Broadcast Console

99-1300-0 (14-input mainframe)
99-1300-1 (22-input mainframe)
99-1300-2 (30-input mainframe)

Operations & Technical Manual

HARRIS 75-51

Revision B • 1/03

Broadcast Communications Division

www.broadcast.harris.com

Contents

Safety Instructions

1. Read All Instructions. Read all safety and operating instructions before operating the product.

2. Retain All Instructions. Retain all safety and operating instructions for future reference.

3. Heed All Warnings. You must adhere to all warnings on the product and those listed in the operating instructions.

4. Follow All Instructions. Follow all operating and product usage instructions.

5. Heat. This product must be situated away from any heat sources such as radiators, heat registers, stoves, or other products (including power amplifiers) that produce heat.

6. Ventilation. Slots and openings in the product are provided for ventilation. They ensure reliable operation of the product and keep it from overheating. Do not block or cover these openings during operation. Do not place this product into a rack unless proper ventilation is provided and the manufacturer's recommended installation procedures are followed.

7. Water and Moisture. Do not use this product near water such as a bathtub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool or the like.

8. Attachments. Do not use any attachments not recommended by the product manufacturer as they may cause hazards.

9. Power Sources. You must operate this product using the type of power source indicated on the marking label and in the installation instructions. If you are not sure of the type of power supplied to your facility, consult your local power company.

10. Grounding and Polarization. This product is equipped with a polarized AC plug with integral safety ground pin. Do not defeat the safety ground in any manner.

11. Power Cord Protection. Power supply cords must be routed so that they are not likely to be walked on nor pinched by items placed upon or against them. Pay particular attention to the cords at AC wall plugs and convenience receptacles, and at the point where the cord plugs into the product.

12. Lightning. For added protection for this product, unplug it from the AC wall outlet during a lightning storm or when it is left unattended and unused for long periods of time. This will prevent damage to the product due to lightning and power line surges.

13. Overloading. Do not overload AC wall outlets, extension cords, or integral convenience outlets as this can result in a fire or electric shock hazard.

14. Object and Liquid Entry. Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short out parts, which could result in a fire or electric shock. Never spill liquid of any kind on the product.

15. Accessories. Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult and serious damage to the product. Any mounting of the product must follow manufacturer's installation instructions.

16. Product and Cart Combination. Move this product with care. Quick stops, excessive force, and uneven surfaces may cause the product and the cart combination to overturn.

17. Servicing. Refer all servicing to qualified servicing personnel.

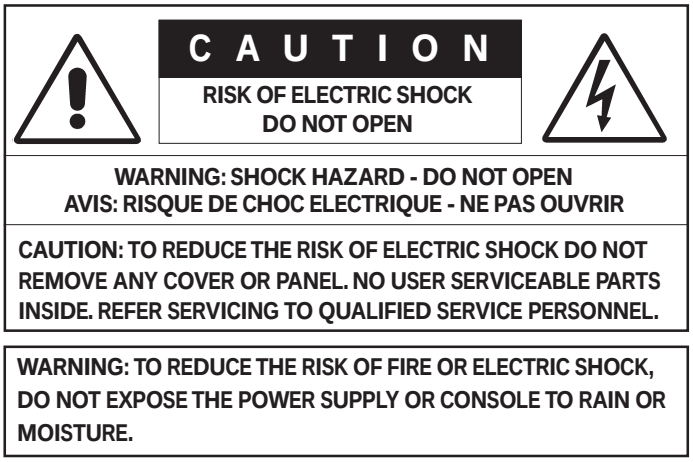
18. Damage Requiring Service. Unplug this product from the wall AC outlet and refer servicing to qualified service personnel under the following conditions:
    a. When the AC cord or plug is damaged.
    b. If liquid has been spilled or objects have fallen into the product.
    c. If the product has been exposed to rain or water.
    d. If the product does not operate normally (following operating instructions).
    e. If the product has been dropped or damaged in any way.
    f. When the product exhibits a distinct change in performance. This indicates a need for service.

19. Replacement Parts. When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.

20. Safety Check. Upon completion of any repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

21. Cleaning. Do not use liquid or aerosol cleaners. Use only a damp cloth for cleaning.

Hazard/Warning Label Identification



The Exclamation Point symbol, within an equilateral triangle, alerts the user to the presence of important operating and maintenance (servicing) instructions in product literature and instruction manuals.

The Lightning Flash With Arrowhead symbol, within an equilateral triangle, alerts the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

WARNING—This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device (pursuant to Subpart J of Part 15 FCC Rules), which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Manual Revisions

This page provides a quick reference of the current document pages and their revision level. If you receive a revision to this document from Harris, replace the old manual pages with the new ones and discard the old pages. Replace this page with the new Manual Revisions page.

Revision	Affected pages	Comments
A	*All pages*	*2/02 First Release*
B	*All pages*	*1/03 corrected various installation & operation descriptions. Added accessory product information.Condensed manual page count.*

General Information

1

Thank you for joining the growing ranks of broadcasters employing Harris Corporation products designed by Pacific Research & Engineering. Harris Corporation supplies audio products and systems to the world's leading broadcast facilities. Our mission is to provide the finest quality products, systems, documentation, and after-sale support. We invite comments and suggestions for improvements to this documentation and to all of our services.

The Legacy is a very sophisticated console with an extensive range of features contained in a compact design. To obtain maximum benefit from the console's capabilities, read the *Installation* and *Operation* chapters prior to product installation.

PRODUCT OVERVIEW

Each Legacy console ships with the following modules installed in the mainframe:

- Microphone Preamplifier module (one 5-input Mic Preamp PCA standard, second 5-input Mic Preamp PCA optional)
- Universal Input modules (as ordered)
- Telco/Codec modules (up to 4, as ordered)
- Remote Line Selector (RLS) modules (as ordered)
- Meter Switcher module (1 standard)
- Control Room module (1 standard)
- Studio module (1 optional)
- Output modules (2 standard)

Blank panels cover unused module positions.

The Legacy's motherboard and module area is completely contained within a sheet metal and extruded aluminum chassis for strength and RFI immunity. The meter panel is hinged at the rear, closing over the upper part of the modules to cover the audio and logic connectors and the Logic Setup switches. The chassis bottom is open beneath the meter panel for easy cable access.

Module Descriptions

Microphone Preamplifier Module

This module (PRE99-1151-2) can hold ten high-performance preamplifiers (five are standard with an additional five optional). Each has a gain trim control under a security cover. Phantom power (+48VDC) is selectable for each input. Each Mic Preamp boosts its mic-level inputs (from -65 dBu to -30 dBu) to a line level (+4 dBu), low-impedance, balanced output for connection directly to a Universal Input module or to outboard mic processing equipment.

One module with a 5-input Mic Preamp PCA is standard; a second optional 5-input PCA may be installed. An additional 5-input Mic Preamplifier module (PRE99-1151-2) or a 10-input Mic Preamplifier module (PRE99-1151-1) may be installed into the slot directly to the right of the standard Mic Preamplifier module.

Universal Analog/Digital Input Module

The Universal Input modules (PRE99-1315) feature two inputs (A and B), each of which can accept analog or digital signals. Setup switches on the module set the source for each input. They also set the source level (for analog signals) or the attenuation amount (for digital signals). Each input has its own fully independent parallel logic control connector for remote control of the module and/or module control of the associated source equipment.

Each Universal Input module includes the following controls or features: A/B input selection, channel on/off control, fader level control, cue control, mode selection with pan/balance control, Send control, and output bus selection to four program buses and one off-line bus.

Two 24-pin logic connectors connect logic wiring to/from external control panels or peripherals. DIP switches set logic and module function options for the A and B inputs.

Telco/Codec Input Module

Up to four Telco/Codec (Telco) modules can be installed into any of the input module slots on the mainframe. The optional Telco module (PRE99-1316) has a single audio input (analog or digital) from a remote send and receive device (like a telephone hybrid, satellite transceiver, ISDN interface, or other stereo or mono Codec).

Each module features manual or automatic control of the Foldback signal returned to the hybrid or codec. The Foldback signal for each Telco module can be manually set to any program or off-line bus. The Foldback signal can also follow the Telco module's on/off status when the Auto-Foldback function is active. The Auto-Foldback function automatically switches the feed to the caller between the off-line mix and the assigned bus with the highest priority. For more information, see the Telco Operation section on pages 3-7 to 3-9.

Each Telco module includes the following controls or features: channel on/off control, fader level control, cue control, mode selection with pan/balance control, Send control, record and monitor controls, and output/Foldback selection to four program buses and one off-line bus. Logic I/O is available for logic wiring to/from the hybrid or codec.

Remote Line Selector (RLS) Module

This module (PRE99-1323) features two banks of eight selection buttons to independently route the eight input signals to the two outputs. The module switch either analog or digital signals, as set by a DIP switch on the module.

Meter Switcher Module

This module (PRE99-1317) is located to the right of the input module area. It provides control of the digital timer and contains the meter source selector buttons and the signal drivers for all the meter displays.

The timer control section features stop, start, hold, and reset controls, as well as whether the modules automatically reset the timer.

Control Room Module

This module (PRE99-1318) contains the monitor source selection and control facilities for the console operator, and a co-host and a guest in the control room. The module has parallel logic control (via a 14-pin connector) which provides external monitor dimming or muting, and warning light control. The module includes four external monitor inputs and six monitor and headphone outputs. The outputs can simultaneously monitor any combination of up to six analog sources (four external inputs and Telco Record and Monitor) and two digital sources (four programs and Send).

The Control Room module features monitor and headphone fader-level controls, monitor-mode con-

trol, cue and talkback level controls, and headphone Auto-Cue select.

Studio Module

The optional Studio module (PRE99-1319) is installed to the right of the Control Room module. It provides a monitor and talkback-level control for one studio or voice booth. The monitor source can be any combination of 11 sources (four external inputs, four programs, Send, and Telco Record and Monitor) simultaneously.

The Studio module has a 14-pin parallel logic connector for external dimming or muting of the studio monitor speakers and control of a studio warning light interface. Controls also provide the ability to talk to or from a studio and an external location.

Output Modules

Two Output modules ship standard with the Legacy.

The Output 1 module (PRE99-1320) contains the digital-to-analog converters and mix matrices for creating mix-minus foldbacks to support up to four Telco/Codec modules. It also contains individually mixed outputs for Telco/Codec recording. There is a mix-minus output for each Telco/Codec module. Digital and analog outputs are provided for the mix-minus and recorder feed outputs. For digital outputs, sample rates of 48 kHz and 44.1 kHz are supported. The mix-minus analog outputs are fixed at +4 dBu. This module features output sample rate selectors for digital outputs and a gain trim control for the analog Telco record mix output.

The Output 2 module (PRE99-1321) contains the AES digital output drivers, digital-to-analog converters, and analog line amplifiers for the Send output and the four program outputs. The digital output sample rate is 48 kHz. An output sample rate of 44.1 kHz can be selected for the program 1 and 2 auxiliary outputs, the program 3 and 4 outputs, and the Send output. Gain trim controls for the analog outputs are also provided.

Power Supply

The separately packaged rack-mount power supply assembly (PRE99-1202) uses keyed connectors to supply a single +48 volts DC to the console mainframe. There are two connectors from the power supply assembly to the console: one connector supplies DC power and the other supplies electrical signal information to the console. The power supply module has an on/off switch and an LED indicator on the front panel. The power supply is fully regulated and protected against excessive current by internal fuses and electronic safeguards.

SPECIFICATIONS

The specifications for the Legacy are significantly more complete, and the related test conditions are more defined, than those usually shown for consoles in this class. Be sure to follow the test conditions and measure in the units as stated.

The specifications are for a fully loaded Legacy-30 input mainframe.

Test Conditions:

Specifications are for the basic signal paths, per channel, with >1k ohm loads connected to the analog main outputs.

0 dBu corresponds to an amplitude of 0.775 volts RMS regardless of the circuit impedance. This is equivalent to 0 dBm measured into a 600 ohm circuit for convenient level measurement with meters calibrated for 600 ohm circuits. Noise specifications are based upon a 22 kHz measurement bandwidth. The use of a meter with 30 kHz bandwidth will result in a noise measurement increase of approximately 1.7 dB.

Total Harmonic Distortion (THD+N) is measured at a +18 dBu output level using 1 kHz or a swept signal with a 22 kHz low-pass filter.

FSD = Full Scale Digital, +24 dBu

Microphone Preamplifiers

Source Impedance: 150 ohms

Input Impedance: 5 k ohms minimum, balanced

Input Level Range: Adjustable, -65 to -30 dBu

Input Headroom: >20 dB above nominal input

Output Level: +4 dBu, nominal

Analog Line Inputs

Input Impedance: >40 k ohms, balanced

Input Level Range: Selectable; -10 dBv, +4 dBu, +6 dBu, +8 dBu

Input Headroom: 20 dB above nominal input

Analog Main Outputs

Output Source Impedance: <3 ohms balanced

Output Load Impedance: 1 k ohms minimum

Nominal Output Levels: Program, Send, Telco/Codec Mix-Minus, Telco Record Mix Feed: +4 dBu, adjustable between +3 dBu and +9 dBu

Maximum Output Levels: Program, Send, Telco/Codec Mix-Minus, Telco Record Mix Feed: +24 dBu; +28 dBu with 100k output load impedance and nominal output level adjusted to +8 dBu

Digital Inputs and Outputs

Reference Level: +4 dBu (-20 dB FSD)

Digital I/O: Through digital input and digital Program, Send, Telco/Codec Mix-Minus outputs

Signal Format: AES-3, S/PDIF (input only)

AES-3 Input Compliance: 24-bit sample rate conversion available, individually switch selectable

AES-3 Output Compliance: 24-bit

Digital Reference: Crystal (internal) or AES-3 (external) at 48 kHz ±100 ppm

Internal Sample Rate: 48 kHz

Output Sample Rates: Program 1 and 2 Main outputs 48 kHz; Program 1 and 2 Aux, Program 3 and 4, Send, Telco/Codec Mix-Minus, and Telco Record Mix outputs 48 kHz or 44.1 kHz, individually switch selectable

Processing Resolution: 24-bit fixed with extended precision accumulators

Conversions: A/D 24-bit, Delta-Sigma, 128x oversampling on all digital inputs; D/A 24-bit, Delta-Sigma, 128x oversampling

Latency: <1.6 ms, mic in to monitor out

Monitor Outputs

Output Source Impedance: <3 ohms, balanced

Output Load Impedance: 1 k ohms minimum

Output Level: +4 dBu nominal, +24 dBu maximum

Frequency Response

Microphone or Line Input to Program or Send Output: +0 dB/-0.5 dB, 20 Hz to 20 kHz

Dynamic Range

Analog Input to Analog Output: 105 dB referenced to FSD, 108 dB "A" weighted to FSD

Analog Input to Digital Output: 109 dB referenced to FSD

Digital Input to Analog Output: 107 dB referenced to FSD, 110 dB "A" weighted to FSD

Digital Input to Digital Output: 138 dB

Equivalent Input Noise

Microphone Preamp: -127 dBu, 150 ohm source

Total Harmonic Distortion + Noise

Mic Pre Input to Mic Pre Output: <0.005%, 20 Hz to 20 kHz, -38 dBu input, +18 dBu output, 100k ohm load, 22 kHz filter bandwidth

Analog Input to Analog Output: <0.003% at 1 kHz, +18 dBu input, +18 dBu output, 100 k ohm load, 22 kHz filter bandwidth

Digital Input to Digital Output: <0.00016%, 20 Hz to 20 kHz, -20 db FSD input, -20 db FSD output, 20 kHz filter bandwidth

Digital Input to Analog Output: <0.003% at 1 kHz, -6 db FSD input, +18 dBu output, 100 k ohm load, 22 kHz filter bandwidth

Crosstalk Isolation

Program-to-Program or to-Program or to-Send: >95 dB, 20 Hz to 20 kHz

A Input to B Input, B Input to A Input: >110 dB, 20 Hz to 20 kHz

Stereo Separation

Analog Program Outputs: >86 dB, 20 Hz to 20 kHz

Console Power Requirements

Fully configured Legacy-14*:* 185 watts at 115/230 VAC, ±12%, 50/60 Hz

Fully configured Legacy-22*:* 250 watts at 115/230 VAC, ±12%, 50/60 Hz

Fully configured Legacy-30*:* 285 watts at 115/230 VAC, ±12%, 50/60 Hz

Power Supply Voltage

Console power: +48 VDC at 8.34 Amp, redundant operation optional

Power Supply Ground

Rack-mount power supply frame: grounded through AC cord

Power Supply Connection

AC input: IEC power cord

DC output: two keyed multi-pin connectors

Dimensions

Legacy-14*:* 9.75″x 41.13″x 33.38″(H, W, D)

Legacy-22*:* 9.75″x 54.44″x 33.38″(H, W, D)

Legacy-30*:* 9.75″x 67.24″x 33.38″(H, W, D)

Power Supply (Rack-mount power supply frame): 3.5″(2 RU) x 19.0″x 16.0″(H, W, D)

Harris Corporation reserves the right to change specifications without notice or obligation.

WARRANTY

The Legacy digital console carries a manufacturer's warranty which is subject to the following guidelines and limitations:

A) Except as expressly excluded herein, Harris Corporation ("Seller") warrants equipment of its own manufacture against faulty workmanship or the use of defective materials for a period of one (1) year from date of shipment to Buyer. The liability of the Seller under this Warranty is limited to replacing, repairing, or issuing credit (at the Seller's discretion) for any equipment, provided that Seller is promptly notified in writing within five (5) days upon discovery of such defects by Buyer, and Seller's examination of such equipment shall disclose to its satisfaction that such defects existed at the time shipment was originally made by Seller, and Buyer returns the defective equipment to Seller's place of business in Mason, Ohio, packaging and transportation prepaid, with return packaging and transport guaranteed.

B) Equipment furnished by Seller, but manufactured by another, shall be warranted only to the extent provided by the other manufacturer.

C) Thermal filament devices, such as fuses, are expressly excluded from this warranty.

D) The warranty period on equipment or parts repaired or replaced under warranty shall expire upon the expiration date of the original warranty.

E) This Warranty is void for equipment which has been subject to abuse, improper installation, improper operation, improper or omitted maintenance, alteration, accident, negligence (in use, storage, transportation, or handling), operation not in accordance with Seller's operation and service instructions, or operation outside of the environmental conditions specified by Seller.

F) This Warranty is the only warranty made by Seller, and is in lieu of all other warranties, including merchantability and fitness for a particular purpose, whether expressed or implied, except as to title and to the expressed specifications contained in this manual. Seller's sole liability for any equipment failure or any breach of this Warranty is as set forth in subparagraph A) above; Seller shall not be liable or responsible for any business loss or interruption, or other consequential damages of any nature whatsoever, resulting from any equipment failure or breach of this warranty.

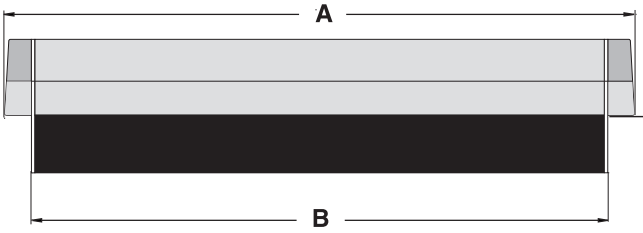
2

Installation

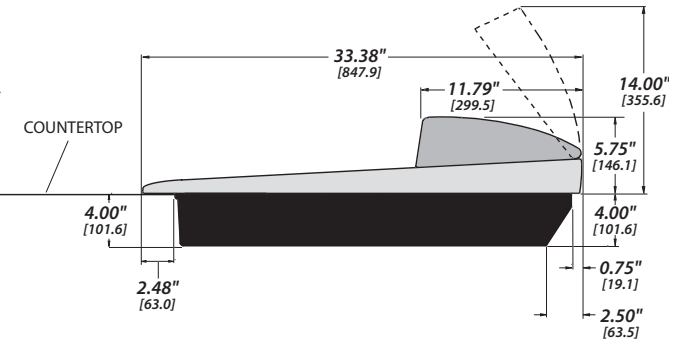
The Legacy mainframe is designed to "drop into" a cutout (shown below) in the studio furniture countertop. A minimum of 14 inches (355.7 mm) of vertical clearance above the countertop is required to fully open the meter panel. The rear 2.5 inches (63.5 mm) of the mainframe is open so wiring can be easily dressed up through the mainframe to the module connectors, which are hidden below the meter panel.

The Legacy console shipment consists of:

- The 14-, 22-, or 30-input mainframe with the standard modules (Microphone Preamp, Meter Switcher, Control Room, and Outputs) installed, along with the other modules ordered (Universal Input, Telco/Codec, RLS, Studio), and blank panels to cover any unused positions.
- The rack-mount power supply assembly.
- The Legacy Tool kit (3 AA batteries, AMP MOD IV crimp tool and contact removal tool, hex driver, and module removal tool).
- Audio and Logic connector kit. The kit contains all the AMP MOD IV connector housings and receptacle contacts typically needed for installation.



Console Front View

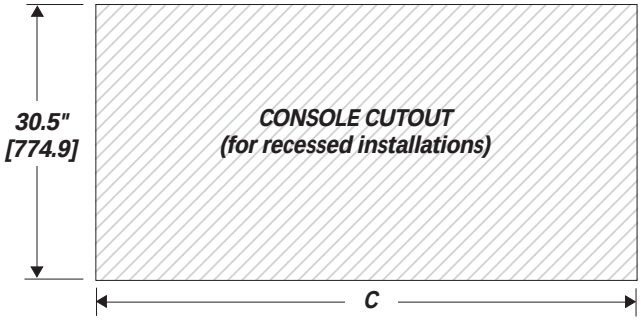


Console Side View, with dimensions (inches & [mm])

Dimension Table

Mainframe	A	B	C
Legacy-14	41.13" [1044.7]	38.94" [989.1]	39.20" [995.7]
Legacy-22	54.44" [1383.2]	51.70" [1313.5]	52.00" [1321.2]
Legacy-30	67.24" [1708.4]	64.50" [1638.8]	64.75" [1645.1]

Millimeter dimensions in brackets. All dimensional tolerances are +¼" [6.35], -0" [0.0]. Typical front setback is 12" [304.8]. Allow 14" [355.7] clearance above the countertop.



Console Installation

To simplify console installation, logic cable wiring diagrams for specific peripheral equipment are available from the Harris Technical Services department. See page 4-1 for contact information.

INSTALLATION NOTE: Do not locate the console near intense electromagnetic hum fields, such as those produced by large power transformers and by audio amplifiers that use inexpensive power transformers operating in or near saturation. Strong electromagnetic fields may impair the performance of the Legacy and neighboring equipment. Audio cables must also be routed to achieve maximum practical distance from all AC power mains wiring.

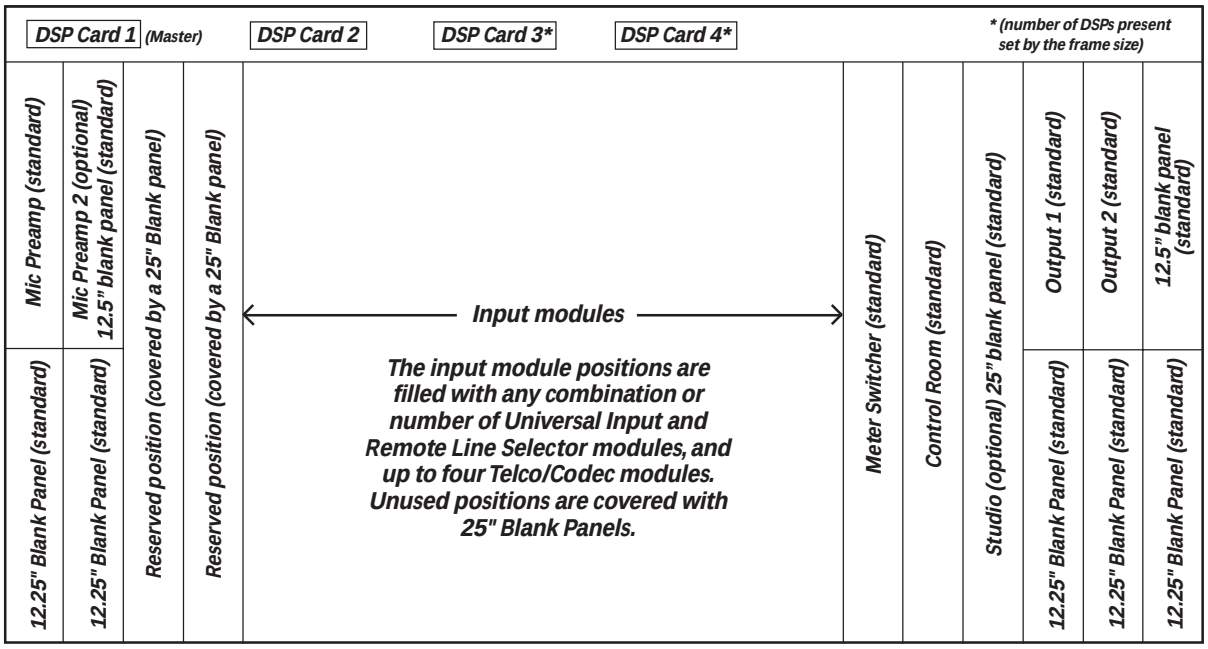
MAINFRAME CONFIGURATION

The Legacy design positions the input modules in the physical center of the mainframe. This gives the operator equal reach to peripheral equipment located to the either side of the console.

Module Placement

The 14, 22, or 30 input module positions can have any combination or order of the following modules installed: Universal Input, Telco/Codec (four maximum), and Remote Line Selector (RLS). The remaining console positions are fixed. The Mic Preamplifier module(s), Meter Switcher module, Control Room module, optional Studio module, and the two Output modules must be positioned as shown in the illustration below.

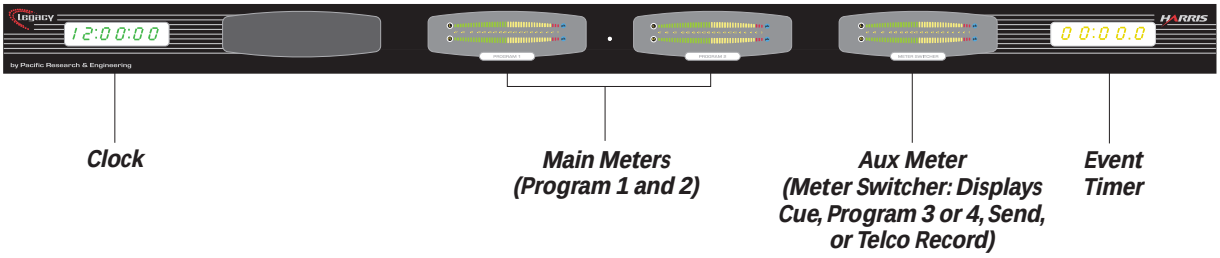
Legacy Mainframe, Module Configuration



NOTE: The number of input module positions matches the console model number (e.g., Legacy-22 has 22 input positions). There are two DSP cards in the Legacy-14, three in the Legacy-22, and four in the Legacy-30.

The areas covered by the five 12.25" Blank Panels can be used for mounting Harris BMXdigital Accessory Panels or custom remote control panels. Since the Harris BMXdigital Accessory Panels are 6" long, a PRE99-1100 Divider Kit (for mounting up to four Accessory Panels in place of two 12.25" Blank Panels), or a PRE99-1101 Divider Kit (for mounting up to six Accessory Panels in place of three 12.25" Blank Panels) is required. Typically, the PRE99-1100 Divider Kit is installed in place of the Blank Panels on the left end of the console and the PRE99-1101 is installed in place of the Blank Panels on the right end of the console. 6" Blank Panels (PRE99-1714-3) cover unused Accessory Panel positions.

Legacy Meter Panel



Meter Panel

The meter panel contains three horizontal bargraph meters. Two of the meters provide individual level monitoring for the Program 1 and 2 outputs. The third meter is used to monitor the level of Cue, Program 3 or 4, any external input, the Send output, or the Telco Record output, as selected on the Meter Switcher module. The level at which the peak indicator (PK) comes on, as well as the meter display mode (peak hold or non-peak hold), may be set for each meter via DIP switches on each meter display board.

The meter panel also contains a slaveable 12/24-hour digital clock (HH:MM:SS) and an event timer (MM:SS:T) that can be controlled manually, through buttons on the Meter Switcher module, or automatically through module On commands.

For additional information on the meter panel, see pages 3-15 and 3-16.

CONNECTOR ACCESS

All module connectors are hidden below the meter panel in normal operation. The meter panel connects to the rear of the console by hinges. To access the connectors, open the meter panel by lifting it up and rotating it toward the rear of the console until it stops.

Caution: Make sure that the panel is open all the way so that it does not accidentally fall shut.

To facilitate initial wiring, the meter panel can be removed from the mainframe chassis.

To remove the meter panel from the mainframe:

1. Open the meter panel fully and unplug the meter power cable (attached to the rear panel) and the two cables (meter signals and talkback mic) from the Meter Switcher module.
2. With another person holding the meter panel, remove the screws and bushings that attach each gas spring to the meter panel. Lay the gas springs on the mainframe while working.
3. Unlatch the hinges by moving the release pins to their unlocked positions and lift the meter panel up and off the mainframe.

To reinstall the meter panel, align the two halves of the hinges, then release the pins out of their unlocked positions.

Reattach each gas spring to the meter panel by inserting a screw through the gas spring and the bushing.

POWER SUPPLY

The power supply assembly is rack mounted (it requires 2 RU or 3.5" [88.9 mm] of rack space) within the console cabinetry, below and to the left or right of the supporting countertop. The Legacy Power Supply must be installed so that the 30 foot power supply cable supplied with the Power Supply is not under any tension when routed through the cabinet and connected to the mainframe's rear panel connectors.

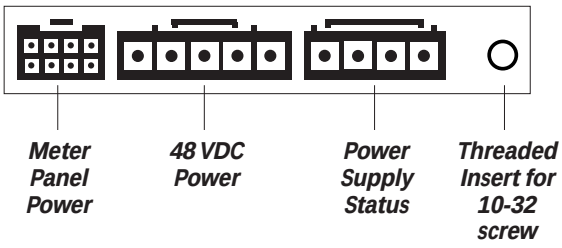
Connecting the Power Supply

The power supply cable has two connectors:

- A 5-pin connector to supply 48 volt DC power to the console.
- A 4-pin connector to supply power supply status information (Imminent Power Loss) to the console.

Both connectors must be attached to the back of the Legacy and to the power supply.

Power Connections — Console Mainframe, Rear Panel



DC GROUNDING NOTE: Do not connect the audio or logic supply ground wiring to the chassis of the power supply.

AC GROUNDING NOTE: Do not defeat the safety ground in any way. Doing so may provide a potentially dangerous condition to the operator.

GROUNDING AND SHIELDING

The broadcast facility's technical ground can be connected to the mainframe chassis using the threaded insert on the rear of the console (shown in the Power Connections drawing on this page). Use a 10-32 screw and crimp lug to terminate the facility's technical ground wire.

Connect the cable shields at both the console and the peripheral end when all system components share a common ground potential and are using isolated ground AC outlets tied individually back to the main technical ground.

If isolated ground AC outlets are not available, connect the cable shields at the console end only. The shields should be floated (left unconnected) at the peripheral device end. Ensure the peripheral devices connect to a clean ground through their power cords, or through separate ground wires to the facility's technical ground.

POWER SUPPLY GROUNDING NOTE: The Power Supply chassis connects to the AC mains safety or "U" ground wire.

AUDIO GROUND NOISES: Buzz pickup is generally electrostatic—such as capacitive coupling between an audio line and a power line. To avoid audio ground noises, do not route audio lines in the same wireway as an AC power line.

INSTALLING BACKUP BATTERIES

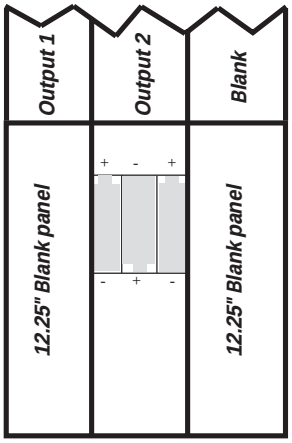
Three AA rechargeable NiCad batteries are supplied in the 76-2001 Tool Kit. They supply a "Keep Alive" voltage to hold each module's logic state during momentary power outages. They mount in a battery clip located below the three 12" blank panels on the right end of the console.

