the current machine. When selected, previously written automation session data is read and new automation session data is written.

Set All to OFF

Selects Machine OFF Status for all machines.

Set All to READ

Selects Machine READ Status for all machines.

Set All to WRITE

Selects Machine WRITE Status for all machines.

Set All to UPDATE

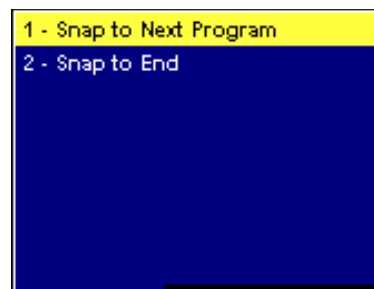
Selects Machine UPDATE Status for all machines.

SNAP▼

The SNAP▼ soft button appears on the Automation Transport Controls as shown in Figure 24 at the top of the next page when Master WRITE Status is selected, provided Machine WRITE or Machine UPDATE Status is selected and incoming SMPTE time code is stopped.

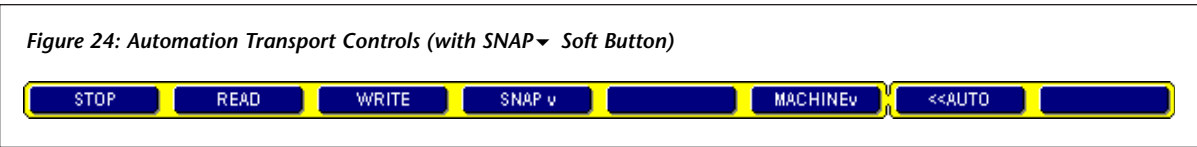
Pressing the SNAP▼ soft button accesses the SNAP▼ Menu shown in Figure 23 (below):

Figure 23: SNAP▼ Menu



During an automation session, it is sometimes preferable to use snapshots rather than dynamic moves. To do this:

1. Start the incoming time code source, then stop it at the desired location.
2. Press the WRITE soft button to select Master WRITE Status.
3. Make the desired changes.
4. Press the SNAP▼ soft button to access the SNAP▼ Menu shown in Figure 23 (above).
5. Select either the Snap to End or Snap to Next Program option. See the next page for option descriptions.



When Machine WRITE Status is selected:

- Selecting the **Snap to End** option extends the current state of the machine to the end of the automation session. All moves and program loads made after the current time will be deleted.
- Selecting the **Snap to Next Program** option extends the current state of the machine to the next program load. All moves made between the current time and the next program load will be deleted. Moves that were made after the next program load will not be affected.

When Machine UPDATE Status is selected:

- Selecting the **Snap to End** option deletes all moves made from the next program load onward (including the program load). All parameters that have been modified since Master WRITE Status was selected are extended to the end of the automation session. Parameters that have not been modified are not affected; their moves continue as before.
- Selecting the **Snap to Next Program** option affects the automation session up to the next program load. All parameters that have been modified are extended to the next program load. Parameters that have not been modified are unaffected; their moves continue as before. Moves that take place from the next program load onward are not be affected.

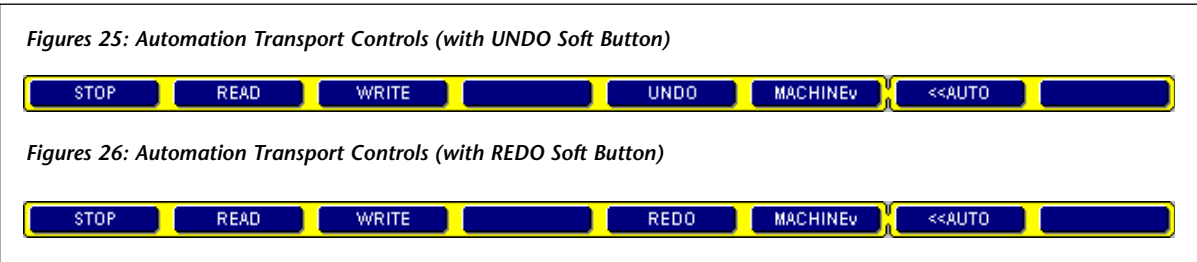
UNDO/REDO

It is not unusual to be displeased with the result of an automation pass. Perhaps a fader moved out of place, or an unexpected program load occurred, or an edit made on the Event List screen failed to work as desired. Whatever the problem, the 960L can undo the last edit and revert the automation session data to its previous state.

