

Chapter 23

Dimmer monitoring

ETC consoles may be connected to ETC Sensor dimming systems via the ETCLink communication protocol. In this configuration, the console operates a dimmer monitoring system that provides you with a wide range of dimmer status information, including overall dimming system status and specific information about individual dimmer modules and dimmer racks.

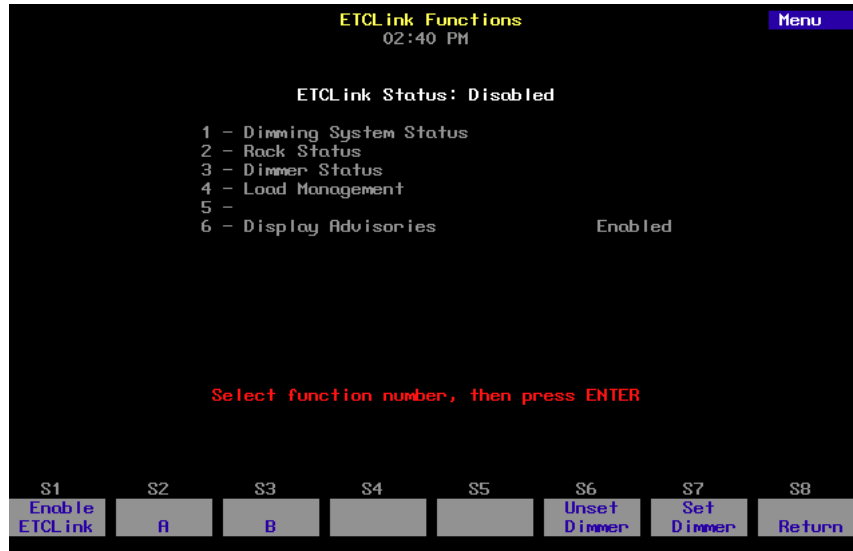
Your window on ETCLink is through the ETCLink Functions menu. Most of the dimmer, rack and dimming system information provided by console displays is also provided by the the Control Electronics Module (CEM) of your Sensor dimming system.

Consult this chapter for information on the following topics:

- Enabling ETCLink
- Enabling / disabling ETCLink error messages
- Recording, checking and clearing dimmer loads
- Examining overall dimming system status
- Examining rack status
- Examining dimmer status
- Setting / unsetting dimmers with ETCLink
- Using Sensor backup looks

ETCLink functions

Go to the ETCLink Functions menu by pressing [Setup] [9] [Enter]. Make selections from this menu to branch to the variety of options available in your dimmer monitoring system.



Enabling ETCLink

Before using ETCLink functions, you must enable your console to work with the ETCLink network. After enabling the connection, you should decide how to handle error advisory messages. See *Error messages*, page 265.

Following is one of two ways to enable ETCLink. You may also enable ETCLink using softkey [S1] in the ETCLink Functions menu, shown above.¹

Keystrokes:	Action:
1. Press [Setup].	Selects Setup menu.
2. Select 6, Options Settings , and press [Enter].	Selects Options Settings menu
3. Press [8], ETCLink , [Enter].	Prompt reads: Enable/disable ETCLink (1 = Enable, 0 = Disable)
4. Press [1] [Enter].	Dimmer Monitoring is enabled

¹ Note that option 9 in the Options Settings menu provides for an ETCLink address setting, which is related to operating more than one console on ETCLink. The default value is 1, and generally should be left as is. If you have questions about this setting, please call ETC Technical Services at 800-775-4382.

Error messages

ETCLink provides messages for a wide variety of conditions, including information regarding your dimmers, racks, system, data, ports, and loads. These messages fall into two categories, fatal messages and secondary messages.²

Fatal messages deal with anything that could potentially terminate or drastically change the look of your show. You may set fatal messages to be displayed even when secondary messages have been disabled.

Secondary messages deal with individual dimmer problems and warnings of potential rack temperature problems. These messages are generally less critical than the fatal messages. If you wish, secondary messages may be disabled without disabling fatal messages. The procedure for enabling or disabling ETCLink error messages is given in the next section.

The console shows error messages in pop-up advisory windows that appear regardless of which display mode you have chosen. They may also appear in abbreviated forms on the Status and About screens.³ Advisories are cleared as soon as you enter any keystroke. An example of such an Advisory message is shown below.



² See *ETCLink errors*, page 353, for a listing of errors.

³ To identify errors on specific dimmers, see *About Dimmer with ETCLink*, page 50.

How to enable / disable ETCLink error messages

Keystrokes:

1. Press [Setup].
2. Press [9], **ETCLink Functions**, [Enter].
3. Press [6], **Display Advisories**, [Enter].
4. Press [1] [Enter].

Action:

Selects Setup display

Selects ETCLink Functions menu

Prompt reads:

Enable/disable display of ETCLink advisories

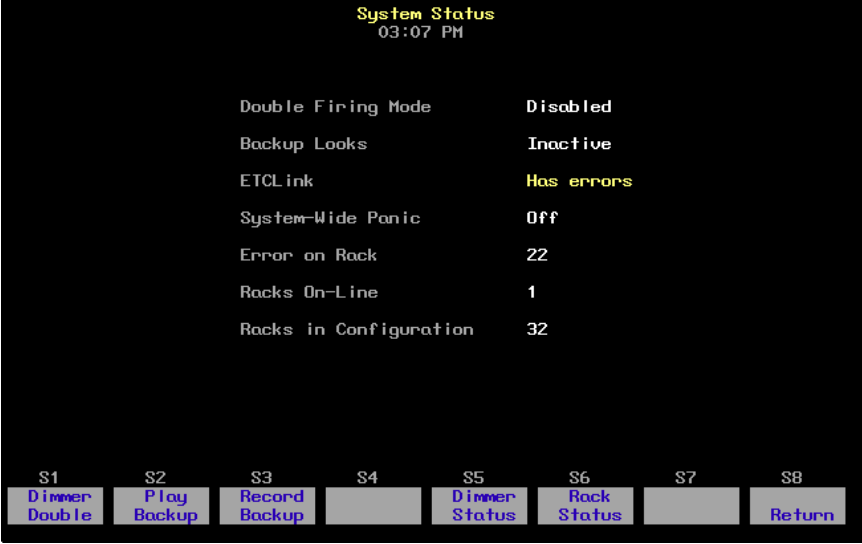
(1 = Enable all, 2 = Enable fatal error advisories only, 0 = Disable)

Enables all ETCLink error advisories

ETCLink displays

Dimming system status

The System Status display provides information about your Sensor dimming system. Press [Setup] [9] [Enter] [1] [Enter] to access the System Status display.



The screenshot shows a terminal window titled "System Status" with a timestamp of "03:07 PM". The main content is a list of system parameters and their current values. At the bottom, there is a row of eight buttons labeled S1 through S8, each with a specific function.

Parameter	Value
Double Firing Mode	Disabled
Backup Looks	Inactive
ETCLink	Has errors
System-Wide Panic	Off
Error on Rack	22
Racks On-Line	1
Racks in Configuration	32

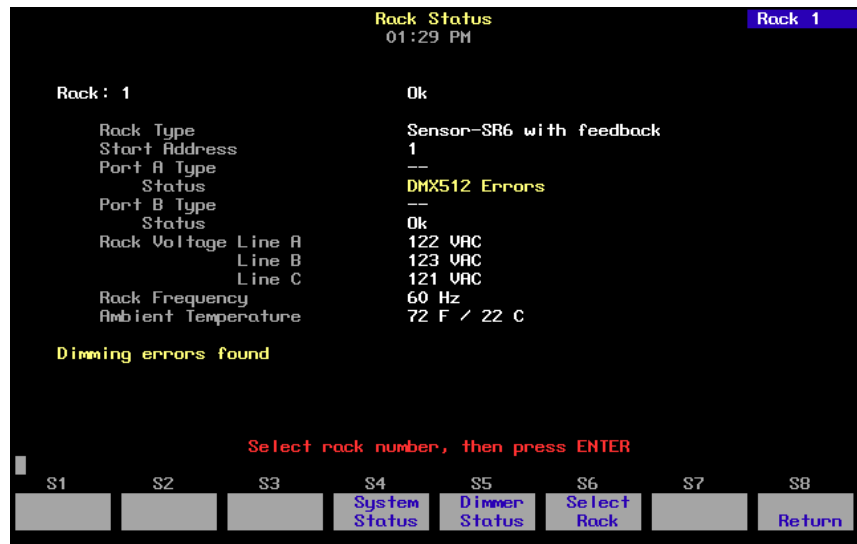
S1	S2	S3	S4	S5	S6	S7	S8
Dimmer Double	Play Backup	Record Backup		Dimmer Status	Rack Status		Return

- **Double Firing Mode** shows whether that mode is enabled or disabled for your system. If Double Firing Mode is disabled, doubled dimmers function as normal dimmers.
- **Backup looks** indicates whether a backup look is active, and, if so, which one.
- **ETCLink** displays any ETCLink errors.
- **System-wide panic** displays status of system-wide panic.
- **Error on rack** displays the number of the rack with an ETCLink error. If errors exist on multiple racks, the first rack with an error is displayed.
- **Racks on-line** displays the number of racks presently on-line throughout the ETCLink network.
- **Racks in configuration** displays the total number of racks in the system.

Dimmer rack status

The Rack Status display provides information about specified dimmer racks, including rack type, starting address, port information, voltage, frequency, and ambient temperature.

Press [Setup] [9] [Enter] [2] [Enter] to access the Rack Status display. Press [S6], **Select Rack**, [#] [Enter] to select a specific rack, [+] to select the next rack, or [-] to view the previous rack.



- **Rack type** displays the type of Sensor rack this rack is. Possible rack types include SR6, SR12, SR24, SR36, SR48, SP6, SP12, SP24, SP48, and may be followed by AF if the rack is equipped with Sensor's Advanced Features option.
- **Start address** displays the lowest dimmer number in the rack.
- **Port A/B type** indicates whether the port is normal or Dimmer Doubled. "--" indicates a normal port.
- **Status** indicates the present status of the port.
- **Rack voltage** displays the input voltage for each of the three phases (A, B and C). Single phase racks only display values for A and C.
- **Rack frequency** displays the input frequency in hertz (Hz).
- **Ambient temperature** displays the temperature of the air drawn into the rack by the rack's fan. Ambient temperature is not displayed unless the fan is running.