To install the backup batteries:

1 Remove the three blank panels located in front of the Output modules.

2 Install the batteries into the battery clip, observing the correct polarity marked on the battery clip, as shown below.

Backup Battery Installation



Middle 12.25" Blank Panel removed to show the battery clip

Note: Replace batteries yearly to ensure continuous backup protection. Because this device is optimized for continuous slow charge operation, use Panasonic P-50AAH batteries (or their equivalent). To prolong battery life, remove the batteries when the console will be powered down for an extended period.

SETTING THE CLOCK

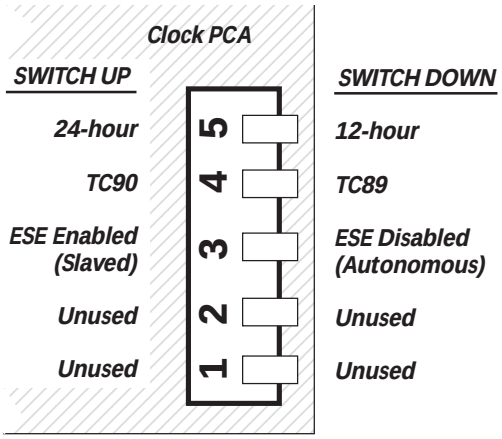
The digital time-of-day clock can operate in autonomous or slave modes. When used autonomously (the factory preset), a temperature-controlled quartz crystal oscillator controls the clock timing. In slave mode, clock timing comes from a TC89- or TC90-compatible ESE master clock reference signal.

Master clocks are available from:
ESE
142 Sierra St.
El Segundo, CA 90245.
Telephone: 310.322.2136
www.ese-web.com

The operating mode (autonomous or ESE slave), the type of ESE signal (TC89 or TC90), and the type of clock time desired (12-hour or 24-hour format) are set using DIP switch DS1 on the clock PCA. DS1 is on the right rear edge of the circuit board.

To access the clock PCA, open the meter panel. The clock PCA is mounted behind the clock display on the meter panel.

Clock Option Switches (DS1)



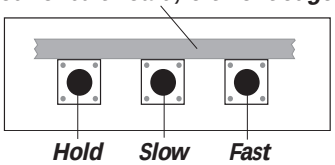
Clock circuit board DIP switch. Factory default settings are DOWN.

With the clock set to autonomous mode, it must be set after power-up. There are three clock set buttons on the bottom left front of the clock PCA.

- Use the right button (Fast) to scroll by minutes at a time.
- Use the middle button (Slow) to scroll by seconds at a time.
- Use the left button (Hold) to synchronize the console clock to an external time reference by setting the clock ahead of the

Setting the Clock

Clock Circuit Board, left front edge



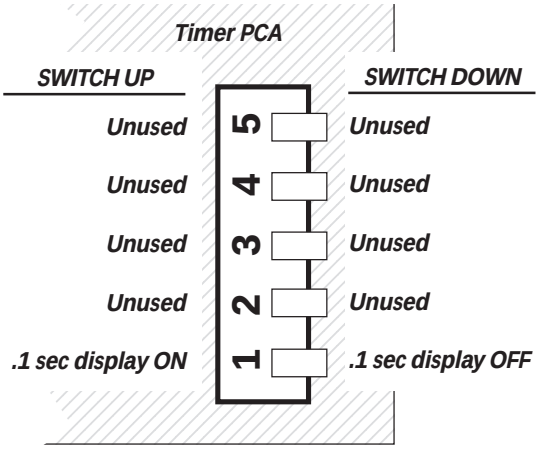
external time reference, then press and hold the HOLD button to freeze the time. When the external time reference reaches the time on the Legacy clock, release the HOLD button to start the clock.

When an ESE time-code signal is connected to the BNC connector on the clock circuit board, and slave mode is selected (DS1-3 is set UP), the clock does not require setting. If the ESE time-code signal fails, the clock automatically defaults to its internal crystal reference oscillator, flashing the display colons to indicate the loss of time-code.

EVENT TIMER

The event timer displays time in minutes, seconds and tenths of seconds. The only timer option setting is whether to display the tenths of seconds digit as the timer runs. DS1-1 (a DIP switch on the timer circuit board, located behind the timer display), sets whether the tenths are shown or not. In the UP position, the tenths of seconds are displayed. In the DOWN position, the factory default, the tenths do not display while the timer runs. Note that the tenths of seconds are always shown when the timer is in the Stop or Hold mode.

Event Timer Option Switches (DS1)



Timer circuit board DIP switch.
Factory default settings are DOWN.

METER SETUP

The level at which the blue peak indicators turn on, as well as the meter display mode (peak hold or non-peak hold), is set separately for each meter using DIP switches on the edge of each meter PCA.

To access the meter DIP switches, open the meter panel by lifting it up and rotating it toward the rear of the console until it stops. Each meter's DIP switches are located on the underside of the meter panel, directly below the right end of each meter.

Meter DIP Switch Definitions

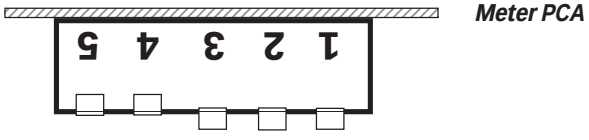
#	Switch Name	UP Function (switch set up)	DOWN Function (switch set down)
1	Peak Indicator Level	See Switch 1 and 2 Table, below	
2	Peak Indicator Level	See Switch 1 and 2 Table, below	
3	Meter Display Mode	Non-peak hold	Peak hold
4	Spare Switch		
5	Termination Switch	Set UP for Meter 1 (PGM 1)	Set DOWN for Meters 2 & 3

Switch 1 and 2 Table

Use these switches to set the level where the Blue peak indicators light.

#1	# 2	Peak Level
DOWN	DOWN	0dB
UP	DOWN	-2dB
DOWN	UP	-4dB
UP	UP	-6dB

Meter Option Switches (DSW2)



Switches 1, 2, 3 shown down, switches 4 and 5 shown up.

Cabling and Wiring

Before installing the console, draw up a facility wiring plan that lists the console interconnections with all peripheral devices. Identify and create tags for all audio and logic cabling. List each connection in a master facility wiring logbook to facilitate wiring installation, future system wiring changes, equipment updates, and system troubleshooting.

Refer to the module Quick Connection Guides, on pages 2-16 to 2-49, for information on each audio and logic connection (including block diagrams for each logic interface connector) and on each module's setup DIP switches.

REQUIRED CABLES AND WIRE

The Legacy uses the following types of cables and wires:

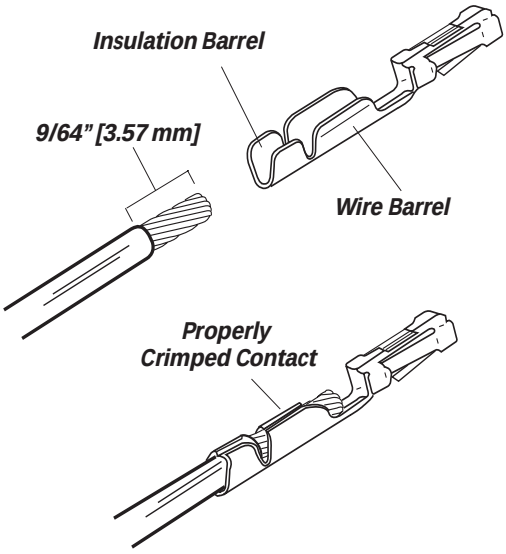
- Analog audio connections require two-conductor, stranded, insulated, foil-shield cable using a separate shield drain wire (equivalent to Belden 8451, 9451 or 8761).

- AES/EBU connections require 110 ohm two-conductor, stranded, insulated, foil-shield cable containing a separate shield drain wire (equivalent to Belden 1800A).

- Logic control cables require stranded, 22 AWG, multiple-conductor, non-shielded, jacketed cable (equivalent to Belden 9423, 8457 or 9421). The number of conductors used is determined by the application. Typically cables with five and eight wires are most often used for constructing logic cables. Even though there are eighteen distinct signals on the Logic Interface connector, only a handful are typically used for any given application.

WIRE PREPARATION

All Legacy audio and logic wiring terminates in AMP MOD IV receptacle contacts at the console. Stranded wire of 22 to 26 AWG, with insulation diameters of .040 to .060 inch, can be used with the AMP MOD IV receptacle contacts.

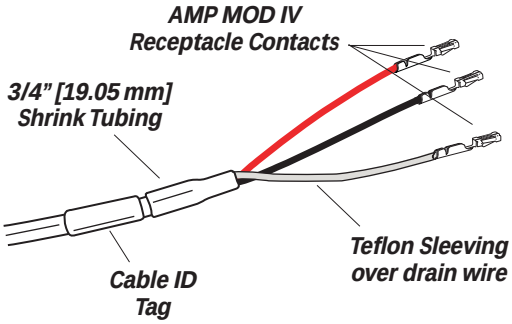


AMP MOD IV Receptacle Contacts

Follow these steps for audio wire preparation:

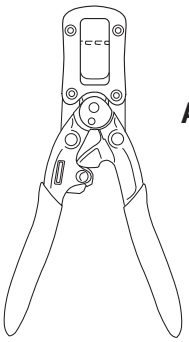
1. Strip the cable insulation jacket and foil shield back 1½" [38.10 mm].
2. Remove the foil shield and sleeve the drain wire with 20 AWG Teflon sleeving. Leave 9/64" [3.57 mm] of the drain wire exposed.
3. Cover the cut end of the jacket with 3/4" [19.05 mm] of heat-shrink tubing. Shrink this tubing, centered on the jacket cut end, to hold the drain wire sleeving in place.
4. Strip the signal wire insulation back 9/64" [3.57 mm].
5. Crimp the receptacle contact onto the wire and insulation.

Audio Cable Shield Note: To ensure your installation follows recommended grounding procedures, you must sleeve all drain wires with Teflon sleeving and put heat shrink tubing over all cable jacket cut ends to insulate the shield wire.



Audio Wire, ready for insertion into an AMP MOD IV connector housing

Logic control cables are fabricated in a similar manner to the audio wiring. Strip the jacket insulation back 1½" [38.10 mm], sleeve the cut end with 3/4" [19.05 mm] of shrink tubing and strip the insulation from each wire 9/64" [3.57 mm].



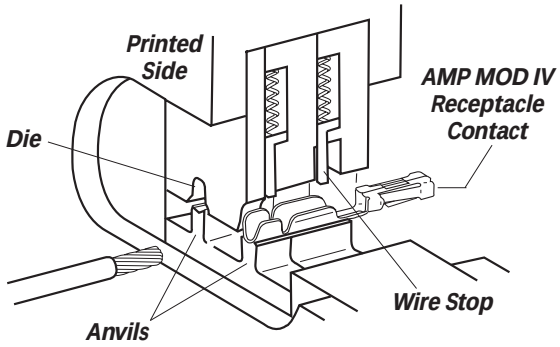
AMP MOD IV Contact Crimp Tool

CRIMP TOOL OPERATION

A ratcheting AMP MOD IV crimp tool is included in the tool kit. The tool crimps both the insulation and wire barrels on the AMP MOD IV receptacle contacts in one crimping action.

To use the ratcheting crimp tool:

1. Hold the crimp tool with the printed side up. Insert the contact from the opposite side, with the barrel openings up, until the insulation barrel end is flush to the opening of the die. Close the tool only until the anvil holds the contact in place (Refer to the cutaway view on this page).
2. Insert the stripped wire into the contact until it hits the tool's wire stop. Hold the wire in place while squeezing the tool handles to crimp the contact onto the wire. The tool handles automatically release and spring open after the crimp cycle is complete.

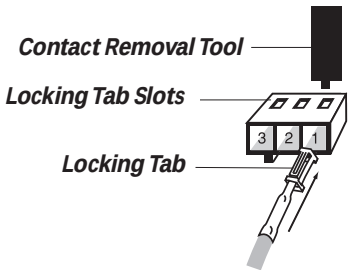


Crimp Tool — Cutaway View

Once the contact has been crimped, insert and lock the contact receptacle into the appropriate connector housing following the pin-out diagrams found in the Quick Guides on pages 2-16 to 2-49.

A receptacle contact is inserted into the housing with its locking tab side toward the locking tab slots on the side of the connector housing. A slight click can be heard when the contact's locking tab springs up into the locking tab slot.

To remove a contact from a housing, the PRE70-129 Contact Removal Tool (included in the PRE 76-2001 tool kit) is required. Insert the tool's tip into the locking tab slot and press the locking tab down while lightly pulling on the wire to remove the contact from the housing.

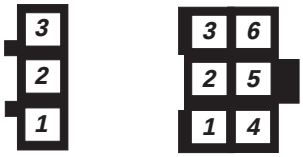


Receptacle Contact Insertion & Removal Detail

AUDIO CONNECTIONS

Audio connections take advantage of the three-pins per row design of the three- and six-pin AMP MOD IV housings. Three-pin housings are used for balanced digital connections while six-pin housings are used for balanced analog connections. One important exception is the Mic Preamp module, which uses three-pin connectors for balanced analog microphone inputs.

Pin Numbers for Analog & Digital Audio Connectors



Pin numbering always shown from the wire insertion end, oriented from the board operator's perspective.

All audio wiring, when plugged into a module connector, has this orientation:

- The audio shields are on pins 1 and 4 (the pins closest to the board operator).
- The audio low wires (typically the black wires) are on pins 2 and 5 (the middle pins).
- The audio high wires (typically the red wires) are on pins 3 and 6 (the back pins).

For stereo applications, the left channel wires plug into the left column of pins and the right channel wires plug into the right column of pins (from the board operator's perspective).

When a six-pin input comes from a mono source (such as an external microphone preamp output), the left and right inputs should be paralleled together (pins 1 and 4 tied together, pins 2 and 5 tied together and pins 3 and 6 tied together). If this is not done, then the module's mode buttons will have to be set for mono operation (see page 3-4 for L/R Mode information on the Universal Input Module).

Analog Connections

There are no analog interstage patch points within the Legacy input or output modules. To use the console with a patch bay, connect the line level outputs from the peripheral devices directly to the patch bay. Normal these signals to the appropriate analog input modules.

Likewise, the Legacy's analog outputs may be routed through a patch bay normalled to standard peripherals such as analog on-air processing gear, recorders, telephone hybrids, etc.

The Mic Preamp module's line-level outputs (+4 dBu, nominal, balanced, mono outputs) can also be routed through a patch bay normalled to an input module, or to external mic processing.

When a mic processor with only a microphone level input is used, the microphone is connected directly to the mic processor, with the processor's line-level output either directly connected to an input module (using the mono wiring pinout shown below) or through a patch bay normalled to an input module.

Two-Channel (Stereo) Line Input or Output — 6-Pin Housing

Pin	*Signal Description*
1	Shield for the left channel, or signal 1
2	Low (- input or output), left channel, or signal 1
3	High (+ input or output), left channel, or signal 1
4	Shield for the right channel, or signal 2
5	Low (- input or output), right channel, or signal 2
6	High (+ input or output), right channel, or signal 2

Single Channel (Mono) Line Input — 6-Pin Connector

Pin	*Signal Description*
1	Shield (connects directly to the chassis)
2	Low (- input) tied to pin 5
3	High (+ input) tied to pin 6
4	Shield (connects directly to the chassis)
5	Low (- input) from pin 2
6	High (+ input) from pin 3

Microphone Input — 3-Pin Connector

Pin	Signal Description
1	Shield (connects directly to the chassis)
2	Low (- input)
3	High (+ input)

Digital Connections

Most of Legacy's digital inputs and outputs are wired like the Microphone Input shown above. One exception is the RLS module, which uses 6-pin connectors since it can be set for analog or digital operation. When set for digital, the signals connect using pins 1, 2, and 3 of the connector.

The other modules with digital inputs or outputs; Universal Input, Telco/Codec, Output 1 and 2, use three-pin connectors like that shown above. The digital inputs accept AES-3 (AES/EBU) compatible signals and, as mentioned in the Unbalanced Connections section that follows, can also accept S/PDIF signals in most cases.

Each digital output is an AES-3 compatible signal (nominal sample rate is 48 kHz, but some outputs are switch selectable for 44.1 kHz) . AES-3 output signals cannot connect directly to an S/PDIF input. A signal translation interface is required to accomplish this function.

AES/EBU Digital Inputs and External Clock Reference Input

Pin	Signal Description
1	Shield (connects directly to the chassis)
2	Low (- input)
3	High (+ input)

AES/EBU Digital Outputs

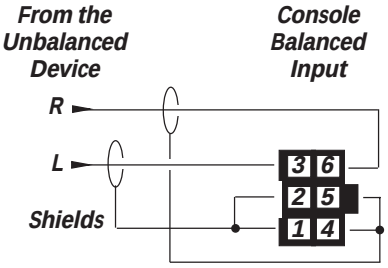
Pin	Signal Description
1	Shield for AES/EBU signal
2	Low (- output)
3	High (+ output)

UNBALANCED CONNECTIONS

Although all analog inputs and outputs are active and balanced, unbalanced consumer or "semipro" equipment can be connected to the console. For best results, connect an unbalanced device through an IHF-PRO match box and keep the unbalanced cable lengths as short as possible.

If a match box is not available, connect an unbalanced device to a Legacy input using the following illustration.

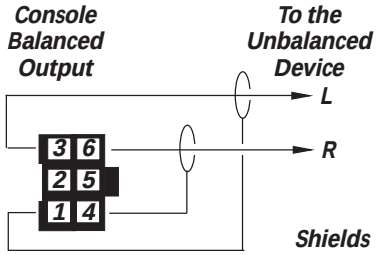
Connecting an Unbalanced Device to a Legacy Analog Input



When an unbalanced device must connect to a Legacy balanced analog output, and an IHF-PRO match box is not available, do not tie the low (-) and shield pins together to "unbalance" the signal. The low output pin must always be left "floating" when unbalancing a Legacy output, as shown in the following illustration.

Connecting an Unbalanced Device to a Legacy Analog Output

(Nominal Output is -2 dBu)

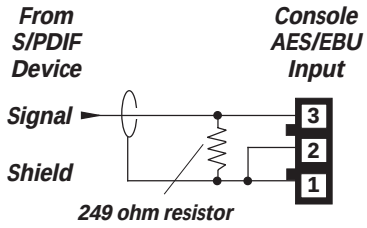


(Make no connections to pins 2 & 5)

S/PDIF Signals

Digital devices with only an S/PDIF digital output can connect to a Legacy input, but only when a 249 ohm resistor is added to load the 75 ohm S/PDIF cable. Install the resistor at the AMP MOD IV housing per the illustration on the next page.

Connecting an S/PDIF Device to a Legacy AES/EBU Input



An unbalanced-to-balanced line transformer can also be used to interface an S/PDIF signal.

Note 1: A signal conversion interface must be used to connect an AES/EBU output to a S/PDIF input.

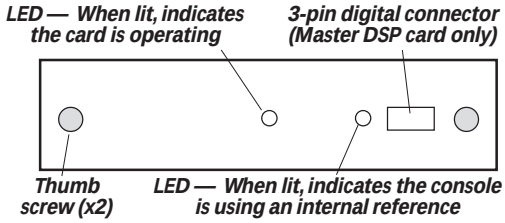
Note 2: Some S/PDIF signals may not work with the Legacy's inputs, even with the additional load resistor or a transformer, because of nonstandard levels or protocols in the S/PDIF product.

DIGITAL CLOCK REFERENCE

The Legacy has an internal clock for sample rate timing, with sample rate converters on each input to synchronize/convert external digital signals to the console's internal 48 kHz sample rate. The console can automatically synchronize to an external AES-3 digital reference signal (of 48 kHz, ±100 ppm only) through a 3-pin connector on the left DSP card (the DSP cards are along the back of the mainframe, below the meter panel).

A green LED next to the connector indicates whether the console is using internal reference (LED is lit), or using the external reference (LED is off). If an external reference signal is connected, and yet the LED is still lit, this indicates the reference signal is not present or is out of range.

Master DSP Card



LOGIC CONNECTIONS

Legacy modules have built-in logic I/O interfaces that can control, or be controlled by, peripheral devices connected to the console. For example, a CD player connected to a module can be automatically started when the module is turned on. Then, at the end of the cut, the CD Player logic can turn the module audio off and control the off button illumination to indicate that the cut has been played.

When a mic remote control panel is connected, its On, Off, Cough, and Talkback buttons control the module while tally outputs from the module control the button tallies on the mic panel.

Legacy modules have the following logic connectors:

- Universal Input modules have two LOGIC I/O connectors for controlling the devices connected to the A and B inputs.
- Telco modules have a single LOGIC I/O connector for controlling the device connected to the module.
- The Meter Switcher module has three EXT TIMER connectors for resetting studio or producer timers, and the connectors for the factory-installed wiring that ties the mainframe to the meter panel.
- The Control Room module has a LOGIC connector for the warning light and talkback outputs and the remote mute and dim inputs. A CUE CNTL connector allows external cue input control.
- The optional Studio module has one LOGIC connector for the studio warning light and talkback outputs and the remote mute and dim inputs and tally outputs. An EXTERNAL connector has the talkback commands and the audio (both to and from) for an external location.

MODULE QUICK GUIDES

Pages 2-16 to 2-49 have Quick Guides to configuring each module's logic connections and DIP switch settings. Each guide includes the audio and logic connector pinouts and signal descriptions, DIP switch setting definitions and, for some modules, logic block diagrams.

Module Quick Guides:

- **Mic Preamp**: pages 2-16 & 2-17
- **Universal Input**: pages 2-18 to 2-21
- **Telco/Codec**: pages 2-22 to 2-25
- **RLS**: pages 2-26 & 2-27
- **Meter Switcher**: pages 2-28 to 2-30
- **Control Room**: pages 2-32 to 2-37
- **Studio**: pages 2-38 to 2-45
- **Output 1**: pages 2-46 & 2-47
- **Output 2**: pages 2-48 & 2-49

Pages 2-50 to 2-55 show examples of typical logic connections to the Universal Input module for a mic remote control panel, a CD player, and a digital delivery system.

Note: To completely isolate the console from the peripheral device, use only the opto-isolated control input and output connections since the Logic Ground and Logic Supply +5VDC connections are referenced to the console's logic power supply and ground.

Connect these only to isolated devices, such as a mic control panel or other Harris Accessory Panel. Connecting the logic ground to a non-isolated peripheral device can result in a ground loop between the console and the peripheral device.

UNIVERSAL INPUT LOGIC INTERFACE

A block diagram of the Universal Input module logic interface is shown on page 2-13. Logic outputs (shown on the right side of the illustration) are isolated from the peripheral device by six solid-state "relays." The "relay contacts" can switch logic voltages up to 60 volts at 350 mA.

Pressing the On button generates a 220 ms contact closure from pin 5 (Start Command Pulse). A sustained contact closure while On is available on pin 23 (Start Command Sustained). It stays closed as long as the module is On. Pressing the Off button generates a 220 ms closure from pin 4 (Stop Command Pulse). These three command outputs are tied together at pin 13 (Command Common).

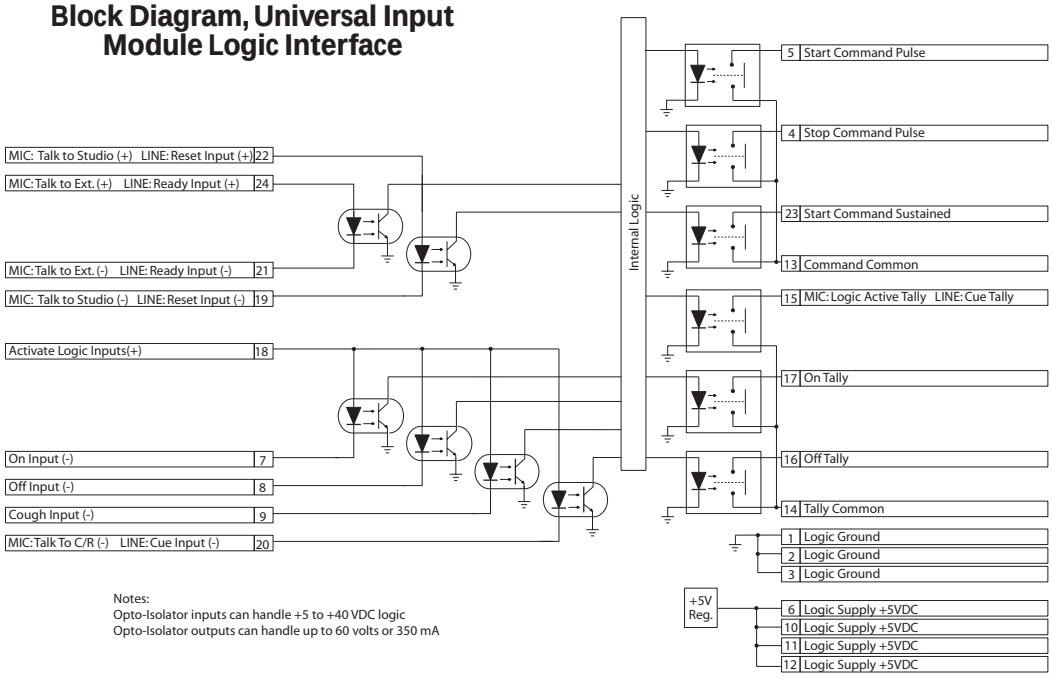
Module DIP switches DS2-2 (for the A input) and DS4-2 (for the B input), set whether a single pulse is output when the module status changes (Off to On, or On to Off), or if each additional press of the On or Off buttons produces another contact closure. The default setting (switch 2 set to OFF) is a single contact closure. When DS2-2 or DS4-2 is set to On, then each additional press of the On or Off button produces another 220 ms contact closure.

The remaining outputs; Logic Active/Cue Tally [pin 15], On Tally [pin 17], and Off Tally [pin 16], are tied together at Tally Common [pin 14]. They present sustained logic outputs for each function.

There are six logic inputs on the left side of the illustration: Reset/Talk to Studio, Ready/Talk to External, On, Off, Cough, and Talk to Control Room/Ext. Cue. These inputs are opto-isolated and current limited so any logic voltage from +5 to +40 VDC can be used.

Reset/Talk to Studio, and Ready/Talk to External have both high (+) and low (-) input pins so that either polarity logic can be used. The other inputs use active low logic (pull to ground) that typically come from a mic control panel (although On and Off could be triggered by a peripheral

Block Diagram, Universal Input Module Logic Interface



Notes:
Opto-Isolator inputs can handle +5 to +40 VDC logic
Opto-Isolator outputs can handle up to 60 volts or 350 mA

device). To use these inputs, pin 18 (Activate Logic Inputs) must be jumpered to the + logic voltage. Typically this is pin 6 (Logic Supply +5VDC), but it can also be supplied by the peripheral device.

The Reset/Talk to Studio and Ready/Talk to External inputs can use either active low logic (pull to ground) or active high logic (pull to +VDC) from peripheral devices. Which function is active is determined by the setting of DS1/DS3 switches 2, 3, and 5. When all are off, the module is set as a Line Input, and the commands are Reset and Ready. When DS1/DS3 switch 2, 3, or 5 is on, then the module is set as a Mic Input and the commands are Talk to Studio and Talk to External.

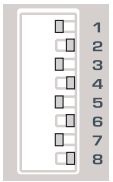
With active high logic, Ready/Talk to External (-) and Reset/Talk to Studio (-) are tied to logic ground on the peripheral device. Ready/Talk to External (+) and Reset/Talk to Studio (+) then connect to the appropriate logic outputs on the peripheral device.

When active low logic is used by the peripheral device, Ready/Talk to External (+) and Reset/Talk to Studio (+) connect to the logic supply voltage on the peripheral device, and Ready/Talk to External (-) and Reset/Talk to Studio (-) connect to the appropriate logic outputs.

Pin 15's signal (Logic Active Tally / Cue Tally) changes depending upon whether the channel logic switches (DS1/DS3) are set to mute any location. When a mute is set (DS1/DS3, switch 2, 3, or 5 is set to On), the module is set as a microphone and the Logic Active Tally output (pin 15) is closed when that input (input A for DS1 or input B for DS3) is active. When no mute is set, the module is set for line logic and pin 15 becomes a Cue Tally.

Setting DIP Switches

When referring to a module's DIP switch setting, a switch is Set to Off when it is to the right and it is Set to On when it is to the left (orientation is from the board operator's perspective). In the illustration, all odd numbered switches are shown set to On and all even numbered switches are shown set to Off.



On = set Left
Off = set Right

Universal Input Module Logic and Microphones

The three main functions of microphone logic are to automatically mute the monitor speakers in the room with the "hot" mic, to command the appropriate hot mic warning light, and to activate such microphone functions as talk to control room and cough.

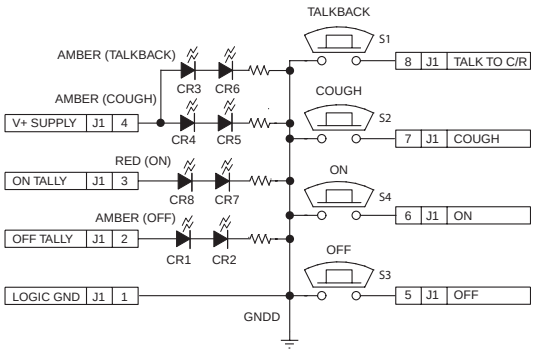
The warning commands come from the Control Room or Studio modules, but it is DS1 (for the A input) and DS3 (for the B input), switches 2, 3, or 5, on each Universal Input module that tell the monitor modules whether a mic is located in the control room, a studio, or an external location.

Pages 2-50 and 2-51 summarize setting up a Universal Input module as a microphone input, utilizing a PRE99-1198 Mic Panel (simplified schematic shown below).

The Mic Panel connects to the module's LOGIC I/O connector. To enable the remote control inputs (On, Off, Cough, Talk to C/R), pin 18 (Activate Logic Inputs) has to be jumpered to pin 6, 10, 11, or 12 (Logic Supply +5VDC).

The On Tally output drives the LEDs in the On button and the Off Tally drives the LEDs in the Off button. The other LEDs (Cough and Talkback) connect internally to the Logic Supply +5 VDC.

Mic Control Panel (Simplified Schematic for PRE99-1197 or PRE99-1198)



J1: TO/FROM CONSOLE CHANNEL LOGIC

All LEDs are tied to Logic Ground (pins 1, 2 or 3 on the LOGIC I/O connector).

To construct a custom mic control panel like that shown on this page, use SPST (single pole, single throw) momentary contact switches with LED or lamp indicators. Lamps must be 6.3 volt type with a current draw of under 50 mA.

Tie one side of each switch and lamp to Logic Common (pin 1, 2 or 3 on the LOGIC I/O connector). The other side of the Cough and Talkback lamps tie together to Logic Active Tally (pin 15).

Each switch is tied to its logic counterpart (the On switch goes to the On (-) input, pin 7, the Off switch goes to Off (-) input, pin 8, etc.). The on/off lamps are tied to their Tally outputs (On lamp to On Tally, pin 17; Off lamp to Off Tally, pin 16).

Tally Common (pin 14) is jumpered to Logic Supply +5VDC (pin 6, 10, 11 or 12) at the LOGIC I/O connector. Pin 18, Activate Logic Inputs (+) is also jumpered to Logic Supply +5VDC (typically pin 6 is used).

Input Module Logic (Universal Input and Telco) and Peripheral Devices

Peripheral devices are controlled through the Start and Stop Command Pulses, or through the Start Command Sustained logic, and the Commands Common connections.

In the basic logic connection example on pages 2-52 and 2-53, active low logic is used, thus Command Common is connected to the logic ground on the peripheral device (labeled Command Common on the Denon CD player in the example).

In the complex logic example shown on pages 2-54 and 2-55, active high logic is used, thus Command Common connects to Logic Supply +5 VDC.

Note: This voltage is more typically supplied directly by the peripheral device in order to prevent ground loops.

Peripheral devices control the module through the Reset and Ready logic inputs. In the example on pages 2-52 and 2-53, only the Ready function is used. The Ready function performs an audio reset, which turns off the module without generating a Stop Command Pulse. In addition, it also controls the Off lamp illumination.

In the example on pages 2-54 and 2-55, Reset (+) and Ready (+) connect to Logic Supply +5VDC on the module. The Ready (-) command and the Reset (-) command are pulled low by the active low logic relay outputs on the peripheral device, which all tie to the module's Logic Ground (pin 1).

