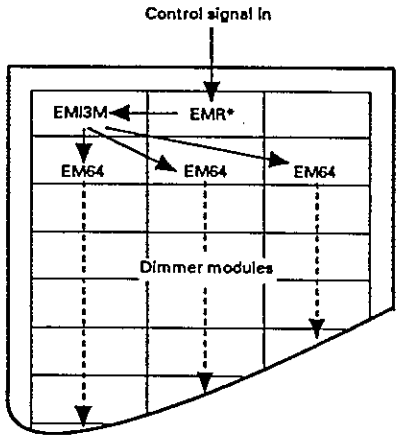
L86

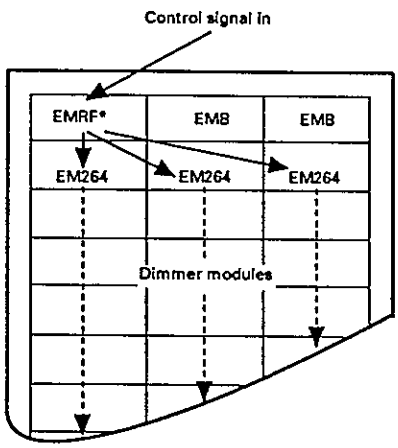
touring rack

USER MANUAL

The arrows in the diagrams below illustrate the flow of control signal in two typically configured *L86 Touring Racks*, one with *EM64s*, the other with *EM264s*.



*Electronics module in this location may be an *EMR*, *EMAR* or *EMRF*.



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Electronic Theatre Controls, Inc.
3030 Laura Lane, Middleton, WI 53562
800/688-4116 FAX 608/836-1736

Dimmer chassis

The *L86 Touring Rack* is a modular dimming system that consists of electronics and dimmer modules in a fan-cooled, steel chassis. Each chassis consists of three columns of modules. The top two rows of slots in each column are for electronics modules. The slots below the electronics modules contain dimmer modules. There are small and large versions of the touring rack with a variety of configurations. See your system drawings for actual configuration.

Electronics modules

The top two slots in each column contain electronics modules.Depending on the age and configuration of your rack, either an *EM264* or an *EM64* controls the dimmers in each column. All of the electronics modules you might find in your system are described below. Refer to your System Manual for more specific configuration information.

Note: The top right slot is used only to store spare modules; control signal is not routed through it. If you have no spare modules, a blank module will be installed to ensure proper cooling.

EMRF In systems using *EM264s*, the *EMRF* is typically installed in the top left slot. In systems using *EM64s*, it is typically installed in the top center slot. The *EMRF* receives DMX512 control signal and sends it to the *EM64s* or *EM264s* without processing. It is used in systems where all dimmers are the same type and are sequentially numbered, and when there is only one source of DMX512 signal. It is also used in systems not configured to accept AMX192 control signal.

EMR *EMRs* are used in place of *EMRFs* in the following situations:
1) When there are multiple size dimmers in the chassis
2) When the first dimmer in the chassis is not a multiple of 48
3) When the system is merging two DMX512 signals
4) When dimmers in the rack are not numbered sequentially
The *EMR* is also installed in top center slot. It receives either one or two DMX512 signals. It also maps input data to specified modules.

EMAR The *EMAR* is functionally equivalent to the *EMR*, but can also be configured to accept D192 or AMX192 control signal.

EMI3M The *EMI3M* is installed in the top left slot of systems that use *EM64s*. It provides optical isolation between the *EM64s* and between *EM64s* and the electronics control modules. Optical isolation helps prevent damage to control electronics that can be caused by high voltage potential in the event of a dimmer failure. If it is not needed, an *EMRF* is installed in its place.

EM264 Replaces *EM64T* and *EMI3M*. The *EM264* receives DMX512 from the *EMRF* or *EMAR* and splits the low voltage serial control data into single low voltage signals for individual dimmer modules. Also provides optical isolation. An *EM264* or an *EM64* must be installed in the second slot from the top in each column of dimmer modules.

EM64T Receives DMX512 control signal from the *EMRF*, *EMR* or *EMAR* and splits the low voltage serial control data into single low voltage signals for individual dimmer modules. An *EM64T* must be installed in the second slot from the top in each column of dimmer modules. A thumbwheel switch on the *EM64T* makes it easy to enter starting addresses.

EM64 Functionally equivalent to the *EM64T*, except that starting addresses are entered on internal jumpers rather than a thumbwheel switch.

EMB Fills unused electronics module slots to maintain proper ventilation.

Removing electronics modules

In certain situations, you may need to remove electronics modules. You do not need to disconnect power to the rack prior to removing modules.

To remove a module, unscrew the brass retaining screw in the center of the module face panel until you are able to slide out the module. To reinsert the module, press gently and steadily on the face panel of the module while you tighten the retaining screw. Tighten the screw with a screwdriver, but be careful not to strip the threads on the screw.