Rack error messages, if any, are announced beneath the ambient temperature line.

Dimmer status

The Dimmer Status display provides information about dimmers, including size and type, recorded load, firing mode, output curve, rack, slot, panic mode, and boost. Press [Setup] [9] [Enter] [3] [Enter] to access the Dimmer Status display.

Dimmer Status 03:09 PM								
Dimmer	Type	Recorded Load	Firing Mode	Curve	Rack	Slot	Panic Mode	No errors Scale/Boost
250	Not Installed							
251	Not Installed							
252	Not Installed							
253	D15AF	1250W	--	Mod Square	22	1	--	116V
254	D15AF	950W	--	Mod Square	22	1	--	116V
255	D15AF	0W	--	Mod Square	22	2	--	116V
256	D15AF	0W	--	Mod Square	22	2	--	116V
257	D15AF	0W	--	Mod Square	22	3	--	116V
258	D15AF	0W	--	Mod Square	22	3	--	116V
259	D15AF	0W	--	Mod Square	22	4	--	116V
260	D15AF	0W	--	Mod Square	22	4	--	116V
261	D15AF	0W	--	Mod Square	22	5	--	116V
262	D15AF	0W	--	Mod Square	22	5	--	116V
263	D15AF	0W	--	Mod Square	22	6	--	116V
264	D15AF	0W	--	Mod Square	22	6	--	116V
265	Not Installed							

Press [+] or [-] to page through dimmers

S1	S2	S3	S4 System Status	S5 Select Dimmer	S6 Rack Status	S7	S8 Return
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Up to 16 dimmers are shown in the display at once. If a dimmer has an error condition, the entire dimmer row is highlighted in yellow (ordinarily the line is in gray). Dimmer errors are also identified in the About Dimmer display. See *About Dimmer with ETCLink*, page 50.

Press [S5], **Select Dimmer**, [#] [Enter] to select a specific dimmer or use [+] and [-] keys to move through the list of dimmers a page at a time. Following is an explanation of column contents.

- **Type** identifies the ETC type designation.
- **Recorded load** displays the load at which the selected dimmer was recorded.
- **Firing mode** identifies whether the dimmer is normal, doubled, or switched. "--" indicates a normal firing mode.
- **Curve** identifies the output curve assigned to the dimmer.
- **Rack** identifies the dimmer's rack number.
- **Slot** identifies the dimmer's slot number in the rack.
- **Panic mode** identifies whether the dimmer is assigned to a panic circuit. "--" indicates an unassigned dimmer.
- **Scale/Boost** indicates either the dimmer's Scale or Boost value. Either can be returned for each dimmer depending upon the rack's CEM software. Scale is expressed in voltage and indicated by a "V" following the number. Boost is expressed in percentage and indicated by a "%" following the number. A non-boosted level of 100 percent is indicated by the symbol "--".

Monitoring dimmers

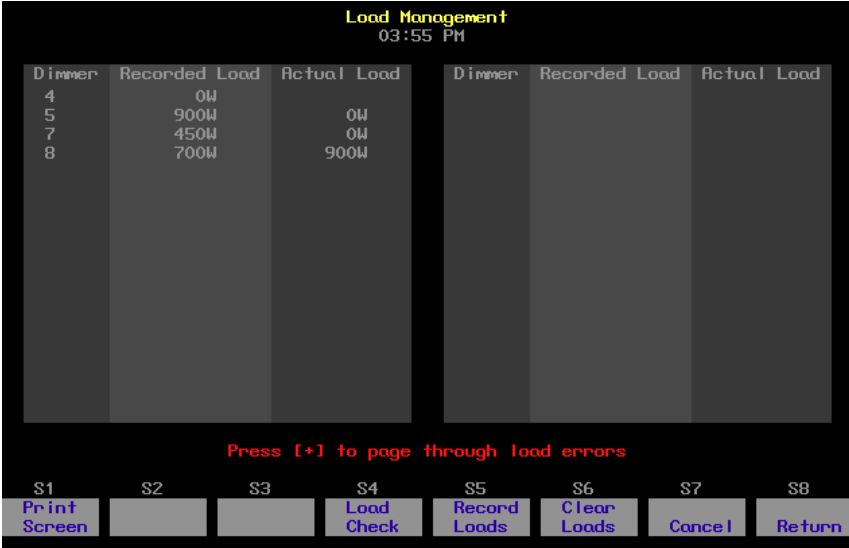
When used in conjunction with Sensor Advanced Feature dimming equipment, the console allows you to monitor individual dimmer loads in your system. This can greatly simplify troubleshooting by identifying such things as burned out lamps, and incorrectly lamped or unplugged fixtures.

When dimmer monitoring is in use, Sensor electronics constantly monitor dimmer loads. Monitoring information is displayed by the dimming system and also sent to the console.

To use this monitoring information efficiently, you must first determine what constitutes a normal load. The console procedure for determining normal loads is called Record Loads, and it is explained in the next section. You may also perform a Record Loads procedure from the Sensor system.⁴

Load Management display

The Load Management lists dimmers for which load errors have been detected, either by the Sensor system or by a Load Check you initiated. If you have a printer attached to your system, you may print the data shown in the Load Management display by pressing [S1], **Print Screen**. An example of a Load Management display is shown below.



The screenshot shows a console display titled "Load Management" with a timestamp of "03:55 PM". The display is divided into two side-by-side tables. The left table has three columns: "Dimmer", "Recorded Load", and "Actual Load". It lists dimmers 4, 5, 7, and 8 with their respective recorded and actual loads. The right table has the same column headers but is currently empty. Below the tables, a red instruction reads "Press [+] to page through load errors". At the bottom, there is a control panel with eight buttons labeled S1 through S8, each with a function: S1 (Print Screen), S2 (blank), S3 (blank), S4 (Load Check), S5 (Record Loads), S6 (Clear Loads), S7 (Cancel), and S8 (Return).

Dimmer	Recorded Load	Actual Load	Dimmer	Recorded Load	Actual Load
4	0W				
5	900W	0W			
7	450W	0W			
8	700W	900W			

If load errors are reported for many dimmers, Use [Page +] and [Page -] to page through the display.

- **Recorded Load** lists the loads determined for the listed dimmers during a Record Loads procedure.
- **Actual Load** lists the current loads for the listed dimmers.

⁴ Loads may not be recorded on Sensor systems without the AF option. See the Sensor CEM Users Manual for more information on recording loads from your dimming system.

Record Loads procedure

Perform a Record Loads any time you relamp your fixtures, change the type of fixtures you are using, change the dimmer numbering scheme, or make any other significant changes to your system. In general, Record Loads should be the last step in setting up your system.

When you perform a Record Loads, the system records load information for dimmers set at a level above zero or for a list of dimmers. If setting dimmers above zero, you can record 24 dimmers per rack at a time until all non-zero dimmers have been recorded. If you have multiple racks, 24 dimmers in each rack are recorded simultaneously.⁵

Caution: Record Loads changes levels on stage. Dimmer outputs rise and fall for several minutes during the procedure. To cancel a Record Loads operation that has already started, press [S7], **Cancel**, [Enter].

Keystrokes:	Action:
1. Set desired dimmers to a level above zero. ^a Only dimmers at levels above zero are recorded.	
2. Press [Setup].	Selects Setup display
3. Select [9], ETCLink Functions , and press [Enter].	Selects ETCLink Functions menu
4. Select [4], Load Management , and press [Enter].	Selects Load Management display
5. Press [S5], Record Loads . If you wish, you may enter a specific dimmer or dimmers to record.	Prompt reads: To record loads, select dimmer(s) and press ENTER (Enter 0 to record loads for all dimmers)
6. Press [0] [Enter].	Advisory reads: New loads will be recorded for all dimmers with levels above zero. Levels on stage will change while the Record Load is in progress. The system will automatically vary the dimmer outputs during the Record Load. The process may take several minutes to complete.
	Press [Enter] to proceed, or press [Clear] to cancel
7. Press [Enter].	New loads are recorded for all dimmers with levels above zero
	<i>a. If you wish, instead of setting the desired dimmers to a level in step 1, you may enter a list of dimmers to record in step 5.</i>

^{5.} On single phase racks, the system checks 16 dimmers per rack at a time.

Load Check procedure

Load Check compares the current load on selected dimmers with their recorded loads. The system checks load information only for selected dimmers. To identify the dimmer(s) you wish to check, use either the console or the CEM to set the desired dimmers at a level above zero.

The system checks 24 dimmers per rack at a time until all dimmers at levels above zero have been checked. If you have multiple racks, 24 dimmers in each rack are checked simultaneously.⁶

Caution: *Load Check changes levels on stage. Dimmer outputs rise and fall for several minutes during the procedure. To cancel a check load operation in progress, press [S7], **Cancel**, [Enter].*

Follow these steps to check loads for your system:

Keystrokes:	Action:
1. Set dimmers to be checked to a level above zero. Only dimmers above zero are checked. ^a	
2. Press [Setup].	Selects Setup display
3. Select [9], ETCLink Functions , and press [Enter].	Selects ETCLink Functions menu
4. Select [4], Load Management , and press [Enter].	Selects Load Management display
5. Press [S4], Load Check . (You may enter specific dimmers to check.)	Prompt reads: To check loads, select dimmer(s) and press ENTER (Enter 0 to check loads for all dimmers)
6. Press [0] [Enter] [Enter].	Advisory reads: All dimmers with levels above zero will have their loads checked. Levels on stage will change while the Load Check is in progress. The system will automatically vary the dimmer outputs during the Load Check. The process may take several minutes to complete.
7. Press [Enter] to proceed with the load check, or press [Clear] to cancel the operation.	Loads are checked for all dimmers with levels above zero Once complete, advisory reads: Load check processing has completed Press [Clear] to continue

a. If you wish, instead of setting the desired dimmers to a level in step 1, you may enter a list of dimmers to record in step 5.