For peripheral devices that require a steady on signal, the Start Command Sustained output can be used.

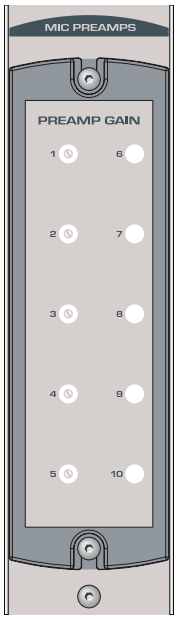
Additional Logic Connections

There are additional logic connections on the Meter Switcher module, Control Room module, and optional Studio module

Three 3-pin connectors on the Meter Switcher module interface remote timers so they can be reset by the console timer reset logic. The Meter Switcher module also has factory-installed cabling for the timer, the talkback mic, and the digital level meters. For more information on the Meter Switcher module's logic connections and settings, see pages 2-28 to 2-30.

A 14-pin connector on the Control Room module carries the logic interface for the Control Room warning light, remote mute and dim inputs, and the mute, dim and talkback tallies. The 8-pin Cue Cntl connector on the Control Room module has the External Cue logic interface. For more information on the Control Room module's logic connections and settings, see pages 2-32 to 2-36.

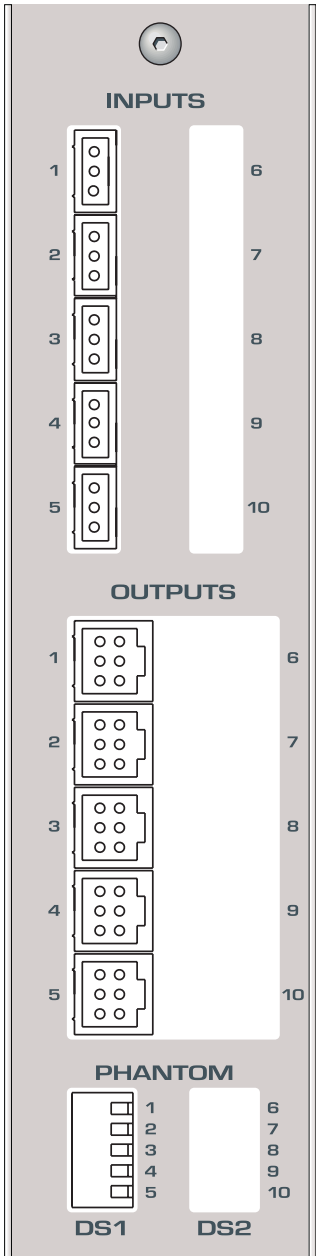
The optional Studio module includes a 14-pin connector to control the studio's logic, including warning lights, mutes, and dims. The Studio module also has a 16-pin connector for the audio and logic for an external site's talkback audio and control. For more information on the Studio module's logic connections and settings, see pages 2-38 to 2-45.



QUICK GUIDE TO THE MICROPHONE PREAMPLIFIER MODULE

Each Legacy Preamplifier module can contain two separate PCAs with five mic preamps on each assembly. The console comes standard with one Preamp module with one five-input mic preamp PCA that allows an additional five-input preamp PCA to be retrofitted. A second Mic Preamp (with either five or ten inputs) can be added to the console.

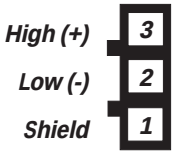
Each Mic Preamp PCA has five 3-pin analog microphone input connectors and five 6-pin analog audio output connectors. Each input connects to a separate mic preamp driving its own line-level balanced analog output connector. The connectors are hidden by the meter panel in normal operation and the trimpots, visible to the operator, are covered by a security cover.



INPUTS

1 - 10 — *The 3-pin analog inputs accept mono microphone signals. Connect only low impedance, balanced, dynamic or condenser microphones, with nominal mic output levels of -65 to -30 dBu, to these inputs.*

Analog Mic Inputs

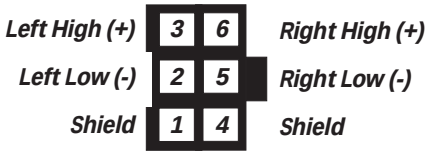


(wire insertion end view)

OUTPUTS

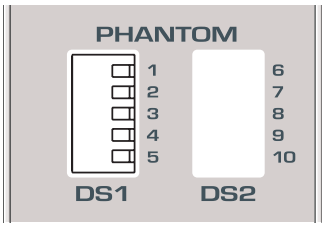
1 - 10 — *The 6-pin analog outputs are wired in parallel (mono) using the standard pinout sequence. This allows these outputs to connect directly to Universal Input modules without requiring any setting changes be made to the Input Mode from a standard stereo input. The preamp output signal level is +4 dBu.*

Analog Preamp Outputs



(wire insertion end view)

MICROPHONE PREAMPLIFIER MODULE SWITCHES



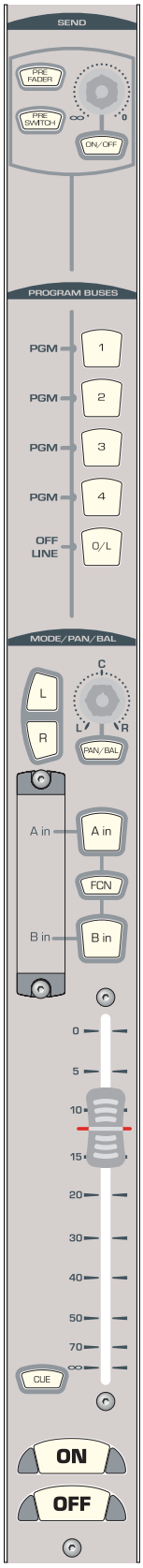
PHANTOM

DS1 — *These five DIP switches control the phantom power for the mic inputs 1 - 5. The factory default for the phantom power is off per the Microphone Preamplifier Module Switch Definitions table shown below.*

DS2 — *These five optional DIP switches set the phantom power for optional mic inputs 6-10.*

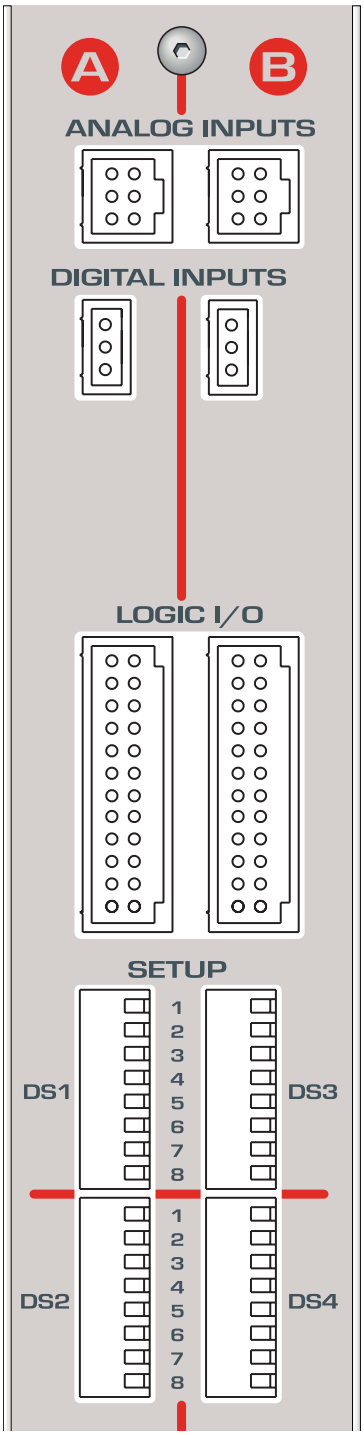
Microphone Preamplifier Module Switch Definitions

	#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
DS1	1	Mic Input #1	Phantom power on	Phantom power off
	2	Mic Input #2	Phantom power on	Phantom power off
	3	Mic Input #3	Phantom power on	Phantom power off
	4	Mic Input #4	Phantom power on	Phantom power off
	5	Mic Input #5	Phantom power on	Phantom power off
DS2 (optional)	6	Mic Input #6	Phantom power on	Phantom power off
	7	Mic Input #7	Phantom power on	Phantom power off
	8	Mic Input #8	Phantom power on	Phantom power off
	9	Mic Input #9	Phantom power on	Phantom power off
	10	Mic Input #10	Phantom power on	Phantom power off



QUICK GUIDE TO THE UNIVERSAL INPUT MODULE

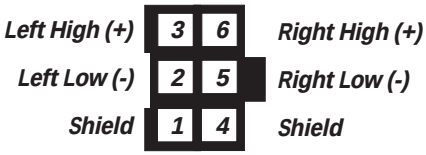
Six connectors come standard on each Universal Input module: two 6-pin analog audio input connectors, two 3-pin digital audio input connectors, and two 24-pin logic connectors. The connectors are hidden by the meter panel in normal operation.



AUDIO

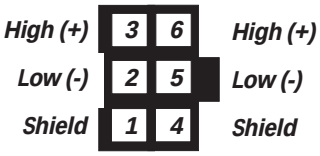
ANALOG INPUTS A & B — *The 6-pin analog inputs accept stereo or mono line level signals. Mono signals, like those from a preamplified microphone, should be paralleled to the left and right inputs.*

Analog Inputs - Stereo



(wire insertion end view)

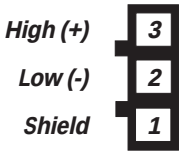
Analog Inputs - Mono



(wire insertion end view)

DIGITAL INPUTS A & B — *The two 3-pin digital inputs accept AES-3 (AES/EBU) or S/PDIF signals (when the circuit shown on page 2-11 is used).*

Digital Inputs

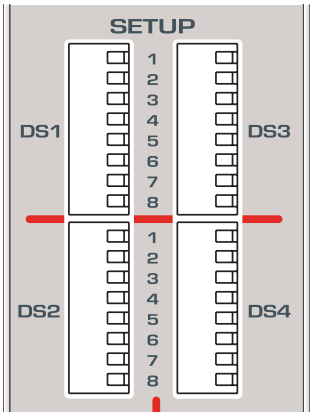


(wire insertion end view)

LOGIC

LOGIC I/O A & B — *Two 24-pin logic connectors allow separate A/B input control of peripheral devices or remote panels connected to the A and B inputs. For additional information, see pages 2-20 and 2-21*

UNIVERSAL INPUT MODULE SWITCHES



SETUP

DS1/DS2 — *These 16 DIP switches affect the logic settings for the A input. Individual switch definitions are listed below.*

DS3/DS4 — *These 16 DIP switches affect the logic settings for the B input. Individual switch definitions are listed below.*

Universal Input Module Switch Definitions

	#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
DS1/DS3	1	Signal Source	Digital Input connector	Analog Input connector
	2	C/R Mute	Mutes C/R Monitor output at module on [1]	No C/R monitor muting
	3	Studio Mute	Mutes Studio Monitor output at module on [1]	No Studio monitor muting
	4	Spare Switch		
	5	External Site Mute	External Mute logic output at module on [1]	No External monitor muting
	6	Console On as Cough	Press & hold On button for Cough button	On button not used for Cough
	7	Timer Reset	Resets timer at module on	No timer reset
	8	Off LED control (Ready)	Local (Off LED follows on/off status)	Peripheral controls Off LED (Ready logic)
DS2/DS4	1	Fader Start/Stop	Fader movement, from full off, turns module on; to full off, turns module off	Fader movement does not affect module on/off
	2	Start/Stop Pulses	Multiple (each press of On or Off button generates another pulse)	Single (pulse is only generated when changing state, Off to On, On to Off)
	3	Start/Stop Control	All (pulse is generated no matter where the on/off control originates)	Local (pulse is only generated by module's On or Off buttons)
	4	Bypass Sample Rate Converter (SRC)	Bypasses internal SRC (external source must run off the same external digital audio reference as console) [2]	Uses internal SRC (normal setting)
	5	Spare Switch		
	6	Spare Switch		
	7	Input Level Set A	See DS2/DS4 table below	See DS2/DS4 table below
	8	Input Level Set B	See DS2/DS4 table below	See DS2/DS4 table below

DS2/DS4 — Switches 7 and 8

These switches are used together to set the level for the input.

7	8	Analog [3]	Digital [4]
Off	Off	+4dBu	0dB
Off	On	+6dBu	-6dB
On	Off	+8dBu	-12dB
On	On	-10dBV	-18dB

[1] The module logic is set as a Microphone when any one of these switches is set to On.
[2] Refer to page 2-11, Digital Clock Reference for details on an external reference.
[3] The nominal input to achieve -20 FSD (equal to a +4 dBu output), with the fader set to the red reference line.
[4] The amount of gain reduction applied to the digital input signal.

UNIVERSAL INPUT MODULE — LOGIC I/O

There are two 24-pin logic interface connectors on the Universal Input module. The left logic connector controls the device attached to the A input; the right logic connector controls the device attached to the B input. The logic connectors are hidden by the meter panel in normal operation. Pages 2-50 to 2-55 show several connection examples.

Note that the Ready and Reset commands are balanced inputs (they have both a + and - input), thus for a switch input the + input has to be tied to Logic Supply +5VDC and the switch tied to Logic Ground.

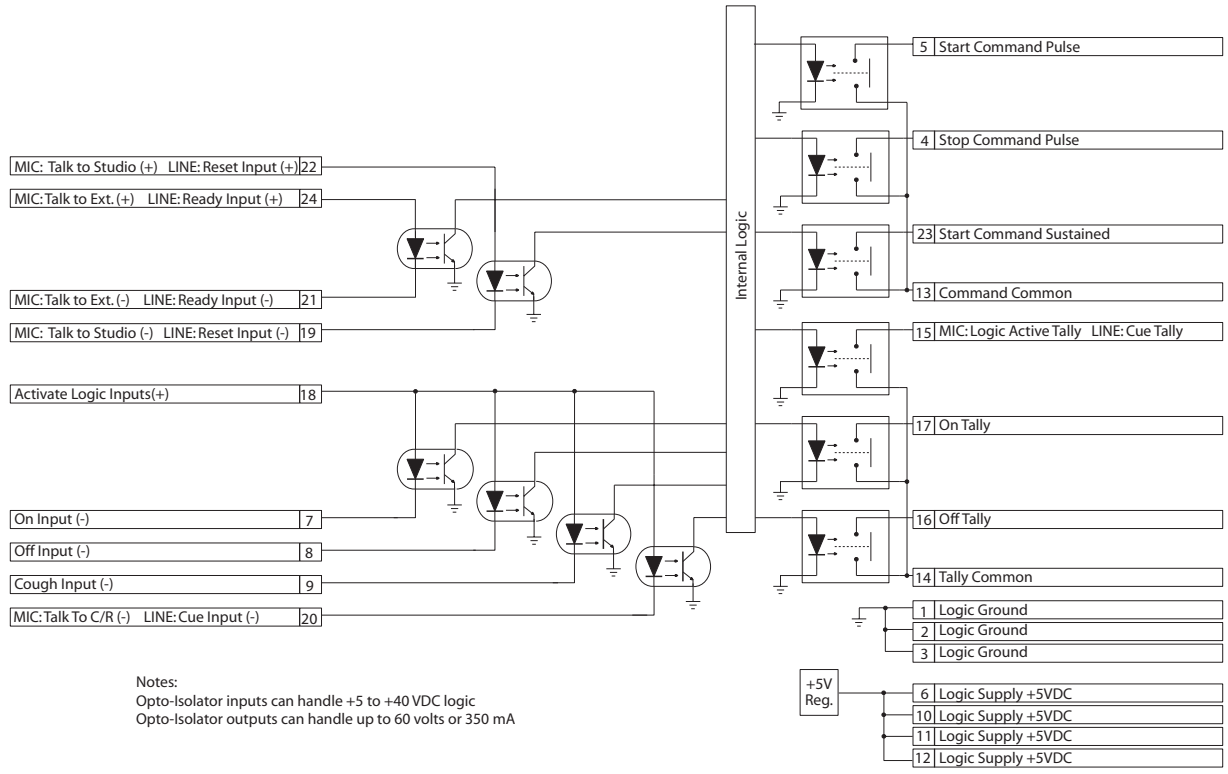
Outputs marked with an * are only available when the module has a Rev. C or later SPROM (21-227-7). When DS1 (for input A) or DS3 (for input B) switches 2, 3, or 5 are set to on, then the MIC logic function is enabled. When switches 2, 3, and 5 are set to off, then the Line logic function is enabled.

Logic Connectors

Logic Supply +5VDC	12	24	*LINE: Ready (+) MIC: Talk to EXT (+)*
Logic Supply +5VDC	11	23	*Start Command Sustained*
Logic Supply +5VDC	10	22	*LINE: Reset (+) MIC: Talk to Studio (+)*
Cough (-)	9	21	*LINE: Ready (-) MIC: Talk to EXT (-)*
Off (-)	8	20	**LINE: Ext. Cue (-) MIC: Talk to C/R (-)*
On (-)	7	19	*LINE: Reset (-) MIC: Talk to Studio (-)*
Logic Supply +5VDC	6	18	*Activate Logic Inputs (+)*
Start Command Pulse	5	17	*On Tally*
Stop Command Pulse	4	16	*Off Tally*
Logic Ground	3	15	**LINE: Cue Tally MIC: Logic Active Tally*
Logic Ground	2	14	*Tally Common*
Logic Ground	1	13	*Command Common*

(wire insertion end view)

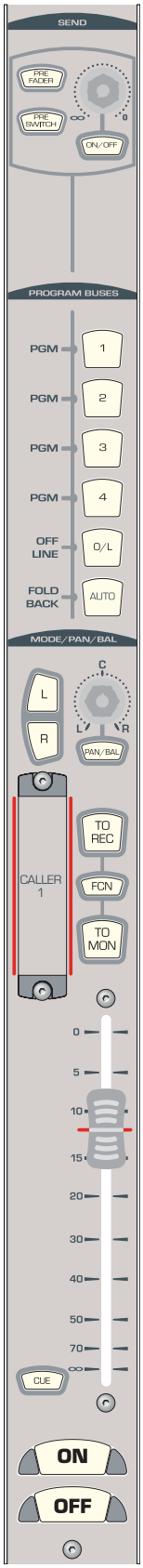
Universal Input Module, Logic I/O — Simplified Logic Diagram



Notes:
Opto-Isolator inputs can handle +5 to +40 VDC logic
Opto-Isolator outputs can handle up to 60 volts or 350 mA

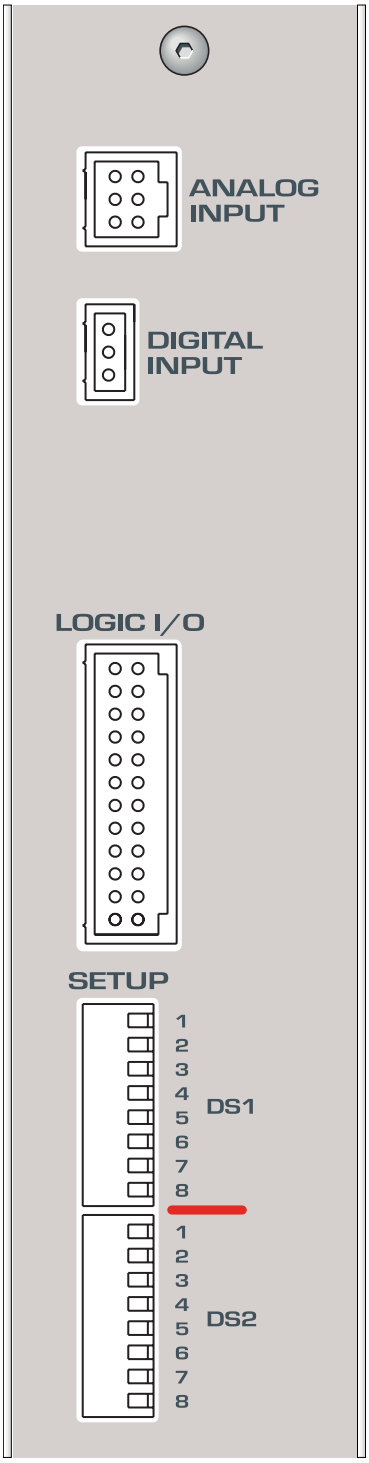
Universal Input Module, Logic I/O — Signal Definitions

SIGNAL / PIN NUMBER	*FUNCTIONAL DESCRIPTION*
START COMMAND PULSE (pin 5)	Equivalent to a Normally Open (N/O) contact. A momentary "contact closure" of 220 ms to Command Common occurs when the module On button is pressed. Typically connects to the Remote Start logic input on the peripheral device. When DS2/DS4-2 is set to On, each press of the On button generates another contact closure.
STOP COMMAND PULSE (pin 4)	Same as the Start Command Pulse, except it is initiated by the module Off button. Typically connects to the Remote Stop or Pause logic input on the peripheral device.
START COMMAND SUSTAINED (pin 23)	A maintained contact closure with Command Common for as long as the module is on. Typically connects to the Remote Start logic input on a peripheral device that cannot use a start pulse.
COMMAND COMMON (pin 13)	The Common (C) relay contact output for the three Start and Stop Command outputs. Sets whether the Start and Stop Commands are active high (connect this pin to the logic supply voltage on the peripheral device) or active low (connect this pin to logic ground on the peripheral device).
ACTIVATE LOGIC INPUTS (+) (pin 18)	To enable the control inputs: On, Off, Cough, Talk/Ext Cue, tie this pin to + logic voltage (+5 to +40). When tied to an isolated device like a mic remote panel, use the Logic Supply +5VDC (jumper pin 18 to pin 6, 10, 11 or 12).
ON (-) (pin 7)	When pulled low, turns the module on from off, generating a Start Pulse if DS2/DS4-3 is set to On. It is ignored if the module is already on, unless DS2/DS4-2 is set On (then each On button press generates a Start Pulse).
OFF (-) (pin 8)	When pulled low, turns the module off from on, generating a Stop Pulse if DS2/DS4-3 is set to On. It is ignored if the module is already off, unless DS2/DS4-2 is set On (then each Off button press generates a Stop Pulse).
COUGH (-) (pin 9)	When pulled low, mutes the audio from all assigned buses, for as long as the Cough button is pressed.
TALK TO C/R or CUE (-) (pin 20)	When pulled low, and the module is set as a Mic, the input audio is muted from all output buses and only routed to the C/R talkback bus. When set as a Line, routes the input audio to the Cue bus while the input is low.
TALLIES	All Tally outputs are N/O "dry contact" type outputs. Typically used to drive indicators, the outputs can sink or source up to 60 volts at 350 mA. The "C" or common contact for all the tallies is Tally Common (pin 14).
OFF TALLY (pin 16)	This output connects to Tally Common while the module is off when DS1/DS3-8 is set to On. When DS1/DS3-8 is set to Off, then this output is controlled by the Ready logic.
ON TALLY (pin 17)	This output connects to Tally Common while the module is on.
LOGIC ACTIVE TALLY or CUE TALLY (pin 15)	This output connects to Tally Common when the module is set as a Mic and the matching A or B input is selected. When set as a Line input, the output is connected to Tally Common while Cue is active.
TALLY COMMON (pin 14)	The Common ("C") contact for the three tally outputs, it must be tied high or low to provide the return path for the tallies. Typically, the tally lamps/LEDs are all tied to ground and Tally Common connects to the lamp supply voltage (+5 to +60 VDC). If the tallies are tied to +VDC, then this pin would tie to ground.
READY / TALK TO EXT. RESET / TALK TO STUDIO (+) & (-)	These complementary logic inputs require +5 to +40 VDC between the (+) input and the (-) input for activation. This can be done by connecting an active high logic to the (+) input and grounding the (-) input, or by supplying +5 to +40 VDC to the (+) input and an active low logic (like a switch to ground) to the (-) input.
READY (+) & (-) (pins 24 & 21)	This function is active when the module is set as a Line Input (DS1/DS3 switches 2, 3, & 5 are all off). When activated while the module is on, turns the module off without generating a stop pulse. When activated while the module is off, it controls the Off LED to indicate device status. Typically, LED off indicates the peripheral is not ready to play, a steady on LED indicates the device is ready, and a flashing LED indicates the device has already played or is not yet cued up.
RESET (+) & (-) (pins 22 & 19)	This function is active when a module is set as a Line Input (DS1/DS3 switches 2, 3, & 5 are all off). When activated while the module is on, turns the module off without generating a stop pulse. Input is ignored if the module is already off.
TALK TO EXTERNAL (+) & (-) (pins 24 & 21)	This function is active when a module is set as a C/R or Studio Mic Input (DS1/DS3 switch 2 or 3 is set on). Can be activated while the module is on or off (when on, it mutes the bus audio), to talk to an External location.
TALK TO STUDIO (+) & (-) (pins 22 & 19)	This function is active when a module is set as a C/R or External Mic Input (DS1/DS3 switch 2 or 5 is set on). Can be activated while the module is on or off (when on, it mutes the bus audio), to talk to the Studio.
LOGIC SUPPLY +5VDC (pins 6, 10, 11, 12)	Module logic voltage output sources that can deliver up to 300 mA of current to isolated control panels. All pins are simply paralleled for convenience.
LOGIC GROUND (pins 1, 2, 3)	Module logic ground. Should be connected to isolated control panels only.



QUICK GUIDE TO THE TELCO/CODEC MODULE

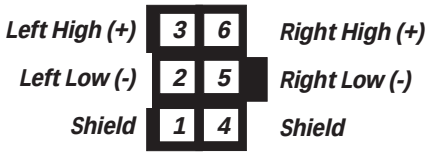
There are three connectors on the optional Telco module: one 6-pin analog audio input connector, one 3-pin digital audio input connector, and one 24-pin logic connector. The connectors are hidden by the meter panel in normal operation.



AUDIO

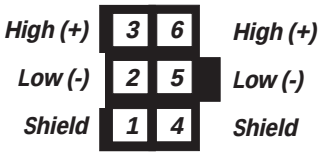
ANALOG INPUT — *The 6-pin analog input accepts line level stereo or mono signals. When a mono signal is connected, parallel the signal to the left and right input pins.*

Analog Inputs - Stereo



(wire insertion end view)

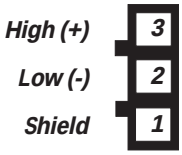
Analog Inputs - Mono



(wire insertion end view)

DIGITAL INPUT — *The 3-pin digital input accepts AES-3 (AES/EBU) or S/PDIF signals (when the circuit shown on page 2-11 is used).*

Digital Inputs

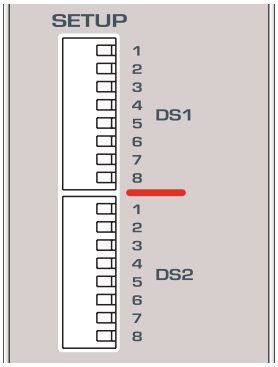


(wire insertion end view)

LOGIC

LOGIC I/O — *The 24-pin logic connector allows control of the connected device by the module, or external control of the module by the device. Logic settings are configured by the Setup DIP switches (see Switch Definitions on page 2-23). Additional logic information is on pages 2-24 and 2-25.*

TELCO MODULE SWITCHES



SETUP

DS1 / DS2 — *These 16 DIP switches set logic functionality for the module, per the Telco Module Switch Definitions table below.*

Telco / Codec Module Switch Definitions

	#	Switch Name	ON Function (set to the operator's left)	OFF Function (set to the operator's right)
DS1	1	Set Telco ID	On (sets the module as Telco / Codec #1) [1]	Off
	2	Set Telco ID	On (sets the module as Telco / Codec #2) [1]	Off
	3	Set Telco ID	On (sets the module as Telco / Codec #3) [1]	Off
	4	Set Telco ID	On (sets the module as Telco / Codec #4) [1]	Off
	5	Spare Switch		
	6	Spare Switch		
	7	Signal Source	Digital Input	Analog Input
	8	Timer Reset	Resets timer at module on	No timer reset
DS2	1	Off Lamp Control	Local (Off lamp follows module on/off status)	Ready (External device controls lamp)
	2	Fader Start/Stop	Fader movement, from full off, turns module on; to full off, turns module off.	Fader movement does not affect module on/off
	3	Sample Rate Converter (SRC)	Bypasses the internal SRC (use only when the console and all the audio sources are locked to an external reference) [2]	Uses internal SRC (normal setting)
	4	Spare Switch		
	5	Spare Switch		
	6	O/L & Record Source	Pre-fader with module off (if Meter Switcher switch 6 is set for Pre-Fader)	Post-fader regardless of module on/off
	7	Input Level	See DS2 table below	See DS2 table below
	8	Input Level	See DS2 table below	See DS2 table below

DS2 — Switches 7 and 8

These switches are used together to set the nominal input level. The factory default is both OFF.

7	8	Analog [3]	Digital [4]
Off	Off	+4dBu	0dB
Off	On	+6dBu	-6dB
On	Off	+8dBu	-12dB
On	On	-10dBV	-18dB

[1] Caution: Set only one of these four DIP switches to On. Each Telco module in the console MUST have a unique ID setting. This setting identifies the module, affecting both signal routing and module controls.
[2] Refer to page 2-11, Digital Clock Reference for details.
[3] The nominal analog input to achieve -20 FSD (equal to a +4 dBu output), with the fader set to the red reference line.
[4] The amount of gain reduction applied to the digital input.

TELCO MODULE — LOGIC I/O

There is one 24-pin logic connector on the Telco module to control the connected device.

To activate the remote inputs (On, Off, Cough, Talk to Caller) jumper pin 18 (Activate Logic Inputs) to +VDC on the remote device, or to pin 6 (Logic Supply +5VDC) when a remote panel is used.

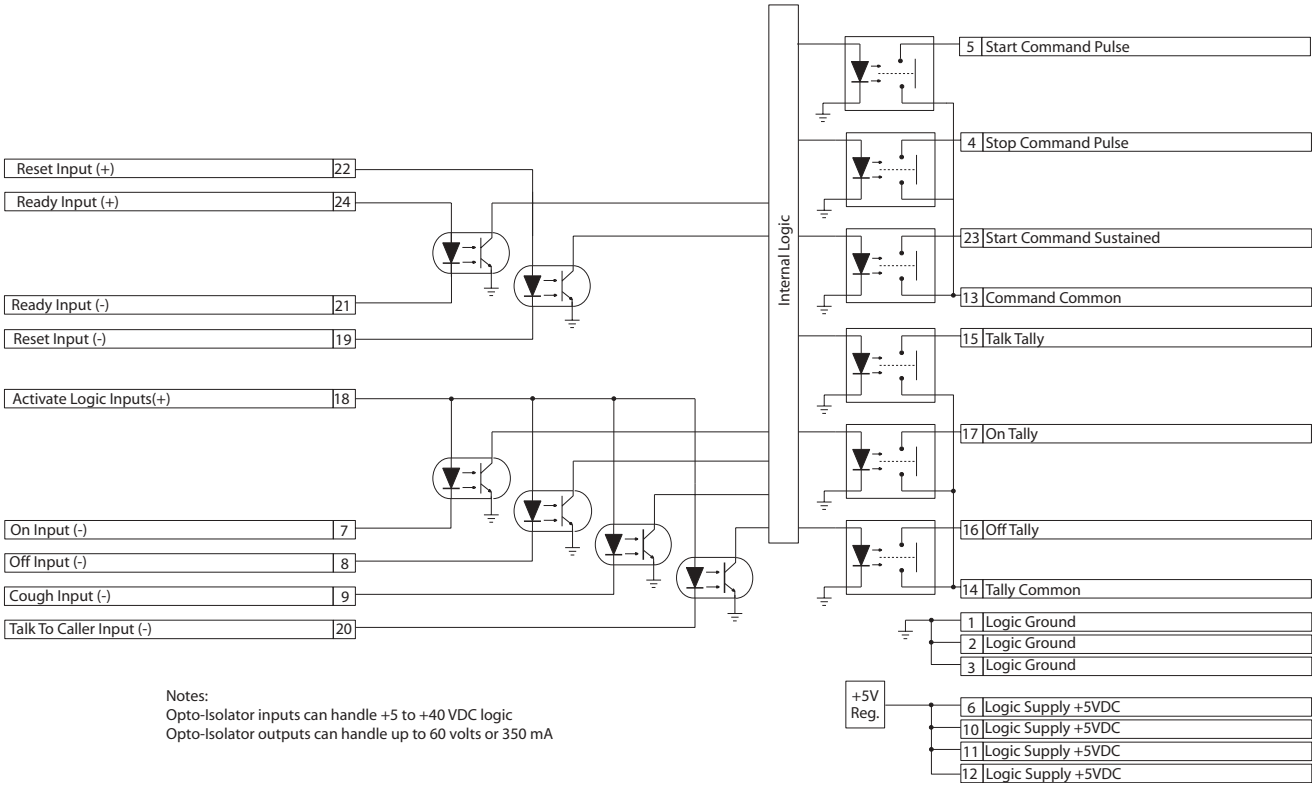
The Talk to Caller (-) logic input allows the board operator to talk to the caller. When this input is pulled low, the console-mounted talkback mic is sent to the left channel of the Mix-Minus output for this caller on the Output 1 module. The right channel mix-minus output is not affected by talkback.