Dimmer modules

Dimmers are supported by a metal shelf system and are arranged in three columns. Each column corresponds to one phase ofline voltage; the left column corresponds to phase A, the middle to phase B and the right to phase C. Each column in a chassis contains either 16 standard-height dimmer modules (eight on a small rack), or eight double-height modules (four on a small rack). Dimmers are arranged numerically left to right, top to bottom. Vacuum the dust off the modules once a year or when they get dirty.

Circuit breakers

Two 20 amp circuit breakers limit current to the load. The top breaker corresponds to dimmer A, the bottom corresponds to B.

The breaker handle moves to the middle position when it trips. To reset, move breaker handle to **Off**, then back to **On**. Be sure to correct the condition that caused the overload before resetting.

Circuit breakers may trip during shipment. Reset them if they do.

Bump buttons

Two circles on the face panel mark the location of the dimmer bump buttons. Press the center of each circle to turn the dimmer on to Full. Release the button to return dimmers to their normal condition.

Control indicators

Two LEDs on the face panel turn on when the dimmer module receives output data from the electronics module.

Output indicators

Two neon lamps on the face panel turn on when the dimmer provides output.

Removing dimmer modules

Before removing dimmer modules, turn off the circuit breakers on the module face panel. To remove the module, place your left and right index fingers in the two holes in the metal ridge that extends from the face panel. Press together to release the latch mechanism, then slide the dimmer module out. (You may have to press in gently first.)

To replace the module, insert the dimmer firmly until you feel it seat and latch. Turn off the circuit breakers on the front of the module before replacing it.

Cooling fans

Each column of dimmer modules is cooled by a squirrel-cage fan located at the bottom of the column. All fans in a column run when any of the *EM64s* or *EM264s* in the chassis are receiving non-zero DMX512 data. They continue to run for three minutes after the DMX512 data is interrupted or reverts to zero levels.

Each fan is protected by a two amp, panel-mount fuse (type ABC-2) located behind the fan. Racks containing *EM264s* also have a six amp fuse (type ABC-6) located in column A. Always disconnect power to the rack before you change a fuse.

Each fan set has its own intake which is covered with a filter. All fan filters should be replaced or cleaned once a year. (Wash filters in clean water.) To remove fan filters, remove the four screws that secure the fan bezel, then gently remove the filter. To order replacement filter elements, call ETC at 608/831-4116.

Power distribution panel

Line feeds

Power connects to the rack through six Cam-Lok J-series (Model E106) connectors. The black, red and blue male connectors provide line connections to each phase. The white connectors provide neutral connections. The green connector provides an earth ground.

The rack is designed for 120/208 3-phase "Y" power, 60Hz. The circuit breaker rating varies from rack to rack. Check the rack label for your rating. The rack can run on 120/220 single phase by supplying two of the line inputs with one leg of the supply. If you do so, be certain to keep your loads distributed as evenly as possible.

Large racks supply two neutral connectors in accordance with current NEC codes as the actual neutral current can exceed the rack's rating. If you use the rack at its full capacity, run a second neutral cable.

Warning: The ground connector provides connection to an earth ground. Do not run the rack without proper ground connection. You must connect the ground first, then the neutral, then the three power legs. Remove them in the reverse order, starting with the power legs.

To connect the mating Cam-Loks to the rack, insert the connector fully and twist clockwise until it snaps into place. To remove, turn 1/4 turn counter-clockwise, then pull.

Warning: Disconnect power at the source before connecting or disconnecting any connectors.

Neon and test jacks

The rack provides test jacks and neon indicators that allow you to see that correct voltage is being supplied to the rack. The neons and test jacks are wired on the line side of the Main Breaker and are protected by two amp fuses located inside the rack.

Main circuit breaker

The circuit breaker disconnects all power to the rack. If a Main Breaker trips, the circuit breaker handle shifts to the middle position. To reset, turn the breaker off and then back on.

Convenience outlets

The rack provides 20 amp Edison-type outlets for general use, one on the small rack, two on the large rack. Use these for consoles, work lights, etc.

Hot pockets

Eight 20 amp Stage Pin type connectors are provided for general use on the large rack. One is provided on the small rack. Use them for testing fixtures, work lights, etc.

Each of the eight breakers in the large rack are also wired to outputs in the Patch bay. Any multipin output can also be patched to these breakers. This is useful for circuits that require a full 120V, such as a mirror ball or fog machine.

Stage pin connector

Each of the 96 Stage Pin type connectors is wired directly to the output of a dimmer. Connectors are rated at 20 amps.

Multipin panels

Panels used will vary from rack to rack, depending on configuration.