^{6.} *On single phase racks, the system checks 16 dimmers per rack at a time.*

Clear Loads procedure

Clear Loads allows you to clear recorded loads information for selected dimmers, thus disabling dimmer monitoring for those dimmers. This can be useful if you know that the load on a dimmer or group of dimmers will change over the course of a show and don't want to receive load error messages every time it happens.

To clear recorded loads, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [9], ETCLink Functions , and press [Enter].	Selects ETCLink Functions menu
3. Select [4], Load Management , and press [Enter].	Selects Load Management display
4. Press [S6], Clear Loads . (If you wish, you may enter a specific dimmer or dimmers to clear.)	Prompt reads: To clear loads, select dimmer(s) and press ENTER (Enter 0 to clear non-zero loads for all dimmers)
5. Press [0] [Enter].	Advisory reads: Recorded loads will be erased for all dimmers with levels above zero, disabling load error messages for those dimmers. Press [Enter] to proceed, or press [Clear] to cancel
6. Press [Enter] to proceed with the load clear, or press [Clear] to cancel the operation.	Loads are cleared for all dimmers with levels above zero

Setting and unsetting dimmers

If your console is connected to an ETC Sensor dimming system by an ETCLink network, you may use your console to set and unset dimmers at the dimmer rack.

Note: For more information on setting dimmers, see the Sensor CEM User Manual.

Setting a dimmer

To set a dimmer or group of dimmers to a level at the dimmer rack, ignoring any DMX512 outputs, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Press [9], ETCLink Functions , [Enter].	Selects ETCLink Functions menu
3. Press [S7], Set Dimmer .	Prompt reads: Select dimmer number(s) to set, then press ENTER (To cancel, press CLEAR)
4. Enter the dimmers you wish to set and press [Enter].	Prompt reads: Select dimmer level (Press FULL button for 100%)
5. Enter the level at which to set the dimmers. Enter in two-digit form (e.g., one percent = 01)	Advisory reads: To confirm, press ENTER To cancel, press CLEAR
6. Press [Enter].	Dimmers are set to desired level

Unsetting a dimmer

To unset a dimmer (or group of dimmers) and return it to normal operation, follow the procedure below. (**NOTE:** Setting a dimmer to level 00 is not the same as unsetting it and returning it to normal operation.)

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Press [9], ETCLink Functions , [Enter].	Selects ETCLink Functions menu
3. Press [S6], Unset Dimmer .	Prompt reads: Select dimmer number(s) to unset, then press ENTER (Enter 0 to unset all dimmers)
4. Enter the dimmers you wish to unset and press [Enter]. Press [0] [Enter] to unset all set dimmers.	Prompt reads: To confirm, press ENTER To cancel, press CLEAR
5. Press [Enter].	Dimmers are unset

Working with Sensor backup looks

A backup look is a recording of a selected look on stage stored in the Sensor CEM. The Sensor system allows you to use either your console or any CEM to bring that look up on stage. You may save and use up to 32 backup looks.

Recording a backup look

To record a backup look, follow these steps:

Keystrokes:	Action:
1. Use your console to create the desired look on stage.	Creates look on stage
2. Press [Setup].	Selects Setup display
3. Select [9], ETCLink Functions , and press [Enter].	Selects ETCLink Functions menu
4. Press [1], Dimming System Status , [Enter].	Selects System Status display
5. Press [S3], Record Backup .	Prompt reads: Select backup look to record, then press ENTER
6. Enter the backup look number (1-32) and press [Enter].	Advisory reads: Record Backup processing has completed. Press [Clear] to continue.

Playing a backup look

Playing a backup look brings up the recorded look on stage. You may play back a backup look from the console or from a CEM.

Only one backup look may be on stage at a time. If there is a backup look on stage when you bring up a new one, the second look replaces the first.

Up and down fade times for backup looks are five seconds. They cannot be modified.

To use the console to play a recorded backup look, follow these steps:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display
2. Select [9], ETCLink Functions , and press [Enter].	Selects ETCLink Functions menu
3. Press [1], Dimming System Status , [Enter].	Selects Dimming System Status display
4. Press [S2], Play Backup .	Prompt reads: Select backup look to play, then press ENTER (Enter 0 to return to normal operation)
5. Enter the backup look number (1-32) and press [Enter]. ^a	Advisory reads: Play Backup processing has completed. Press [Clear] to continue.

- a. To clear a playing backup look, enter [0] in step 5 as the backup look number. The currently playing backup look will be cleared from the stage.*

Chapter 24

Control interfaces

The console can control and be controlled by a wide variety of external devices. These control interfaces may be as simple as a switch and as complicated as another piece of electronic equipment. They may be timed or asynchronous.

Chapter 24 explains the following interfaces with the console:

- MIDI
- Real Time Programs
- DMX512 Input
- MIDI and SMPTE time codes
- Remote Macros
- Serial Interface

MIDI

MIDI (Musical Instrument Digital Interface) is a digital communication protocol that allows you to interconnect musical instruments and digital electronic equipment, such as lighting control consoles. The console supports MIDI Show Control 1.0 (MSC) and a subset of MIDI known as ETC MIDI. If you are not familiar with MIDI and would like more information on how it works, *Control Systems for Live Entertainment*, by John Huntington, includes several sections that deal with the subject.

ETC MIDI

The console both transmits and receives MIDI messages with any MIDI instrument. The MIDI protocol can control cues, macros, submaster bump switches and the level wheel.

ETC assumes that MIDI users have a working knowledge of MIDI. This section provides ETC MIDI interface information, message formats and message definitions. See *Installing MIDI*, page 344 for installation information.

Configuring ETC MIDI

The console operates at all times in MIDI Mode 3 or Omni = off/Poly. This means it only receives or transmits MIDI commands on the user-selected channel.

Configure the console for ETC MIDI by specifying the MIDI channel number. Be sure your MIDI gear is set to the same channel. The console remembers the selected MIDI channel the next time it is turned on. The procedure for selecting the MIDI channel is given below:

1. Press [Setup]. Go to the setup display
2. Press [6] [Enter]. Selects the Options Settings menu
3. Press [1] [Enter]. Prompt reads:
Select MIDI channel (#1 through 16), or press DISABLE MIDI to disable MIDI
4. Enter a number between 1 and 16.^a Specifies MIDI channel
5. Press [Enter]. Completes the ETC MIDI setup

a. Press [S1], **Disable MIDI**, here to disable ETC MIDI.

ETC MIDI message formats

The following table lists MIDI message formats used to control the console. All numbers are in hexadecimal format.

Note off message format

<8n><kk><vv>
8 Note off status
n MIDI channel number (0-F)
kk Key number (0-7F)
vv Note off velocity (0-7F)

Note on message format

<9n><kk><vv>
9 Note on status
n MIDI channel number (0-F)
kk Key number (0-7F)
vv Note on velocity (0-7F)
[00=Note off]

Control change message format

<Bn><kk><vv>
B Control change status
n MIDI channel number (0-F)
kk Control number (70-92)
vv Control value (0-7F)

Program change message format

<Cn><kk>
C Program (patch) change status
n MIDI channel number (0-F)
kk Program number (0-7F)

Pitch bend message format

<En><ll><mm>
E Pitch bend status
n MIDI channel number (0-F)
ll Least significant 7 bits of pitch bend value (0-7F)
mm Most significant 7 bits of pitch bend value (0-7F)

MIDI Message definitions

Submaster bump switch execution

Submasters 1 - 36	C#0 - C3	#1 - #36
Submasters 37 - 72	C#3 - C6	#37 - #72
Submasters 73-108	C#6 - C9	#73 - #108

Note: C5 = MIDI note #60 or middle C.

Cue execution in AB fader pair

Next cue	Program change 0
Cues 1 - 127	Program change 1 - 127
Cues 128 - 255	Controller change 70, parameters 0 - 127
Cues 256 - 383	Controller change 71, parameters 0 - 127
Cues 384 - 511	Controller change 72, parameters 0 - 127
Cues 512 - 639	Controller change 73, parameters 0 - 127
Cues 640 - 767	Controller change 74, parameters 0 - 127
Cues 768 - 895	Controller change 75, parameters 0 - 127
Cues 896 - 999	Controller change 76, parameters 0 - 103

Cue execution in CD fader pair

Next cue	Controller change 77, parameter 0
Cues 1 - 127	Controller change 77, parameters 1- 127
Cues 128 - 255	Controller change 78, parameters 0 - 127
Cues 256 - 383	Controller change 79, parameters 0 - 127
Cues 384 - 511	Controller change 80, parameters 0 - 127
Cues 512 - 639	Controller change 81, parameters 0 - 127
Cues 640 - 767	Controller change 82, parameters 0 - 127
Cues 768 - 895	Controller change 83, parameters 0 - 127
Cues 896 - 999	Controller change 84, parameters 0 - 103

Macro execution

Macros 1 - 127	Controller change 85, parameters 1 - 127
Macros 128 - 255	Controller change 86, parameters 0 - 127
Macros 256 - 383	Controller change 87, parameters 0 - 127
Macros 384 - 511	Controller change 88, parameters 0 - 127
Macros 512 - 639	Controller change 89, parameters 0 - 127
Macros 640 - 767	Controller change 90, parameters 0 - 127
Macros 768 - 895	Controller change 91, parameters 0 - 127
Macros 896 - 999	Controller change 92, parameters 0 - 103

Level change wheel

<u>Wheel "ticks"</u>	<u>Pitch bend value (hexadecimal)</u>	<u>Message values (decimal)</u>	
0	2000	ll=0	mm=64
+1	2001	ll=1	mm=64
-1	1FFF	ll=127	mm=63
+8191 (+12.5%)	3FFF	ll=127	mm=127
-8192 (-12.5%)	0	ll=0	mm=0
+655 (+1%)	228F	ll=15	mm=69
-655 (-1%)	1D71	ll=113	mm=58

MIDI Show Control (MSC)

The consoles recognize the following MSC commands, which may be either transmitted or received (all other commands are ignored):

- Go
- Stop
- Resume
- Fire

Configuring MIDI Show Control

The console can receive MSC information, send MSC information, or both. Enable the sending and receiving of MSC information by specifying the device(s) that will act as the sender and receiver with respect to the console.