Logic Connectors

Logic Supply +5VDC	12	24	*Ready (+)*
Logic Supply +5VDC	11	23	*Start Command Sustained*
Logic Supply +5VDC	10	22	*Reset (+)*
Cough (-)	9	21	*Ready (-)*
Off (-)	8	20	*Talk to Caller (-)*
On (-)	7	19	*Reset (-)*
Logic Supply +5VDC	6	18	*Activate Logic Inputs (+)*
Start Command Pulse	5	17	*On Tally*
Stop Command Pulse	4	16	*Off Tally*
Logic Ground	3	15	*Talk Tally*
Logic Ground	2	14	*Tally Common*
Logic Ground	1	13	*Command Common*

(wire insertion end view)

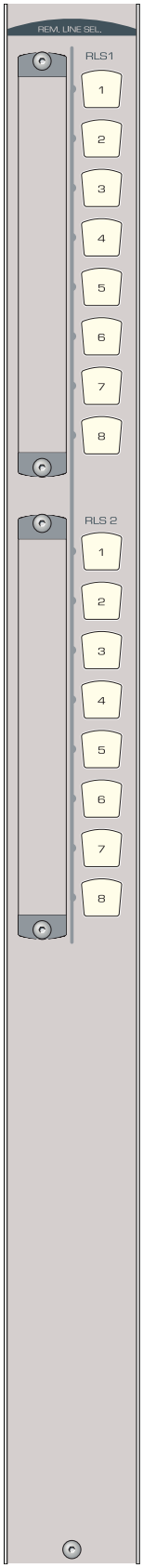
Telco Module, Logic I/O — Simplified Logic Diagram



Notes:
Opto-Isolator inputs can handle +5 to +40 VDC logic
Opto-Isolator outputs can handle up to 60 volts or 350 mA

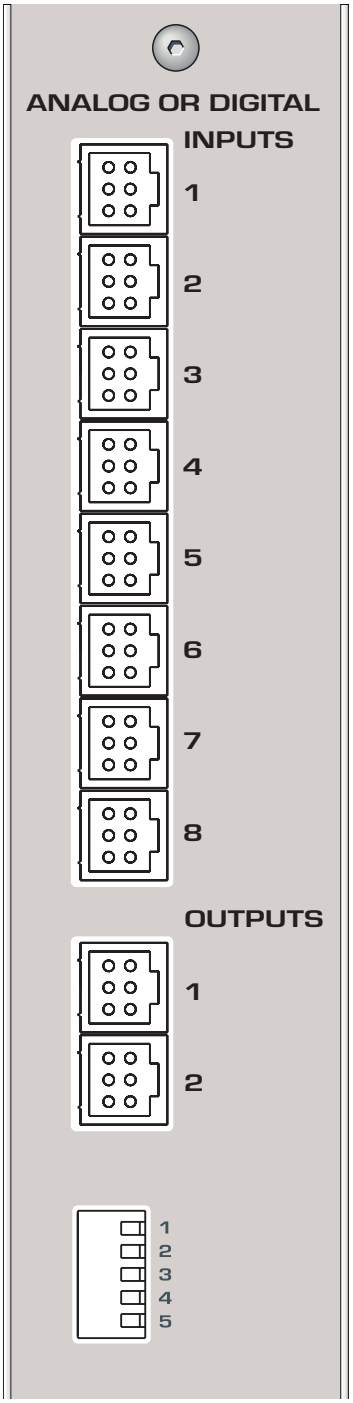
Telco/Codec Module, Logic I/O — Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
START COMMAND PULSE (pin 5)	Normally Open (N/O) contact output. A momentary "contact closure" of 220 ms to Command Common occurs when the module status changes to On from Off. Typically connects to the Remote Start logic input on the peripheral device.
STOP COMMAND PULSE (pin 4)	Normally Open (N/O) contact output. A momentary "contact closure" of 220 ms to Command Common occurs when the module status changes to Off from On. Typically connects to the Remote Stop or Pause logic input on the peripheral device.
START COMMAND SUSTAINED (pin 23)	Normally Open (N/O) contact output. A "contact closure" to Command Common occurs while the module is On. Typically connects to the Remote Start logic input on a peripheral device that cannot use pulses.
COMMAND COMMON (pin 13)	The Common (C) contact output for the Start and Stop commands. For an active high logic on the command outputs, connect Command Common to the logic supply voltage on the peripheral device. For an active low logic on the command outputs, connect this pin to logic ground on the peripheral device.
ACTIVATE LOGIC INPUTS (+) (pin 18)	Connecting +5 to +40 VDC to this input enables the active low external control inputs (On, Off, Cough, Talkback). If the control inputs are isolated from other devices (e.g., on a control panel), the +VDC can come from +5 Logic.
ON (-) (pin 7)	When pulled low, turns the module On from Off. Input is ignored if the module is already on.
OFF (-) (pin 8)	When pulled low, turns the module Off from On. Input is ignored if the module is already off.
COUGH (-) (pin 9)	When pulled low, the module audio is muted from all assigned buses.
TALK TO CALLER (-) (pin 20)	When pulled low, the console talkback mic audio is routed to the telco mix-minus output for this module.
TALLIES	The Tally outputs are N/O "dry contact" outputs. Typically used to drive indicator lamps or LEDs, the outputs can sink or source up to 60 volts or 350 mA. The "C" contact for all the tally outputs is Tally Common.
OFF TALLY (pin 16)	While the module is off, the Off Tally output connects to Tally Common—if Ready (DS1/DS3-1) is set to On. When DS1/DS3-1 is set to Off, then the Off Tally is controlled by the Ready input logic.
ON TALLY (pin 17)	While the module is on, the On Tally output connects to Tally Common.
TALK TALLY (pin 15)	While the Talk to Caller input is pulled low, the Talk Tally output connects to Tally Common.
TALLY COMMON (pin 14)	The "C" relay contact for the Off, On, and Talk tallies. Typically, the tally lamps/LEDs are tied together to ground and Tally Common connects to the lamp supply voltage (up to 60 volts). If the tallies use +6.3 volt, 40 mA lamps, and are isolated from peripheral devices (as in a remote mic control panel), then the Tally Common can come from Logic Supply +5 Logic.
READY (+) & (-) **RESET (+) & (-)**	These complementary logic inputs require +5 to +40 VDC between the (+) input and the (-) input for activation. This can be done by connecting an active high logic to the (+) input and grounding the (-) input, or by supplying +5 to +40 VDC to the (+) input and an active low logic to the (-) input.
READY (-) & (+) (pins 21 & 24)	When activated while the module is on, the module turns off without generating a stop pulse. While the module is off, the Ready logic controls the Off LED to indicate device status. Typically, LED off indicates the peripheral is not ready to play, LED on indicates the device is ready, and a flashing LED indicates the device has already played or has not been cued up.
RESET (-) & (+) (pins 19 & 22)	When activated while the module is on, turns the module off without generating a stop pulse. Input is ignored if the module is already off.
LOGIC SUPPLY +5VDC (pins 6, 10, 11, 12)	Module logic voltage output source that can deliver up to 300 mA of current.
LOGIC GROUND (pins 1, 2, 3)	Module logic ground.



QUICK GUIDE TO THE REMOTE LINE SELECTOR (RLS) MODULE

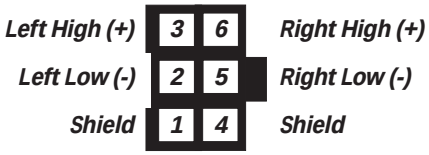
There are ten connectors on each optional Remote Line Selector (RLS) module: eight 6-pin audio input connectors and two 6-pin audio output connectors. All connectors are set for either analog or digital signals. The connectors are hidden by the meter panel in normal operation.



ANALOG OR DIGITAL INPUTS

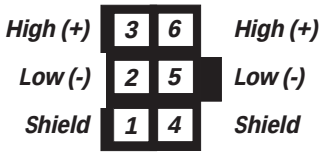
1 - 8 — *The 6-pin input connectors can accept either all analog (stereo or mono) signals or all digital AES-3 (AES/EBU) compatible signals (signal type set using a module DIP switch). When an analog mono input is connected, parallel the signal to both the left and right inputs. For a digital input, connect the AES-3 signal to pins 1, 2, and 3 only.*

Analog Inputs - Stereo



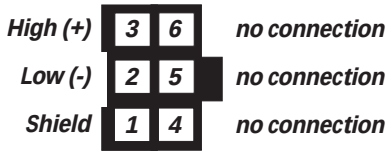
(wire insertion end view)

Analog Inputs - Mono



(wire insertion end view)

Digital Inputs/Outputs

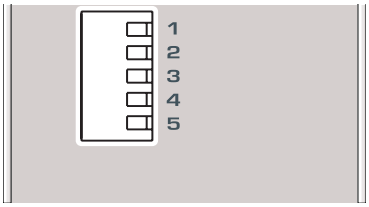


(wire insertion end view)

OUTPUTS

1 & 2 — *The 6-pin outputs are either both analog or both digital (signal type set using a module DIP switch).*

REMOTE LINE SELECTOR (RLS) MODULE SWITCHES

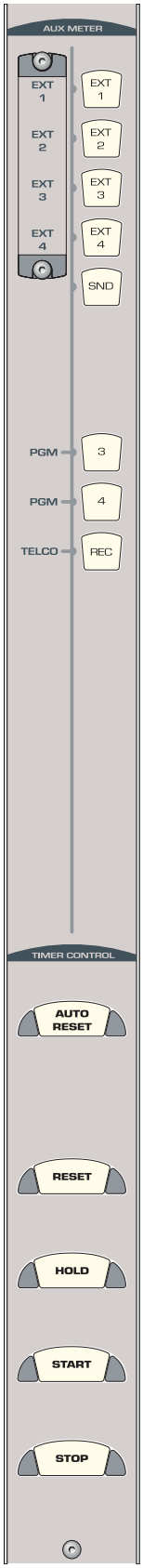


SETUP

1 - 5 — *DIP switch 1 sets the module for either analog or digital operation. The default setting is off (analog). The other switches are not used.*

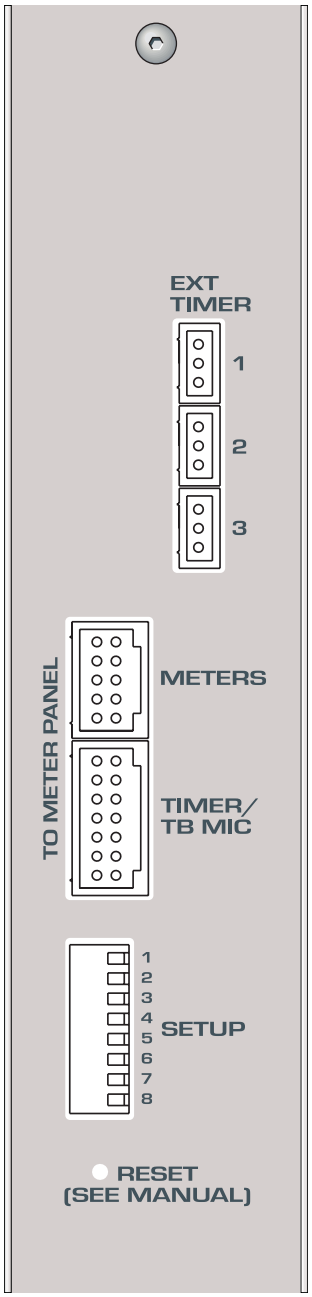
Remote Line Selector (RLS) Module Switch Definitions

#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
1	Signal Source	Digital	Analog
2	Spare Switch		
3	Spare Switch		
4	Spare Switch		
5	Spare Switch		



QUICK GUIDE TO THE METER SWITCHER MODULE

There are three user connections—3-pin external timer logic connectors, on the Meter Switcher. The two To Meter Panel connectors are factory connected. All connectors are hidden by the meter panel in normal operation.



EXT TIMER

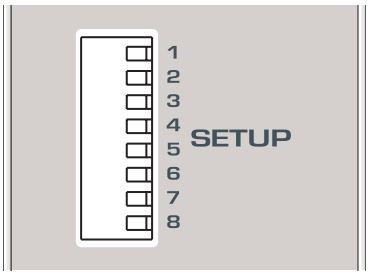
1, 2, 3 — *Each 3-pin External Timer connector can be used to reset an external digital timer. For pinout, see page 2-30.*

TO METER PANEL

METERS — *Factory harnessed connector for the digital signal meters.*

TIMER/TB MIC — *Factory harnessed connector for the digital timer and the console talkback microphone.*

METER SWITCHER MODULE SWITCHES



SETUP

1 - 8 — *These eight DIP switches affect various logic settings for the console per the Meter Switcher Module Switch Definitions table below.*

Meter Switcher Module Switch Definitions

#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
1	Spare Switch		
2	Spare Switch		
3	Cancel Cue at Module On	Cue function for that channel is turned off when the module is turned On	Cue is not affected when the module is turned On
4	Cue LED Blink	Cue LED blinks while Cue is on	Cue LED is solid while Cue is on
5	Spare Switch		
6	Off-Line Signal Level	The Off-Line audio feed level is controlled by the fader (post-fader)	The Off-Line audio feed is not affected by the module fader (pre-fader)
7	Spare Switch		
8	Spare Switch		

CONSOLE RESET

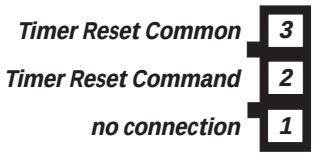
RESET

(SEE MANUAL) — *This push-button switch resets the installed input and monitor modules to their factory default settings without powering down the console. Typically, this switch is used only for test purposes since it does not reset the DSP cards.*

METER SWITCHER MODULE — EXTERNAL TIMER

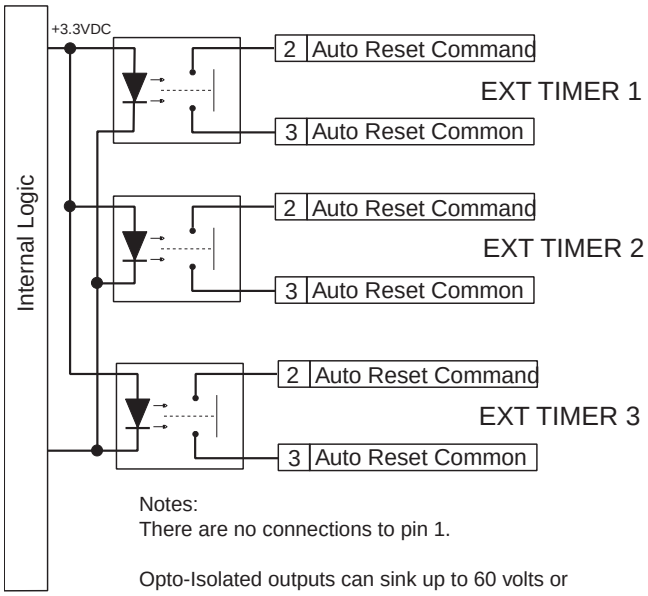
The three 3-pin external timer connectors have identical signals and connector pin outs. They function in parallel with the console timer, although only the auto reset command is active (e.g., external timer reset is only triggered by a module timer reset command).

Logic Connectors



(wire insertion end view)

Meter Switcher Module, External Timer — Simplified Logic Diagram



Notes:
There are no connections to pin 1.

Opto-Isolated outputs can sink up to 60 volts or 350 mA max. current flow.

Meter Switcher Module, External Timer — Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
TIMER RESET COMMAND (pin 2)	A module timer reset command shorts this pin to Pin 3.
TIMER RESET COMMON (pin 3)	A module timer reset command shorts this pin to Pin 2.

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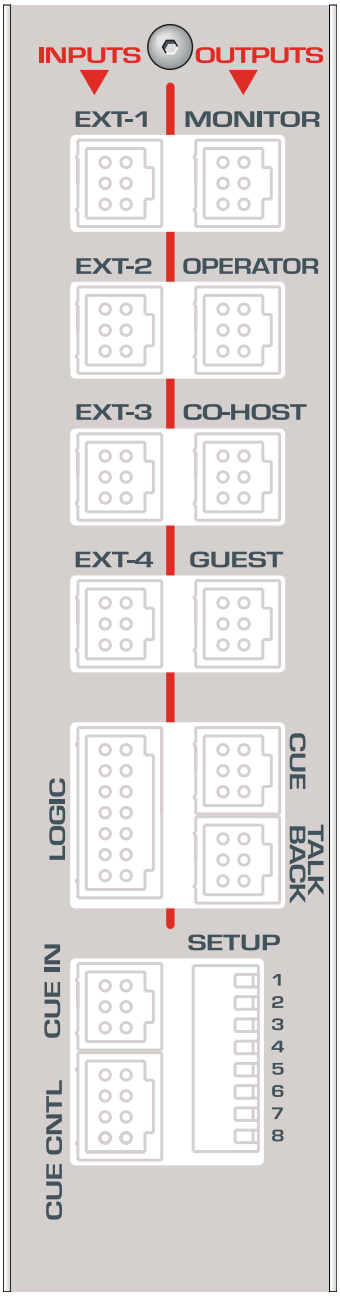
QUICK GUIDE TO THE CONTROL ROOM MODULE

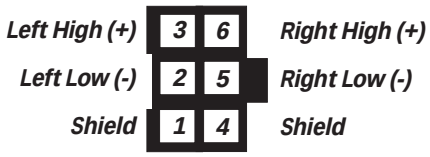
There are thirteen connectors on the Control Room module: five 6-pin analog audio input connectors, six 6-pin analog audio output connectors, one 14-pin logic connector, and one 8-pin logic connector. The connectors are hidden by the meter panel in normal operation.



INPUTS

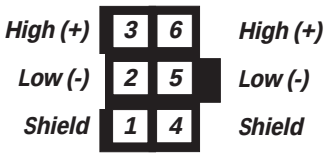
EXT-1, EXT-2, EXT-3, EXT-4, CUE IN — *The 6-pin analog inputs accept stereo signals or mono signals from up to four external sources and a cue source. When a mono signal is connected, parallel the signal to the left and right input pins.*

Analog Inputs - Stereo



(wire insertion end view)

Analog Inputs - Mono

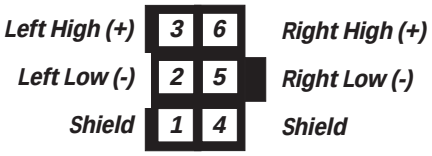


(wire insertion end view)

OUTPUTS

MONITOR, OPERATOR, CO-HOST, GUEST, CUE, TALKBACK — *The 6-pin balanced stereo analog outputs are wired using the standard pinout sequence.*

Analog Outputs



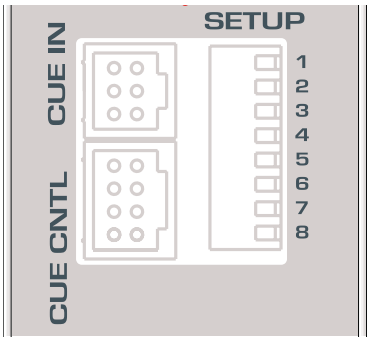
(wire insertion end view)

LOGIC

LOGIC — *This 14-pin connector has the warning light control output, remote inputs for C/R mute and dim, and control outputs for talkback, mute, and dim indicators. For more information, see pages 2-34 & 2-35.*

CUE CNTL — *This 8-pin connector has an external cue control input. For more information, see page 2-36.*

CONTROL ROOM MODULE SWITCHES



SETUP

SETUP — *These eight DIP switches affect logic functionality for the module per the Control Room Module Switch Definitions below.*

Control Room Module Switch Definitions

#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
1	Operator Headphone AutoCue function	Cue feeds left channel, monitor feeds right, while Cue is active and AutoCue is On	Stereo Cue is fed to Operator output while Cue is active and AutoCue is On.
2	Talkback into Co-Host Headphone	Talkback to C/R also fed to the Co-Host headphone output	Does not route talkback to C/R to the Co-Host headphone output
3	Talkback into Cue	Talkback to C/R is added to the Cue output	Talkback to C/R does not feed the Cue output (only feeds Talkback output)
4	Dim Monitors when Receiving Talkback	Dims monitors by 12 dB when receiving Talk to C/R signal	Does not dim monitors when receiving Talk to C/R signal
5	Auto-switch External Inputs 1 & 2 *	Performs automatic switching from Ext. Input 1 to Ext. Input 2 while there is a live mic in the Control Room	Does not perform automatic switching
6	Auto-switch External Inputs 3 & 4 *	Performs automatic switching from Ext. Input 3 to Ext. Input 4 while there is a live mic in the Control Room	Does not perform automatic switching
7	Spare Switch		
8	Spare Switch		

** Switch 5 (or 6), when set to On, automatically switches the Operator, Co-Host, and Guest headphone outputs between an air monitor signal on External Input 1 (or External Input 3), which has an objectionably long propagation delay, with a synthetic air signal (with relatively little delay) connected to External Input 2 (or External Input 4). Note that to do this the monitor source must be set to External Input 1 (or External 3).*

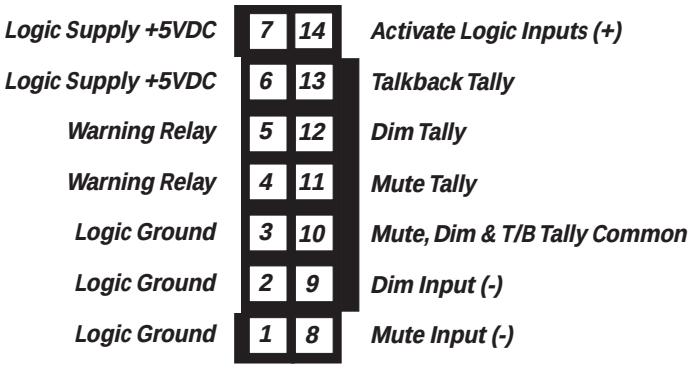
CONTROL ROOM MODULE — LOGIC

The 14-pin Logic connector has the warning light output "relay," the remote mute and dim control inputs, and three indicator outputs (talkback, dim, mute).

Pins 4 and 5 offer an isolated contact pair for triggering an external warning lamp interface.

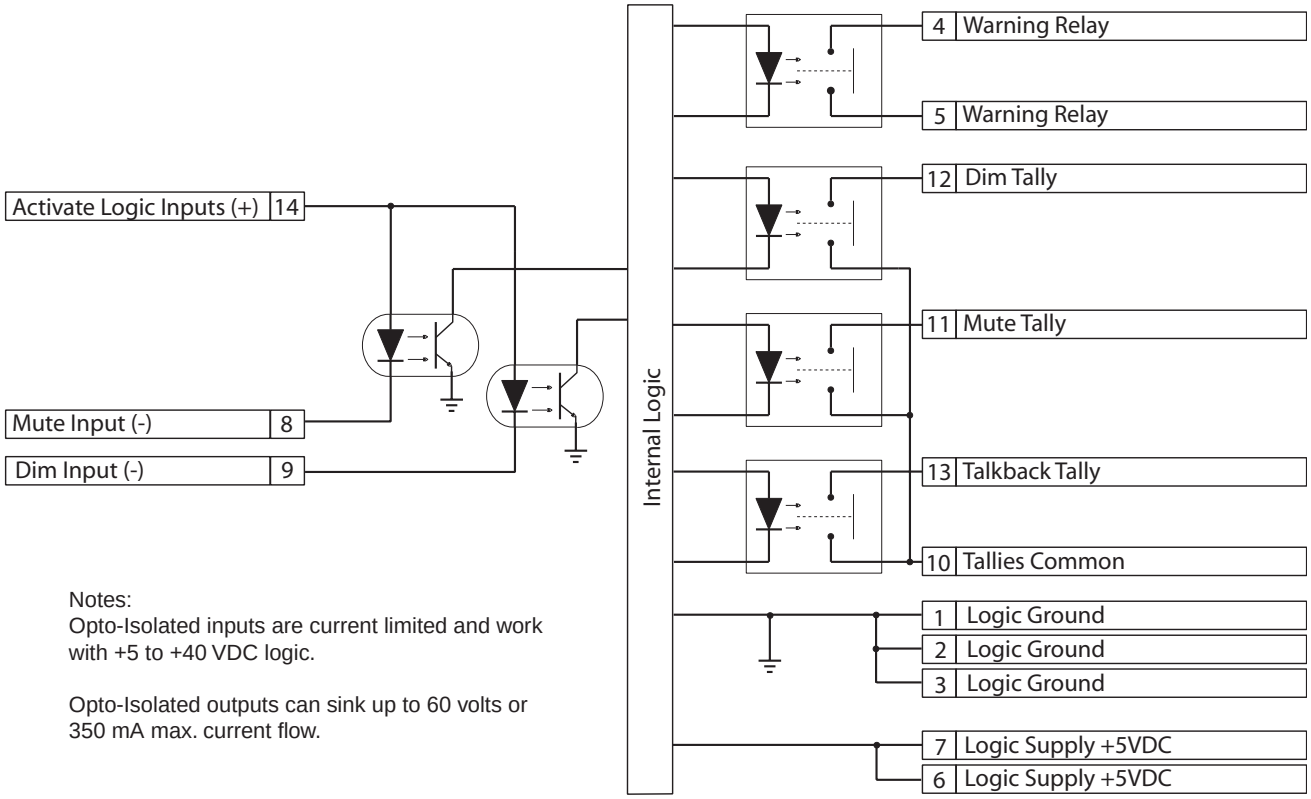
To use the remote inputs (Dim, on pin 9; Mute on pin 8), pin 14 (Activate Logic Inputs) must be tied to Logic Supply +5VDC (pin 6 or 7), or if an external device rather than a switch is activating these inputs, then this voltage should come from the external device to keep the console isolated.

Logic Connectors



(wire insertion end view)

Control Room Module, Logic — Simplified Logic Diagram



Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

Opto-Isolated outputs can sink up to 60 volts or 350 mA max. current flow.

Control Room Module, Logic — Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
TALKBACK TALLY (pin 13)	Normally Open (N/O) contact output. A contact closure is generated while there is talkback to the Control Room. The Common (C) contact is the Mute, Dim & T/B Tally Common output.
WARNING RELAY (pins 4 and 5)	Isolated, Normally Open (N/O) and Common (C) contact outputs. A "contact closure" is generated anytime a Control Room mic module is On-Air (assigned to any Program bus and turned On) or an External Mute command is being received.
ACTIVATE LOGIC INPUTS (+) (pin 14)	Connecting +5 to +40 VDC to this input enables the active low external control inputs Mute and Dim. If the inputs are isolated (e.g., on a remote control panel), the +VDC can come from Logic Supply +5VDC.
MUTE INPUT (-) (pin 8)	Mutes the Control Room monitors and triggers the Warning Relay when pulled low.
DIM INPUT (-) (pin 9)	Dims the Control Room monitors by 12 dB when pulled low.
MUTE TALLY (pin 11)	Normally Open (N/O) contact output. A contact closure is generated anytime a Control Room mic module is On-Air (assigned to any Program bus and turned On), a possible mic feedback condition exists, or an External Mute is received. The Common (C) contact is the Mute, Dim & T/B Tally Common output.
DIM TALLY (pin 12)	Normally Open (N/O) contact output. A contact closure is generated whenever the C/R monitors are dimmed by talkback or by an external Dim command. The Common (C) contact is the Mute, Dim & T/B Tally Common output.
MUTE, DIM & T/B TALLY COMMON (pin 10)	The Common (C) contact output for the Mute, Dim, and Talkback tally outputs. When the tallies are all wired together to ground, this pin ties to a supply voltage. If all the tallies are tied to a supply voltage then this pin is tied to a ground. When the tallies are isolated (e.g., on a remote panel) and consist of 5 volt LEDs or 6.3 volt/50 to 100 mA lamps, then the tallies are tied to Logic Ground and this pin is jumpered to Logic Supply +5VDC.
LOGIC SUPPLY +5VDC (pins 6 and 7)	Module logic voltage output source that can deliver up to 300 mA of current. The pins are simply paralleled for convenience.
LOGIC GROUND (pins 1, 2, 3)	Module logic ground. Use only on isolated ground devices like a control panel.

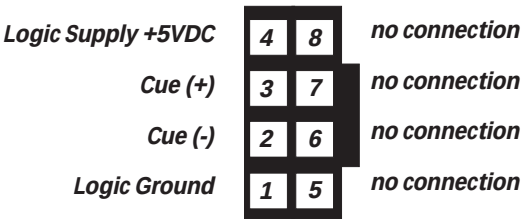
CONTROL ROOM MODULE — CUE CNTL

This 8-pin connector controls whether the External Cue audio input feeds the Cue bus.

To route the External Cue audio to Cue using a remote panel, jumper pin 3 (Cue +) to pin 4 (Logic Supply +5VDC). Connect a single pole switch to Pin 2 (Cue -) and pin 1 (Logic Ground).

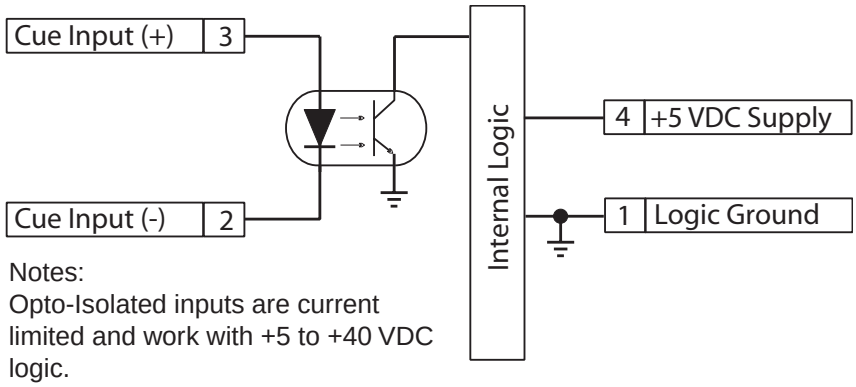
If an external device (like a Digital Delivery System) is used to trigger the External Cue, do not connect to pins 1 and 4. All logic voltages and ground must come from the external device. For low logic, connect the logic signal to pin 2 and a voltage source to pin 3. For high logic, connect the logic signal to pin 3 and tie pin 2 to logic ground.

Logic Connectors



(wire insertion end view)

Control Room Module, Cue Control — Simplified Logic Diagram



Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

Control Room Module, Cue Control — Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
CUE INPUT (+) & (-) (pins 3 & 2)	When activated, adds the External Cue input to the Cue bus. These complementary logic inputs require +5 to +40 VDC on the (+) input and ground on the (-) input for activation. This can be done by connecting an active high logic to the (+) input and grounding the (-) input, or by supplying +5 to +40 VDC to the (+) input and an active low logic to the (-) input.
LOGIC SUPPLY +5VDC (pin 4)	Module logic voltage output source that can deliver up to 300 mA of current. Use only on isolated ground devices like a control panel.
LOGIC GROUND (pin 1)	Module logic ground. Use only on isolated ground devices like a control panel.