Six-circuit multipin panel

There are sixteen 19-pin connectors, each wired for six circuits, for a total of 96 circuits. Each circuit is wired to a cord in the Patch Bay. This allows any of the output circuits to be patched to any dimmer output.

The pins are rated at 20 amps. Each circuit has its own neutral and ground conductor. The pinout is given below.

Manufacturer: Litton Veam #VSC020-32S-19S

Socapex #SLEF 419 AR (upon request)

Pin Use:

1 Hot #1
2 Neutral #1
3 Hot #2
4 Neutral #2
5 Hot #3
6 Neutral #3
7 Hot #4
8 Neutral #4
9 Hot #5
10 Neutral #5
11 Hot #6
12 Neutral #6
13 Ground
14 Ground
15 Ground
16 Ground
17 Ground
18 Ground
19 No connection

Twelve-circuit multipin panel

Each 37-pin connector is wired for 12 circuits. There are eight connectors for a total of 96 circuits in the small rack, and 16 connectors for a total of 192 circuits in the large rack. Each circuit is wired to a cord in the Patch Bay. This allows any of the output circuits to be patched to any dimmer output.

The pins are rated at 20 amps. Each circuit has its own neutral and ground conductor. The pinout is given on the next page.

Manufacturer: Pyle Starline #ZRLP-20-350SN

Pin Use:

1 Hot #1
2 Neutral #1
3 Ground #1
4 Hot #2
5 Neutral #2
6 Ground #2
7 Hot #3
8 Neutral #3
9 Ground #3
10 Hot #4
11 Neutral #4
12 Ground #4
. .
. .
. .
34 Hot #12
35 Neutral #12
36 Ground #12
37 No connections

Patch bay

Dimmer terminal

The terminal blocks are wired to the output of each dimmer. The rack provides two terminals for each dimmer. This allows you to connect two multipin circuits to the dimmer.

Patch cords

Sensor touring racks provide a patch cord for each of the multipin connectors. Each connector is labeled with a letter and a number. The letter corresponds to one of the connectors, the number corresponds to the circuit number of that connector.

To connect a multipin to a dimmer, make sure the dimmer is off, then insert the cord into the terminal for that dimmer. Two cords can be patched to each dimmer. Be sure the connector is firmly seated. To remove, be certain the dimmer is off, then grasp the cord near the terminal block and pull it out.

Warning: Do not pull the cord by the wire.

Work lights

The work lights are controlled by a circuit breaker inside the patch bay. Replace the work light bulbs with 14V miniature bayonet-type bulbs.

Control panel

The control panel serves as the control signal input panel.

Data input connectors

These two 5-pin XLR type connectors are for control data. All data formats connect through these connectors. The male connector is wired in parallel with the female. The shield is tied to the chassis ground.

Systems that use the *EM264* accept only DMX512. The *EM64* electronics module has a jumper for format selection. See the *EM64* user manual for further instructions.

The digital pinout is as follows.

1 Common
2 Data –
3 Data +
4 Not used
5 Not used

If you are using control consoles from other manufacturers, you may need to add an *EMAR*. See the *EMAR* user manual for more information.

Last rack switch

This switch connects the data line terminators. Press it in **ONLY** on the last rack in the chain. There should never be more than one terminator in the data line.

Note: Avoid using the last rack switch when using AMX192. It will not hurt anything but may cause ghosting when used with Strand Century products.

Terminator switches

Systems that contain *EM264s* require that the three termination switches on the *EM264* be set as follows: **DMX1** to **Off**, **DMX2** to **On** and **SIO** to **On**. See the *EM264* user manual for more information.

Normal/analog switch

The Normal/Analog switch only appears on systems that contain *EM64s*. This switch selects between analog or digital inputs. When in, the Cinch Jones type analog inputs are selected. When out, the 5-pin digital connector is selected. If you are using analog input, replace the *EMI3M* with an *EMRF*

Terminal connector

The control panel also has a 25-pin D type connector that connects to the *EMAR*. See the EMAR manual for usage.

Analog input connectors

Use the eight 10-pin Cinch Jones connectors to connect to analog control consoles. The pinout is as follows:

1 Level 1
2 Level 2
3 Level 3
4 Level 4
5 Level 5
6 Level 6
7 No connection
8 Common
9 No connection
10 No connection

Service

If your rack should require service, please contact ETC or a qualified service representative.

To reach Electronic Theatre Controls' customer service department, call 800/775-4382 Monday through Friday, from 9:00 AM to 5:00 PM Central Standard Time. If you call for emergency service after hours and weekends, your call will be answered electronically and forwarded to a service representative who will contact you as soon as possible.

Address all correspondence about your *L86 Touring Rack* to:

Electronic Theatre Controls, Inc.
Customer Service Department
3030 Laura Lane
Middleton, WI 53562