The sending and receiving device numbers are disabled by default. To enable these devices, proceed as follows:

1. Press [Setup]. Go to the setup display
2. Press [6] [Enter]. Selects the Options Settings menu
3. Press [2] [Enter]. Prompt reads:
Select MIDI receiver device (#0 - 126), or press DISABLE MIDI to disable MIDI Show Control
4. Enter a number from 0 to 126.^a Specifies the number of the device that will send to the console (console is the receiver)
5. Press [Enter]. Prompt reads:
Select MIDI transmitter device (#0 - 126), or press DISABLE MIDI to disable MIDI Show Control
6. Enter a number from 0 to 126.^b Specifies the number of the device that will transmit the MSC signal
7. Press [Enter]. Completes the setup

*a. If the MIDI receiver device had been previously specified, press [S1], **Disable MIDI**, here to remove that specification.*

*b. If the MIDI transmitter device had been previously specified, press [S1], **Disable MIDI**, here to remove that specification.*

MSC commands received by the console

Consoles enabled for MSC accept the following MSC commands. When the console receives one of these commands, it executes the command immediately. In order to accept MSC commands, the console's receiver **Device ID** must match the target device ID for the MIDI device sending the signals.

Go	<ul style="list-style-type: none">• If no cue number is sent, Go presses [A/B Go] on the console. The next cue on the cue list runs in the A/B fader.• If a cue number is sent, the specified cue runs on the A/B fader.• If a cue number is sent, and 2 is sent as the list entry, that cue runs on the C/D fader.• If cue 0 is sent, and 2 is sent as the list entry, the command presses [C/D Go]. The pending cue runs in the C/D fader. You may also press [A/B Go] by sending Go-Cue 0-1.
Stop	<ul style="list-style-type: none">• The Stop command by itself holds all fades in both fader pairs.• If Stop is sent with a cue number and a list entry of 1, only the cue running in the A/B fader holds.• If Stop is sent with a cue number and a list entry of 2, only the cue running in the C/D fader holds.• The cue number field is ignored, but must be included if a list entry is sent.
Resume	<ul style="list-style-type: none">• The Resume command by itself resumes all holding fades in both fader pairs.• If Resume is sent with a cue number and a list entry of 1, only a cue holding in the A/B fader resumes.• If Resume is sent with a cue number and a list entry of 2, only the cue holding in the C/D fader resumes.• The cue number field is ignored, but must be included if a list entry is sent.
Fire	<ul style="list-style-type: none">• The Fire command executes a specified macro. Macro number must be in the range 1-127. If no macro is specified, or if the macro number is out of range, the command is ignored.

MSC commands transmitted by the console

MIDI Show Control (MSC) allows the console to send the following commands to MIDI devices. If MSC output is enabled on the console, the console automatically sends the MSC commands. The console's transmitter **Device ID** must match the device ID for the MIDI device receiving the signals.

[A/B Go]	<ul style="list-style-type: none">• If a cue is pending, the console transmits [A/B Go] with cue number and a list entry of 1.• If a cue is holding, the console transmits [A/B Resume] with cue number and a list entry of 1.
[C/D Go]	<ul style="list-style-type: none">• If a cue is pending, the console transmits [C/D Go] with cue number and a list entry of 2.• If a cue is holding, the console transmits [C/D Resume] with cue number and a list entry of 2.
[A/B Hold]	<ul style="list-style-type: none">• If a cue is running, the console transmits [A/B Stop] with cue number and a list entry of 1.
[C/D Hold]	<ul style="list-style-type: none">• If a cue is running, the console transmits [C/D Stop] with cue number and a list entry of 2.
Macros	<ul style="list-style-type: none">• For macros 1-127, the console transmits Fire with the macro number.

Real time programs

The console allows you to create up to 500 real time programs that can run automatically when you're not there. For example, you may wish to turn on the work lights for a choir rehearsal between 7 PM and 9 PM on Monday and Wednesday. Or, perhaps, warm the filaments of your studio instruments 15 minutes prior to your news program.

These programs run in real time, which means that they execute periodically when a pre-set time and day of the week arrives. They can be referenced to an absolute time, such as 7:00 a.m., or they can be referenced with the Astro Clock function to execute in relation to your local sunrise or sunset.

The Real Time Clock must be set for the current time and date so that Real Time Programs will run correctly.⁷ Also, real time programs must be enabled. The sections below explain how to enable, create and edit real time programs, including assigning labels to them.

Go to the Real Time Programs display

Press [Setup] [1][2], **Real Time Programs**, [Enter] to go to the Real Time Programs display.




The screenshot shows the 'Real Time Programs' display. At the top, it says 'Real Time Programs' and '04:31 PM'. The title 'Program 1' is in the top right corner. The main area contains a table with the following data:

Program	Time	Days	Macro	Label
1	08:00 AM	Mon Tue Wed Thu Fri	1	Program 1
2	12:00 AM	Mon Fri	2	Program 2
3	05:00 AM	Tue Wed Thu	3	Program 3

Below the table, it says 'Select program number'. At the bottom, it shows 'Sunrise 07:09 AM' and 'Sunset 07:16 PM'. There are eight softkey buttons labeled S1 through S8:

- S1: Select Program
- S2: Time
- S3: Astro Clock
- S4: Days of week
- S5: Macro
- S6: Label
- S7: More Softkeys
- S8: Return

⁷ See *Setting the clock*, page 32, to set the Real Time Clock.

Navigation and Feedback - Real Time Programs display					
		[S]			±
Select a program	X	X	X		X
Select a field to edit		X		X	
Select new field data					X
White row	Indicates program selected				
Yellow coloration	Indicates field selected				

Enabling / disabling real time programs

Real time programs are enabled by default. Follow the procedure below to enable or disable real time programs:

Keystrokes:

1. Press [Setup].
2. Press [6] [Enter].
3. Press [1][1] [Enter].
4. Press [1] [Enter].

Action:

- Selects Setup display mode
- Selects Options Settings menu
- Prompt reads:
**Enable/Disable real time programs
 (1 = enable, 0 = disable)**
- Enables Real Time Programs.

Creating real time programs

Follow these steps to create and label a real time program:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S1], Select Program , [1] [Enter].	Prompt reads: Enter time (12 hour clock) Press [+] to enter AM or PM
4. Press [8][0][0] [Enter].	Enters time to run macro. Prompt reads: Enter days of week (1=Mon, 2=Tue, 3=Wed, 4=Thu, 5=Fri, 6=Sat, 7=Sun)
5. Press [1] [And] [3] [Thru] [5] [Enter].	Enters days to run macro Prompt reads: Enter macro number
6. Press [5] [Enter].	Creates real time program 1 Prompt reads: Type program label (F6 = clear to end, F7 = previous program label, F8 = next program label)
7. Enter a label, then press [Enter].	Labels the real time program

Real time programs with astronomical time

Use the Astro Clock function to specify that a real time program runs at a time related to the local sunrise or sunset rather than at a specific time of day.

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S1], Select Program , [1] [Enter].	Prompt reads: Enter time (12 hour clock) Press [+] to enter AM or PM
4. Press [S3], Astro Clock .	Prompt reads: Select astronomical time of day (0 = none, 1 = before sunrise, 2 = after sunrise, 3 = before sunset, 4 = after sunset).
5. Press [1] [Enter].	Selects before sunrise. Prompt reads: Enter time offset (hours/minutes)
6. Press [1][0] [Enter].	Enters time offset before sunrise when the macro runs Prompt reads: Enter days of week (1=Mon, 2=Tue, 3=Wed, 4=Thu, 5=Fri, 6=Sat, 7=Sun)
7. Press [1] [And] [3] [Thru] [5] [Enter].	Enter days to run macro Prompt reads: Enter macro number
8. Press [5] [Enter].	Creates real time program 1 Prompt reads: Type program label (F6 = clear to end, F7 = previous program label, F8 = next program label)
9. Enter a label, then press [Enter].	Labels the real time program

Editing real time programs

Once you have created a real time program, you can easily make changes to it and others in the Real Time Programs display. Press [↑] or [↓] to move from one program to the next. Press [←], [→] to move from one program field to the next. You must press [Enter] to leave the label field.

Deleting real time programs

You can delete all real time programs as one of the Clear Functions reached from the Setup menu (option 12). Alternatively, you can delete one program at a time in the Real Time Programs display.

Delete real time programs singly with the following procedure:

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S7], More Softkeys , [S6], Delete Program .	Prompt reads: Select program number(s) to delete, then press ENTER To cancel, press CLEAR
4. Press [5] [And] [6] [Enter].	Selects programs 5 and 6 to delete Prompt reads: To confirm, press ENTER To cancel, press CLEAR
5. Press [Enter].	Deletes programs 5 and 6

Inserting real time programs

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S7], More Softkeys , [S1], Insert Program .	Prompt reads: Select program number to insert, then press ENTER To cancel, press CLEAR
4. Press [4] [Enter].	Specify insertion at program 4 Prompt reads: Select number of programs to insert, then press ENTER To cancel, press CLEAR
5. Press [2] [Enter].	Inserts two new programs starting with number. All following programs are renumbered

Copying real time programs

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S7], More Softkeys , [S2], Copy Program .	Prompt reads: Select program number(s) to copy, then press ENTER To cancel, press CLEAR
4. Press [1] [Thru] [5] [Enter].	Selects programs 1 through 5 to copy Prompt reads: To copy selected programs(s), select time and press ENTER Press [+] to enter AM or PM
5. Press [7][0][0] [+] [Enter].	Copies program 1 to a new program starting at 7:00 AM; the rest of the programs maintain their original relationship in time

Moving real time programs

You may move one or more real time programs from one time slot to another. (To move a single program, you may also use the arrow keys to highlight the time for the program you want to move, use the keypad to enter the new time, then press [Enter].)