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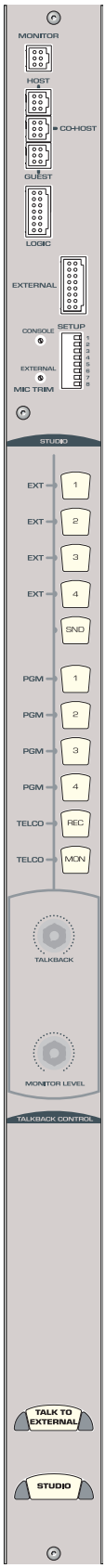
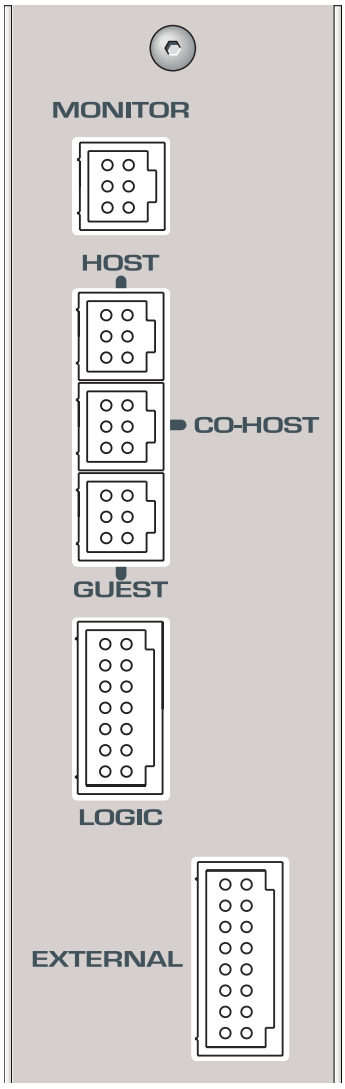


QUICK GUIDE TO THE STUDIO MODULE

Six connectors are on the optional Studio module: four 6-pin analog audio output connectors, one 14-pin studio logic connector, and one 16-pin external logic connector. All audio outputs have the same audio source(s), selected using the eleven Studio source selector buttons. All connectors are hidden by the meter panel in normal operation.

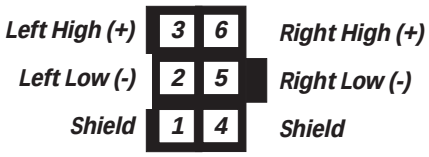


AUDIO OUTPUTS

MONITOR — *This 6-pin analog output connects to the amplifier for the studio or voice booth speakers. Its output level is controlled by the MONITOR LEVEL control on the module, or by a Studio Monitor Panel, PRE99-1190 with a Dual Fader Panel, PRE99-1192. The output is wired using the standard pinout sequence shown below.*

HOST, CO-HOST, GUEST — *These 6-pin analog outputs send audio to the headphone amplifiers for the Host, Co-Host, and/or Guest in a studio or voice booth. The Host output also has Talk to Studio audio, whereas the Guest output only has the selected Studio Monitor source audio. The Co-Host output can follow the Host output or be set to only output Talk to Studio audio (SETUP switch 5 determines this setting). The outputs are wired using the standard pinout sequence shown below.*

Analog Outputs



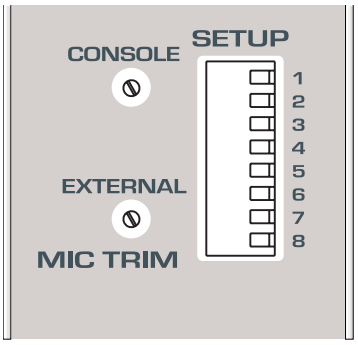
(wire insertion end view)

LOGIC

LOGIC — *This 14-pin connector has the control output for the studio warning light interface and remote logic inputs for studio monitor dimming and muting. See pages 2-40 & 2-41 for details.*

EXTERNAL — *This 16-pin connector has the talkback controls allowing an external location to talk to the control room and to the studio. It also has the talkback audio, both to and from the external site. Pages 2-42 to 2-45 detail the various functions.*

STUDIO MODULE SWITCHES AND MIC TRIMS



SETUP

SETUP — *These eight DIP switches affect logic settings for the module per the Switch Definitions table below.*

MIC TRIM

CONSOLE — *Sets the level of the console talkback mic into the Talk to Studio and Talk to External outputs.*

EXTERNAL — *Sets the level of the External location talkback mic into the Control Room and Studio talkback outputs.*

Studio Module Switch Definitions

#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
1	Auto-switch External 1 & 2 [1]	Performs automatic switching from Ext. Input 1 to Ext. Input 2 while there is a live mic in the Studio or voice booth	Does not perform automatic switching
2	Auto-switch External 3 & 4 [1]	Performs automatic switching from Ext. Input 3 to Ext. Input 4 while there is a live mic in the Studio or voice booth	Does not perform automatic switching
3	Spare switch		
4	Spare switch		
5	Co-Host receives talkback only	The Co-Host output has Talk to Studio audio only, muting the selector audio	Co-Host output has the same signals as the Host output
6	Spare switch		
7	External mute/dim enable [2]	External logic connector pins 4 and 5 function as the logic outputs External Mute and External Dim (used with an external control device)	External logic connector pins 4 and 5 function as Talk to Studio and Talk to Studio Host logic inputs
8	Spare Switch		

[1] Switch 1 (or 2), when set to On, automatically switches the Host, Co-Host, and Guest headphone outputs between an air monitor signal on External Input 1 (or External Input 3), which has an objectionably long propagation delay, with a synthetic air signal (with relatively little delay) connected to External Input 2 (or External Input 4). Note that to do this the Studio Monitor source must be set to External Input 1 (or External 3).

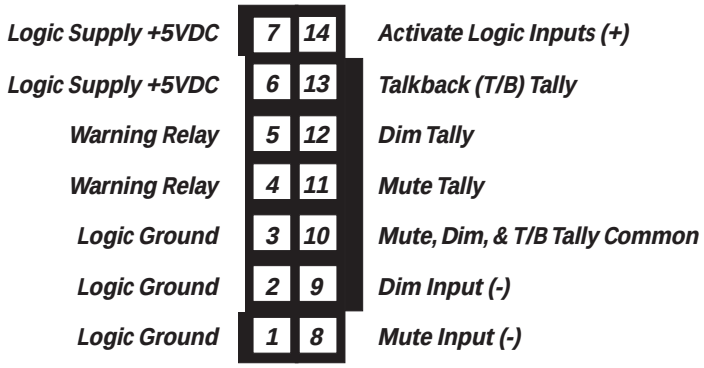
[2] Typically switch 7 is set to On only when a talent microphone (connected to an input module on the console) is at the External location. In this case talkback control is done through the module logic connector. With no talent mic at the External location, set the switch to Off. In this case a talkback mic is connected to the External connector pins along with a talkback control panel.

STUDIO MODULE — LOGIC

This 14-pin connector has outputs for controlling the studio warning lamp interface and for lighting tallies when Dim, Mute, or talkback are active. There are also remote mute and dim inputs on the connector.

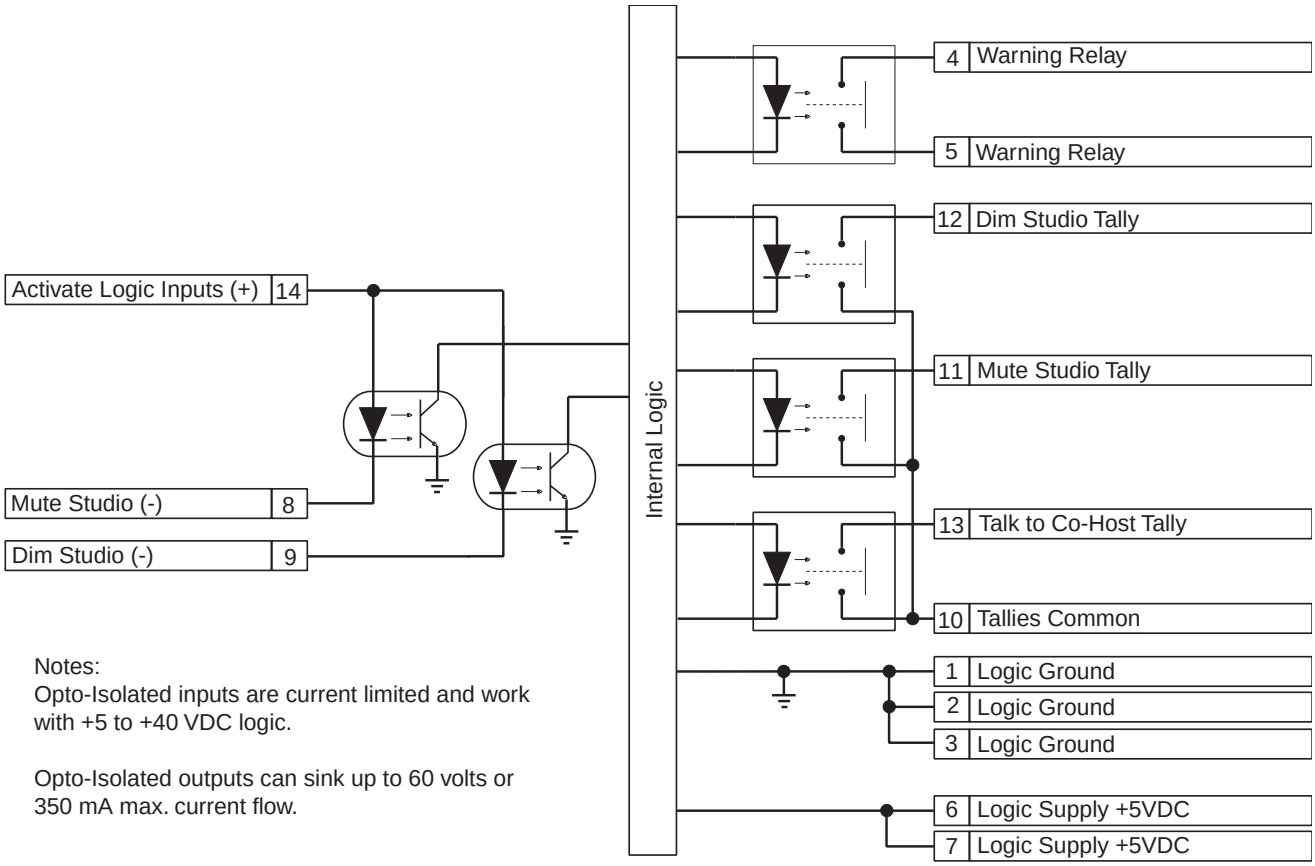
To activate the Remote Studio Dim (Pin 9) and Remote Studio Mute (Pin 8) inputs, Pin 14 (Activate Logic Inputs) must be jumpered to +5 to +40 volts. This voltage is normally supplied from an external device when mute or dim are actively controlled. If simple switches are controlling the mute or dim then +5 VDC can be supplied by Pin 7

Logic Connectors



(wire insertion end view)

Studio Module, Logic — Simplified Logic Diagram



Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

Opto-Isolated outputs can sink up to 60 volts or 350 mA max. current flow.

Studio Module, Logic — Signal Definitions

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
WARNING RELAY (pins 4 and 5)	Normally Open (N/O) and Common (C) contact outputs. A contact closure is maintained while the studio/voice booth has a live mic (as determined by the settings of input modules DIP switches DS1/DS3-3, Studio Mute).
ACTIVATE LOGIC INPUTS (+) (pin 14)	Connecting +5 to +40 VDC to this input enables the active low control inputs, Mute and Dim. If the control logic comes from an isolated device (e.g., a remote control panel), the +VDC can come from Logic Supply +5VDC.
MUTE INPUT (-) (pin 8)	When this pin is pulled low, the Studio monitor speakers are muted and the Studio Warning relay is activated.
DIM INPUT (-) (pin 9)	When this pin is pulled low, the Studio monitor speakers are dimmed by 12 dB
TALKBACK TALLY (pin 13)	Normally Open (N/O) contact output. A contact closure is generated while the Studio or Host is receiving talkback. The Common (C) relay contact is the Mute, Dim & T/B Tally Common output.
MUTE TALLY (pin 11)	Normally Open (N/O) contact output. A contact closure is generated any time the studio monitor speakers are muted. The Common (C) relay contact is the Mute, Dim & T/B Tally Common output.
DIM TALLY (pin 12)	Normally Open (N/O) contact output. A contact closure is generated any time the studio monitor speakers are being dimmed. The Common (C) relay contact is the Mute, Dim & T/B Tally Common output.
MUTE, DIM, & T/B TALLY COMMON (pin 10)	The Common (C) contact output for the Mute, Dim, and Talkback tallies. Tie this pin to + voltage when the tallies are tied together to ground. Tie this pin to ground if the tallies are commoned together to a voltage source. When the tallies are on an isolated panel, this pin can jumper to Logic Supply +5VDC or to Logic Ground.
LOGIC SUPPLY +5VDC (pins 6 and 7)	Logic voltage outputs that can deliver up to 300 mA of current to isolated control panels. All pins are simply paralleled for convenience.
LOGIC GROUND (pins 1, 2, 3)	Module logic ground. Should be connected to isolated control panels only.

STUDIO MODULE — EXTERNAL (WITH DIP SWITCH 7 SET TO OFF)

This configuration (DIP switch 7 set to Off) is used in applications where the External location does not have a talent mic connected to a console input, but is a location that needs to talk to the control room and studio. This requires that a dynamic microphone be connected to Talk From External audio (pins 1, 2, 9) and a powered monitor speaker be connected to Talk to External audio (pins 3, 10, 11).

A custom talkback panel would connect press to talk switches to the Talk to C/R, Talk to Studio, and Talk to Studio Host inputs (pins 14, 4, and 5). The common side of the switches connect to Logic Ground (pin 16). Jumper pin 15 to pin 7 to activate these inputs.

Talk to External tally (pin 6) can be used to light a talk tally. The common connection is Logic Ground (pin 16).

See pages 2-44 & 2-45 for details on the functions with DIP switch 7 set to On.

Signals with DIP Switch 7 Set to Off

(wire insertion end view)

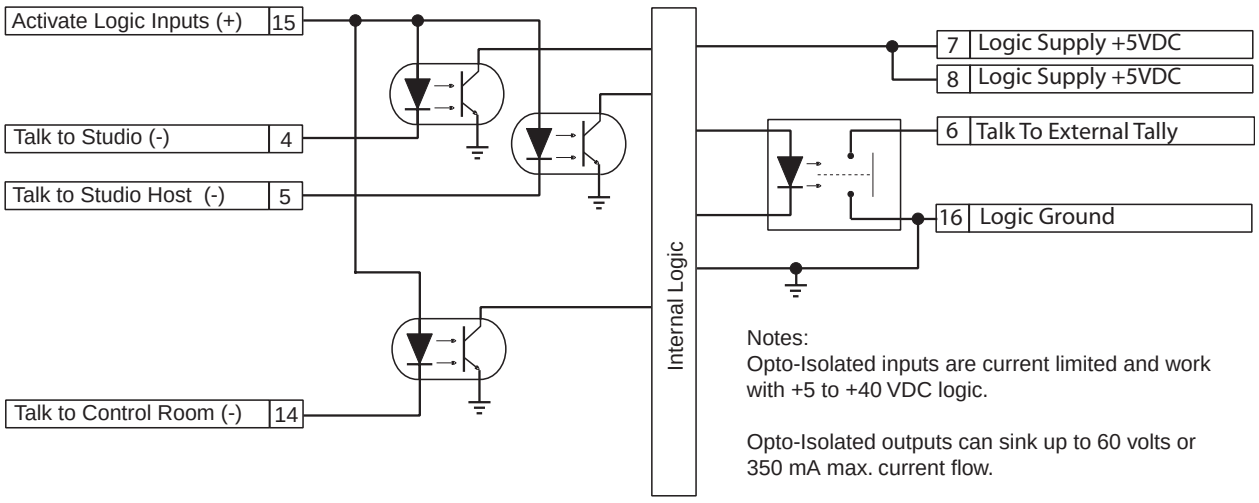
Logic Supply +5VDC	8	16	*Logic Ground*
Logic Supply +5VDC	7	15	*Activate Logic Inputs (+)*
Talk to Ext. Tally	6	14	*Talk to Control Room (-)*
*Talk to Studio Host (-) **	5	13	*no connection*
*Talk to Studio (-) **	4	12	*no connection*
Talk to Ext. Audio (low)	3	11	*Talk to Ext. Audio (high)*
Talk from Ext. Audio Shield	2	10	*Talk to Ext. Audio Shield*
Talk from Ext. Audio (low)	1	9	*Talk from Ext. Audio (high)*

* *Pin function only when DIP switch 7 is set to Off*

Audio Connections

Talk Audio to External (pins 3,10,11)
Talk Audio From External (pins 1, 2, 9)

Studio Module, External (DIP Switch 7 Off) — Simplified Logic Diagram



Studio Module, External — Signal Definitions *(with DIP Switch 7 set to Off)*

PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
LOGIC CONNECTIONS:	
TALK TO STUDIO HOST (-) (pin 5) *	When pulled low, the Talk From External audio is routed to the Studio Host output.
TALK TO STUDIO (-) (pin 4) *	When pulled low the Talk From External audio is routed to the Studio monitor and Host outputs.
TALK TO CONTROL ROOM (-) (pin 14)	When pulled low the Talk From External audio is routed to the Control Room talkback bus.
TALK TO EXTERNAL TALLY (pin 6)	Normally Open (N/O) contact output. A contact closure to Logic Ground is generated while the External site is receiving Talk To External talkback audio.
ACTIVATE LOGIC INPUTS (+) (pin 15)	When pulled to +5 to +40 volts, enables the three Talk switch inputs (Talk to C/R, Studio, and Studio Host). When tied to an isolated device like a remote panel, the Logic Supply +5VDC can be used (jumper pin 7 or 8 to pin 15).
LOGIC SUPPLY +5VDC (pins 7 & 8)	Module logic voltage output sources that can deliver up to 300 mA of current to isolated control panels. All pins are simply paralleled for convenience.
LOGIC GROUND (pin 16)	Module logic ground. Should be connected to isolated control panels only.
AUDIO CONNECTIONS:	
TALKBACK AUDIO TO EXTERNAL, SHIELD (pin 10)	Shields the talkback audio going to the External location.
TALKBACK AUDIO TO EXTERNAL, (LOW) & (HIGH) (pins 3 & 11)	Balanced audio (differential pair) connections for the Talkback audio going to an External location.
TALKBACK AUDIO FROM EXTERNAL, SHIELD (pin 2)	Shields the talkback audio coming from an External location.
TALKBACK AUDIO FROM EXTERNAL, (LOW) & (HIGH) (pins 1 & 9)	Balanced audio (differential pair) connections for the External location dynamic talkback mic.

* This pin functions differently when DIP switch 7 is set to On (see pages 2-44 and 2-45).

STUDIO MODULE — EXTERNAL (WITH DIP SWITCH 7 SET TO ON)

This configuration (DIP switch 7 set to On) is used in applications where the External location has a talent mic connected to a console input.

As such, the Talk to logic (Talk to C/R and Talk to Studio) is connected to the input module logic (see pages 2-20 & 2-21). Pins 4 and 5 can then be used as the logic outputs Dim (activated when another location talks to External) and Mute (activated when the External mic module is on). These are available to drive an outboard mute/dim controller for an External monitor speaker.

Typically the Talk from External audio and Talk to Control Room logic is not used in this application.

See pages 2-42 & 2-43 for the functions when DIP switch 7 is set to Off.

Signals with DIP Switch 7 Set to On

(wire insertion end view)

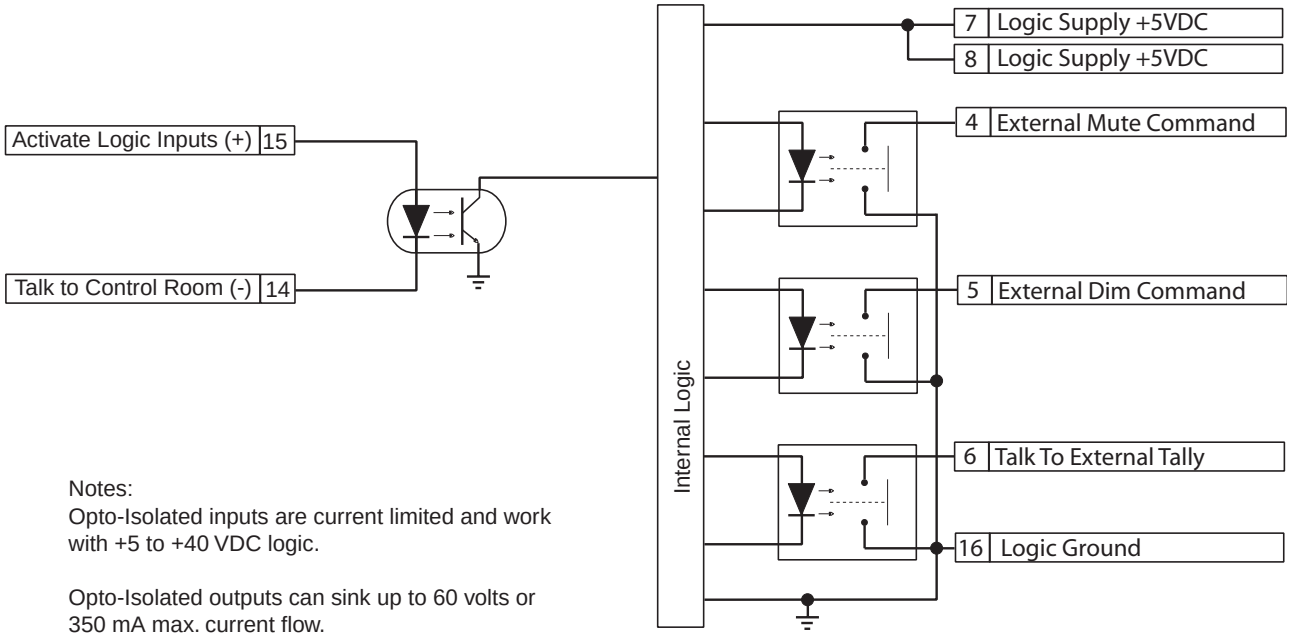
Logic Supply +5VDC	8	16	*Logic Ground*
Logic Supply +5VDC	7	15	*Activate Logic Input (+)*
Talk to External Tally	6	14	*Talk to Control Room (-)*
*Dim Command (N/O)**	5	13	*no connection*
*Mute Command (N/O) **	4	12	*no connection*
Talk to Ext. Audio (Low)	3	11	*Talk to Ext. Audio (High)*
Talk from Ext. Audio Shield	2	10	*Talk to Ext. Audio Shield*
Talk from Ext. Audio (Low)	1	9	*Talk from Ext. Audio (High)*

* *Pin function only when DIP switch 7 is set to On*

Audio Connections

Talk Audio to External (pins 3,10,11)
Talk Audio From External (pins 1, 2, 9)

Studio Module, External (with DIP Switch 7 On) — Simplified Logic Diagram



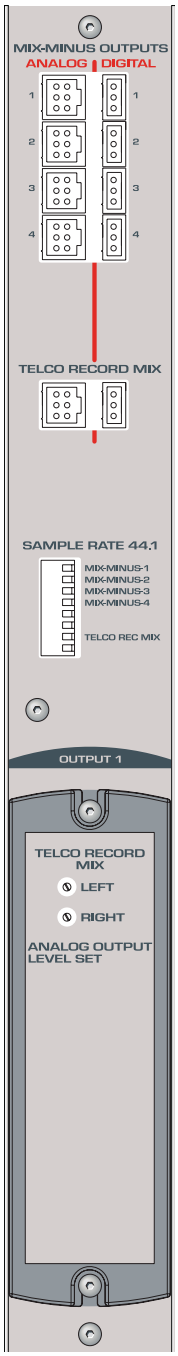
Notes:
Opto-Isolated inputs are current limited and work with +5 to +40 VDC logic.

Opto-Isolated outputs can sink up to 60 volts or 350 mA max. current flow.

Studio Module, External — Signal Definitions *(with DIP Switch 7 set to On)*

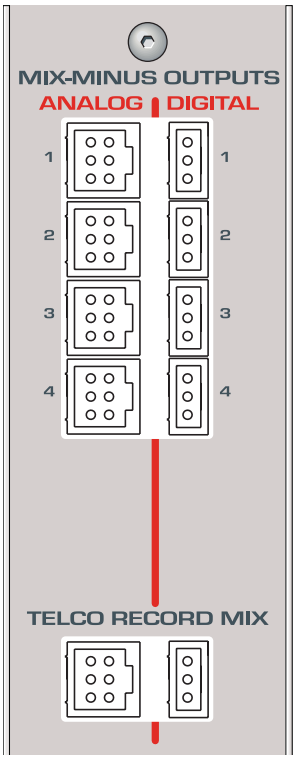
PIN NAME/NUMBER	*FUNCTIONAL DESCRIPTION OF CONNECTION*
LOGIC CONNECTIONS:	
EXTERNAL DIM COMMAND (pin 5) *	Normally Open (N/O) contact output. A contact closure to Logic Ground (pin 16) occurs while the External site receives Talk to External in order to dim the monitor speakers using an external device.
EXTERNAL MUTE COMMAND / RELAY (pin 4) *	Normally Open (N/O) contact output. A contact closure to Logic Ground (pin 16) occurs when an External microphone is turned on in order to mute the monitor speakers using an external device.
TALK TO CONTROL ROOM (-) (pin 14)	When pulled low, routes the Talk From External audio input to the Control Room talkback bus. Typically not used in this application since Talk to C/R is done through the External's Mic module.
TALK TO EXTERNAL TALLY (pin 6)	Normally Open (N/O) contact output. A contact closure to Logic Ground (pin 16) occurs while the External site is receiving Talk To External talkback audio.
ACTIVATE LOGIC INPUTS (+) (pin 15)	To enable the control input Talk to C/R, tie this pin to + logic voltage (+5 to +40). Typically not used in this application.
LOGIC SUPPLY +5VDC (pins 7 & 8)	Module logic voltage output sources that can deliver up to 300 mA of current to isolated control panels. All pins are simply paralleled for convenience.
LOGIC GROUND (pin 16)	Module logic ground. Should be connected to isolated control panels only.
AUDIO CONNECTIONS:	
TALKBACK AUDIO TO EXTERNAL, SHIELD (pin 10)	Shields the talkback audio going to the External location.
TALKBACK AUDIO TO EXTERNAL, (-) & (+) (pins 3 & 11)	Balanced audio (differential pair) connections for the Talkback audio going to an External location's powered monitor speaker.
TALKBACK AUDIO FROM EXTERNAL, SHIELD (pin 2)	Shields the talkback audio coming from an External location. Typically not used in this application.
TALKBACK AUDIO FROM EXTERNAL, (-) & (+) (pins 1 & 9)	Balanced audio (differential pair) connections for the Talkback audio coming from an External location. Typically not used in this application.

* This pin functions differently when DIP switch 7 is set to Off (see page 2-42).



QUICK GUIDE TO THE OUTPUT 1 MODULE

There are ten connectors on the Output 1 module: five 6-pin analog audio output connectors and five 3-pin digital audio output connectors. The connectors are hidden by the meter panel in normal operation.



MIX-MINUS OUTPUTS

ANALOG — *The 6-pin analog outputs have the same mono mix-minus signal applied to both outputs. The left channel also has Talk to Caller audio. The output level is fixed at a nominal +4 dBu.*

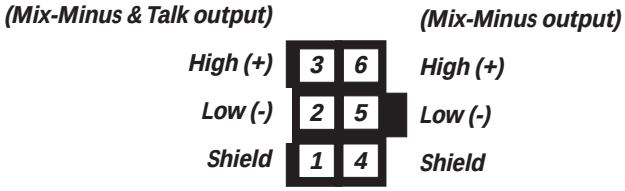
DIGITAL — *The 3-pin AES-3 (AES/EBU) digital outputs can individually be set for sample rates of either 48 kHz or 44.1 kHz. They have the same signals (left and right channels) as the analog outputs.*

TELCO RECORD MIX

ANALOG — *The 6-pin analog output is wired using the standard pinout sequence. The left channel is a mix of those Telco/Codec modules that have the TO REC function active; the right channel is the base record mix. For more information on the composition of the record mix output, see pages 3-7 through 3-9.*

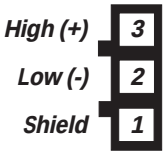
DIGITAL — *The 3-pin AES-3 (AES/EBU) digital output has the same signal as the analog output.*

Analog Outputs — Mono (Mix-Minus 1 - 4)



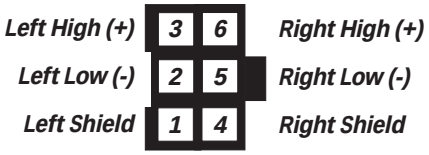
(wire insertion end view)

Digital Outputs



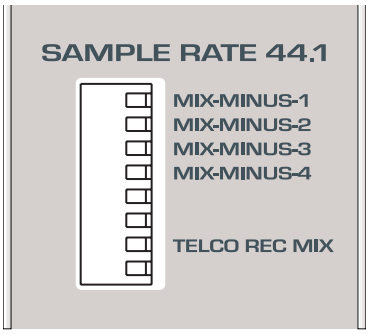
(wire insertion end view)

Analog Outputs — Stereo (Telco Record Mix)



(wire insertion end view)

OUTPUT 1 MODULE SWITCHES

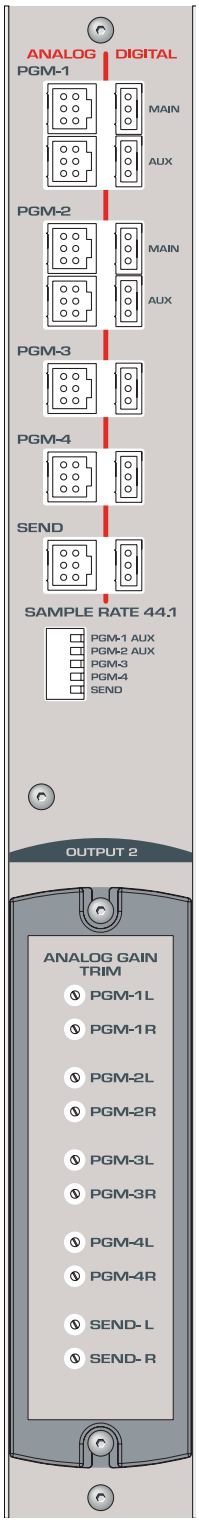


SAMPLE RATE 44.1

MIX-MINUS-1 to -4, TELCO REC MIX — *The DIP switches set the sample rates for the various digital outputs per the Output 1 Module Switch Definitions table below.*

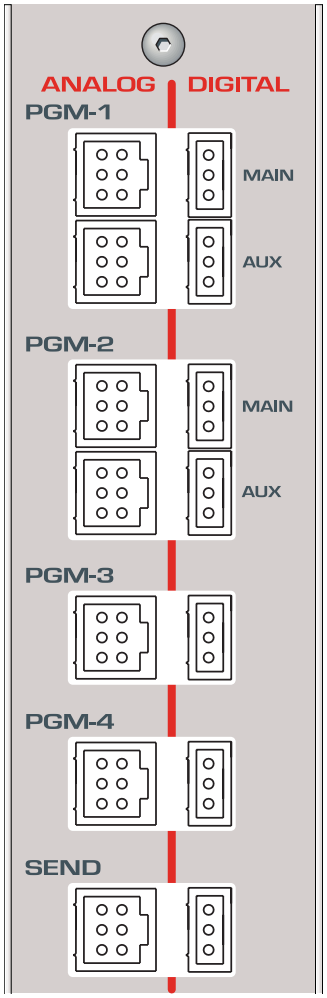
Output 1 Module Switch Definitions

#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
1	Mix-minus 1	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
2	Mix-minus 2	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
3	Mix-minus 3	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
4	Mix-minus 4	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
5	Spare Switch		
6	Spare Switch		
7	Record Mix	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
8	Spare Switch		



QUICK GUIDE TO THE OUTPUT 2 MODULE

There are fourteen connectors on the Output 2 module: seven 6-pin analog audio output connectors and seven 3-pin digital audio output connectors. The connectors are hidden by the meter panel in normal operation.