When an automation session is modified, the UNDO soft button appears on the Automation Transport Controls as shown in Figure 25 (below). Pressing the UNDO soft button "undoes" the edit and restores session data to its previous state. When the edit is undone, the UNDO soft button becomes the REDO soft button as shown in Figure 26 (below). Pressing the REDO soft button "redoes" the edit and restores session data to its edited state. When the edit is redone, the UNDO soft button will appear again.

Because of this, the UNDO/REDO soft button can be used to toggle between the edited and unedited versions of the automation session until one version is stored. When the session is stored, the UNDO/REDO soft button disappears from the Automation Transport Controls shown in Figure 20 (page 24) until another modification is made.

... UNDO/REDO continues on page 28



UNDO/REDO *(continued from page 27)*

The UNDO/REDO feature works on a per-machine basis. When an automation session is modified with more than one machine, the UNDO/REDO feature will only affect the machine shown on the LARC2 display.

FREQUENTLY ASKED QUESTIONS**What is the difference between SMPTE and MIDI time code?**

MIDI time code (MTC) is SMPTE time code converted for transmission over a MIDI cable. MTC maintains the same timing accuracy as SMPTE time code. To ensure this, it is recommended to dedicate a MIDI cable to MTC. MIDI data for other devices should be transmitted on separate cables.

Does Lexicon recommend the use of a specific SMPTE-to-MIDI converter?

Lexicon does not recommend the use of a specific SMPTE-to-MIDI converter, as any converter should work. Converters that were used in product development include the Midiman Syncman, Digidesign SMPTE Slave Driver and Universal Slave Driver, the Mark of the Unicorn MIDI Timepiece AV, and Opcode Studio 4.

What happens when a new automation session is created?

First, all user register banks are copied to a special session area. These register banks will be saved with the automation session itself to allow the session to be easily transported from machine to machine without affecting the existing state of user registers on each individual machine. During the session, any registers that are created, loaded, or modified will actually be in this session area.

Next, the current state of the 960L is examined. Word clock settings, DSP

configuration, I/O routings, programs, and parameters are all saved at time 00:00:00:00.

Hint:

Make sure the 960L is in the desired state before creating a new automation session. Remember, most configuration settings cannot be changed once the session begins (see pages 10 and 11).

What happens when an existing automation session is loaded?

First, user registers are replaced with session registers. Registers that were saved with the automation session become the working registers. This is temporary; the original user registers will return when the session is closed.

Next, the 960L is configured to the state saved with the loaded session. Word clock settings, DSP configuration, I/O routing, programs, and parameters stored at time 00:00:00:00 are applied.

Hint:

After loading an automation session, run time code for a few seconds to ensure that the master and the 960L are synchronized.

What happens when an automation session that was created on a 960L with two DSP cards is run on a 960L with one DSP card?

When an automation session that was created on a 960L with two DSP cards is loaded on a 960L with one DSP card, the session data for the second DSP card will be ignored (but preserved). When the session is transferred back to a 960L with two DSP cards, session data that was saved for the second DSP card will be available again. New moves will be available on the first DSP card.

What happens when an automation session that was created on a 960L with one DSP card is run on a 960L with two DSP cards?

When an automation session that was created on a 960L with one DSP card is loaded on a 960L with two DSP cards, the second DSP card will be configured like the first. There will be no moves on the second DSP card.

What settings can be adjusted after an automation session begins?

Word clock source and I/O routing remain adjustable during an automation session. Word clock rate can also be changed within the selected single or double-speed family (i.e. the setting can be changed between 44.1 and 48kHz or between 88.2 and 96kHz, but not between 44.1/48kHz and 88.2/ 96kHz).

Machine configuration cannot be changed – stereo cannot be changed to surround, and so on.

What happens when automation is closed?

When automation is closed, the 960L remains in the current state – with the same configuration and effects loaded. However, user registers are restored to their previous state. If a session register is loaded, it will be replaced with the first preset in the first factory bank.

Why do user registers change from session to session?

Each automation session has its own unique set of user registers. This allows sessions to be run on various machines without affecting the existing state of user registers on each individual machine.

When an automation session is closed, why do machines that were running session registers load the Large Hall factory program?