Keystrokes:	Action:
1. Press [Setup].	Selects Setup display mode
2. Press [1][2] [Enter].	Selects Real Time Programs display
3. Press [S7], More Softkeys , [S3], Move Program .	Prompt reads: Select program number(s) to move, then press ENTER To cancel, press CLEAR
4. Press [1] [Thru] [5] [Enter].	Selects programs 1 through 5 to move Prompt reads: To move selected programs(s), select time and press ENTER Press [+] to enter AM or PM
5. Press [5][0][0] [Enter].	Copies program 1 to a new program starting at 5:00 PM; the rest of the programs maintain their original relationship in time.

Sorting real time programs

The console automatically sorts real time programs according to time of day when you exit the display or when you move, copy or delete programs. You can force a sort at any time you are in the display by pressing [S7], **More Softkeys**, [S8], **Sort**.

DMX In

You can use DMX512 levels from another source, such as another console, to control a show in your console. When DMX512 information is used as input to your console, it is called DMX In.

There may be circumstances where you want to obtain a “snapshot” of current levels of DMX In, such as if you want to use a particular look on stage that has been established by another console. For that purpose, you may record current levels of DMX In into cues or other program elements in your console.

You may also use DMX In levels to set channel levels dynamically in your console. In that application you would refer to DMX In as focus point 0. As DMX In varies, any channel levels set with reference to focus point 0 will automatically and immediately update, just as they would do if recorded with reference to any other focus point.⁸

The first step in using DMX In for either purpose is to enable DMX In. The enabling procedure is given in the following section. You can refer to focus point 0 in your commands without first enabling it, but levels will not be set in cues or other recorded elements that reference focus point 0 until DMX In is enabled.

Enabling DMX In

Record DMX In directly and use focus point 0 to set levels after assigning a starting channel for DMX In. The assignment of a starting channel is known as enabling DMX In, and is accomplished in the Options Settings display shown below.⁹



^{8.} Even though focus point 0 functions like any other focus point, you cannot create it or record to it using the procedures given in Chapter 12 Focus points, page 145.

^{9.} DMX In is disabled by default.

Keystrokes:	Action:
1. Press [Setup].	Selects Setup menu
2. Press [6] [Enter].	Selects Options Settings menu
3. Press [3] [Enter].	Prompt reads: Select DMX512 In starting channel (Enter 0 to disable)
4. Press [1][0][0] [Enter]. ^a	Enables DMX In and specifies channel 100 as the first channel to receive DMX In signals

a. Make sure you have enough channels to accommodate all DMX In channels. For an Insight 3 with 512 channels, you must set the DMX In starting channel at 1 to use all 512 DMX In channels.

Working with DMX In and focus point 0

After enabling DMX In, you can record DMX In levels in the Stage or Fader displays or you can record all active channels except DMX In. You can record using focus point 0 or except focus point 0 without first enabling DMX In.

The following procedure illustrates the use of the DMX In softkey in the Stage display.

Keystrokes:	Action:
1. Press [Stage].	Selects the stage display
2. Press [Record] [5].	Prepare to record to cue 5
3. Press [S7], More Softkeys , until [S4] reads DMX In .	
4. Press [S4], DMX In , [Enter]. ^a	Selects DMX In channels
5. Press [Enter].	Records DMX In levels to cue 5

a. Press [Except] before pressing [S4] in this step to record all active channels except DMX In channels.

Using DMX In to set levels

You may be interested in having your cues or other recorded elements reflect DMX In levels continuously, not just at one point in time. The console allows you to do that by recording with reference to focus point 0, which always contains the current value of DMX In after DMX In is enabled.

The following procedure illustrates how to record a cue with reference to focus point 0. Assume for this example that DMX In was enabled for channels starting at channel 600.

Keystrokes:	Action:
1. Press [Stage].	Selects the stage display
2. Press [Channel] [6][0][0] [Thru] [6][9][9] [Focus Point] [0] [Enter].	Sets channels 600 - 699 at levels established in focus point 0
3. Press [Record] [Cue] [5] [Enter].	Records cue 5

Viewing DMX In

View DMX In channels with the Fader display. Either choose option 5 when entering the Fader display or press [S1], **Select Fader**, while you're in the Fader display.

Time Code

You can create and run shows that respond to programming based on a standardized time code protocol. The console responds to both the Society of Motion Picture and Television Engineers (SMPTE) time code and to the Musical Instrument Digital Interface (MIDI) time code.

The console generates an internal time code in both MIDI and SMPTE protocols. The console also can run under external MIDI and SMPTE control, but an option must be installed for external SMPTE (external MIDI capability is standard for the console). You can have both clocks simultaneously enabled so that if ever the external time code signal stopped during a show, the internal clock would immediately take over preserving the continuity of your show.

Shows designed for time code control consist of a series of events that play back at specified times. A time code program also has a modifiable loop time that ranges from 5 seconds to 24 hours. There can be as many as 3,000 time code events, with each event having any combination of cues loaded in faders (one cue for each of two faders), a submaster bump button or a macro.

Up to 32 events may be executed in a single frame.¹⁰ Event times are expressed in hours, minutes and seconds, with each second broken down into frames. For example, 01:25:30:17 is one hour, twenty-five minutes, thirty seconds and seventeen frames. Two frame rates are available in addition to the default rate, which is thirty frames per second.

^{10.} *If more than 32 events are assigned to the same frame, only the first 32 are executed in that frame, with the rest executing in the following frame or frames until all those assigned are used up. In manual mode, however, only one event is executed when step is pressed, regardless of how many are assigned.*

Creating time code programs

Create time code programs in the Time Code Events display or in Learn mode.



Press [Enter] to move from field to field for an event. Alternatively, use the arrow keys to move around the display. Press [←] or [→] to move horizontally. Press [↑] or [↓] to move vertically. If you are at the right end of a line, you can press [→] to move to the next line. When you reach the last line, you can press [↓] to add a new time code event.

In the Time Code Events display

Use the following procedure to create a time code program. Any cues, submasters or macros you use in this procedure must be pre-recorded.

Keystrokes:

1. Press [Setup].
2. Press [1][3], **Time Code Events**, and press [Enter] [Enter].
3. Enter [1][0][0].
4. Press [Enter].
5. Press [1].
6. Press [Enter].

Actions:

- Selects Setup display
- Selects Time Code Events display and event 1. Prompt reads:
Select Code Time
(Press TIME to edit specific fields)
- Selects one second as the time of the first SMPTE event you want to create
- Highlight moves to the **A/B** field
Prompt reads:
Select A/B Cue
- Enters cue 1 for event 1 to play on the A/B fader
- Highlight moves to the Rate field
Prompt reads:
Select A/B Rate
(0 to 2000, 100 = Normal)

7. Press [1][2][5]. (Zero stops the fade; 50 runs the fade at half its recorded rate. If no rate is entered, the cue runs at its recorded rate.) Enters a rate of 125 percent of the recorded fade rate
Corner reads:
Rate 125
8. Press [Enter]. Highlight moves to the **C/D** field
Prompt reads:
Select C/D Cue
9. Repeat steps 6 through 8 for fader C/D.
10. Press [Enter]. Moves the highlight to the **Bump** field. Prompt reads:
Select submaster number for bump event, then press [+] for ON, or [-] for OFF
11. Enter the desired submaster number, then press [+] to set the submaster **ON**, or [-] to set the submaster **OFF**.
12. Press [Enter] to move the highlight to the submaster **Rate** field. Prompt reads:
Select Bump Rate (0 to 2000, 100 = normal)
13. Press [Enter]. Leaves fade rate at normal and moves the highlight to the **Macro** field
Prompt reads:
Select Macro
14. Press [5]. Selects macro 5 to run when event plays
15. Press [Enter]. Moves the highlight to the **Label** field
Prompt reads:
Enter Label
16. Name the event if you wish by typing a label on the attached alphanumeric keyboard.
17. Press [Enter]. Enters label. Prompt reads:
Select event number
18. Enter the number of an event followed by [Enter].
19. Repeat steps 3 through 18. Repeat to add additional events

In Learn mode

Learn mode allows you to record macro keys, submaster bump buttons and fader [Go] keys into time code events as you go along. Record a time code program live in Learn mode without concerning yourself with the code time.

Follow these steps to record time code events in Learn mode:

Keystrokes:

1. Press [Setup].
2. Press [1][3], **Time Code Events**, and press [Enter].
3. Press [S7], until [S6] reads **Learn Mode**.
4. Press [S6], **Learn Mode**.
5. If using the internal clock to time the show, press [S2], **Clock Enable**, to start the clock.^a
6. Go to the Stage display
7. If using an external time code to time the show, start the external clock now. Time code Input must have been enabled before you do this. See *External time code clock*, page 305, for details.
8. Select the cues, submasters and macros you want to record as time code events.
9. At the exact moment in the program that you want each cue, submaster or macro to begin, press [Go] for the fader in which you want the time code event to run the cue, press the submaster's bump button, or start the macro.
10. Press [Setup] [1][3] [Enter] [S6], **Learn Mode**.

Actions:

- Selects Setup display
- Selects Time Code Events display mode
- TimeCd Learn** flashes in red in the upper left corner of the screen
- The internal clock, in the upper right corner of the display, starts to run
- Each button press is recorded as an event in your time code program
- Returns to Time Code Events display and deactivates Learn mode; edit the events as necessary

a. While in the Time Code Events display, you may press [Record] to enter a blank event.

Reset loop time

A time code program loop plays from the first event time to the last event time, then resets and plays again. Any events with code times before the first time or after the last time are ignored. The resettable loop time can run from five seconds to 24 hours.¹¹

If you are running a time code program from an external clock, the external clock will control the loop time with its own first event time and last event time settings. To provide synchronized internal clock backup, you must set the first event time and last event time in the Time Code Events display to correspond exactly with those times set for the external clock.