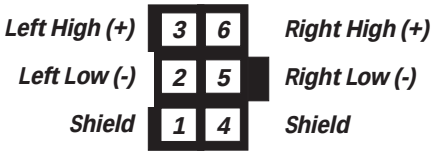
ANALOG OUTPUTS

PGM-1, PGM-2 — *Each bus has an isolated MAIN and AUXiliary analog output. The outputs are wired using the standard stereo pinout sequence.*

PGM-3, PGM-4 — *There is a single analog output for each of these Program buses. They are wired using the standard stereo pinout sequence.*

SEND — *Analog output of the Send bus. It is wired using the standard stereo pinout sequence.*

Analog Outputs



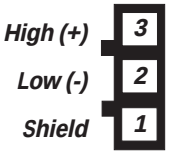
(wire insertion end view)

DIGITAL OUTPUTS

PGM-1, PGM-2 — *There are two digital outputs (MAIN and AUXiliary) for each of the Program 1 and Program 2 buses. All outputs are AES-3 (AES/EBU) compatible. The MAIN outputs are fixed at a 48 kHz sample rate. The AUX outputs are DIP switch-set between 48 kHz and 44.1 kHz.*

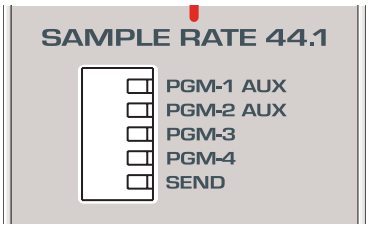
PGM-3, PGM-4, and SEND — *There is a single digital output for each of the Program 3, Program 4, and Send buses. All the outputs are AES-3 (AES/EBU) compatible. Each output can be individually set (via DIP switch) for either 48 kHz or 44.1 kHz sample rates.*

Digital Outputs



(wire insertion end view)

OUTPUT 2 MODULE SWITCHES

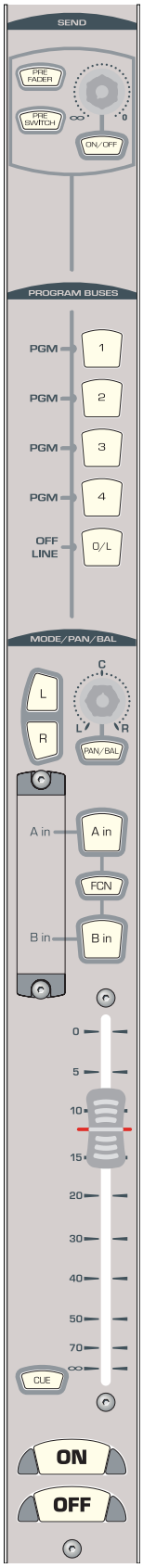


SAMPLE RATE 44.1

PGM-1 AUX, PGM-2 AUX, PGM-3, PGM-4, SEND — *These DIP switches set the sample rates for the various digital outputs per the Output 2 Module Switch Definitions table below.*

Output 2 Module Switch Definitions

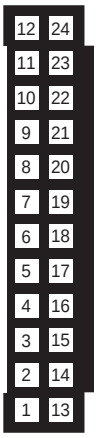
#	Switch Name	ON Function (set to operator's left)	OFF Function (set to operator's right)
1	Program 1 AUX	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
2	Program 2 AUX	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
3	Program 3	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
4	Program 4	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz
5	Send	Sets the digital sample rate to 44.1 kHz	Sets the digital sample rate to 48 kHz



Mic Remote Control Connection Example

This example shows how to set up a Universal Input module as a microphone input, using a remote mic control panel and the A input. For more information on logic connections and DIP switch settings for the Universal Input module, see pages 2-18 through 2-21.

UNIVERSAL INPUT MODULE LOGIC CONNECTOR SIGNAL TABLE

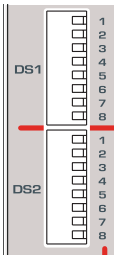


(wire insertion end view)

PIN #	SIGNAL	FUNCTION
1	**LOGIC GROUND**	Module logic ground.
2	LOGIC GROUND	Module logic ground.
3	LOGIC GROUND	Module logic ground.
4	STOP COMMAND PULSE	Stop command output. "N/O" contact.
5	START COMMAND PULSE	Start command output. "N/O" contact.
6	**LOGIC SUPPLY +5VDC**	5 volt source.
7	**ON INPUT (-)**	Remote On switch input (active low).
8	**OFF INPUT (-)**	Remote Off switch input (active low).
9	**COUGH INPUT (-)**	Remote Cough switch input (active low).
10	**LOGIC SUPPLY +5VDC**	5 volt source.
11	LOGIC SUPPLY +5VDC	5 volt source.
12	**LOGIC SUPPLY +5VDC**	5 volt source.
13	COMMAND COMMON	Start/Stop Pulse, Start Sustained common. "C" contact.
14	**TALLIES COMMON**	Tally common connection. "C" contact.
15	LOGIC ACTIVE TALLY	Logic active tally output. "N/O" contact.
16	**OFF TALLY**	Off tally output. "N/O" contact.
17	**ON TALLY**	On tally output. "N/O" contact.
18	**ACTIVATE LOGIC INS (+)**	+VDC to enable external inputs On, Off, Cough, Talkback.
19	RESET (-)	Remote Audio Off input (active low).
20	**TALK TO C/R INPUT (-)**	Remote Talkback input (active low).
21	READY (-)	Remote Ready input (active low).
22	RESET (+)	+VDC to enable Audio Reset function (audio off control).
23	START SUSTAINED	Start sustained command output. "N/O" contact.
24	READY (+)	+VDC to enable the Ready function (Off lamp control).

Notes: +VDC is between +5 and +40 VDC.
Output relays can switch voltages up to +60 VDC
Bold indicates connections used in this example.

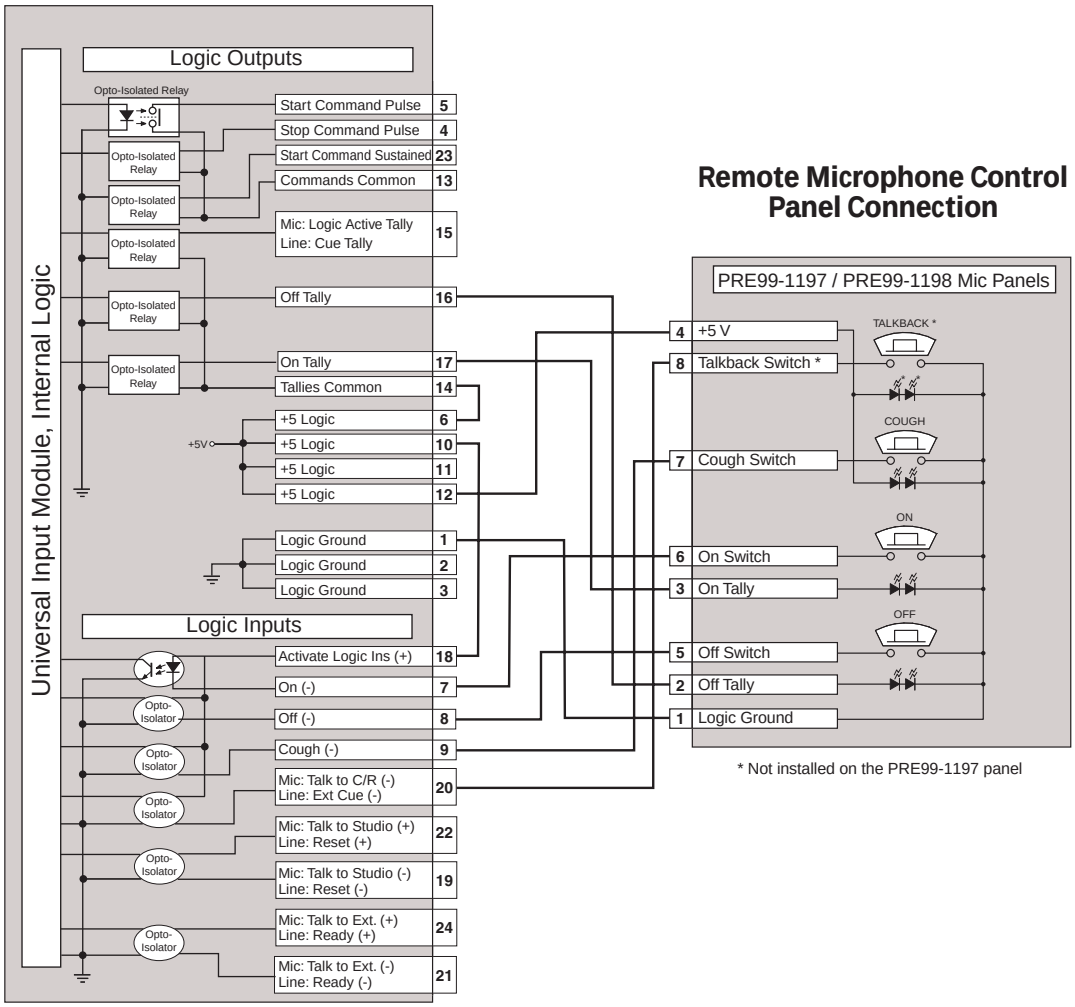
DS1 AND DS2 SWITCH SETTINGS FOR A STUDIO MIC PANEL



DS1 #	DS1 Switch Name	DS1 Setting	DS2 #	DS2 Switch Name	DS2 Setting
1	Signal Source	OFF	1	Fader Start	OFF
2	CR Mute	OFF *	2	Start Pulse	OFF
3	Studio Mute	ON *	3	Start/Stop Pulse	OFF
4	Spare Switch		4	Bypass SRC Converter	OFF
5	External Site Mute	OFF	5	Spare Switch	OFF
6	Local ON Cough	OFF	6	Spare Switch	OFF
7	Timer Reset	OFF	7	Input Level Set A	OFF
8	Off Lamp Control	ON	8	Input Level Set B	OFF

Note: Set the switch to the operator's left for ON. Set the switch to the operator's right for OFF.
* Studio mic settings shown

SIMPLIFIED DIAGRAM FOR INTERFACING A REMOTE MIC CONTROL PANEL



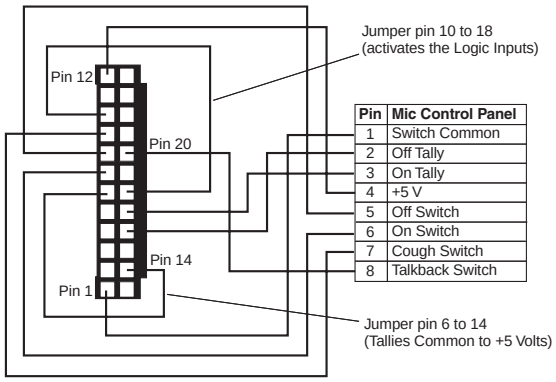
Remote Microphone Control Panel Connection

* Not installed on the PRE99-1197 panel

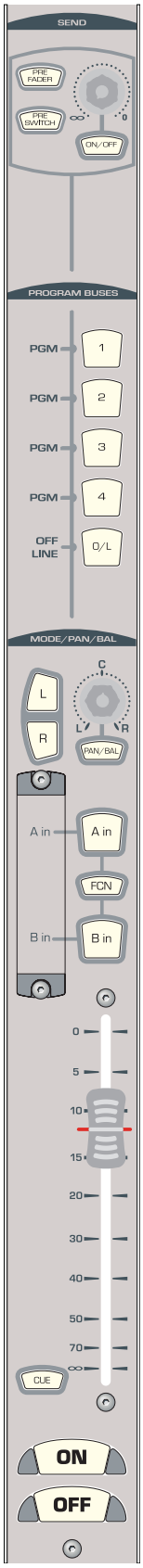
Universal Input Module Logic Interface

Wiring diagram for a PRE99-1198 Mic Remote Control Panel with Talkback

This diagram shows the wiring of the PRE99-787-CU cable. It is used with the PRE99-1197 Mic Panel (with On/Off/Cough buttons) or the PRE99-1198 Mic Panel (with On/Off/Cough/Talkback buttons) and a Universal Input module.



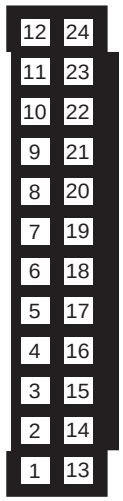
Pin	Mic Control Panel
1	Switch Common
2	Off Tally
3	On Tally
4	+5 V
5	Off Switch
6	On Switch
7	Cough Switch
8	Talkback Switch



Basic Logic Connection Example

This example shows how to set up a Universal Input module (A input) to interface with a CD player, such as the Denon DN-951/961. For more information on logic connections and DIP switch settings for the Universal Input module, see pages 2-18 through 2-21.

UNIVERSAL INPUT MODULE LOGIC CONNECTOR SIGNAL TABLE

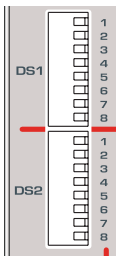


(wire insertion end view)

PIN #	SIGNAL	FUNCTION
1	LOGIC GROUND	Module logic ground.
2	LOGIC GROUND	Module logic ground.
3	LOGIC GROUND	Module logic ground.
4	**STOP COMMAND PULSE**	Stop command output. N/O relay contact.
5	**START COMMAND PULSE**	Start command output. N/O relay contact.
6	LOGIC SUPPLY +5VDC	5 volt source.
7	ON INPUT (-)	Remote On switch input (active low).
8	OFF INPUT (-)	Remote Off switch input (active low).
9	COUGH INPUT (-)	Remote Cough switch input (active low).
10	LOGIC SUPPLY +5VDC	5 volt source.
11	LOGIC SUPPLY +5VDC	5 volt source.
12	LOGIC SUPPLY +5VDC	5 volt source.
13	**COMMAND COMMON**	Start/Stop Pulse, Start Sustained common. C relay contact.
14	TALLY RELAYS COMMON	Tally relays common connection. C relay contact.
15	LOGIC ACTIVE TALLY	Logic active tally output. N/O relay contact.
16	OFF TALLY	Off tally output. N/O relay contact.
17	ON TALLY	On tally output. N/O relay contact.
18	ACTIVATE INPUTS (+)	+VDC to enable external inputs On, Off, Cough, Talkback.
19	RESET (-)	Remote Audio Off input (active low).
20	TALK TO C/R INPUT (-)	Remote Talkback input (active low).
21	**READY (-)**	Remote Ready input (active low).
22	RESET (+)	+VDC to enable Audio Reset function (audio off control).
23	START SUSTAINED	Start sustained command output. N/O relay contact.
24	**READY (+)**	+VDC to enable the Ready function (Off lamp control).

Notes: +VDC is between +5 and +40 VDC.
Output relays can switch voltages up to +60 VDC
Bold indicates connections used in this example.

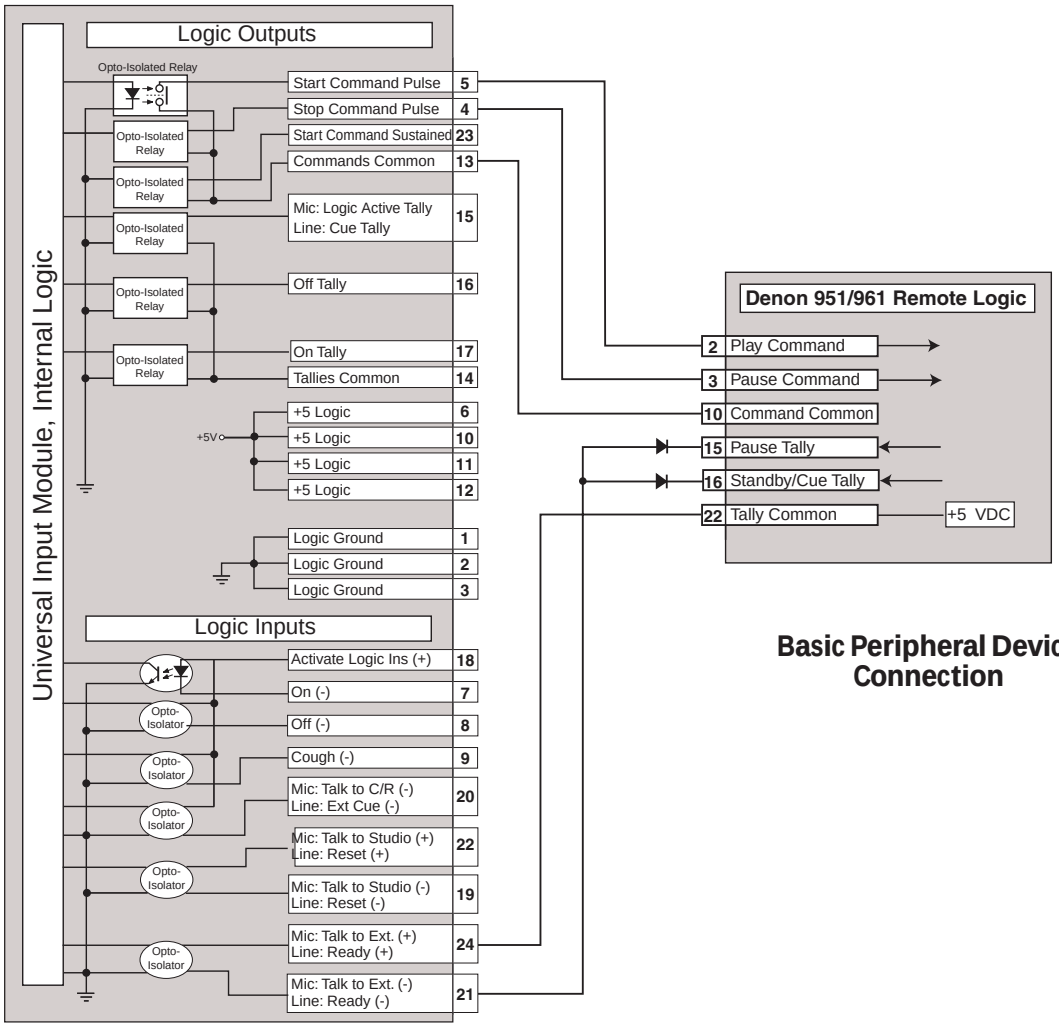
DS1 AND DS2 SWITCH SETTINGS, AS USED WITH A CD PLAYER



DS1 #	DS1 Switch Name	DS1 Setting	DS2 #	DS2 Switch Name	DS2 Setting
1	Signal Source *	ON	1	Fader Start	OFF
2	CR Mute	OFF	2	Start Pulse	OFF
3	Studio Mute	OFF	3	Start/Stop Pulse	OFF
4	Spare Switch		4	Bypass SRC Converter	OFF
5	External Site Mute	OFF	5	Spare Switch	OFF
6	Local ON Cough	OFF	6	Spare Switch	OFF
7	Timer Reset	ON	7	Input Level Set A	OFF
8	Off Lamp Control	OFF	8	Input Level Set B	OFF

Note: Set the switch to the operator's left for ON. Set the switch to the operator's right for OFF.
* Digital input shown

SIMPLIFIED DIAGRAM FOR INTERFACING THE DENON DN-951/961 CD PLAYER

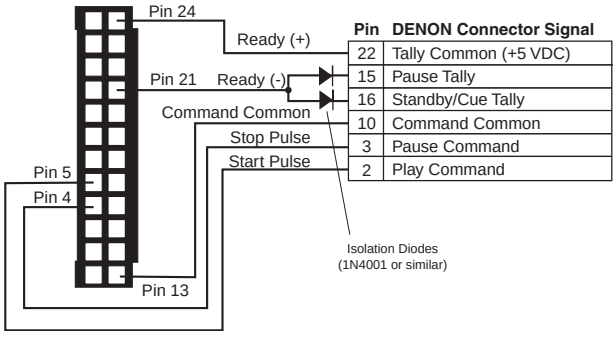


Basic Peripheral Device Connection

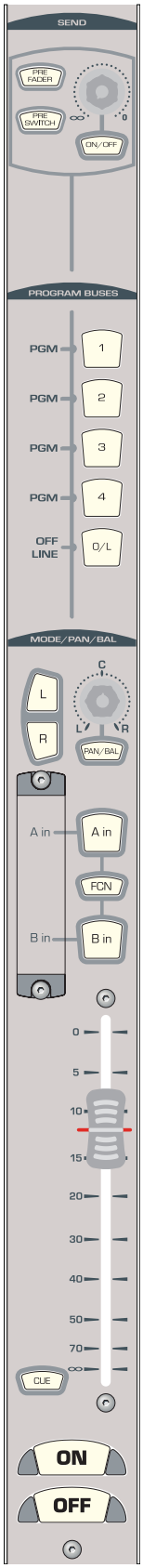
Universal Input Module Logic Interface

Wiring diagram for a Denon DN-951/962 CD Player

This diagram shows the wiring between a typical CD player and a Universal Input module set as a line input.



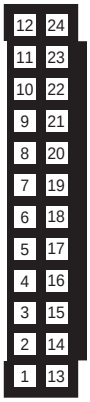
Pin	DENON Connector Signal
22	Tally Common (+5 VDC)
15	Pause Tally
16	Standby/Cue Tally
10	Command Common
3	Pause Command
2	Play Command



Complex Logic Connection Example

This example shows how to set up a Universal Input module (A input) to interface with an Enco DADpro digital delivery system. Additional logic connections and DIP switch setting information for the Universal Input module is on pages 2-18 through 2-21.

UNIVERSAL INPUT MODULE LOGIC CONNECTOR SIGNAL TABLE

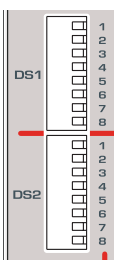


(wire insertion end view)

PIN #	SIGNAL	FUNCTION
1	**LOGIC GROUND**	Console logic ground.
2	LOGIC GROUND	Console logic ground.
3	LOGIC GROUND	Console logic ground.
4	**STOP COMMAND PULSE**	Stop command output. N/O relay contact.
5	**START COMMAND PULSE**	Start command output. N/O relay contact.
6	**LOGIC SUPPLY +5VDC**	5 volt source.
7	**ON INPUT (-)**	Remote On switch input (active low).
8	OFF INPUT (-)	Remote Off switch input (active low).
9	COUGH INPUT (-)	Remote Cough switch input (active low).
10	**LOGIC SUPPLY +5VDC**	5 volt source.
11	**LOGIC SUPPLY +5VDC**	5 volt source.
12	**LOGIC SUPPLY +5VDC**	5 volt source.
13	**COMMAND COMMON**	Start/Stop Pulse, Start Sustained common. C relay contact.
14	TALLY RELAY COMMON	Tally relays common connection. C relay contact.
15	LOGIC ACTIVE TALLY	Logic active tally output. N/O relay contact.
16	OFF TALLY	Off tally output. N/O relay contact.
17	ON TALLY	On tally output. N/O relay contact.
18	**ACTIVATE INPUTS (+)**	+VDC to enable external inputs On, Off, Cough, Talkback.
19	**RESET (-)**	Remote Audio Off input (active low).
20	TALK TO C/R INPUT (-)	Remote Talkback input (active low).
21	**READY (-)**	Remote Ready input (active low).
22	**RESET (+)**	+VDC to enable Audio Reset function (audio off control).
23	START SUSTAINED	Start sustained command output. N/O relay contact.
24	**READY (+)**	+VDC to enable the Ready function (Off lamp control) .

Notes: +VDC is between +5 and +40 VDC.
Output relays can switch voltages up to +60 VDC
Bold indicates connections used in this example.

DS1 AND DS2 SWITCH SETTINGS FOR AN ENCO DADPRO



DS1

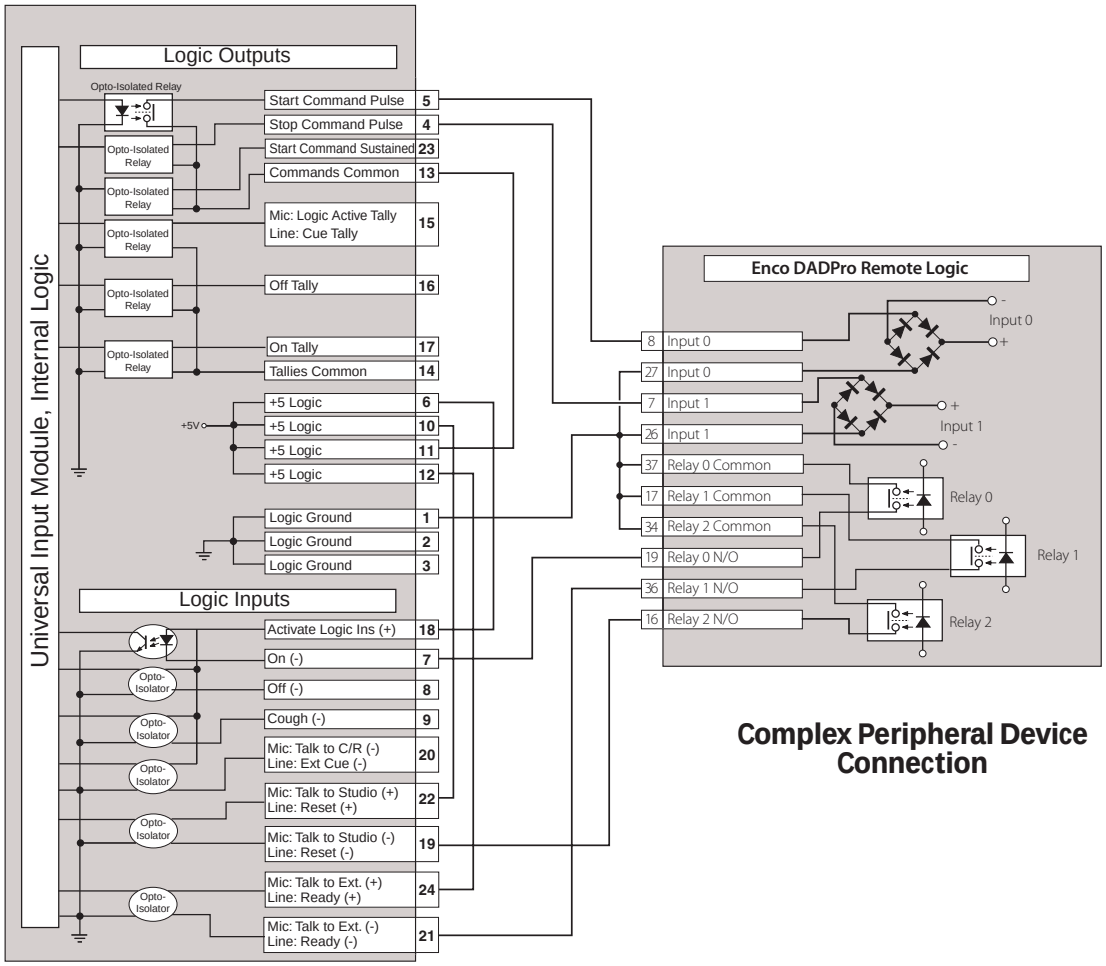
#	*Switch Name*	*Setting*
1	Signal Source *	OFF
2	CR Mute	OFF
3	Studio Mute	OFF
4	Spare Switch	
5	External Site Mute	OFF
6	Local ON Cough	OFF
7	Timer Reset	ON
8	Ready Lamp Status	OFF

DS2

#	*Switch Name*	*Setting*
1	Fader Start	OFF
2	Start Pulse	ON
3	Start/Stop Pulse	OFF
4	Bypass SRC Converter	OFF
5	Spare Switch	OFF
6	Spare Switch	OFF
7	Input Level Set A	OFF
8	Input Level Set B	OFF

Note: Set the switch to the operator's left for ON. Set the switch to the operator's right for OFF.
* Analog input shown

SIMPLIFIED DIAGRAM FOR INTERFACING AN ENCO DADPRO

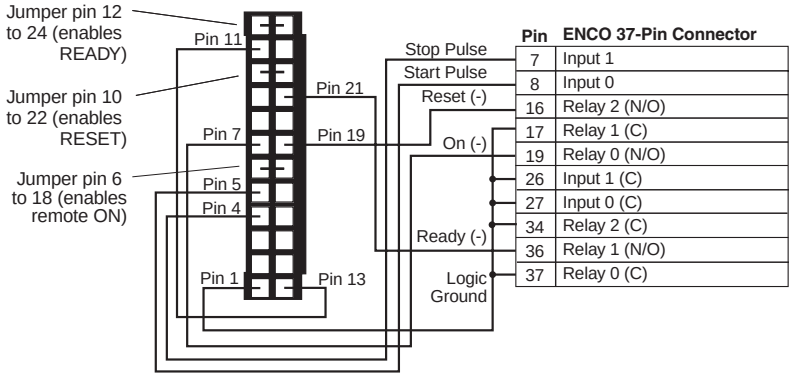


Complex Peripheral Device Connection

Universal Input Module Logic Interface

Wiring diagram for an ENCO DADpro Digital Delivery System

This diagram shows the wiring between a typical Digital Delivery System (using isolated logic connections) and a Universal Input module, set as a line input.



Pin	ENCO 37-Pin Connector
7	Input 1
8	Input 0
16	Relay 2 (N/O)
17	Relay 1 (C)
19	Relay 0 (N/O)
26	Input 1 (C)
27	Input 0 (C)
34	Relay 2 (C)
36	Relay 1 (N/O)
37	Relay 0 (C)

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3

Operation

The operational functions for each module and component in the Legacy console are covered in this chapter. For an illustration of the module placement within the mainframe, see page 2-2.

Module Overview

INPUT MODULES

The Legacy has four types of input modules:

- Microphone Preamplifier
- Universal Input
- Telco/Codec (Telco), up to four
- Remote Line Selector (RLS)

One 5-input Mic Preamp is standard. A second 5-input Mic Preamp PCA can be ordered and installed into the standard Mic Preamp module. A second 5-input or 10-input Mic Preamp module can be installed directly to the right of the standard Mic Preamp.

Any combination of Universal Input modules, RLS modules, and up to four Telco modules may be installed in any of the input module positions.

Pages 3-2 through 3-14 have Quick Guides to operating the input modules:

- Mic Preamp — page 3-2
- Universal Input — pages 3-3 & 3-4
- Telco — pages 3-5 to 3-9
- RLS — page 3-10

METER SWITCHER MODULE

The Legacy has one Meter Switcher module, installed into its dedicated position in the mainframe. The Quick Guide to operating the Meter Switcher module is on page 3-11.

MONITOR MODULES

The Legacy has two types of monitor modules available:

- Control Room
- Studio

The Control Room module comes standard, installed into its dedicated position. The optional Studio module is installed directly to the right of the Control Room module. The Quick Guides to operating the monitor modules are on pages 3-12 and 3-13.

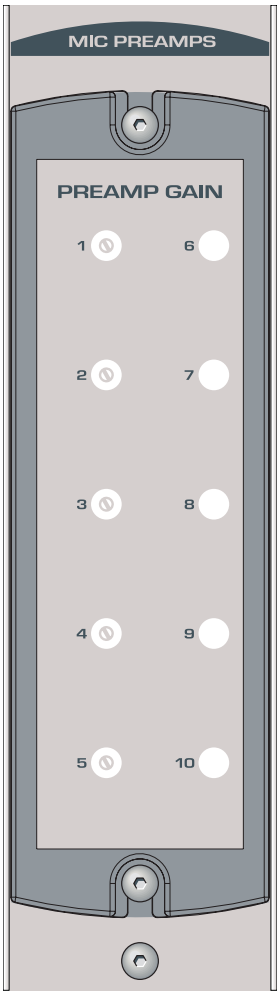
- Control Room module — pages 3-12
- Studio module — pages 3-13

OUTPUT MODULES

The Legacy has two standard output modules installed into dedicated positions on the mainframe. Their Quick Guides are on page 3-14.

Meter Panel Overview

The Legacy meter panel attaches at the rear of the console and closes over the upper part of the modules, hiding all connectors and DIP switches. A Quick Guide to the meter panel functions is on pages 3-15 and 3-16.



MICROPHONE PREAMPLIFIER MODULE QUICK GUIDE

This module amplifies up to ten low-level microphone signals to line-level. The module comes standard with five mic preamps, with an additional 5-input Mic Preamp PCA (PRE95-1151-2) available as an option to the standard Mic Preamp module. A second Mic Preamp module can also be ordered. Use PRE99-1151-1 to order a 10-input Mic Preamp module or PRE99-1151-2 to order a 5-input Mic Preamp module.

The +4 dBu mono output from each preamplifier can be jumpered directly to a Universal Input module, routed to a patch bay, or connected to an external line-level signal processor.

DIP switches (hidden by the meter panel) switch phantom power to any input. Gain trim controls set the preamp gain as required for the application. These are normally set once during installation and then covered by a security panel.