Remember, each automation session has its own unique set of user registers. When an automation session is closed, these registers are no longer available. So, machines that are running session registers load a default program (Large Hall).

What is the maximum length for an automation session?

The maximum length for an automation session is 23 hours and 59 minutes (see page 17).

What is Session Offset?

Session Offset can be described as the time at which the 960L begins counting frames. It marks the beginning of time for an automation session. (See the Session Offset section that begins on page 16 for more information.)

What happens if time code passes through midnight?

Although the 960L can handle the transition smoothly, it is recommended to avoid situations where time code passes through midnight. (See the *Session Offset* section that begins on page 16 for more information.)

What happens when a program load is deleted from the Event List?

When a program load is deleted on the Event List screen, all parameters that take place before the next program are deleted. Because parameters only make sense in the context of a particular program, there is no reason to save them after the program load is deleted. (See the Editing Rules & Restrictions section that begins on page 20 for more information.)

. . . *Frequently Asked Questions continues on page 30*

Frequently Asked Questions

(continued from page 29)

What happens when a program is moved on the Event List?

In general, the machine attempts to maintain all parameters in their original positions when a program is moved on the Event List. However, the results of program moves can be more complicated. (See the *Editing Rules & Restrictions* section that begins on page 20 for more information.)

Why can't the first program on the Event List be deleted?

Each machine must have a default state. This state requires that one program be loaded at all times. The first program, which occurs at time 00:00:00:00, represents the default state and therefore cannot be deleted. However, the program can be changed. Just locate time 00:00:00:00, select Master WRITE Status, and select a new program. (See the *Editing Rules & Restrictions* section that begins on page 20 for more information.)

Why can't the first mute on the Event List be deleted?

Just as each machine in the automation session must have a default program state, each must also have a default mute state (either on or off). The first mute, which occurs at time 00:00:00:00, represents the default state, and therefore cannot be deleted. However, the mute state can be changed. Just punch-in a new mute value at time 00:00:00:00. (See the *Editing Rules & Restrictions* section that begins on page 20 for more information.)

Why didn't the program load at the exact specified frame?

While loading, most reverb and delay algorithms require a little time to perform DSP housekeeping. In addition, audio must propagate through the reverb itself (just like a real room). Because of this, programs may not load at the exact specified frame.

For example, if the program load button is pressed at time 1:00:00:00, the change might not take place until 1:00:01:15. When this occurs, use the Event List screen to move the program load to an earlier time. (See the *Event List* section that begins on page 20 for more information.)

Why is Master WRITE Status cancelled when the automation session begins before the Session Offset?

Remember, each automation session has a maximum length of 23 hours and 59 minutes. No moves can be recorded during the one-minute period preceding Session Offset. This allows the 960L to distinguish between the beginning and end of the session. Therefore, the machine will not allow automation session data to be written during this one-minute period.

When the Snap to Next Program option is selected for the mute on event, why isn't a mute off event inserted at the next program load?

Selecting the Snap to Next Program option for a mute event essentially writes that event until the next mute event. For instance, snapping a mute on event to the next program writes mute on until the next mute off event. Snapping a mute off event to the next program writes mute off until the next mute on event.

How many levels of UNDO are there?

There is one level of UNDO. Pressing the UNDO soft button "undoes" the last edit and restores session data to its previous state. When the edit is undone, the UNDO soft button becomes the REDO soft button. Pressing the REDO soft button "redoes" the edit and restores session data to its edited state. When the edit is redone, the UNDO soft button will appear again. (See the UNDO/REDO section that begins on page 27 for more information.)

Is there a separate UNDO for each machine?

A separate UNDO/REDO option is available for each machine that has written data during the automation session. Pressing the UNDO/REDO softbutton "undoes" or "re-does" the last edit that was made on that machine; it has no effect on edits that were made on other machines. The UNDO/REDO softbutton remains available until automation session data is saved on the machine.

If the 960L is currently running Software Version 2.5, is it necessary to obtain a license key from Lexicon to retain this functionality?

It is not necessary to obtain a license key from Lexicon to retain Software Version 2.5 functionality. Installing Software Version 3.0 will automatically enable this functionality, which is now called the Delays & Additional 96kHz Reverbs Package.

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(*Ill.*) stands for *Illustration*.

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