Use this procedure to set loop times either when running on the internal clock alone or when running from an external clock with internal clock backup.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , and press [Enter].	Selects Time Code Events display
3. Press [S7] until [S8] reads Reset Loop .	
4. Press [S8], Reset Loop .	Prompt reads: Enter first valid frame of internal time, then press ENTER. (Press TIME to edit specific fields)
5. Press [1][0][0][0].	Sets ten seconds as the starting time for the time code program
6. Press [Enter].	Prompt reads: Enter last valid frame of internal time, then press ENTER. (Press TIME to edit specific fields)
7. Press [5][0][0][0][0] then press [Enter].	Sets the time code program to reset at the five minute mark

¹¹. *If the loop is set to less than five seconds, the internal clock resets it to five seconds from the loop's starting time.*

Editing time code programs

Once you have created a time code program, you can easily insert, copy, move, and delete events in the Time Code Events display. You may apply these edits to individual events or to a range of events.

Deleting time code events

Follow these steps to delete time code events:¹²

Keystrokes:

1. Press [Setup].
2. Press [1][3], **Time Code Events**, and press [Enter].
3. Press [S7] until [S6] reads **Delete Event**.
4. Press [S6], **Delete Event**.
5. Press [5] [And] [6] [Enter].
6. Press [Enter] to delete the event or [Clear] to leave it unchanged.

Actions:

- Selects Setup display
- Selects Time Code Events display
- Prompt reads:
**Select event number(s) to delete,
then press ENTER
To cancel, press CLEAR**
- Enters events 5 and 6 to delete
Prompt reads:
**To confirm, press ENTER
To cancel, press CLEAR**

^{12.} The **Clear Time Code Events** menu option on the Clear Functions menu allows you to delete all recorded time code events. To do so, press [Setup] [4] [Enter] [1][3] [Enter] [Enter].

Inserting time code events

Insert a time code event into an existing time code program with this procedure:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , and press [Enter].	Selects Time Code Events display
3. Press [S7] until [S1] reads Insert Event .	
4. Press [S1], Insert Event .	Prompt reads: Select event number to insert, then press ENTER To cancel, press CLEAR
5. Press [4] [Enter]. ^a	Prompt reads: Select number of events to insert, then press ENTER To cancel, press CLEAR
6. Press [2].	Indicates that you wish to insert two new events Corner reads: Insert 2
7. Press [Enter].	New events 4 and 5 are inserted; all following events are renumbered

a. The new event(s) will be inserted before event 4.

Copying time code events

If you are creating a series of similar time code events, you may find it easier to create one event and then copy that as the basis for additional events. Follow the procedure below to copy a selected event or range of events to different code times:

Keystrokes:

1. Press [Setup].
2. Press [1][3], **Time Code Events**, and press [Enter].
3. Press [S7] until [S2] reads **Copy Event**.
4. Press [S2], **Copy Event**.
5. Press [1] [Thru] [5].
6. Press [Enter].
7. Press [Time] [Time] [2][5].
8. Press [Enter].

Actions:

- Selects Setup display
- Selects Time Code Events display
- Prompt reads:
Select event number(s) to copy, then press ENTER. To cancel, press CLEAR
- Selects events 1 through 5 to copy
- Prompt reads:
To copy selected event(s), select time and press ENTER. To cancel, press CLEAR
- Selects 25 seconds for the first event to copy
- Copies event 1 to a new event starting at 25 seconds; the rest of the events maintain their original relationship in time

Moving time code events

Follow this procedure to move a selected event or range of events from one code time to another. The event will move to the new time when you sort the event list or leave the Time Code Events display.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , and press [Enter].	Selects Time Code Events display
3. Press [S7] until [S3] reads Move Event .	
4. Press [S3], Move Event .	Prompt reads: Select event number(s) to move, then press ENTER To cancel, press CLEAR
5. Press [1] [Thru] [5]. ^a	Selects events 1 through 5 to move
6. Press [Enter].	Prompt reads: To move selected event(s), select time and press ENTER. To cancel, press CLEAR
7. Press [Time] [Time] [Time] [5].	Selects five minutes for the first event to move
8. Press [Enter].	Copies event 1 to a new event starting at the five minute point; the rest of the events maintain their original relationship in time

a. To move a single event, you may also use the arrow keys to highlight the code time for the event you want to move, then press [+] or [-] until the new code time is displayed in the keypad prompt window, and press [Enter]. Or, use the keypad to enter the new time, then press [Enter].

Editing events

Time code events may contain a combination of cues, macros and submasters. Each cue or submaster may have a rate applied, and the event may be labeled for easy identification. You may add, change or delete any of these items from an event by following these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , and press [Enter].	Selects Time Code Events display
3. Use the arrow keys to highlight the field of the item you want to edit.	Selects field to edit
4. Enter the new contents of the field. If you wish to delete the item, press [Clear].	
5. Press [Enter], or use the arrow keys to select another field.	

Range editing

If you wish to apply a change to a range of events, you may select multiple events and edit them all in a single step. For example, if you wanted to set the rates for your first ten events to 50 percent, you could do so by following these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , and press [Enter].	Selects Time Code Events display
3. Press [S7] until [S1] reads Select Event .	
4. Press [S1], Select Event .	Prompt reads: Select event number
5. Press [1] [Thru] [1][0].	
6. Press [S4], Rate .	The first rate field is highlighted Prompt reads: Select A/B Rate
7. Press [5][0].	Sets the rate to 50 percent
8. Repeat steps 6 and 7 for the remaining rate fields.	

For example, if you wanted to move ten events five seconds later in a program, proceed as follows:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , and press [Enter].	Selects Time Code Events display
3. Press [S7] until [S1] reads Select Event .	
4. Press [S1], Select Event .	Prompt reads: Select event number
5. Press [1][1] [Thru] [2][0].	
6. Press [S2], Code Time .	The time field is highlighted Prompt reads: Select Code Time (Press TIME to edit specific fields)
7. Press [Time] [Time].	Selects the seconds field for all ten events Prompt reads: Select seconds
8. Press [+] five times.	Each time you press [+], the seconds field for each event increases by one second
9. Press [Enter].	Sets the new times

Setting time code frame rate

The time code frame rate may be set to 24, 25 or 30 frames per second. 30 frames per second is the default. If you are running the time code program from an external clock with internal clock backup, make sure the internal clock has the same frame rate as the external clock.

To change the frame rate, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [6], Options Settings , and press [Enter].	Selects Options Settings menu
3. Press [6], Time Code Frames Per Second , [Enter].	Prompt reads: Select Time Code frames per second, then press ENTER (1 = 30 fps, 2 = 25 fps, 3 = 24 fps)
4. Press [2] [Enter].	Time code frame rate is set to 25 fps

Running a time code program

You can run a time code program in three ways: using the console's internal time code clock, using an external time code clock or manually.¹³ When using the external time code source, the internal clock serves as a back up to continue the program if the external clock fails.

Internal time code clock

Follow this procedure to run a time code program using the console's time code clock:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , and press [Enter].	Selects Time Code Events display mode
3. Press [S1], Internal Clock .	Prompt reads: Set internal clock, then press ENTER (Press TIME to edit specific fields)
4. Use the keypad or the [+] and [-] keys to enter the code time of the first event you want to view, or enter zero to start at the beginning of the time code program.	
5. Press [Enter].	
6. Press [S2], Clock Enable , to start the internal clock running at the desired code time. ^a	Each time code event will run at its recorded time

*a. This softkey toggles between Clock Enable and Clock Disable. A disabled clock is indicated by the message Clock Disabled in the upper left corner of the display and an unchanging **TimeCd** value. When the clock is enabled and runs, the **TimeCd** value runs up.*

^{13.} As you play a time code program, you may find it useful to include the Time Code List on the playback monitor. Display the Time Code List by pressing [Setup] [6] [Enter] [7] [Enter] [1] [Enter].

External time code clock

Follow this procedure to run a time code program automatically using an external time code clock. Note that this procedure enables both the internal and the external time code clocks. The order of the procedure below is important so that the external clock starts the time code program and the internal clock is synchronized to it. If the external clock starts the program but its signal is later dropped or obscured by noise, the internal clock takes control and runs the program without interruption.

If the external clock's signal is present when the clock is enabled, the time code program starts immediately. If it is not yet present when you enable the internal time code clock, you will see the message **Waiting for input** at the upper left corner of the Time Code Events display. This message disappears and the **TimeCd** value begins to run as soon as the external time code signal takes over.¹⁴

Follow the procedure below to enable an external MIDI time code clock with internal time code backup:

Keystrokes:

1. Press [Setup].
2. Press [6], **Options Settings**, and press [Enter].
3. Press [5], **Time Code Input**, [Enter].
4. Press [2] [Enter].
5. Press [S8], Return.
6. Press [1][3] [Enter].
7. Press [S2], **Enable Clock**.

Actions:

- Selects Setup display
- Selects Options Settings menu
- Prompt reads:
Enable/disable external time code input
0=Disable, 1 = Enable SMPTE,
2 = Enable MIDI Time Code (MTC)
- Enables the external MIDI time code clock
- Returns to the Setup display
- Selects the Time Code Events option
- Enables the internal time code clock

¹⁴ You can verify which clock is running the program by the color of the **Timecd** number in the upper left corner. A red number means the internal clock is running the program; a green number means that the external clock is running the program.

Manual playback

The [Manual Mode], [Pause Mode], and [Step] softkeys allow you to manually control playback of time code events without a time code source enabled. Press [Time] to select an event out-of-sequence by specifying its code time. Use either the Manual Mode or Pause Mode softkeys to ensure that neither an internal nor an external time code clock can run events while you are creating or editing a time code program.

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [1][3], Time Code Events , [Enter].	Selects Time Code Events display
3. Press [S3], Manual Mode or... Press [S4], Pause Mode .	Stops the time code input and resets the console to the first recorded time code event, or... Interrupts time code input at the current time code event
4. Press [S5], Step . ^a	Advances to the next recorded time code event,
5. Repeat step 4 to advance sequentially through time code events.	
6. If you are in Manual mode, press [S3], Manual Mode . If you are in Pause mode, press [S4], Pause Mode .	Returns to normal operation and the time code resumes

a. In Manual mode, pressing [Step] starts with the first recorded time code event and proceeds in recorded order. Only one event is executed each time you press [Step].