MIC PREAMPS

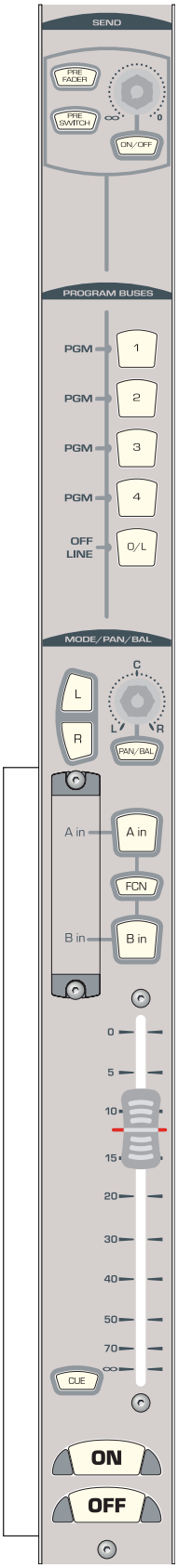
This module section has the trim controls for setting the nominal output to +4 dBu for each microphone. The nominal input signal levels can range from -65 dBu up to -30 dBu

PREAMP GAIN 1 - 5 — *Gain trim controls for the five standard microphone inputs (INPUTS 1 - 5).*

PREAMP GAIN 6 - 10 — *Gain trim controls for an optional 5-input Mic Preamp PCA (INPUTS 6 - 10).*

UNIVERSAL INPUT MODULE QUICK GUIDE

This module has two inputs, each with analog and digital inputs. The source used, as well as other module set-up functions, is set by DIP switches. Two logic connectors allow individual control of the connected devices, with talkback functions for modules set as mic inputs. Every Universal Input module can be assigned to any combination of four Program buses, one Send, and one off-line bus.



FADER SECTION

This section has the module On, Off, and Cue buttons, the input select controls, and the fader. The 2.0" x 0.5" area to the left of the A in, B in, and FCN buttons is available for labelling the A and B inputs. The protective lens can be removed, using the PRE70-90 Hex Driver (included with the tool kit) so that a label can be placed under the lens..

A IN — *Used along with the **FCN** button to select the A Input. The button is lit when the A input is selected.*

FCN — *Protects the input selector buttons from accidental changes. To change the input source, **FCN** must be pressed and held for about one second (until the **FCN** button lights up). This activates the **A in** and **B in** buttons so the input can be changed. The **FCN** button automatically turns off after about three seconds.*

B IN — *Used along with the **FCN** button to select the B Input. The button is lit when the B input is selected.*

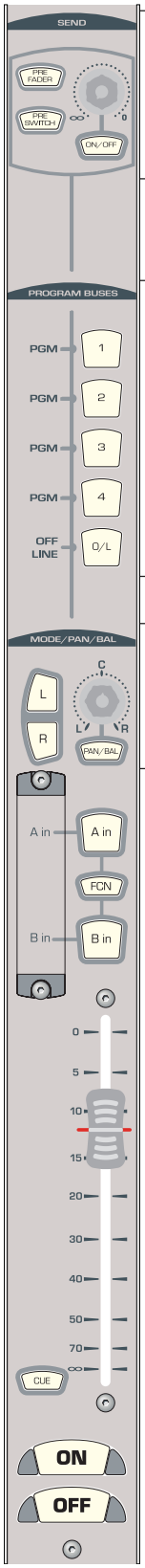
FADER — *100 mm module level control. Setting the fader at the red reference line (-12 dB) sets the module for unity gain.*

CUE — *When lit, routes the input audio to the Cue output. This does not affect the on-line signal. The cue audio is always pre-switch and pre-fader. When the module is used with a microphone, the cue function is momentary. When the module is not a mic input, the cue button toggles the cue function on and off.*

ON — *Press to turn the module on, applying the module's audio to the selected buses. Pressing this button also initiates logic control commands (such as Start Pulse, Mute, Timer Reset, On Tally, etc.), depending upon the Setup DIP switch settings. This button is lit whenever the module is on.*

OFF — *Press to turn the module off, removing the module's audio from all selected Program buses (and the Send if set for post-switch). Pressing this button also initiates logic control commands (such as Stop Pulse, Off Tally, etc.), depending upon the Setup DIP switch settings. The button illumination may be controlled by an external device to indicate its ready status.*

Universal Input Module (continued)



SEND

This section has the level, on/off control, and signal routing controls to feed the module's audio to the Send bus.

PRE FADER — *When lit, the Send audio feed is taken before the module fader (thus adjusting the fader level does not affect the Send output level). When unlit, the Send level is affected by the module fader setting.*

PRE SWITCH — *When lit, the Send audio is always active (it is not affected by the module On/Off buttons). When unlit, the Send audio feed follows the module on/off status.*

Rotary Volume Control — *Sets the level of the module audio feeding the Send bus.*

ON/OFF — *When lit, connects the module to the Send bus. If the module is on (or if the PRE SWITCH button is lit) and the rotary volume control is turned up (and the module fader is up, if PRE FADER is not lit), then audio is applied to the Send bus. When unlit, no audio from this module is applied to the Send bus.*

PROGRAM BUSES

This section has four Program and one off-line bus selectors.

PGM 1, PGM 2, PGM 3, PGM 4 — *When lit, routes the module audio to any combination of the Program 1, Program 2, Program 3, and Program 4 buses. When unlit, the module audio does not feed that bus. These outputs are always post-switch and post-fader.*

OFF LINE (O/L) — *When lit, routes the module audio to the Off-Line bus (which is used to build up an off-air mix-minus for the Telco/Codec outputs). The Off-Line feed is always pre-switch, but whether it is pre-fader or post-fader is set for all Inputs by a DIP switch on the Meter Switcher module. For details on setting this option, see page 2-29.*

MODE/PAN/BAL

This section has the controls for setting the module's mode (stereo or three mono modes) and the pan or balance of the module's bus outputs.

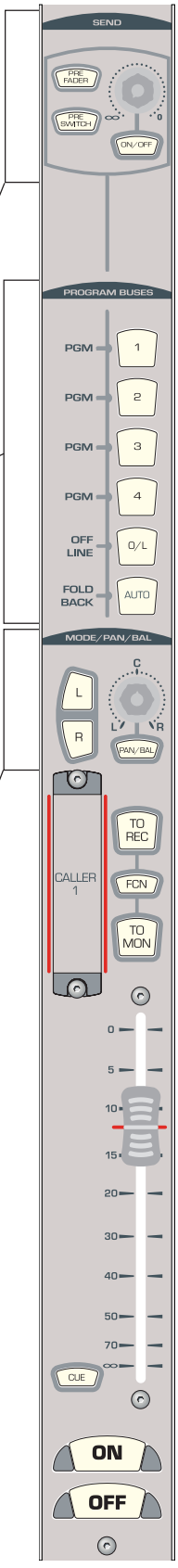
L & R — *These buttons set the mode (stereo or mono). When both buttons are unlit, the module is stereo input/stereo output. When the L (left) button is lit, the left input feeds both the left and right outputs. When the R (right) button is lit, the right input feeds both the left and right outputs. When both L and R buttons are lit, the left and right inputs are summed into a mono mix, which then feeds both the left and right outputs.*

Rotary Pan/Balance Control — *When the PAN/BAL button is lit on a stereo signal, the control functions as a balance pot. On a mono signal (either L or R, or both buttons are lit), the control functions as a pan pot to position the input signal within the stereo spectrum.*

PAN/BAL — *When lit, activates the pan/balance control. When unlit, adjusting the pan/balance control does not affect the audio.*

TELCO/CODEC MODULE QUICK GUIDE

Up to four Telco modules may be installed into any input module position in the mainframe. The module has a single input (analog or digital). DIP switches set the input source and other module functions, such as the Telco ID number for the module. A logic connector allows control of the connected device. Telco modules can be assigned to any of the four program, Send, Off-Line, Telco Record, and Telco Monitor buses. Text on using the Telco module's special functions follows on pages 3-7 to 3-9.



SEND

This section has the same controls and functions as the Universal Input module. See page 3-4 for functions.

PROGRAM BUSES

This section allows the four main outputs and one off-line output to be selected. It also sets manual or automatic foldback.

PGM 1 - 4 — *Assigns the module to any combination of the Program 1, Program 2, Program 3, and Program 4 buses. When the module is assigned to a bus, the associated button is lit. A "winking" button indicates the bus output being used as the Foldback Mix.*

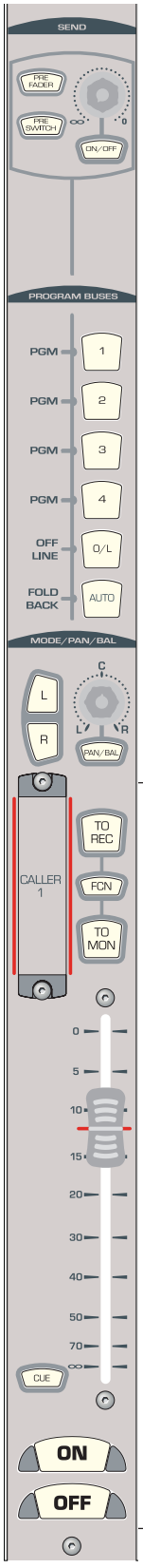
OFFLINE (O/L) — *The off-line bus is used for building up off-air mix-minuses. The Telco module feed to this bus is always pre-switch but post-fader. When assigned to this bus, the O/L button lights. A "winking" button indicates the output that's being used as the Foldback Mix.*

AUTO — *When lit, automatically switches the foldback mix between a program bus (when the module is on) and the off-line bus (when the module is off). When unlit, the foldback mix is not affected by the module on/off status. For more information on the Foldback Mix and using the Auto button, see pages 3-7 to 3-9.*

MODE/PAN/BALANCE

This section has the same controls and functions as the Universal Input module. See page 3-4 for functions.

Telco/Codec Module (continued)



FADER SECTION

This section has the module On, Off, and Cue buttons, the Telco controls, and the fader.

TO REC — *Used along with the **FCN** button to add this module to the Telco Record output—provided the module is assigned to the Record Base Mix (see page 3-8). The button is lit when the module feeds the Record Output and blinks to indicate the module is not assigned to the Record Base Mix, and thus will not be recorded.*

FCN — *Protects the **TO REC** and **TO MON** buttons from accidental changes. To change their status, **FCN** must be pressed and held for about one second (until the **FCN** button lights up). This activates the **TO REC** and **TO MON** buttons so they can be changed. The **FCN** button automatically turns off after about three seconds.*

TO MON — *Used along with the **FCN** button. When the button is lit, the module feeds the Telco Monitor bus. This bus is selected for monitoring on the Control Room and Studio modules.*

FADER — *100 mm module level control. Setting the fader at the red reference line (-12 dB) sets the module for unity gain.*

CUE — *When lit, routes the audio input to the Cue Output pre-switch and pre-fader. Its use does not affect the on-line signal.*

ON — *Turns the module on, applying the module's audio to the selected buses. Selecting this button also initiates On logic control commands, depending on DIP switch settings. This button is lit whenever the module is on.*

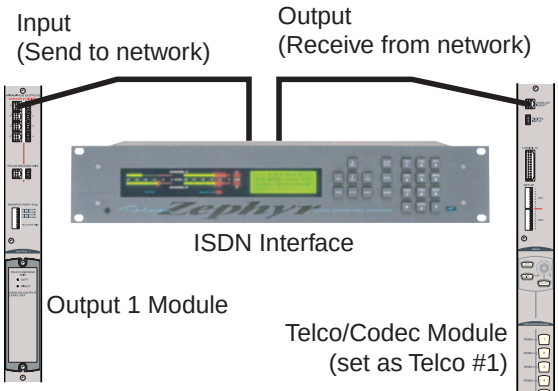
OFF — *Turns the module off, removing the module's audio from all selected buses. Selecting this button also initiates Off logic control commands, depending on DIP switch settings. The button illumination may be controlled by an external device to indicate its ready status.*

TELCO/CODEC MODULE OPERATION

Up to four "callers" (any remote send/receive device like a telephone hybrid, satellite transceiver, ISDN interface, etc.) can connect to their own Telco modules, as shown below.

Each Telco module must be set to a unique Telco ID number (see page 2-23) to create a unique mix-minus output on the Output 1 module. The mix-minus outputs, also called foldback mixes, send one of the program or off-line buses back to the callers—but always minus that caller's audio. Hence the mix-minus nomenclature, and why there are four foldback outputs on Output 1.

Typical Telco/Codec Connection



Each mix-minus output has two channels. The left channel is for the caller, remote talent, or a remote producer since it can have talkback superimposed onto the mix-minus audio. The right channel is a "clean feed" (it has no talkback). It can be used for guests or a remote site broadcast feed. The board operator can talk to any caller (using the talkback mic in the console), by connecting an external Talk to Caller switch to the Telco module logic connector. One SPST momentary switch would be required for each caller.

FOLDBACK MIX

The foldback mix source, indicated by a "winking" bus assignment button, can be any program or the off-line bus.

NOTE: The off-line bus is pre-switch and post-fader on the Telco modules. The Universal Inputs are pre-switch, but they may be pre-fader or post-fader, as set for all modules by Meter Switcher module DIP switch 6 (see page 2-29).

The bus used for the foldback mix is determined from the buses assigned and whether Auto-Foldback is on, and if it is, then the Telco's state (module On or Off) affects which bus is selected.

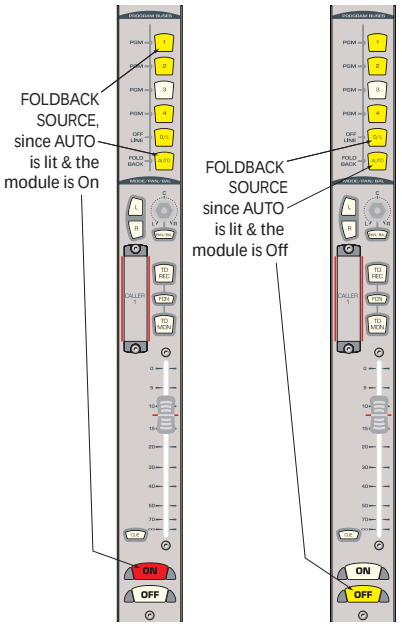
Auto-Foldback On

When the AUTO button is lit, as shown below, that Telco's foldback mix automatically switches between an assigned program bus when the module is On, and the off-line bus when the module is Off, using this bus priority:

While the Module is On, Program 1 is the foldback mix source. If it's not assigned, then the source is selected in this order; Program 2, Program 3, Program 4, Off-Line.

While the Module is Off, Off-Line is the primary foldback mix. If it's not assigned, there will be no mix-minus audio (except for any talkback on the left channel output).

Foldback Sources when AUTO is lit



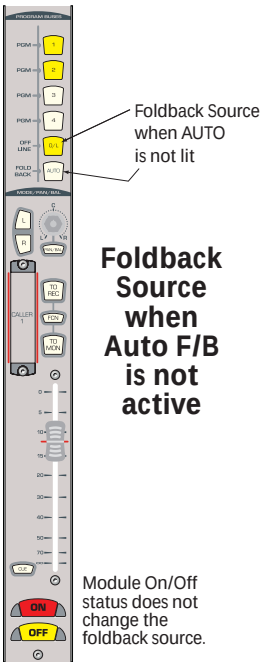
Auto-Foldback On is the most common setting for call-in contests or interviews where the caller will go live on-air. Typically, only the talent's mic module and the caller's Telco module are assigned to the Offline (O/L) bus. With the Telco module Off, the caller can hear the talent thru the offline bus, and the talent can hear the caller through either the Telco Monitor output or Cue. When the Telco module is turned on, the mix-minus feed is switched to Program 1 (assuming the air feed is Program 1), so the caller now hears everything going to air—minus their own voice.

Auto-Foldback Off

When Auto-Foldback is off (the AUTO button is not lit), the module uses a different bus priority order.

While the Module is On or Off, the primary foldback source is Off-Line. If it is not assigned then the program buses are selected in this order; Program 1, Program 2, Program 3, Program 4.

Auto-Foldback Off is the most common setting for recording callers for later broadcast and for doing a live remote where a "broadcast" feed to the remote site is required. In a remote broadcast, when the remote talent goes on-air, the mix-minus should not change, thus only Program 1 can be selected on the Telco and its mix-minus will always be sent back to the remote, regardless of whether the module is On or Off. If a special remote broadcast mix is required, assign Off-Line as well, and it will be the return feed, regardless of the Program bus assignments and whether the module is On or Off.



Foldback Source when Auto F/B is not active

TELCO RECORD MIX

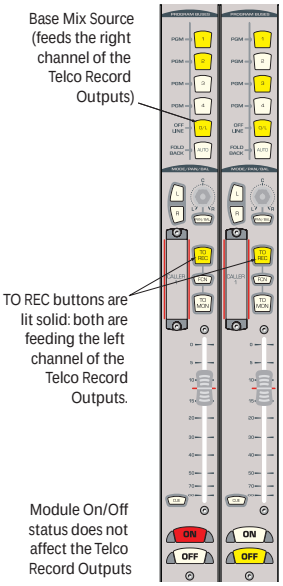
A two-channel Telco Record Mix output is available in analog and digital format on the Output 1 module.

The left channel has only the callers from the Telco modules that have their TO REC buttons lit solid (see page 3-6 for more info on this button).

The right channel has a base mix (one program or the off-line bus). The source for the base mix is determined by a bus priority order, similar to how the Foldback Mix source is selected. Again, the highest priority bus assigned on any TO REC enabled Telco becomes the source for the base mix—even if more lower priority buses are assigned on more TO REC enabled Telco modules.

Typically, only one caller is recorded at a time, but, because there can be up to four Telcos, and each module can have completely different assignments, the TO REC buttons not only record enable a module, they also indicate whether or not that Telco is actually being recorded.

Typical Record Enabled Telco Button Settings



When the TO REC buttons are lit solid, as shown to the right, those callers are feeding the left channel of the record output. When the TO REC button is "winking," (as shown on the next page) it indicates that caller is NOT being recorded.

As with creating the Foldback Mix, the bus priority order changes when a TO REC Telco has Auto-Foldback enabled. But, there is added complexity since multiple modules can have AUTO

turned On! Thus, the easiest way to record a caller is to keep AUTO turned off and only have one Telco module with TO REC active.

Here are the two Telco Recording priority orders and what happens in each condition:

AUTO is un-lit on all TO REC Telcos: The Base Mix source is Off-Line and the TO REC Telco module On/Off settings do not affect the record output (as shown on the previous page). It is the easiest method to record callers.

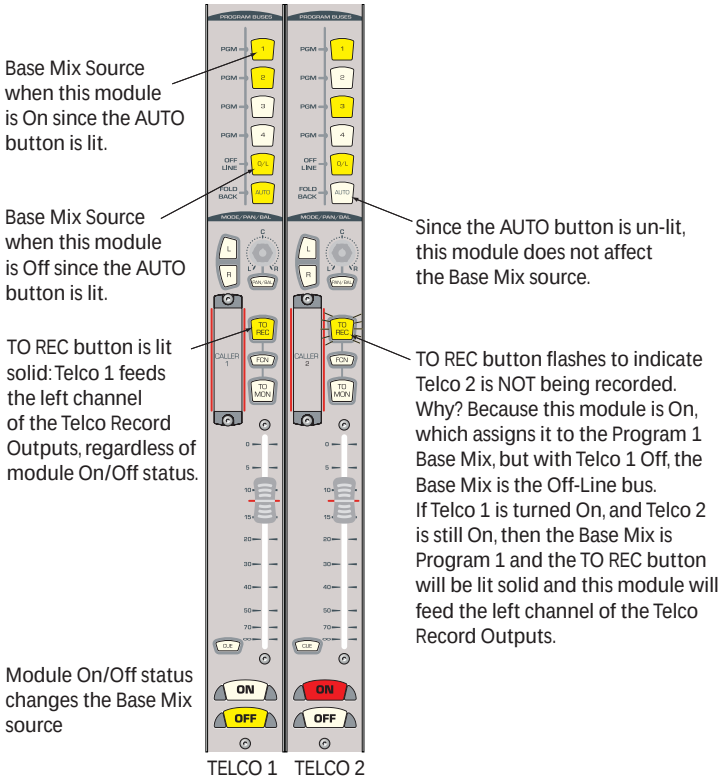
If Off-Line is not assigned, then the Program buses are used in order; Program 1, Program 2, Program 3, Program 4. In this case the TO REC Telco module must be turned On to record the caller. If the TO REC module is Off, then TO REC will wink, indicating that caller is NOT feeding the Telco Record output.

AUTO is lit on at least one TO REC Telco: In this case, the base mix source is affected by the On/Off state of any TO REC Telco with its AUTO button lit. When all of the Telcos with AUTO lit are On, then Program 1 is the primary base mix (followed by Program 2, Program 3, Program 4, Off-Line).

When any of these modules are Off, then Off-Line becomes the base mix. If it's not assigned, there will be no callers recorded and all the TO REC buttons will be winking. This is summarized in the illustration on this page.

NOTE: The Telco modules' Off-Line bus feeds are post-fader. Thus, the fader level must always be raised when recording. The other modules may have their off-line bus feeds set for pre- or post-fader (see page 2-29 about this setting).

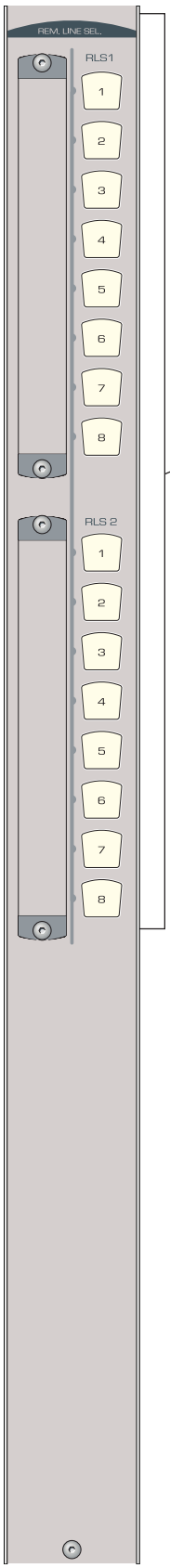
Recording Functions, with Auto Foldback Active, on one or more Record Enabled Telcos



Here is a summary table of what is, or is not, recorded:

TELCO RECORD MIX OUTPUT, CHANNEL ASSIGNMENT SUMMARY

LEFT CHANNEL	Only those Telco modules with their **TO REC** buttons lit solid
RIGHT CHANNEL	All modules assigned to the Base Mix bus, including those Telco modules that are not record enabled (**TO REC** button is not lit)
NOT RECORDED	Any module NOT assigned to the Base Mix bus, which includes any Telcos with a winking **TO REC** button



REMOTE LINE SELECTOR (RLS) MODULE QUICK GUIDE

This module can be set to switch either analog or digital signals to any two locations (Universal input or Telco module, or an external destination like a recorder). A DIP switch sets the signal type (analog and digital sources cannot be mixed on the same RLS module).

Two banks of eight selection buttons independently route the input signals to the two outputs. RLS modules can be installed anywhere in the input module positions in the mainframe.

REM LINE SEL

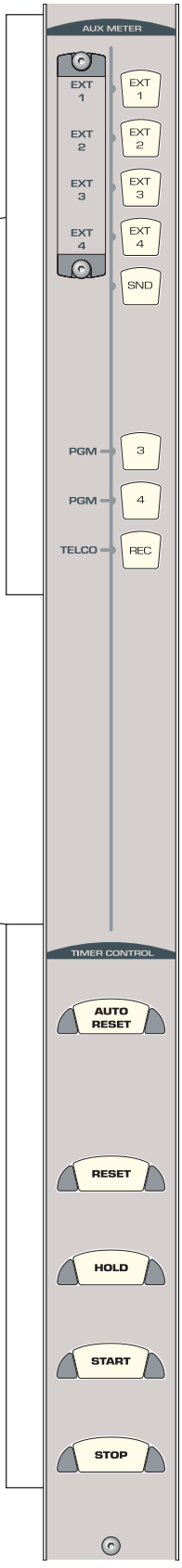
This section has two banks of eight selection buttons used to independently route any of the eight input signals to either, or both, of the two outputs when analog signals are used. With digital signals, each input can only feed one output at a time.

RLS 1, 1 - 8 — *When a button is lit it indicates that input number is going to the output. Only one button at a time can be selected.*

RLS 2, 1 - 8 — *When a button is lit it indicates that input number is going to the output. Only one button at a time can be selected.*

METER SWITCHER MODULE QUICK GUIDE

This module has the controls for the digital timer. It also contains the auxiliary meter selector source buttons, the signal drivers for all the meters, the logic connectors to control up to three external timers, and DIP switches to control various module functions.



AUX METER

This section controls which bus signal is sent to the Meter Switcher bargraph meter on the meter panel. Cue overrides this selection while it is active. Thus, when any Cue button is lit, the Meter Switcher meter displays the Cue level and the selected Aux Meter button winks to indicate it is not being shown on the meter.

EXT 1 - EXT 4 — *When lit, assigns the External 1, 2, 3, or 4 input to the auxiliary meter.*

SND — *When lit, assigns the Send bus output to the auxiliary meter.*

PGM 3, PGM 4 — *When lit, assigns Program 3 or 4 to the auxiliary meter.*

TELCO REC — *When lit, assigns the Telco Record output to the auxiliary meter.*

TIMER CONTROL

This section has the controls for the event timer, located at the right end of the meter panel.

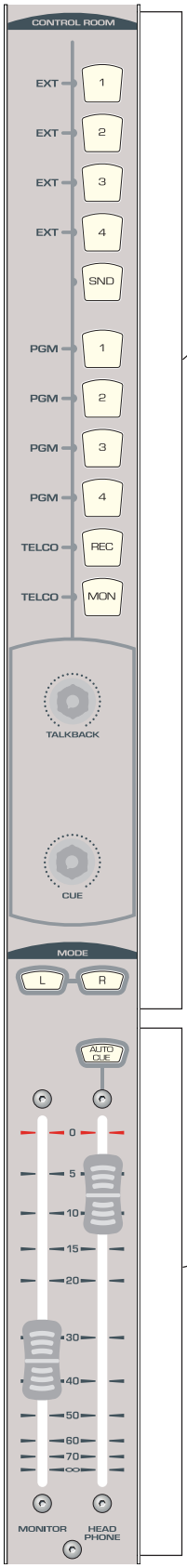
AUTO RESET — *When lit, allows the timer to be automatically reset whenever an input module, with its timer reset function enabled, is turned on. When a reset command is detected, the timer resets to 00:00.0 and immediately starts counting upward. When inactive (not lit), the timer ignores module timer reset commands.*

RESET — *Manually resets the timer to 00:00.0. If the timer was already counting, the timer will continue to count up from 00:00.0.*

HOLD — *When pressed and held, stops the timer's display to show the elapsed time (the timer itself continues to run). Releasing HOLD returns the timer display to the current run time.*

START — *Immediately starts the timer from the displayed time.*

STOP — *Immediately stops the timer. The elapsed time remains on the timer display until cleared by the RESET button, or START is pressed to start the timer counting up from the displayed time.*



CONTROL ROOM MODULE QUICK GUIDE

This module has the control facilities for the console operator, including monitor source selector buttons, talkback and cue level controls, mode selector buttons and fader control of the monitor speaker and operator headphone outputs.

CONTROL ROOM

This section selects which audio signals are sent to the various Control Room outputs. Multiple sources can be selected, by pressing and holding one button while additional buttons are pressed. There is no limit to the number of analog sources (the four Externals and two Telcos) that can be selected, but only two digital sources (the Send and the four Programs) can be selected simultaneously.

EXT 1, EXT 2, EXT 3, EXT 4 — *When lit, assigns External 1, 2, 3, or 4 to the Control Room outputs.External inputs are an analog source*

SND— *When lit, assigns the Send bus to the Control Room outputs. The Send bus is a digital source.*

PGM 1, PGM 2, PGM 3, PGM 4 — *When lit, assigns Program 1, 2, 3, or 4 to the Control Room outputs. The Program buses are digital sources.*

TELCO REC — *When lit, assigns the Telco Record output to the Control Room outputs. This is an analog source.*

TELCO MON — *When lit, assigns the Telco monitor mix to the Control Room outputs. This is an analog source.*

TALKBACK Volume Pot — *Controls the level of the dedicated Talkback output.*

CUE Volume Pot — *Controls the level of the dedicated Cue output.*

L & R MODE — *These buttons set the monitor mode (stereo or mono) for both the monitor speakers and headphones. When both buttons are unlit, the outputs are stereo. When the L (left) button is lit, the left input feeds both the left and right outputs. When the R (right) button is lit, the right input feeds both the left and right outputs. When both L and R buttons are lit, the left and right inputs are summed into a mono mix to feed both the left and right outputs.*

AUTO CUE — *When lit, and Cue is active, feeds Cue to the operator headphone output (how it is fed is set by DIP switch 1, see page 2-33 for details). When unlit, the Cue does not affect the Operator headphones.*

FADERS

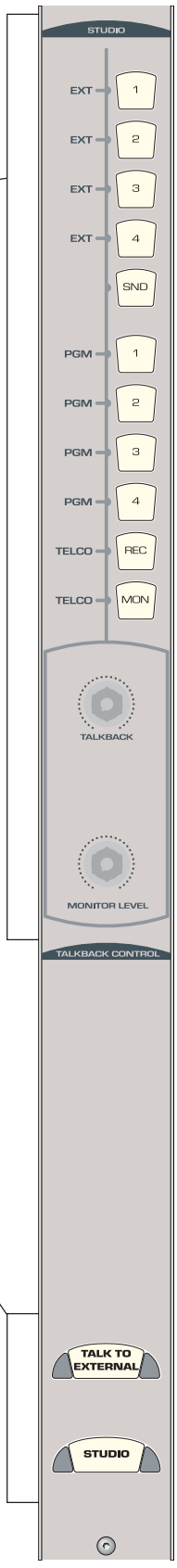
This section controls the monitor and headphone output levels.

MONITOR FADER — *100mm fader to adjust the level of the Control Room monitor speakers. It controls the level of the Monitor output.*

HEADPHONE FADER — *100mm fader to adjust the level of the console operator's headphones. It controls the level of the Operator output.*

STUDIO MODULE QUICK GUIDE

This module has the monitoring and talkback controls for one studio or voice booth and a talkback button for an external location.



STUDIO

This section controls which audio buses are sent to the Studio outputs (Monitor, Host, Co-Host, and Guest). Multiple buttons—up to all of them if desired, can be selected by pressing and holding one button while pressing additional buttons.

EXT 1, EXT 2, EXT 3, EXT 4 — *When lit, assigns External 1, 2, 3, or 4 to the Studio outputs.*

SND— *When lit, assigns the Send bus to the Studio outputs.*

PGM 1, PGM 2, PGM 3, PGM 4 — *When lit, assigns Program 1, 2, 3, or 4 to the Studio outputs.*

TELCO REC — *When lit, assigns the Telco Record output to the Studio outputs.*

TELCO MON — *When lit, assigns the Telco monitor bus to the Studio outputs.*

TALKBACK Volume Pot — *Controls the Talkback level into the Studio outputs that receive talkback (Monitor, Host, Co-Host).*

MONITOR LEVEL Volume Pot — *Controls the level of the Studio speaker output (Monitor). This control is not active when a Studio Control Panel (PRE99-1190) and a Dual Fader controller (PRE99-1192) are connected to the console.*

TALKBACK CONTROL

This section allows the control room operator to talk to the studio talent (Host and Co-Host) and to an external location.

TALK TO EXTERNAL — *When pressed and held, routes the console talkback microphone to the External location talkback output.*

STUDIO — *When pressed and held, routes the console talkback microphone to the Studio Monitor, Host, and Co-Host outputs.*

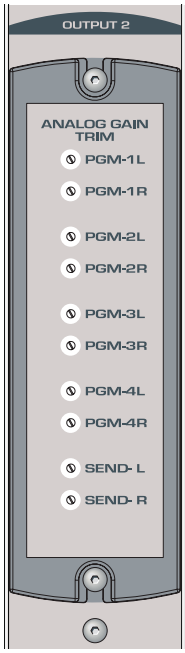
OUTPUT 1 MODULE QUICK GUIDE

This module has the mix-minus outputs, for up to four Telco modules, and the telco record outputs. Two trim controls set the analog record output levels. These controls are normally set once during installation, so should NOT require adjustment by the board operator.

OUTPUT 1

Normally protected by a security cover. It has the separate trimpots for setting the Telco Record Mix outputs.

TELCO RECORD MIX, LEFT & RIGHT — *Sets the analog output levels for the Telco Record Mix output.*



OUTPUT 2 MODULE QUICK GUIDE

This module has the outputs for Program 1, Program 2, Program 3, Program 4, and Send. Trim controls, for the analog outputs, set the left and right channels separately. These controls are normally set once during installation so should NOT require adjustment by the board operator.

OUTPUT 2

Normally protected by a security cover. Separate multi-turn trimpots set the left and right analog output levels for each bus.