Remote macros

The remote macro feature provides the ability to control up to 8 console macros from locations up to 1000 feet away. Typically the Remote Macro control device is an eight button control station.

The remote macro terminals on the console rear panel control macros 1,901 through 1,908.¹⁵ To operate one of these console macros from a remote location, press the appropriate control.

ETC does not provide remote macro control units. However, the console does provide a 25-pin connector labeled **Remote Go** to which you may attach a user-supplied, remote macro control device. See *Installing remote macros*, page 346 for more information about connecting a remote macro controller to your console.

¹⁵. *The Insight Lighting Playback Controller has 32 remote macros that are wired to four connectors on the LPC rear panel. These macros are numbered 1,901 through 1,932. See the Insight LPC QuickGuide for further information.*

Chapter 25

Accessories

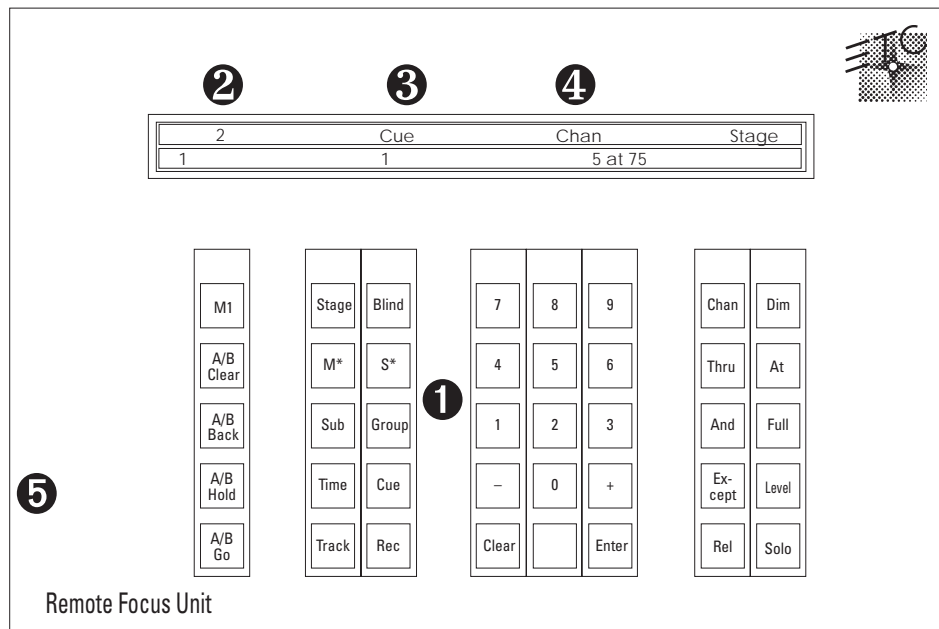
Chapter 25 provides information about the following lighting system accessories:

- Remote Focus Unit (RFU)
- Designer's Worksheet
- Alphanumeric keyboard
- Full Tracking Backup
- Moving Light Module
- Expression Off-Line

For accessory installation instructions, see *Appendix A Installation*, page 321. For purchase information, please contact your local dealer or ETC.

Remote Focus Unit (RFU)

The Remote Focus Unit (RFU) is a small, portable control panel you can use from a remote location, such as in the house, on your studio set or from backstage, with or without a remote monitor. You can control most console functions (not submasters) with an RFU. The console keypad and RFU are able to operate simultaneously. Changes made from both console and RFU are displayed immediately on both the console monitor and the RFU.



❶ Keypad

The keys on the RFU's keypad function exactly like their counterparts on the console.

❷ Fader window

The top line displays the next cue on the cue list. The bottom line displays the cue in the A/B fader on the left and the cue in the C/D fader on the right.

❸ Cue/channel number window

Displays the currently selected cue, group or submaster

❹ Keypad prompt window

Displays the same prompt that appears in the upper right corner of the Stage or Blind display.

❺ Power switch

Power is **ON** in the up position and **OFF** in the down position. To operate your installed RFU, move power switch to **ON**. **WARNING:** Do not connect or disconnect the RFU when it is turned on.

For RFU installation instructions see *Installing Remote Focus Unit*, page 343. For instruction on installing a remote monitor, see *Installing remote video monitors*, page 336.

Designer's Worksheet

Designer's Worksheet gives you control of the console from remote locations such as in the house, on the set, or backstage. The Designer's Worksheet is a digitizer tablet that emulates the console face panel and provides user-definable regions. All functions may be selected using the stylus supplied with the Designer's Worksheet.¹⁶

Three digitizer templates are available. The correct template for your worksheet depends on your digitizer's size. Each digitizer allows you to program up to 2,000 regions, each of which may be associated with a macro.

12 x 12 inch digitizer

If you own a 12 x 12 inch digitizer, you can select one of two digitizer layouts. One layout provides control of submasters and faders, while the other deletes the submasters for increased workspace area.

12 x 17 inch digitizer tablet

The 12 x 17 layout provides control of fader keys and all console functions other than submasters, fader sliders, and the Grandmaster slider.

*Note: You may control submaster sliders from either the console or the digitizer, but not both. Use the Designer's Worksheet Setup display to select this option.*¹⁷

Using the Designer's Worksheet

To use the Designer's Worksheet to control console keys, touch the corresponding area on the worksheet with the stylus. To use submaster sliders or the wheels, drag the stylus along the corresponding control strip.

The remaining area of the tablet is available for user-definable regions. To each of these regions you may assign a macro containing a sequence of up to 50 console keystrokes. Each region's macro can execute cues, manipulate channel levels or execute any series of keystrokes. Once you assign a macro to a region, start the macro by touching the region on the tablet.

For example, you might draw a picture of the stage and outline regions corresponding to various instruments or fixtures on stage or in a studio. You might program each region to select the channels for that area of the stage. You can then touch that region to select channels, and then enter desired level.

Or, you might program more abstract regions on the worksheet. For example, you might program several areas on the worksheet, each representing a song in a band's play list.

^{16.} *If you have not yet installed your digitizer tablet, see Installing Designer's Worksheet, page 340.*

^{17.} *See Setting Designer's Worksheet options, page 27.*

Programming regions

Before you begin programming, design your worksheet regions by drawing them on the worksheet tablet provided. Be certain that the tablet has been calibrated. See *Installing Designer's Worksheet*, page 340 for details on calibrating the tablet. Place your drawing under the clear plastic cover sheet, and you're ready to start.

To create new or edit existing regions and macros, follow these steps:

Keystrokes:

1. Turn Designer's Worksheet on.
2. With the worksheet pen, touch [Setup].
3. Select 7, **Designer's Worksheet Editing**, and touch [Enter].

Actions:

Selects Setup display

Prompt reads:

Select region number or touch a previously defined region, then touch ENTER

The following console screen appears

```
Insert Mode          Designer's Worksheet Editing          Region 1
                    02:39 PM

Region Operation(s)
R 1 Setup 1 Enter 7 Enter 0 Enter Enter Stage
R 2 Setup 1 Enter 7 Enter 1 Enter Enter Stage
R 3 Bump24
R 4 Setup 1 Enter 1 0 Enter DWS-Sliders Stage
R 5 M6
R 6 Bump1 Mwait-0 Bump2 Mwait-0 Bump3 Mwait-0 Bump4 Mwait-0 Bump5
    Mwait-0 Bump6 Mwait-0 Bump7 Mwait-0 Bump8 Mwait-0 Bump9 Mwait-0 Bump10
    Mwait-0 Bump11 Mwait-0 Bump12 Mwait-0 Bump13 Mwait-0 Bump14 Mwait-0
    Bump15 Mwait-0 Bump16 Mwait-0 Bump17 Mwait-0 Bump18 Mwait-0 Bump19
    Mwait-0 Bump20 Mwait-0 Bump21 Mwait-0 Bump22 Mwait-0 Bump23 M6
R 10 Setup 1 Enter PurgeFlexi Stage
      Select region number or touch a previously defined region,
      then touch ENTER

S1 S2 S3 S4 S5 S6 S7 S8
Select Delete On Off Clear Copy Return
Region Region Entry Sub-Bump Sub-Bump Region Region
```

4. Enter the new region number, or select an existing region, either by touching the region or by entering its number from the keypad.

5. Touch [Enter].

Prompt reads: **Outline region or touch ENTER to continue**

- | | |
|--|--|
| <p>6. To create a new region or to add to an existing region, trace the area you want to define for that region number, then press [Enter]. To keep an existing region, touch [Enter].</p> | <p>The console displays a highlighted R next to the macro number to indicate that it has been assigned to a region
 Prompt reads:
 Select operations for this region
 Touch ENTER MACRO when done</p> |
| <p>7. Touch desired keystrokes to create a new macro assigned to the new region.</p> | <p>As you touch keys on the worksheet or console, they are displayed on the editing screen</p> |
| <p>8. Use the arrow keys to edit macros, if necessary. Macro editing is described in greater detail in <i>Chapter 15, Working with macros</i>.</p> | |
| <p>9. Press or touch [Enter Macro] to save the macro. Each macro has a 50 keystroke limit.</p> | <p>Prompt reads:
 Select region number or touch a previously defined region, then touch ENTER</p> |
| <p>10. Enter another macro or edit an existing macro by following steps 4 through 9. Or, return to another mode by touching the appropriate key.</p> | |

Hint: If you need to exceed the 50 keystroke limit, link another macro to the end by entering its number as the last keystroke, then enter the rest of your commands in the linked macro.

Macro Wait

To program a pause in the macro, press [Macro wait]. The console displays **Mwait-0**. Enter the length of the pause in minutes and seconds, or as a fraction of a second in decimal form from 0.1 seconds to 99:59 minutes.