PGM-1L/-1R — *Sets the left/right output levels for the Program 1 analog outputs. Both the Main and Aux output are affected equally.*

PGM-2L/-2R — *Sets the left/right output levels for the Program 2 analog outputs. Both the Main and Aux outputs are affected equally.*

PGM-3L/-3R — *Sets the left/right channel output levels for the Program 3 analog output.*

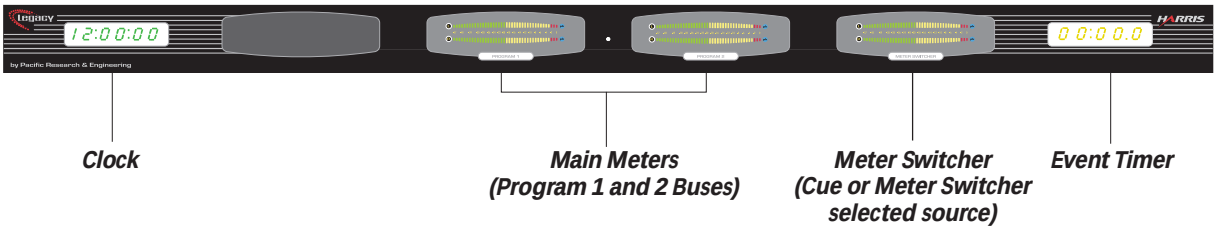
PGM-4L/-4R — *Sets the left/right channel output levels for the Program 4 analog output.*

SEND-L/-R — *Sets the left/right channel output levels for the Send analog output.*

METER PANEL QUICK GUIDE

Each meter panel has a Clock, three Stereo Bargraph Meters, and an Event Timer.

Legacy Meter Panel



CLOCK

The clock expresses time in Hours:Minutes:Seconds in either 12- or 24-hour display format. See page 2-5 for information on setting the clock and for the clock board's DIP switch functions.

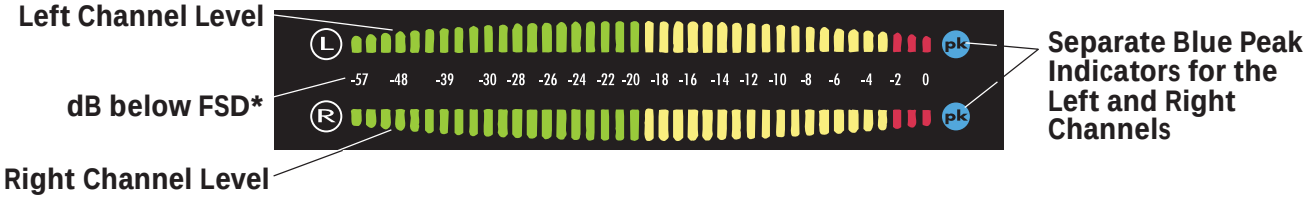
EVENT TIMER

The event timer displays time in Minutes:Seconds:tenths of seconds. See page 2-6 for information on setting the timer board's DIP switches and page 3-11 for the event timer control functions.

BARGRAPH METERS

Three horizontal stereo bargraph meters display Program 1, Program 2, and either Cue or a source selected on the Meter Switcher mdoule. The first two meters, from the left, provide separate level monitoring for the Program 1 and Program 2 buses. The third meter, Meter Switcher, shows the cue bus level (when Cue is active), or a selected source (an external input, the Send bus, the Telco Record Base Mix, Program 3 or Program 4) as set by the Source Selector buttons in the Aux Meter section of the Meter Switcher module (see page 3-11).

Legacy Bargraph Meter



** FSD = Full Scale Digital, or 0 on the meters—the maximum console output level*

Each bar segment, from 0 down to -30, represents a 1 dB level change between bars. From -30 to -57, each bar represents a 3 dB difference in level.

The bars are green from -57 up to -20. The -20 level is equivalent to a 0 VU setting on a mechanical meter. With a properly set up console this results in a +4 dBu analog output (analog outputs can be level trimmed, however). From -20 up to -3 the LEDs are yellow. Levels should normally peak in this area.

The 0, -1, and -2 bars are red to indicate the signal is dangerously close to clipping. To prevent digital distortion on the outputs, the red bars should rarely, if ever, light up—especially the 0 bar since this indicates the signal is at, or beyond, Full Scale Digital (the digital clipping point).

The meters display both the average signal level and the peak level. A solid moving bargraph indicates the average level while the peak level is indicated by a single bar, which is typically 6 to 10 dB higher than the average bargraph. The peak indicator can be set for peak hold, where the highest peak bar stays lit for about 3 seconds, or non-peak hold, where the peak more accurately follows the signal, separately for each meter using DIP switches on the edge of each meter PCA (see page 2-6).

The two blue peak indicators light up to indicate the signal is too hot. The level at which the blue peak indicators turn on (0, -2, -4, or -6) is set separately for each meter using DIP switches on the edge of each meter PCA (see page 2-6).

4 Maintenance

The Legacy console is designed to give you many years of trouble-free operation. If your Legacy does require servicing, please read this chapter as it provides information about maintaining and obtaining service for your Legacy.

Parts and Repair Services

The only parts that are field replaceable are faders, fader knobs, and rotary knobs (see page 4-2 for part numbers). Assemblies may be replaced in the field, but are generally not field-serviceable. For servicing, assemblies should be returned to Harris Technical Services Department.

Legacy technical information (this manual, schematics, SPROM revision information, etc.) are available at this Internet support site: `ftp://ftp.pre.com`. Log in as: `customer` (the username). The password is: `pacific`. All documents and schematics are published in PDF format, so Acrobat Reader 4.0 or later is required.

PARTS ORDERING AND REPAIR INFORMATION

Spare modules and assemblies can be purchased through a sales representative or through the Harris Technical Services Department. To expedite the ordering process and ensure the correct parts are ordered, have the Harris part numbers available when ordering. For a list of parts, see page 4-2. Modules and other assemblies may have lead times exceeding two weeks, so order accordingly.

Assemblies being returned to Harris for service, exchange, or credit must have an RA (Return Authorization) tracking number. This number is assigned by the Technical Services Department. Assemblies received without an RA number written on the shipping label side of the packaging may be returned or subject to an additional handling fee.

To order assemblies or to request an RA, contact Harris by mail, phone, fax, e-mail, or visit the Harris Website:

Harris Corporation
Attention: Technical Services Department
4240 Irwin Simpson Road
Mason, OH 45040 USA

Phone: 513.459.3503, 8:00 to 5:00 EST
Fax: 513.701.5309
E-mail: presupport@harris.com

www.broadcast.harris.com

All U.S. orders and serviced assemblies are shipped FOB Mason, Ohio using UPS Groundtrak, unless otherwise specified. Federal Express or UPS two-day, overnight and next morning delivery is also available for most items. For next day delivery, orders must be placed before 2 p.m. Eastern Time, and the shipping method must be specified at the time of order.

Assembly orders or repair services can be charged to American Express, VISA, or Mastercard. Orders may also be shipped COD, if not on account with Harris. Contact a sales representative for account information.

SPARE AND REPLACEMENT PARTS

The tables on this page list the replaceable or serviceable assemblies and parts for Legacy. It is recommended that one or more of each item be kept on site for emergency use.

Replaceable Parts

The following table lists the parts that are field-replaceable.

Legacy Replacement Parts

Harris #	*Description or Use*
19-327	Flex cable, 30 conductor
21-227-7	Universal Input module SPROM
21-227-8	Telco/Codec module SPROM
21-227-9	Meter Switcher module SPROM
21-227-10	Control Room module SPROM
21-228-1	DSP module SPROM
21-332-1	Output 1 module SPROM
21-332-3	Studio Monitor module SPROM
21-334-1	Remote Line Selector module SPROM
32-725	Rotary knob
32-726	Fader knob (silver)
32-727	Fader knob (red)
32-728	Fader knob (green)
32-729	Fader knob (blue)
32-730	Fader knob (yellow)
33-27-2	Gas spring
80-1753	Trimpot cover lens (Output & Mic Pre)
80-1754	Label cover lens (Input, Telco, & Meter Switcher)
80-1787	Label cover lens (RLS)
90-1709	30' power cable (power supply to console)
90-1713-1	Fader assembly, all modules except C/R
90-1713-2	Fader assembly, Control Room module
99-1100	Divider kit for two 12.25" blank panels
99-1101	Divider kit for three 12.25" blank panels
99-1714-1	Blank panel, 12.5" long (2nd mic preamp cover)
99-1714-2	Blank panel, 25" long (module cover)
99-1714-3	Blank panel, 6" long (accessory panel blank)
99-1714-4	Blank panel, 12.25" long (standard covers)

Serviceable Assemblies

The following table lists the serviceable and replaceable modules and assemblies.

Legacy Assemblies and Modules

Harris #	*Description or Use*
90-1704	Power Stick assembly (Legacy-22 & -30)
90-1727	Power Stick assembly (Legacy-14)
95-1180-1	3.3 V power converter, PCA
95-1180-2	5 V power converter, PCA
95-1180-3	19 V power converter, PCA
95-1181	Power entry converter
95-1178	Clock, PCA
95-1179	Timer, PCA
99-1151-1	Mic Preamp module, 10 Input
99-1151-2	Mic Preamp module, 5 Input
95-1151-1	Main PCA (Mics 1 - 5)
95-1151-2	Optional PCA (Mics 6 - 10)
99-1160-1	DSP, master, assembly (has connector)
99-1160-2	DSP, slave, assembly (no connector)
99-1184	Legacy dual meter assembly
99-1202	Power Supply
99-1315	Universal Input module
90-1315	Faceplate/switchboard assembly
95-1152-4	Main PCA
99-1316	Telco/Codec module
90-1316	Faceplate/switchboard assembly
95-1152-2	Main PCA
99-1317	Meter Switcher module
90-1317	Faceplate/switchboard assembly
95-1159-2	Main PCA
99-1318	Control Room module
90-1318	Faceplate/switchboard assembly
95-1157	Main PCA
95-1167	Connector assembly
99-1319	Studio module
90-1319	Faceplate/switchboard assembly
95-1158-2	Main PCA
99-1320	Output 1 module
95-1155-2	Output 1 PCA
99-1321	Output 2 module
95-1156	Output 2 PCA
99-1323	RLS module
90-1333	Faceplate/switchboard assembly
95-1323	Main PCA

TOOL AND INSTALLATION KITS

A tool kit and an installation kit are shipped with each new console.

Tool Kit

The contents and quantities of the tool kit are listed in the table below.

Tool Kit (Part #76-2001)

Harris #	*Description or Use*	*Qty.*
38-88	Spare Button Head Screws	12
50-7	AA NiCad Batteries	3
70-126	AMP Crimp Tool	1
70-129	Extraction Tool	1
70-43	Module Pull Tool	1
70-90	Allen Driver Hex Tool	1

Installation Kit

The installation kit received depends on the Legacy console ordered:

- Legacy-14 uses kit 76-926-0
- Legacy-22 uses kit 76-926-1
- Legacy-30 uses kit 76-926-2

The contents and quantities of the installation kit are listed in the table below.

Legacy Installation Kit Parts (Part # 76-926-0, -1, -2)

Harris #	*Description or Use*	*Qty.* -0*	*Qty.** -1*	*Qty.*** -2*
14-482	1x3 Receptacle housing	42	57	73
14-484	2x3 Receptacle housing	54	69	85
14-492	2x7 Receptacle housing	1	1	1
14-494	2x8 Receptacle housing	1	1	1
14-513	2x12 Receptacle housing	25	40	56
15-938	AMP MOD IV Terminal	956	1361	1793

* Quantity for Legacy-14
** Quantity for Legacy-22
*** Quantity for Legacy-30

Module Servicing

Most modules consist of two assemblies: a faceplate/switchboard assembly and a Main PCA. A third assembly may be used to add additional connectors. Assemblies may be replaced in the field, but none are field-serviceable.

Note: Do not disassemble the faceplate/switchboard assembly.

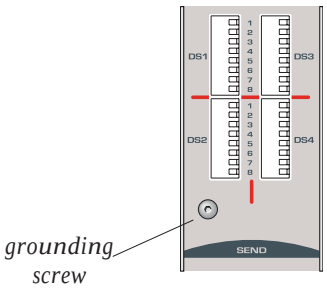
Any module that is not currently in the console's signal path, except for the DSP modules and Output 2, can be removed and installed with the console powered on, and on-air, without causing audio interruption or noises in the program audio.

It is best to first unassign all bus assignment buttons and then unplug all input, output, and logic cables before removing a module from the console.

Removing Modules

To remove a module from the mainframe:

1. Open the meter panel.
2. Use the included hex tool (PRE 70-90) to remove the two screws located at the top and bottom of the module.
3. Use the hex tool to remove the grounding screw located directly below the DIP switches.
4. Screw the module pull tool (PRE 70-43) into the grounding screw hole and use the tool to carefully lift the module out of the mainframe.



Note: If you need to replace one of the assemblies, contact Harris Technical Services for further instructions.

Installing Modules

To install a module into the mainframe:

1. Open the meter panel.
2. Remove the blank panel, if installed, then lower the module into its slot. Be sure to align the pins on the PCA with the motherboard connector in the mainframe.
3. When the pins are aligned, press straight down to seat the module. Do not force the module, and do not press on buttons or connectors while seating the module.

Note: If the module does not work after installation, remove the module. Visually check to make sure that no connector pins are bent, then reinstall the module.

FADER SERVICING

There are no replaceable or rebuildable parts on the Legacy fader assembly. Fader service is comprised of cleaning and lubricating. Faders are conductive plastic, single-element faders.

If the fader movement is rough, either the lubricant on the glide rails has evaporated or foreign material has gotten into the fader. Dow Corning 510 is the preferred glide rail lubricant as it will not migrate to the contact fingers like other lubricating oils.

Fader Disassembly and Cleaning

To disassemble and clean faders:

1. Remove the module from the mainframe.
2. Remove the fader knob and the two fader mounting screws, then remove the fader from the switch assembly.
3. Remove the snap-on fader assembly cover. It is held in place by plastic tabs.
4. Clean the fader using either a dry cotton swab or a cotton swab dampened with distilled water.

Note: The use of chemical cleaners on the conductive plastic will substantially shorten fader life. Never touch the fader slider contact fingers while cleaning the fader parts.

Use only a dry cotton swab, or a cotton swab dampened with distilled water, to clean the fader parts. Always use a clean dry swab to dry off the conductive plastic tracks after cleaning. If the fader rails are noticeably dirty, wipe them off using a dry cotton swab before lightly lubricating the top rail with Dow Corning 510 lubricant (or equivalent).

If coffee, a soft drink, or other sugared liquid has been spilled into the fader, remove it from the module as soon as possible and remove the top cover of the fader. Hold the fader under hot running water and move the fader slider back and forth to dissolve the sugars and other chemicals. Thoroughly dry the rails and conductive plastic using dry cotton swabs and then lubricate the top fader rail with Dow Corning 510 lubricant (or equivalent).

Lubricating the Glide Rail

Move the fader slider to the middle of its travel and place one drop of Dow Corning 510 lubricant (or equivalent) on the top rail on either side of the fader slider bushings. Move the slider through its full travel to distribute the lubricant. Be sure to wipe off any excess lubricant. Normally only the top rail (the one on which the fader slider bushings glide) requires lubricant.

CLOCK AND EVENT TIMER

The Clock and Event Timer assemblies are mounted in the meter panel.

Clock Troubleshooting

If the clock is not working properly, check that the supply cable leading to the assembly is installed correctly. Also check the DIP switches that control the clock's operating mode. The clock's DIP switches are at the edge of the clock circuit board. For more information about the clock circuit board switches and settings, see page 2-5.

Event Timer Troubleshooting

If the Event Timer is not working properly, check that the cable leading to the assembly is installed correctly. It plugs into the Meter Switcher module.

If the tenths of seconds display is not functioning as expected, check the DIP switch on the Event Timer circuit board. For more information about the Event Timer, see page 2-6.

If the Event Timer is not automatically resetting as expected, check the input modules' DIP switches to make sure the Timer Reset switch is set correctly. For more information about setting the input module DIP switches, see page 2-19.

BACKUP BATTERIES

A "Keep Alive" voltage is generated by three AA nickel cadmium (NiCad) batteries (PRE 50-7), supplied in the tool kit. These batteries supply a voltage that holds each module's logic state during momentary power outages. This ensures that the console powers back up in the same state it was in when power was lost.

These batteries should be replaced yearly to ensure continuous backup protection. Additional battery information is given on pages 2-4 & 2-5.

POWER SUPPLY

Periodically check that the vent openings on the power supply chassis are not blocked and that there is no dust buildup on the vent openings.

Caution: To reduce the risk of electric shock, do not open the power supply. Refer servicing to qualified service personnel only.

Power Supply Connections

The power supply cable has two connectors:

- The 5-pin connector supplies DC power to the console.
- The 4-pin connector supplies an Imminent power shutdown warning to the console.

Both connectors must be attached to the back of the Legacy and to the power supply. See page 2-4 for additional information about the power supply connections.

5-pin Connector

Pin	*Signal*	*Wire Color*
1	+48V	Red
2	+48V	Yellow
3	Shield	Clear
4	+48V Return	Black
5	+48V Return	Blue with Black Stripe

4-pin Connector

Pin	*Signal*	*Wire Color*
1	Power Supp 1 Collect	Orange
2	Power Supp 1 Emit	Brown
3	Power Supp 2 Collect	Blue
4	Power Supp 2 Emit	Red with Black Stripe

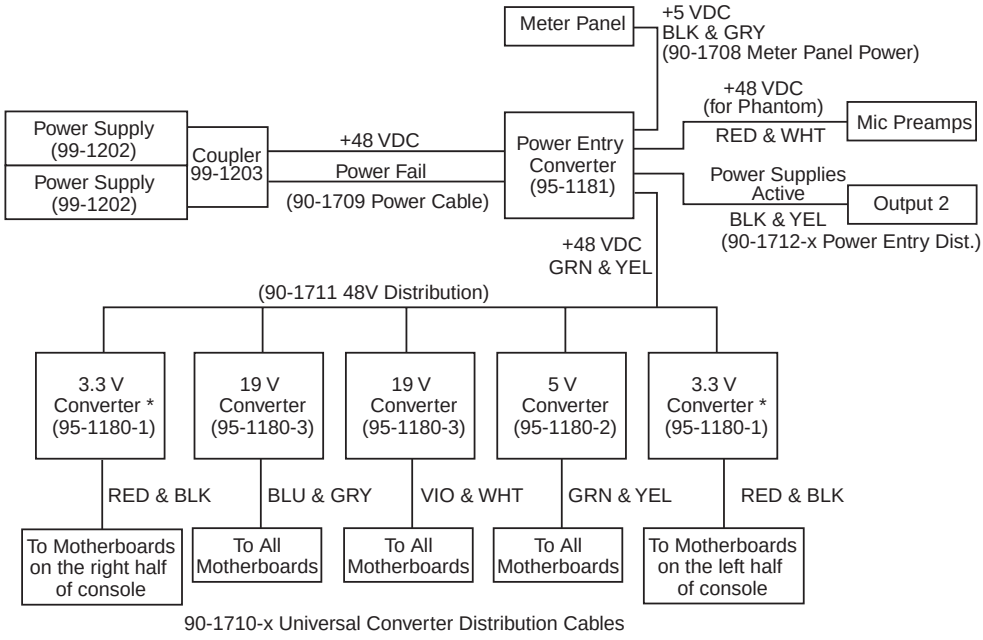
GENERAL TROUBLESHOOTING TIPS

Five converter boards (four on the Legacy-14) are on the Power Stick assembly mounted to the rear chassis. Each converter board is protected by a solder-in fuse. A red LED on each board indicates it is working (remove the bottom cover panels to observe these LEDs). The boards convert the +48 VDC input into +/-19, +5, and +3.3 volts. A power flow block diagram is shown below.

The console will not function without the Master and Slave DSPs and Output 2 installed. These modules generate several clock signals that coordinate communications between the console modules. If these are clocks are missing there will be no module activity (no button LEDs, no meter displays, etc.). No other modules (Input, C/R, Session, etc.) are absolutely essential to "starting up" the console.

The green LED on the power supply indicates its 48 volt output is good. Red LEDs on the DSP cards indicate they are powered. If the power supply is good, and yet the only lights on the console are the LEDs on the DSP cards and the dB and channel lights on the meters, then check the Imminent Power Loss signal (as previously shown in the Power Supply section). With the power supply on, pins 1 & 2 are shorted (and pins 3 & 4 as well if a secondary supply is used). If this signal opens up, it tells the console the power supply has lost power. This causes the modules to save their current button settings before the supply voltage is lost (large supply capacitors keep things powered up for a very short time). Pins 1 & 2 can be manually shorted at the mainframe 4-pin connector to see if this signal is the cause of a start-up problem.

LEGACY POWER DISTRIBUTION SYSTEM



Left End Motherboard (1 per console): Mic Preamp 1, Mic Preamp 2, Input positions 1 - 6, Master DSP
Middle Motherboards (1 on -14, 2 on -22, and 3 on -30): Eight Input Positions, 1 Slave DSP
Right End Motherboard (1 per console): Meter Switcher, Control Room, Studio, Outputs 1 and 2

* On the Legacy-14, there is only one 3.3 V Converter that goes to all motherboards.

5

Accessories

Harris offers a number of accessories and services to complement the Legacy console. Available accessories include several types of host and guest panels (mic control panels and headphone panels), console drop-in peripheral control panels, a Host Turret with Clock and Timer that has space for eight control panels, and a 3 x 6 Headphone Distribution Amplifier with digital level control panels. Services range from supplying logic wiring diagrams for common peripheral devices to system wiring design and installation packages.

FURNITURE AND CABINETRY

Harris has a complete line of standard and custom furniture and cabinetry to house the Legacy console and studio peripheral equipment, as well as complete turnkey studio design and implementation services. Contact a Harris sales representative for details.

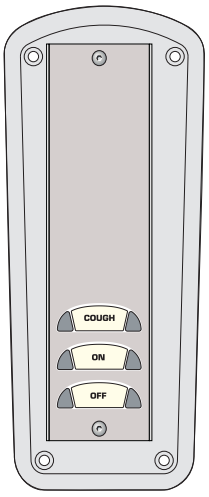
FURNITURE-MOUNTED PANELS

Furniture-mounted accessory panels maintain the look and feel of the console while providing remote control for important studio functions. All Legacy accessory panels are either 1.6" x 6" or 3.2" x 6". Single width panels (1.6" x 6") include various microphone control panels, studio and headphone level fader panels, and peripheral control panels. Cabinet skirt-mounted panels include headphone jack panels, and headphone jack and level control panels. Custom-designed countertop and turret-mounted switch and indicator panels are also available.

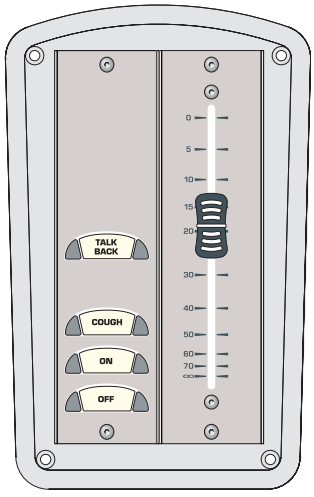
For mounting any single 1.6" x 6" control panel, use the PRE99-1788-1 Single Cabinet Plate. When two 1.6" panels or when a 3.2" double-width panel is required in the same location, use the PRE99-1788-2 Dual Cabinet Plate.

The PRE99-1213 Studio Turret (shown on the next page) is a countertop turret that comes with a PRE99-1211 Clock and Timer. It has space for eight single-width 1.6" panels.

CABINET PLATE APPLICATION EXAMPLES



PRE99-1788-1 SINGLE POSITION CABINET PLATE (SHOWN WITH PRE99-1197 BASIC MIC CONTROL)

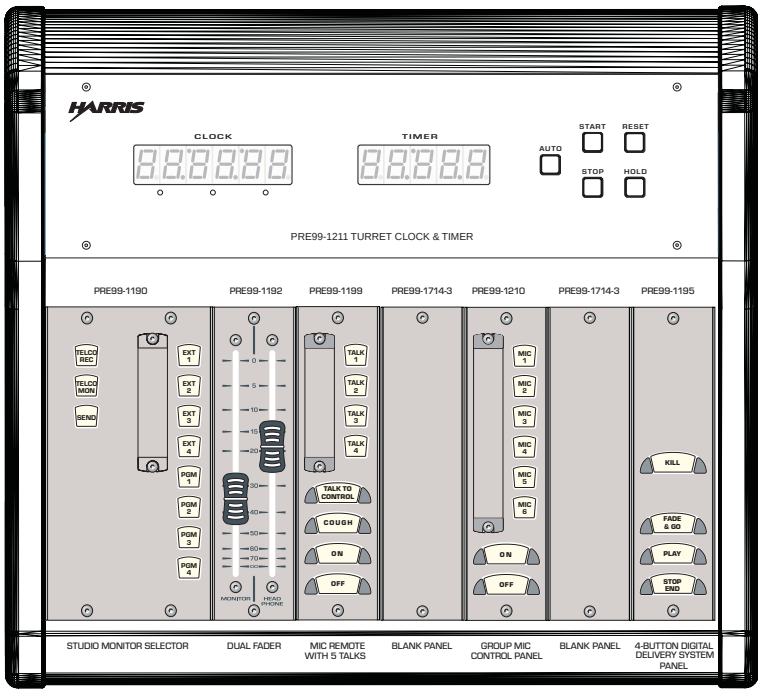


PRE99-1788-2 DUAL POSITION CABINET PLATE (SHOWN WITH A PRE99-1198 MIC CONTROL W/TALK BUTTON & A PRE99-1191 FADER)

PERIPHERAL PANELS

These panels allow the console operator to control other equipment without turning away from the console. Available drop-in panels include the Telos Desktop Director and Switch Console, several digital delivery system controllers, a delay unit controller, and a tape remote. Some of these require Divider Kits (see page 2-2) when mounting into the blank panel areas at either end of the mainframe.

PRE99-1213 TURRET APPLICATION EXAMPLE



MIC REMOTE PANELS

Four mic remote control panels are available for the Legacy. The basic panel is the PRE99-1197, with On, Off, and Cough buttons. The PRE99-1198 (shown in the cabinet plate example on the previous page) adds a Talkback button to the three basic panel buttons. A simplified schematic, and connection information, for these panels is shown on page 5-3.

The PRE99-1199 Mic Control panel (shown in the turret example above) is designed for a host or co-host. It has the standard On, Off, Cough, and Talk to Control Room buttons, but also adds four additional Talk buttons that can be configured for talking to the studio, directly to a host and a co-host, and with an external location.

The PRE99-1210 Group Mic Controller (shown in the turret example) is used in a studio where separate guest mic control panels are not installed. The panel gives a host On/Off control for up to six microphones from a single 1.6" panel.

HEADPHONE DISTRIBUTION AMP

The PRE99-1215 Headphone Amp has six outputs for one Host and up to five Co-Hosts or Guests. The three inputs to the amp come from the Host, Co-Host, and Guest outputs (from either a Control Room or a Studio module).

Headphone levels are digitally controlled through the PRE99-1214-series headphone panels. Headphone panels are available with and without a volume control pot. Those without a pot are designed to work with the Headphone fader controller (shown in the dual cabinet plate example on the previous page).

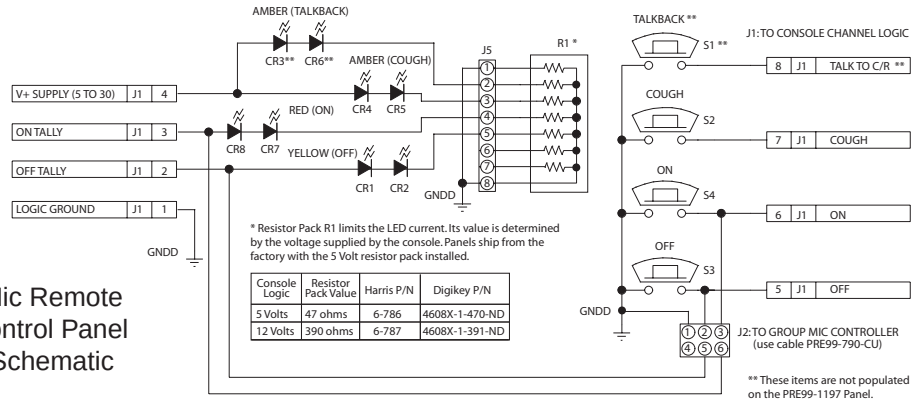
Existing headphone panels, which use a pot to directly control the amplified level, can also be used with the PRE99-1215 amplifier.

LOGIC WIRING DIAGRAMS & CABLES

To assist in logic cable design and construction, Harris' Technical Services Department can supply logic wiring diagrams for many popular peripheral devices (see page 4-1 for contact info).

To assist in installation, Harris also offers premade peripheral logic cables for many popular devices. For availability and pricing, contact a sales representative.

MIC REMOTE CONTROL PANEL (PRE99-1197 AND PRE99-1198) INFORMATION

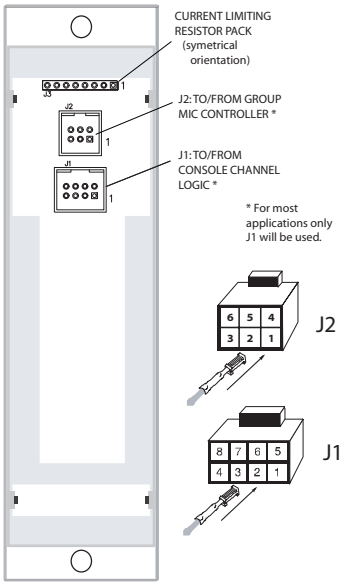


* Resistor Pack R1 limits the LED current. Its value is determined by the voltage supplied by the console. Panels ship from the factory with the 5 Volt resistor pack installed.

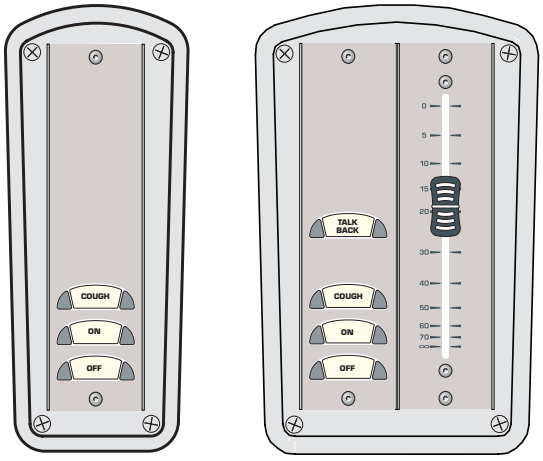
Console Logic	Resistor Pack Value	Harris P/N	Digikey P/N
5 Volts	47 ohms	6-786	4608X-1-470-ND
12 Volts	390 ohms	6-787	4608X-1-391-ND

Mic Remote Control Panel Schematic

Mic Remote Control Panel Connections



Application Examples



PRE99-1788-1 SINGLE CABINET PLATE with a PRE99-1197 GUEST MIC PANEL (ON/OFF/COUGH)

PRE99-1788-2 DUAL CABINET PLATE with a PRE99-1198 GUEST MIC PANEL (ON/OFF/COUGH/TALKBACK) & PRE99-1191HEADPHONE FADER PANEL

PRE99-787-CU, 1.6" Mic Remote Panel Cable (for PRE99-1197 and PRE99-1198)

P1	Signal	Pin		Pin	Signal	P2
	Logic Ground	1	BLK	1	Logic Ground	
	Off Tally	2	WHT	16	Off Tally Output	
	On Tally	3	RED	17	On Tally Output	
	V+ Supply	4	GRN	12	+5 Volt Supply	
	Off Switch	5	BRN	8	Remote Off Switch	
	On Switch	6	BLU	7	Remote On Switch	
	Cough Switch	7	ORG	9	Remote Cough Switch	
	Talkback Switch	8	YEL	20	Remote Talk C/R Switch	
				14	Tally Common	
				6	+5 Volt Supply	
				18	Opto Source Voltage	
				10	+5 Volt Supply	

Mic Remote Panel

Console LOGIC I/O Logic Connector

PARTS LIST
P1: Housing, 8-pin AMP MOD IV (PRE14-486)
P2: Housing, 24-pin AMP MOD IV (PRE14-513)
Contacts, AMP MOD IV (PRE15-938-1)
Cable: 8-conductor Belden # 9421 or equivalent
Jumper Wire: 26 AWG white hookup, UL1429 or equivalent

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Index

Note: Page numbers are listed as Chapter-Page

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U

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