Copying regions

You may want to copy a region or use regions as building blocks for new regions. To copy contents of one region to another, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [7], Designer Worksheet Editing , and press [Enter].	Selects Macro display mode Prompt reads: Select region number or touch a previously defined region, then touch ENTER
3. Press [S7], Copy Region .	Prompt reads: To copy region(s), select region number(s) to copy and touch ENTER To cancel, touch CLEAR
4. Press [2] [Enter]. ^a	Prompt reads: To copy selected region(s), select target region and touch ENTER To cancel, touch CLEAR
5. Press [Enter].	Prompt reads: To copy selected macro(s), select target macro and press ENTER To cancel, press CLEAR
6. Press [2][5], the number of the new region.	Corner reads: Region 25
7. Press [Enter].	Region copy is complete. The contents of region 2 have been copied into region 25

a. You may use [And] and [Thru] to enter multiple regions to copy. If you do, the new regions will be numbered consecutively, starting with the region you enter in step 6.

Clearing regions

You must be in Designer's Worksheet Editing display mode to clear individual regions. To clear all regions, you can use the Clear Designer's Worksheet option from the Clear Functions menu, as described in *Chapter 22 Clear functions*, page 259.

Note: Clearing regions does not affect the macro assigned to the region. Clearing a region removes it from the digitizer and the Designer's Worksheet display, and removes the macro assignment.

To clear regions, follow these steps:

Keystrokes:	Actions:
1. Press [Setup].	Selects Setup display
2. Press [7], Designer's Worksheet Editing , and press [Enter].	Selects Designer's Worksheet Editing display mode
3. Press [S6], Clear Region .	Prompt reads: To clear region(s), select region number(s) and touch ENTER To cancel, touch CLEAR
4. Press [7].	Selects region 7 to clear Corner reads: Region 7
5. Press [Enter].	Prompt reads: To confirm, touch ENTER To cancel, touch CLEAR
6. Press [Enter] to clear the region or [Clear] to cancel the action.	Clears region 7 from the Designer's Worksheet layout; removes the assignment of macro 7 to region 7

Alphanumeric keyboard

The Insight console supports an alphanumeric keyboard. If you have either a Remote Interface Unit or a Remote Video Interface unit attached to your console, you can also attach an alphanumeric keyboard to that peripheral device and achieve the same results.¹⁸

The keyboard's function is to allow you to assign labels (also called names) to your show and to elements of it, including cues, submasters, groups, channels, dimmers, time code events and fixtures. Names may have up to 16 characters, composed of letters, numbers or the symbols #, %, &, *, (,), +, ', -, [,], / as well as the comma and period.

Labeling procedure

1. Go to the display in which you want to create a label. For example, go to [Stage] or [Blind] to label cues, submasters, groups or focus points. Go to the Time Code Events display to label an event.
2. At the console, select the item to label. For example, if you want to label cue 5, press [Cue] [5] [Enter] to make the selection.
3. Press [Label] on the console or [F5] on the keyboard to enter label mode. When in label mode, a blue band appears at the upper right corner of the monitor containing a prefix, such as **Label**, and a blinking cursor.
4. Type the desired label on the alphanumeric keyboard. You may use the [Home], [End] and [Insert] keys on the keyboard when entering a label. Home and End allow you to move directly to the beginning or end of the name, respectively. Insert is a toggle that allows you to choose between overwriting or inserting text. You may also use [F6] to clear the label from the point of the cursor to the end of the line.
5. Press [Enter] on the alphanumeric keyboard to record the label, or press [Esc] to quit and return to the original console display screen.
6. Press [F8] on the alphanumeric keyboard to advance to the next selection, such as the next cue, submaster or group. Press [F7] to go to the previous selection.

Shows

To name a show, press [Setup] [S1], **Show Name**, and use steps 3-5 of the *Labeling Procedure* above to enter the show's name.

¹⁸. See *Installing an alphanumeric keyboard*, page 338, for installation information.

Full Tracking Backup

Full Tracking Backup (FTB) allows you to connect two consoles, or one console and a Lighting Playback Controller (LPC), using one as a backup for the other. This provides you with a working console running your current show even if something happens to your main console.

Use the keyswitch on the back right corner of the console's face panel to switch from one processor to the other. The LEDs labeled **A** and **B** indicate which console is which, and which is the main console.

Note: Only the main console may be used to control outputs. The backup console (or LPC) remains inert until either the keyswitch transfers control to it or the link between the two consoles is broken.

The FTB system

In an FTB system, the main console's processor controls the lighting system. If the backup console's processor detects an interruption in operation of the main console's processor, the backup takes over. This happens with no effect on operation other than a warning message and a momentary pause (about five seconds).

When you turn the system on, the **A** console is the main processor, and the **B** console is the backup. Set DIP switches 2 and 3 on each console to determine which is **A** and which is **B**. Switch control from **A** to **B** or back by turning the **System** keyswitch.

Note: The B console will only be the main console if manually switched or if control switches due to a problem in A. See Appendix B for DIP switch information.

Backing up shows

When you turn an FTB system on, the show in console **A** (main) is loaded automatically into console **B** (backup). During operation, all keystrokes and slider moves entered on the main console are mirrored on the other console's displays. Changes and updates are recorded on both.

Warning: If you work on console B while console A or FTB is turned off, any changes you have made will be erased when you activate FTB. The show in console A always replaces the show in console B when an FTB system starts up.

To avoid this, save the show on console B to a diskette before you reactivate FTB. Once the system is back on, you may load the show from the diskette onto console A.

LEDs

Two LEDs labeled **A** and **B** are located in the back right corner of the consoles' face panels. On console A, the **A** LED is lit. On console B, the **B** LED is lit. The LED flashes on the backup console and is solid on the main console. If neither LED is lit, FTB is off, or has been interrupted.

Using Full Tracking Backup

To use Full Tracking Backup, follow these steps:

1. Turn system on. As part of the startup process, the show in console **A**'s memory is copied to console **B**, overwriting the contents of **B**.
2. If the show you want to run is not in **A**'s memory, insert the show diskette into the main console's diskette drive after the Stage display appears. Only the main console's diskette drive may be used when FTB is activated.
3. Read show into the main console's memory from diskette. The show is read simultaneously into the backup console. Continue using consoles normally.

If the main processor does not contact the backup processor within 30 seconds, the following message appears: **System B does not respond. System A is now operating as a stand-alone system. System B has been disconnected from the network. To reconnect System B to the network, you must reboot both System A and System B.**

Press [Clear] to remove the message. You can now use the main console in normal, single console operation.

If either console fails, the other console takes control automatically and allows you to use the functioning console in normal, single console operation.

If the link between the two consoles is interrupted, the system informs you and allows you to use both consoles in normal, single console operation.

Full Tracking Backup with an LPC

A Full Tracking Backup system may consist of two tracking consoles, or of one console and a Lighting Playback Controller (LPC). In a system that includes an LPC, the A/B keyswitch on the console remains active regardless of which processor is in control. You can always use the keyswitch to switch from one to the other.

For more information regarding running a show from an LPC, please refer to the *LPC QuickGuide* that came with your LPC.

Moving Lights Module

The Moving Lights Module (ML Module) is an option for Insight 2 and 2x consoles. It is a free-standing device containing the page buttons and encoders that are standard equipment on all Insight 3 consoles. With moving light software (version 3.0 and above) installed in your Insight 2 or 2x system, the ML Module provides all the functionality of an Insight 3. You can even attach a pointing device, such as a mouse, trackball or trackpad to the ML Module for added convenience in making selections and setting levels.

Installation

1. Switch off the console power.
2. Connect the ML Module to the console port labeled Digitizer/Serial. You cannot use the Digitizer/Serial port for any other purpose when using it for the ML Module.¹⁹
3. Plug the power cord of the Moving Lights Module into a wall receptacle or a power strip.

Enable the ML Module with the following procedure:²⁰

1. Switch on the console power.
2. Press [Setup] [6], **Option Settings**, [Enter] to go to the Options Settings menu.
3. Press [1][2], **External Port**, [Enter].
4. Press [2] [Enter] to enable the ML Module.

Attaching a pointing device

You may attach a pointing device, such as a mouse, trackball or trackpad to the ML Module. Switch off the power to the console and to the ML Module. Connect the mouse or trackball to the RS232 port labeled "Mouse" located at the left side of the ML Module's rear panel. The pointing device must be Microsoft-compatible.

Device check

The pointing device should be ready for use when the console and module are switched on. Verify normal operation by patching fixtures as explained under **Working with Moving Lights**, page 16. Movement of the pointing device should control pan and tilt levels; its buttons should reselect fixtures in the Fixture Box window. If the device doesn't function normally, proceed as follows:

1. Verify that the pointing device is Microsoft compatible.
2. Verify that the pointing device works normally in another system, such as in a computer.
3. If steps 1 and 2 don't correct the problem, call ETC Technical Service at 800-775-4382.

¹⁹ If you have a Remote Interface unit or a Remote Video Interface unit in your system, you may connect the Designer's Worksheet to that unit and use it independently of whatever is connected to the console's Digitizer/Serial port.

²⁰ **NOTE:** Do not enable the ML Module for an Insight 3 console. If you do, the console's built-in encoders will not work.

Expression Off-Line

When you want to create or modify a program but are not near your console, consider working off-line with Expression Off-Line. This handy program runs on a pc computer and emulates the function of Insight consoles running version 3.03 system software.

With Expression Off-Line, you can do everything in the computer you could do at your console keyboard except run a show. When the show you produce in Expression Off-Line is ready, merely store it on a diskette, transfer the diskette to your console, read it and run it. Or, if you want to modify a show stored in the console, you can do it in Expression Off-line as well and free the console for other purposes.

One advantage of using Expression Off-Line is that you can print lists from your show without attaching a printer to the console. Another advantage is that you can label elements in your show without the need to attach a keyboard to your console.

Expression Off-Line is available without charge from ETC. It can be ordered through your dealer or directly from ETC at 800-775-4382. You can also download Expression Off-Line from the ETC website at www.etcconnect.com.